ThermoFisher SCIENTIFIC

The world leader in serving science

MSDS# 8400 COVER SHEET

26156	Pierce® ChIP Kit, Agarose
Component #	Description
1862281	ChIP Kit Subassembly
1862243	Anti-RNA Polymerase II antibody
1862244	Normal Rabbit IgG
1862245	ChIP Positive Control Primers
1862229	Micrococcal Nuclease
1862236	Proteinase K

Life Science Research
Pierce Biotechnology Inc.
PO Box 117
3747 N. Meridian Road
Rockford, IL
61105
(815) 968-0747
(815) 968-7316 fax
www.thermo.com

ThermoFisher SCIENTIFIC

The world leader in serving science

MSDS# 8402 COVER SHEET

1862281	ChIP Kit Subassembly
Component #	Description
1862232	ChIP Protein Agarose
1862233	IP Dilution/Wash Buffer (5X)
1862234	IP Wash Buffer (5X)
1862235	IP Elution Buffer (5X)
1862240	DNA Column Binding Solution
1862241	DNA Column Wash Solution
1862225	pH Indicator
1862242	DNA Column Elution Solution
1862231	5M Sodium Chloride Solution
1862282	Chromatin Prep Subassembly

Life Science Research
Pierce Biotechnology Inc.
PO Box 117
3747 N. Meridian Road
Rockford, IL
61105
(815) 968-0747
(815) 968-7316 fax
www.thermo.com

Thermo SCIENTIFIC

Part of Thermo Fisher Scientifi
The world leader in serving science

Material Safety Data Sheet

ChIP Grade Protein A/G Plus Agarose

1. Product and company identification

Product name : ChIP Grade Protein A/G Plus Agarose

Supplier : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117
Rockford, IL 61105
United States
815.968.0747 or
800.874.3723

Manufacturer : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117
Rockford, IL 61105
United States
815.968.0747 or
800.874.3723

Code : 0026159 0026161 1862232 1901992

MSDS # 8388

Validation date : 6/8/2012.

Print date : 6/8/2012.

Responsible name MSDS (Regulatory Specialist)
CHEMTREC:
800.424.9300
OUTSIDE US:
703.527.3887

Material uses **Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.**

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid. [White, Insoluble Protein Solid in Liquid Buffer]

Color : Colorless.

Odor : Odorless.

Hazard statements : CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Precautionary measures : Do not breathe vapor or mist. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Skin : No known significant effects or critical hazards.

Eyes : No known significant effects or critical hazards.

Potential chronic health effects

Life Science Research Pierce Biotechnology Inc. PO Box 117 3747 N. Meridian Road Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com

2. Hazards identification

Chronic effects : Contains material that may cause target organ damage, based on animal data.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: upper respiratory tract, eyes, teeth.

Over-exposure signs/symptoms

Inhalation : No specific data.

Ingestion : No specific data.

Skin : No specific data.

Eyes : No specific data.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
sucrose	57-50-1	1 - 3

Canada

Name	CAS number	%
sucrose	57-50-1	1 - 3

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Life Science Research Pierce Biotechnology Inc. PO Box 117 3747 N. Meridian Road Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com

4. First aid measures

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Life Science Research PO Box 117 Rockford, IL (815) 968-0747 www.thermo.com
Pierce Biotechnology Inc. 3747 N. Meridian Road 61105 (815) 968-7316 Fax

ChIP Grade Protein A/G Plus Agarose

7. Handling and storage

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
sucrose	**ACGIH (United States).** TWA: 10 mg/m³ **NIOSH REL (United States, 6/2009).** TWA: 5 mg/m³ 10 hour(s). Form: Respirable fraction TWA: 10 mg/m³ 10 hour(s). Form: Total **OSHA PEL (United States, 6/2010).** TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust **OSHA PEL 1989 (United States, 3/1989).** TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust **NIOSH (United States).** TWA: 5 mg/m³ **ACGIH TLV (United States, 1/2011).** TWA: 10 mg/m³ 8 hour(s). **OSHA PEL (United States). Notes: Respirable** TWA: 15 mg/m³ 8 hour(s).

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
sucrose	US ACGIH 1/2011	-	10	-	-	-	-	-	-	-	
	AB 4/2009	-	10	-	-	-	-	-	-	-	
	BC 9/2011	-	3	-	-	-	-	-	-	-	[a]
		-	10	-	-	-	-	-	-	-	[b]
	ON 7/2010	-	10	-	-	-	-	-	-	-	[c]
	QC 9/2011	-	10	-	-	-	-	-	-	-	

Form: [a]Respirable dust [b]Total dust [c]total dust

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmospher or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriat techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Life Science Research PO Box 117 Rockford, IL (815) 968-0747 www.thermo.com
Pierce Biotechnology Inc. 3747 N. Meridian Road 61105 (815) 968-7316 Fax

8. Exposure controls/personal protection

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid. [White, Insoluble Protein Solid in Liquid Buffer]

Color : Colorless.

Odor : Odorless.

pH : 7

10. Stability and reactivity

Chemical stability : The product is stable.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sucrose	LD50 Oral	Rat	29700 mg/kg	-

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Life Science Research PO Box 117 Rockford, IL (815) 968-0747 www.thermo.com
Pierce Biotechnology Inc. 3747 N. Meridian Road 61105 (815) 968-7316 Fax

ChIP Grade Protein A/G Plus Agarose

11. Toxicological information

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sucrose	A4	-	-	None.	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sucrose	LD50 Oral	Rat	29700 mg/kg	-

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sucrose	A4	-	-	None.	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Life Science Research PO Box 117 Rockford, IL (815) 968-0747 www.thermo.com
Pierce Biotechnology Inc. 3747 N. Meridian Road 61105 (815) 968-7316 Fax

12. Ecological information

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Other adverse effects : No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Target organ effects

U.S. Federal regulations : **TSCA 5(a)2 proposed significant new use rules**: 5-chloro-2-methyl-2H-isothiazol-3-one; 2-methyl-2H-isothiazol-3-one
TSCA 8(a) IUR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: sucrose
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: sucrose: Delayed (chronic) health hazard

Clean Water Act (CWA) 311: Hydrogen chloride

Life Science Research PO Box 117 Rockford, IL (815) 968-0747 www.thermo.com
Pierce Biotechnology Inc. 3747 N. Meridian Road 61105 (815) 968-7316 Fax

15. Regulatory information

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

State regulations

Massachusetts : The following components are listed: SUCROSE DUST

New York : None of the components are listed.

New Jersey : The following components are listed: Agarose

Pennsylvania : The following components are listed: Agarose; .ALPHA.-D-GLUCOPYRANOSIDE, .BETA.-D-FRUCTOFURANOSYL

United States inventory (TSCA 8b) : Not determined.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : Not determined.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : **Australia inventory (AICS)**: Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.

16. Other information

Label requirements : CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

The customer is responsible for determining the PPE code for this material.

Life Science Research PO Box 117 Rockford, IL (815) 968-0747 www.thermo.com
Pierce Biotechnology Inc. 3747 N. Meridian Road 61105 (815) 968-7316 Fax

16. Other information

National Fire Protection Association (U.S.A.) :

Date of printing : **6/8/2012.**
Date of issue : 6/8/2012.
Date of previous issue : No previous validation.
Version : 1
Prepared by : MSDS (Regulatory Specialist)

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Life Science Research Pierce Biotechnology Inc. PO Box 117 3747 N. Meridian Road Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&'() "*$#+(, "#"() - $$#

! "(#$(%&) *&+, (-(. /01(2) 3415

78(. %012#("30(2/ 49"3+(&0$3#&&2"#&3

.%012#(3"4$	: ! "(#$(%&) *&+, (-(. /01(2) 3415		
)199'&$%	: A14$B+(C&0145[DE&4, *$&E $&4$E4(2&*4E1, +'+FG $+H+2+I (66; J+B<3+5(&#+(866<! M, &4@D7' *40 76! +&87=<; Q (+5 7<<=7; O=; 9:	! "31"'2#!1$%	: A14$B+(C&0145[DE&4, *$&E $&4$E4(2&*4E1, +'+FG $+H+2+I (66; J+B<3+5(&#+(866<! M, &4@D7' *40 76! +&87=<; Q (+5 7<<=7; O=; 9:
5/0$	: 67899: :		
!),)(O	: 7: 7N		
6"'&0"#&3(0"#$	: ;-66-9<69=		
.%&#(0"#$	: ;-66-9<69=		
;$<9/3<&=$(3"4$	: PD%D(DQ4E&'&0"		
	5>?! @?5: ABB&DCDEEFEB GH(@I, ?(H): JEF&DJF AAU	! "#$%&'(1<$<	: $"$%#(# $(&0<#%2#&3 =//L'$#"?/ %@9$9$%'30 &#$30$0(1<$&(G# $%#&$N 2/3#'2#(<199'&$%(/ %<9$2&&2 "99'&0"#&3<8
.%012#(#+9$	: >&) &@=		

D&>"Q'%0<(&0$3#&&2"#&3

?4$%B$32+/TS%&M

.-+<&2"'(<#'#$	: >&) &@=		
5/'/%	: [+'+5400=['4/5=		
G0/%	: H@5400=		
)&P3"'(M/%0	: . W X#XYZ		
>"Q'%((<#'#&4 $3#<	: [WMDRD(J RD$#I WAHJ \ (AJ V[AL(R\ R(WK%[D] #K (#I J #WA#HX+((PW (2R(VW PCM> #C(D. W>>H. R%#([HX AWK D(P WARJ #/W+(AVWA[WK ([WMDR(AW YRA(HJ YWK %/WP WR=		
.%2"1#&3"%#(4 $"<1%<	: %+(, +'(T5&/*14(' / Q+5(+5(B&0"+(%+(, +'(&F40"+((M04(+, 'GU&I(//@?) / *4(' 4, *&'*&, +((%+(, +'4/ *L(@&K(+5(0B +K4(U14, () 0&F(*1&((G5+@E"+(W'+&@E+, */E(U&I(4G40L(0K&(/, @E+*1&F=]44Q(E+, '/&4 5(*&1*GE+04@&((. /01(*1+5+) F'1'G/3415(1/, @&F=		
G)>R$5)(<#'#1<	: A1&(B/*45&'(&(E+, 0&@54@1/S'5@+) 0(TG*14(HDVW(V/S'5@[+B B), &E'*&, (D'/, @5@ ^9N[CJ (6N5<=69<<_=		
;/1#$</(*($3#%	: %4$B/'(E+, */E'+(RG4(E+, */E'+(# 1/'/*&, +(# F40"&, =		
./#&3#&'(''21#$(-$"'# ($"*$2#<			
I3-"'''#&3	: #&&(*&F(*+(5400&(*+5[00(3"4B+((RI Q+0) 54(*+(@E+B Q+0&&, (Q5+@E'0(B/G(E/) 04(/(14/'*1 1/S'5@((D45&) 0(43(#E'0(B/GT4(@'/G4@&+"+U&F(4I Q+0) 54=		
I3P$<#&3	: V/ $B:3)'(&[0U/"+U4@=		

#$(%&( )*+,)- . ('(/ 012(3+4456

D&>"Q'%0<(&0$3#&&2"#&3

)L&I	: #&&(*&F(*+(0K&=	
?+$<	: D4' 454'G[5&(*&F(*+(4G40+((J &K(+3(0458&) 0(@B/F4(*+(4G40=	
/#&3#&'(2-%3&2($"*$2#<		
5-%3&2($"*$2#<	: [+, '/&0(B/*45&'(*1/*(E/, (E/) 04('/'5F4*(+5F/, (@B/F4=	
5"%&&/P$3&2&#+	: X+(K, +U, (0&E, &&E7, *(43#tE'0(+5(E&&E/'(1/S'5(@=	
! 1#'P$3&2&#+	: X+(K, +U, (0&E, &&E7, *(43#tE'0(+5(E&&E/'(1/S'5(@=	
@$%#P$3&2&#+	: X+(K, +U, (0&E, &&E7, *(43#tE'0(+5(E&&E/'(1/S'5(@=	
, T'/94 $3#'($"*$2#<	: X+(K, +U, (0&E, &&E7, *(43#tE'0(+5(E&&E/'(1/S'5(@=	
Y$'%&&#+($"*$2#<	: X+(K, +U, (0&E, &&E7, *(43#tE'0(+5(E&&E/'(1/S'5(@=	
@'%P$#/ %P' 3<	: [+, '/&0(B/*45&'(U1&E1(B/G(E/)04(@B/F4(*+(*14(3#"+U&F(+5F/, 0b(K&&4G0L(') , F0L '&4$L(0Q44, L(F/0*5+&*40*&/*(*5'E*L4, @E5&4L(0K&L(4G40L(0*+B/E1=	
GT$%&U9/<1%(<$P3<S<+4 9#4<		
I3-"'''#&3	: W@4504(0CB Q'+B0(B/G&E) @(*14(3#"+U&Fb 5400&(*+5Q*5'E'(&&(*&, E+) F1&F	
I3P$<#&3	: X+(0Q4E&&E(@'/=	
)L&I	: W@4504(0CB Q'+B0(B/G&E) @(*14(3#"+U&Fb &&(*&, 54@400	
?+$<	: W@4504(0CB Q'+B0(B/G&E) @(*14(3#"+U&Fb Q'&(+5&&(*&, U/*14&F 54@400	
! $0&2"'(2/30&&3< "PP%T" #$0(=+(/T$% $U9/<1%	: $54a4I &0"&F(@+5@5(&`+"`&F(/, G'/'5F4*(+5F/, 0(B4, *&, 4@&(*1&(P D%D(/0(T4&F(/* 5&K(B/GT4(/'FF5'`/*4@TG+'45&4I Q+0) 54(*+(*1&(Q5+@E"=	

) $$(# U&2/'/P&2"'(&0*/%4 "#&3(V $2#&3(77W

F8(5/49/<&&&3S&8*/%4 "#&3(/3(&8P%$0&$3#<

H3&$0() #&<

Z"4$		5R) (314 =$%	[
$+'G+H G&6L9a4*1/, 4(@G_L((cat'6L6L L: a'4*5/B4*1GT) *G_Q14, Gasf a1Q@+H Ga 0+@&B(E1'+5&@ *5+B4*/B+'		N<: 8a6Nal ; 8Q a5Qal ; ; a'8a6	: (a! : (a! 6(a(

5"3"0"

Z"4$		5R) (314 =$%	[
$+'G+H G&6L9a4*1/, 4(@G_L((cat'6L6L L: a'4*5/B4*1GT) *G_Q14, Gasf a1Q@+H Ga *5+B4*/B+'		N<: 8a6Nal ; ; a'8a6	: (a! 6(a(

@$%(" %(3/(" 00&&3"'(&P%0&3#<(9%<$3#(M- &2- NM&# $&(# $(21'%&3#(L3/M'$0P$(/ *(# $(<199'&$%'30(&&(# $ 2/32$3#%#&3<(" 99'&2" ='$N(' %(2" <<&&0(" <(-"Q'%/1<(# (/ %# $(3$T&%34 $3#" 30(-$32$(%\ 1&&(%9/ %&3P(&& # &(<$2#&38

C8(Y8/%#(" 80(4 $" <1%$<

? +$(2/ 3#' 2# : [14EK(3+5(/ , @54B +`4(/ , G(E+, */ E*('4, 040+(#B B 4@&,*4'G3) 01(4G40(U&1(Q4, *G+3(U/ *45 3+5(/ *('4/ 0*(6! (B & ) *40(+HEF 0&, / `"G'&8*&F(*14() QQ45(/ , @+U45(4G#`&0)+((Y 4*(B 4@&F ' / `"4, *&, (&B B 4@&,*4'G=

) L&(2/ 3#' 2# : # (E/ 04(+3(E+, */ E(U&B B 4@&,*4'G3) 01(0K&(U&1(Q4, *G+3(U/ *45(3+5(/ *('4/ 0*(6! (B &) *40 U1&(54B +`&F(E+, */ B &/ `4(@E/+*1&F(/ , @01+40+((_ / 01(E/+*1&F(T43+54(54) 04+((`['4/ , 01+40(*1+5+) F1'GT43+54(54) 04+((Y 4*(B 4@&F ' /("4, *&, (&B B 4@&,*4'G=

I3- "'"'#& 3 : P+` 4(4I Q+04@Q45(+, (*+(354101(/ &+((B, +*(T54/ "1&F(U&T54/ "1&F(&(B54F) ' / 5+5(& 5400&5/ *+5(3/ 5540(*(+EE) 50(Q5+ `&@(/ 5&&&` (5400&5/ *&, (+5+I GF4, (T(&"5/ &4@Q450+, , 4'= >++04, ,(*&'1(E+*1&F(0) E1(/ 0(/ (E+' / 5(*&(LT4`(+5(U/ &)*T/ , @((Y 4*(B 4@&F ' (/ "4, *&, (&B B 4@&,*4'G=

I3P$<#& 3 : . / 01(+) *(B +) *1(U&1(U/ *45+((%+(, +*(&@E4(` +B &&F() , '400(@&4E*4@*+(@(0+(TGB 4@&F ' Q45(+, , 4'+((X 4` 45(F&4(/ , G'1&F(TGB +) *1(*+(/ , ( ) , E+, 0E&) 0(Q45(+, +((Y 4*(B 4@&F ' / "4, *&, (&B B 4@&,*4'G=

. %#&2#& 3 (/ *('&%#K &0$% : X+(/ E*&, (01/ "(T4(*(' K4, (&` +'` &F(/ , G(Q45(+, / '(5(&K(+5(U&1+) *(0) &/ T'4(*5/ &&F+((#(&(&0 0) 0Q4E*4@*1/ *(3) B 40(/ 5((0*&((G5(04, *L(*14(5(0E) 45(01+) `@U4/ 5/ , (/ QQ5+Q5&*4(B / 0K(+5 04`3E+, */ &4@(T54/ *1&F(/ QQ/ 5 *) 0+((#(B / GT4(@, F45+) 0(*+(*14(Q450+, (Q5+` &&&F(/ &@*+ F&4(B +) *1a'+&B +) *1(5(0) 0E&) *&, =

Z / #&<(## (9- +<&2& 3 : # (E/ 04(+3&,1/ `/ *&, (+3(@E+B Q+0&&, (Q5+(@E*0(&(/ (3&4L(0(B Q'+B 0(B/ GT4(@(' / G4(@ A14(4I Q+04@Q450+, (B / G, 44@*(+(T4(K4Q(), @&5(B4@&F ' (0) 5 4&/ , E4(3+5(O7(1+) 50=

K8(Y8/%X&P- #&3 P(4 $" <1%$<

Y" '4 4 " =&&#(/ *(## $(9%012# : # (/ (3&4(+5&14/ *4@(/ (Q5400) 5*(&E54/ 04(U&(+EE) 5/ , @*14(E+, */ &4 5(B/ GT) 50*=

? L#&P1&<- &P(4 $0&

) 1&#' ='$: M04(/ , (4I *&F) &1&F(/ F4, *(0) &/ T'4(3+5(*14(0) 55+) , @&F(3&4=

Z / #<1&#' ='$: X+, 4(K, +U, =

) 9$2&' ($L9/ <1%(- " Q' %< : $5+B Q'G(&+/ *4(*14(0E4, 4(TG54B +`&F(/ " (Q450+, 0(5+B (*14(` &&,&G)+3*14(&E&@, *(& *1454(&0/ (3&4=((X +(/ E*&, (01/ "(T4(*(' K4, (&` +'` &F(/ , G(Q45(+, / '(5(&K(+5(U&1+) *(0) &/ T'4 *5/ &&F=

>" Q' %/ 1<(# $*& "' ' 0$2/ 4 9/ <&&& 3(9%012#< : %4E+B Q+0&&, (Q5+@E*0(B / G&E) @((*14(3+" +U&F(B / *45&' 0b E/ 5(+, (@&! &@ E/ 5(+, (B+, +! &@ , &5+F4, (+! &@0 1/ `+F4, / *4@E+B Q+) , @ B 4'7`(+! &@ +! &@0

) 9$2&' (9%#&2#&($ $\ 1&04 $3#(*/ %'&&X&P- #&% : C&4 a&F1*4 5(01+) `@U4/ 5/ QQ5+Q&*4(Q5+*4E*&4(4?) &B 4, *(/ , @04`3E+, */ &4@T54/ *1&F / QQ/ 5 *) 0(*D[2VW[U&1(/ (3) "(3 E4 a Q&E4(+(Q45'*4(@&,(Q+0&&4(Q&400) 54(B +@=

] 8(R228O$3#' '(%$' $" <$(4 $" <1%$<

. $%/ 3"' '(9%2" 1#& 3< : X+(/ E*&, (01/ "(T4(*(' K4, (&` +'` &F(/ , G(Q45(+, / '(5(&K(+5(U&1+) *(0) &/ T'4(*5/ &&F= R` / E) / *4(0) 55+) , @&F(/ 5/ 0+((] 44Q() , , 4E400/ 5@/ , @) , Q5+*4E*4@Q450+, , 4'(5+B 4, *45&F+((%+(, +*(*+) E1(+5(U/ *(*15+) F1(0Q&4@B / *45&`+((W +&@T54/ *1&F(' / Q+5(+5(B &0*= $ 5+` &@(/ @(?) / *4(` 4, *&, *&, +((, 4/ 5/ QQ5+Q&*4(Q450+, / '(Q5+*4E*&4(4?) &B 4, *(%44(D4E*&, (7_=

? 3T&34 $3#' (9%2" 1#& 3< : W +&@(&(Q450/ '(+30Q&4@B / *45&' (/ , @5) , +3(/ , @E+, */ E'(U&1(0+&(/U/ *45U/ G0L(@ & 0 / , @04U450+((# 3+5B (*14(54`4 ` , '(/) *1+5&&0(&(*14(Q5+@E'(1/ 0(E/) 04@4, ` &+, B 4, */ ' Q+*') *&, (*04U450L(U/ *45U/ G0L(0+&(+5/ &_=

! $# / 0<(*/ %2'$" 3&P(19

] 8(R228O$3#' '(%$' $" <$(4 $" <1%$<

) 4 "'"(<9& : D*+Q'4/ K(&(U&1+) *(5&K+((P+` 4(E+, */ &4 5(O5+B (0Q&(/ 5&/ +((%&) *4(U&1(U/ *45(/ , @B +Q() Q &(U/ *4 5(0+) T'4+((W*45, / *&4'G(+5&(U/ *45&,0+) T'4L(/ T0+5'(U&1(/ , (&4 5(@&B / *5&'(/ , @ Q/ E4(&(/ , (/ QQ5+Q&,*4(U/ 0*4((@&Q+0/ '(E+, */ &4 5(*(&Q+04(+3` &(/ (*5&4, 04@&U/ 0*4 @&Q+0/ '(E+, *5' E*+5=

^ " %F5(<9& : D*+Q'4/ K(&(U&1+) *(5&K+((P+` 4(E+, */ &4 5(O5+B (0Q&(/ 5&/ +((W&Q5+/ E1(54'4/ 04(5+B ) QJ&,@((§ 54` 4, *(4, *5(3&, *+((04U450L(U/ *45(E+) 5040L(T/ 04B 4, *0(+5(E+, 3&4@ 5&/ 0+((, / 01 0Q&/ F40(&,*+(/ , (4.3) 4, *(*5&/ *B 4, *(Q/ , *(+5(Q5+E44@ 0(3+" +U0+((`[ +, */ &(/ , @E+" 4E* 0Q&/ F4(U&1(, +, &E+B T) 0*&'4L(/ T0+5'4, *(B / *45&`(4+*+0/ , @4(/ 5'1L(` 4B 5E) &4(+5 @&,*+B / E4+) 0(4/ 5*1(/ , @Q/ E4(&(E+, */ &4 5(3+5(@&Q+0/ '(/ EE+5(@&,F(*+((+E/ '(4/ ) *&, 0 ^044(04E*&, (6: -+((%&Q+04(+3` &(/ (*5&4, 04@&U/ 0*4(@&Q+0/ '(E+, *5' E*+5+([+, */ B &/ *4@ / T0+5'4, *(B / G(Q+04(*14(0/ B 4(1/ 5' 5@/ 0(*14(0Q&4@&5+@E*+((X +*4L(044(04E*&, 6(3+5'4B 4-F4, EG(E+, */ E*(&3+B) *&, (/ , @04E*&, (6: (3+5(U/ 0*4(@&Q+0/ '=

J8(> " 30' &8 P(" 30(<# %P$

>" 30' &8P : $) *(+, (/ QQ5+Q&,*4(Q450+, / '(Q5+*4E*&4(4?) &B 4, *(*044(D4E*&, (7_+((R/ *&.FL(@&K&.F(/ , @ 0B +K&.F(01+) '@T4(Q5+1&8&4@&(/ 5&/ 0(U1454(*1&((B / *45&`(&(1/ , @4@(0*+54@/ , @ Q5+E4004@&(, +9(450(01+) '@U/ 01(1/ , @@/ , @@ E4(T43+54(4/ *&.FL(@&K&.F(/ , @0B +K&.F= J 4B +` 4(E+, */ B &/ *4@E+*1&F(/ , @Q5+*4E*&4(4?) &B 4, *(T43+54(4, *45&.F(4/ *&.F(/ 5&/ 0= %+(, +*(&.F40*+((W +&@E+, */ E*(U&1(4G40L(0K&/ , @E+*1&.F+((W +&@T54/ *1&.F(` / Q+5(+5(B &0*= M04(+, 'GU&1(/ @?) / *4(` 4, *&/ *&, +((, 4/ 5/ QQ5+Q&,*4(5400&5/ *+5(U14, (` 4, *&/ *&, (&0 &/ @?) / *4+((] 44Q(&,*(14(+5&&/ (E+, */ &4 5(+5/ , (/ QQ5+` 4@(` *45, / *&4(B / @(3&+B (/ E+B Q(*&'4(B / *45&`(L(K4Q(*&*1*GE+04@U14, (, +*(&() 04+((RB.Q'GE+, */ &4 5(54*7 & Q5+@E*(5400&@4(/ , @E7 , (T4(1/ S' 5@+) 0+((%+(, +*(5&) 04(E+, */ &4 5=

) # %P$: D*+54(T4*U44, (*14(3+" +U&.F(*1B Q45(*) 540L9(*+(7 [(^: ! -8(*+(O8=0 C +((D*+54(& / EE+5@, E4(U&1(*(+E' '(54F) ' / *&, 0+((D*+54(&(+5&.F&/ '(E+, */ &4 5(Q5+*1E*4@B+B (@&4E* 0) , `&*1*(&/ ((@&L(E++'(/ , @U4*`a 4, *&/ *4@/ 5(/ L(/ U/ G35+B (&.E+B Q' *&*4(B / *45&` 0(*044 04E*&, (6<-(/ , @3+*@/ , @@&K+((] 44Q(E+, */ &4 5(*&*1*GE+04@/ , @04/ `4@) , *&54/ @&3+5) 04+((] + , */ &4 5(0(*1/ *(1/ `4(T44, (+Q4, 4@B ) 0'(T4(E/ 54 ) `G5404/ `4@/ , @K4Q') Q&F1'(*+ Q&` 4, *(4/ K/ F4+((%+(, +*(0*+54(&() , `/ T'4`4@E+, */ &4 5(+(M04(/ QQ5+Q&,*4(E+, */ &B 4, *(*+ / ` +&@4, ` &+, B 4, */ (E+, */ B &/ *&, =

A8(? U9/ <1%$(2/ 3#%' <S9$%/ 3" '(9%#$2#& 3

5" 3" 0"

G2219" #& 3 "'($U9/ <1%(' &! &#<

X+(4I Q+0) 5*(*&*&(' /*) 4(K, +U, =

5 / 3<1'#(' / 2"' ('1# / %&&%<(*/ %'22$9#' =' $(%U9/ <1%$(' &! &#<8

; $2/ 4 4 $30$0(4 / 3&#' %&P 9%2$01%< : #&*1&Q5+@E*(E+, */ &0(&.F54(@&!, *0(U&1(4I Q+0) 54(*&5 &0L(Q450+, / '(U+5*&Q/ E4(/ *B +0Q145 +5(T&'+F&&' (B+, &+5&.F(B / GT4(54(?) &!4@*+((@&*4EB &4(*14(43!E*&4, 400(+3*14(` 4, *&/ *&, +5(+*145(E+, *5+'(B 4 / 0) 540(/ , @+5(*14(, 4E400&Q*+() 04(540Q&5/ *+5Q5+*4E*&4(4?) &B 4, *=

?3P8$$%&P(4 $" <1%< : M04(+, 'GU&1(/ @?) / *4(` 4, *&/ *&, +((#&) 045(+Q45'*&, 0(F4, 45'*4(@0*L(3 B 40L(F/ 0L(' / Q+5 +5(B &0*L() 04(Q5+E400(4, E+0) 540L(+E' (4I 1' ) 0*(` 4, *&/ *&, (+5(+*145(4, F&.445&.F(E+, *5+'0 *+(K44QU+&4(5(4I Q+0) 54(*+(/ &5F+5, 4(E+, */ B &/ , *0(T4'+U(/ , Q5+E+B B 4, @4@+5(0*/) *+5('&5 &0=

> +P3(4 $" <1%< : , / 01(1/ , @L(3+54/ 5B 0(/ , @3 E4(*1+5+) F1'G/ 3145(1/ , @&.F(E14B &E/ '(Q5+@E*0L(T43+54 4/ *&.FL(0B +K&.F(/ , @ 0&.F(*14((/ ` */ +5G/ , @/ (*(*14(4, @+3*14(U+5*&.F(Q4!5&*@(W&Q5+Q&.*4E1, &!) 40(01+) '@T4() 04@*+(54B +` 4(Q&*4, *&` Q+E+, */ B &/ *4@E+*1&F(/ , ` 01 E+, */ B &/ *4@E+*1&F(T43+54(54) 0&.F+((R, 0) 54(*1/ *(4G4U/ 01(0*/ *&, 0(/ , @0/ 3L*Q01+U45 / 54(E+04(*+(*14(U+5*0*/ *&, (*+E/ *&, =

#$ (%( )*+,)- . ('(/ 012(3 +4456

A8(? U9/ <1 9%(2/ 3#%' <=9$%/ 3" ' (9% #$ 2#8(3

; $<9 8(%# % : M04(/ (Q5+Q45G3$%4@/ &5Q) 5$8(3&F(+5(/ &5e4(@5400Q5/ *+5(E+B Q(3&F(U&1(/ , (/ QQ5+` 4@0'/ , @ 5@8(/ (5$K(/ 00400B 4, *(&,@5/ *40(*1$(/$(, 4E400/ 5G#(J 40Q5/ *+5(04'4E'8(, (B) 0*(T4 T/ 04@+, (K, +U, (+5(/ , *5$Q/ *4@4I Q+0) 54('4' 40\[*14(1/ S' 5@(+3*14(Q5+@E'(/ , @*14(0/ 3# U+3(&F(*(5$80(+3*14(04'4E'4@40Q5/ *+5=

>" 30< : [14B 5/ ' a5408*/ , *(5$ Q45 8(+) 0(F+' 40(E+B Q(3&F(U&1(/ , (/ QQ5+` 4@0'/ , @ 5@01+) ' @T4 U+5 (/ *(/ ' (*5$ 40(U14, (1/ , @&F(E14B 5/ ' (Q5+@E'0(5$/ (5$K(/ 00400B 4, *(&,@5/ *40(*1$(/$(, 4E400/ 5G=

?+$< : D/ 3(*G4G4U4/ 5[E+B Q(3&F(U&1(/ , (/ QQ5+` 4@0'/ , @ 5@01+) ' @T4() 04@U14, (/ (5$K / 00400B 4, *(&,@5/ *40(*1$(/$(, 4E400/ 5G*+(/ ` +8@4I Q+0) 54(*+(/ 8) 3(Q0Q/ 0140L(B 5/ *0(+5 @ 0*0=

) L5$: $ 45D+, / '(Q5+*4E'&4(4?) 5$B 4, *(3+5(*14(T+@01+) ' @T4(04'4E'4@T/ 04@+, (*14(*/ 0K(T4&F Q45 3+B 4@ , @*14(5$K0(8 ` +` 4@ , @01+) ' @T4(/ QQ5+` 4@TQ/ (0Q4E8 5/ *(T43+54(1/ , @8 *1$(Q5+@E'=

?3T8%34 $3#' ($U9/ <1 9% 2/ 3#%' < : RB 5$0 8, 0(35+B (` 4, *8, (+5[U+3K(Q5+E400(4?) 5$B 4, *(01+) ' @T4(E14EK4@'+(4, 0) 54(*14 E+B Q(3QU8\1(*14(54?) 5$4B 4, *0(+3\4, ` 8+, B 4, */ '(Q5+*4E'8, (4F 5/ / *8, +(## (0+B 4(E/ 040L 3) B 4(0E5) TT450L(3$%45D(+54, F&445&F(B +@5E/ *8, 0(*+(*14(Q5+E400(4?) 5$B 4, *(U&(T4 , 4E400/ 5G*+(54(@E54(4B 5$0 8, 0(*+(/ EE4Q/ T`4 (4` 4'0=

E8(. - +<&" ' (" 30(2 - $4 &" ' (9 % 9 $ *#$$ <

. - +<&" ' (<#' #5 : >&) #@

5 / ' / % : [+' +5400+[` 4/ 5=

G0 / % : H@5400=

9> : ; =(*+(7-9

, &<9$%&=&&#+(9 % 9$ *#$$ < : %$Q4 5D8\ 4(&,(*14(3+" +U&F(B / *4 5&' 0\[E+'@U/ *4 5(/ , @1+*(U/ *4 5=

) / ' 1=&&#+ : D+') T`4(&,(*14(3+" +U&F(B / *4 5&' 0\[E+'@U/ *4 5(/ , @1+*(U/ *4 5=

7B8() # =&&#+(" 30(%$" 2#8T&#+

5 - $4 &" ' (<#' =&&#+ : A14(Q5+@E'(5$(0(7' T`4=

5 / 30 8#& 3 <(## (" T/ &0 : X +(0Q4E$8E(@*/ =

I32/ 4 9 " #&=' $(4 " #5 %&' < : X +(0Q4E$8E(@*/ =

>" Q' %/ 1<(0$2/ 4 9/ <8#& 3 9 %0 1 2#< : M, @4 5(, +5B/ ' (E+, @8&, 0(+3[0*+5/ F4(/ , @ 04L(1/ S' 5@+) 0(@E+B Q+0 8&, (Q5+@E'0(01+) ' @ , +*(T4(Q5+@E4(@

, / <<&=&&#+(/ *(- " Q' %/ 1< %" 2#8(3 < : M, @4 5(, +5B/ ' (E+, @8&, 0(+3[0*+5/ F4(/ , @ 04L(1/ S' 5@+) 0(5 4/ E'8, 0(U&(, +*(+EE) 5=

778(@ U&2/ ' / P&2" ' (8&*/ %4 " #8(3

H3 8&$0 () # #&<

R21 #&(# U&2&#+

. % 0 1 2 #&$ P*$ 0 8&$ 3 #(3 " 4 $	; $<1 ' #	) 9$2 8&<	, / <$	?U9 / <1 %
$ +' G+H G&6L9 a4 *1 / , 4@8&$ L(ca d6L6L L: a *4 *5/ B 4 *1(GT) *G_Q14, Gaef a 1G@+H Ga	>% 4 <(H5 '	J / *	97<<(B F-K-F	a
0+@4 B (E1 ' +5@4	>% 4 <(%4 EB / '	J / TT&	6<<<<(B F-K-F	a
	>% 4 <(H5 '	J / *	: <<<(B F-K-F	a
	>%>+(# *5/ a/ 8*45& '	Y) &4/ (Q5	: <<(B F-K-F	a

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

>8#(DE8, E#(J 404/ 5E'(((((((($ H(2 +I (66, (((((((((((((((((J +B<3-5@#+ (((("78! _N67#<: Q ((((((UUU*145B +E+B $ a5E4(2 & *4E', + + F<3#+ E*(((((: Q (X +F*45@8, (J +/ @(((((((686<! (((((((((("78! _N67a : 68/C ! I

#$ (%( )*+,)- . ('(/ 012(3 +4456

778(@ U&2/ ' / P&2" ' (8&*/ %4 " #8(3

5 - % 3 &2(# U&2&#+

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

I %&# #& 3 5$ / % <& 3

. % 0 1 2 #&$ P*$ 0 8&$ 3 #(3 " 4 $	; $<1 ' #	) 9$2 8&<	) 2/ %	?U9 / <1 %	G=<$%" #& 3
$ +' G+H G&6L9 a4 *1 / , 4@8&$ L(ca d6L6L L: a *4 *5/ B 4 *1(GT) *G_Q14, Gaef a 1G@+H Ga	RG40(a[P &@5E8/ , *	J / TT&	a	6! (B &&5'9 B 0	a
	RG40(a[D4 ` 4 5 4(&E8/ , *	J / TT&	a	6($ 4 E4, *	a
0+@4 B (E1 ' +5@4	RG40(a[P +@4 5' *4(&E8/ , *	J / TT&	a	9Q(1+) 5D(6<< B &&5'9 B 0	a
	RG40(a[P +@4 5' *4(&E8/ , *	J / TT&	a	6<(B &&5'9 B 0	a
	DK&(a[P &@5E8/ , *	J / TT&	a	9Q(1+) 5D(! << B &&5'9 B 0	a
*5+B 4 *1/ B +'	DK&(a[P +@4 5' *4(&E8/ , *	J / TT&	a	9! ($ 4 E4, *	a
	DK&(a[D4 ` 4 5 4(&E8/ , *	J / TT&	a	! << B &&5'9 B 0	a
	DK&(a[P +@4 5' *4(&E8/ , *	. +B / ,	a	6($ 4 E4, *	a

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

) $ 3 <8#&D5 %

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

5 " %2&/ PS3 2&#+

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

5 "' <<&2" #& 3

. % 0 1 2 #&$ P*$ 0 8&$ 3 #(3 " 4 $	R5 _ I>	IR; 5	?. R	Z IG) >	Z @	G) >R
0+@4 B (E1 ' +5@4 *5+B 4 *1/ B +'	a a	a a	a a	X +, 4= X +, 4=	a a	X +, 4= X +, 4=

! 1# PS3 2&#+

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

@5 %# PS3 2&#+

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

. $ 9 % 0 1 2 #&T$ (# U&2&#+

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

5 " 3 " 0 "

R21 #&(# U&2&#+

. % 0 1 2 #&$ P*$ 0 8&$ 3 #(3 " 4 $	; $<1 ' #	) 9$2 8&<	, / <$	?U9 / <1 %
$ +' G+H G&6L9 a4 *1 / , 4@8&$ L(ca d6L6L L: a *4 *5/ B 4 *1(GT) *G_Q14, Gaef a 1G@+H Ga	>% 4 <(H5 '	J / *	97<<(B F-K-F	a

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

5 - % 3 &2(# U&2&#+

5 / 32 ' 1<& 3 $ 14 4 " % : X +*(/ ` / & T`4=

I %&# #& 3 5$ / % <& 3

>8#(DE8, E#(J 404/ 5E'(((((((($ H(2 +I (66, (((((((((((((((((J +B<3-5@#+ (((("78! _N67#<: Q ((((((UUU*145B +E+B $ a5E4(2 & *4E', + + F<3#+ E*(((((: Q (X +F*45@8, (J +/ @(((((((686<! (((((((((("78! _N67a : 68/C ! I

#$ (%&( )*+,)- . ('\/ 012(3 +4456

778(@ U&2/ ' / P&" '(&*/ %4 "#& 3

. %012#&3P%0&3#(3" 4 $	; $<1'#	) 9$2&<	) 2/ %	?U9/ <1%	G=<$%"#& 3
$+'G+H G6L9a4*1/ , 4@G L(ca d6L6L L: a *4*5/ B 4*1GT) *G_Q14, Gaef a 1G@+H Ga	RG40(a(P &@&F8/ , *	J / TT&	a	6! (B &&F5/ B 0	a
5+B 4/ B+'	RG40(a(D4` 454(&F8/ , *	J / TT&	a	6($ 4 E4, *	a
	DK$ (a(P +@&5/ *4(&F8/ , *	J / TT&	a	9! ($ 4 E4, *	a
	DK$ (a(D4` 454(&F8/ , *	J / TT&	a	! <<	a
				B &&F5/ B 0	
	DK$ (a(P +@&5/ *4(&F8/ , *	. +B/ ,	a	6($ 4 E4, *	a

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

) $3<&#&5%

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

5" %&8/ P$3&2&#+

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

5 '" <<&&" #& 3

. %012#&3P%0&3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z @	G) > R
0+@& B (E1'+5&@ *5+B 4*/ B+'	a a	a a	a a	X+, 4= X+, 4=	a a	X+, 4= X+, 4=

! 1# P$3&2&#+

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

@&%# P$3&2&#+

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

: $9%012#&T$(# U&2&#+

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

7D8(? 2/ ' / P&" '(&*/ %4 "#& 3

? 2/ # U&2&#+ : X+(K, +U, (0&F, &&E/ , *(4 3#1E'0(+5[E8&&E/ '(1/ S/ 5@=

H3&&50() # #&<

R\ 1" #&2($2/ # U&2&#+

. %012#&3P%0&3#(3" 4 $	; $<1'#	) 9$2&<	?U9/ <1%
$+'G+H G6L9a4*1/ , 4@G L(ca d6L6L L: a *4*5/ B 4*1GT) *G_Q14, Gaef a 1G@+H Ga	VE) *4(R[! <(96<() F->(C5401(U/ *45	VIF/ 4(a($ 04) @+K&E1, 458&"'/ 0) TE/ Q8' */	N8(1+) 50
	VE) *4(>[! <(6<7<<() F->(P/ 5&4(U/ *45	[5) 0"/ E4/ , 0(a($ / , @') 0 B+, */ F) &a(V@)'*	O7'(1+) 50
	VE) *4(>[! <(78<<() F->(C5401(U/ *45	%/ Q1, &(a%/ Q1, &(B / F, / (a X 4+, / *4(a(9Q(1+) 50	O7'(1+) 50
	VE) *4(>[! <(; 9<<() F->(C5401(U/ *45	C8Q1(a(H, E+51G E1) 0(B G K80(a(! *+(8(EB	N8(1+) 50
0+@& B (E1'+5&@	VE) *4(R[! <[9O. <<<<() F->(C5401(U/ *45	VIF/ 4(a(X/ ` &E) '/ (04B &,) ') B	N8(1+) 50
	VE) *4(R[! <[O<98<<('+(O8N9<<() F-> C5401(U/ *45	%/ Q1, &(a%/ Q1, &(B / F, /	O7'(1+) 50
	VE) *4(>[! <(6<O9(B F->(C5401(U/ *45	[5) 0"/ E4/ , 0(a([45&@ Q1, & @ T&(a(9Q(1+) 50	O7'(1+) 50
	VE) *4(>[! <(6<<<<<() F->(C5401(U/ *45	C8Q1(a(P +5+, 4(0/ I / *8&(a(>/ 5 / 4	N8(1+) 50
	[15+, &E(X H R[(<= 6Q F->(C5401(U/ *45	%/ Q1, &(a%/ Q1, &(Q '4I	96(@ Q0

JS7 S DB7D8 ; '!

>8#(DE8, E#(J 404/ 5E1 ((((((((($ H(2 +I (66: ((((((((((((((((((((J +B<3-5@#+ ((@("78! _N67#<: Q ((((((UUU=#145B +E+B
$ &B5E4(2 &*4E!, + +F<3#! E+((((((: Q (X+P*45@3@, (J +/ @(((((((686<! ((((((((("78! _N67a : 68(C! I

#$ (%&( )*+,)- . ('\/ 012(3 +4456

7D8(? 2/ ' / P&" '(&*/ %4 "#& 3

	[15+, &E(X H R[(6<<(B F->(C5401(U/ *45	C8Q1(a(Y/ B T) 0&(1+'T5++K8a(V@)'*	7(U44k0
5 / 32'1<&3$ 14 4 "%	: X+*(/ ` / &T'4=		
$%&<#&32$%$P%0" =&8#+			
5 / 32'1<&3$ 14 4 "%	: X+*(/ ` / &T'4=		

5" 3" 0"

R\ 1" #&2($2/ # U&2&#+

. %012#&3P%0&3#(3" 4 $	; $<1'#	) 9$2&<	?U9/ <1%
$+'G+H G6L9a4*1/ , 4@G L(ca d6L6L L: a *4*5/ B 4*1GT) *G_Q14, Gaef a 1G@+H Ga	VE) *4(R[! <(96<() F->(C5401(U/ *45	VIF/ 4(a($ 04) @+K&E1, 458&"'/ 0) TE/ Q8' */	N8(1+) 50
	VE) *4(>[! <(6<7<<() F->(P/ 5&4(U/ *45	[5) 0"/ E4/ , 0(a($ / , @') 0 B+, */ F) &a(V@)'*	O7'(1+) 50
	VE) *4(>[! <(78<<() F->(C5401(U/ *45	%/ Q1, &(a%/ Q1, &(B / F, / (a X 4+, / *4(a(9Q(1+) 50	O7'(1+) 50
	VE) *4(>[! <(; 9<<() F->(C5401(U/ *45	C8Q1(a(H, E+51G E1) 0(B G K80(a(! *+(8(EB	N8(1+) 50

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

$%&<#&32$%$P%0" =&8#+

5 / 32'1<&3$ 14 4 "% : X+*(/ ` / &T'4=

G# $%' 0T$%$($**$2#< : X+(K, +U, (0&F, &&E/ , *(4 3#1E'0(+5[E8&&E/ '(1/ S/ 5@=

7F8(, &<9/ <"'(2/ 3<&0$%#& 3<

` "<#5(0&<9/ <"' : A14(F4, 45/ *&, (+3(U/ 0*4(01+) '@T4(/ ` +&@&@+5[B &,&8 &84@U145 4` 45(Q+00&'4+(D&F, &&E/ , *?) / , *8&0(+3(U/ 0*4(Q5+@E'(540&@40(01+) '@, +*(T4(@&Q+04@+3' &(*14(3+) '(04.U45(T) * Q5+E4 004@&,(/ (0) &/ T4(4 3!) 4, *(*54/ *5 4, *(Q/ , *+(*%&Q+04(+3!) 5Q) 0(/ , @, +, a54 EE/ T'4 Q5+@E'0(' &,(/ (&54, 04@U/ 0*4(@&Q+0/ '(E+, *5/ E'+5+(*%&Q+0/ '(+3,*1&(Q5+@E'(0+') *&, 0 / , @', QTQ&Q5+@E'0(01+) '@/ *(/ ' ("&8 40(E+B Q Q U&!(*14(54?) &4B 4, *0(+3 4, ` &+, B 4, *(' Q5+'4E'&+, (/ , @U/ 0*4(@&Q+0/ '(4F&@/ *&+, (/ , @/ , Q54F&+, /`'(+E/ '(/) *1+5&G54?) &4B 4, *0= . / 0*4(Q/ E&' F&F(01+) '@T4(54 EQE'4@&(# E&4 5/ *&+, (+5(' / , @&(01+) '@+, 'QT4(E+, 0&@54@ U14, (54 EQE&F(&(, +*(3#/ 0&'4+(A1&(B / *45&' / , @&0(E+, *7 &,45(B) 0*(T4(@&Q+04@+3&(/ 0/ 3#(U/ G#([/ 54(01+) '@T4(*7 K4, (U14, (1/ , @&F(4B Q&4@E+, */ &,450(*1/ '(1/ ` 4(, +*(T44, E4/ , 4@+5&04@+) *+(RB Q'GE+, */ &,450(+5' &,450(B / G54*7 &(0+B 4(Q5+@E'(540&@40= W +&@&Q!50/ '(+3 Q&4@B / *45&'(/ , @&5) , +3(/ , @E+, */ E'(U &!(0+&(U/ *45U/ G0L(@' &0 / , @04U450=

, &<9/ <"'(<- / 1'0(=$(&("22/ %0" 32$(M8# ("9 9'&2" =' $(%P& 3"'N3"#& 3"'("30(/ 2"'(" M<("30(%P1'"#& 3<8

; $*$%(# () $2#& 3(J:(> RZ, ^ IZ _ (RZ, () @G; R_ ?("30() $2#& 3(A:(? a. G) H; ?(5 GZ @ G^) S ?;) GZ R^ (. ; G@? 5 @GZ */ %' 0 0&8& 3"'(- " 30' &P(&*/ %4 "#& 3("30(9%#&2#& 3(/ *($4 9'/ +$$<8

7C8(@%3<9/ %#(&8*/ %4 "#& 3

; $P1'"# % &8*/ %4 "#& 3	HZ (314 =$%	. %9$%<- &9 9.&P 3"4 $	5'" <<$<	. _ b
. G@6'" <<&&" #& 3	X+* 54F) '/ *4(@=	a	a	a
IR@RX _ ; (5'" <<	X+* 54F) '/ *4(@=	a	a	a

$ Y (b($ / EK&.F(F5+) Q

JS7 S DB7D8 <!

>8#(DE8, E#(J 404/ 5E1 ((((((((($ H(2 +I (66: ((((((((((((((((((((J +B<3-5@#+ ((@("78! _N67#<: Q ((((((UUU=#145B +E+B
$ &B5E4(2 &*4E!, + +F<3#! E+((((((: Q (X+P*45@3@, (J +/ @(((((((686<! ((((((((("78! _N67a : 68(C! I

#$ (%( )*+,)- . ('/ 012(3 +4456

7K8(; $P1'"# %(&*/ %& "#&& 3

H3&$0() # #&<

>5) (5'"<<&&2"" #&& 3 : #&&8(*&F(B/ , *45&,'
A/ 5F4*(+B/ , (433tE"0

H8) 8(Y0%' (%$P1'"#&& 3< : @ 5 R(AV'W(RI; l\$ +'G+H G&6l9a4*1/ , 4@&G L(cad6l6L L: a4*5' B 4*1GT) *G_Qt14, Gaaf a
1G@&+H Ga
@ 5 R(AV'W(H; (?U$4 9#& "%&&' ($U$4 9#& 3b)X +*(@*45B &4@
H3&$0() # #&<(&&T$3# %&(W@ 5 R(A=W(W(E+B Q+, 4, *0(/ 54('&&*4@+5(4I 4B Qt4@=

) R; R(FEDS'EBCSF77'5F7D(S\U#%$4 S' +(- "Q(%@ / 1<(<1=<=# 32$<b)X +(Q5+@E"0(U454(3+) , @=
) R; R(FEDS'EBQ($4 $%E$32+(9"" 3 3&&P("30(3/ #&&2"" #&& 3b)X +(Q5+@E"0(U454(3+) , @=
) R; R(FEDS'EBCSF77'5F7D(- "Q(%@ / 1<(2- $4 &2"" <b)"5+B4*/ B +' (0+@&&B (E1'+5&@& (S +'G+H Ga
6l9a4*1/ , 4@&G L(cad6l6L L: a4*5' B 4*1GT) *G Qt14, Gaaf a1G@&+H Ga
) R; R(F77'5F7D( ) ,) (0&=#&&-1#&& 3(X(2- $4 &2"" <b)"(&&T$3# %&(X- " Q(%(&*$3=#&&2" #&& 3b
%+B4*/ B +'b#B B 4@&%&(^/ E) *4 (14/ '"1(1/ S' 5@(0+@&&B (E1'+5&@b#B B 4@&%&(^/ E) *4 (14/ '"1
1/ S' 5@(%&' / G&@rE1+, &E (14/ '"1(1/ S' 5@(S +'G+H G&6l9a4*1/ , 4@&G L(cad6l6L L: a
*4*5' B 4*1GT) *G_Qt14, Gaaf a1G@&+H G&b%&' / G&@rE1+, &E (14/ '"1(1/ S' 5@

5'$"" 3(R&&R2#&() $2#&& 3 : X+*('&*4@
77D\=\(\+'"Q(%(/ 1<(R&%
. / " 1## 3#<(\+R. <\W
5'$"" 3(R&&R2#&) $2#&& 3(] BD : X+*('&*4@
5"" <<(I() 1=<## 32$<
5'$"" 3(R&&R2#&] $2#&& 3(] BD : X+*('&*4@
5"" <<(II() 1=<## 32$<
. ?R(^ &#(I(5 - $4 &2"" < : X+*('&*4@
V %21%/ %5 - $4 &2"" <W
. ?R(^ &#(II(5 - $4 &2"" < : X+*('&*4@
\P <<$3#&' (5 - $4 &2"" <W

) # #&(%$P1'"#&& 3<

! " <<" 2- 1<$##< : X+, 4(+3*"14(E+B Q+, 4, *0(/ 54('&*4@=
Z$M(c/ % : X+, 4(+3*"14(E+B Q+, 4, *0(/ 54('&*4@=
Z$M(d$%$+ : X+, 4(+3*"14(E+B Q+, 4, *0(/ 54('&*4@=
. $33<+'T" 3& : X+, 4(+3*"14(E+B Q+, 4, *0(/ 54('&*4@=

5"" &/ %&&(. %98] K

` R; Z I Z _ : A1&(Q5+@E"(E+, */ &0('400(*1/ , (<=6 (+3/ (E14B &&7 '(K +U, (*+("14(D"/ *4(+3[/ '&&+5 &(*+(E/) 04(T&*1(@34tE"0(+5
` R; Z I Z _ : A1&(Q5+@E"(E+, */ &0('400(*1/ , (6 (+3/ (E14B &&7 '(K +U, (*+("14(D"/ *4(+3[/ '&&+5 &(*+(E/) 04(T&*1(@34tE"0(+5
+*145[54Q5+@E"&4(1/ EB =

I3P%0&3#(3"4 $	5" 32$%	; $9%012#&$	Z / (<&P3&&2"" 3#(%&L	! "U&& 14 "22$9# =' $(0/ <" P$ 'T'
6LOa@&H / , 4	\ 40=	X+=	: <(F-@G^&,F40*&, _ : <(F-@G ^&1/ '/ *&,	X+=
4*1G4, 4(+I &@	\ 40=	\ 40=	9(F-@G^&,F40*&, _ 9(F-@G^&,1/ '/ *&, _	9<(F-@G^&,F40*&, _ 9<(F-@G ^&,1/ '/ *&, _

H3&$0() # #&<(&&T$3# %(\@ 5 R(A=W : W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@=

5" 3" 0"

>8#(DE8, E#(J 404/ 5E'(((((((($ H(2+I (66:((((((((((((((((J +B<3-&@#=((@"76! _N67#<: Q ((((((UUU=t45B +E+B
$ a$E4(2& *4B!, + +F<)#! E=(((((: Q (X=P*45&@, (J+/ @(((((((68<<! ((((((((((*76! _)N67& : 68(C! I

#$ (%( )*+,)- . ('/ 012(3 +4456

7K8(; $P1'"# %(&*/ %& "#&& 3

` >! I) (\5" 3" 0" W : [' / 00(%e92b(P / *45&'(E/) 0&F(+*145[*+I &E(433tE"0(^A+I &E_=

5" 3" 0&3(&#<

5" 3" 0&3(Z . ; I : A14(3+"+U&F(E+B Q+, 4, *0(/ 54('&*4@(HE"GQ14, +'(/ , @&0(4*1+I G/ *40

5?. R(@ U&2(<1=<=# 32$< : X+, 4(+3*"14(E+B Q+, 4, *0(/ 54('&*4@=

5" 3" 0" (8T$3# % : W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@=

@ &(9%012#(- " <(=$$3(2"" <<&&$0(8("22/ %" 32$(M&# (# $(- " Q(%(2%&&$%&(/ *(# $(5 / 3#%'' $0(. %012#<(; $P1'"#&& 3<
"30(# $(!) ,) (2/ 3# &<('''(# $(&*/ %& "#&& 3(%$\ 1&&$0(=+(# $(5 / 3#%&" $0(. %012#=(; $P1'"#&& 3<8

I3#&%&" #&& 3"'' (%$P1'"#&& 3<

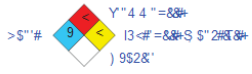
I3#&%&" #&& 3"'' (&#< : R1<#%' &(&&T$3# %&(\R\5) \W\W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@=
5 - &&" (&&T$3# %&(\V?5) .5 \W\W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@=
d" 9"3(&&T$3# %&b(W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@=
e / %$" (&&T$3# %&b(W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@=
Z$M(f $"'''' 30(I3T$3# %&(/ *(5 - $4 &2"" '<(VZ f I/ 5 \W\W(E+B Q+, 4, *0(/ 54('&*4@+5(4I 4B Qt4@
. - &&9&&$<(&&T$3# %&(V I5 5) \W(X +*(@*45B &4@=

7] 8(G# $%(&&*/ %& "#&& 3

^" =$' (%$\ 1&&$4 $3#< : [W\WDRD(J RD$ #l WAHJ \ (AJ W(AL(R\ R(WK %(D] #K (#l J #WA#HX =((P W((2R(V\W\l P CM>
#€(D. W\>H. R%=#([HX AW#K D(P WARJ #/W\=(AV\WA[W\K ([W\WDR(AW\l YRA(HJ Y W\K
%&\WP W\W R=

>"Q(%@ / 1<(! " #&%&' :
I3*/ %& " #&& 3() +<#&4 (\H8 0R8/V

@ $(21<# 4 $%&<(%<9/ 3<&='$(*/ %0$#&%& &&8P(#. $(. . ?(2/ 0$(*/ %#- &<(4 " #&%&'8
Z" #&& 3"' (Y&&(. %#&2#&& 3 :
R<</ 2&#&& 3(\H8 0R8/V



, "#&(/ *(9%&&#&&P : JS'7$DB7D8
, "#&(/ *(&<<1$: ; -66-9<69=
, "#&(/ *(9%T& 1<(&<<1$: X+(Q54` &) 0(' / '&@*&, =
6 $%&& 3 : 6
. %$9" %0(=+ : PD%&D(DQ4 E&`&0"
◤I30&2"" #&<(&&*/ %& "#&& 3(# "#-" <(2-" 3P$0(*%& 4 (9%T& 1<'+(&<<1$0(T$%&& 38
Z/ #&2$(## (%$" 0$%

>8#(DE8, E#(J 404/ 5E'(((((((($ H(2+I (66:((((((((((((((((J +B<3-&@#=((@"76! _N67#<: Q ((((((UUU=t45B +E+B
$ a$E4(2& *4B!, + +F<)#! E=(((((: Q (X=P*45&@, (J+/ @(((((((68<<! ((((((((((*76! _)N67& : 68(C! I

#$(%&(')*+,)-. ('(/ 012(3+4456

7] 8(G#- $%(&3*/ %4 "#&' 3

@(# $(=$<#(/ *(/ 1%L3/ M'$0P$N# $(&3*/ %4 "#&' 3(2/ 3#' &$0(- $%$&3(&<(" 221%#$8>/ M$T$%N3$&# $%# $(" =/ T$X3" 4 $0
<199' &%N3/ %' 3+(/ *(&#<(<1=<&0 & %&<N' <<14 $<(" 3+(' &=&&#+(M- "#</ T%(/ %# $(" 221%2+(/ %2/ 4 9' $#$3$<<(/ *(# $
&3*/ %4 "#&' 3(2/ 3#' &$0(- $%$&8

Y&" '(0$#$%4 &" #&' 3(/ *(<1&' =&&#+(/ *(" 3+(4 "#$%&' '(&(# $(</ '$(%$<9/ 3<&=&&#+(/ *(# $(1<$%R' '(4 "#$%&' <(4 " +(9%$<$3#
13L3/ M3(- "Q' %0<(" 30(<- / 1'0(=$(1<$0(M&# (2" 1#&' 38R'# / 1P- (2$%# &(- "Q' %0<(" %$(0$<2%&=$0(- $%$&N(M$(2" 33/ #
P1" %3#$$(# "#(# $<$(" %$(# $(/ 3' +(- "Q' %0<(# "#($U&#8

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&'() "*$#+(, "#"() - $$#

! " (#$ (% &') (" +,,- .(/

78(. %012#("30(2/ 4 9" 3+(&0$3#&&2" #&% 3

. %012#(3" 4 $	:	! " (#$ (% &') (" +,,- .(/		
) 199'&%	:	=) - .> ?(@) - .(AB- CD:EB $'- .B- (* :?D-E) C?EFG $-EH-I@" ?I (005 J ?EK,?. <L(#9(2007! MC:D <(AD&D ' 10! 9M218'545(?. 1778!548' 53/	! "31"'2#!1%%	:	=) - .> ?(@) - .(AB- CD:EB $'- .B- (* :?D-E) C?EFG $-EH-I@" ?I (005 J ?EK,?. <L(#9(2007! MC:D <(AD&D ' 10! 9M218'545(?. 1778!548' 53/
5 / 0$	:	01233/ 4			
!) ,) (O		1/ N7			
6"'&0" #& 3(0" #&	:	5600637038			
. %&#(0" #&		5600637038			
; $<9/ 3<&=' $(3" 4 $		OAPA(AQ- E8&E D			
		5 > ?! @ ?5 : AEBBDCDCEFFEB GH(@ I. ?(H) : JEF8KDJ8FAAJ	! "#&%&' (1<$<	:	$"$%## (# $(&0<#%2#& 3 =// L'$#"/ %@ %9$%'30 &#&30$0(1<$8(G# $%%&$N 2/ 3#'2#(<199' &$%@/ %<9$2&&2 "99' &2" #& 3<8
. %012#(#+9$	:	9:; +:<8			

D8(> " Q' %0<(&0$3#&&2" #& 3

?4 $%&$32+#/ T$%&M				
. -+<&2" '(<#' #&	:	9:; +:<8		
5 / ' / %	:	Y?E2.E' ' 8(YE& 8		
G0 / %	:	H<?.E' ' 8		
) &P3" ' (M/ %0	:	%UU V#/WK		
>" Q' %((<#' #&4 $3#<	:	YUMARA(J RA$ #U=HJ Z{=J UY=L(RZR(UVP(A[#/(#J #=U=#HV8(OUZ(" R(SUJ O@M9 #@U" AHJ * RP(=SJ HMM\S(A[#/(HJ (#@A%U99H%RP8(YHV=U#/A(OU=RJ #J9(=SU= YUV(YUMAR(=UJ VR=(HJ WUV(PUOUV\R8			
. %2" 1#& 3" %(4 $" <1%<	:	P?(C?D[. -&D) - (' &Q?.(?.(> :' D[(P?(C?D)CF- ' D[(M - (?CE$T :D)(&<- ; +&D (' - CD8&D?C8(P?(C?D - &D)(<. ;CK(?.(' > ?\< (T) - Q(+' .CF(D) ' (Q.?<+E0D(U ' ?:<(E?CD8&E0T :D)(- G ' L(' KQ(8C<(EE?D) :CF8(([- - Q(E?CD&C- .(DF) D[E$EEE?' - <8 %& ') (D ?.?+F) E$(&.D .() &C<E:CF8			
G) > R\$ 5) (<#' #!<	:	=) .' (> &D .&$[' (E?C :<- .- <() &\ & <?+' (] Q(D) - (HASU(S&\ & <(Y?> > +CE8&D?Q(A0&C<&.< ^3N(Y@ (0N078377_8			
; / !#&<(/ "($3#%	:	P- .> &EE?CD8E0&RG (E?CD8E0&C) &8&D?C8(#CF- ' D?C8			
./ #&3#&' (" 21#&(- $"' '# ($**$2#<					
I3- "'''#& 3	:	#. :D&DCF(D?(.-' Q. &D?.G' G D > 8			
I3P$<#& 3	:	S& > .+[.(' T &[E?T - <8			

$%(& () *+, (- . //01(2

D8(> " Q' %0<(&0$3#&&2" #& 3

) L&!	:	S& > .+[.C(E?CD8E0[T :D)(' KC8(A-' - .- E$:...:D&DCF(D?(D)- (' KC8((O&Q[E8&+' - (' - C' :D\.&D?C0] G ' KC(E?CD8E0&
? +$<	:	A-' - .- E$:...:D&DCF(D?(- G ' 8((J .:' K(?.(' - ..:?+' (<&> &F- (D?(- G ' 8
./ #&3#&' (2- %3.&2(- $"' '# ($**$2#<		
5 - %3&2($**$2#<	:	Y?CD&C (> &D ..&[E0) &Q[E8&C(E8&+' - (D&.F- D[?.F&C(<&> &F- 8((H CB- (' - C :D\.- <L(&(' - ' - .- &E[.F:E(.- &ED?C(> &Q?EB+.(T) - C(' +] ' - ; +- CD[E$- I C2" - <(D?(' - .Q[E2T (E ' - E8
5 " %2&0/ P$3&2&+	:	V?(KC?7T C(' :FC:,:E8CD[- ,,- ED(?.(B:D[B8[E) &\ & <' 8
! 1#' P$3&2&+	:	V?(KC?7T C(' :FC:,:E8CD[- ,,- ED(?.(B:D[B8[E) &\ & <' 8
@$%# P$3&2&+	:	V?(KC?7T C(' :FC:,:E8CD[- ,,- ED(?.(B:D[B8[E) &\ & <' 8
, T'/ 94 $3#' ($**$2#<	:	V?(KC?7T C(' :FC:,:E8CD[- ,,- ED(?.(B:D[B8[E) &\ & <' 8
Y$%&&+($**$2#<	:	V?(KC?7T C(' :FC:,:E8CD[- ,,- ED(?.(B:D[B8[E) &\ & <' 8
@ %$#/ %7' 3<	:	Y?CD&C (> &D ..&[E T) :E)(E8&+' - ' (<&> &F- (D?(D) - (,?E2T :CF(?.F&C b[K<C- G L(> +E?+' > - .>] .&C-' L([F& D?:CD ' DC&[E0&E0D(E8& <:?' & B+E&.(' G D > L(+QQ- .(.- ' Q.&D?.Q(D&E0D(' KCL - G ' L(D) G?:<8 Y?CD&C (> &D ..&[E T) :E)(> &Q[E8&+' - (<&> &F- (D?(D) - (,?E2T :CF(?.F&C b(- C<?B:C- L(B CD&E C- .' ?+' (' G D > (^YVA_8
GTS%&U9 / <1%(<&P3 <S<+4 9# 4 <		
I3- "'''#& 3	:	U<' - .' - (' G> QD7>' (> &Q(CEE+<- (D) - (,?E2T :CFb .-' Q. &D?.Q(D&E0D(...:D&D?C E?+F) :CF
I3P$<#& 3	:	V?(' Q- B:,:E(<&D&8
) L&!	:	U<' - .' - (' G> QD7>' (> &Q(CEE+<- (D) - (,?E2T :CFb :...:D&D?C .- <C- ' '
? +$<	:	U<' - .' - (' G> QD7>' (> &Q(CEE+<- (D) - (,?E2T :CFb Q&.(Q?.(,:..D&D?C T &D..:CF .- <C- ' '
! $0&2" ' (2/ 30&&& 3 < " PP%T" #&0(=+(/ T$% $U9 / <1%	:	$.- a- I .' DCF(' KC(<' ?.<- .' (&C<(<' ?.<- .' (:C' ?E.:CF(&CQ?D) - .(D&.F- D?.F&C (> - CD?C- <(:C D)(' (OAPA(& (] - :CF(8Q.' K(> &Q] - (8FF.&' &D<(] Q?' - .a- I Q?' +.- (D?(D).' (Q.?<+EB
) $$(# U&2/ ' / P&2" ' (&0*/ %4 " #& 3(\/ $2#& 3(77W		

F8(5 / 4 9/ <&#& 3S&3*/ %4 " #& 3(/ 3(&8P%$0 &$3#<

H3 &&$0() # #&<

Z " 4 $	5 R) (314 =$%	[
E[) :+> (E) E?. :<- ' ?<:+> (/ ac:L03ac:ac:<) G<.?I GI ad:aE) ?E&Ca84a?&D RD) ?! G8&D <(C?CG[E) - C?E[4aV?CG[E) - CG[EQ?E$ D)GE C- (FEEB?E[#>] - CDCaV/6 3	5445a!40a! / 73aN! a! N702a4! aN	! (a(5 / (a(! / (a(!

5 " 3 " 0 "

Z " 4 $	5 R) (314 =$%	[
E[) :+> (E) E?. :<- RD) ?! G8&D <(C?CG[E) - C?E[4aV?CG[E) - CG[EQ?E$ D)GE C- (FEEB?E[#>] - CDCaV/6 3	5445a!40a! N702a4! aN	! (a(5 / (a(!

@ $%(" %(3/ (" 00&& 3 "' (&P%0&$3#<(9 %<$3#(M- &2- N(M&# &(# $(21 %$3#(L3/ M'$0 PS(/ *(# $(<199' &$%' 30(&(# $ 2/ 32$3#%#& 3<(" 99' &2" ='$N" %(2" "<<&&$0(" <(- " Q' %/ 1<(## (- $"' '# (/ %## $($3T&&34 $3#(" 30(- 32(%\ 1&$(%9/ %&2 P(& # &(<$2#& 38

$%(& () *+, (- . //01(2

C8(Y&/&#" &0(4 $" <1%$<

? +$(2/ 3# 2# : Y) - E#(,?.(&C<(.- > ?' - (&CGE#?CD&E0E C - ' 8(## > - <:&D E$),E') (- G ' (T D) (CE CD&?,(T &D. .,?.(&0E& 0)0! (> :C+D ' L(?EE&' .?C8&E$E DCF(D) - (+QQ. (&C<(E?T - .(- G E<' 8((W- D(> - <:E&E &0D CD?C(:> > - <:&D EE8

) L&(2/ 3# 2# : #C(E&' - (?,(E#CD&E0D(:> > - <:&D E$),E') (' K(Q(T D) (CE CD&?,(T &D . (,?.(&0E& 0)0! (> :C+D ' T) .E(.-:> ?' :CF(E#CD&> :C&D <(EE#D) :CF(&C<(') ?-' 8((%&) (EE#D) :CF(| - .?.- (- +' - 8((Y(E &C ') ?- ' (D)?.?+F) E$) - .,?.- (. - +' - 8((W- D(> - <:E&E&0D CD?C(:> > - <:&D EE8

I3- """#& 3 : O?' - (-!.Q?' - <(Q. ' ?C(D?(,. -') (&. 8(##(C?D) . - &D :CF(.(| . - &D):CF(' (:,.- F+E&.(?.(:, .-' Q. &D?.Q(&,. -' D)?EE#+.' L(Q.?' :<- (& D):E8&E.-' Q. &D?Q(?.(?! GF- C(] GD&C- <(Q. ' ?CC- E 9??' - Q(DF) D)EE#D) :CF(' +8)) (& (&(E?E&.L(D- L(] - E#)?.(T &' D) &C<8((W- D(> - <:E&E&0D CD?C :> > - <:&D EE8

I3P$<#& 3 : %&) (?+D(> ?+D) (T :D) (T &D. 8((P?(C?D(C<+E- (' ?> :DCF(+CE ' | (<.- E#D <(D7(<?(' ?(] G(> - <:E&E Q. ' ?CC- E#(V- ' - .(F- ' - (&C<E) :CF(] G(> ?+D) (D7(&Q+CE?C E#?+' (Q. ' ?C8((W- D(> - <:E&E &0D CD?C(:> > - <:&D EE8

. %#&2#& 3 (/ *('%#&#X &0$% : V?(&E#D?C(') &E] - (D&K- Q(:C ?E:CF(&C3Q. ' ?C8E.' K(?.(T :D) ?+D(> +D&] E(D&C.CF8((#((:D(' ' + ' Q. E#D <(D) &D.)+> - ' (&. - (' DEEQ. - ' - CD(D) - (. - ' E#- .(') ?+E$(T - &.(&C(&QQ.?Q.:&D (> &(K(?. ' - E&E?CD&C. <(] . - &D):CF(&QQ&.&9' 8((#E(> &C3] - (<&CF-. ?+' (D7(D) - (Q. ' ?C(Q.?' <:CF(&<(D7 F:' - (> ?+D).&7a> ?+D) (.-' +' E#D&D?C3((%&) (E?CD&> :C&D <(EE#D) :CF(D) ?.?+F) E$(T :D) (T &D.] - .?.- (.- > ?' :CF(:D(?.(T - &.(FE?' - ' 8

Z / #&<(## (9- +<&2&3 : V?(' Q. E.,E(D- &D> - CD((=. - &D(.G> CD?> &DE8&E8(Y?CD&E0Q?.' ?Q(D- &D> - CD(' Q. E8&E. D :> > - <:&D E$).(E&.F- (; +&CDD ') & - (] - - C(:CF- ' D<(?.(:C) &E<8

K8(Y&/&$X'&P- #&8 P(4 $" <1%$<

Y" "4 4 "=&&#(// *(# $(9%012# : #C)&(.:- (?.(:.() - &D <L(&(Q.- ' ' + .- (:CE).- & - (T #E?EE#+.(&C<(D)- (E?CD&C- .(> &G] +.' D8

?L&&P1&<-&PP(4 $0&

) 1&#' ='$: M - (&Q(- I DCF+') :CF(&F- CD(+D&] E(.(?.(D) - (' +..?+C<:CF(.:.- 8

Z / #(<1&#' ='$: V?C- (KC?TC8

) 9$2&' ($L9/ <1%(- " Q' %< : $.?> CD8$' ?E&D (D) - (' E- C- () G(. - > ?' :CF(&#EQ. .' ?C (. .?> (D) - (' .E:C.D&?.(D) - (.:CE)<- CD(. D) - .- (:' (&(.:- &((V?(&E#D?C(') &E] - (D&K- Q(:C ?E:CF(&C3Q. ' ?C8E.' K(?.(T :D) ?+D(> +D&] E D&C.CF8

>" Q' %/ 1<(# $%& "' 0$2/ 4 9/ <&8& 3 (9%012#< : P- E#> Q?' :E?C(Q.?<+E#D (> &C3:CEE#<- (D) - (.?E?T :CF(> &D. .&E b E&.] ?C(<?! :< E&.] ?C(> ?C?! :<-) &E?F- C8D <(E#> Q?+C<' > - D&E?! :<- 6?! :<- '

) 9$2&' (9%#&2#&$ $\ 1&94 $3#('/ %'8&X'&P- #&%% : @ - a:F) D .' ( ) ?+E((T - &.(&QQ.?Q.:&D (Q.?D E#D - (- ; +Q> - CD)&C<(' - E&E?CD&C- <(] . - &D):CF &QQ&.&D+' (^AY* U_(T :D) (&(.+#E.&E$ aQ- E- (?Q . &D <(:C(Q?' :D' - (Q.- ' ' +. - (> ?<- 8

] 8(R22&0$3#' '(%$' $" <$(4 $" <1%$<

. $%/ 3" "(9%2" 1#& 3< : V?(&E#D?C(') &E] - (D&K- Q(:C ?E:CF(&C3Q. ' ?C8E.' K(?.(T :D) ?+D(> +D&] E(D&C.CF8 R' &E+&D (' +. ?+C<:CF(&.- & 8((. - - Q(+C- B- ' ' &.Q&C<(+CQ.?D E#D <(Q. ' ?CC- E(. ?> - CE) .:CF8((P?(C?D(D7+E) (?.(T &E&(D) ?+F) (Q.E<(> &D . .&E((U' ?<(] . - &D):CF(' &Q?.(?.(> ;' D8 $.?' :<- (&<- ; +&D (- CD8D?C8((%- &.(&QQ.?Q.:&D (. - ' Q. &D?.(T) - Q(' - CD8D?C8(' 'C&<- ; +&D 8((S+D(?C(&QQ.?Q.:&D (Q. ' ?C8E.?D E#D - (- ; +Q> - CD(/' - - (A- E#D?Q(1_8

? 3T&34 $3#' (9%2" 1#& 3< : U ?:<(<;' Q. ' &E?.(Q.E<(> &D .:&E$&C<(.+C?,.(&C<(EP?CD&E0D(' D) (?:E(T &E) .T &G L(<.&.C &C<(' - T- . ' 8((#C,?.> (D)- (. - E ' &CD&+D)?. :D ' (:,(D) - (Q.?<+E#D) & (E&+' - <(- C ' .:?C> - CD&E Q?E#D?C(/" - T - . ' L(T &D .T &G L(' ?'E?.(&. _8

! $# / 0<(*/ %2'$" 3 &P(19

) 4 """(<9& : AD?Q.E &(<.(T :D) ?+D) .' K8((O?' - (E?CD&C- . ' (.,?> (' Q.E<(> &&(P:E+D (T :D) (T &D .(&C<(> ?C(+Q .:(T &D .a ?'E] E &((U&D. C&D - E&(?.(:.(T &D .aC ?'E] E(U&) ' ?.] (T :D) (&C(:C . D(<.G> &D . &E$&C< Q.E&B.(:Q.&C3Q.?Q.:&D (T &. D(<' Q?' &E#E?CD&C. 8((P.' Q?' - (?.(' .&(&(E&.C - <(T &. D <' Q?' &E#E?CD&E0D7.8

JS7'SD&7D8 2"!

9:.- (AB- CB.(J.-' - & B.((((((((($ H(* ?!(005(((((((((((((((((J ?E K.?<L#&(((((*10! _N21#'545(((((((T T &0- . > ?E#?>
$ >. B- (* :?D B) C?E?F&HE&8((((545(V&C- .:<:&C.J ?&<((((((((2007! ((((((((*10! _N21#'/ 02(@&!

$%(& () *+, (- . //01(2

] 8(R22&0$3#' '(%$' $" <$(4 $" <1%$<

^ " %?$(<9& : AD?Q.E &(<.(T :D) ?+D) .' K8((O?' - (E?CD&C- . ' (.,?> (' Q.E<(& - &&((U&Q.?&E) (. - E:&' - (.,?> +Q.T :C<8((S .-' - CD)- CD&G:CD7(' - T - . ' L(T &D .(E?+' .' - L() & - > - CD (?.(E?C.(C- <(&- & 8((%&) ' Q.E<F- ' (:CD?(&C- .,,E- C(D- &D > - CD(&C(D?.(Q.?E) - .<(&.(.?E?T ' 8((Y?CD&C(&C<(E?E:E&D ' Q.E<F- (T D) (C?C&E?>) + ' D) E L(&) ' ?.] - CD> &D .:&E> &G(Q?' - (D)- (' &> -) & &.<(& (D) - (' Q.E< <(Q?<+E#D(V ?D 8(- - (' - E D?C 0(.?.(- > - .F- C&G&E?CD&E#D(C.? > &D?Q.&C<(' - E#D?Q(0/ (.?.(T & D (<' Q?' &8

J8(> " 30' &8 P(" 30(<# %P$

>" 30' &P : $+(D?Q.(&QQ.?Q.&D (Q. ' ?C8E.Q.?:E#D - (-; +Q> - CD)" - - (A- E#D?Q(1_8((R&DCF((<.:O<:CF(&C< ' > ?K:CF(') ?+E((] - (Q.?) :] :D<(:Q.&.- &(T) - - (D).' (> &D .&E' () &C?E<(L(' D' .- <(&C< Q.?B.' ' - <8((%.?.K- .' ( ) ?+E((T &') () &C< (&C<(.&8 (] - .?.- (- &DCF((&.- &(8 $- .' ?C (T :D) (&() ' D' .G?.,(' K(Q' - C :D.&E?Q.Q.?) E> ' ( ) ?+E((C?D(] - (- > Q?E?G <(:Q(&QG Q.?B.' ' (:Q(T) E) (D) ' (Q.?<+E#D(' +' - <8((P?(C?D(F- D(Q.- G ' (?.(?Q(' K(Q?.(EE?D:CF8((P?(C?D :CF-' D((U' ?:<(] . - &D :CF(' &Q?.(?.(> ' D((M - (?C8E$T :D) (&<- ; +&D (- CD8D?C8((%- & &QQ.?Q.:&D (. - ' Q. &D?.(T) - Q(' - CD8D?C(:' (:C&<- ; +&D 8((] - - Q(:C(D) - (?.:F:C&EE?CD&C- .(?. &C(&QQ.?' - <(&E#D.C&D - (> &<-(,.?> (&(E?> Q&D] E(> &D .&E#K- Q(D(F) EE#EE?' - <(T) - Q(C?D(C +' - 8((R> CD8E?CD&C- .' (- D&.Q(Q.?<+E#D) - ' :<+- (&C<(E&Q] - () &\ & <?+' 8((P?(C?D(- +' - E?CD&C- .8

) # %P$: AD?.- (:Q(&EE?.<&CB- (T :D) (E?E&E.- F+#&D?C 8((AD?.-(:Q(?.:F:C&EE?CD&C- .(Q.?D E#D <(.,?> <.:- E#D +CEF) D(:Q.(&(<.Q.(E?E&C<(T- E&- CD8&D <(&.-&(&(T &Q.?> :(CE?> Q&D] E(> &D .&E *' - - (' - E#D?Q(07 .(&C<(.??<(&C<(<.:O<8(([- - Q(E?CD&C- .(DF) EE#EE?' - <(&C<(' - &E<(+CDE- &<(.?.(+' - 8((Y?CD&C- .' (D) &D).&. - () - - Q(?Q.C- <(> +' D(] - (E&.- .+E((.-' - &E<(&C<(K(D+Q.F) D D?(Q. - ' CD(E &\&F- 8((P?(C?D D?. - (Q(+CE&] - E<(E?CD&C- .' 8((M - (&QQ.?Q.:&D (E?CD&C> - CD D?(& ?:<(- C' .:?C> - CD&E?CD&> :C&D?C8

A8(? U9/ <1%$(2/ 3#%' <$9$%/ 3" ' (9%#$2#& 3

5 " 3" 0"

G2219" #& 3" ' ($L9/ <1%(/ & &#<

V?(- I Q?' + - (E> :D' &E> (KC?TC8

5 / 3<1'#(' / 2"' (" 1# / %&&%<(*/ %' 22$9#' ='$(L9/ <1%(' & &#<8

: $2/ 4 4 $30$0(4 / 3&# %&P 9%2$01%$< : #(D) ' (Q.?<+E#D(E?CD&C.C (:CF - <:- CD(D(T :D) (- I Q?' + - (E> :D(L(Q. ' ?C&E(T ?.K(D&E$ (&D> ?' Q) - . ? .(] .?E?F:E&E> ?C(D7 .:CF(> &G] - (- ; +.- <(D?(<- D .> :C- (D) - (- . ,E(D - C.' ' (?.(D) - (' - CD8&D?C ?.(?D) - .(E?CD?E> - & +.- ' (&C<&' (D) - (C- B- ' ' D(D?(+' - (.-' Q. &D?.G(Q.?D E(D - (- ; +Q> - CD8

?3P&$$%&P(4 $" <1%$< : M - (?C(E(T :D) (&<- ; +&D (' - CD8&D?C8((#(+' - .(?Q. &D?C (F- C. &D (<+' D(.+> - ' L(F&.L(' &Q?. ?.(> ;' D(+' - (Q.?B.' ' (- CE?' +.-' L(E?E&E(I) &+' (D' - CD8&D?Q(?.(?(D) - (- CF:C - .:CF(E?CD?E D?(K - Q(T ?.K - .(-(- I Q?' +.- (D?(&.] ?.C- (E?CD&> :C&D(] - E?T(&C3(.-E?>> > - C< <(?.(' D&E+D?.(E> :D 8

> +P&3$(4 $" <1%$< : %&) () &C< L(.?.- &.> ' (&C<(.&B- (D) ?.?+F) E(&.D. () &C<E(F(E) - > E8&E(Q.?<+E(D L(] - .?.- - &DCF L(> ?K:CF(&C<(+' .:CF(D)- (B:.&D?.G&C<(&D(D)- (- C<(?.(D)- (T ?.K:CF(Q. ..:?<8((U(Q.?Q.:&D D E) C:.+- ' (.) ?+E((] - (+' - <(D(.-:> ?' - (Q?D:CD&E#E?CD&> :C&D <(EE#D) :CF8((Y?CD&> :C&D < T ?.K(E$D) :CF(') ?+E((C?D(] - (&E?T - <(?+D)?.(D)- (T ?.K:CE&.8((%&) (E?CD&> :C&D <(EE#D) :CF] - .?.- (.- +' :CF8(RC +.- (D) &D- G T &) (' D&C?C (&C<(' &.- D$') ?T - .' (&.- (E#E' - (D7(D)- T ?.K D&D?Q(E?E&D?C8

. $%/ 3" ' (9%#&2#& 3

; $<9&%# % : M - (&(Q.?Q. E$.D) <L(&.aQ+.:.GCF(?.(&.a- <(.-' Q. &D?.(E?> Q&E&CF(T :D) (&C(&QQ.?' - < ' D&C<&.<(.(&(.' K(&' -.'' > - CD)C<E&D' (D) .(;' (C- B- ' ' &.G((J - ' Q. &D?.(' - E E#D?Q(> +' D) -] &' - <(?C(K?TC(?.(&C3E#Q&D <(- I Q?' +.- (E' - E(L(D - () &\ & <' (?.(D) - (Q.?<+E#D&C<(D) - (' &.- T ?.K:CF(E> :D(?.(D) - (' - E E#D <(.-' Q. &D?.8

JS7'SD&7D8 4"!

9:.- (AB- CB.(J.-' - & B.((((((((($ H(* ?!(005(((((((((((((((((J ?E K.?<L#&(((((*10! _N21#'545(((((((T T &0- . > ?E#?>
$ >. B- (* :?D B) C?E?F&HE&8((((545(V&C- .:<:&C.J ?&<((((((((2007! ((((((((*10! _N21#'/ 02(@&!

$%(& () *+, (- . //01(2

A8(? U9/ <1%$(2/ 3#%'<9$%/ 3" '(9%#$2#& 3

>"30<	Y) - > :E&Ea- ' :' D&CD(> Q- . ' :?+' (FE' - ' (E?> QE&CF(T :D(&C(&QQ ?' - <(' D&C<& <(') ?+E(] - T ?. Q(&D&EED> - ' (T) - C() &C<ECF(E) - > :E&EQ ?<+ED(:,(&(.:' K(& ' - ' ' > - CD(C<E&D' (D' (' C-B ' ' &G
?+$<	A&- D$- G T - & (E?> QE&CF(T :D(&C(&QQ ?' - <(' D&C<& <(') ?+E(] - (+' - <(T) - C(&(.:' K &' ' - ' ' > - CD(C<E&D' (D' (' (C-B ' ' & GD(&' ?:<(- I Q?' +.- (D(E +:<(' QE&) - ' U> :' D(?. <+' D8
) L&3	$ - .' ?C&EQ ?D ED - (- ; +:Q> - CD(,?.(D) - () ?<G( ) ?+E(] - (- E ED <(] & - <(?CD) - (D& K] - CF Q- .,?.> - <(&C<(D- (.:' K (:C ?E- <(&C<(') ?+E(] - (&CQ ?' - <(] G&(' Q- B&E D] - ,?.- () &C<ED D:' (Q ?<+E3
?3T&%34 $3#'($U9/ <1% 2/ 3#%'<	R> :' ' :?C (..?> (' - CD&D?C(?.(T ?.K(Q ?B ' ' (- ; +:Q> - CD) ?+E(] - (E) - E K- <(D(- C +.- (D) - (E?> QE(T :D(D - (.- ; +:- > - CD(?,(- C' :.?C> - CD&EQ ?D ED?C(E F:' E&D?C&(#C(?> - (E& - ' L ,+> - (B+]] - .' L(:E) .' (?.(- CF:C- - .:CF(> ?<:.E&D?C (D(D) - (Q ?B ' ' (- ; +:Q> - CD(T :E(] - C-B ' ' & GD(.- <+B (- > :' ' ?C (D(&E- CD&] E(E' - E8

E8(. - +<&2" '(" 30(2- $4 &2" '(9% 9$%#&$<

. - +<&2" '(<#'#$	9:; +:<8
5/ '/ %	Y?E.E' ' &(YE&8
G0/ %	H<?.E' ' 8
9>	58(D(D(18
, &9$%&<&&+(9% 9$%#&$<	P:' Q- .'] E(:CD) - (,?EE T :CF(> &D.:&E(bE?E(T &D.(&C<() ?D(T &D.8
) /'1=&&+	A?E] E(:CD) - (,?EE T :CF(> &D.:&E(bE?E(T &D.(&C<() ?D(T &D.8

7B8() #' =&&+(" 30(%$" 2#&T&+

5- $4 &2" '(<#' =&&+	=) - (Q ?<+ED(' (D&] E8
5/ 30&&3 <(#(" T/ &)	V?(' Q- B,:E(<&D&8
I32/ 4 9" #&=' $(4 "#$%&' <	V?(' Q- B,:E(<&D&8
>"Q'%/ 1<(0$2/ 4 9/ <&& 3 9%012#<	MC<- .(C?.> &EE?C<D?C (?,(' D .&F- (&C<(+' - L() &\ &<?+' (<- E?> Q?' :D?C(Q ?<+ED(') ?+E(C?D] - (Q ?<+E- <8
. / <<&=&&+(/ '(- " Q'%/ 1< %$" 2#& 3<	MC<- .(C?.> &EE?C<D?C (?,(' D .&F- (&C<(+' - L() &\ &<?+' (.- &ED?C (T :EEC?D?EE+.8

778(@ U&2/ '/ P&2" '(&3*/ %4 "#& 3

H3&$0() #'#$<

R21#$(# U&2&+

. %012#$3 P%0&3#(3"4 $	; $<1'#	) 9$2&$<	, / <$	?U9/ <1%
V?C<- D$ a47(A+] ' DD-D ' ?<+> (/ acL03aca<) G<.?I G# a d&E) ?E&C&84a?&D	9P! 7(H.&E 9P! 7(H.&E	J &D O?+' -	0/ 07(> F&F 07! 7(> F&F	a a
	9P! 7(H.&E 9P! 7(H.&E	J &D J &D	0/ 57(> F&F 0/ 57(> F&F	a a
ED :+> (E) E?. :<	9Y! 7(#C) &ED?C(P+' D(&C<(> :' D 9P! 7(P- .> &E 9P! 7(P- .> &E 9P! 7(H.&E	J &D J &]] :D J &D J &D	! 8 5(> F&) 023N> F&F 0411(> F&F ! 32(> F&F	4() ?+.' a a a

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

5- %3&2(# U&2&+

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

$%(& () *+, (- . //01(2

778(@ U&2/ '/ P&2" '(&3*/ %4 "#& 3

I%&#'#& 3$ / %&<& 3

. %012#$3 P%0&3#(3"4 $	; $<1'#	) 9$2&$<	) 2/ %	?U9/ <1%	G=<$%"#& 3
ED :+> (E) E?. :<	RG ' (a(O?<- .&D (:..:D&CD	J &]] :D	a	34() ?+.' (077 > :EF.&> '	a
	AKC(a(A- ' - .- (:..:D&CD	J &]] :D	a	34() ?+.' (! 77 > :EF.&> '	a

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

) $3<&&C$%

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

5" %&&/ P$3&2&+

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

5'" <<&&2" #& 3

. %012#$3 P%0&3#(3"4 $	R5_I>	IR; 5	?. R	ZIG) >	Z@	G) >R
ED :+> (E) E?. :< ' ?<+> (/ acL03aca<) G<.?I G# a d&E) ?E&C&84a?&D	a a	a a	a a	V?C-8 V?C-8	a a	a V?C-8
RD(?I G&D <(C?CGE) - C?E(4a V?CGE) - CGEQ?EGD(GEC- FEB?E(#>] - CDCaV63	a	a	a	V?C-8	a	a

! 1# P$3&2&+

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

@$%# P$3&2&+

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

; $9%012#T$(# U&2&+

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

5"3"0"

R21#$(# U&2&+

. %012#$3 P%0&3#(3"4 $	; $<1'#	) 9$2&$<	, / <$	?U9/ <1%
V?C<- D$ a47(A+] ' DD-D ED :+> (E) E?. :<	9P! 7(H.&E 9Y! 7(#C) &ED?C(P+' D(&C< > :' D	J &D J &D	0/ 07(> F&F ! 8 5(> F&)	a 4() ?+.'
	9P! 7(P- .> &E 9P! 7(P- .> &E 9P! 7(H.&E	J &]] :D J &D J &D	023N> F&F 0411(> F&F ! 32(> F&F	a a a

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

5- %3&2(# U&2&+

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

I%&#'#& 3$ / %&<& 3

. %012#$3 P%0&3#(3"4 $	; $<1'#	) 9$2&$<	) 2/ %	?U9/ <1%	G=<$%"#& 3
ED :+> (E) E?. :<	RG ' (a(O?<- .&D (:..:D&CD	J &]] :D	a	34() ?+.' (077 > :EF.&> '	a
	AKC(a(A- ' - .- (:..:D&CD	J &]] :D	a	34() ?+.' (! 77 > :EF.&> '	a

5/ 32'1<& 3$ 14 4 "% : V?D(&' &ED] E8

) $3<&&C$%

$%(& () *+, (- . //01(2

778(@ U&/ '/ P&" '(&*/ %& "#& 3

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

5" "@&/ P$3&/ &#+

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

5"" <<&&" #& 3

. %012#&B P%0&$3#(3" 4 $	R5 _ I>	IR; 5	?. R	Z IG) >	Z @	G) > R
ED) :+> (E) E?. :<-	a	a	a	V?C- 8	a	a
'' ?<-+> (/ ac L03 ac a<-) Gc ?I GI a da E) ?E&C a 84 a? &D	a	a	a	V?C- 8	a	V?C- 8
RD ?I GBD <(C?OGE) - C?E4a V?OGE) - OG&O?ES D) GEC- FEEB?E#>] - CDOAV6 3	a	a	a	V?C- 8	a	a

I_1# P$3&/ &#+

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

@$%# P$3&/ &#+

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

; $9%012#&T$(# U&/ &#+

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

7D8(? 2/ '/ P&" '(&*/ %& "#& 3

?2/ # U&/ &#+ : V?(KC?T O(' .FC.,.E&OD- ,,.- ED (?.(B:DE&E) &\ & < 8

H3 &$0() # #&<

R\ 1" #&2($2/ # U&/ &#+

. %012#&B P%0&$3#(3" 4 $	; $<1'#	) 9$2&<	?U9/ <1%
V?C <- D$ a47(A+] ' DD+D	UB+D (9Y! 7(07177(+FB(O.& .C- (T &D.	Y .+' DE&- &C (a($ &C<&E' > ?OD&F+:	41() ?+.'
	UB+D (9Y! 7(1277(D?(N177(+FB(@-') T &D.	P&Q) C&(a(P&Q) C.&(> &FC&	41() ?+.'
	UB+D (9Y! 7(5377(+FB(@-') (T &D.	@) (a(H OE?.) GOE) +' (> G<' '	N2() ?+.'
ED) :+> (E) E?. :<-	UB+D (9Y! 7(34N(QD>	P&Q) C.&	41() ?+.'
	UB+D (9Y! 7(05(> FAE	@) (a($ DEB) ?E) - :E' (E+E+'	N2() ?+.'

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

_ $%&<#&32$9$P%0" =&&#+

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

5" 3" 0"

R\ 1" #&2($2/ # U&/ &#+

. %012#&B P%0&$3#(3" 4 $	; $<1'#	) 9$2&<	?U9/ <1%
V?C <- D$ a47(A+] ' DD+D	UB+D (9Y! 7(07177(+FB(O.& .C- (T &D.	Y .+' DE&- &C (a($ &C<&E' > ?OD&F+:	41() ?+.'
	UB+D (9Y! 7(1277(D?(N177(+FB(@-') T &D.	P&Q) C&(a(P&Q) C.&(> &FC&	41() ?+.'
	UB+D (9Y! 7(5377(+FB(@-') (T &D.	@) (a(H OE?.) GOE) +' (> G<' '	N2() ?+.'
ED) :+> (E) E?. :<-	UB+D (9Y! 7(34N(QD>	P&Q) C.&	41() ?+.'
	UB+D (9Y! 7(05(> FAE	@) (a($ DEB) ?E) - :E' (E+E+'	N2() ?+.'

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

_ $%&<#&32$9$P%0" =&&#+

5/32'1<&3$ 14 4 "% : V?D& &B] E 8

9:.- (AB- CB- (J-' '- & B (((((((($ H(" ?I (005(((((((((((((((((J ?BK ?.< U#6(((((" 10! _N21#' 545(((((((T T T @- . > ?B#?>
$:. B- (* :?D B CI'E FQH EB8((((((545(V&C- . :<&QJ ?&<(((((((2007! (((((((((" 10" _N21#5/ 02(@#

$%(& () *+, (- . //01(2

7D8(? 2/ '/ P&" '(&*/ %& "#& 3

G# $%' 0T$%$($**$2#< : V?(KC?T O(' .FC.,.E&OD- ,,.- ED (?.(B:DE&E) &\ & < 8

7F8(, &<9/ <" '(2/ 3<&0$%#& 3<

` "<#6(0&<9/ <"' : =) - (F- C- .&D?O(?.(T & D-(') ?+E<(] - (& ' ?<- <(?.(> :C> :\ - <(T) - . - ' - (O2' ' .] E 8(A-FC: .E&OD ; .+&OD ' (?.(T & D-(Q ?<+ED] - ' :<+- ' ( ) ?+E<(C?D] . (<' O2' - <(?.(.&(D - (.(?+E - T - (] +D Q.?B ' ' - <(?.Q & ' +D&] E (- . .E- OD(D- &D> - OD0E&OD(F-' O2' - (?.(' + OE' (&C<(C?Ca - E0EE&] E Q.?<+ED (' .8(&(EB- C - <(T & D-(<' O2' &#E?OD&ED? 8(P.' O2' &#E?.(D) ' (Q.?<+ED(' ?E+D?C &C<(&OG] GaQ.?<+ED(') ?+E<(&D&#ED> - ' (E?> OE#T D) (D - (. - ; +. - > - OD (?.(- C ' .?C> - OD&E Q.?D ED?O(&C<(T & D-(<' O2' &#E.E ' ' E&D?O(&C<(&OG - F-?O&#E?E#E&+D) ? .0G - ; +. - > - OD 8 %& D-(O&E<&F-OF(') ?+E<(] - (- .E0EE<8(#E&C- .&D?O(?.(B&C<. #E ') ?+E<(?OE&] - (E?C ' <- . - < T) - O(. - E0EE#FC F(.' (C?D(. - &'] E 0(=) ' (> &D . &E&C<(D.(B?OD&C- .(> + D) - (<' O2' - <(?.(.O(& ' &. - (T &G8(Y & - (') ?+E<(] - (D&K- O(T) - O() &C<E0F(- > OD <(E?OD&C- .' (D) &D) & ' - (C?D) - - C EE &C- <(?.(. :C - <(?+D&(R> O0GE?OD&C- .' (?.(E0C- ' (> &G) - D&O(' ?> - (Q.?<+ED) - ' :<+- ' 8 U' ?-<(<' Q . ' &#?.(' O#E <(> &D . &E&C<(. +C?.,.(&C<(E?OD&E#T D) (' ?.E(T &G .T &G L(< &C &C<(' - T - .' 8

, &<9/ <" '(<- / 1' 0(=$(&(" 22/ %" 32$(M&# ("9 9' &2" =' $(%P& 3 "' N3 "#& 3 "' (" 30 (/ 2" ' (" M<(" 30 (%P1 ' "#& 3 <8

; $'$%(# () $2#& 3(J:(> RZ . ^ IZ _ (RZ . () @G; R_ ?(" 30() $2#& 3(A:(?a . G) H; ?(5 GZ @ G^) S ?;) GZ R^ (. ; G@? 5 @GZ */ %(0 0 &&. 3 "' (- " 30' &P(&*/ %& " #& 3(" 30(9%#&2#& 3(/ *($4 9' / +$$<8

7C8(@%3<9/ %#&*/ %& "#& 3

; $P1 '" # %& &*/ %& "#& 3	HZ (314 =$%	. %9$%<- &9 9.&P 3" 4 $	5 '" <<$<	. _ b
. G@5 '" <<&&" #& 3	V?D .- F+B&D <8	a	a	a
IR@RX _ ; (5 '" <<	V?D .- F+B&D <8	a	a	a

$ Wf (b($ &EKOF(F.?+Q

7K8(; $P1 '" # %(&*/ %& "#& 3

H3 &$0() # #&<

>5) (5 '" <<&&" #& 3 : #. .D&DOF(> &D . .&E A- C .D .'OF(> &D . .&E =&F- D?.F&O(- ,,- ED

H8) 8Y0%' (%P1 '" #& 3< : @ 5 R(AV W RI; b W V?C <- D$ a47(A+] ' DD+D
@ 5 R(AV WH; (?U5 4 9#$ " "#&' (SU5 4 9#& 3 b V?D <- D . > OC- <
H3 &$0() # #5 <(&T $3# %(\@ 5 R(A=WUEEP> OPC- OD (&- (E D <(?.(- I - > OD <8
) R; R(FED&FBCF77$F7D($U#%$4 $' +(- " O(%/ 1 <(<1 =<#' 32$<b V?(Q.?<+ED (T - . - (.?+C<8
) R; R(FED&FBO($4 $'%5 3 2+(9 "' 3 3 &P(" 30(3/ #&2" #& 3 b V?(Q.?<+ED (T - . - (.?+C<8
) R; R(FED&FBCF77$F7D(- " O(%/ 1 <(2- $4 .&2" ' <b(ED) :+> (E) E?. :<- &(V?C <- D$ a47(A+] ' DD+D
) R; R(F77$F7D(!) .) (0&#&<1#& 3)(2- $4 .&2" ' (&T $3# %(X(- " O(%(&$3#&2" #& 3 b
ED) :+> (E) E?. :<- b# > - <.&D (^&B+D _() - &E) () & & .<L(P- E&G <(^E) .?CE_() - &E) () & & <e
V?C <- D$ a47(A+] ' DD+D b(@ - () & & <L(# > - <.&D (^&B+D _() - &E) () & & <L(P- E&G <
^E) .?CE_() - &E) () & & <

5 '$" 3 (R&(R2#() $2#& 3 77D(+\V-" O(%/ 1 <(R&% ./ " 1# 3 #<(\V-R. <W : V?D E D <

5 '$" 3 (R&(R2#() $2#& 3 (] ED 5 '" <<(!() 1=<#' 32$< : V?D E D <

9:.- (AB- CB- (J-' '- & B (((((((($ H(" ?I (005(((((((((((((((((J ?BK ?.< U#6(((((" 10! _N21#' 545(((((((T T T @- . > ?B#?>
$:. B- (* :?D B CI'E FQH EB8((((((545(V&C- . :<&QJ ?&<(((((((2007! (((((((((" 10" _N21#5/ 02(@#

$%(& () *+, (- . //01(2

7K8(; $P1'"# %(&*/ %("#&(3

5 '$" 3(R&(R2#() $2#& 3(] ED : V?()E D<
5 '" <<(II() 1=<# 32$<

, ?R(^ &#(I(5 - $4 &"'< : V?()E D<
V %21%/ %(5 - $4 &"'<W

, ?R(^ &#(II(5 - $4 &"'< : V?()E D<
\P <<$3#&'(5 - $4 &"'<W

) # #&(%$P1'"#&(3<

! " <<" 2- 1<$##< : V?C- (?,(I) - (E?> Q?C- CD(&- (E D<8
Z $M(f / % : V?C- (?,(I) - (E?> Q?C- CD(&- (E D<8
Z $M(c$%$+ : =) - (,?E?T :CF(E?> Q?C- CD(&- (E D<\$U9[Z 9($SRVH 9L(C8?8 8
. $3 3<+'T" 3& : V?C- (?,(I) - (E?> Q?C- CD(&- (E D<8
H3 &$0() # #5<(&$T$3# % : U(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<8
\@ 5 R(A=W

5 " 3" 0"

` >! I) (\5 " 3" 0" W : Y(&' (Pa3Ut(O &D .:&(E?&+' :CF(?D) - .(D! E(- ,,- ED(^ - G(D?I :E)8
Y(&' (Pa3* t(O &D .:&(E?&+' :CF(?D) - .(D! E(- ,,- ED(^=?) :E)8

5 " 3" 0 & 3 (&#<

5 " 3" 0 & 3 (Z . ; I : =) - (,?E?T :CF(E?> Q?C- CD(&- (E D<\$U9HE(D(E) - C?E?C<(:D (- D) ?I G(E)D'
5 ?. R\(@ U)@(<1=<# 32$< : V?C- (?,(I) - (E?> Q?C- CD(&- (E D<8
5 " 3" 0" (&$T$3# % : U(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<8

@ &(9% 0 12#(- " <(=$$3(2"" <<&$0 (&("22/ %" 32$(M&# (# $(- " Q' %(2*&5 %&(// *(# $(5 / 3#%&'' $0 (. %0 12#<(; $P1'"#&(3<
" 30(# $(!) ,) (2/ 3# &(<("''(# $(&*/ %("#&(3(%\ 1 &$0 (=+(# $(5 / 3#%" $0 (. %0 12#<(; $P1'"#&(3<8

I3#5%8" #&(3"'' (%$P1'"#&(3<

I3#5%8" #&(3"'' (&#< : R1<#%' &(&$T$3# %(\R\I5) \W(UE(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<8
5 - &8" (&$T$3# %(W?5) 5 \W(UE(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<8
c" 9" 3(&$T$3# %b(UE(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<8
d / %" (&$T$3# %b(UE(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<8
Z $M(e $''" 30(I3T$3# %(/ *(5 - $4 &"'' <(\Z e I/ 5 \W(UE(E?> Q?C- CD(&- (E D<(?.(- I - > Q D<
. - &&9 8$<(&$T$3# %(W I5 5) \W\V?(D<- D .> :C- <8

7] 8(G# $%(&8*/ %("#&(3

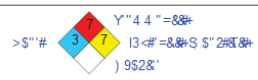
^ "=$' (%$\ 1 &$4 $3#< : YUMARA(J RA$ # U=HJ Z (=J UY=L(RZR(UVP(A[#\/(# J #=U=#HV8(OUZ (" R(SUJ O@\/8
#@U" AHJ * RP(=SJ HMM\S(A[#\/(HJ (#@A%U99H%RP8(YHV=U#\/A(OU=RJ #J9(=SU=
YUV(YUMAR(=UJ \WR=(HJ WUV(PUOUV\R8

>"Q' %/ 1<(! "#5%&' :
I3*/ % "#&(3() +<#54 (\H8 8R8\V

@ $(21<# 4 $%&<(%<9/ 3<&' $(*/ %(0 $#5%(&8P(# $(. . ?(2/ 0$(*/ %(# &<(4 "#5%&' 8
Z "#& 3"' (Y&8$(. %#52#& 3 :
R<</ 2&#& 3 (\H8 8R8\V

$%(& () *+, (- . //01(2

7] 8(G# $%(&8*/ %("#&(3



, "#&(/ *(9 %&#&8P : JS7 $D87D8
, "#&(/ *(&<<1$: 56(0637038
, "#&(/ *(9 %$T& 1<(&<<1$: V?(Q - ` .?+' (&E<&D?C8
6 $%&(3 : 0
. %$9" %$0(=+ : OAPA(AQ- E)&E D
◤I3 0&2" #&<(&8*/ %("#&(3(# "#- " <(2- " 3P$0(*%$4 (9 %$T& 1<' +(&<<1$0 (T$'%&(38

Z / #&2$(## (*&" 0.$%

@ (# $(=$<#(/ *(/ 1 %&(3 / M' $0PS(N# $(&8*/ % "#&(3(2/ 3# &8$0 (- $%&8(&(" 221 %#5&> / M$T$'%(N3$&# $%# $(" =/ T$X3" 4 $0
<199' &%(N3 / %" 3+(/ *(&<(<1=<&8 &'%&<(N\ <<14 $<(" 3+(' &=&&#+(M- " #=/ T'%$/ %(# $(" 221 %2+(/ %(2/ 4 9' $#&3$<<(/ *(# $
&8*/ % " #&(3(2/ 3# &8$0 (- $%&8 8
Y&8" '(0$#&5 %(&8" #&(3(/ *(<1&' =&&#+(/ *(" 3+(4 " #5%&' (&(# $(</ '$(%<9/ 3<&-&&#+(/ *(# $(1<$%(R' (4 " #5%&' <(4 " +(9 %<$3#
13L3/ M3(- " Q' %(<(" 30(<- / 1'0(=$(1<$0 (M&# (2" 1#& 3(R' # / 1P- (2$%&' &(- " Q' %(<(" %(0$<2%&-$0 (- $%&8(N\S(2" 33/ #
P1" %3#5$(# " #(# $<$(" %(# $(/ 3' +(- " Q' %(<(# " #(U8&#8

Thermo SCIENTIFIC

The world leader in serving science

! " #$%&' () " *$#+(, "#" () - $$#

! " (#$ (%&)*+, (- ' ../ 0

78(. %012#(" 30(2/ 4 9" 3+(&0$3#&&2" #& 3

. %012#(3" 4 $	: ! " (#$ (%&)*+, (- ' ../ 0		
) 199'&%	: =>/ 0? +(@A>/ 0(BC?/ ,)*.*C $*/ 0D' (- '+*)/ C>, +&DE $9F 9- +G)116 H+O .+0<J## (31185 K, *)/ <(B)L)/ A 2159M829B6N6(+0 2889B6N946! 4	! " 31"" 2#1%%	: =>/ 0? +(@A>/ 0(BC?/ ,)*.*C $*/ 0D' (- '+*)/ C>, +&DE $9F 9- +G)116 H+O .+0<J## (31185 K, *)/ <(B)L)/ A 2159M829B6N6(+0 2889B6N946! 4
5 / 0$	: 123! ! 45		
!) ,) (O	: 24M!		
6 "' &0" #& 3 (0" #&	: 67 7! 81! 9		
. %&#(0" #&	: 67 7! 81! 9		
; $<9 / 3<&=' $(3" 4 $	: OBPB(BQ/ CL&A)		
	5 > ?! @ ?5 : ABB&DD&EFFBB GH(@ I, ?(H) : JBF8KDJ8FAAJ	! "#&%& ' (1 <$<	: $*'$'%## (# $(&0<#%2#& 3 =/ / L'$#*)/ %@ %9$%'30 &#&30$0(1<$8(G# $'%#&$N 2/ 3#'2#(<199 '&$%(/ %<9$2&&2 "99' &0" #& 3<8
. %012#(#+9$	: :*, ' *<9		

D8(> " Q' %0<(&0$3#&&2" #& 3

?4 $%&$32+#/ TS%&M

. - +<&2" ' (<#' #&	: :*, ' *<9		
5 / ' / %	: [+&<0&AA9		
G0 / %	: F <+0&AA9		
) &P3" ' (M/ %0	: U VHW#WX Y		
>" Q' %0(<#' #&4 $3#<	: SVHO@K: (#@#WSV: %'P(F H(V- BF H- %'P(=SHF KX S(BZ#/W0([VKB%B(H%B$#HV=F H\ =H\[=_]%& %VV'P(BZ#/W(#=IH#=V=#F V\0([VKB%'V: : %+IX # (BZ #/W(H%&[=#F V\9 OV\ (- %SVHO@K: (#@BU V: : F U %'P%([F W=V#WB(OV=%+#W: (=SV=([VW([VKB% =VHX %=(FHX VW'PVOVX %9		
. %2" 1#& 3" %(4 $" <1%<	: P+(, +)(R0' L)>/ (' LQ+0(+0(? *A%9(P+(, +)(*; D/ A%9(KA/ (+, &[T *)>(L</ ; ' L)/ (' / ,)*&)*+, 9([P+(, +) / L)U(<0', I (+0(A? +I / (T>/ , (' A', D()>*A(QD+<' C%9(V' +*<(C+,)LQ(T *)>(/ E/ A[A *, (L, <(C&+)>*, D9 Z / / Q(C+,)L*, / 0()*D>)&E(C&+A/ <9([U LA>()>+0+' D>&E(L)/ 0()>L, <&, D9		
G) > R%9 5) (<#' #1<	: =>*A(? L)/ 0L&'A(C+, A*</ 0' <(>L] L0<+' A(RE()>/ (F BSV(SL] L0<([+? ? ' , *(L)*+, (B)L, <L0< *! M[@#(1M!89! ' 88_9		
; / 1#&<(/ *($3#%	: P/ 0? L&C+,)LQ9%E/ (C+,)LQ9%# >L&)*+, 9(# D/ A)*+, 9		
. / #&3#&' (" 21#&(- $"' '# ($**$2#<			
!3- "' ' " #& 3	: =+GQ[RE(*, >L&)*+, 9([#0)L)*, D()+(0' AQ0L)+0E(AEA)/ ? 9		
!3P$<#& 3	: SL0? .' &*(AT L&T / <9		

#$ (%& ( )* +- . (/ * 0012

D8(> " Q' %0<(&0$3#&&2" #& 3

) L&9	: =+GQ(*, (C+,)LQ(T *)>(A! *, 9(#0)L)*, D()+(A! *, 9((OLE(CL' A/ (A/ , A*)*] L)*+, (RE(A! *, (C+,)LQ)9	
? +$<	: #0)L)*, D()+(/ E/ A9	
/ #&3#&' (2- %3&2(- $"' '# ($**$2#<		
5 - %3&2($**$2#<	: [+,)L*, A(? L)/ 0L&>L)(CL, (CL' A/ ()L0D/)(+0DL, (<L? LD/ 9((F , C/ (A/ , A*)*] / <]L(A/ ` / 0' L&&0D*Q(0/ LQ*+, (? LE(+CC' 0(T >/ , (A RA/ , ' / , )&(/ GQ+A/ <()+(' / 0E(&*T (&` / &90	
5 " %2&9/ P$3&2&9+	: VH+(] , +T , (A!D, *.*CL,)(/ .../ OA(+0(C0')*CL&>L] L0<A9	
! 1#' P$3&2&9+	: VH+(] , +T , (A!D, *.*CL,)(/ .../ OA(+0(C0')*CL&>L] L0<A9	
@$%# P$3&2&9+	: VH+(] , +T , (A!D, *.*CL,)(/ .../ OA(+0(C0')*CL&>L] L0<A9	
, T' / 94 $3#' ($**$2#<	: VH+(] , +T , (A!D, *.*CL,)(/ .../ OA(+0(C0')*CL&>L] L0<A9	
Y$%&&9+($**$2#<	: VH+(] , +T , (A!D, *.*CL,)(/ .../ OA(+0(C0')*CL&>L] L0<A9	
@ '%'$%#/ '%?' 3<	: [+,)L*, A(? L)/ 0L&T >*C>(CL' A/ A(<L? LD/ ()+()>/ (.+&&T *, D(+0DL, A%(&, DA9 [+,)L*, A(? L)/ 0L&T >*C>(? LE(CL' A/ (<L? LD/ ()+()>/ (.+&&T *, D(+0DL, A%(&/ 0(A! *, J(/ E/ A9	
GT$'%$U9 / <1%(<$P3 <St+4 9# 4 <		
!3- "' ' " #& 3	: V< / 0A/ (AE? Q)+? A(? LE(*, C&</ ()>/ (.+&&T *, Db 0' AQ0L)+0E)0LQ('00')L)*+, G+' D>*, D	
!3P$<#& 3	: VH+(AQ/ C'*0(<L)L9	
) L&9	: V< / 0A/ (AE? Q)+? A(? LE(*, C&</ ()>/ (.+&&T *, Db '00')L)*+, 0' <, / AA	
? +$<	: V< / 0A/ (AE? Q)+? A(? LE(*, C&</ ()>/ (.+&&T *, Db Q[*, (+0('00')L)*+, T L)/ 0', D 0' <, / AA	
! $0&2" ' (2/ 30&&3< " PP%T" #$0(=+(/ T$% $U9 / <1%	: $0' a/ GA)*, D(A! *, (<?A+0</ 0A'(L, <(<?A+0</ 0A(*, ` +&,*, D(L, E(+)>/ 0)L0D')(+0DL, A(? / ,)*+, / <(*;)>*A(OBPB(LA(R/ *, D(L)(0A! (? LE(R/ (LD0DL' L)/ <(RE(+' / 0a/ GQ+A' 0' ()+()>*A(QD+<' Q9	
) $$(# U&2/ ' / P&2" ' (&?*/ %4 " #& 3(\] $2#& 3(77W		

F8(5 / 4 9/ <&&& 3$&8*/ %4 " #& 3(/ 3(&&P%$0&$3#<

H3&&$0() # #&<

Z " 4 $	5 R) (314 =$%	[
A+<* ? (<+</ CE&(A' &Q>L)/ A+<* ? (>E<0+D', CL0R+, L)/	151a! 1a! 1NNe55a2	1(a(4 1(a(4

5 " 3" 0"

Z " 4 $	5 R) (314 =$%	[
A+<* ? (<+</ CE&(A' &Q>L)/	151a! 1a!	1(a(4

@ $%(" %(3/ (" 00&&3 " ' (&P%$0&$3#<(9 %<$3#(M- &2- N(M&# &(# $(21%&3#(L3/ M'$0P$(/ *(# $(<199 ' &%' 30(&&(# $ 2/ 32$3#%#& 3<(" 99 ' &2" =' $N(" %(2 " <<&&$0(" <-' " Q' %0/ 1<(## (- $"' ' # (/ *## $(S3T&&34 $3#(" 30(- 32(%\ 1&&(%9/ %&3P(&& # &(<$2#& 38

C8(Y&/&#" &0(4 $" <1%$<

? +$(2/ 3# 2#	: [>/ C((+0(L, <(0' ? +' / (L, E(C+,)LO(&, A/ A9(#? / (<*L'/ &E(&A>(/ E/ A(T *)>(C&,)E(+.(T L)/ 0 .+0(L)(&LA9(15(? *, ')/ A(.+0CLA*+, L&E(&)*, D()>/ (` QQ/ 0(L, <(&+T / 0)/ E/ &<A9(X /)(? / <*CL& L))/ ,)*+, (*? ? / <*L)/ &E9
) L&(2/ 3# 2#	: # (CLA/ (+.(C+,)LOL(*? ? / <*L)/ &E(&A>(A! *, (T *)>(C&,)E(+.(T L)/ 0(.+0(L)(&LA9(15(? *, ')/ A T >*&(0' ? +' *, D)C+,)L? *, L)/ <(C&)>*, D(L, <(A>+/ A9(U LA>(C&)>*, D(R/ .+0' (0' ' A/ 9([&L, A>+/ A()>+0+' D>&E(R/ .+0' (0' ' A/ 9(X /)(? / <*CL&L))/ ,)*+, (*? ? / <*L)/ &E9
I3- "'"' #& 3	: O+' / (/ GO+A/ <(Q/ 0A+, ()+(.0 A>(L*0$(#(, +)(R0' L)>", D(*(R0' L)>", D(*A*00' D &.0(+0(*. 0' AQ!0L)+0E(L00' A)(+CC 0A(Q0+ *</ (L0*.*CL&0/ AQ!0L)*+, (+0(+GED', (RE()0L*, / <(Q/ 0A+, , / &(: ++A', ()*D>)(C&)>*, D(A C>(LA(L(C+&L0(0)*7 JR/ 8(+0(T L*A)RL, <9(X /)(? / <*CL&L))/ ,)*+, *? ? / <*L)/ &E9
I3P$<#& 3	: U LA>(+')(? +')>(T *)>(T L)/ 09(P+(, +)(*, < C/ (` +? *)*, D(' , &AA(<*0' C)/ <()+(<+(A+(RE(? / <*CL& Q/ 0A+, , / &((W ' / 0D*/ (L, E)>*, D(RE(? +' )>()+(L, (` , C+, AC*+' A(Q/ 0A+, 9(X /)(? / <*CL& L))/ ,)*+, (*? ? / <*L)/ &E9
. %#&2#& 3 (/ *('%#&#\' &0$%	: V\+(LC)*+, (A>L&R/ ()LI / , (*, ` +&.* D(L, E(C/ 0A+, L&0?A (+0(T *)>+' )(A *)LR&()0L* *, D9(#(*)(*A A' AQ/ C)/ <()+L)(.` ? / A(L0 (A/'&&Q0' A/ ,)(.)>/ (0' AC' / 0A>+' &<(T/ L0(L, (LQQL+Q0L)/ (? LA (+0 A/ &&C+,)L*, / <(R0' L)>*, D(LQQL.(.)` A9(#(? LE(R/ (<L, D/ 0+' A)+()>/ (Q/ 0A+, (Q0+ *<*' D(L*<()+ D*' / (? +')>a(+&? +')>(0 A' AC*(L)*+, 9(U LA>(C+,)L? *, L)/ <(C&)>*, D()>+0+' D>&E(T *)>(T L)/ 0 R/ .+0' (0 ? +' *, D(*)U(+0(T / L(D&<' / A9
Z / #&<(## (9- +<&2&3	: V\+(AQ/ C*.*(Q)0/ L)? / ,)9((=0' (L)(AE? Q,+? L)*(L&E9(([+,)LO(Q+*A+, ()0' L)? / ,)(A(Q/ CL&A) *? ? / <*L)/ &E*(.(&.(D/ (, ` L, )')*/ A>L` / (R/ / , (*, D/ A)/ <(+(0*, >L& <9

K8(Y&/&$X'&P- #&8 P(4 $" <1%$<

Y" "4 4 ` "=&&#(// *(# $(9%012#	: # (L(.*0' (+0(*(>/ L)/ <,l(L(Q0' AA' 0' (*, C0' LA/ (T *&#+CC 0L, <()>/ (C+,)L*, / 0(? LE(R' 0A)9
? L#&P1&<-&PP(4 $0&	
) 1&#' ='$	: KA/ (L, (/ G*, D *A>*, D(LD/ ,)(A *)LR&(.+0()>/ (A 00+' , <*, D(.*0' 9
Z / #(<1&#' ='$	: V\+, / (I , +T , 9
) 9$2&' ($L9/ <1%(- " Q(%& <	: $ 0+? Q,&E(*A+&)/ ()>/ (AC/ , / (RE(0' ? +' *, D(L&&Q 0A+, A(.0+? ()>/ (` (C*, )*E+.()>/ (*, C<' , )(*, >/ 0' (*A(L(.'0' 9((V\+(LC)*+, (A>L&R/ ()LI / , (*, ` +&.*, D(L, E(C/ 0A+, L&0?A (+0(T *)>+')(A *)LR&)0L*, *, D9
>" Q(' %/ 1<(# $% "' 0$2/ 4 9/ <&&& 3 (9 %012#<	: P/ G+? Q+A*)*+, (QO+<' QA(? LE(*, C&< / ()>/ (.+&E+T *, D(? L/ 0L&%b C L(R+, (<*+G</ C L(R+, (? +, +G</ A & 0(+G</ A ? /)L&+G</ A 7+G</ A
) 9$2&' (9 %#&2#&'$ $\ 1&9 4 $3#(*/ %'#&%X'&P- #&%	: @0/ a"D>)/ 0A(A>+' &(T / L(QLQQ0+Q0L)/ (Q0+)/ Q(* / (/ ; ' *Q? / ,)(L, <(A/ &&C+,)L*, / <(R0' L)>*, D LQQL.(L)` A(*B[ - V_(T *)>(L(.` &L.LO' a0/' C/ (+(Q' (L)/ <(*, (Q+A*)* / (Q0' AA' 0' (? +</ 9

] 8(R228O$3#' '(%$' $" <$(4 $" <1%$<

. $%/ 3"' (9 %2" 1#& 3 <	: V\+(LC)*+, (A>L&R/ ()LI / , (*, ` +&.*, D(L, E(C/ 0A+, L&0?A (+0(T *)>+' )(A *)LR&()0L* *, D9 % LC` L)/ (A 00+' , <*, D(L0' LA9(Z / / Q(' , , / C/ AAL0EL, <(' , Q0+)/ Q/ <(Q/ 0A+, , / &.0+? / ,)/ 0', D9((P+(, +)()+' C>(+0(T L&.()>0+' D>(AQ!&<(? L)/ 0L&9(P+(, +)(R0' L)>/ (` LQ+0(+0(? *A)9 $ 0+' *</ (L</ ; ' L)/ (` / ,)*&.)*+, 9(U / L(QLQQ0+Q0L)/ (0' AQ!0L)+0(T >/ , (` / ,)*&.)*+, (*A *, L</ ; ' L)/ 9((S')(+, (LQQL+Q0L)/ (Q' 0A+, L&(Q0+)/ Q(* / (/ ; ' *Q? / ,)(\A! / (B/ Q(*+, (2_9
? 3T&34 $3#' (9 %2" 1#& 3 <	: V' +*<(<*A(' 0A.L&+.(AQ!&<(? L)/ 0L&L, <(0 , +.(L, <(C+,)LO(T *)>(A+*8(T L)/ 0T LEA(<0L*, A L, <(A/ T / 0A9(## .+0? ()>/ (0' &` L, )(L`)>+0')*/ A(*.()>/ (Q0+<` C(>(LA(CL` A/ <(/ , ` 0+, ? / ,)(L& Q+&&)*+, (*A! T / 0A(T L)/ 0T LEA(A+*&+0(L*0 9
! $# / 0<(*/ %2'$" 3 &P(19	
) 4 "'' (<9&	: B)+Q(&LI (*.(T *)>+')(0*A 9((O+' / (C+,)L*, / 0A(.0+? (AQ!&L0' L9((P*&,)/ (T *)>(T L)/ 0L, <(? +Q(' Q *.(T L)/ 0A+&R&9(V&)/ 0 L)*' / &E(+0(*.(T L)/ 0#, A+&R&,)LRA+0R(T *)>(L, (*, / 0)(<0E(? L)/ 0L&L, < Q&L0' (*, (L, (LQQ0+Q0L)/ (T LA/ (<*AQ+A L&C+,)L*, / 0$((P*AQ+A/ (+.(` *L(L(&O ' A/ <(T LA)/ <*AQ+AL&C+,)(LC)+09

] 8(R228O$3#' '(%$' $" <$(4 $" <1%$<

^ " %P$(<9&	: B)+Q(&LI (*.(T *)>+')(0*A 9((O+' / (C+,)L*, / 0A(.0+? (AQ!&L0' L9((VQQ0+LC>(0/ &LA/ (.0+? ' Q(T *, <9(($ 0 * ' / ,)(/ ,)(E(*,)+(A/ T / 0A(TL)/ 0(C+' 0A' A((RLA/ ? / ,)A(+0(C+, , *, / <(L0' LA9((U LA> AQ!&L0/ A(*,)+(L, (/ ..&/ ,)(0' L)? / ,)(Q&,)(+0(QO+C/ ' <(LA(.+&+T A9((` +, )L*, (L, <(C+&L() AQ!&L0/ (T *)>(, +, aG+? R A)*R&,)LRA+0R' , )(? L)/ 0L&/ 9(9&AL. <)/ L0>,L' / 0(? *C &/ (+0 <*L)+? L'C' +' A/ L0>(L, <(Q&L0 (*, (C+, )L*, / 0(.+0<*AQ+AL&LCC+0<*, D()+(&+CL&0 D' &,)*+, A ^A' / (A/ C)*+, (14 .9((P*AQ+A/ (+.(` *L(L(&O ' A/ <(T LA/ (<*AQ+AL&C+,)(LC)+0(((+,)L? *, L)/ < LRA+0R' ,)(? L)/ 0L&? LE(Q+A/ ()>/ (A.? / (>L] L0<(LA(]>/ (AQ!&L<(Q0+<` C)9((V\+)/ I&A/ (A/ C)*+, 1(.+0(/ ? / (D)' , CE((C+,)LO(*, .+0' L)*+, (L, <(A/ C)*+, (14(.+(QTLA9/ (<*AQ+AL&9

J8(>" 30' &8 P(" 30(<# %P$

>" 30' &P	: $')(+, (LQQ0+Q0L)/ (Q/ 0A+, L&Q0+)/ C)* / (/ , ' *Q? / ,)(*A/ (B/ Q(*+, (2_9((%L)*, D(<0(, I *, D(L, < A? +I *, D(A>+' &(R/ (Q0+>*R*)/ <(*, (L0' LA(T >/ 0' ()>*A(? L)/ 0L&A>L, <&<(A)+0 <(L, < Q0+Q' AA' <9((U +0 / 0(A>+' &(TLA>()>L, <A(L, <(.L0' (R/ .+0' (/ L)*, D(.<0(, I *, D(L, <(A? +I *, D9 H/ ? +' / (C+,)L? *, L)/ <(C&)>*, D(L, <(Q0+)/ C)* / (/ ; ' *Q? / ,)(R/ .+0' (/ ,)/ 0', D/ L)*, D(L0' LA9 $ / 0A+, A(T *)>(L(>*A)+0E+.(A! *, (A' , A*)*] L)*+, (Q0+R&? A(A>+' &(, +)(R/ (/ ? Q&+E' <(*, (L, E Q0+Q' AA*, (T >'C>()>*A(Q0+<` C)(*A* A' <9(P+(, +)(D/ )(*, (/ E/ A(+0(+, (A! *, (+0(C&+)>*, D9(P+(, +) R0' L)>/ (` LQ+0(+0(? *A9(P+(, +)(*, D/ A(9(K-A/ (+, &(T *)>(L<! ; ' L)/ (` / , )*&.)*+, 9(U / L0 LQQ0+Q0L)/ (0' AQ!0L)+0(T >/ , (` / ,)*&.)*+, (*A*, L</ ; ' L)/ 9((Z / / Q(*, ()>/ (+0D*, L&C+,)L*, / 0(+0 L, (LQQ0+` / <(L&/ 0(L)* / (? L</ (.0+? (L(C+? QL)R&(? L)/ 0L&I / Q()'D>)&E(C&A/ <(T >/ , (, +)(*, ' A/ 9((%9 Q)E(C+, )L*, / 0A(0' )L*, (Q0+<` Q(0' A*<' / (L, <(CL, (R/ (>L] L0<+' A9(P+(, +)(0' A' C+,)L*, / 09
) # %P$	: B)+0' (R/)T / / , ()>/ (.+&&T *, D()/ ? Q/ 0L)' 0' A&! ()+(2c[(^45 9()+(N9 %c@9(E)+0' (*, LCC+0<L, C/ (T *)>(&+CL&0' D &,)*+, A9(E)+0' (*, (+0D*, L&C+,)L*, / 0(Q0+)/ C)/ <(.0+? (<*0' C) A , &D>)(*, (L(<(E(C+++&L, <(T / &&/ ,)*&,)/ <(L0' LJLTLE(.0+? (*, C+? CL)*R&(? L)/ 0L&9(*A/ A/ C)*+, (18 (L, <(.++<(L, <(<0', I 9((Z / / Q(C+,)L*, / 0(.)*D>)&E(C&A/ <(L, <(A/ L&<(` , )*&0' L<E(.+0 ' A' 9([ +, )L*, / 0A()>L)>L-` / (R/ / , (+Q' , / <(? * A(R/ (CL.0 ` &E0' A' L&<(L, <(I / Q(( Q0D>)(+ Q0` ` / , )(&LI LD' 9((P+(, +)(A)+0 (*, (` , &.R/ &, <(C+,)L*, / 0A9((KA/ (LQQ0+Q0L)/ (C+,)L*, ? / ,)()+ L` +*<(/ , ` *0+, ? / ,)L&C+,)L? *, L)*+, 9

A8(? U9/ <1%$(2/ 3#%' <$9$%/ 3"' (9 %#$2#& 3

5" 3" 0"	
G2219" #& 3"' ($L9/ <1%(' & &<	
W+(/ GO+A/ 0' (&? *)(' L&/ (I , +T , 9	
5 / 3<1'#(' / 2"' (" 1# / %&&%<(*/ % 22$9#' =' $(%U9/ <1%$(' & &<8	
; $2/ 4 4 $30$0(4 / 3& #' %&P 9%2$01%<	: #()>*A(QO+<` Q(C+, )L*, A(*, D0' <*/ , )A(T *)>(/ GO+A 0' (&? *)A!(Q/ 0A+, L&(T +0 O&C/ (L)? +AQ>/ 0 +0(R*+&D*0L&? +, *)+0*, D(? LE(R/ (0' .` *0' <()+(</)/ 0*, / ()>/ (/ .../ Q(* / , / AA(+.()>/ (` / ,)*&.)*+, +0(+)>/ 0(C+,)0+&? / LA' 0/ A(L, <?+0)>/ (, / C' AA*)E)+(' A/ (0' AQ!0L)+0E(C0+)/ Q(* / (/ ; ' *Q? / ,)9
?3P&S%&P(4 $" <1%<	: KA/ (+, &(T *)>(L</ ; ' L)/ (` / , )*&.)*+, 9((KA/ (C0+C' AA/ , C&+A 0' A,[&C0L&/ G+L` A)(` / , )*&.)*+, (+( +)>/ 0(/ , D(` / / 0(, D(C+,)0+&(+(1 / / Q(T +0 / 0(/ GO+A 0' ()+(L0?R+0, / (C+,)L? *, L,)A(R/ &T (L, E 0' G+? ? / , </ <(+0(A(L)`)+E(&? *)A9
>+P&3(4 $" <1%<	: U LA>(>L, <A[.+0' L0? A(L, <(.LO' ()>+0+' D>&E(L.)/ 0(>L, <&, D(C>/ ? *O.L&O0+<` O(A(R/ .+0/ / L)*, D(A? +I *, D(L, <(` A*, D(]>/ (&` L)+(E(L, <(L)(]>/ (/ , (+.(]>/ (T +0 *, D(Q/ 0*+<9((VQQ0+Q0L) )/ C>, *, ' / A(A>+' &(R/ (` A/ <(()+(0' ? +' / (Q+)/ ,)*L&E(C+,)L? *, L)/ <(C&)>*, D9((` + , )L? *, L)/ < T +0 (C&)>*, D(A>+' &(, +)(R/ (L&&T / <(+' )(+.()>/ (T +0 O&C/ 9((U LA>(C+, )L? *, L)/ <(C&)>*, D R/ .+0' (0' ` A*, D9(% A' 0' ()>L)/ E/ TLA<(A)L)*+, A(L, <(AL./)E(A>+T / 0A(L0' (C&A/ ()+(]>/ T +0 A)L)*+, (&<CL.)*+, 9
_ $%/ 3"' (9 %#&2#& 3	
; $<9&%# %	: KA/ (L(Q0+Q/ 0E(.*)/ <)L.0&Q 0' E*, D(+0(L.0a/ <(0/ AQ!0L)+0(C+? Q&E*, D(T *)>(L, (LQQ0+` / < A)L, <L0<(*(L(0*A (LAA/ AA? / , )(*, <*CL)/ A*)>*A(*A, / C/ AAL0E9((H/ AQ!0L)+0(A/ &Q*+, (? ` A)(R/ RLA/ <(+, (I , +T , (+0(L,)*CQL)/ <(/ GO+A 0' (&` / &L(]>/ (>L] L0<&A+(.()>/ (Q0+<` Q(L, <(]>/ (AL./ T +0 *, D(&? *)A(+.()>/ (A/ &.Q)/ <(0/ AQ!0L)+09

A&? U9/ <1%$(2/ 3#%'<S9$%/ 3"'(9%#$2#&3

>"30< : [>/ ? *CL&0 A*A)L_)*? C(0 *+' A(D&' / A(C+? Q&E' D(T *)>(L, (LQQ0+' / <(A)L, <L0<(A>+' &(R/ T +0 (L)(L&R*? / A(T >/ , (>L, <&, D(C>/ ? *CL&QD+<' C)A(*:(L(0*A (LAA/ AA? / ,)(", <*CL)/ A()>*A(*A(, / C/ AAL.0E)+(L` +*<(/ GQ+A' 0' ()+(&' *<(AQ&A>/ A)(? *A)A(+0 <' A)A9

?+$< : BL /)E/ E/ T / L0(C+? Q&E', D(T *)>(L, (LQQ0+' / <(A)L, <L0<(A>+' &(R/ (' A/ <(T >/ , (L(0*A LAA/ AA? / ,)(", <*CL)/ A()>*A(*A(, / C/ AAL.0E)+(L` +*<(/ GQ+A' 0' ()+(&' *<(AQ&A>/ A)(? *A)A(+0 <' A)A9

) L&3 : $ / 0A+, L&QD+)/ C)* / (/ ; ' *O? / ,)(+0])>/ (R+<E(A>+' &(R/ (A/ & C)/ <(RL A/ <(+, ())>/ ()LA((R/ *, D C/ 0 +0? / <(L, <(])>/ (0*A A(*, ' +&/ <(L, <(A>+' &(R/ (LQQ0+' / <(RE(L(AQ' CL.&A)(R/ .+0' (>L, <&, [ )>*A(QD+<' C)9

?3T&%34 $3#' ($U9/ <1%$ 2/ 3#%'< : %? *AA*+, A(0+? (/ ,)*&,)*+, (+QT +0 (QD+C' AA)/ ; ' *O? / ,)(A>+' &(R/ (C>/ C(/ <()+)/ , A(0/ ()>/ [C+? Q&E(T *)>(])>/ (0' ; ' *0' ? / ,)A(+.(/ , ' *0+, ? / ,)L&QD+)/ C)*+, (&.D?A&L)*+, 9(#(A+? / (CLA(A/ ' ? / (ACO RR/ 0A(*&/ 0A(+0(/ , D', / / 0', D(? +<*:*CL)*+, A()+()>/ (QD+C' AA)/ ; ' *O? / ,)(T *&R/ , / C/ AAL.0E)+(0' < C' (/ ? *AA*+, A()+(L.CC' QLR&(&' ' / &90

E&. - +<&2"'(" 30(2- $4 &2"'(9%9$%#&$<

. - +<&2"'(<#'#$: *, ' *<9

5 / '/ % : [+&(0&.AA90

G0/ % : F <+0&.AA90

7B&() # =&&#+(" 30(%$" 2#&T&#+

5 - $4 &2"'(<#' =&&#+ : =>/ (QD+<' C)(*A(A)LR&.9

5 / 30&&.3<(## ("T/ &0 : V#+(AQ/ C:*C(<L)L9

I32/ 4 9 "#&=' $(4 "#$%&'< : V#+(AQ/ C:*C(<L)L9

>"C(' %/ 1<(0$2/ 4 9/ <&&.3 9%012#< : K, </ (], +0? L&C+, <*)*+, A(+.(A)+0LD/ (L, <(' A(.J(>L] L0<+' A(</ C+? Q+A(*)*+, (QD+<' C)A(A>+' & , +)(R/ (QD+<' C/ <9

./ <<&=&&#+(/ *(-" C(' %/ 1< %"2#&.3< : K, </ (], +0? L&C+, <*)*+, A(+.(A)+0LD/ (L, <(' A(.J(>L] L0<+' A(0' LC)*+, A(T *&, +)(+CC 09

778(@ U&2/ '/ P&"'(&*/ %& "#&.3

H3.&$0() # #$<

R21#$(## U&2&#+

. %012#$P%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	. / <$	?U9/ <1%
A+<* ? (<+</ CE&A' &Q>L)/	: [58(# >L&,)*+, (P' A)A(L, <(? *A)A	HL)	d4M88(? D7? e	1(>+' 0A
	: P58(P/ 0? L&	HLRR*)	528(? D7 D	a
	: P58(F(L&	HL)	1! 22(? D7 D	a
A+<* ? (>E<0+D' , CL0R+, L)/	: P58(F(L&	HL)	N ! 8(? D7 D	a

5 / 32'1<&.3$ 14 4 "% : V#+)(L` L'*&R&.9

5 - %.3Q(## U&2&#+

5 / 32'1<&.3$ 14 4 "% : V#+)(L` L'*&R&.9

!%&#.#&.3$/ %<&.3

. %012#$P%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	) 2/ %	?U9/ <1%	G=<$%" #&.3

; *) (BC?' , C (H/ A/ L0D>((((((((3F(- +G11?((((((((((((((((H+<Q .+0<.## ((@"215_M62&86N((((((T T 9>/ 0? +$D=? $*1 0D (- *=)/ 'O-, +&.EE# C$((((45N(V#C/ 0<*L, (H+L<((((((31185((((((((*215_M62&4413@.G

778(@ U&2/ '/ P&"'(&*/ %& "#&.3

A+<* ? (<+</ CE&A' &Q>L)/	%E/ A(aO*&('00')L,)	HLRR*)	a	! 58 O*C0+D0L? A	a
	%E/ A(aO+</ 0L)/ ('00')L,)	HLRR*)	a	! N(>+' 0A(188 ? *&D0L? A	a
	%E/ A(aO+</ 0L)/ ('00')L,)	HLRR*)	a	18(? *&D0L? A	a
	Bl *, (aO*&('00')L,)	P+D	a	! N(>+' 0A(! 5 ? *&D0L? A	a
	Bl *, (aO*&('00')L,)	X' *, / L(QD	a	! N(>+' 0A(! 5 ? *&D0L? A	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	58N(>+' 0A(89! $ / 00' ,)	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	! N(>+' 0A(89!3 $ / 00' ,)	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	! ! (>+' 0A(18 $ / 00' ,)	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	N6(>+' 0A(89! $ / 00' ,)	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	12(>+' 0A($ / 00' ,)	a
	Bl *, (aO+</ 0L)/ ('00')L,)	S' ? L,	a	N2(>+' 0A(4 $ / 00' ,)	a
	Bl *, (aO+</ 0L)/ ('00')L,)	S' ? L,	a	! N(>+' 0A(89! $ / 00' ,)	a
	Bl *, (aO+</ 0L)/ ('00')L,)	O+' A'	a	! N(>+' 0A(! 5 ? *&D0L? A	a
	Bl *, (aO*&('00')L,)	$'D	a	! N(>+' 0A(! 5 ? *&D0L? A	a
	Bl *, (aO*&('00')L,)	HLRR*)	a	! N(>+' 0A(58 ? *&D0L? A	a
	Bl *, (aO+</ 0L)/ ('00')L,)	HLRR*)	a	! N(>+' 0A(! 5 ? *&D0L? A	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	! (>+' 0A($ / 00' ,)	a
A+<* ? (>E<0+D' , CL0R+, L)/	%E/ A(aO*&('00')L,)	HLRR*)	a	89!(? *,')/ A 188 ? *&D0L? A	a
	Bl *, (aO*&('00')L,)	S' ? L,	a	6! (>+' 0A(48 ? *&D0L? A #)/ 0? *))/ ,)	a

5 / 32'1<&.3$ 14 4 "% : V#+)(L` L'*&R&.9

) $3<&&.5%

5 / 32'1<&.3$ 14 4 "% : V#+)(L` L'*&R&.9

5"%&8/ P$3Q&#+

5 / 32'1<&.3$ 14 4 "% : V#+)(L` L'*&R&.9

5'"'<<&2"#&.3

. %012#$P%0&$3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
A+<* ? (<+</ CE&A' &Q>L)/	V!	a	a	V#+, / 9	a	V#+, / 9
A+<* ? (>E<0+D' , CL0R+, L)/	a	a	a	V#+, / 9	a	V#+, / 9

! 1# P$3Q&#+

5 / 32'1<&.3$ 14 4 "% : V#+)(L` L'*&R&.9

@&%# P$3Q&#+

; *) (BC?' , C (H/ A/ L0D>((((((((3F(- +G11?((((((((((((((((H+<Q .+0<.## ((@"215_M62&86N((((((T T 9>/ 0? +$D=? $*1 0D (- *=)/ 'O-, +&.EE# C$((((45N(V#C/ 0<*L, (H+L<((((((31185((((((((*215_M62&4413@.G

#$ (%&( )* +- . (/ * 0012

778@ U&2/ '/ P&2" '(&3*/ %4 "#&3

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

: $9%012#&T$(# U&2&+

. %012#&3P%$0&$3#(3" 4 $	! "#$%3"' # U&2&+	Y$%#&&+	, T'/ 94 $3# # U&	) 9$2&$<	, / <$	?U9/ <1%$
A+<* ? (<+</ CE&A' &D>L)/	a	a	a	O+' A/	P/ 0? L&b N28(? D7 D	a

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

5"3"0"

R21#$(# U&2&+

. %012#&3P%$0&$3#(3" 4 $	; $<1'#	) 9$2&$<	, / <$	?U9/ <1%$
A+<* ? (<+</ CE&A' &D>L)/	: [58(# >L&)*+, (P' A)A(L, < ? "A)A	HL)	d4M88(? D7? e	1(>+' 0A
	: P58(P/ 0? L&	HLRR*)	528(? D7 D	a
	: P58(F 0L&	HL)	1! 22(? D7 D	a

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

5 - %3&2(# U&2&+

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

I%#&#' #&3$5 / %$<&3

. %012#&3P%$0&$3#(3" 4 $	; $<1'#	) 9$2&$<	) 2/ %$	?U9/ <1%$	G=<$%"#&3
A+<* ? (<+</ CE&A' &D>L)/	%E/ A(a(O"&(*00)L,)	HLRR*)	a	! 58 O'C0+D0L? A	a
	%E/ A(a(O+</ 0L)/ (*00)L,)	HLRR*)	a	! N>+' 0A(188 ? "&D0L? A	a
	%E/ A(a(O+</ 0L)/ (*00)L,)	HLRR*)	a	18(? "&D0L? A	a
	BI ", (a(O"&(*00)L,)	P+D	a	! N>+' 0A! 5 ? "&D0L? A	a
	BI ", (a(O"&(*00)L,)	X' ", / L(Q)D	a	! N>+' 0A! 5 ? "&D0L? A	a
	BI ", (a(O"&(*00)L,)	S' ? L,	a	58N>+' 0A(894 $/ 00',)	a
	BI ", (a(O"&(*00)L,)	S' ? L,	a	! N>+' 0A(8983 $/ 00',)	a
	BI ", (a(O"&(*00)L,)	S' ? L,	a	! ! (>+' 0A(18 $/ 00',)	a
	BI ", (a(O"&(*00)L,)	S' ? L,	a	N6(>+' 0A(895 $/ 00',)	a
	BI ", (a(O"&(*00)L,)	S' ? L,	a	12(>+' 0A! $/ 00',)	a
	BI ", (a(O+</ 0L)/ (*00)L,)	S' ? L,	a	N2(>+' 0A(4 $/ 00',)	a
	BI ", (a(O+</ 0L)/ (*00)L,)	S' ? L,	a	! N>+' 0A(891 $/ 00',)	a
	BI ", (a(O+</ 0L)/ (*00)L,)	O+' A/	a	! N>+' 0A! 5 ? "&D0L? A	a
	BI ", (a(O"&(*00)L,)	$'D	a	! N>+' 0A! 5 ? "&D0L? A	a
	BI ", (a(O"&(*00)L,)	HLRR*)	a	! N>+' 0A(58 ? "&D0L? A	a
	BI ", (a(O+</ 0L)/ (*00)L,)	HLRR*)	a	! N>+' 0A! 5 ? "&D0L? A	a
	BI ", (a(O"&(*00)L,)	S' ? L,	a	! (>+' 0A!	a

JSDB7D8 7"!

: "/ (BC*, C! (H/ A/ L0D>(((((((($F(- +G116((((((((((((((((((H+C! , +0< J# (((("215_M82a86N6(((((((T TT 9>/ 0? +8D>?
$7 00' (- "+)/ O>, +&DE(# C8((((46N6(W8O/ 0<"L, (H+L<((((((((31185((((((((("215_M82a6413(@LG

#$ (%&( )* +- . (/ * 0012

778@ U&2/ '/ P&2" '(&3*/ %4 "#&3

				$/ 00',)	

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

) $3<&#0&$%

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

5" %2&3/ P$3&2&+

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

5"' <<&3&2" #&3

. %012#&3P%$0&$3#(3" 4 $	R5_ I>	IR; 5	?. R	ZIG) >	Z@	G) > R
A+<* ? (<+</ CE&A' &D>L)/	V!	a	a	W+, / 9	a	W+, / 9
A+<* ? (>E<0+D/ , 0L0R+, L)/	a	a	a	W+, / 9	a	W+, / 9

! 1#' P$3&2&+

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

@$%#' P$3&2&+

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

: $9%012#&T$(# U&2&+

. %012#&3P%$0&$3#(3" 4 $	! "#$%3"' # U&2&+	Y$%#&&+	, T'/ 94 $3# # U&	) 9$2&$<	, / <$	?U9/ <1%$
A+<* ? (<+</ CE&A' &D>L)/	a	a	a	O+' A/	P/ 0? L&b N28(? D7 D	a

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

7D&(? 2/ '/ P&2" '(&3*/ %4 "#&3

?2/ # U&2&+ : W+(I , +T , (A'D, "."0L,)(/ ../ 0A(+0(00')"0L&>L] L0<A9

H3&$0() #' #$<

R\ 1" #&2($2/ # U&2&+

. %012#&3P%$0&$3#(3" 4 $	; $<1'#	) 9$2&$<	?U9/ <1%$
A+<* ? (<+</ CE&A' &D>L)/	VC)/ (%$ 58(1! 88(' D7 (OL0', / (T L)/ 0	V&DL/ (a(BI / &)+, / ? L(C+A)L]' ?	M8(>+' 0A
	VC)/ (: [58(M88(' D7 (OL0', / (T L)/ 0	[0 A)L0' L, A(aV0/ ? "L(AL& L(a V<' &(a! 5(<LEA(a495()+(N55(? ?	N2(>+' 0A
	VC)/ (: [58(1N88(' D7 (@0/ A>(T L)/ 0	PLQ>, "L(aPLQ>, "L(Q &G(a W + , L)/	N2(>+' 0A
	VC)/ (: [58(5M8(' D7 (@0/ A>(T L)/ 0	@A>(a['00>", ' A? 0'DL&(a(: L0' L/ (a ! (<LEA(aN56(? ? (a51(? D	M8(>+' 0A
	[>0+, "C(WF %$ (49 (? D7 (@0/ A>(T L)/ 0	PLQ>, "L(aPLQ>, "L(? LD, L(a W + , L)/ (af ! N>+' 0A	! 1(<LEA
	[>0+, "C(WF %$ (d 1456(' D7 (@0/ A>(T L)/ 0	@A>(a($"? / Q>L& A(Q0+? / &A(a(6 <LEA/ A8&L53A6Q)	N (<LEA
A+<* ? (>E<0+D/ , 0L0R+, L)/	VC)/ (%$ 58(358888(' D7 (@0/ A>(T L)/ 0	V&DL/ (a(WL' "C &(A/ ? ", ' &?	M8(>+' 0A
	VC)/ (%$ 58(! 458(? D7&	PLQ>, "L	N2(>+' 0A
	VC)/ (: [58(636926(? D7 (OL0', / (T L)/ 0	[0 A)L0' L, A(aV? / 00L? EA"A RL>"L(aN)+(5(<LEA	N2(>+' 0A
	VC)/ (: [58(6558888(' D7 (@0/ A>(T L)/ 0	@A>(aXL? R A'L(L..", "A(aV<' &	M8(>+' 0A
	[>0+, "C(WF %$ (563(? D7 (@0/ A>(T L)/ 0	PLQ>, "L(aPLQ>, "L(? LD, L(a W + , L)/ (af ! N>+' 0A	4(T/ / I A

5/ 32'1<&3$ 14 4 "%$: W+)(L`L"&R&9

. $%&<&$32$$$P%0" =&&+

JSDB7D8 8"!

: "/ (BC*, C! (H/ A/ L0D>(((((((($F(- +G116((((((((((((((((((H+C! , +0< J# (((("215_M82a86N6(((((((T TT 9>/ 0? +8D>?
$7 00' (- "+)/ O>, +&DE(# C8((((46N6(W8O/ 0<"L, (H+L<((((((((31185((((((((("215_M82a6413(@LG

#$ (%( )* +- . (/ * 0012

7D8(? 2/ '/ P&" '(&*/ %& "#& 3

5 / 32'1<& 3$ 14 4 '"% : VW)(L`L"&R&9

5 " 3 " 0 "

R\ 1" #&(S2/ # U&&#

. %012#&&P%0&3#(3" 4 $	; $<1'#	) 9$2&<	?U9 / <1%
A#<* ? (<+</ CE&A\ &>L)/	VC)/ (%[58(1! 88(` D7. (OL0', / (TL)/ 0 VC )/ (: [ 58(M88(` D7. (OL0', / (TL)/ 0 VC)/ (: [58(1N88(` D7. (@/ A>(TL)/ 0 VC )/ (: [ 58(5M8(` D7. (@/ A>(TL)/ 0 [>0+, *Q\VF %[(49 (? D7. (@/ A>(TL)/ 0 [>0+, *Q\VF %[(d1456(` D7. (@/ A>(TL)/ 0	V&L/ (a(El / &)+, / ? L(C+A)L)' ? [0 A)L0' L. A(a(V0)/ ? *L(AL& L(a \/<` &(a! 5(<LEA(a(45(0)+(N8(? ? PLQ>, *L(a(PLQ>, *L(Q! & Q(a W +, L)/ @A>(a([!00>*, ' A(? 0'DL&,(a(: L0 L/ (a ! ?<LEA(a(N8(? ? (a(51(? D PLQ>, *L(a(PLQ>, *L(? LD, L(a W +, L)/ (a(! N>+' 0A @A>(a($ *? / Q>L&,A(QD+? / &,A(a(6 <LEA(/ A8tL53A6Q	M8(>+' 0A N2(>+' 0A N2(>+' 0A M8(>+' 0A ! 1(<LEA N! (<LEA

5 / 32'1<& 3$ 14 4 '"% : VW)(L`L"&R&9

$%&&#&32$$$P%0"=&&#<

5 / 32'1<& 3$ 14 4 '"% : VW)(L`L"&R&9

G# $'%[0T$%$($**$2#< : VW)(I , +T , (A(D, *.*(L ,)(/ ../ QA(+0(D0')*(L&>L] L0<A9

7F8(, &<9 / <"'(2/ 3<&0$%#& 3<

` "<#&(0&<9 / <"' : =>/ (D/ , / (L)*+, (+(T LA)/ (A>+' &(R/ (L` +*</ <(+0(? *, ?.*] / <(T >/ 0` ` / 0(Q+AAR&.9(B*D, *.*(L,) .' L,)"}" A(+(T LA)/ (QD+<' Q(/0' A*<' / A(A>+' &(, +)(R/ (<*AQ+A/ <(+.(`L()>/ (.+' &A\ T / 0(R, ) Q0+0` AA/ <(*, (L(A`*)LR&((/ ../&/ , )()0' L)? / , )(Q&, .9(P*AQ+A/ (+.(A 0Q&,A(L, <(, +, a0' CE0&R& Q0+<' QA(` L(L(&O , A/ <(T LA)/ (<*AQ+AL&(C+,)0LQ+0$(P*AQ+AL&+.()>*A(Q0+<' Q,(A+&,)*+, A L, <(L, E(REaQ0+<' QA(A>+' &(L)(L&Q*? / A(C+? Q&(T *)>)/ (0' ;' *0' ? / ,)A(+.(/ , ` *0+, ? / ,)L& Q0+)/ C)*+, (L, <(T LA)/ (<*AQ+AL&&D*A&,)*+, (L, <(L, E(0' D*+, L&&Q.L&' >+0*E(0' ;' *0' ? / ,)A9 U LA)/ (QL0 LD*, D(A>+' &(R/ (0' CEC&<9(# C*, / 0L)*+, (+0(&, <.*&A>+' &(+, &(R/ (C+, A*</ 0' < T >/ , (0' CEC&, D(*A(, +)(/ LA*R&9((=>*A(? L)/ 0L&, <(*)A(C+,)L*, / 0(? ' A(R/ (<*AQ+A/ <(+.(*, (L AL/ (T LE9([L0/ (A>+' &(R/ ()LI / , (T >/ , (>L, <&, D(/ ? Q)*/ <(C+,)L*, / 0A)>)>L)`>L` / (, +)(R/ / , C&L, / <(+0(0', A(<(+')9(%? Q(E(C+,)L*, / 0A+0(&, / 0A(? LE0/)L*, (A+? / (Q0+<' Q(0' A*<' / A9 V' +*<(<*AQ/ 0AL&(+.(AQ&<(? L)/ 0L&, <(0 , +..(L, <(C+,)LC)(T *)>(A+*8(T L)/ 0T LEA)(<0.*, A L, <(A/ T / 0A9

, &<9 / <"'(<- / 1'0(=$(8(" 22/ %" 32$(M&# ("9 9'&2" =' $(%P& 3" "N3" #& 3" "(" 30(/ 2" "(" M<(" 30(%P1' " #& 3<8

; $"$%## () $2#& 3(U:(> RZ , ^ IZ _ (RZ , () @G; R_ ?(" 30() $2#& 3(A:(? a. G) H; ?(5 GZ @ G^) S ?;) GZ R^ (. ; G@? 5 @GZ */ %" 0 0 8& 3" "(- " 30' 8P(8*/ %& " #& 3(" 30(9%#&2#& 3(/ *($4 9'/ +$$<8

7C8(@%3<9 / %#(8*/ %& "#& 3

. $P1' " # % 8*/ %& " #& 3	HZ(314 =$%	. %9$%<- 8/9 8P 3" 4 $	5' " <<$<	. _ b
. G@5' " <<&&" #& 3	V#) 0' D` &)/ <9	a	a	a
IR@RX _ ; (5' " <<	V#) 0' D` &)/ <9	a	a	a

$X (b($ L Q *, D(D0+' Q

; *) (BC? , C (H/ A/ L\D>((((((((((3 F(- +G11?((((((((((((((((((+<Q .+0<J## ((@"215_M62#86N6(((((((T T 9>/ 0? +8D>?
$ * 0D (- *-)/ 'D>, +&-E8# C$(((((+6N6(V#8O/ D>*L, (H+L<(((((((31185((((((((@"215_M62#6413(@.G

#$ (%( )* +- . (/ * 0012

7K8(; $P1' " # %(8*/ %& "#& 3

H3&$0() # #&<

>5) (5' " <<&&2" #& 3	:	=+GQ(? L)/ 0L& #0?)L)*, D(? L)/ 0L& B/ , A*)] *, D(? L)/ 0L& =LD0')(+0L, (/ ../ C)A
H8) 8(Y0%' (%P1' " #& 3<	:	@ 5 R(A\/ V#H; (?U$4 9#$ " "%8$" ($U$4 9#& 3b(V#)(</)/ 0? *, / < H3&$0() # #&<(8*T$3# %(\@ 5 R(A=\#)V8Q+? Q+, / ,)A(L0' (8&)/ <(+0)/ G ? Q)/ <9) R; R(FEDB*EBC$F77$F7D(S U#%$4 $' +(- " Q' %)/ 1<(<1=<#' 32$<b(V#+(Q0+<' Q(A(T / 0' (.+' , <9) R; R(FEDB*EBC(S4 $*P$32+(9" " 33&P(" 30(3/ #&&2" #& 3b(V#+(Q0+<' Q(A(T / 0' (.+' , <9) R; R(FEDB*EBC$F77$F7D(- " Q' %)/ 1<(2- $4 &2" " <b(A+<* ? (>E<0+D' , (L0R+, L)/ (! 8 (BP*B B+&,)*+,) R; R(F77$F7D(!) , ,) (0&<#&<1#& 3(0(2- $4 &2" " '(8T$3# %(X(- " Q' %)(&$3#&2" #& 3b A+<* ? (>E<0+D' , (L0R+, L)/ \#P ? / <'L)/ (*LC)/ _[>/ L&>(>L] L0< (! 8 (BP*B(B+&,)*+, b #P ? / <'L)/ (*LC)/ _[>/ L&>(>L] L0<
5 '$" 3(R&(R2#() $2#& 3 77D\#\#" Q' %)/ 1<(R&% . / " 1# 3#<(\/ R. <W	:	V#)(8A)/ <
5 '$" 3(R&(R2#() $2#& 3(] E0 5 " " <<(I() 1=<#' 32$<	:	V#)(8A)/ <
5 '$" 3(R&(R2#() $2#& 3(] E0 5 " " <<(II() 1=<#' 32$<	:	V#)(8A)/ <
, ?R(^ &#(I(5 - $4 &2" " < V %21%/ %5 - $4 &2" " <W	:	V#)(8A)/ <
, ?R(^ &#(II(5 - $4 &2" " < \/P<<$3#&" (5 - $4 &2" " <W	:	V#)(8A)/ <
) # #&(P&P1' " #& 3<<		
! " <<" 2- 1<$##<	:	V#+, / (+.()>/ (C+? Q+, / ,)A(L0' (8A)/ <9
Z $M(c / %	:	V#+, / (+.()>/ (C+? Q+, / ,)A(L0' (8A)/ <9
Z $M(d$%$+	:	V#+, / (+.()>/ (C+? Q+, / ,)A(L0' (8A)/ <9
. $33<+'T" 3&	:	V#+, / (+.()>/ (C+? Q+, / ,)A(L0' (8A)/ <9
H3&$0() # #&<(8T$3# % \@ 5 R(A=W	:	V&C+? Q+, / ,)A(L0' (8A)/ <(+0)/ G ? Q)/ <9
5 " 3 " 0 "		
` >! I) (\5 " 3 " 0 " W	:	[&AA(P:d - b(O L)/ 0L&CL' A", D(+)>/ (I)+GQ(/ ../ C)A(^=+GC_9
5 " 3 " 0 & 3 (&#<		
5 " 3 " 0 & 3 (Z . ; I	:	V#+, / (+.()>/ (C+? Q+, / ,)A(L0' (8A)/ <9
5 ?. R(@ U&2(<1=<#' 32$<	:	V#+, / (+.()>/ (C+? Q+, / ,)A(L0' (8A)/ <9
5 " 3 " 0 " (8T$3# %	:	V&C+? Q+, / ,)A(L0' (8A)/ <(+0)/ G ? Q)/ <9

@ &(9%012#(- " <(=$$3(Z" " <<&&$0(8(" 22/ %" 32$(M&# (# $(- " Q' %(2%&5%&(/ *(# $(5 / 3#%&" " $0(. %012#<(; $P1' " #& 3< " 30(# $(!) , ,) (2/ 3# 8<(" " '(# $(8*/ %& " #& 3(%$\ 1&$0(=+(# $(5 / 3#%&" " $0(. %012#<(; $P1' " #& 3<8

I3#5%&" #& 3" " (%P1' " #& 3<

; *) (BC? , C (H/ A/ L\D>((((((((((3 F(- +G11?((((((((((((((((((+<Q .+0<J## ((@"215_M62#86N6(((((((T T 9>/ 0? +8D>?
$ * 0D (- *-)/ 'D>, +&-E8# C$(((((+6N6(V#8O/ D>*L, (H+L<(((((((31185((((((((@"215_M62#6413(@.G

#$ (%&( )* +- . (/ * 0012

7K8(; $P1'"# %+(&3*/ %4 "#&3

I3#$%3"#& 3"'(&#< : R1<#%'&(&T$3# %+(VRI5) VbV&C+? Q+, /,)A(L0'(&A)/ <(+0(/ G'? Q)/ <9
5- &"(&T$3# %+(V?5) 5VbV&C+? Q+, /,)A(L0'(&A)/ <(+0(/ G'? Q)/ <9
d"9"3(&T$3# %b(V&C+? Q+, /,)A(L0'(&A)/ <(+0(/ G'? Q)/ <9
e/ %$"(&T$3# %b(V&C+? Q+, /,)A(L0'(&A)/ <(+0(/ G'? Q)/ <9
Z$M(f $"'"30(I3T$3# %+(/ *(5-$4 &"'<(VZf I/ 5VbV&C+? Q+, /,)A(L0'(&A)/ <(+0(/ G'? Q)/ <
. - &&9&$<(&T$3# %+(V I55) VbV&C+? Q+, /,)A(L0'(&A)/ <(+0(/ G'? Q)/ <9

7] 8(G# $%(&3*/ %4 "#& 3

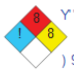
^"=$'(%$\ 1&&4 $3#< : SVHO@K: (#@#VSV: %P(FH(V- BFH- %P(=SHFKX S(BZ#W9([VKB%B(H%B$#HV=FH\
=HV[=J%. %VWP(BZ#W(#HH#=V=#F W9(OV\ ([VKB%(V: : %HX #[(BZ#W(H%V[=#F W9
OV\ (- %(SVHO@K: (#@BU V: : F U %P9([F W=V#WB(OV=%H#V: (=SV=([VW[VKB%
=VHX %=(FHX VWPVOVX %9

>"Q'%9/ 1<(! "#$%&'
I3*/ %4 "#& 3() +<#$4 (VH8) 8R8/V :

>$"'#	!
Y"4 4 "=&&+	8
. - +<&"'(- "Q'%9<	8

@ $(21<# 4 $%&<(%$<9/ 3<&'$(*/ %0$#$%4 &&P(# $(. . ?(2/ 0$(*/ %# &<(4 "#$%&'8

Z"#& 3"'(Y&$(. %#$2#& 3
R<</ 2&#& 3(VH8) 8R8/V :



, "#$(/ *(9%&#&P	: JDDB7D8
, "#$(/ *(&<<1$	: 67 7 81! 9
, "#$(/ *(9%T& 1<(&<<1$	: W+(Q0/ `*+' A(' L&<L)*+, 9
6$%& 3	: 1
. %9"%0(=+	: OBPB(BQ' CL&A)

I30&2"#$<(&3*/ %4 "#& 3(# "#(- "<(2- "3P$0(*%4 (9%T& 1<'+(&<<1$0(T$%& 38

Z/ #&2$(# (%$"0$%

@ (# $(=$<#/ *(/ 1%L3/ M'$0P$N# $(&3*/ %4 "#& 3(2/ 3#'&$0(- $%$&(&("221%#$&>/ M$T$%3$&# $%# $("=/ T$X3"4 $0
<199'&%3/ %'3+(/ *(&#<(<1=<&0&%$<N' <<14 $<("3+('&=&&+(M- "#</ T%/ %# $("221%2+(/ %2/ 4 9'$#3<<(/ *(# $
&*/ %4 "#& 3(2/ 3#'&$0(- $%$&8
Y&"'(0$#$%4 &"#& 3(/ *(<1&'=&&+(/ *("3+(4 "#$%&'(&(# $(</ '$(%$<9/ 3<&=&&+(/ *(# $(1<$%R'(4 "#$%&'<(4 "+(9%$<$3#
13L3/ M3(- "Q'%9<("30(<- / 1'0(=$(1<$0(M# (2"1#& 38R'# / 1P- (2$%#'&(- "Q'%9<("%(0$<2%&=$0(- $%$&N(M$(2"33/ #
P1"%3#$$(# "### $<$("%(# $(/ 3'+(- "Q'%9<(# "#($U&#8

Thermo SCIENTIFIC

EO@&%B=>?@ &$A,B>?@ C,?* QDC

The world leader in serving science

! " #%/&" ($) " *%#+$ " #" $) - %&#

! " #$%&'( ) *$+,*-,*. $ &'(Q,&*

78$ & 012#$ 30$2/ 4 9" 3+$0%3#*"2"#/ 3

. &'012#3+4 %	: ! " #$%&'( ) *$+,*-,*. $ &'(Q,&*		
) 199(%&	: =>?@ &$A,B>?@ C,?* QDC E,?@?$+ &D?C>* && F E9G5$+ &H611< I &CJDK@HL $3116M N*,0?-$ QDD?B 21MP32$6<5<$K@ 26692<59?<47	! "31*" 2#1 &&,	: =>?@ &$A,B>?@ C,?* QDC E,?@?$+ &D?C>* && F E9G5$+ &H611< I &CJDK@HL $3116M N*,0?-$ QDD?B 21MP32$6<5<$K@ 26692<59?<47
5 / 0 %	: 1234456		
!) ,) $D	: 27PM		
6" (!0" #/ 3$D" #%	: 78!<&46149		
. &3#$D" #%	: 78?6&46149		
; %9 / 3< =(%3 " 4 %	: Q / ! / $R ?. ('O0K@5? S?C,O,E0T 5 >?! @ ?5 : ABE8CDCEEFEEB GH(@ I. ,?$+I) : JEF8KDJ8FAAJ	! "#/&" ($1 <%<	: %'%8# $# %&3<#8!2#/ 3 =/ / L(%#$/ &$9 &! 9%8$' 30 '3#/&0 %$1<3#8G# %&M <%N 2/ 3#' 2#5<199 ("%8? / &<9%2 "*2 " 99 (2"*#/ 3 <8
. &'012#3+4 %	: : ,; (,- 9		

D8$> " Q' &0 <$0%3#*"2"#/ 3

2 4 %&P%3 2+$ T"&T" %M

. - +<2" ($<# #%	: : ,; (,- 9
5 / (/ &	: %&'&@?EE9
G0 / &	: %>O@0D?@B0C9
) 'P3" (3M/ &0	: Y #! " L" Z [
>" Q' &0$<#' #!4 %3#<	: A: #QQ.#+: U$ \L NIL $#" ! $ # EGI $B%GQ+N/ =L+ : U$B #I Q,AN: LA Y #: : GY U! 9 %#'N/ U/ $ U/ EIL #=GI _$=I # %=H&J_U$#" ! $ ` L" $L I L=#=LG" $B%&G" =#L" / Q#=UI L#: $=^ #=$%#" $%#N/ U$=#! Z U=$GI Z # " $ # Q=#Z U9
. &$2" 1#/ 3" &+$L % <1&%<	: ! &$' &DM/@0D>?$aOS&$K@ _EB$B &$' &Q$* . ?EBBBNEP?$K' F$K (,0+$O ?; (O0?$a?* 0'OQ,&* 9B &$' &0 ?O0$ @,J$K@B &J?3K(>?* $[E$* . $D>,EBS@+ (OBB# a&,- $O&' OOOOX ,0+$?F?EHEJ,* $O' - $C &0>,* . 9 ' ??S0OX OF$U@ $>?O0HEBO@EBO' - $OO) ?$% ??S0O&* OO' ?@. >0F$C &EP - $B9' OE> 0+&@(. >'F$OD?@+O' - '* . 9
G) > R3+5) $<# #1 <	: =>,EB OO'@D$,EBO&* E- ?@- $+OVO@&(EMVF$D>?3G/ ^ #9 OVO@3%&)) (*,OO0&* $ 0D' - O@ R4F$%AI $IP16914667 9		
; / 1#%<$ "$?@#&	: ! ?@ O3O&* 0OO0BUF?$O&* 0OO0B* >OO0&* 9&* . ?E0&* 9		

./ #?@#" (3 21#/&_% (# $%&*?@#<

!3 - "(" #/ 3	: L@@D0* . $0&$@E$.@0&@EEFEEP) 9BUH$&E(@$0&$?O&) S&E0,&* $S@& (OEB) OF$OO(EP$O&>?O0> >OVO@9B ?@&(EBP!D?OEB) OF$V/P$?'O?- $0&* &X ,*. $?H$&E(@9
!3P%#/ 3	: =&H-IO$,DEBK O' &X?- 9
) L'3	: L@@D0* . $0&$EJ,* 9
? +%<	: L@@D0* . $0&5'F?EB

FFEBDE7D8 ! '! !

; ,D$ C?* O'$?B?O@>$BBBBBBBG$+&H<B1<BBBBBBBBBBBBBBBBBBBB &CJDK@HL $BBF21MP32b6<5<$BBBBBXXX$>?@ &8$&)
E,?@'$+,&?O>* &&. F$c OBBBBB'<5<$ $E?@,O'$ &O>BBBBBBBB116MBBBBBBBBBF21MP32b<713$HOH

%&$ ( )* + , $., / ., 0$1 ( )* 2 (,

D8$> " Q' &0 <$0%3#*"2"#/ 3

./ #?@#" ($2- & 3'2$ % (# $%&*?@#<

5 - &(3'2$%&*?@#<	: %&* 0O,* EB) OO'@$D>O$OO' $OO(EP$O0@?O0K@O' $ O) O ?9
5 " &2'3/ P%3'2'#+	: " &$J* &X,* $EL . *,DOO' 0$'DO' OEBK&$@@OO$>OVO@EB
! 1# P%3'2'#+	: " &$J* &X,* $EL . *,DOO' 0$'DO' OEBK&$@@OO$>OVO@EB
@&' # P%3'2'#+	: " &$J* &X,* $EL . *,DOO' 0$'DO' OEBK&$@@OO$>OVO@EB
, %'%/ 94 %3#' ($%&*?@#<	: " &$J* &X,* $EL . *,DOO' 0$'DO' OEBK&$@@OO$>OVO@EB
Y%8#(#+$%&*?@#<	: " &$J* &X,* $EL . *,DOO' 0$'DO' OEBK&$@@OO$>OVO@EB
@ &*%$B &P" 3<	: %&* 0O,* EB) OO'@$%<,>,C>$OO(EP$B O) O ?$0K$D>?$0K' &X,* . $K@O' EB$D>?$' ?@&(BIEFFE0P) K V%* ?$) O@$K 9 %&* 0O,* EB) OO'@$%<,>,C>$) OF$OO(EP$' O) O ?$0K$D>?$0K' &X,* . $K@O' EB$V%&+ H&J,- * ?FEK ',a?@BBS ??* H$ CE0@&,* 0'E0,* O$0@O4OO@ &aCE0('O@FFE0P) H$ SS?@@BBS.@0K@@O4EJ,*K C?* 0@$?@&(BIEFFE0P) $P%' / TH$?F?H$?* EB%@&X@?O9

GT$&%&J9 / <1&$<' P3<$<+4 9 # 4 <

!3 - '(" #/ 3	: # - a?(@?$EF) S0&) EB) OF$* C(- ?$D>?$0K' &X,* . c @BS.@0K@$H@O0J@@O0,&* C&(. >,* .
!3P%#/ 3	: " &EB?C,DO$ O0O9
) L'3	: # - a?(@?$EF) S0&) EB) OF$* C(- ?$D>?$0K' &X,* . c ,@@O0,&* @ - * ?EB
? +%<	: # - a?(@?$EF) S0&) EB) OF$* C(- ?$D>?$0K' &X,* . c SO' $K@@O0,&* X O0'@ @ - * ?EB
! %'2" ($2/ 30 '#/ 3 " PP&T" #%0$=+$ T%&X %J9 / <1&%	: E@&?HE0* . $,EB&@?@$* a&a,* . $O' F$O@?O0K@O' EB) ?* 0,&* ?- $' $D>EBQ / ! / $OEHV?,* . $O0 @EJ$) OF$V?$O . @&O0?- $V?$&a?@?H$&E(@0K$D>EB$@& (O0

) %8# U2/ (/ P'2" ($3*/ &4 "#/ 3$J %2#/ 3$'7W

F8$5 / 4 9/ <'#/ 3 $3*/ &4 "#/ 3$' 3$3P8%0'%3#<

H3'#%0$ #'#%<

Z" 4 %	5 R) $3 14 =%&	[
. (O' ,- ,* ,( ) $O>'&@?	M6!61b!	4M6!65M
S@$O' b4!b&	3<!b7!b6	4M6!65M

5 " 3" 0"

Z" 4 %	5 R) $3 14 =%&	[
. (O' ,- ,* ,( ) $O>'&@?	M6!61b!	4M6!65M
S@$O' b4!b&	3<!b7!b6	4M6!65M

@ %8%' &$&) / $ 0 0'#/ 3" ($3P8%0'%3#<$) 8%<%3#&M- '2- !$M/# ' 3$# %21&8$3#&L 3 / M(%0 P%3 "$# %%<199 (%8$ 30$3$# %
2/ 32%3#&*#/ 3<$' 99 ('2" =(%&$ &$2(" <<*" %0$ <$ " Q' &0 / 1<$# $ %(# $) &$# *%3@ T' &(34 %3#5 30$ %2%8$% 1' &8$3 9 / #' 3P$3
' <$<%2#/ 38

C8$Y' &<#$ '0$4 %' <1&%<

? +%2 / 3#' 2#	: %>?CJ$K&@' - $2) &a?$O' F$O&* 0OO0$?* EB'EB$L)) ?- ,O0' F$O(EB>$'F?EB$K ,0+$$?* (F$$J$K O0'@ DK&@0$?CE0$ M) ,* (0'EB&$OOCE,&* O' F5,D* . $D>?$(SS?@0' - $&X ?@'F?' ,- EB$Z ?0) ?- ,CO O0'* 0,&* $)) ?- ,O0' F9
) L'3 $2/ 3#' 2#	: L* $OCEP?$K0C&* (OOO4$)) ?- ,O0' F$O(EB>$EJ,* $(,0+$$?* (F$$J$K O0'@$K&@0?CE0$ M) ,* (0'EB X>,'?$2) &a,* . $C&* 0D) ,* O0'- $C&0>,* . $O' - $E>&?EB$B' CE>$C&0>,* . $/?DK@2$2(EB?$B%?O' E>&?EB>&@(. >'F$V?DK@?$2(EB?$$Z ?0) ?- ,CO$OO0?* 0,&* $)) ?- ,O0' F9

FFEBDE7D8 3'! !

; ,D$ C?* O'$?B?O@>$BBBBBBBG$+&H<B1<BBBBBBBBBBBBBBBBBBBB &CJDK@HL $BBF21MP32b6<5<$BBBBBXXX$>?@ &8$&)
E,?@'$+,&?O>* &&. F$c OBBBBB'<5<$ $E?@,O'$ &O>BBBBBBBB116MBBBBBBBBBF21MP32b<713$HOH

%&$ ( )* + , $., / ., 0$1 ( )* 2 (,

C&$\Y' &<#$ '0$4 %' <1&%<

I3- "(''#/ 3 : Q.&a?$?HS&EP- $5?@&" XQ@$-$O(@&U$ &&V@O>.* . H$LV@O>.* . $E&@@ ('O@X&D @ES.@X&?$O@EQX&O(@H&S@a.- ?$Q@OC.O$?ES.@Q&" $X&$H F. ?* $V?$Q@* ?- $5?@&" * ?'9 . .&&E?" $Q. >0C&>.* . $E(C>$O.E&O&CX "O@Q?H&V" O&X@(O.EQV@ - %$Z ?Q) ?- ,CO$CQP" Q&* ,)) ?- .,CO?'F9

I3P%#/ 3 : Y CE>$X(Q) .&(0>$X(.0>$X(CO?@$ &$" &Q5* - (C?$a.&) .(" . $(* '?EE$.@CO?- $Q&$ &$E&V?$) ?- .CO S?@&" * ?'5E ?a?@.a ?$O'F>.* . $V?$) &(0>$X&O'$(* C&* EC.&(E8S?@&" %$Z ?Q) ?- .,CO CQP" Q&* $)) ?- .,CO?'F9

. &#?&#/ 3$' *$' &<#X' '0%&< : " &$CCQ&* $E>O'$V?$QU?* $" a&a.* . $O' F8S?@X* O3@EU$X@(0>&(O$E(,CO\V?$Q@* . * . $%L%CB E(E8S?CO?- $>O$Q)) ?E8O@E6U' $S@E?* U4$>?3@EQ(?@>&(' . $(?Q$O' $CESS@$S@Q0?$ .CE($X@ E8?'D\C&* (C)* ?- $V@CO>.* . $CESS@Q0(EH&L0) .CF$V?$ O' . ?@(EH&X$>?$S?@X* $5@a- . * . $Q>.$X . a?$) &(0>0X&) &(0>$Z&(EC.CO\&* %$V' CE>$C&* (C) . ,* CO?- $C&>.* . $>&@(. >?F$X (0>$X CO?@ V?'D\C@Q@) &a,* . $\H&@ ?Q@ &a?E9

Z / #%<$# $9 - +<'2" 3 : L* $CCE?$X&" >O.CO&* $X&$?C&) S&E&0&* $S@ (C(E$* $O&)(H&EF) S0&) E8) CF$V?$?'CF?- 9 =>?$?HS&E?- $S?@&* $) CF$"??- $X&$V?$)?S0(* - ?@ ?- .CO5E(@?," O' C?$X&@&2$>&(@9

K&$\Y' &0\X*' P- #3P$4 % <1&%<

Y(''4 4 "='(#$' %#' %@&(012# : A'O( ) .O\V?$; (- %$L* $O5Q@$X@$>?O?- H$O$S@EEH @5* O@CEP?$X ,"$X.O(@0' - $>?$O&* O0* ?@) CF$V(@0%X .0>$O>?$@U$X5O$E(V&P; (?* 0?HS &E&* %$ (* &0X&%EP?X ?@ CF$O@O?$O@&@ ?HS&E&* $>O\O@9

?U#3P1' <- '3P$ %0 '"

) 1'# =(% : NE?$ (@C>?) .,CO\H?%G.H%X O0?@$S@F$X& T$X@&X.O) 9

Z / #%<1'# =(% : ! &$ &0(EP$X O0?@?09

) 9%2" (9%&9/ <1&%' "O(80< : E.@(S0F5E$X O?$>?$EC* ?3\V?$20) &a,* . $O' $5?@&* E8X@) $>?$a.C,* .(F5&$>?$* C- ?* 0$D 0>?@5E$C0(@$5 &$CO0&* $E>O' $\V?$QU?* $,* a&a,* . $O' F8S?@X* O3@EU$X@(0>&(O$E(,CO\V? 0@&* . * . 9$0.&a?$O&* O0* ?@$X@) $)(&$O@O&$>$-E8CO' $\V?$ &* ?$\.0>&(0(@$U 9$NE?$%C0?@ BS0(@EH&S?* $D) ?$X@O' F$X0>?@ * .0&* $E&(@?9$NE?$?HS &E&* b$&@&$?* ?0(@0 Fa?* '(' O0* . H$.. >0* . $O' - $ C0?@0$>O' - ','. T$?(.,S) ?* 0$NE?$ &* E8SC@* . $D&&E8$=QU? S(@0(0&* O@$?OE(@E8O O*E0$?'?0(@E8C0(C$ .EC>O@?E8$=&$Da&- $(]@$X@?HS&E&* K - .E8S0?$E0(C$?'?0(@(F$ (@. $\0@' E0?@\F$ @(* - .* . $O' - $\V&* - .* . $O&* (O* ?@$O' - ?; (.S) ?* 0\V?(X@$\@' E0?@ . $) O?@Q9$U) S5F$O&* O0* ?@$X@0* $5@&(O0$@E- (?$O' - CO' $\V?$>O\O@&(E8$ &$' &$(@(EP$O&* O0* ?@

) # &P% : /0&@$* $0CC&@O' C?$\ .0>$&CO$?@ ('O0&* E8$ 0&@$* $O E?. @ .O0* - $O' - $OSS@a?- $O@C9 / 0&@$* $&@ . *O$O&* O0* ?@$X@?O?- $(@) $.@C0E(* ' . >0$* $O5 @H0&&$O' - $\'?'ta?* (' O0?- O@O&O(CF$(@) $(* C&) .SO(\V?$) O0?@E&P?'?EPCO&* $'&1&5O' - $0&&- $O' - $ -$ @J.9$U) .* O0?O'$. * .0&* $E&(@?E8$?SO@O?$(@) $&H- .* . $) O0?@E8$??SC&* O0* ?@$) >0F$C&E?- O' - $EPO?- $(* (' $?@O F$X@$?@E8$?SO@O?$(@) $&H- .* . $) O0?@E8$??SC&* O0* ?@$) >0F$C&E?- O' - $EPO?- $(* (' $?@O F$X@$?@E8$?SO@O?$(@) $&H- .* . $) O0?@E8$??SC&* O0* ?@$) >0F$C&E?- @?E?O?- $O' - $\?'5O(S@>0&&5@a?* O5?QU O ?9$ &$' &0&$X@&* $(* ' .* . O\V?'?- $O&* O0* ?@$NE? OSS@$C@O*$O&* O0*) ?* O0&$Da&- $?* a(@*) ?* O0$O&* O0) , * O0&* 9

A&$?U9/ <1&%$2/ 3#&((<$9 %&</ 3" ($9&(#/%2#/ 3

H3' #/0$ #' #/%<

I3P&%0' %@#	?U9/ <1&%'$4 ' #<
S@$O' b4 b&	R5 _ I> $\H3' #/0$ #' #/%<\W / =U: d666SS) $%-Y #d$666$SS) !) > R$\H3' #/0$ #' #/%<\W =Y #d$P26$) . 8 f R5 _ I> $@ 6 $\H3' #/0$ #' #/%<1DSE7EM W / =U: d666SS) $1M$) .* (0?FB!9 $%-Y #d$666$SS) 2>&(@$E!9 Z1G) > $?^ $\H3' #/0$ #' #/%<1$ $SEEEEW / =U: d$144M$. 8 f$1M$) .* (0?FB!9 $% =U: d$M66$SS) $1M$) .* (0?FB!9 $%-Y #d$P26$) . 8 f16>&(@$E!9 $%-Y #d$666$SS) 16>&(@$E!9 G) > R$?^ $\H3' #/0$ #' #/%<1$ $SE7EM W =Y #d$P26$) . 8 f2>&(@$E!9 $%-Y #d$666$SS) 2>&(@$E!9 G) > R$?^ $'EAE$\H3' #/0$ #' #/%<1F'EAE\W / =U: d$144M$. 8 f$1M$) .* (0?FB!9 $% =U: d$M66$SS) $1M$) .* (0?FB!9 $%-Y #d$P26$) . 8 f2>&(@$E!9

%&$ ( )* + , $., / ., 0$1 ( )* 2 (,

] 8$R22'0%3 # (9$%(% <%$4 % <1&%<

^ " &P%<9 '((: / 0&S$?OJ EX .0>&(0(C@J $%D.&a?$C&* O0* ?@E8D@ $E&S" $O@O0E# SS&@OC>$@?OE?$D@ (S\.* - $E(@a?* O@?* 'D@* 0&E?'X ?@H<.O0?@C@X>?@0>E@ O0?@@&(@P?H&(0E?) ?* O&E@C@&* D?- $O@OE&E\Y OE> E&S" O ?E5* 0&E0?$?D@ ?* 0E(O' 0&C@O) ?* 0E5 O' 0&C@&@C?'?- $OE&E&* &X E&E0&* 0O* $O' - $C&* ?O0 E&S" O ?$\.0>$' &* b0E&) \W E&V\H&O\VE&&0?* 0) O?@@$?9 $E&O' - H$?O@+$a?@ .C(' 0?$&@ - .O0&) OC?& E8?@O@-$O' - $5 OC?$* $C&* O0* ?@&&$ E8S&E0$O0C&@0* . $0&$&O0$@ ('O0&* B E8?'?$E?O0&* $1?'E8N E?$E5O@H<$&@0E&&0&* E8O - $?+HS &E&* b5@&0?* 0 O$.C?* E8?- $\ OE?@$ .E8S&E0$O&* @@O0&@@&* O0) , * O?@- $O\V E&@0?* 0) O?@@$ OF$S&E?$D>? E8O ?$>O\O@$O5E8O>?E5$'' ?- $S@ (O0E$ &0?cE8?>?E5$?@ O?@@$?E?O0&* $1?'E8@) ?@?* OF$O&* O000 ,* O&@ O0&* $O' - $E?O0&* $1?'E8@ CE8?$ .E8S&E09

J8$> " 30('3P$' 30$<# &' P%

>" 30(3P : E(0$* OS@$S@O?'$S?@$* O$S@&O?O0a?$?; (.S) ?* 0$E?'?$?O0&* $2'T$8U O0* . H$ @J.* . $O' - E) &J.* . $D>&(' - $\V?$S@>.\W0?- $.* $O@CE$X>?@0>E@ O0?@@$E8>O' - '?- H&E0&@- $O' - S@C?'E8?- 9$Y &@?@E8>&(' - $\O&>$-O' - E8O' - $D0C?$\V?D\@$?O0* . H$ @J.* . $O' - $E) &J.* . 9 ! ?) &a?$O&* 0O ,* O0?- $C&O-.* . $O' - $S@&O?Oa?$?; (.S) ?* 0\V?D\@$?* 0@ . $?O0* . $O@OE8 ! &$' &0& ?0&* $?F?E8R@&* $EU ,* $R@C&0>.* . 9$ &$ &0\V@O0>?$aOC8$@&@ ,E0$$ &$' &0&* . ?E0 NE?$&* F$X .0>$O .?; (O0?$a?* 0'O0&* Y$Y ?O@O$S@$S@O?'$@E$S@0R&@>?* $a?* 0'O0&* $E ,* O. ?; (O0?$$ &$' &0$?* 0?@E8R@ ?$O@OE8O' - $O&* D'?- EOC?E$ * * ?EE8O .?; (O0?'F a?* 0'O0?- Y$??S$* $0>?$@ ,* O$C&* 0O * ?@$X@?* $S@&@?- $O0?@O0a?$ O .?$O@ $O BSO(@EH&S?* $D) ?$X@O' F$>0>?@ * ,0&* $E&(@?9$NE?$?HS &E&* b$@&@?' ?O(@O Fa?* '(' O0* . H$.. >0* . $O' - $ O0?@0$>O' - ','. T$?(.,S) ?* 0$NE?$ &* E8SC@* . $D&&E8$=QU? S(@O(0&* O@$?OE(@E8O O*E0$?'?0(@E8C0(C$ .EC>O@?E8$=&$Da&- $(]@$X@?HS&E&* K - .E8S0?$E0(C$?'?0(@(F$ (@. $\0@' E0?@\F$ @(* - .* . $O' - $\V&* - .* . $O&* (O* ?@$O' - ?; (.S) ?* 0\V?D\@$?O0* E0?@ . $) O?@Q9$U) S5F$O&* O0* ?@$X@0* $5@&(O0$@E- (?$O' - CO' $\V?$>O\O@&(E8$ &$' &0&(EP$O&* O0* ?@

A8$?U9/ <1&%$2/ 3#&((<$9 %&</ 3" ($9&(#/%2#/ 3

H3' #/0$ #' #/%<

I3P&%0' %@#	?U9/ <1&%'$4 ' #<
S@$O' b4 b&	R5 _ I> $\H3' #/0$ #' #/%<\W / =U: d666SS) $%-Y #d$666$SS) !) > R$\H3' #/0$ #' #/%<\W =Y #d$P26$) . 8 f R5 _ I> $@ 6 $\H3' #/0$ #' #/%<1DSE7EM W / =U: d666SS) $1M$) .* (0?FB!9 $%-Y #d$666$SS) 16>&(@$E!9 $%-Y #d$P26$) . 8 f2>&(@$E!9 Z1G) > $?^ $\H3' #/0$ #' #/%<1$ $SEEEEW / =U: d$144M$. 8 f$1M$) .* (0?FB!9 $% =U: d$M66$SS) $1M$) .* (0?FB!9 $%-Y #d$P26$) . 8 f16>&(@$E!9 $%-Y #d$666$SS) 16>&(@$E!9 G) > R$?^ $\H3' #/0$ #' #/%<1$ $SE7EM W =Y #d$P26$) . 8 f2>&(@$E!9 $%-Y #d$666$SS) 2>&(@$E!9 G) > R$?^ $'EAE$\H3' #/0$ #' #/%<1F'EAE\W / =U: d$144M$. 8 f$1M$) .* (0?FB!9 $% =U: d$M66$SS) $1M$) .* (0?FB!9 $%-Y #d$P26$) . 8 f2>&(@$E!9

%&$ ( )* + , $., / ., 0$1 ( )* 2(,

A&$? U9/ <1 &/&$2/ 3#&/ (<$9 %&</ 3" ($9 &/ #/2#/ 3

	$&-Y #<$566$&S) 2>&(@&ET9

5 " 3 " 0 "

G2219 " # / 3 " ($%U9 / <1 &$%'4 '#<		@ RSAS / 1&<W			) @ ^ 3J7K$% '3<W			5 %('3P				
I3P&%0 '%2#	^ '<%$" 4 %	994	4 P$% '	G# %&	994	4 P$% '	G# %&	994	4 P$% '	G# %&	Z / #'#/ 3<
S@&SO" b\b&	N/ $#%Z L^ $%$616	466	b	b	566	b	b	b	b	b	
	#+ $$%66P	466	5P4	b	566	P25	b	b	b	b	
	+%$P%616	466	b	b	566	b	b	b	b	b	
	G" $-%616	466	b	b	566	b	b	b	b	b	
	\ %$%662	566	P27	b	M66	1476	b	b	b	b	

5 / 3<1(#& / 2 " ($' 1 # / &#%<$/ &$ 22%9 # '=(%$%U9 / <1 &$%'4 '#<8

; %2 / 4 4 %3 0%0$4 / 3 '# &3 P 9& 2%01&%< : L$D> .E$E@& - (ODC&* (D)* E&*. @- ,?* EB\K (\ >$?HS&E(@5,) .(EH&S?@&* O\%K &@S OC?$D) &E$>?@ &@\V& &_ .CO$) &* .O&@ .$) .CF$V?$D@ (.@- $0&$?0?@ * ?$D>?$?D?O0a?* ?EB&D>?$a?* (' O) &* &@&D>?@&* (@$) ?.O(H (@E$O" - 8&@>?$* ?C?EB.O"F$D&$ EP$@E$.@0&@E$@0?O0a?$?; (,S) ?* 09

?3P'3%&3P$% %<1&%< : NEP$&* 'F$\ (\>$D ?; (O0?$a?* (' O) &* $%NEP$%@C?EB$?* C&E(@EH&&CO$?H>O(E0$a?* (' O) &* $&@ &\>?@$?* . ,* ??@ . $D&* O@EB0E&$]??S$\ &@?@$?H$&E(@$D&$D @&@?$D&* (D) . ,* O' EB\V?&\ $D' F @D&$) ?* - ?- $%@E$D0(D\@$5) .(EH$=>?$?* . ,* ??@ . $D&* O@EB0E&$??- $D&$J??S$ CEH&aOS&@ &@ (EB0D&* C?* O@) &* EB\V?&\ $D' F$&\ ?@H$&Ba?$,) .(EHNEP?H &B,&* H$@&$a?* (' O) &* ?; (,S) ?* 09

>+P '%@%$ % <1&%< : Y O$>$\O' - EH&D\@O@ EB\O' - $D0C?$D>&@(. >'F$D0P@>O' - ',* . $D>?) .CO$S@& - (O0EH&\P'D\@ ?O0* . H$) &J,* . $\O' - $(E* . $D>?$O&O&@$D' - $D0D>?$?* - $&D0>?$\ &@,* . $5?@& - %# SS@&S@0P \P<>* ,; (?EB>&(' - $\V?$(EP - $D&$@) &a?$S&D?* 0O' F$D&* (D) . ,* O0?- $C&0>,* . %5Y O$> O&* (D) . ,* O0?- $C&0>,* . $\V?D\@&@(E* . %J* E(@&>O0?P?X O$>$EO0&* EB\O' - $PO0?F$>&\ ?@ O@&C&E?$D&$>?$\ &@EH0J&* $&CO0&* 9

. %&</ 3" ($9 &/ #/2#/ 3

; %<9 '&/ # &< : NEPOE&@S?@F$J0?- H$O@E(@F,* . $\@J@F- $@E$.@0\@&@$) .SF,* . $\ (\>$D' OS@a?- EB0' - O@$E>&(' - $\V?X &@$D0E' $J) ?EB\>?* $>O' - ',* . $C>?) .CO$E@- (O0EH&D0E@J$O0EEP?EB) ?* 0$* - .,CO0?EB0>.E$E8 ?O?EB0E@E$?E$.@0\@E$?* ?O J&* $ (EB\V?V0EP - $&* $J * &\,* $\@$?0C,S0?- $?H$&E(@$?a?* EH0>?$>O\O@E$D0E>?$\@- (O0EO - $D>?$EO0?X &@,* . $,) (EB\D0>?$EP'?O0?- $@E$.@0\@

>" 30< : %>?) .CO0@EB0O' 0%) S?@&(B5 ' &a?EB0&) .SF,* . $\ (\>$D' OS@a?- $B0' - O@$E>&(' - $\V?X &@$D0E' $J) ?EB\>?* $>O' - ',* . $C>?) .CO$E@- (O0EH&D0E@J$O0EEP?EB) ?* 0$* - .,CO0?EB0>.E$E8 * ?O?EBO@9

?+%< : / CO?O\F$?F?X ?O@D&) .SF,* . $\ (\>$D' OS@a?- $B0' - O@$E>&(' - $\V?$ B?- $\ (>?* $O&@J O&EP?EB) ?* 0$* - .,CO0?EB0>.E$E8 ?O?EB0E@E$O a&- $?H$&E(@0D&$.,(,- E OE>?B4) .EB&E@& - (EB&9

) L' 3 : E?@&* O$S@0?O0a?$?; (,S) ?* 0D&@>?$\&- F$E>&(' - $\V?$E?' ?O?- $\OE?- $&* $\>?$O&J$\V?,* . S?@&@ ?- $O' - $\>?$@J B5 * a&a?- $O' - $E>&(' - $\V?$O$S@a?- $\V?$O&E$?C,O .E$\V?D\@&>O' - ',* . 0>.E$S@& - (O09

?3T' &' 34 %@# ($%U9 / <1&% 2/ 3#&(< : U) .EB.&* EB&@&) $a?* (' O) &* $%@& &@0$&@C?EB$?; (,S) ?* 0E>&(' - $\V?$C>?CJ?- $D&$?* B(@$\>?F O&) SF$\ (\>$D>?$?@; (,@) ?* EB\D$?* a ,@*) ?* O0$S@&O?O0&* $?. .B O0&* $&* $B&) ?$O0B?E\K (D) ?$EO@\V?@H\D0?@\K@?* . ,* ??@ . $) & .D O0&* EB\D$>?$S@C?EB$?; (,S) ?* 0\K ,' $\V? * ?C?EBO@&D&@- (C?$?) .EB.&* EB&D$O0C?$O0\V?$?a?E9

E&$ - +<'2" ($' 30$2- %4 '2" ($9 &/ 9%&#%<

. - +<'2" ($<#' #% : : ,; (,- 9

Y(" <- $9/ '3# : %&$P - $O[S<$4 1$D&$MJ%$F3P2$D&$171gAT

Y(" 4 4 "=(%$'4 '#< : : &X ?@$4h
NSS?@$14h

5 / (/ & : %&&J@EE9

G0 / & : %>O@O0?@$O09

%&$ ( )* + , $., / ., 0$1 ( )* 2(,

E&$ - +<'2" ($' 30$2- %4 '2" ($9 &/ 9%&#%<

9> : <

7B&) #' ='('#-$' 30$&% 2#T'#+

5 - %4 '2" ($<#' ='('#+ : =>?$S@& - (O0$EHEOOV\P9

5 / 30 '#/ 3 <$# $' T/ '0 : # a&- $D' $S&EEVV?$E&(@?EB&$. * .0,&* $HBSO@&%&@D0) .?T$% .&$' &D$S@EEE(@/?H&O(0%K ?* - K V@@V?H&B& - ?@& - @H& @ - $%@$HS&EP$O&* O0* ?@D0&$>?O0%&@E&(@?EB&$. * .0,&* 9

I32 / 4 9 "#=(%$4 "#/&" (< : I ?OOa?$%@$' O&) SOOVV?$K .(>$D>?$D&* &X ,* . $) O0P@D\B
&H-,V* . $) O0P@D\B

>" Q' &0 / 1<$0%2 / 4 9 / <#/ 3 9& 012#< : N* - ?@ &@ O$D&* - .0,&* EB&D\EO&@ ?$D' - $(EP H$>O\O@&(E$?O&) S&E0,0&* $%@& - (O0EB$>&(' - * &D\V?$S@& - (C?- 9

. / << '=(#+$' *$ " Q' &0 / 1< &% 2#/ 3< : N* - ?@ &@ O$D&* - .0,&* EB&D\EO&@ ?$D' - $(EP H$>O\O@&(EB@OO0,0&* EB$K,"$* &D&OO(@

778$@ U2 / (/ P'2" ($3*/ &4 "#/ 3

H3' #/0$ #' #/&<

R21#/$# U2' #+

. & 012#S3 P&%0 '%#&3 " 4 %	; %<1(#	) 9%2' %<	, / <%	?U9 / <1&%
. (O' ,- ,* ,( ) $D>' &@? S@&SO" b\b&	: ! M&$G@ : %M&$L" >OO,0&* $(O0S&@ : ! M&$(?@ O : ! M&$(?@ O : ! M&$G@	I O0 I O0 I OVVV0 I O0 I O0	5<M&) . &I. <49$) . &I. 14266$) . &I. 14266$) . &I. 57P3$) . &I.	b 5$>&(@ b b b b

5 / 32(1</ 3$) 14 4 " &+ : " &0$a O' OVV?9

5 - &(3' 2$#/ U2' #+

5 / 32(1</ 3$) 14 4 " &+ : " &0$a O' OVV?9

I&&# #/ 3:5 / &(</ 3

. & 012#S3 P&%0 '%#&3 " 4 %	; %<1(#	) 9%2' %<	) 2/ &%	?U9 / <1&%	G=<%&" #/ 3
. (O' ,- ,* ,( ) $D>' &@?	UF?E\$&Q & ?@0P$,@@O' 0	I OVVV0	b	21566 Q.O@ @ B	b
	/ J,* $&I ?a?@$,@@O' 0	I OVVV0	b	45$>&(@E\66) , ",. @ B	b
S@&SO" b\b&	UF?E\$&Q & ?@0P$,@@O' 0	I OVVV0	b	45$>&(@E\66) , ",. @ B	b
	UF?E\$&Q & ?@0P$,@@O' 0	I OVVV0	b	16$) , ",. @ B	b
	UF?E\$&I ?a?@$,@@O' 0	I OVVV0	b	166) , ",. @ B	b
	/ J,* $&Q ,- $,@@O' 0	I OVVV0	b	M66) , ",. @ B	b

5 / 32(1</ 3$) 14 4 " &+ : " &0$a O' OVV?9

) %< #O'&

5 / 32(1</ 3$) 14 4 " &+ : " &0$a O' OVV?9

5 " &2' 3 / P%@' 2' #+

5 / 32(1</ 3$) 14 4 " &+ : " &0$a O' OVV?9

5 (' << " 2" #/ 3

. & 012#S3 P&%0 '%#&3 " 4 %	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
S@&SO" b\b&	#5	7	!	" &* ?9	b	b

! 1# P%@' 2' #+

5 / 32(1</ 3$) 14 4 " &+ : " &0$a O' OVV?9

%&$ ( )* + , $., / ., 0$1 ( )* 2 (,

778$@ U 2/ (/ P' 2" ($ 3*/ &4 " #/ 3

@&' # P%@' 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

; %9 & 012#T%@# U 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

5 " 3 " 0"
R21#%@# U 2'#+

. & 012#53 P&%0' %9#53 " 4 %	; %<1(#	) 9%2' %<	, / <%	?U9 / <1&%
. (O" , -" , ( ) $> ' &@ ? S@$SO" b4 b&'	: ! M6$G@ : %M6$!* >OO0&* $ OS&@ : ! M6$?@ O : ! M6$?@ O : ! M6$G@	! O0 ! O0 ! OVV!0 ! O0 ! O0	5<M6 . 8!. <49$. 8 1426 6$. 8!. 1426 6$. 8!. 57P3$. 8!.	b 5$>&(@ b b b

5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

5 - &(3'2$#' U 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

!&&# #/ 3$% / &&(</ 3

. & 012#53 P&%0' %9#53 " 4 %	; %<1(#	) 9%2' %<	) 2/ &%	?U9 / <1&%	G=<%&" " #/ 3
. (O" , -" , ( ) $> ' &@ ?	UF? E!&Q & - ?@0" $(@@" O" 0 / J,* $!$?a?@$(@@" O" 0	! OVV!0 ! OVV!0	b b	21566 Q.O@ @ B 45$>&(@E!66) ,",.. @ B	b b
S@$SO" b4 b&'	UF? E!&Q & - ?@0" $(@@" O" 0 UF? E!&Q & - ?@0" $(@@" O" 0 UF? E!&$?a?@$(@@" O" 0 / J,* $!$Q ,'- $(@@" O" 0	! OVV!0 ! OVV!0 ! OVV!0 ! OVV!0	b b b b	45$>&(@E!66) ,",.. @ B 45$>&(@E!66) ,",.. @ B 16$) ,",.. @ B 166) ,",.. @ B M66) ,",.. @ B	b b b b b

5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

) %@<#Q!&
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

5 " &2' 3/ P%@' 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

5(" <<" "2" #/ 3

. & 012#53 P&%0' %9#53 " 4 %	R5 _ I>	IR: 5	?. R	Z IG) >	Z @	G) >R
S@$SO" b4 b&'	#5	7	!	" &" ?9	b	b

! 1# P%@' 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

@&' # P%@' 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

; %9 & 012#T%@# U 2'#+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

%&$ ( )* + , $., / ., 0$1 ( )* 2 (,

7D8$?2/ (/ P' 2" ($ 3*/ &4 " #/ 3

?2/ # U 2'#+ : " &$J* &X * $EL * ,DCC" 0$?"D7 OEE$X@$@CO$>OVO@E9
H3' #%0$ #' #%<
R\ 1" #2$%2/ # U 2'#+

. & 012#53 P&%0' %9#53 " 4 %	; %<1(#	) 9%2' %<	?U9 / <1&%
S@$SO" b4 b&'	#(, 0$J%M6$ 1666$) . 8 #(, 0$J%M6$ 4666$) . 8 #(, 0$J%M6$M164$) . 8 #(, 0$J%M6$32M1$) . 8 #(, 0$ $%M6$1566666X1FM6666$) . 8 Q.O@ ?$\ O0"@ #(, 0$ $%M6$P356$) . 8 #(, 0$ $%M6$ 1566666$) . 8	#'. O" #'. O" ! O$>*.O ! O$>*.O&$ O$>*.O$ O *.O %@E!OC?O" E!&$%@" . &* $Q@" . &* A!B>* A!B>$%Z O) W{E!O$O!D7" .E!&$%6XZ76))	45$>&(@ <4$>&(@ 45$>&(@ 45$>&(@ 52$>&(@ P3$>&(@ P3$>&(@

5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9
%&' <#%@2'%@ %P&' 0" =' (' #+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9

5 " 3 " 0"
R\ 1" #2$%2/ # U 2'#+

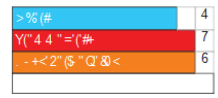
. & 012#53 P&%0' %9#53 " 4 %	; %<1(#	) 9%2' %<	?U9 / <1&%
S@$SO" b4 b&'	#(, 0$J%M6$ 1666$) . 8 #(, 0$J%M6$ 4666$) . 8 #(, 0$J%M6$M164$) . 8 #(, 0$J%M6$32M1$) . 8 #(, 0$ $%M6$1566666X1FM6666$) . 8 Q.O@ ?$\ O0"@ #(, 0$ $%M6$P356$) . 8 #(, 0$ $%M6$ 1566666$) . 8	#'. O" #'. O" ! O$>*.O ! O$>*.O&$ O$>*.O$ O *.O %@E!OC?O" E!&$%@" . &* $Q@" . &* A!B>* A!B>$%Z O) W{E!O$O!D7" .E!&$%6XZ76))	45$>&(@ <4$>&(@ 45$>&(@ 45$>&(@ 52$>&(@ P3$>&(@ P3$>&(@

5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9
%&' <#%@2'%@ %P&' 0" =' (' #+
5 / 32(1</ 3$ 14 4 " &+ : " &0$Da"Q"OVV!9
G# '%$' 0T'%&<%@%"%2#+ : " &$J* &X * $EL * ,DCC" 0$?"D7 OEE$X@$@CO$>OVO@E9

7F8$ ' <9/ <" ($2/ 3 <' 0'%&' #/ 3 <

a " '<#%@' <9/ <" (: =>?$?* ?@0!&* $X@$K OE0?$E>&('- $V/?$Da&- ?- $X@ ,*) \V?- $(>?@a?@$&$EE!W?$5 ,* ,DCC' 0
; (O" 00?E$X@$K OE0?$S@& - (O0$?@E!- (?E!E>&('- $ &0$V?$,E$&E9?- $X@a O$0>?$0&('$P?X ?@V!0
S@$C?E9?- $* $O!E(,0OVV!?$"D0 ?* O0$?@O) ?* O0$S" O!0$,E$&E?$X0$E(@$ (E!0" - $ &* b@0FCOVV?
S@$- (OE!$a,O0O$,C?* E9?- $\ OE0?$,E$&E>O$O$* 0$?@O&$@$,E$&E>O$X@$>- E!0$@$ (O0H E$X (0&* B
O" - $O" F$V/F!$@$ (OE!E>&('- $O!$O"$0) ?E!O&$) SF$\ 0-$0>?$@ (@ ?* O$&$@* a @*) ?* 0D
S@$?O0&* $O" - $\ OE0?$,E$&E>O$?_ ,E>O0&* $O" - $O" F$?@ _&* O$&$O0$O (0-&@F$?@ (@ ?* OE9
Y OE0?OO,JO ,* ,$E>&('- $V/?$@CFC?- 9!L* C,* ?@0!&* $X@$O" - D'$E>&('- $X* "F$V/?$X&* "E!- ?@-
X >?* $@?CFC,* ,$E$" &!0?OE!VV/?$E=>,E!$ O0?@0$O" - $O!E!C&* 0D* ?@ (E0$V/?$,E$&E9 - $X!3* $O
BO?7$\ CF$$?<Q@E>&('- $V/?$1DJ?* $\ >?* $>O" - '.* ,$?) $0?- $C&* 0D* ?@$D>O0$>Oa?'$ &0$V/?*
C?>O" ?- $X@@E9?- $X(0!&U) $0F$C&* 0D* ?@$X@$>$ * ?@$!$ CF$?@0D* $E&) ?$S@& (O0!@E!- (?E9
] O0$&$@$ $C@ (O0!@E!- (?E!) CF$Q@O0" O>, >F$DO( ) OVV!?$K@?HS &E!a?$O) &E$>?@
* E!- ?$D>?$C&* 0D* ?@$!$ &$" &!0[0!$\ ?* - $X@ @ - $ E9?- $C&* 0D* ?@$! * "?E!E!D>?F$>Oa?$V/?*
C?>O" ?- $D>&@(.>'F$* 0" @O" F$!# a&,- $,E$?@O$X!E,"?- $) O0" @O$O" - $K@" &!0$O" - $C&* 0D0D
X ,0>E,'H$X O0" @CFE!$ @* E$O" - $F?X ?@E9

, ' <9/ <" ($<- / 1(0$=%3" 22/ &0" 32*$M!# $" 99("2" =(%&$&P / 3" (!N$" # / 3" ($" 3 0$) / 2" ($" M<$" 3 0$&$P1("" # / 3 <8
; %9%&$# $) %2#/ 3$) :$>RZ , ^IZ _ $RZ , $) @G; R _ ?$' 30$) %2#/ 3$A $'b . G) H; ?$5 GZ @ G^) S ?;) GZ R^ $; G@' 5 @GZ
*/ &$' 00" #/ 3" ($ " 30 (3P$3 *'/ &4 " " #/ 3$' 3 0$9 &! #%2#/ 3$ "$%4 9(/ +%%<8


4
7
6


7
4
6

%&.$ ( )* + , $., / ., 0$1( )* 2(,

7] 8[G# %&$3*/ &4 "#/ 3

@ 9# %=%=#8 *$' 1&L3 / M(%0 P%&# %3*/ &4 "#/ 3$2/ 3#' 3%0 $ %&%3$<$' 221&' #/&8>/ M%'T%&8B%# %&9# %' =/ T%3" 4 %0 <199(*%&8G/ /&' 3+$ *$#<$<1=<'0"' &%<1$' <<14 %<$' 3+$" = ('#+$M- "#</ %'T%&8/ &9# %' 221&' 2+$ /&2/ 4 9(%#9@%<<$ *$# % '3*/ &4 "#/ 3$2/ 3#' 3%0 $ %&%38
Y' 3" (\$0 %#5&4 '3"#/ 3$' *$<1'#" = ('#+$ *$' 3+$4 "#/&" ($<$# %=</ (%&8%<9/ 3<' = ('#+$ *$# %&1 <%&8R\($4 "#/&" (<$4 "+$9 &%<%3#
13L3/ M3$ "Q' &0 <$' 30 $<- / 1(0$=%&1 <%09M'# $2" 1#/ 3[R(# / 1P- $2%&#' 3$ "Q' &0 <$ &&0 %<2&=%0 $ %&%31M%2" 33/ #
P1" &' 3#%&9# "#9# %<%' &&9# %&1 3(+$ "Q' &0 <$# "#&U <#6

F$FB\$DB7D8 ! ! '! !

_,D% Q7*'Q7$?B?O@>[redacted]EG$-&H-B1<[redacted] &Q/B&@&. [redacted]1MS*32b6<5<[redacted]X X %@ ?@ &8(&)
E.?@7$-,&D'O>*&&. F$r O[redacted]7<5<$ %2\ ?@,O'$ &O-[redacted]118M[redacted]1MS*32b*713$AOH

Thermo SCIENTIFIC

The world leader in serving science

! " #%&" ($) " *%#+$ "#" $) - %&#

! " #$%&'( ) * $+ , - . $ &'(0!&*

7$& & 012#$'30$2/ 4 9" 3+$0%3#*"2"#/ 3

. & 012#$3"4 %	: ! " #$%&'( ) * $+ , - . $ &'(0!&*		
) 199(%&	: >. ?@ &$A1 . ?@ B!?* 0!EB D!?@?$E!&0?B * &&FG D:H:3E:&! $227 J &$HK3&@&M$1229N O* 1?=$' 0 0?- 32NP43:9767$&@ 399:376:Q75Q	! "31"" 2#1&$&	: >. ?@ &$A1 . ?@ B!?* 0!EB D!?@?$E!&0?B * &&FG D:H:3E:&! $227 J &$HK3&@&M$1229N O* 1?=$' 0 0?- 32NP43:9767$&@ 399:376:Q75Q
5 / 0 %	: 2345562		
!) ,) $D	: 3QP4		
6 "(0"#/ 3$D"#%	: 7@2365925:		
. &3#$D"#%	: 7@2365925:		
; %9/ 3<=(%3"4 %	: R/ ! / $' S?B!'10		
	5 >?! @ ?5 : ABBIDDCEEFEB GH(@ I, ?$H) : JEF$KDJ8FAAU	! "#&"($1 <%	; %'&$# $+ %&3<#&I2#/ 3 =// L(%#$?/ &$& 9%&$'30 "3#&3 0 %$1 <9&&G# %&M <%N 2/ 3#'2#5<199(%&$?/ &&<9%2'"2 "99(2"#/ 3<8
. & 012#$+9 %	: ; 1<(1+:		

D&$>" P' &0 <$0%3#*"2"#/ 3

?4 %&D?3 2+$ T%&T"%M	
. -+<2" (5<#' #%	: ; 1<(1+:
>"P' &0$<#' #%4 %3#<	: " H>$TVDT%>T! $+H$DJ H! O%T$' M" MN%#" >$+! YTJ / T$ZT#; >Z$TAAT%>/ $+ ZT" >ZT$JT%HRRT" ! T! $M / >J O%>M" / $AHJ O/ T+JT$AH; ; H+ T! :
G) >R5+ 5) $<#' #1<	: + . 1?$D 1 $, 0'(@'$1 $' &0E&*- 1+?@=$, V, @&(-$(G!0 ?$H/ Z#$Z , V, @$%&)) (* !B, 0!&* / 0, * =, @&5P$%AJ $2P29:2599]L$D 1 $R / ! / $E&* 0 1 -$, '(, ["?$1 D&@ , 0!&* $E@B 'D&$D ? -, C'$, * =' 1 F$, * =$&@$?@ - ?$&D 2$&@=(E0$>, 1 $R / ! / $' , &('=$?$@0 1 ?=$ * = , ^, 1, ['?3D&@') S:&G'?-$, * =$&0 ?@ - ?@&D 1 $5@=(E0
; / 1#%<$ "$'@#$<	: ! ?@ , '$E&* 0 E0$T G'$E&* 0 E0$M. , ', 0!&* :$MF?- 0!&* :
/ #%3#" ($ 21#&_ %(# $%&*%2#<	
I3- "("#/ 3	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
I3Q?%<#/ 3	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
) L'3	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
? +%<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
/ #%3#" (3$2- &(3'2$ %(# $%&*%2#<	
5 - &(3'2$%*%2#<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
5 "$2'3/ Q?%'2'#<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
! 1#' Q?%'2'#<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :

%&' $( ) *+, - $ / 01$2) *+3) -

D&$>" P' &0 <$0%3#*"2"#/ 3

@?&' # Q?3' 2'#<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
, %'%/ 94 %3# ($%*%2#<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
Y%&#'(#+$%*%2#<	: " &$<" &U* $ 1*" 1B * 0$'C7E0 $&@B'0B, '$, V, @ - :
GT%&%U9 / <1&%<' Q3 <S<+4 9# 4 <	
I3- "("#/ 3	: " &$ S?B!0B5=, 0 :
I3Q?%<#/ 3	: " &$ S?B!0B5=, 0 :
) L'3	: " &$ S?B!0B5=, 0 :
? +%<	: " &$ S?B!0B5=, 0 :
! %0'2" (S2/ 30'#/ 3< "QQ&'T" #%0$=+$ T%& %U9 / <1&%	: " &* ?3<" &U* :
) %&# U2/ (/ Q2" ($3*/ &("#/ 3$U/ %2#/ 3$7'W	

F&$5 / 4 9/ <'#/ 3S3*/ &4 "#/ 3$ 3$3Q&%0'%3#<

@ %&%$ &%$3 / $3Q&%0' %3#<$9 &%<%3#&M- '2- NM# '3$# %21 &&3#&L3/ M(%0Q5%' $#. %5<199("%&$ 30$3$# %2/ 32%3#&*#/ 3< "99(2" =(%&$ &%2("<<*"%0$'<$. "P' &0 / 1<3# $ %(# $' &$# *%3T &(34 %3#&$ 30$ %2?%&%Z1'&%&%9 / &#3Q&3$# '<$<%2#/ 38	

C&$Y'&<#&$'0$4 % <1&%<

? +%2/ 3#' 2#	: % ?EK$X&@*=$(@) &^?$ * QEE&* 0 E0$?*-?-:$M) ?=1 0?'QE(-. $?G?-$U 0 $5?* 0E&%$U, 0?@ (X@ 05?, -.02N$) 1 (0?- L$EEE - '&*, "QE1D?F$0 ?$?<$ SS?@*=$&U?@G?'+-:$X ?0) ?=E), ' , 0?* 0E*1 G) S0$) - $&EE(@
) L'3$2/ 3#' 2#	: M$EB - ?$X QE&* 0 E0$) ?=1 0?'QE(-. $ K1 $U 0 $5?* 0E&%$U, 0?@X@ 05?, -.02N$) 1 (0?- U. 1?$(@) &^1 F$E&* 0) 1 . 0?=$E&0 1 F$, *=$. &?--$>. , -. $E&0 1 F$, ?Q&@5?(- ?:$>&?, * -. &?-$0 &@(F. 'QE(?Q&@5?(- ?:$X ?0) ?=E) '$ 0?* 0E*1 G) S0$) - $&EE(@
I3- "("#/ 3	: R&^?$?! S&- ?=$S7@&* $X&$Q@. . $ 1@&E0$ &0[@ 0 1 F!1[@ 0 1 F$1 $1@@F(', @&@$C @- S1Q@&@$ @@- 0$EE&(@$S@*1+?$ @E0$1 '$Q- S1Q0E* $&@&(G?'?* $[QE1@1 ?=$S?@&* *?: ; &&- ?* $0F. 0E5&0 1 F$ (E. $. -$. $E&*, @&0'P1$[? 0$&@U, 1 Q[, * =:$X ?0) ?=E) '$ 0?* 0E* $1C -G) S0$) - $&EE(@
I3Q?%<#/ 3	: + , -. $X(0$) &(0 $U 1 0 $U, 0?@$1 &$'&0$1 =(E?'$ &) 0 1 F$[* '?- -$=1@E0?=$0&$=&$ &$[G) ?=E), ' S?@&* *?'.$5 ?^?@F1 ?$ * Q1 1 F$[G) &(0 $0&$, *$[* E&* - E&(- $5?@&* .$X ?0) ?=E), ' , 0?* 0E* 1 G) S0$) - $&EE(@
. & #%2#/ 3$' *$' &<#&*' 0 %&<	: " &$, E0&* $. , "$[?$1 K?* $1* ^&^1 F$, * Q5?@&* , '3@K$&@U 1 0 &(05 ('0 ['?3@1 1 F:
[/ #%<$1 $9- +<2" "3	: " &$ S?B!0E&1@ 0) ?* 0$>@, 05 G) S0&) , 0E["G$1%&* 0 E0E&1 &* $1@(0) ?* 05 S?B!'10 1) ?=1 0?'G1, @?$<(, * 00?- $, ^?$[??* $1* F?- 0?=$&@* . , '?=:

K&$Y'&%&*Q- #3 Q&$4 % <1&%<

Y(" 4 4 "='(#+$ *$# %@ &(012# ?U#3Q1' <'3Q&$4 %0'"	: M$, $1@&K@$1$?, 0?=L$, $&@- (@$1 E@2 , - ?$U1$R&EE(@ * =$0 ?'E&* 0 1 ?@ , Q[(@0
) 1'# =(%	: O- ?$, * $?I 0!1 F(1 . 1 F$, F?* 05 ('0 ['?3&@ ?$ (@& * =1 F$0@
[/ #&<1'#' =(%	: " &* ?3<" &U* :
) 9%2' "($%&9 / <1&%<$ "P' &0 <	: D@ S0G$1 &, 0?$1 ?$ E0?* ?$ Q&@) &^1 F$, "$5?@&* - $2@ S0 ?$ E!1 10&K$1 ?$1 E!=?* 0$C 0 ?@$1 $ S0@$1' &$, E0&* $. , "$[?$1 K?* $1* ^&^1 F$, * Q5?@&* , '3@K$&@U 1 0 &(05 ('0 ['? @1 1 F:
>"P' &0 / 1<$# %&' "(0%2/ 4 9/ <#/ 3$9&(012#<	: " &$ S?B!0B5=, 0 :
) 9%2' "($9&(#%2#T% %Z1'94 %3#&/ &8'&%*Q- #/&<	: A1@ .0F. 0?@5 . &('=$U?, @ SS(@$S1@ 0?$5@?E0!*?$?<($5) ?* 05, *=$?'C E&* 0 1 ?=$[@, 0 1 F , $S, @0(- $/ %E#]$U 0 $, $['$C E?_$?E?$&S?@0?=$1 $&- 1!*?$S@- (@5) &=?:

\ 8$R22'0%3#' ($8%(% <%$4 % <1 8%<

. %&< / 3" ($9 8%2" 1#/ 3 <

: " &$ E0 8* $. , "$?$U K?* $1* & ^ † F$, * (3$5?@&* , '$Q+K$*&U 1 0 & (5 (1) ['?$Q2 † † F: T^ , E(, 0*$ ((@$(* =† F$ @ - :$5 ??S$[* * ?E?- - , (@$ * =$[* S&0?E0* =$$?@&* * ?'$1@& ?* 0*@F:$1 &$ &0 0K, B $K&U, 'K1 @(F. $ S1'?=$, 0*@ ' :$D (0$R * $ SS@$&@ 0*$5?@&* , ' S&0*E0 ?$?<(5) ?* 05 - ??$?E0 8* $3]:

? 3T' & 34 %3# ($9 8%2" 1#/ 3 <

: #^ &!+$=1 $?@ ' $K(5 S1'?=$) , 0*@ ' $ * =$(@* &(5 * =$E8* 0 E0 $U 1 0 $ &!1$U, 0*@ , G L$=@† - , *=$?U?@$M(3@ $0 ?$(@?^ , * 05 (0 &(@?- $1$0 ?$5@&=(E0 5 , - $E, (- ?=$*^ 1@') ?* 0 ' S&*(0 8* $- ?U?@$U, 0*@ , G L$ &1$3@ 1@

[%# / 0 <$/ &$2(% 3 '3 Q$1 9

) 4 " ((5<9 '((

: / 0$SS?, K$(5U 1 0 & (5(3 K$ER &^ ?$E8* 0 † ?@$1@) $ S1'$, @ :$1 1(0*$U 1 0 $U, 0*@ * =$) &S$[S 1$U, 0*@ &(['?, $#' 0*@ , 0 † ?' G$3&@$(5U, 0*@ -f - &((['?L$ [- &@$U 1 0 $, * $1* ?(@=@$1 , 0*@ ' $ * = S , EP$1* $, * $ SS@$&@ 0*$U, - 0*$=1 S&- , 'E8* 0 † ?@$1 1 $&- ?$&(5 1 $ $ EP?* - ?=$U, - 0* =1 S&- , 'E8* 0(2E(8&@

] " &2%&<9 '((

: / 0$SS?, K$(5U 1 0 & (5(3 K$ER &^ ?$E8* 0 † ?@$1@) $ S1'$, @ :$1D @*?* 0$?* 0(5† 0&$?U?@&L U, 0*@E8&(@?- L$[, - ?) ?* 0 $&@$E8* 0 ?=$, @ , - :$1+ , - , $ S1', F?- $1* 0&$ * $?*(D(?* 0(@?, 0) ?* 0 S , * 0$&@&@E8*?=$ - $3(* &U- :$1@&* 0 † $, * =$E8* ?E0$ S1', F?$U 1 0 $ &* E8) [(- 0['?L , [- &(@)* 05 , 0*@ ' $*F:$, , * =L$?, @ L$?@ 'E ' 0*$1@=† 0&) , EP&(- $?, @ $ * =$5, EP$1 E8* 0 † ?@$&@=† 1 S&- , '$, EE8&@† F$1&$E8) '$2@F(' , 0&* - $-??$?E0$ * $2(D:$1 † 1 $&- ?$&(5 1 $ 'E?* - ?=$U, - 0*$=1 S&- , 'E8* 0(2E(8&@$5 &0?& ??$?E0$ * $2(3&@) ?(@)* E(8E8* 0 E0 † (&@, 0&* $ * =$?E0$ * $2(3&@U, - 0*$=1 S&- , ':

J8$> " 30('3 Q$' 30 $-# &' Q%

>" 30('3 Q

: D(0$* $, SS@$&@0*$5?@&* , '$S@0*E0 * ?$?<(5) ?* 05 - ??$?E0$* $3]:$1 , 0† F$=@K† F$ * = -) &K† F$, &('=$[?$&@ 1 1D*=$† $, @ - $U. ?@$1 1 $, 0*@ '$* $, * =?=L$ (&@=$ * = S@$EP- - ?=:$>- &(@?@$, &('=$U, - , $, * = - $ * =C, EP[?(&(@$?, 0† F$=@K† F$ * =$) &K† F: J ?) &* ?$8* 0) † , 0*=$E&U 1 F$ * =$E@0*E0 * ?$?<(5) ?* 0[?(&(@$?* 0*@ F$?, 0† F$, @, - :

) # &' Q%

: / 0&(@5 ?0U ??* $1 ?$3& $U 1 F$1?) $?@0(@- a5 9'0&$5 N#%843 $0&$7 7bA] :$1 0&(@$† $ EE8&@ * EP? U 1 $ &E) '$(@F(' , 0*&* - :$1 0&(@5 † $ &(@$ 1 , '$E8* 0 † ?@$&@?E0*=$(@) $=1(@E0$ (* ' F . 0$† $ $=@$, EE8&$ * =$U ?* ^ ?* 01, 0?=$ @ L$ U, (&(@) $1 EE) , S, 0['?$, (*@) - $- ??$?E0$ * $2 9]$ * = 0&&=$ * =$=@K$??S$E8* 0 † ?@$F. 0(5E8&- ?=$, * =$?, '?=$[* 0$(2) =(&(@ - ?:$8&* 0 † ?@ 0 , 05 , ^?$[??* $&S?* ?=$) (- 0[?$E) @(2("(&(2- ?, '?=$ * =$K?$0$ S(@ 0$&$5@* ?* 05?, K F?: ! &$ &05 0(@$† $[* ', [?'?=$E8* 0 † ?@$1O- ?$ SS@$&@0*$E8* 0 †) ?* 0$&$ ^ &!+ ?* ^ 1@') ?* 0 ' $E8* 0) † , 0*$ * :

A8$? U9 / <1 8%$2 / 3#&/ (<$9 %8< / 3" ($9 & #/2#/ 3

5 " 3" 0"

G2219 " #/ 3" ($%&9 / <1 8%$'4 '#<

" &$ 9! $&- (@$1 0$, '(?$* &U* :

5 / 3<1 (#$ / 2" ($' 1# / &#%<$?/ &$ 22%9 # =(%8%&9 / <1 8%$'4 '#<8

; %2/ 4 4 %3 0 %9 $ / 3 '# & 3 Q 9 & 2%9 1 8%<

: N(5) 1 $S@=(E0 E8* 0 † - $† F@=†?* 0 $U 1 0 $?! S&- (@$1) 1 0 L$S?@&* , 'L$U &@$S, E?$ 0) & S. ?@ &@ 1%&F-E) '$) &* 1%@F$) , (&(?$2@<(1(?=$0&$5-?0?@ † ?$0 ?$?(D'E0!* ?* ?-- $K(5) ?$?* 01, 0&* &@&0 ?@$&* 0@$) ?, -(@-$ * *=@&@ ?$* ?E?-- 1(3&$5 - ?$?@- S1@0&@$&@?E0!* ?$?<(5) ?* 0

?3 Q'3 %8&3 Q$4 % <1 8%<

: " &$ S?E('$?* 01, 0&* $?@<(1@) ?* 0 - :$K &&=$F?* ?@$?* 01, 0&* $, &('=$[?$ ((D E8* 0&$, B&* 0@$U 1 &@?@$! S&- (@$5 1) 1 0 L$[- ?$S@E?- - $?* B &- (@- L$&$, '$?! . , (- 0$?* 01, 0&* $K&(5 1) ?@ ?* F † ??@ F E&* 0@- $1&K??S$U 1 &@?@$! S&- (@$[?' &U$, * 0$S@=(E0 5 , ?@$1 F&$, &F E) '$&@$?@P- $K(5) 1 $S@=(E0 5 , ^?$ &0[??* 0 &@(F. ' (E8* ^?- 0F, 0*=:

5 - &' 3'2$# U 2' #:

5 / 32(1 < / 3$ 1 4 4 " &+

: " &0$ ^, 1, ['?:

I &&# / 3:$ / &&(</ 3

5 / 32(1 < / 3$ 1 4 4 " &+

: " &0$ ^, 1, ['?:

) %< #P%&

5 / 32(1 < / 3$ 1 4 4 " &+

: " &0$ ^, 1, ['?:

A8$? U9 / <1 8%$2 / 3#&/ (<$9 %8< / 3" ($9 & #/2#/ 3

>+Q %8%$4 % <1 8%<

: + , - $, * = L$(3&@, @ - $ * =$C EP$1 &@(F. ' (E8 (D*@, * =' 1 F5E8 ?) 'E, '$S@=(E0 - L$[?(&(@ ?, 0† F L$) &K† F$ * =$[- 1 F$1 ?$, ^, 0&* @$ * =$, $1 0 ?$?* =$&$1 ?$U&@† F$5?@=:$# SS@$&@ 0 0*E8 * 1((?- $, &('=$[?$[- ?=$K$1@) &* ?$5&@0* 01 * (E8&* 0) † , 0?=$E&U 1 F:$>+ , - E8* 0) † , 0?=$E&U 1 F$[?(3&@@(- 1 F:$# * - (@$1 , 0?@U, - . $ 0 (8* - $ * =$, (?0(5 . &U?@ , @5E8 &- ?$K&U ?$U&@(0 (8* $&E[0(8* :

%&< / 3" ($9 & #/2#/ 3

; %<9 '& # &+

: O- ?$ $S@&$?(@$K1D?=L$ '(@$((D(@† F$K&@ 1@?=$@- S1@0K&@$K) S(@† F$U 1 0 $ * $ SS@*?= - 0 * =, @$(5 $(@K$ - - ?- -) ?* 0$† =E(0?- $U 1 $† $?E?- - , @$U ?- S1@0K@ ?' ?E0!$ * $) (- 0[? [, - ?=$* $(* &U * $K@ * 0E$5, 0?=$?! S&- (@5?^ ?' - L$U ?$, V, @- $K&U 1 ?$5@=(E0 5 * =$U ?$, (?U&@† F$1 1 0 $K&U 1 ?$?' ?E0!* =$@- S1@0K@

>" 30<

: % ?) 'E ' @- 1 0 * 0$) $?@$(- $F&* ?- $E8) $(@† F$U 1 0 $ * $ SS@*?=$ 0 * =, @$5 , &('=$[? U&@$5 0('$U) ?- $U. ?* $, * =† F$E ?) 'E '$(@=(E0 1 $(@K$ - - ?- -) ?* 0$† =E(0?- $U 1 $† * ?E?- - , @

?+%<

: / , (?0(3?U?, @E8&) $(@† F$U 1 0 $ * $ SS@*?=$ 0 * =, @$5 , &('=$[?$ (- ?=$U. ?* $ $@K , - - ?- -) ?* 0$† =E(0?- $U 1 $† $?E?- - , @@$5 ^ &+$?! S&- (@@0$5 ^ &+$?! S&- (@@0$5 ^ k(1+$ S, - . ?- L$) 1 0 $&@ =(- 0 :

) L' 3

: D?@$* , '$(@?E0!* ?$?<(5) ?* 0$K&@) $(@$[?$ &=(@$, &('=$[?$?* ?E0?=$[, - ?=$&* $U ?$1 - K$[?1 F S?@$&@ ?=$ * =$U ?$@K $† * &* ?=$ * =$, &('=$[?$ SS@*?=$[(@$ $ S?E('1 0[?(&(@5 , * =† f 0 1 $S@=(E0

?3 T' & 34 %3# ($%&9 / <1 8%$ 2/ 3#&(<

: T) 1 - $&* - $(@$) $?* 01, 0&* $K&@) $(@$5@E?- - $?<(5) ?* 05 . &('=$[?$E(?E K?=$K$* - (@$1 ?(E&) S(@U 1 0 $1 ?$(@<(1@) ?* 0 $K&$?* ^ 1@') ?* 0 '$S@0*E0 * $?F1 , 0&* :$M$ &) ?$E(- ?- L (:) ?$ E0@[(?(@L$1D?@$K@* F† ??(@F$) &=1(E(0&* - $K&1 ?$S@E?- - $?<(5) ?* 0L U1 '$[? * ?E?- - , @$K&@=(EP$?) 1 - &* - $K&$ EE?$U ['?$?^?' - :

E8$ - +<'2" ($' 30 $2 - %4 '2" ($9 & 9%&# %<

. - +<'2" ($<#' #%

: ; 1<(1+:

9>

: 7:4 $K&7:3

7B8$) # =' ('#+$ 30 $8% 2# T' #+

5 - %4 '2" ($<#' =' (#+

: >. ?$S@=(E0 $1 $ 0 ['?:

5 / 30 '#/ 3 <$#' $ 'T / ' 0

: " &$ S?B1 E8=, 0 :

I32 / 4 9 " #=(%& " #/&," (<

: " &$ S?B1 E8=, 0 :

>" P' &0 / 1 <$0 %2/ 4 9 / <#/ 3 9 & 0 12#<

: O* =?@ &@, '$E&* =0 1&* - $K&5 0&@F?$ * =$[- ?L$, V, @&(- $=?E&) S&- 0 1&* $&@=(E0 $. &('= * &0[?$S@=(E0?=

. / << ' = ' (#+$ '$ * P' &0 / 1 < &%2#/ 3 <

: O* =?@ &@, '$E&* =0 1&* - $K&5 0&@F?$ * =$[- ?L$, V, @&(- $@, E0 1&* - $U 1 '$* &0$E E(@

778$@ U2/ (/ Q2" ($3*/ &4 " #/ 3

H3' #/0$ # #%<

R21#/$# U 2' #+

5 / 32(1 < / 3$ 1 4 4 " &+

: >&0$?$?- 0$K&@(@* &U' ?=F?L$0 ?$0N 1E K&F E) '$&@$?@P- $K&5 1 $S@=(E0 5 , ^?$ &0[?? * 0 &@(F. ' (E8* ^?- 0F, 0*=:

5 - &' 3'2$# U 2' #+

5 / 32(1 < / 3$ 1 4 4 " &+

: " &0$ ^, 1, ['?:

I &&# / 3:$ / &&(</ 3

5 / 32(1 < / 3$ 1 4 4 " &+

: " &0$ ^, 1, ['?:

) %< #P%&

5 / 32(1 < / 3$ 1 4 4 " &+

: " &0$ ^, 1, ['?:

778$@ U'2/ (/ Q2" ($3*/ &4 "#/ 3

5"&2' 3/ Q/$&'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
! 1# Q/$&'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
@/&'# Q/$&'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
; %9& 012#T%@# U'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
5"3"0"
R21#/&@# U'2'##
5/32(1</3$ 14 4 "& : >&$0 ?$[?- 0&K&K(@K' &U'?=F?!$0 ?$0N !&K &F"E 'S5@S?@P- K0 1 $5@=(E0$, ^?$ &0[??* 0 &@(F. 'G#' ^?- 0F, 0?=:
5- &3'2$# U'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
I&&#'#/3$5/&& </3
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
) %3<#P%&
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
5"&2'3/ Q/$&'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
! 1# Q/$&'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
@/&'# Q/$&'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
; %9& 012#T%@# U'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:

7D8$? 2/ (/ Q2" ($3*/ &4 "#/ 3

?2/ # U'2'## : " &3K' &U'* $!F* 1DB, * 0?/ C7 E0 $K@E@0B, '$, V, @ - :
H3'#%0$ # #%<
RZ1"#2$%2/ # U'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
. %&< <#%2%@ %0&' 0" ='(##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
5"3"0"
RZ1"#2$%2/ # U'2'##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
. %&< <#%2%@ %0&' 0" ='(##
5/32(1</3$ 14 4 "& : " &0$ ^, 1, [*?:
G# %&5 0T%&<%@&*%2#< : " &3K' &U'* $!F* 1DB, * 0?/ C7 E0 $K@E@0B, '$, V, @ - :

7F8$ '<9/ <" ($2/ 3<'0%&'#/ 3<

^ " '<#&0' <9/ <" (: >. ?$F?*?@0&* $K&$J, - 0'$. &('=$[?$, ^ &+?=$K@ 1] \/?=$J. ?@* ?@$&-] [*?:$# !F* 1DB, * 0 <(, * 00P- $K&J, - 0'$5@=(E0$2- +(?- $, &('=$' &0$[?$=1 S&- ?=$K@$ 1 $0 ?$2&' $?U?@$ (0 S@EP- - ?=$!' $ $ (1[[*?$*C[?* 00@_0 ?* 00$, * 0$1 1 S&- ?$K@$ (@$(- $ * =$ &* @EDB, [*? S@=(E0-9 1 $, $*EP* - ?=$J, - 0'$=1 S&- , '$E&* 0@E0K@$ 1 S&- , '$K@$0 1 $5@=(E0$5 &(0B* - , * =$, * 0$[GS@=(E0 $. &('=$, 0(* $0[?- $E&) S G&J 0 $0 ?$@<('@ ?* 0 $K@$?* ^ '@$*) ?* 0 ' S@?E0K* $ * =$J, - 0'$=1 S&- , '$?F1', 0K* $ * =$, * G&@F K*, 'S&B, '$, (0 &@0B@<('@ ?* 0 : + , - 0'$S, E&, F1 F$. &('=$[?$@EGB1?=-$M!B1?@0K* $K@$, * =0[$. &('=$K* 0[?E&* - +?@= U. ?* $@EGB1 F$1 $ &0$7, - [*?:$>. 1 $, 0?@'$ * =$0 $E&* 0 1?@$ (- 0[?$=1 S&- ?=$K$1 $ - , 0?J, G1) $0GE&* 0 1?@$K@$1?@$, G&@0 1 $ &) ?$S@=(E0$2- +(?- :$#^ &!=$=1 S?@' &$ S1?=$, 0?@'$ * =$@' &G$ * =E&* 0 E0$J 0 $ &1$J, 0?@, G$S=@1 - $ * =$?U?@

, ' <9/ <" ($<- / 1(0$=%3 22/ &0" 32%M # $ 99(2" =(%&%&0/ 3" (!$" # / 3" ($' 30$J/ 2" ($" M<$ 30$%&01("# / 3<8

; %9%&# $ %2#/ 3$J:$> R[,] I[_ $R[, $ @G; R_ ?$' 30$ 9 %2#/ 3$A:$?` . G) H; ?$5 G[@ G]) S ?;) G[R] $; G@ 5 @G[*/ &$ 00'#/ 3" ($ " 30('3Q$3*/ &4 "#/ 3$' 30$9&# #%2#/ 3$ *$%4 9(/ +%%<8

7C8$@&' 3<9/ &#$3*/ &4 "#/ 3

; %01("# &* '3*/ &4 "#/ 3	H[$14 =%&	. &9%&<- '99'3Q 3" 4 %	5("<<%<	. _ a
. G@5 ("<<"2"#/ 3	" &0 @F(', 0?=:	–	–	–
IR@RX _ ; $5("<<	" &0 @F(', 0?=:	–	–	–

DX c&6D, EK1 F$F@(S

7K8$ %Q1("# &+$3*/ &4 "#/ 3

H3'#%0$ # #%<
>5) $5(" <<"2"#/ 3 : " &0$@F(', 0?=:
H9) 8%'%0%&(($%Q1("#/ 3< : @ 5 R$A'V\$H; $'U%4 9#$" &#" ($%U%4 9#/ 3&5 &0$=?0?@1?=
H3'#%0$ # #%<$3T%@# &+$\@ 5 R$A=\&#" "$E&) S&*?*0 $ @$1 0?=$K@$!?) S0?=:
) R; RFEDFBCF77$F7D$%U#&4 %{+$ "P' 80/ 1 <$<1=<#' 32%<&5 &$S@=(E0 $ J?@3K(* =:
) R; RFEDFBC3%4 %@2%@2+$9("33'3Q5' 30$3/ #"2"#/ 3&5' &$5@=(E0 $ J?@3K(* =:
) R; RFEDFBCF77$F7D$ "P' 80/ 1 <$2- %4 '2" (<&5 &$S@=(E0 $ J?@3K(* =:
) R; R$F77$F7D$) ,) $0' <#&=1#/ 3$%2- %4 '2" ($3T%@# &+$% "P' 80 $0 %@#"2"#/ 3&5' & S@=(E0 $ J?@3K(* =:

5(%3$R'&$R2#&) %2#/ 3 77D/=\$" P' 80/ 1 <$R & . / ((1# 3#<$J-R. <W : " &0$1 0?=
5(%3$R'&$R2#&) %2#/ 3$\E0 5("<<$3$ 1=<#' 32%< : " &0$1 0?=
5(%3$R'&$R2#&) %2#/ 3$\E0 5("<<$1$) 1=<#' 32%< : " &0$1 0?=
. ?R$] '<#&1$5 - %4 '2" (< V &%21&/ &$5 - %4 '2" (<W : " &0$1 0?=
. ?R$] '<#&1$5 - %4 '2" (< V?<<%#" ($5 - %4 '2" (<W : " &0$1 0?=

%&' $( ) *+, - $ /01$2) *+3) -

7K8$ %&Q1("# &+$3*/ &4 "#/ 3

) # #%$&Q1("#/ 3<

! "<<"2- 1<%##	: " &* ?$&Q1) ?$E&) S&* ?* 0 $ @$5 1 0?=:
[%#\5 / &.	: " &* ?$&Q1) ?$E&) S&* ?* 0 $ @$5 1 0?=:
[%#\5)%&<%	: " &* ?$&Q1) ?$E&) S&* ?* 0 $ @$5 1 0?=:
. %3<+(T" 3 '"	: " &* ?$&Q1) ?$E&) S&* ?* 0 $ @$5 1 0?=:
H3' #%0$) # #%<$3T%3# & \@ 5 R$A=W	: #" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=:

5" 3" 0"

^ >! I) $J5 " 3" 0" W	: " &0E&* 0@"?=$(* =?@+ ZRM1$ % * , =,] :

5" 3" 0"" 3$' <#<

5" 3" 0"" 3$[. ; I	: " &* ?$&Q1) ?$E&) S&* ?* 0 $ @$5 1 0?=:
5 ?. R$@ U2$<1=<# 32%<	: " &* ?$&Q1) ?$E&) S&* ?* 0 $ @$5 1 0?=:
5" 3" 0" $3T%3# &	: #" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=:

@ '<$0.& 0 12#$ " <$=%#&$2(" <<" *%0 $3 $ 22/ &0" 32%&M # $# %$ "P' &0 $2 &.#%&" $' *$# %$5 / 3#& ((%0 $.& 0 12#=$ %Q1("# / 3< "3 0$# %&) ,) $2/ 3#" 3<$' ((# %&3*/ &4 "#/ 3$&Q1' &0 0$=+# %65 / 3#& ((%0 $.& 0 12#=$ %Q1("# / 3<8

I3#%&3" #/ 3" ($' <#<

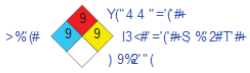
I3#%&3" #/ 3" ($' <#<	: R1<#&' (" "$3T%3# &+$\R!5) \&#" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=: 5 - '3" $3T%3# &+$\7 5) 5 \&#" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=: b" 9" 3 $3T%3# &+&#" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=: c / &%$3T%3# &+&#" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=: [%#\5 %(" 30 $3T%3# &+$ "$5 - %# '2" (<$\[I/ 5 \&#" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?= . - '(' 9 9 '3%<$3T%3# &+$\/ I 5 5) \&#" "$E&) S&* ?* 0 $ @$5 1 0?=$&@ I ?) S0?=:

7\ 8&G# %&$3*/ &4 "#/ 3

] "=%$&Z1' &%4 %3#<	: " H>$T\WDT%>T! $>H$DJ H! O%T$' M " MM%# " >$#! YTJ / T$Z T#; >Z $TAAT%>/ $+ ZT" >ZT$JT%HRRT" ! T! $M1 / >J O%>M" / $AHJ O/ T#JT$AH; ; H+ T! :
>" P' 80 / 1<$["#&" (I3*/ &4 "#/ 3$) +<#%4 $\H$ 8R8\W	:

@ %Q1<# 4 %&$<$&%<9/ 3<=(%&/ &0 %#&4 '3' 3Q&# %& . ?$2/ 0 %&/ &#- ' <$["#&" (8

["#/ 3" ($\' &&$ & #%2#/ 3 R<</ 2 " "#/ 3$\H$ 8R8\W



. "#&' *$9 &3#3Q	: JS'AS$B7D8
. "#&' *$<<1%	: 7$2365925:
. "#&' *$9 &&" / 1<$<<1%	: " &$5@^ &(- $9, '+, 0&* :
6 %&< / 3	: 2
. &%9" &%0$=+	: R/ ! / $' S?B['1 0

JS'AS$B7D8 : "

%&' $( ) *+, - $ /01$2) *+3) -

7\ 8&G# %&$3*/ &4 "#/ 3

◤ I30' 2" #%<$3*/ &4 "#/ 3$# " #$ " <$2- " 3Q?%0$'&(4 $9 &$T' / 1<(+$<<1%$T%&<' / 38

[/ #2%# $&% 0 %&.

@ $# %=%<#$ "$ 1 &L3 / M(%0Q?%&# %$3*/ &4 "#/ 3$2/ 3#' 3%0 $ %&%3 $<$' 221 &#%$> / M%T%&&$3%# %&$# %$=/ T%3 " 4 %0 <199 (" %&&$3 / &$' 3+$' *$#=$<1=<' 0 "' &%<1$ <<14 %<$' 3+$["=' ('#+$M- " #</ %T%&&$ / &&# %$ 221 &2+$' &&2 / 4 9 (%#%3%<<$' *$# % '3*/ &4 "#/ 3$2/ 3#' 3%0 $ %&%38

Y' 3" ($0 %#%&4 '3" #/ 3$' *$<1'# =' (' #+$' *$ 3+$\ " #%&" ($<$# %</ (%&&%<9 / 3<=' (' #+$' *$# %$ <%&&R' (($\ " #%&" (<$\ " +$9 &%<%3&# 13L3 / M3 $ " P' 80 <$' 30$<- / 1 (0 $=%$1<%0 $M / # $2" 1#/ 3&R (# / 1Q- $2%&#" 3$ " P' 80 <$' &%0 %<2&=%0 $ %&%31$M%&2" 33 / # Q1" &' 3#%&# " #$# %<%' &%&# %$ 3(+$ " P' 80 <$# " #%\J <#8

JS'AS$B7D8 #":

Thermo SCIENTIFIC

The world leader in serving science

& 22'0$3#' (&%($" $&4 $" 1%$

. $%/ 3" (& %2" 1#/ 3 +&(*+$&) & &) $&$ + '$ &)$ & , +$) &' &,& '* + *& *') &,)'$'$ 5
)( ) * & ,.+ $%$ &,) 5&& ! & $$ ( ) &)$%&$! ,+* (* %& , +$$ &+
$*,'$ 5&& +&$+'&+ (&,&) &,+ &!' %&) *,') &$%& $+ &)$%&+$*)'(*& '* &+' &) *,) &%)'$
!,+* (* & '! $*& & (*+$& 5) $%& 5&& +&$+'&+ (&,&) &,+ &!' %&) *,') &$%& $+ &)$%&+$*)'(*& '* &+' &) *,) &%)'$
!,+* (* & '! $*& & (*+$& 5

3 '%34 $3# (& %2" 1#/ 3 +'%&% ! ,.) & &!' %&) *,') &$%& $+ &)$%&+$*)'(*& '* &+' &) *,) &%)'$
) $%& , 5&&5 +, & &) $*& *+,'* && &,+%(*&) &) %&$ ',+$ $*)
! + *+$& , &) *,) &+' &,&', 5

! $# / 0 &/ %2($" 3'3 &

) 4 "((& '((

+! &) &&' + *&' 5&& + &+$*)'$, &,+ &!' &,) 5&&,' * &'* &) * ,&$%& +! &!
' &) *, + 5&& * ,$) " &+,&&) * , '$ + &, + &'* $&$& ,'%% &) *, ') &$%
!) (&$&$&!! ,+! ,') * &) * &% ! +) &+$*)'$,5&& ! + &+' &') &&($ %&) *
% ! +) &+$*,)(*+,5

"%$& '((

+! &) &&' + *&' 5&& + &+$*)'$, &,+ &!' &,) 5&&, $*&,$*, &$*+&
) *, &+ , &) $" &+,&+$*$ %&,) 5&&) &!') &$*+&$& $*&) * ;
!) $*&+,&,+(%& &+ + 5&& +$*)'$&$*&+ (*&!') & '* &+$ (+ *
) +, $*&) * ,') &5 5&) $%&) ,* & , '('* &+,&&) *+) (+ &) ,* &$%&) (&$
(+$*)'$,&+,&% ! +) &((+,%$ &+&+() &) "+$ & & (*+$& 5&& ! + &+&')&
'($ %&) * &% ! +) &+$*,)(*+,5&& +* & & (*+$&&+,& , $(&+$*)(*
'$ +,) "+$&$%& (*+$& &+,&) * &% ! +) 5

& "30('3 &30&# % $

"30('3 *&$&! ! ,+! ,') * & , +$) &,+* (* & '! $*& & (*+$& 5&&) "$ &%'$ '$ &$%
+ '$ & + %& &,+ ' '* %&$&,) & , & ' &) * ,') & &) $% %&*+, %&$%
!,+(%&&& +, , & + %&) &) $% &$%&)(& +, &) "$ &%'$ '$ &$%& + '$ 5
+ &+$*) '$) * %& +* '$ &$%&,+* (* & '! $*& +, &$*,'$ &) "$ &,) 5

) # % $ *+, & * $& &+ + '$ & ! ,) * , &04&+01 &/ &+22 5&& *+, &$&((+,%$(
'* &+() &) "+$ 5&& *+, &$&+,' $) &+$*)'$,&, +* (* %&,+ &% (*& $' '$&$&%
(++ &$%& $*") * %&,) &,) &+ &$(+ !) * &,) *,') &$%&) &$%&) &$%&) &$%
++%&$%&%'$ 5&& ! &+$*)'$,& * &+ %&$%&) %&$*&) %&$*&) %&+,& 5&& +$*)'$,
*) *&) & $&! $ %& *& &) , &) %&$%& ! *&! , *&+& $*&)) 5
+&+'*+, &$&$) %&+$*)'$, 5&& &!! ,+! ,') * &+$*)'$ *&+& +'%
$ ',+$ $*) &+$*) '$) "+$5

& / 1%&2/ 3#%($%/ 3" (& %#$2#/ 3

5" 3" 0"
221 "#/ 3" (& / 1%&4 '#
+& ! + , & '*& &$+ $5

5/ 3 1(#&/ 2" (&1# / %#$ &/ %&22$ # ($& / 1%&4 '#
$2/ 4 4 $30$0& / 3'# %3 #& ' &,+%(*&+$*)'$ &$, % $* & '* & ! + , & '* & , +$) & +, !) (&* + ! ,
%2$01% +,&'++ '() & +$'*+,'$ &) & & ', %&+&% *, '$ & & (* $ & & $*) "+$
+,&* ,&+$*,+&) , &$%&,& &$ ('* &+& & ! ',) *+, &,+* (* & '! $*5
3 '3$$%3 & $" 1% +&! (') & $") "+$& , $* 5&& ++%& $,) & $") *+$& + %& & '(' $*&+
(+$*,+ & +, & ! + , &+&)', +,$ &+$*) '$) $* 5&&& ' &,+%(*&+$*)'$ &$, % $*
'* & ! + , & '* & &,+(&$(+ , &+() &) *& $*) "+$&,&*
$ '$,'$ &+$*,+ &+& ! &+, ,& ! + , & + &$ & (+ $% %&,&,*) * *+,
' '* 5

' &(' $(& ,).(&&&&&&&&&. & + &- 2&&&&&&&&

$%&( ) *+, -. /

& / '2/ (/ '2" (&3*/ %4 "#/ 3

5"%2'3/ $3'2#
5/32(1 '/3) 14 4 "% +'3))') 5
! 1# $3'2#
5/32(1 '/3) 14 4 "% +'3))') 5
$%# $3'2#
5/32(1 '/3) 14 4 "% +'3))') 5
$ %012# $3 '2#
5/32(1 '/3) 14 4 "% +'3))') 5
5"3"0"
21#5 '2#
5/32(1 '/3) 14 4 "% +& & '& & ,&$+ % & &+ '(++ '() &,+! ," & & ' &,+%(*&) &+'& $
* +,+ && *) * %
5-%3'2 '2#
5/32(1 '/3) 14 4 "% +'3))') 5
%#'#/3 5/% '/3
5/32(1 '/3) 14 4 "% +'3))') 5
) $3 '# $%
5/32(1 '/3) 14 4 "% +'3))') 5
5"%2'3/ $3'2#
5/32(1 '/3) 14 4 "% +'3))') 5
! 1# $3'2#
5/32(1 '/3) 14 4 "% +'3))') 5
$%# $3'2#
5/32(1 '/3) 14 4 "% +'3))') 5
$ %012# $3 '2#
5/32(1 '/3) 14 4 "% +'3))') 5

& 2/ (/ '2" (&3*/ %4 "#/ 3

2/# '2#
+&$+ $&' $' '() $*& (* &,&,'*() &)),%5
3'#50&#5
1"#2&2/# '2#
5/32(1 '/3) 14 4 "% +'3))') 5
$%' #532$ 0$ %0" '(#
5/32(1 '/3) 14 4 "% +'3))') 5
5"3"0"
1"#2&2/# '2#
5/32(1 '/3) 14 4 "% +'3))') 5
$%' #532$ 0$ %0" '(#
5/32(1 '/3) 14 4 "% +'3))') 5
$%&0 $%$&*"$2# +&$+ $&' $' '() $*& (* &,&,'*() &)),%5

$%&( ) *+, -. /

& ' / "(&2/ 3 '0$%#/ 3

" #&&' / "(& $.) "+$& &) * & + %& & +'% %& & '$' ' %& , &+ ' &&' $' '() $*
) $** & &) * &,+%(*& '% & + %& +'& &%! + %& & ') & &+ & & *
! .+(%&$& & ") & $*&) * $*&) $"&& ' ! + & & .! & $%&+$, ( )
! .+% (* & ') & &($ %&) * &% ! +) & +$*.) (*+.&& ' ! +) & & ' &,+%(*&+ *+$
) $%& $ & ! .+% (* & + %& '& & &+ ! & '* & & ' $* & & $ ',+$ $')
! .+* (*+$& $%&) * &% ! +) & ') *+$& $%& $ & '+$) &+() & * +,'* & ' $* 5
) * &) ( ) '$ & + %& & ((%&&$ ('$.) "+$& & $%' & + %&+$ & &+$ '%, %
$& (('$ & &+'&) ' &&, ' &) * ,') & $%& & +$') '$,& *& &% ! + %& &$&
) &) &&, ! * & +$') '$, & +, & $ &) &) '$ &+ & ,+%(*& '% &&, +'%&% ! ,)
+ &! ' %&)* ,') & $%& $+ & $%& +$') (*& '* & +' &) * ,) &%) '$ & $%& , 5

, ' / "(& - / 1(0 & $&3 & 22/ %" 32$ & '# & ('2" (S&$ '/ 3" (&"#/ 3" (& 30 & / 2" (& " & 30 &$ 1("#/ 3
$"$%& & $2#/ 3& & , & & 30 & $2#/ 3& & .) &) .) & 5
/ %& 00'#/ 3" (& "30('3 &3/ %4 "#/ 3& 30 & %#52#/ 3& *&4 (/ +$$

& %3 / %&3*/ %4 "#/ 3

$ 1("# % '3*/ %4 "#/ 3	&14 $%	% $%- ' '3 3"4 $	5(" $	.
, &(" '*"2"#/ 3	+* ,) * %5			
, &("	+* ,) * %5			

&&) ('$ &,+ !

& $ 1("# %&3*/ %4 "#/ 3

3'#50&#5
5) &(" '*"2"#/ 3 +'&) * %5
) & 0%(&$ 1("#/ 3) 5 & " & & $4 #. "%"(&$ 4 #/ 3 & +'&% * , '$ %
3'#50&#5 &3 $3# %&) 5 & & +'&% * , '$ %
) & &$ #$4 $(+&," "%/ 1 &1 #'32$ & +&,+%(* & , &+ $%
) & &$4 $%$32+&("33'3 &30&/ #"2"#/ 3 & +&,+%(* & , &+ $%
) & &" "%/ 1 &- $4 '2"(& +&,+%(* & , &+ $%
) & &) ,) &0' #% 1#/ 3&&2- $4 '2"(&3 $3# %&& " "%&0$3#"2"#/ 3 & +
! ,+%(* & , &+ $%

5($"3& '%& 2#&$ $2#/ 3 +'& * %
& " "%/ 1 & '%
. / ((1# 3# & .
5($"3& '%& 2#&$ $2#/ 3 & +'& * %
5(" &&$ 1 #'32$
5($"3& '%& 2#&$ $2#/ 3 & +'& * %
5(" &&$ 1 #'32$
, &' #&& - $4 '2"(+'& * %
. %21%/ %& - $4 '2"(
, &' #& & - $4 '2"(+'& * %
$3#"(& - $4 '2"(

$%&( ) *+, -. /

& $ 1("# %&3*/ %4 "#/ 3

) # #5 &% 1("#/ 3

! " "2- 1 $##	' &) * ,') & &+'& * %
$ & / %	' &) * ,') & &+'& * %
$ &$%$+	' &) * ,') & &+'& * %
.$33 +("3'"	' &) * ,') & &+'& * %
3'#&0& # #5 &3 $3# %	+'&% * , '$ %
) 5 &	

5"3"0"

!) &5"3"0"	+'&+$*,+ %&$%,& " # &) $) % 5

5"3"0""3& .

5"3"0""3& .	' &) * ,') & &+'& * %
5 . &/ '2&1 #32$	' &) * ,') & &+'& * %
5"3"0"&3 $3# %	+'&% * , '$ %

- ' & %012#& " &$$3&2(" '*$0&3&22/ %" 32$& '# & $& " "%&2%#5%' & *& $5 / 3#%((($0& %012# & $ 1("#/ 3 "30& $&) ,) &2/ 3#"3 &((& $&3*/ %4 "#/ 3&$$ 1'%$0& +& $5 / 3#%((($0& %012# & $ 1("#/ 3

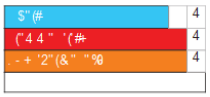
3#5%"#/ 3"(&$ 1("#/ 3

3#5%"#/ 3"(& #	1 #%("'&3 $3# %& 5) & +'&% * , '$ %
	5-'3"&3 $3# %& 5) 5 & +'&% * , '$ %
	" "3&3 $3# % & +'&% * , '$ %
	/ %" &3 $3# % & +'&% * , '$ %
	$ & $"(" 30&3 $3# % & *5 - $4 '2"(& / 5 & +'&% * , '$ %
	. -'('3$ &3 $3# %& 55) & +'&% * , '$ %

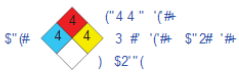
& # $%&3*/ %4 "#/ 3

" $(&% 1'%4 $3#	&	&	&	& #	# #	&	&	" &	& "
	" &		&	#	&	&	&	&	5

" "%/ 1 & "#5%'(3*/ %4 "#/ 3& + #54 &)



- $&21 # 4 $%& &5 / 3 ' ($&/ %0$#5%4 '3'3 &# $& . &2/ 0$&/ %&#-' & "#5%'(
"#/ 3"(&'%& %#52#/ 3
/ 2'"#/ 3&)



. "#&*& %3#3

. "#&*& 1$	23 . 304- 05
. "#&*& %' / 1 & 1$	+&, '+ &) '% * +$5
$%/ 3	-
. % "%0& +	&! (') ' *

5

` & (` $(& .).(&+ & - 2 +(. +;%# -1 &/ . 42 2 5 . +$+
` .(& +* ($+ + 5(2 2& %. ,%) $& +) * --41 . -1 &/ . 2 - / &)

$%&( ) *+, -. /

& # $%&3*/ %4 "#/ 3

30'2"#5 &3*/ %4 "#/ 3&# "#& " &2-"3 $0&%4 & % '/ 1 (+& 1$0& $%' / 3

/ #2$&# &5"0$%

/ &# $& $ #&*& 1%& 3/ ($0 $ &# $& 3*/ %4 "#/ 3&2/ 3#'3$0& $%'3& & 221%#5 & / $ $%&3$'# $%&# $& / $ 3"4 $0 1 ('$%&3 / %& 3+& *&# & 1 '0'"% & 14 $ & 3+&" '('#+& -"# / $ $%&/ %&# $& 221%2+& %2/ 4 ($#&3$ &*&# $ '3*/ %4 "#/ 3&2/ 3#'3$0& $%'3

'3"(&0$#5%4 '3"#/ 3& *& 1'# '('#+& *& 3+&4 "#5%'(& &# $& / ($&5 / 3 ' '(#+& *&# $& $%& ((&4 "#5%'(& "+& %$ 3# 13 .3/ 3& " "% & 30& - / 1(0& $&4 $0& '# &2" 1#/ 3 & (# / 1 - &2$%#'3& " "% & %&0$ 2% $0& $%'3 & $&2"33/ # 1"%3#&$&# "#&# $ $&'%&# $& 3(+& " "% & "#& ' #

#

` & (` $(& .).(&+ & - 2 +(. +;%# -1 &/ . 42 2 5 . +$+
` .(& +* ($+ + 5(2 2& %. ,%) $& +) * --41 . -1 &/ . 2 - / &)

Thermo SCIENTIFIC

The world leader in serving science

$%&'( ) *+, -'. */0 - '1) */0 -

' 228Ø$3#' ('%($" $'4 $" 1%$

. $%/ 3" (%2" 1#& 3 — " % -%' & ' *'-* %&-* ' * ' % & - '%' - %' (-, &', -*-* 7 + (' (%* -* ' 7 '(** ' * '(* %' %* & %% *, -* 7'! %*%,% '%' &', %' -& ') , - & (,'%' % - , ' % & % ,- ' (-) *, ' ,%'0 7

3 &%34 $3#' (%2" 1#& 3 — # %' - &%' -& ') , - & * ' (*%' * ' %, , - ' %&& ' -* * ' 7' * %) ', ' & ' *' (%-, '-', ' %(, ' (* -%) *, & %&-%' ' %&%' - 7

! $# / 0 '*/ %2($" 3& '1

) 4 "((&(— , %'& '-' -, %' - 7' % ' %, -* ' %) ' -& 7'! -&, ' -, ' * ') %'(-' , %& &7'# & * , - & '%' - * ' & * ' *' ') , - & * & ,*' *' % , - , ' - % & %, -* 7'! - % '%' - ' & * - % & %, ,%7

"%$' &(— , %'& ' -' -, %' - 7' % ' %, -* ' %) ' -& 7' * ' *' -*% ' %) (-& % *') , - & 7 7 * ' ') - (& '%' - ,%) % ' * & ' -* %, -* '%' - % & % -* ,%&% 7'$%, -* ' %& -& % -* ,%&% & (&,%' '/ 7'! - % '%' - ' & * ' * - % & %, ,%7" % ' -%'/ %') * ' %, , -* %) ,%' * ' -%'/ ' %' ' - % &

' "30(& '"30' # % $

"30(& — (,'%' % - , ' % & % ,- ' (-) *, ' -%'0 7'+ ,-* ' -* -* ' *) %-* ' %&' % - , -*' * & ' % ' * ' % 7' % ' %&' * ' * ' % ' ,-* ' -* -* ' *) %-* 7) % ' %,) -* , &% -* ' * ' % ,- ' (-) *, ' % ' * , -* ' -* 7

) # % $ — , % ' *' , '%&% -* ',) ('26',%2 $' 10',%44 7', % '-*' % * , &% & (&,-% 7', % '-*'%- -* & %, ,-* ' % , ' %) ' - ' (* & , -*' ' %&& * ' & * ,&, ' ' ' %) ,- &') , - &' ' -%'/ 6 ' * %' * ' -* 7 ' %, ,-* ' ,&' &% * ,' &' (*,-& ' %'(7'$%, -* ' ' ' *'% * ') (' ' (&' & * ' * ' '(- ,'% * ,& ! %'%', % '-*'(*& & ' %, -* 7' ' % - , ' %, -*) *, ' ,% % * - %) *, & %,) -* ,%7

' / 1%$'2/ 3#%($%/ 3" (' %#$2#& 3

5 " 3" 0"

221 "#& 3" ($ / 1%$'(& &#

" % % (&) -' & ' * % *7

5/ 3 1(#(/ 2" ("1# / %&& '*/ %'22$ # ($'$ / 1%$'(& &#

$2/ 4 4 $30$0'4 / 3&# %&3 — ' , ' %(, ' %, ,-* '-* - * ' -, ' %('&) -, ' % & % & ' ,) % %2$01%$ — %' -%&- &) %'-%-* ') ' ' ' (- ' % ,) -* ' - * '%, ' * ,-%'% ' %' ' %, %&) (' * 5%', '* -, '%(- ,%' % ,- ' (-) *, 7

3 &$$%&' '4 $" 1%$ — " % - & * ,-& -%' (-) *, 7' %%' * & * ,& -%' %&' ' (- - *, ' % %, %& % ' ' %(' %- %' * %,) -* *, 7' ' * ' %(' %, -* ' * - ' %(' ,' * -& -%' %'% -* ' %(' &) -, ' (' * &%('&% & (' * -& -%' %'% * -* ' %' , ,(,% &) -, 7

7 7 3"

$%&'( ) *+, -'. */0 - '1) */0 -

' / 1%$'2/ 3#%($%/ 3" (' %#$2#& 3

+ &3'4 $" 1%$ — ' * ' %) ' * ' ' %%(&' , ' * &') - & %(, ' % -* ') %-* ' * ' (-* ' ' & ,% ' * ' ' %, ' % -* ' * 7'# % - , ' * - (' %(&' (' ,%) % ' % * , - &' %,) -* , ' &% -* 7' %,) -* , ' &% -* ' (-* 7'+* (' , ' ' , -% ' * ' , ' % ' &% ' %, ' % , -%' &% -%7

$%/ 3" (' %#$2#& 3

$ &%# % — ' ' % &' , ' - (- -* '%' - ' - ,%' % &-* ' - ' *' % , * ' -' - ' , ') * ' - ' - ' * 7' - ,%' & ,%') (, '%' * % *'%' * , - ' %(' & &' , '%', ' %(, ' * ' , % -* '&) - ,' %' , & ' - ,%7

"30 — $) - & - , * ' -) -%(' &% ' %) &-* ' -, ' *' % ' , * ' %(&' %*' ' &-) ' *' * &* ') - & %(, '-' ' - *) * ' -* - , ' , ' - * 7

+$ — . , ' ' %) &-* ' -, ' *' % ' , * ' %(&' '(' *' ' -) * ' -* - , ' - ' -* ' ,% %' %(' ,%& (-' & ') - , '% (, 7

) &(— % & % ,- ' (-) *, ' %', ' % ' %(&' ' & , ' '%', ' ,' -* %) , ' * ' , ' - -* %& ' * ' %(&' ' % ' , ' - & , ' % ' * &' , - ' %(, 7

3 &%34 $3#' ($ / 1%$ 2/ 3#%(— +) - -% ' %) ' *-&,-%'%' % ' % ' (-) *, ' %(&' ' ,% * (' , %) &' -, ' (-) * ,' % ' * ' -% ,' ,% ' ,&' &7 ,() ' (' -& ' % ' * ,-* ') %-- ,-% ' ,% ' % ' (-) *, -& * ,% (') - -% ,' % ' ,&'& &7

'. - + &" (' "30'2- $4 &" (' % $'#&$

. - + &" (' #'#% — - (- 7

7 ') # &(&#+'" 30'%" 2#& &#+

5 - $4 &" (# &&#+ — ' %(, '- ' , &7

5/ 30&&3 '#' " / &0 — " % -- ' , 7

32/ 4 "#& ($'4 "#%%& (— " % -- ' , 7

" "%/ 1 '0$2/ 4 / &&3 %012# — * '*%) & % -,-% '%' ,% * * '(' %(' %) %-,-%' %(, ' %(& *%' %(7

./ & &&#+'/ *-" "%/ 1 %" 2#& 3 — * '*%) & % -,-% '%' ,% * * '(' %(' ,-% ' -&' %'% (7

77 ' / &2/ (/ &" ('&&*/ %4 "#& 3

3&&5 0') # #&

21#&'# &2&#+

5/ 32(1 &3) 14 4 "% — %, ' ,'%'% ' *% & ', ',%- %&&- & % ,- '%', -' %(, ' '*% * , %*% &'-* ,- , 7

5 - %3 &2'# &2&#+

5/ 32(1 &3) 14 4 "% — " % -& &7

%&# #&3 5/ %& &3

5/ 32(1 &3) 14 4 "% — " % -& &7

) $3 &&$%

5/ 32(1 &3) 14 4 "% — " % -& &7

5 " %2&/ $3&2&#+

7 7 4"

$%&'( ) *+, -'. */0 - '1) */0 -

77 ' / &2/ (/ &"('&3*/ %4 "#&3

5/32(1 &3) 14 4 "% " % -& &7
! 1# $3&9+
5/32(1 &3) 14 4 "% " % -& &7
$%# $3&9+
5/32(1 &3) 14 4 "% " % -& &7
$ %012#& $'# &9+
5/32(1 &3) 14 4 "% " % -& &7
5"3"0"
21#5'# &9+
5/32(1 &3) 14 4 "% % ' '%'% ' *% & ', '%- %9%- & % ,- '%', - ' %(,' '*% *
, %% &'-* ,- , 7
5-%3&'# &9+
5/32(1 &3) 14 4 "% " % -& &7
%&'#&3 5/%% &3
5/32(1 &3) 14 4 "% " % -& &7
)$3 &&$%
5/32(1 &3) 14 4 "% " % -& &7
5"%&/ $3&9+
5/32(1 &3) 14 4 "% " % -& &7
! 1# $3&9+
5/32(1 &3) 14 4 "% " % -& &7
$%# $3&9+
5/32(1 &3) 14 4 "% " % -& &7
$ %012#& $'# &9+
5/32(1 &3) 14 4 "% " % -& &7

7 ' 2/ (/ &"('&3*/ %4 "#&3

2/# &9+ " % *% *' - *-- *,' ,'% -,- & 7
3&50') #5
1"#&'$2/ # &9+
5/32(1 &3) 14 4 "% " % -& &7
$%& #532$ 0$ %0" &9+
5/32(1 &3) 14 4 "% " % -& &7
5"3"0"
1"#&'$2/ # &9+
5/32(1 &3) 14 4 "% " % -& &7
$%& #532$ 0$ %0" &9+
5/32(1 &3) 14 4 "% " % -& &7
$%0 $%$'$""$2# " % *% *' - *-- *,' ,'% -,- & 7

$%&'( ) *+, -'. */0 - '1) */0 -

7 ', & / "('2/ 3 &0$%#&3

" #&'0& / "(' * -%'% ' %&' ' % '%') -*-) - ' ' % - &7'. - *-- *,
(*,-' '% ' ' %(' - (' %&'*% ' - % '% -' ' %& ' (,
% '-*' ' (- &' & *' ') *' &*,7'! - % '% ' (& ' * '*% & &
%(' -' '& * ' ' - % & %' ,%7'! - % &%, -' %(' %&-%
* ' *' %(' %&' &-) ' %) &' - ' ' (-) *, '% ' * -%) *, &
% -%' * ' ' - % && - & -%' * ' * ' -% &&% & (%-' (-) *, 7
-* ' %&' ' & 7' * -* -%'%'&* -& %&'%&' ' % -
*' & '-'%' - &7' -') , - & * ' ' %, -* ') (' ' - % '%'-*'
' 7'+) , ' %, -* '%'&' ') ' -*' %) ' %(; -(7'# %' -
% -& ') , - & * ' (*%' * ' %, , ' -, ' %& , -* ' * ' 7

, & / "(- / 1(0' $'&'"22/ %"32$' &#'" (&" ($'% & 3"('3"#&3"('"30'(/ 2'('(" '"30'% 1("#&3
$"$'%'#') $2#&3' ' ' ') '"30') $2#&3' ') '5)) ' 5
/ %'00&&3"(-"30(& '&/ %4 "#&3"30' %#52#&3'/ "$4 (/ +$$

7 ' %3 /%#&3*/ %4 "#&3

$ 1("# % &3*/ %4 "#&3	'314 $%	, % $% - & & 3"4 $	5(" $	.
, '5(" &&2"#&3	" % (&, 7			
, '5("	" % (&, 7			

' ' -* ' %

7 ' $ 1("#/ %'&3*/ %4 "#&3

3&50') #5
5) '5(" &&2"#&3 " % (&, 7
) ' 0%('% 1("#&3) 5 ' " ' ' $4 #, "'%&'($ $4 #&3'" %' ,) -*
3&50') #5 '& $3#%') 5 ' '#&% % *, ' '&, '%') , 7
) ' 77 7 '$ #$4 $(+'-" "%0/ 1 ' 1 #'32$ '" % %(, ' %* 7
) ' '$4 $%$32+' ("33& '"30'3/ #&&2"#&3'" % %(, ' %* 7
) ' 77 7 '-" "%0/ 1 '2-$4 &2"('" % %(, ' %* 7
) ' 77 7 '!) ,) '0&#& 1#&3' '2-$4 &2"(& $3# %' '-" "%'&0$3#&&2"#&3'" %
%(, ' %* 7

5($"3' &% 2#') $2#&3 " % & ,
77 ' " "%0/ 1 ' &%
. / ((1# 3#' .
5($"3' &% 2#) $2#&3' " % & ,
5(" ' ') 1 #'32$
5($"3' &% 2#) $2#&3' " % & ,
5(" ' ') 1 #'32$
, ' &# '5 - $4 &2"(" % & ,
. %21%/ %5 - $4 &2"(
, ' &# '5 - $4 &2"(" % & ,
$3#&('5 - $4 &2"(

$%&'( ) *+, -'. *+/0 - '1) *+/0 -

7 ' $ 1("# %'&*/ %4 "#& 3

) # #5"% 1("#& 3

! " "2- 1 $## " % '%', ' % % *, ' '&, 7
$ ' / % " % '%', ' % % *, ' '&, 7
$ ' $%$+ " % '%', ' % % *, ' '&, 7
. $33 +("3& " % '%', ' % % *, ' '&, 7
3#&50') # #5 '& $3# % #& %) % *, ' '&, '%') , 7
) 5 '

5"3"0"
!) ' 5"3"0" " % %, %& '(* . ' $ * 7

5"3"0&3'(&#
5"3"0&3' . " % '%', ' % % *, ' '&, 7
5 . ' / &' 1 # 32$ " % '%', ' % % *, ' '&, 7
5"3"0"'& $3# % #& %) % *, ' '&, '%') , 7

- &' %012# - " ' $$3'2(" &$0'&'"22/ %"32$' &'# $'- " "%'2%&$%&' / "# $'5 / 3#%((($0'. %012# ' $ 1("#& 3 "30'# $'!) ,) '2/ 3# & '"((# $'&*/ %4 "#& 3'% 1&$0' +'# $'5 / 3#%((($0'. %012# ' $ 1("#& 3

3#5%"#& 3"('(%$ 1("#& 3
3#5%"#& 3"('(&# 1 #%(&'& $3# %' 5) '# & %) % *, ' '&, '%') , 7
5 - &"'& $3# %' 5) 5 '# & %) % *, ' '&, '%') , 7
" "3'& $3# %'# & %) % *, ' '&, '%') , 7
/ %"'& $3# %'# & %) % *, ' '&, '%') , 7
$ ' $"('30' 3 $3# %'/ "5 - $4 &"(' / 5 '# & %) % *, ' '&, '%') , 7
. - && &$ '& $3# %'. 55) '# & %) % *, ' '&, '%') , 7

7 ' # $%&3*/ %4 "#& 3

" $('% 1&$4 $3# " '+ +$ +! ' ' ! $+'. " $#" '#! + . +' +# '+ +$.' +" +' +$ +" ! +! ' " . $ " . ' ' . +'# +' +! 7

" "%/ 1 '! "#5%(3"/ %4 "#& 3') + #5 4 ')

- $'21 # 4 $%&'% / 3 &($*/ %0$#5%4 &&& '# $'. . '2/ 0$*/ %#+ &'4 "#5%&(
"#& 3"(' &&$' . %#5 2#& 3
/ 2&#& 3')

. "#5'/ *' %&#&3 7 7
. "#5'/ *'& 1$ 4$ 05 26/ 27
. "#5'/ *' % & 1 '& 1$ " % .%(' & .-%7
6 $%& 3 /
. % "%0' + . ! . '. - & ,

7 7 7"

$%&'( ) *+, -'. *+/0 - '1) *+/0 -

7 ' # $%&3*/ %4 "#& 3

30&2"#5 '&*/ %4 "#& 3'# "#- " '2-"3 $0'*%4 ' % & 1 (+'& 1$0' $%& 3
/ #&2$'# '%" 0$%
/ '# $' $ #/ *'/ 1% 3/ ($0 $ '# $'&*/ %4 "#& 3'2/ 3# &$0'- $%&&'&'"221%#5 ' / . $ $%3$&# $%# $'" / $ 3"4 $0 1 (&%3/ %"3+'/ *'&# ' 1 &&%& '" 14 $ '"3+'(& &&#+ -"# / $ $%7/ %# $'"221%2+'/ %2/ 4 ($#5 3$ '/ *'# $ &*'/ %4 "#& 3'2/ 3# &$0'- $%&&
&"(0$#5%4 &"#& 3'/ *' 1&# &&#+'/ *'"3+'4 "#5%&(&'# $ / ($'% / 3 & &&#+'/ *'# $'1 $% ((4 "#5%&('4 "+' % $3# 13 3/ 3'- " "%0 ''30' -/ 1(0' $'1 $0' &# '2" 1#& 3 ' (# / 1 - '2$%&'&'- " "%0 '"%'0$ 2%&$0'- $%&& ' $'2"33/ # 1"%3#5$'# "## $ $'"%'# $'/ 3(+'- " "%0 '# "#$ &#

7 7 #"

Thermo SCIENTIFIC

Part of Thermo Fisher Scientific

Material Safety Data Sheet

1. Product and company identification

Product name	: 5M Sodium Chloride		
Supplier	: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723	Manufacturer	: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 800.874.3723
Product No.	: 1862231 1890702 1896129		
MSDS #	: 8387		
Validation date	: 3/11/2010.		
Print date	: 3/11/2010.		
Responsible name	: MSDS Specialist		
In case of emergency	: CHEMTREC: 800.424.9300 OUTSIDE US: 202.483.7616	Use of Substance/Preparation	Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

2. Hazards identification

Physical state	: Liquid.
Odor	: Saline, astringent.
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: WARNING! CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. Irritating to eyes, respiratory system and skin. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation	: Irritating to respiratory system.
Ingestion	: No known significant effects or critical hazards.
Skin	: Irritating to skin.
Eyes	: Irritating to eyes.

Potential chronic health effects

Chronic effects	: Contains material that may cause target organ damage, based on animal data.
Carcinogenicity	: No known significant effects or critical hazards.

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

Thermo SCIENTIFIC

2. Hazards identification

Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.
Target organs	: Contains material which may cause damage to the following organs: skin, eyes, stomach.

Over-exposure signs/symptoms

Inhalation	: Adverse symptoms may include the following: respiratory tract irritation coughing
Ingestion	: No specific data.
Skin	: Adverse symptoms may include the following: irritation redness
Eyes	: Adverse symptoms may include the following: pain or irritation watering redness
Medical conditions aggravated by over-exposure	: Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

The preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : Not classified.

See toxicological information (section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
Sodium Chloride	7647-14-5	25 - 45

Substance/preparation : Preparation

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Inhalation : Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

Thermo SCIENTIFIC

5M Sodium Chloride

4 . First aid measures

Ingestion : Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See section 11 for more detailed information on health effects and symptoms.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : Decomposition products may include the following materials:
halogenated compounds
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

Thermo SCIENTIFIC

5M Sodium Chloride

6 . Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Europe

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

Thermo SCIENTIFIC

5M Sodium Chloride

8 . Exposure controls/personal protection

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Liquid.

Color : Colorless.

Odor : Saline, astringent.

10 . Stability and reactivity

Chemical stability : The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous reactions : Will not occur.

11 . Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium chloride	LD50 Dermal	Rabbit	10000 mg/kg	-
	LD50 Intraperitoneal	Rat	2600 mg/kg	-
	LD50 Oral	Rat	3000 mg/kg	-
	LDLo Intraperitoneal	Rat	3.72 g/kg	-
	LDLo Subcutaneous	Rat	3500 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat	>42 gm/m3	1 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Carcinogenicity

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

Thermo SCIENTIFIC

5M Sodium Chloride

11 . Toxicological information

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sodium chloride	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Europe

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Hazardous waste : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

Thermo SCIENTIFIC

5M Sodium Chloride

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not available.	Not available.	Not available.	-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Irritating material
Target organ effects

U.S. Federal regulations : United States inventory (TSCA 8b): All components are listed or exempted.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: sodium chloride
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: sodium chloride: Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists : CEPA Toxic substances: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: None of the components are listed.
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Canada inventory : Canada inventory: All components are listed or exempted.

EU regulations

Risk phrases : This product is not classified according to EU legislation.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Korea inventory (KECI): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Japan inventory (ENCS): All components are listed or exempted.

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

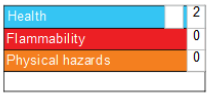
Thermo SCIENTIFIC

5M Sodium Chloride

16 . Other information

Label requirements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :

Date of printing : 3/11/2010.
Date of issue : 3/11/2010.
Date of previous issue : 12/15/2009.
Version : 1.01

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

Biosciences Division Pierce 3747 N. Meridian Rd. PO Box 117 Rockford, IL 61105 (815) 968-0747 (815) 968-7316 Fax www.thermo.com/pierce

ThermoFisher SCIENTIFIC

The world leader in serving science

MSDS# 8401 COVER SHEET

1862282	Chromatin Prep Subassembly
Component #	Description
1861744	Membrane Extraction Buffer
1861745	Nuclear Extraction Buffer
1862228	MNase Digestion Buffer
1862230	MNase Stop Solution
78443S	Halt Protease & Phosphatase Inhibitor Cocktail EDTA-Free (100X)
1862223	Glycine Solution (10X)
1862224	PBS (20X)
1862186	DTT, lyophilized, 500mM

Life Science Research
Pierce Biotechnology Inc.
PO Box 117
3747 N. Meridian Road
Rockford, Il
61105
(815) 968-0747
(815) 968-7316 fax
www.thermo.com

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&'(")$#* +"#" ($$#

! "#

% #" " * & $ #&)& "#&

% # " $! "#
(* * ! $%&( ) $ "*+(+) # $'
('&% $'% $' $) + ! ")" # %$% $'% $' $) +
$' $ # -6) $' $ # -6)
*
) -6 +(-6) -6 +(-6

$
! (+(
"'&"#& "#$
%& # "#$
$ &'$ " $! $ (+' $ (+
! ! "#$%&' $ $)$%# # $ & #% #&
'$#) % % $%"
(+ (&#$ $ $ # $% & $
'&$%) % $ &
" '&"#&

% ##" $

" "% & $ #&)& "#&

$%$ * $%&$
* &"' # #$
' % ' $
% ' $
" "% #"#$ $ # " " " " " " " " " "
" " ! ! " " " " " "
((#" $ + %(-6'( ) +) $'$ ((' & + $ ((' %%) (+)
+) (' + !)+) ((&$) '%(+) ' + (+ +$
($ ( )) ( ) ' $' $ + $ ' + ! &$ '$+) $ ( )
(((&$ ' $% $$ ( ) +$' $' + ' +
#$) $ #% $'%( )+ +" $)+ +) ((+)) $ +)
#$ #&'" #$ $"'# $))$ #
"'"#&))) ( ) +$ $ + ' ' + ((('
$ #&))) ( ) +$ $ + ' ' + ((('
(&))) ( ) +$ $ + ' ' + ((('
*$))) ( ) +$ $ + ' ' + ((('
#$ #&'' % & $"'# $))$ #
% & $))$ #))) ( ) +$ $ + ' ' + ((('
"%& $ &&'))) ( ) +$ $ + ' ' + ((('

! "#

$ $) $ $ $(' # * ' +$'% %
$' $ # -6) ! $' ( ) ((-

$ %&

" "% & $ #&)& "#&

! #' $ &&'))) ( ) +$ $ + ' ' + ((('
$%# $ &&'))) ( ) +$ $ + ' ' + ((('
+$ $' $ #" $))$ #))) ( ) +$ $ + ' ' + ((('
$%&&' $))$ #))) ( ) +$ $ + ' ' + ((('
$%$ %$ & * #
"'"#& $ (+
$ #& $ (+
(& $ (+
*$ $ (+
! $ &"' &&')$))
" % "#$ * $%
$ %
($$ # & ' &"' &) % "#& ($ #&

&&& &) % "#& & %$ &$

$%$"%$ & %$ &$ # %$ $ # & &' & # $ %%$ # '$ $)# $ '&%' & # $ $ #%#&
" '&" '$ "%$ '" &$$ " " "% # $"'# %# $ $ &% $ #" $ $ %$ &&$ %$ %#& & # & $ #&

&%#" & $" %$

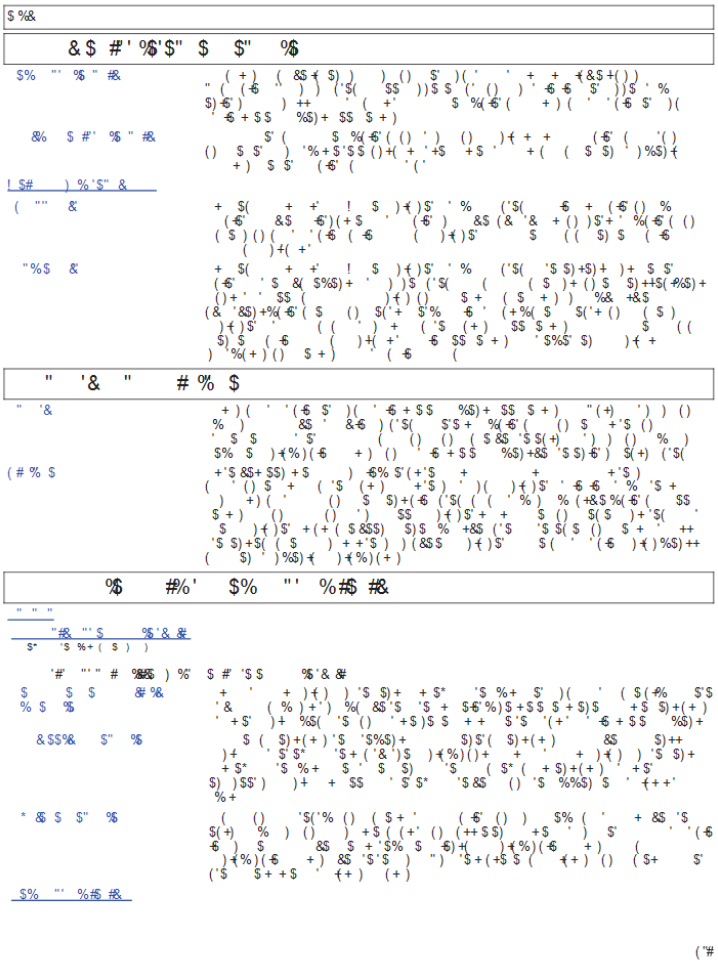
*$ # # $ ' ( ) '$% $ ( )) +(+$) $ %%$ (-6 $ $ + $) + (-6'
' (+$(+ %) -6 ( ) (+) +$ $' ( ) $' $ $ $+%$ (
(+6) +) % + % '
(& # ' #) ($) +(+ %%$ (-6) + $) + (-6' ' (+$(+ %) -6
$'$%)) +(%) (-6 +) ( ) $ (+) &$ '$'$ $ $( )
$ + ' &$ '$'$ $ $+%$ ((+6) +) % + % '
"'"#& ! $ $* $ $') + '$ (') +&$(+) &'$(+) ''$ (' '
'$ '(+' (''$ + ' $ ('+ ('$ ' (+) ' * $) & +( ) $ $'))$
$) + + +) (((' +$ &$ + ' (+&( ) $+%$ ((+6) +)
% + % '
$ #& (+% + + (-6') +) $ %+)) $ '$ -6 + & %$ (
$'))$ $ $' $ ( ) +) & % + + ( ))) $') $+%$ (
(+6) +) % + % '
%#& #&))&%#" & $% (+) (&$ +($)) ( ) $') (' ' + + +(& $ + ( ))
#& # * & & $ +$(-%$) + '$(+ % + %(+ ( ) +(+ +) +$(-%$) + $ (+
%%$ (-6 (' $ ( ) ++$ ($ &$$)) $ -6 ') ($

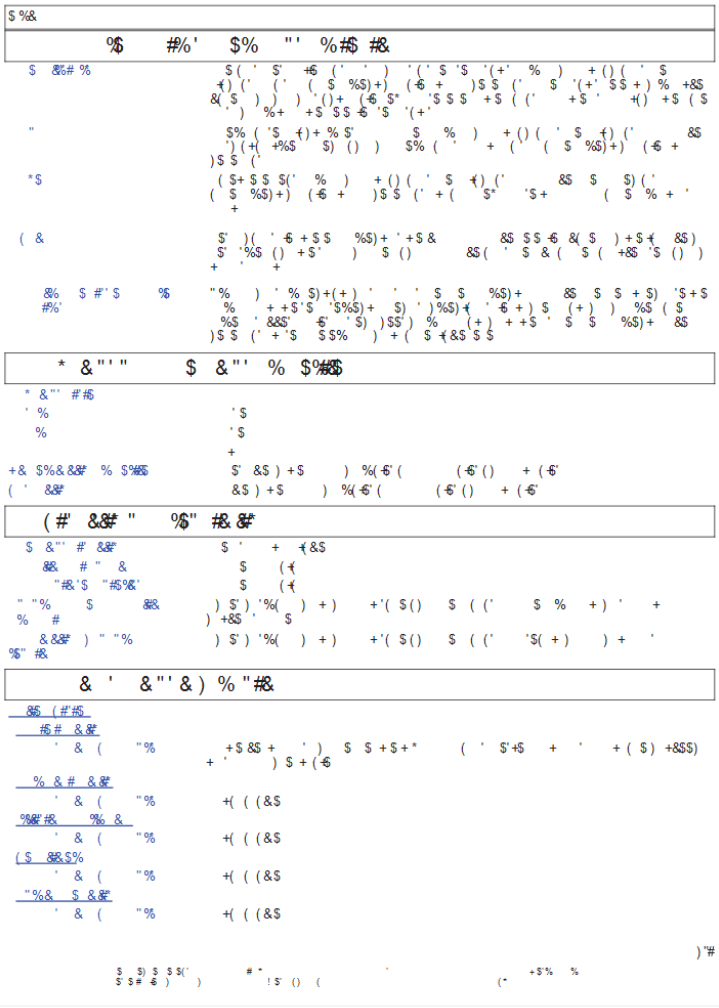
&$)& #& $" %$

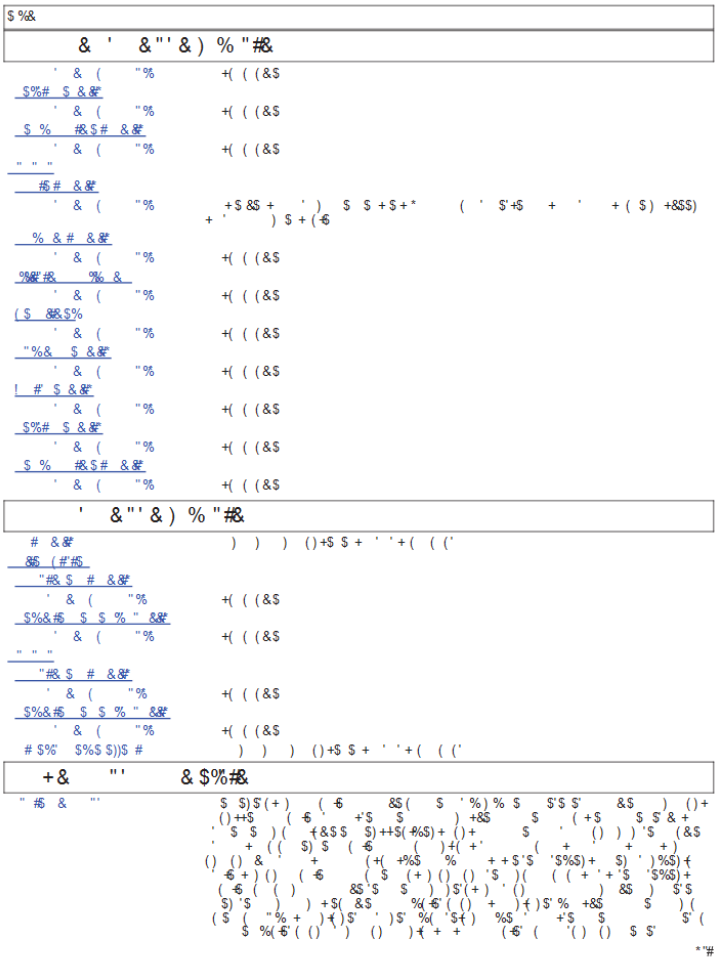
"" " &&') # $ % #) ('$ ' $(-6 ('$ '$) '$($ ' ( ) +$) +( ) $' %(& ' +
#& & & $ &
(&' '$ $ ( ) $'+)) ($) + +&$ ' +$ '')) '$
&' '$) $))
($ &' $ % " "% ' % + (-6 + $ $) $ & '$%) ($') ' % + $) + +$) $) +
+ $' $ ('$ (+) (&$ +($)) ( ) $')(' ' + + +(& $
+( ))
" "% # $% "' $ (+(
$ &&' % # '$ -6' $(' (' (-6 ' -6 + $ $ %$) +( ) $) +( ) $ &$(+)
($ &' %#& #& $ (('(+ # + (($ $ $ $'(-6) + $ '$ '$ '$ % $
$ & $ #) %$ $)& #&%

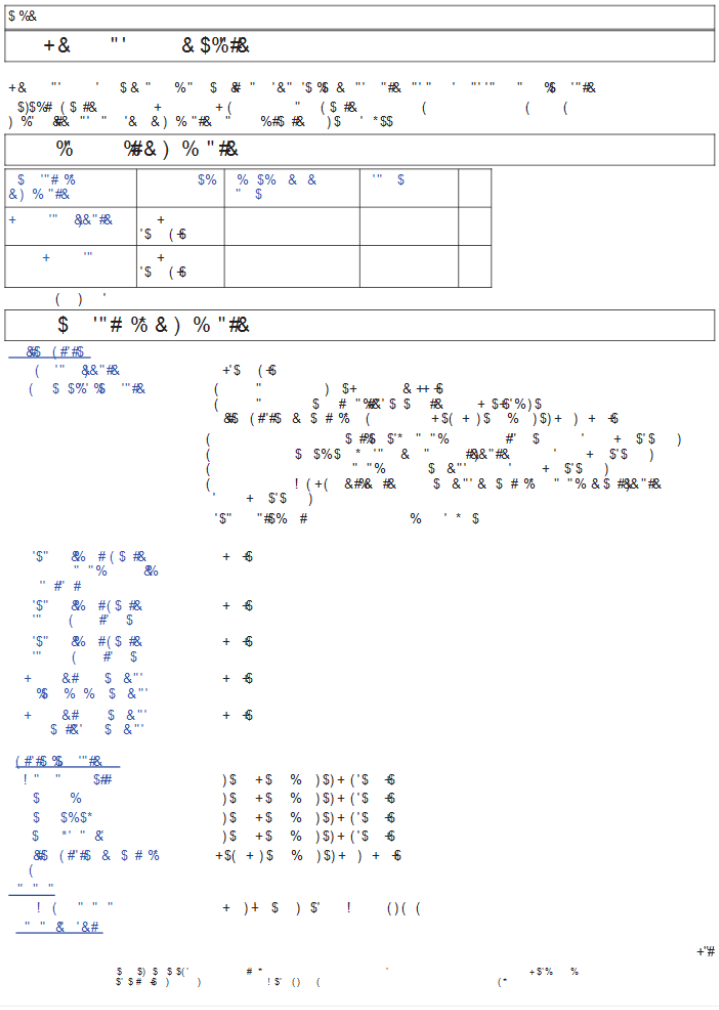
' "#

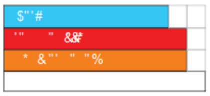
$ $) $ $ $(' # * ' +$'% %
$' $ # -6) ! $' ( ) ((-











Thermo SCIENTIFIC

The world leader in serving science

! " #$%&' (")$# +"#' (, $$#

! " #

- % #" . " * & $ #&)& "#&

- % # " $! " #

('&%

. .# $$' &$$+)

%) . &%+' (' %+. % (. ' *

. $

! (+(

"'& "#& "#&

- %& # "#&

$. &'$ " $

$%&$' ( ) $%&*) ' + $, +$, &(

%) .

$+-*' .* +$$.

$+-*' .* +$$.

! ! "#&%&' $ $)$%# # $ & #% #&

. '$#) . % % $%"

(+ (&#& $ $ # $% & $

. #' # '&%). % $)&&

" '& "#&

- % ## $.

" " % & $ #&)& "#&

$%$ * . $%&

- , * &"' # #& .

. ' . % .

. %

(& "' . % ! !

" "% #'#& $ # " " " " ! ! ! . ! !

" " " ! " # " ! !

- % " #& "% $" %

((##

. #& .) $ #%

- . #& #&' " #& . $"'# $))$ #

, "'"#&

$ #& !

(&

*$

- . #& #&' . % & . $"'# $))$ #

! "! #

. # $$' %) . &%+' (' # . '(! . &$$+) %) . &%+' $&

$ %&

" " % & $ #&)& "#&

. % & $))$ #

"%&. $ &&" !

! #' $ & &&" !

$%# $ & &&" !

+$ $'. $ #" $))$ # !

$%&&&" $))$ # !

"%$#. %"

$%& . %$ & * #

, "'"#&

$ #& !

(&

*$

! $ &"' . &&

" % "#& * . $%

$. %

($$# &. '. &"' &). % "#& ($ #&

. . &#& &). % "#& . & %$ &$ #

&& (#' #&

" $	($%	
	' &(' $( )	$

, $%"% . " &&. "' & %$ &$ # % $ # , &. &' & # $ %$ # . '$ $.) #, $ '&%' & # $. $ #%#& " '&" '$ "% "" &,& " , " "%. # , $"'#, . %#, $ $ &% $ #" , $ $ % &&$ % . %&. & # & $ #&

&%#" & $" %$

*$. # #

$)

(& . #' #

$)

, "'"#&

$ #&

. !

- %#& #& .))&%#" & $%

! "! #

. # $$' %) . &%+' (' # . '(! . &$$+) %) . &%+' $&

$%&

&%#" & $" %$

. #& # , * & & !

&$)& , #& $" %$

'" " &&# .) # $ % #
#& & & $ &
(&# '$
. # &# '$!
($ &' $. %$, " "%
. !
" "%. # $% "'
$ . . &&. % #
-
($ &' %#& #& $
$ & $ #). %9&&)&, #&%
#

& $ #' %$'$" $ $" %$

- $%. "' %$ " #& !
"
%.
&% $ #' % " #&
! $# .). % '$" &
(""" &
"%$ &
$.
$ $
. !

" '& " # % $

" '& %. "

('1 #
. # $$` %@) . &%+' (` . .
. '(! . &$$+) %@) . &%` $&

$%&

" '& " # % $

(# % $ * %) .& (&(.
$+

. %$. #%' $%. "' %#$ #&

" " "
"#& "' $. %$ '& &#
!
. '# . "' " # . %&&$). % $ # '$ $. %$ '& &#
$. $ $. &# %&
% $ %$
& $$%& $" %$
* &$ $ $" %$
. "
- $%. "' %#& #&
$ &%# %
"
*$
(&
&% $ #' $. % "
. #%'

- , * & "' " , $ & "' % $%#&$

- , * & "' #'#&
. ' %
. %
' .(' .&
+& $%& &&# % $%#&$
(. ' &&#

)'1 #
. # $$` %@) . &%+' (` . .
. '(! . &$$+) %@) . &%` $&

$%&

(#' &&# " %$" #& &#

, $ &"' # &&#
. &&. # " & !
. "#& '$ "#5%&' !
" "%. $. &&.
% #
- . & &&# .) ," "%.
%" #&

. & . '. &"' &). % "#&

&&. (#'#&.
#&# & &#

- % #& % && # " $	$ '#	($ &&	+. $	. %
	) +) +		$++++ - +++ - ++ -	

. ' & ("% !
. % & # & &#
. ' & ("% !
%&#' #&. . %. &

- % #& % && # " $	$ '#	($ &&	(. %	. %	$%"#&
	" "			*($++ $+ *( ) ++	

. ' & ("% !
($ &&.$%
. ' & ("% !
"%&. $ & &#
. ' & ("% !
'" &&"#&

- % #& % && # " $			-	(	-	(
				! .		! .

! # $ & &#

- % #& % && # " $	$ #	$%& $ #	$ '#
	! ! !		

*"! #

. # $$' '(" ! . &$$+) %&) . &%+' (' %&) . &%' $&.

$%&

. & . '. &"' &). % "#&

	!		

. ' & ("% !
$%# $ & &#

- % #& % && # " $	$ '#	($ &&	+. $	. %
			*) ++ - $, ++ - $, ++ - $' $+ -	$+ $$ $+ $

. ' & ("% !
$ % #& $ # & &#

- % #& % && # " $	! "#&%"' # & &#	$%&& #	+$ $'. $ # # &	($ &&	+. $	. %
					*' -) &(++ - $+ -) ++ - $( ) -) + - $ ((+ - (%+ - & - $+ -	$) $ (& (% $%

+"! #

. # $$' '(" ! . &$$+) %&) . &%+' (' %&) . &%' $&.

$%&

. &.'. &"'&). %"#&

. ' & ("% !

" " "

#&# &&

. ' & ("% !

.% &# &&

. ' & ("% !

%&&'#& %& &

. ' & ("% !

($ &&$%

. ' & ("% !

"%&. $ &&

. ' & ("% !

'" &&"#&

- % #& % && # " $			-	(	-	(
				! .		! .

! # $ &&

. ' & ("% !

$%# $ &&

. ' & ("% !

$ % #&$# &&

. ' & ("% !

.'. &"'&). %"#&

&&! !

&& (#'#&

"#& $ # &&

- % #& % && # " $	$ '#	($ &&	. %
	")+*(++++ - ")+(+*&++ (&*++ -	!	,& (%
	)+$+(* -	*(	(%
	)+$++++++ - ! " +. $(- ! " $++ -		,& *$ %

. ' & ("% !

-$%&#& $ $ % " &&

. ' & ("% !

" " "

"#& $ # &&

. ' & ("% !

-$%&#& $ $ % " &&

. ' & ("% !

#$%' $%$ $))$ # !

, "! #

. # $$' '(' ! . &$$+) %@) . &%+' (' %@) . &%' $&

$%&

+& . "' . ' &$%#&

" #& & . "'

+& . "' , . ' $& " . %" $ && " '&" '$% & "' "#& "' ' " . "' '" " % '"#&

$)$%# ($ #& + +(" ($ #& - ((- ( ). %' && "' , " '& &). %"#& " %#$ #& .)$ ' . *$$

%. %#&). %"#&

$ '"# % &). %"#&	$%	- % $% , & " $	'" $	-
+ '" &&"#&	! .			
+ '"	! .			

$ '"#. %&). %"#&

&& (#'#&

('" &&"#&

($ $%' % '"#& (" $ #- "%&' $ $ #& !

&& (#'#& & $ # % (

($ #/$ $'* , " "%. #' $!

($ $%$ * '" & " . #&&"#& !

(, " "%. , $ &"'

(! (+(&#& #& , $ &"' & $ # % , " "% & $ #&&"#&

'$" "#%% #

'$" && #($ #& !
" "%. &&
- . " #' # -

'$" && #($ #& !
'" (#' $

'$" && #($ #& !
'" (#' $

+ &# , $ &"' !
- %$ %. % , $ &"'

+ &# , $ &"' !
$ #&' , $ &"'

- "! #

. # $$' '(' ! . &$$+) %@) . &%+' (' %@) . &%' $&

$%&

$ '"#. % &). % "#&

(#'#& %& '"#&

! " " , $## !

$.% !

$ $%$* !

- $ *' " & !

&& (#'#& & $ # %

(

" " "

! (" " " !

" " & '&#

" " & - !

- . & #' $!

" " " & $ # %

, & % #, " $$ '" &$& & " .% " $ &# #, $, " "% %&$%& .) # $. #%"'$ - % # $ '"#&
" # $! (+ (. # & "" # $ &). % "#& %& &$& * # $. #%"'$ - % # $ '"#&

#$%"#& "' %& '"#&

#$%"#& "' '&#

#%'& & $ # % (!

, &" & $ # % (!

" " & $ # % !

. %" & $ # % !

$ $"'" $ # % .) , $ &"' . !

- , && & $ & $ # % - (!

#, $%&). % "#&

" $' %& &$ $ # " " " ! ! ! . ! !

" " " " ! # " ! !

" "%. ! "#$%&'

). % "#& (* #$ (

$"'#

'" " &&#

- * & "' , " "%

, $ # $%& % . &'$). % $#$% & & # $ - - . $). %# & "#$%&'

"#& "' &$$ - %#$ #&

. &#& (

'" " &&#

$"'# #' &&# $" #& &#

($ &'

+"#$.) %& #&

+"#$.) & $ $+-*' -* +$$.

+"#$.) % & & $ $+-$$-* +$$.

$%& $.+$

- % "% *

&"#$ &). % "#& #, "#, " , " $)% % & '* & $ $%&

#& $ # %" $%

. '! #

. # $$' %$) . &%+' (' . .

. '(' ! . &$$+) %$) . &%' $&

$%&

$%&). % "#&

. # $ $ # .) . % . '$ $ # , $ &). % "#& . # & $. $%& & " %#$. $ $% $& $%# $ " . $ " $
'&% . % * .) & & &%& " $ " * '& &&# . "# . $ $%. %# $ " % * . % . '$#$ $.) # $
&). % "#& . # & $. $%&
& "' $#$% & "#& .) &# &&# .) " * "#$%& & # $. '$ % . & &&# .) # $ $% " "#$%& " * % $ #
. " "% " , , $ $ & " #& '# . , $%# & , " "% "% $ %& $, $%& $ " . #
"% #$ # "##, $ $ "% # $. '* , " "% # "#$ & #

! #'! #

. # $$' %$) . &%+' (' . .

. '(' ! . &$$+) %$) . &%' $&

Thermo SCIENTIFIC

C#?0(+/(=>%? +(@&>%0(AB% "/'B
The world leader in serving science

! "#$%&' '() " *$#+(, "#' () - $$#

! " #$%(&') %&"+, (- . .//%0

78(. %012#("30(2/ 4 9" 3+(&0$3#&&2" #& 3

. %012#(3"4 $	:	! " #$%(&') %&"+, (- . .//%0	
) 199'&%	:	=>%? +(@&>%0(AB% "/'B C'%0E%(- '+"%E>, +D-) E C9F 9(- +G)11H I +EJ/+0<KL (31185 M.'"%<(A"#"% 2159%G2$%HCH(+0 2889?HC97H47	
! "31"'2#1 %%	:	=>%? +(@&>%0(AB% "/'B C'%0E%(- '+"%E>, +D-) E C9F 9(- +G)11H I +EJ/+0<KL (31185 M.'"%<(A"#"% 2159%G2$%HCH(+0 2889?HC97H47	
5 / 0$	:	1234442	
!) ,) (O		2725	
6"'&0"#& 3(0"#&	:	56\6@8149	
. %&1#(0"#&		5676@8149	
; $<9 / 3<&<'$(3"4 $		! A&A(AP%E#D&	
		5>?! @?5: ABB8CDCEFEBB GH(@ I. ?(H) : JEF8<DJ9FAAJ	! "#&%&'(1<$< : $"$%## (# $(&0<#%2#& 3 =/ / L'$#"/ %@%9S%'30 &#&30$0(1<$8(G# $%%&$N 2/ 3# 2#(<199'&%@/ %<9$2&&2 "99'&2" #& 3<8
. %012#(#+9$	:	:';. .'<9	

D8(> " P' %0<(&0$3#&&2" #& 3

?4 $%&32+/ TS%&M		
. -+<&2"'(<# #&	:	:';. .'<9
5/'/ %	:	U+9-D7%$9(UD#09
G0/ %	:	F<+D7%$9
>"P' %(<# #&4 $3#<	:	" F =(QTCQU=Q&(=F(CI F &MUQ(AIV" L@JUW =(W&XQI AQ(YQW =Y(Q@@QU=A(Z YQ" =YQ(I QUF! ! Q" &Q&(L" A=I MU=LF" A(@F I (MAQ(W Q(@F : : FZ Q&9
G) >R9-5) (<# #1 <	:	Z >'D(%">'$(? #"%0#!D$(, +"(B+, $'<%0?#<(>#$#0<+. $((E("><9%F AYWY#$#0<(U+? ? . , 'B#"+, A'#, <#0<(\4NU@ (1N1891488]K"><'$(! A&A(B+, '#', $(^#D#[D%', /+0? #"+, (B0"B#!0?+("><9% $#/%><#, <D) (#, <(P0+P"%(. $'%+/("><9"F0+<. B'9=>'$(! A&A(S>+. B<([%(0(#', %<(#, < #^#"B#[D%/+0(%? PB-EP&8&(#, <(+">%(. $'%$(+/("><9"F0+<. B'9
; / 1#&<(/ "($3#%	:	&%0? #!(B+, "#B'9(QE"%(B+, "#B'9[L >#B"+, 9[L) %"+, 9
/ #&3#&"('"21#&(- $"'# ($**$2#<			
I3-"'"#& 3	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
I3Q&<#& 3	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
) L&	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
? +$<	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
/ #&3#&"(2- %3 &(- $"'# ($**$2#<			
5- %3&2($**$2#<	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
5"%&8/ Q&3 &&#+	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
! 1#' Q&3 &&#+	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9

$ %&) (* +) ' -+ / (0 122) 3

D8(> " P' %0<(&0$3#&&2" #& 3

@$%# Q&3 2&#+	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
, T' / 94 $3#"($**$2#<	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9
Y$'%&&#+($**$2#<	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0"B#!D>#'S#0<$9

GT$'%$U9/ <1%$(<&Q3<S<+4 9# 4 <

I3-"'"#& 3	:	" +($F'%&/'E(<#"#9
I3Q&<#& 3	:	" +($F'%&/'E(<#"#9
) L&	:	" +($F'%&/'E(<#"#9
? +$<	:	" +($F'%&/'E(<#"#9
! $0 &"'(2/ 30 &&& 3<	:	" +, %J, +R, 9
"QQ'%T" #&0(=+(/ T$'% $U9/ <1%		

) $$(# U&2/ ' / Q&"'(&*/ %4 "#& 3(\/ $2#& 3(77W

F8(5 / 4 9/ <&&& 3 $&&*/ %4 " #& 3(/ 3(&&Q'%$0&$3#<

@ $'%(" %(3/ (&&Q'%$0&$3#<(9 %<$3#M- &- NM\$# &&(# $(21'%&3#L3/ M'$0Q&(// "(#. $(<199'&%'&3 0(&&(# $(2/ 32$3#%#& 3< "99'&2" = $\(" %(2" "<<&&$0(" <(- "P' %0/ 1<(## (/ %## $(($3T&& 34 $3#("30(- $3 2$(%Z1&&&(%&9/ '%&&Q(&&(# &(<$2#& 38

C8(Y&/&#(" &0(4 $" <1%$<

? +$(2/ 3# 2#	:	U>%EJ/(+Q(#, <(0%? +^%(#, E(B+, "#B'(D% $%$9((L? ? %<'#"%&E/(D$>(%E%&(R'">(F(D% 'E+/(R#"%0 /+Q(#"'(D#$'(15(? ', . "%$(+EB#$'+, #(]E(D"",) (">%. FP%Q(#, <(D\R%Q(%E"/Q<$9((V %(? %<'B#D #"%" "+, (/(\$E? P'+? $(+EB 09
) L&(2/ 3# 2#	:	L (B#$%(+/(B+, "#B'(K? ? %<'#"%&E/(D$>(&J', (R'">(F(D% 'E+/(R#"%0(/+Q(#"'(D#$'(15(? ', . "% R>'D%0(? +^',) (B+, "#' ', #"%<(EB">',) (#, <(S>+%$9((Z #$>(EB">',) ([%+0(%0% $%9((UD#, $>+%&(">+0+.) >(]E[%+0(%0% $%9((V %(? %<'B#D#"%" "+, (/(\$E? P'+? $(+EB 09
I3- "'"#& 3	:	! +^%(%(P+$%<(P%&$+, (*+(/0%&>(#(%9((U(, +"[[0%#">',) K'/([0%#">',) ($('00%) . B#Q(+Q'(/ 0%&P 0#"+Q(E(#0%&'(+EB 0&K(P0+^'<(%#0"/ B#]0%&P0#"+, (+Q(+QE, % ([E('0#", %<(P%&+, . %9 : ++$%(*) >"(EB">',) ($. B>(#$(#(B+D#0K(*%([%Q(+0(R#'$"[#, <9((V %(? %<'B#D#"%" "+, (/ $\E? P'+? $(+EB 09
I3Q&<#& 3	:	Z #$>(+. '(? +. ">(R'">(R#"%&9((&+(, +"(', <. B%(^ +? '",) (. , B&$(<'0%&%<('+(<+(S+([E(? %<'B#D P%&+, . %&(" %%&) ^%(#, E>',) ([E(? +. ">("+(#, (. , B+, $B+. $(P%&+, 9((V %(? %<'B#D #"%" "+, (/(\$E? P'+? $(+EB 09
. %#&2#& 3(/ "(*&#K' &0$%	:	" +(#B"+, (S>#]0[%("#J% (', ^ +B',) (#, E[P%&+, #]0$J(+Q(R'">+. "($. '"#[D%('0#", ',) 9
[/ #&<(# (9- +<&2&3	:	" +($F'%&/'E("0%#"? % "9(=0%#"($E? P'+? #"B#]0E9((U +, "#B'(P+'$+, ("0%#"? % "($P%&B#]0$* '? ? %<'#"%E&"/(E#0) %, . #, *"%(>#^%([%%,) %"%<(+Q', >#]0<9

K8(Y&/&$X&Q- #&&Q(4 $" <1%$<

Y"'"4 4 "=&&#+(/ "(# $(9%012# ?(U&&Q(1&<- &Q(4 $0&	:	L (#(/'0%+Q'(/(>%#"%<K(#(P0%&$. 0%(, E0"#$%(R'(]0+E&0(#, <(">%(E+, "#', %(? #E([. 0$"9
) 1&#'=$	:	M$%(#, (%&',) . '$>',) (#) % "($. "#[D%(+Q(">%($. 00+. , <,) (/'0%9
[/ #(<1&#'=$	:	" +, %J, +R, 9
) 9$2&"($U9/ <1%(- "P' %<(	:	C0+? P'(B(' $+B#"%">%($E%(%[E(0%? +^',) (#]0[P%&$+, $(/0+? (">%(\'B, "'E+/(">%', B<% "(/ ">%0%($(#(/'0%9((" +(#B"+, (S>#]0[%("#J% (', ^ +B',) (#, E[P%&$+, #]0$J(+Q(R'">+. "($. '"#[D% "0#", ',) 9
>"P' %/ 1<(## $%& "' 0$2/ 4 9/ <&&& 3(9 %012#<=	:	" +($F'%&/'E(<#"#9
) 9$2&"(9%#&2#&'$ $Z1&4 $3#"/ %(8&&X'&Q- #&%%	:	@(0%/') >"%&($>+. B<(R'#0(##PP0+P0#"%(P0+"%E^^%%. '?? % '(#, <($%0 B+, "#', %<([0%#">',) ##F"#F0#". $(\AU- V\((R'">(#(/. 0]0'##B%(P "%E%(+P"%0#"%<(', (P+$" ^^%(P0%&$. 0%(? +<%0

$ %&) (* +) ' -+ / (0 122) 3

\ 8{R22&0$3# '(%$' $" <$(4 $" <1 %$<

. $%/ 3"' (9%2" 1#& 3<

: " +(#B"+, (>=#[[%'#J% (', ^ +-B',) (#, E[P%6$+, #[[0$J(+0[R'">+. *($, "#[[%{%0#', ',) 9 Q^#B #"%($. 00+. , <',) (#0%#$9(' %6P(. , , %#&$#OE#, <(' , P0+*%6#%<(P%6$+, . %(/0+? %, "%0,) 9(&+(, +"(*+. B>(+0R#D(">0+.) >'SP'D%<(? #"%0#B(C. *(+, (#FP0+P0#"%(P%6$+, #D P0+*%6^ %(%. ' P? % *(\$%6A%6"+, (2]9

? 3T8&34 $3#' (9%2" 1#& 3<

: V\#+'<(<'$P%6$#D+/(SP'D%<(? #"%0#B#, <(0 . +//(#, <(B+, *#B(R'">(S+'[0R#*%0R#E$K(<0#', $ #, <(S%R%6$9(L /+0? (">%(0%0#, *(#, ">+0"%6(/(">%#P0+<. B"(>#$(E#. $%<(% ^ 0+, ? % *#D P+D[0"+, (\S%R%6$K(R#*%0R#E$\$+'D+0(#'0]9

[$# / 0<(*/ %2'$" 3&0Q19

) 4 "'' (<9 &

: A*+P(D%#J(/(R'">+. *(0$J 9(! +^%(B+, *#', %6$(/0+? (SP'D0#*0#9(&'D *%(R'">(R#*%0#, <(? +P(. P '/(R#*%0$+D [D%((V0%0 #^+^%0B(+0'(/(R#*%0', $+D [D%(#[$+0((R'">(#, (, ^0(' <(E? #*%0#D#, < P#B#'(, (#, (#FP0+P0#*%(R#$*%<'SP+$#(E#, *#', %0$((&'$P+$%+/(^'#(#(E#% $%<(R#$*% <'SP+$#(E#, *(#B+09

] " %6$(<9 &

: A*+P(D%#J(/(R'">+. *(0$J 9(! +^%(B+, *#', %6$(/0+? (SP'D0#*0#9(C0%% *(% *(E", *+(\$%R%6$K, R#*%0(E#. 0$%6$(# #$%? % *$(+0(B+, /', %<(#(0*#$%9(Z #$>(SP'E#) %6(', *+(#, (%'D % *(*0(#*? % * P#B#, *[+0([P0+E#8<(#$(/+0(#R$9((U+, *#', (#, <(B+0(B(R'(SP'E#) %(R'">(, +, B+? [. $*[D%K #[$+0[% *(? #*%0#0(%9 9$#, <(*(#0*0>K(*0? 'B D*%(+0(<'#*+? #E%#. $(%'#0>(#, <(P#B#E%', B+, *#', %0(/+0(<'$P+$#(0#E#+0<',) (*+(0+E#*0(0%) . B#*+, $(\$%6($%6'+, (17]9(&'$P+$%(+/(^'#(# 0E#% $%<(R#$*%<'SP+$#(0B+, *(#B+0(((" +*%($%6($%6'+, (1(/+0(*0 %) % EE(B+, *#B' ', /+0? #*+, (#, <(\$%6'+, (17(/+0(R#$%(<'SP+$#(0

J8{>" '30' &8Q(" 30 (<# %Q$

>" 30' &8Q

: C. *(+, (#FP0+P0#*%(P%6$+, #[0P0+*%6#*^%% . 'P? % *(\$%6(A%6'+, (2]9(Q#*,) K<0, J',) (#, < S? +J',) ($>+. B>([%(P0+>'['*%<(', (#0%#$(R>%0%6$>'S(? #*%0#0[S(>#, <(S(#, </(#B%[%+0%%*,) K<0, J',) (#, <(S? +J',) 9 I %9 +^%(B+, *#? ', #*%<(EB>",) (#, <(P0+*%6#*^%% . 'P? % *([%+0%% *%0,) (%#*,) (#0%#$9

) # %Q$

: A*+0%[%R%% (">%/+(0B'R',) (*%? P*%0#*. 0%$a(4 (*+(2bU,(\75$(*+(C8$Cb[0%9(A*+0%', #EB+0<#, E%(R'">(D+E#[0D%. *B#"+, $9((A*+0%', (+0) ', #(D+, *#', %(P0+*%6*%</0+? (<0%6" $. _D >*(', (#(<0E#B+#(0#, <(R%0D%. *B#"%<(#0%#(#R#E(/0+? (', B+? P#*[D%? #*%0#B(\$%% $*%6"+, (18](#, <(/++<(#, <(<0 , J$(' %6P(B+, *#', %(") >*0EED$%<(#, <(S%#B%<(. , *0D%#<E(/+0 . $%(U+, *#', %$(">*#^%(%% (+P%%(?. $*([%E#0%. 0D%%#B%<(#, <(J%P(. P0) >(*+ P0%% *([B#J#) %(&+(, +*(S*+0%', (. B#[%8<(B+, *#', %6$((M$%#FP0+P0#*%(B+, *#', ? % *(*+ #^+'<(% ^0+, ? % *#(E+, *#? ', #*+, 9

A8{? U9/ <1 %$(2/ 3#%' <$9 $%/ 3"' (9% #$2#& 3

5" 3" 0"

G2219" #& 3"' ($U9/ <1 %{ & &<

" +(%G#+$. 0%D? *(*+#D%J, +R, 9

5/ 3<1'#(/ 2"' (" 1# / %&$<(*/ % 22$9#' ='$($U9/ <1 %{ & &<8

; $2/ 4 4 $30$0(4 / 3& #Q Q 9%2$01%<

: L/(">'$(P0+<. B*([B+, *#', $(',) 0%<'% *$(R'">(%G#+$. 0%D? '*SH(P%6$+, #[0R+0J F0#EP%#"? +$P>%0% +0['+B) 'B#0[? +, *+0,) (? #E[[%0%. '0%<(*+(<%%0' , %">%%/%E*^% %$(+/(">%* %, "B#" +, +0(+">%0[B+, *0+0? *#$. 0%&(#, <G+0(">%, %E%$S *E(*+(. $%(0%$P 0#*+0E[P0+*%E*^%% . 'P? % *9

? 3Q8S%8Q(4 $" <1 %<

: " +(SP%B#[0 % *B#"+, (0% . '0%? % *$9(V ++<() % %#[0 % *B#"+, ($>+. B>([[%$. /'[*(+ B+, *0+0R+0J %Q%#+$. 0%*+(#"([+0 %B+, *#? ', #, *$9(L/(">'$(P0+<. B*(B+, *#', $(',) 0%<'% $ R'">(%G#+$. 0%D? *$(, $%P0+B%$S(% EB>$. 0%$(B+B#0%&>#. $(*(% *B#"+, (+0+">%0 %) ', %0,) (B+, *0+B(*+(J %$(R+0J %Q%*+$. 0%[%B+R(#, E(0%$B+? ? % <%(+0(S"#". *+0E D? '*$9

> +Q3(4 $" <1 %<

: Z #$>(>#, <$H(+0%#0? $(#, <(/#EP%">+0+.) >0B#/'%Q>#, <(0) (B>%? B#0[P0+<. B'$H[%+0% %#",) K(S? +J',) (#, <(. $',) (">%B#*#+0E(#, <(#"(">%% <(+/(">%(R+0J',) (P%0+<9((\FP0+P0#*% *%B>, ', . %($>+. B>([%, $%(*+(0%? +*%P+*% "#0B(B+, *#? ', #*%<(EB>",) 9(Z #$> B+, *#? ', #*%<(EB>",) ([%+0%0% $',) 9(Q, $. 0%(">#*(%E%R#$>($'#*+, $(#, <(S#/%E($>+R%$ #0%(EB$%*+(">%(R+0J $'#"+, (D-B#"+, 9

. $%/ 3"' (9%#&2#& 3

: '/%AB'% B%(*$*#B>((((((((CF(- +G11H(((((((((((((((((+BJ/+0<%L ((((\215)\N82_8HOH((((((RRR9>%0? +$B+? C*%B%(- '+*%B>, +G) E(L B9((((7HOH' (*0<'#, (! +#<((((((((\31185((((((((\215)\N82_H713(@G

$ %&) (* +) ' -+ / (0 122) 3

A8{? U9/ <1 %$(2/ 3#%' <$9 $%/ 3"' (9% #$2#& 3

; $<9&%# %

: M$%(#(P0+P0Q((/ *"%<(#'0 P. 0/E,) (+0(#' 0./%<(0%&P0(#*+0(B+? P((E,) (R'">(#, (#FP0+^%< $'#, <#0<('/(#(0$J(#$$%&$? % *(', <'B#*%(">'$('(, %B#&$#OE$((I %&P 0#*+0($%B&'+, (? . $*[[%#$%<(+, (J, +R, (+(0#, "B(P#*%<(%E'+$. 0%(B>%&$(#(">%>#$#0<$(+/(">%(P0+<. B'(#, <(">%(#/% R+0J',) (D' "$(+/(">$%B&'%<(0%&P 0#*+09

>" 30<

: U>%? 'B#D0%&'$'#, *(K? P*0(*^+. $() B^%&(B+? P((E,) (R'">(#, (#FP0+^%<($'#, <#0<($>+. B>([% R+0 (#'(#0(? %&(R>% (>#, <D) (B>%? 'B#0[P0+<. B'$('(/(#(0$J(#$$%&$? % *(', <'B#*%(">'$('(, %B#&$#OE9

? +$<

: A#/?%E[%B#R%#0(B+? P((E,) (R'">(#, (#FP0+^%<($'#, <#0<($>+. B>([% $%<(R>% (#(0$J #$$%&$? % *(', <'B#*%(">'$('(, %B#&$#OE*(#^+'<(%G#+$. 0%(*+(D . '<(SP#B#$>%G#? 'S'$(+0 <. $'$9

) L&

: C%6$+, #[0P0+*%6*^%% . 'P? % *(+0(">%[+<E($>+. B>([%($%B&'%<([#$%<(+, (">%(*#$J([%,) P%0+0? %(#, <(">%0$J $(', ^ +B%<(#, <(S>+. B>([%(#FP0+^%<([E(#(SP%B#*E$*([%+0%(#, <D) ">'$(P0+<. B'9

? 3T8&34 $3#' ($U9/ <1 %$ 2/ 3#%' <

: Q? 'S$'+. $(/0+? (^%*(B*+, (+0(R+0J (P0+B%&$(%. 'P? % *($>+. B>([%([%(B>%E0J%<(*+(% $. 0%(">%E B+? P((E(R'">(">%(0%. '0% *$(+/(% ^0+, ? % *(#(P0+*%6*+, (D% $(B*+, $(L ($+? %(E#$*%6K /. ? %$(E0. [[%($%(">D%&$(+0(%) ', %0,) (? +<'/(B*+, $(*(+(">%(P0+B%&$(% . 'P? % *(R'(D[% , %E?&$#(E*(+(0%<. B%(%? 'S$'+, $(*(+(#EB%(P*#[D%(D9 %0&9

E8{. - +<&2"' (" 30 (2- $4 &2"' (9% 9$%#&$<

. - +<&2"' (<#' #&

: :', . '<9

5/ '/ %

: U+B+D%$$9(UD%#09

G0/ %

: F <+D%$9

9>

: H82(*+(29#

. &<9$%&=&&#+(9% 9$%&$<

: &'$P%&$ [D%(, (">%/+(0B'R',) (? #*%0#B(B+B+D((R#*%0(#, <(>+*(R#*%09

) / '1=&&#+

: A+D[D%(, (">%/+(0B'R',) (? #*%0#B(B+D((R#*%0(#, <(>+*(R#*%09

7B8( ) #' =&&#+(" 30 (%$" 2#&T&#+

5 - $4 &2"' (<#' =&&#+

: =>%([P0+<. B*(S(S"#[D%9

5/ 30 &8& 3<(# (" T/ &)

: " +(SP%B/'B(<#'*#9

I32/ 4 9" #&=$(4 " #5%&' <

: " +(SP%B/'B(<#'*#9

>" P' %/ 1<(0$2/ 4 9/ <&8& 3 9%012#<

: M, <%(, +0? #(B+, <'*+, S(+/(S"+0#) %#, <(. $%(>#$#0<+. S(<%B+? P+$"*+, (P0+<. B'$(S(>+. D< , +"([%([P0+<. B'%<9

. / <<&=&&#+(/ *(- " P' %/ 1< %" 2#&(3<

: M, <%(, +0? #(B+, <'*+, S(+/(S"+0#) %#, <(. $%(>#$#0<+. S(0%#B"+, S(R'(D, +"(+(EB 09

778(@ U&2/ ' / Q&2" '(&8*/ %4 " #&(3

H3,8&0() #' #5<

R21#5(#' U&2&#+

: =+(">%([%$'(+/(+. (U, +R(D%<) %(">%(*+GB+D+) 'B#([P0+P%0"%&(+/(">'$(P0+<. B'(>#^%(+"([%% *>+0+.) >(B#[, ^%$*") #*%<9

5 - % 3&2(#' U&2&#+

: " +*(#^#'B#([D%9

I%&#' #& 3$ / %<& 3

: " +*(#^#'B#([D%9

) $3<&8&$%

: " +*(#^#'B#([D%9

5" %2&8/ Q&3 2&#+

: " +*(#^#'B#([D%9

: '/%AB'% B%(*$*#B>((((((((CF(- +G11H(((((((((((((((((+BJ/+0<%L ((((\215)\N82_8HOH((((((RRR9>%0? +$B+? C*%B%(- '+*%B>, +G) E(L B9((((7HOH' (*0<'#, (! +#<((((((((\31185((((((((\215)\N82_H713(@G

$ %&) (* +) ' -+ / (0 122) 3

778(@ U&2/ ' / Q&2" " '(&*/ %4 " "#&\ 3

5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
@$%# Q&3&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
; $9%012#&T$(## U&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
5 " 3 " 0 "
R21#&(## U&2&+
5 / 32'1<&\3$ 14 4 "% : =+(">%[%$'(+/(+. (U , +R(D%<) %(C>%("+GB+B) 'B#'[D*0+P%0"%(+//(">'$(P0+<. B'(>#^% +"([%% *>+0+.) >(D[', ^%$") #"%<9
5 - % 3&(## U&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
!%&#' #&\ 3$ / %% <&\3
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
) $3<&#&$%
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
5 " %&(# / Q&3&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
! _1# Q&3&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
@$%# Q&3&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
; $9%012#&T$(## U&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90

7D8(? 2/ ' / Q&2" " '(&*/ %4 " "#&\ 3

? 2 / # U&2&+ : " +(J, +R, ($) , '/'B#, "(%/%B'$(+0([E0"B#[D>#$#0<$9
H3&$0() #'#$<
RZ 1" #&2($2/ # U&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
. $%&<#$32$%$Q%0" = &&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
5 " 3 " 0 "
RZ 1" #&2($2/ # U&2&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
. $%&<#$32$%$Q%0" = &&+
5 / 32'1<&\3$ 14 4 "% : " +"(#^#'B#[D90
G# $"% 0 T$%$($""$2#< : " +(J, +R, ($) , '/'B#, "(%/%B'$(+0([E0"B#[D>#$#0<$9

7F8(, &<9 / <" " '(2 / 3 <&0$ %#&\ 3 <

^ " "<#$(0&<9 / <"' : =>%) % %B#"+, (+/(R#$"%($>+. B([%(#^+'<%<(+0(? ' , '? ' S%<(R>%D%è %Q(P+$$'[D9$((A') , '/'B#, * ; . , #, *"" %(+/(R#$"%(P0+<. B'((D%$<. %$($>+. B((, +"([%<'$P+$%<(+/(^ '#(">%/+. D$%R%Q[. * P0+B'%$%<(' , (#($. '"#[D%%/D % "(D%#"? % "(P B#, "9((&'$P+$%+/(($. 0FD$(#, <(, +, . 0%EEEB#[D% P0+<. B'$(^"#(#((DE% $%<(R#$"%<'$P+$#(D$+, "0#B'+0((&'$P+$#(D+/(">'$(P0+<. B'(K$+D "+, $ #, <(#, E([E.P0+<. B'$($>+. B((#"(D]"? %(B+? P(B(R">(">%D% . '0% % "$(+/(% ^'0+, ? % "#D P0+"%B'+, (#, <(R#$"%<'$P+$#(D]%'$B"+, (#, <(#, E(D%'+, #(D>B'#(D#. ">+0"E(D% . '0% % "$9 Z #$"%(F#EI#) ' ,) ($>+. B(([%D%EEEED%<$((L B, %(#"+, (+0(B#, </"(D]$>+. B((+, B([[%B+, $'<%D%< R>% (D%EEED) ('$(, +'(/%#'$[D9((=>'$(? #"%D#(B#, <('"$(B+, "#", %Q? . $"([%<'$P+$%<(+/(', (# $#/%(R#E((Q? P"E(B+, "#", %$(+0(D %$(? #E(D%#', ($+? %(P0+<. B'(D%'<. %$((V# +'<(<'$P%$#D +/($P(D]%<(? #"%D#(B#, <(0 , +//(#, <(B+, "#B'(R' ">($+'B(R#"%QR#E$K<0#', $(#, <('$%R%$9

KF'DE7D8 7"#

: '%AB'% B'%('%$"#B>((((((((CF(- +G11H(((((((((((((((((+BJ/+0<%L ((((215)(N82_8HCH((((((RRR9>%? +$B+? C'%B'%(- '+"%B>, +G) E(L B9((((7HCH(' $(%D<'#, ((+#=<((((((((G1185((((((((215)(N82_H713(@$G

$ %&) (* +) ' -+ / (0 122) 3

7F8(, &<9 / <" " '(2 / 3 <&0$ %#&\ 3 <

, &<9 / <" '(<- / 1 '0(=$(&$("22 / %" "32$(M&+ ("99 '&" "='$(%Q&\3" 'N3" "#&\ 3" '("30(/ 2" '(" "M<("30(%Q1' " "#&\ 3 <8
; $"$%(# () $2#&\ 3(J: (>R[_] I[_ (R[, () @G; R_ ?("30() $2#&\ 3(A:(?` . G) H; ?(5 G[@ G]) S ?;) G[R] (. ; G@? 5 @G[*/ %' 0 0 &&\ 3 "'(- " 30 '&0Q(&3 */ %4 " "#&\ 3("30(9 %#%2#&\ 3(/ */(%$4 9 '/ +$$<8

7C8(@% 3 <9 / %#(&*/ %4 " "#&\ 3

; $Q1' " # % &*/ % " "#&\ 3	H[(314 =$%	. %9$%(<- &9 9 &Q 3" 4 $	5 ' " <<$<	. _ a
. G@(5 ' " <<&&2" #&\ 3	" +" 0%) . B#"%<9	–	–	–
IR@RX _ ; (5 ' " <<	" +" 0%) . B#"%<9	–	–	–

CV c(a(C#EJI',) () 0+. P

7K8(; $Q1' " # %(&*/ %4 " "#&\ 3

H3&$0() #'#$<
>5) (5 ' " <<&&2" #&\ 3 : " +"(0%) . B#"%<9
H8) 0(Y0%' (%$Q1' " #&\ 3 < : @ 5 R(AV'\WH; (?U$4 9#$ " "%$&' ($U$4 9#&\ 3 a(" +"(<%$%0' , %< H3&$0() #'#$<(&3T$3# %4(\@ 5 R(A=\W\WE+? P+, % "$(#0%(D$"%<(+0(%&3@ P"%<9
) R; R((FEDSFBCS77F7D($U#%$4 $'+(- " P' %) / 1 <(<1=<#' 32$<a(" +(P0+<. B'$(R%0%)/+. , <9
) R; R((FEDSFBC($4 $%&$32+(9' " 33&Q(" 30(3/ #&&2" #&\ 3a(" +(P0+<. B'$(R%0%)/+. , <9
) R; R((FEDSFBCS77F7D(- " P' %) / 1 <(2- $4 &2" ' <a(" +(P0+<. B'$(R%0%)/+. , <9
) R; R(F77$F7D(!) ,) (0&#%&=1#&\ 3(X(2- $4 &2" ' (&3T$3# %4)(X(- " P' %((&0 $3#&&2" #&\ 3a(" + P0+<. B'$(R%0%)/+. , <9

5 '$" 3(R&(R2#(() $2#&\ 3 77D\#\W" P' %) / 1 <(R&% . / " 1# ' 3#<(\'\F R. <W : " +"(D$"%<
5 '$" 3(R&(R2#() $2#&\ 3(\ BD 5 " " <<(I() 1=<# ' 32$< : " +"(D$"%<
5 '$" 3(R&(R2#() $2#&\ 3(\ BD 5 " " <<(II() 1=<# ' 32$< : " +"(D$"%<
. ?R(] &#I(5 - $4 &2" " < V %21%)/ %(6 - $4 &2" " <W : " +"(D$"%<
. ?R(] &#II(5 - $4 &2" " < \'\P <<$3#&' (5 - $4 &2" " <W : " +"(D$"%<

) # #&(%$Q1' " #&\ 3 <
! " <<" 2- 1 <$## : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
[$M(b / % : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
[$M(c$%$+ : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
. $33<+'T" 3& : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
H3&$0() #'#$<(&3T$3# % \W(]E+? P+, % "$(#0%(D$"%<(+0(%&3@ P"%<9
\@ 5 R(A=W
5 " 3 " 0 "
^ >! I) (\5 " 3 " 0 " W : " +"(B+, "0+D]%<(. , <%(]Z Y! IA(\U#, #'<#]9
5 " 3 " 0 & 3 (&#< : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
5 ?. R(@ U&2((<1=<#' 32$< : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9

KF'DE7D8 8"#

: '%AB'% B'%('%$"#B>((((((((CF(- +G11H(((((((((((((((((+BJ/+0<%L ((((215)(N82_8HCH((((((RRR9>%? +$B+? C'%B'%(- '+"%B>, +G) E(L B9((((7HCH(' $(%D<'#, ((+#=<((((((((G1185((((((((215)(N82_H713(@$G

$ %&) (* +) ' -+ / (0 12) 3

7K8; $Q1'" # %+(&3 */ %4 " #& 3

5 " 3 " 0 " (&T$3# % : W[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9

@ &(9% 0 12#(- " <(=$$3(2' " <<&&0(&(" 22/ %" 32$(M& (# $(- " P' %(2%&%& (/ "(# $(5 / 3#%' '$0(. %0 12#<(; $Q1'" #& 3< " 30(# $(!) ,) (2/ 3# &<(" " (# $(&3 */ %4 " #& 3(%Z 1&&0(=+(# $(5 / 3#%' '$0(. %0 12#<(; $Q1'" #& 3<8

I3#5%" #& 3" ' (%$Q1'" #& 3<

I3#5%" #& 3" ' (&#< : R1<#%' &(&T$3# %(VRI5) VaW[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9
5 - &" (&T$3# %(V? 5) 5 VaW[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9
c" 9 " 3(&T$3# %aW[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9
d / %" (&T$3# %aW[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9
[$M(e$" ' " 30(I3T$3# %(/ "(5 - $4 &" ' <([el / 5 VaW[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9
. - &&9 &$<(&T$3# %(V I5 5) VaW[]B+? P+, % "$(#0%[D$"%<(+0[%C9? P"%<9

7\ &(G# $%(&3 */ %4 " #& 3

] " =$'(%Z 1&&4 $3#< : " F =(QTCQU=Q&(=F(CI F &MUQ(ALV" L@UW =(W&XQI AQ(YQW =Y(Q@@QU=A(Z YQ" =YQ(I QUF! ! Q" &Q&(L" A=I MU=LF " A(@F I (MAQ(VW Q(@F : : FZ Q&9

>" P" %/ 1<(! " #5%&' :
I3*/ %4 " #& 3() +<#4 (VHI) &R&W

@ $(21<# 4 $%&<(%$<9/ 3<&' $(*/ %0$#5%4 &&Q(# $(. . ?(2/ 0$(*/ %# &(4 " #5%&' 8

[" #& 3" ' (Y&&$(. %#52#& 3 :
R<</ 2&#& 3(VHI) &R&W

, " #5(/ "(9%&#&Q : KFDB7D8
, " #5(/ "(&<<1$: 5646/8149
, " #5(/ "(9%$T& 1<(&<<1$: " +(P0%'+. $(^#D<#"+, 9
6 $%&3 : 1
. %9" %0(=+ : ! A&A(AP%B#D$*

I30&2" #5<(&3 */ %4 " #& 3(#- " <(2- " 3Q$0(*%4 (9%$T& 1<'+(&<1$0(T$%&3 8

[/ #&2$(#(%$" 0$%

@ (# $(=$<#/ "(/ 1%&3/ M'$0Q$N# $(&3 */ %4 " #& 3(2/ 3#" &3$0(- $%$&(&(" 221%" #$>/ M$T$%3$# $%# $(" =/ T$X3" 4 $0 <199' &%3/ %(3+(/ "(&<(1=<&&%&<(N" <<14 $<(" 3+(' & =&&+(M- " #</ T%/ %# $(" 221%2+(/ %2/ 4 9' $#53$<</ "(# $ &3*/ %4 " #& 3(2/ 3#" &$0(- $%$&8
Y&" ' (0$#5%4 &" #& 3(/ "(<1#&" =&&+(/ "(" 3+(4 " #5%&' (&(# $(</ '$(%$<9/ 3<&=&&+(/ "(# $(1<$%R' (4 " #5%&' <(4 " +(9%$<$3# 13L3/ M3(- " P" %0<(" 30(<- / 1'0(=$(1<$0(M& (2" 1#& 3R' # / 1Q- (2$%#" &(- " P" %0<(" %$(0$<2%&=$0(- $%$&(M$(2" 33/ # Q1" %3#$$(# " #(# $<$(" %$(# $(/ 3'+(- " P" %0<(# " #(\$U&<#8

KFDB7D8 #"#

Thermo SCIENTIFIC

The world leader in serving science

! "#$%" (&) " *$#+& "#" &) - $$#

! " #$%& () * &) + (-) .

78& %012#&3 0&/ 4 9" 3+&0$3#*"2"#/ 3

. %012#&9"4 $	: ! " #$%& () * &) + (-) .		
) 199('$%	: ; <%=>) &'-$<%&. @% (-A@ B-%=@&C-) (%@.) + DE BfF 7&C) G&/ H I) @A = k&8&/ / 45 M -(% & (#(% 0/ 57M107H0H<H&, = 0447DHOf3H23	! "31*"2#1 %%	: ; <%=>) &'-$<%&. @% (-A@ B-%=@&C-) (%@.) + DE BfF 7&C) G&/ H I) @A = k&8&/ / 45 M -(% & (#(% 0/ 57M107H0H<H&, = 0447DHOf3H23
5 / 0$	: / 012234		
!) ,) &D	: 0301		
6"('0"#/ 3&0"#&	: 56&624/ 27		
. %3#&9"#&	: 56&624/ 27		
; $<9/ 3<=(5&9"4 $	: ! ' P' & * %@#+$(5 >?! @ ?5 : ABB8CDCEFFBB GH@ I . ?&!) : JEF8<DJ8FAAJ	! "#&%'(&1 <$<	: $"$%&' &# $&3<#%2#/ 3 =/ / L($#&' %&9%9$%& 30 '3#&30$0&1<$8&G# $%M' <$N 2/ 3#* 2#&<199('$%&/ %&<9$2'"2 "99('2"#/ 3<&8
. %012#&9+9$	: 8-9, -: 7		

D&&>"P' %0<&0$3#*"2"#/ 3

?4 $%&$32+& TS%'$M

. -+<'2" (&<# #&	: 8-9, -: 7
5 / (/ %	: U) + =#&$7
G0/ %	: F :) =#&$7
>"P' %8&<# #&4 $3#<	: UF" ; VL" ' & V; QI LV8& VW; & VX&JVM Q&VI YQ; &F I YV" &PVI VYQK&CV QP;&" V" LI V8&PV; V7
. %2" 1#/ 3" %&1 $" <1%<	: P) &) (&5=%#(<%&#") -&+=& -$(7&&P) &) (&#(I&. = J&+=&>) J%&' <% & $-. D&<-$&+ : , @7] #$<&<) + , D<-E&#A%&<#. : + D7
G) >R3-5) &<# #1 <	: ; <-$&> #(%=#&$&@. $- %% &<#F#=) , S&EE&<%&F' VW&V#F#= &J) > > , . -@(-) . & (#. : #= Z2N&J?! &JV 47 244[7
; / 1#&<& *&3#%	: P%=> #-&@. (#@K&P>&@. (#@7&. <##(-) . 7& D%(-) . 7
/ #&3#" (& 21#&& $" (#. &"*$2#<		
I3-"("#/ 3	: QG') $, =%&) & %@> *) $-(-) . & + : , @5&> #E3@, $%#&%#+(-&<#F#= 7& %=) , S&#W@5&> #E S%& %##E% &&,+ T - D&K3') $, =%7
I3Q5<#/ 3	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
) L'3	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
?+$<	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
/ #&3#" (&2- %3'2&$" (#. &"*$2#<		
5 - %3'2&"*$2#<	: U) . (#-. $& #(%=#-&<#(&> #E3@, $%&#=D%&, =D#. &#> #D%&$#$% &, . &#. > #-&,&#(#7	
5"%2'3/ Q5 3'2'#+	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7	

$ % ( ) & + - & , ./ -0 1

D&&>"P' %0<&0$3#*"2"#/ 3

! 1#' Q5 3'2'#+	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
@5%# Q5 3'2'#+	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
. $TS(/ 94 $3#'(&*"$2#<	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
YS%(#+&*"$2#<	: ") &! .) T . &-D. A@. (&#W@5&, =&@+(-@-&<#F#= $7
@ %Q5#& %Q' 3<	: U) . (#-. $& #(%=#-&<-@&> #E3@, $%&.#> #D%&) &<-%&) + T - D&) =D#. $_&-, @, $ > %> S+#. %@&J -. k&E%7

GT$%&U9/ <1%&<Q3<S<+4 9# 4 <

I3-"(" #/ 3	: ") &*" %@A@&#(#7
I3Q5<#/ 3	: ") &*" %@A@&#(#7
) L'3	: ") &*" %@A@&#(#7
?+$<	: ") &*" %@A@&#(#7
! $0'2" (&/ 30'#/ 3< "QQ%T"'#&0&-+&TS% $U9/ <1%	: B=%%G$(-. D&-$) = %&& \ ) +-. D&#. E&#=D%&) =D#. $&> %(-) . % & &<-$& ' P' &#$&%. D&#(=$J&> #E&S%&ED D#\#(% &&E&) \ %=%G) $, =%&) &<-$&+ : , @7

) $$&# U2/ (/ Q2" (&3*/ %& "#/ 3&/ $2#/ 3&7W

F8&5 / 4 9/ <'#/ 3S3*/ %& "#/ 3& 3&3Q?$0'$3#<

H3'#&0&#'#&<

Z"4 $	5R) &14 =$%	[
%<E=% %$<$Z) QEP%<E=% % -(=+ [(%=#Z#@&+@#@ [	1HO2^5	/ 4&&24

5"3"0"

Z"4 $	5R) &14 =$%	[
%<E=% %$<$Z) QEP%<E=% % -(=+ [(%=#Z#@&+@#@ [	1HO2^5	/ 4&&24

@ $%&%&$ / &00'#/ 3" (&3Q?$0'$3#<$%<$3#&M- '2- N&M# '3& $&21%&3#&3 / M($0Q5&& *&# $&<199('$%&30&3&# $ 2/ 32$3#%&# / 3<&99('2" =($N&%&2(" <<*"$0&<&" P' %/ 1<&# & $"(# & %&# $&3T'%34 $3#&30& 32&&\ 1'%&&9/ %#3Q&3 # '<&$2#/ 38

C8&Y'%#&'0&4 $" <1%$<

?+$&2/ 3# 2#	: U<%@3&\-&#. : &%>) \ %&#. E&@. (#@&% $%7&> > % #(%E&+ $<&E%&T -(<&-% (E&\ A&T #(%= A)=&#(&#$(&5&- . , (%&+&@#$-) . #-E&M-. D&<%&. * * %&#. : &+T %&&E%+ $7&Y %&- % -@+ #((%(-) . &> > % #(%E7
) L'3&2/ 3# 2#	: L &@#$%&.A&@. (#@&> > % -#(%E&+ $<&J-. &T-(<&-% (E&\ A&T #(%&) -&+(&#$(&5&- . (% T <-%&%>) \ - D&@. (#> - #(% &@) (<-. D&#. : &<) %7&. #$<&@ (<-. D&%A) =%&% $%&J-%#. $<) %&<) + , D<-E&$%A) =%&% $%&Y %&- % -@+&#((% (-) . &> > % #(%E7
I3-"("#/ 3	: !) \ %&G') $% & %&) . &) &%%<&#=7&J&)) (&$-%#(<-. D&&$=%D. #=&)=&A =%&* -#() -E&#=%(&.@@-$J&=) \ -. %&+(-A@#-E%&* -#(-) . &,-&) QED% &EE&#-. % & %&) . . %7 8)) $% &D<(&@ (<-. D&. @&$%&@ +#+&(%&$%(&) -=&.#-$(S#. : 7&Y %&- % -@+&#((% (-) . -> > % #(%E7
I3Q5<#/ 3	:] #$<&, (&-) , (<&T -(<&T #(%=7&P) &) (& : , (@&.) > (-. D&. -%$S&.-=%@% &) &.) &) &) &EE&> % -@+ * %&) . . %7&. % %&D\ %#. E(<-. D&EE&>) , (<&) #. &. . @. S@ , S&<%&) . 7&Y %&- % -@+ #((%(-) . &> > % #(%E7
. %#&2#/ 3& *&'%#&'0$%	: ") &#@) . &<+#&$%&#J% & \ ) +-. D&#. E&<%&) . # &-$J&) -&T -(<) , (&, {#S-%&=#-. -. D7&&& #E S%&#. D%) , S&) &<%&%&) . & + \ -: -. D&+-&) &D\ %&>) , (<*() ^>) , (<&%, $@#(-) . 7
Z / #&<&# &- +<'2"'3	: L &@#$%&.A&. <#+#(-) . &.A&.%@> *) $-(-) . &+ : , @&. &#&-%&E> *() > $&+ #E&%&.%#E% 7 ; <%&G') $% & %&) . & #E&.%% &) &$%&1%(&. . '%&& % -@+&, = %+## . @&A)=&D0&) , =&7

$ % ( ) & + - & , ./ -0 1

K8X''%$X'Q- #3Q&4 $'' <1%$<

Y(''4 4 ''=' (*#-&*&# $.9%012# : L &#&%9&) -8-&&%#(% I&#& -%$S, =%&, @?#'$%T -+&) @@-&#. : &(<%&@. (#-. %&- #E&S, -$(7
?1J#3Q1'<- '3Q&4 $0'''
) 1'# =($: M$%#. .&\G}- D, -$<-. D#D% (&, -(#S+%&\-8(<%&, =) , . : -. D&-%7
Z / #&<1'# =($: '') . %&\ ) T . 7
) 9$2'' (&U9/ <1%& ''P' %<: B+) > * (+E&S) #(%&<%&@% %$E&%») \ - . D&+#& %$) . $&%) > &<*%&.@ -(E&) A&<%&, @ % (&A (<%+%&S&#&=%&&K) #@) . &<=+#&%#J% & . \ ) +-. D#. E&< %$) . # #<&J&) -8T -(<) , (&, (#S+% (#-. - . D7
>''P' %/ 1<#. $%& '' (: , @&» #E&. @ : %(<%&\ +T - D& #(%+#&_
0$2/ 4 9/ <#/ 3&9%012#< (@+$) . &-) G: %
(@+$) . &) .) G: %
. -(+ D% &G: %$
) 9$2'' (&%#&2#T$: ?-=%AD<(%$&$<) . + &T %#-&+'' *+ =#(%&+ (%@\ %&9, -* > % (&. : &%A@. (#-. % &=%#(<-. D
$\ 1'94 $3#&/ %&''%X''Q- #&% #'' *+#-(, .$&Z UCV[&T -(<&+&\ +&#@&'' -%@&) * %#(% & &) $-(-\ %&: =%$, -=%&) : %7

] 8&R22'0$3# (&%($'' <$&4 $'' <1%$<

. $%/ 3'' (&%2'' 1#/ 3< : '') &=@) . &<=+#&%&#J% & \ ) +-. D&#. E&< %$) . #-&<$J&) -8T -(<) , (&, (#S+%&#- -. D7
Q\#@#(%&, =) , . : -. D&#-%#$T&. %$ & . %(@&$#+E&#. : &. * +) (%@% & %$) . %&%) > % (%#. D&%P) &) (&) . @&) &+8T #-&<=) . D<&$'' -#% & #(%+#%&\ ) -: &$-%#(<-. D&#'') +&) -$(7
B+) \ -: %&. %9, #(%& % (-#+(-) . %&, %#-&#'' *+) * =#(%&+%$'' -#() -8T <% & % (-#+(-) . &$
-. #. %9, #(%&E, (&) . &#'' *+) * =#(%& %$) . #-&+) (%@\ %&9, -* > % (&$%&. %@) . &0 [7
?3T'%34 $3# (&%2'' 1#/ 3< : V\) - . &-$'' %$#-&) A&'' -#% & #(%+#&# . : &< .) A&#. : &@. (#@&T -(<$) -I&T #(%T #E&+&-#-. $
#. : &'%T '%$&&, A => &<%&%#\ #. (&#, (<) =(-%$&A(<%&+) : . @&+#$&@#. $% &\ +) . > % (#+
*) +# (-) . &$%T %$\&T #(%T #E&+&) -8-&#+&T [7

! $# / 0<&/ %&($'' 3'3Q&9

) 4 '' ((&'9'((: ' () * &#J &&T -(<) , (&-$J &&.) \ %&@ . (#-. %$&+) > &'' -#&+-%#&&P-+ (%T -(<&T #(%&#. : &+) * &*
-A&T #(%+$) + S+%&&\+(%+ #(-\ %E&) -&A&T #(%+-. $) + S+%&#S$) =S&T -(<&#. &. %+&-+E&. #(%+#&#. :
* #@&. &#. &'' *+) * =#(%T #$(%&-$*) $+#&@. (#-. %+&&P-$*) $%) A. #-&+@(%. $% &T #$(%
: -$*) $+#&@. (+#@ =7
^ '' %$&'9'((: ' () * &#J &&T -(<) , (&-$J &&.) \ %&@ . (#-. %$&+) > &'' -#&+-%#&&\ * +) #@&%#+$%&+) >
. *T - . :&&=+% % (&% (+E&. () &%T %$&T #(%+&@. =%+&T#$%+ % ($&-+&@. A. % &=%#$%&, #$<
$* -#+D?&&. () &#. &&+% % (&-%#(> % (& #. (&-&+) @% &#$&A+) T $%&J) . (#-. &#. : &@-#+&@
$* -#+D?&T -(<&.) . ^@> S. $(-$+%&#SS) =$% (& #(%+#&&D?&# . : K&#+(<&.%>- .@-+%& =
: #() > #@+) . $&#+(<&# . : &#@?&. &@ . (#-. %+&) -&. $*) $+#&@. (=+. D&) &+@=$%D. #(+) . $
Z5%&%@) . &3[?&P-$*) $%) .%&-+#&&%@% $% &T #$(%&. $*) $+#@. (+#@ =&J) . (#> - . #(%
#SS) =$% (& #(%+#& #E&) $%&<%&#> %&+F+= &$5&<%&* -+% &+) : . (@&.) (%&$%&%@) .
/ &+-&% %D% @&@. (#@& A => #(-) . &. : &$%@) . &3&\ =&T #$(%&. $*) $+#7

J8&'' 30('3Q&' 30&-# %Q$

>''30 (3Q : B, (&) . &+'' *+) * =#(%& %$) . #-&+) (%@\ %&9, -* > % (&$%&. %@) . &0[?&Q#(- D&. = J- D&. : $>) J- D$<) . + &$%& +<-S-(% & &=+#$&T <%+%&<-$&+ #(%+#-&$&+#. : -+% +&() =% &. :
* +) @&$% ?&.) =J+%$&<) . + &T #$<&+#. : $&+ : &+@&$%+ =%&+#(- D&. = J- D&. : &>) J- D7
I %) \ %&@ . (#> - . #(% &@ (<- D&+ . . &+) (%@\ %&9, -* > % (&$%+ =%&% (%- D&+#(- D&+=%+$7
P) &.) (&. D?&(?&A\ ) - &@ . (#@T -(<&E%&J- &. : &@ (<- . D?&A\ ) - : &$-%#(<- D&+#'') +) -&- -$(7
' %% &. &<%&. =D- #+@ . (#-. %&) -&+ &'' *+) \ % &+(%+ =+ &+&@> * #(-$+%
> #(%+#+&% (&D<(E&@ $% &T <% &) (& &$%&> * (E&@. (#-. %&$+(-\ &+) : . (@&+%. : &.) $ (%&+ &+ &+@&$%+ &+ &+ &

$ % ( ) & + - & , ./ -0 1

7B8 #' ='('#-& 30&$" 2#T'#-

. / <<'=' ('#-&'& "P' %/ 1< %" 2#/ 3< : M . : %&) => #-&@. : -(-) . $& A&() -#D%#. : & $%&-#R#=) , $&%#@) . $& -#&) (& @@=7

778&@ U 2/ (/ Q 2" (&3*/ %& "#/ 3

H3'#&0& #'#&<

R21#&# U 2'##

. %0 12#&3 Q%$0'$3#&" 4 $	; $<1(#	) 9$2'$<	, / <$	?U9 / <1%
%<E% %&&2 CE%<E% % {=+ [(%=#-@&-@ #@ [	8P54&E -#+	I #(	350H& D&ID	^

5 / 32(1</ 3$ 14 4 "% : ;) &<-%&S%(&,A& , -&I .) T -% D%&<-%&) G@+ D@-& = * %(-%&$,A&<-$& = : , @&-#\ %&) (&S%% (<) = , D<-E& . \ %(-D#(% 7

5 - %3'2&# U 2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

!%&#' #/ 3$ / %& </ 3

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

) $3<#F5%

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

5 "%2' 3/ Q&3'2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

! 1# Q&3'2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

@&%# Q&3'2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

: $9%012#T$&# U 2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

5 "3" 0"

R21#&# U 2'##

. %0 12#&3 Q%$0'$3#&" 4 $	; $<1(#	) 9$2'$<	, / <$	?U9 / <1%
%<E% %&&2 CE%<E% % {=+ [(%=#-@&-@ #@ [	8P54&E -#+	I #(	350H& D&ID	^

5 / 32(1</ 3$ 14 4 "% : ;) &<-%&S%(&,A& , -&I .) T -% D%&<-%&) G@+ D@-& = * %(-%&$,A&<-$& = : , @&-#\ %&) (&S%% (<) = , D<-E& . \ %(-D#(% 7

5 - %3'2&# U 2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

!%&#' #/ 3$ / %& </ 3

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

) $3<#F5%

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

5 "%2' 3/ Q&3'2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

! 1# Q&3'2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

@&%# Q&3'2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

: $9%012#T$&# U 2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

$ % ( ) & + - & , ./ -0 1

7D&? 2/ (/ Q 2" (&3*/ %& "#/ 3

?2/ # U 2'## : ") &.) T . &-D . A@ . (&%A%@5&) -&@-(-@ &=#R#= $7

H3'#&0& #'#&<

R\ 1"#2&$2/ # U 2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

_ $%' <=&32$'$ $Q%0" ='('##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

5 "3" 0"

R\ 1"#2&$2/ # U 2'##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

_ $%' <=&32$'$ $Q%0" ='('##

5 / 32(1</ 3$ 14 4 "% : ") (&\ #-#S#7

G# $%&0T$%$&*"$2#< : ") &.) T . &-D . A@ . (&%A%@5&) -&@-(-@ &=#R#= $7

7F8& '<9/ <" (&/ 3 <'0$%#/ 3<

_ " <=&&'<9/ <" (: ; <%&D% %=#(-) . &,A&I #$(%&=<) . + &$%&=\ ) - % &, =-& - . > -R% &I <%% %=&,) $$-S-#7&&. -D . A@ . (9 , #. ((-(-%&&,A&I #$(%&=) : . @&$%&- . %&&<) . + &,) (&$%&. $*) $% &,A&. #&<%&), . &$%I %&&. (* =) @&$% &. &#&, -(#S-#&&&A% % (&-%#(> % (& #. (7&&P-$*) $%&,A&, =* + $&#. : &.) . ^-%=@&@#S-% * =) : . @&&. #&#&&@& $% &I #$(%&-$*) $-#-&@. (=#(@ =7&&P-$*) $-#-&@. A&<-$&=) + (-) . $ #. . &# E&&E=" =) . (@&$&<) . + &#(&#-&> %&&@> * E&I (<&-<%&#9 . -=% % ($&,A&& \ =) . > % (#+ * =) (%@) . &#. . &I #$(%&-$*) $-#-&@. D&$-#(-) . &# : &. E&%&) . #-&@ . @-&#, (<) =(E&%9 . -=% % ($7] #$(%&-#@-#-D- D&<) . + &$%&=#(&@% 7&&. @ %#(-) . &,=&#. : A-#&<) . + &,) . E&%&@. $- %% T <% &%@&@. D&$&,) (&&#$-S-#&&, <-$& #(%=#&#. : &$&@. (#- %&& . $(&$%&-$*) $% &,A&. &# $-#A&I #E7&&J#=%&<) . + &$%&#J% &I <% &#. : + D&% * (-% &@. (#- %&$&<#(&=#\ %&) (&$%& @-#. % &,=&-. $% &, (7&&2> * (E&@. (#- %$&,=&- %$&& #E&%(#-. &) > %&=) : . @&%&- . %7 V\ ) - . &-$* %$&#-&) ,A&* -#% &+ #(%=#&#. : &- .) A&#. : &@. (#@&I -(-&) -I&I #(%=I #E&I&,=#-. $ #. : &%'I %57

, '<9/ <" (&- / 1(0&=$&3&'22/ %" 32$&/I +- &'99 ("=(&-$&Q / 3" (I&" #/ 3" (&'30 &/ 2" (&" M<&'30 &$&Q1 ("#/ 3<8

; $*$%#/ &,$2#/ 3&I :&=RZ . ^IZ ' &RZ . ,&,@&; R ' ?&'30 &,$2#/ 3&I :&=a . G) H; ?&=GZ @ G^) S ?;) GZR^ & ; G@ 5 @GZ

/ %&00'#/ 3" (&" 30 (3Q&3/ % "#/ 3&'30 &9%-&$2#/ 3& *&-4 9(/ +$$<8

7C8&@%3<9/ %&&3*/ %& "#/ 3

; $Q1 ("# % '3*/ % "#/ 3	HZ &14 =$%	. %9$%&-'99'3Q 3"-4 $	5 (" <<$<	. ` b
. G@& ("<<"2"#/ 3	") (=-&D . #(% 7	^	^	^
IR@RX ` ; &("<<	") (=-&D . #(% 7	^	^	^

BY b&&$#@-. D&D=} , *

7K8& $Q1 ("# %&3*/ %& "#/ 3

H3'#&0& #'#&<

>5) &("<<"2"#/ 3 : ; #-D%&,=D#. &A%@&

H& &X'0%(&$Q1 ("#/ 3< : @ 5 R&X V&H; &'U&4 9#&" %&" (&U&4 9#/ 3 _&,) (&%%>- . %

H3'#&0& #'#&<&3T$3# %&@ 5 R&=V&V+R@> *) . % ($&#-&&(% &,-&&3& *(% 7

) R; R&EDDFBC$F77$F7D&U#&4 $(+& "P' %/ 1<&=1=<#' 32$< &) & =} : . @&$& %9&, . : 7

) R; R&EDDFBC&4 $%&32+&9("33'3O&'30 &/ #"2"#/ 3 _&) & =} : . @&$& %9&, . : 7

) R; R&EDDFBC$F77$F7D& "P' %/ 1<&- $4 '2" (<_

%<E% %&S,CE%<E% % {=+ [(%=#-@&-@ #@ [

) R; R&F77$F7D&) .) &'<#=1#/ 3&&-$4 '2" (&3T$3# %&& "P' %&0$3#"2"#/ 3 _

%<E% %&S,CE%<E% % {=+ [(%=#-@&-@ #@ [_&P%#E% &@=) . -@&%#+(-&=#R#=

$ % ( ) & +- & , ./ 4) 1

7K&8; $Q1 (" # %&3*/ %4 "#/ 3

5 ($" 3&R'%R2#8 $2#/ 3 : ") (&$(%
77DV&V& "P' %/ 1<&R'%
./ ((1#' 3#<&/ R. <W

5 ($" 3&R'%R2#8 $2#/ 3& ED : ") (&$(%
5 (" <<&8 1=<#' 32$<

5 ($" 3&R'%R2#8 $2#/ 3& ED : ") (&$(%
5 (" <<&8 1=<#' 32$<

, ?R& '<#&8 - $4 '2" (< : ") (&$(%
V %21%/ %8 - $4 '2" (<W

, ?R& '<#&8 - $4 '2" (< : ") (&$(%
V<<$3#" (& - $4 '2" (<W

) #' #5&$Q1 (" #/ 3<

! " <<" 2- 1<$#< : ") . %& A&<%&@> *) . % ($&=%&$(% 7
Z$M& / % : ") . %& A&<%&@> *) . % ($&=%&$(% 7
Z$M& $%$+ : ") . %& A&<%&@> *) . % ($&=%&$(% 7
. $33<+(T" 3" : ") . %& A&<%&@> *) . % ($&=%&$(% 7
H3'#$0 & #' #5<&3T$3# %& : V+&@> *) . % ($&=%&$(% & =&&%> * (% 7
V@ 5 R&=W

5 " 3" 0"
_ >! I) &5 " 3" 0" W : U#$$&^2C & #(%=#&@, $-. D& (<%&) G@&A@&Z) G@7
5 " 3" 0"' 3& <#<
5 " 3" 0"' 3&Z. ; I : ") . %& A&<%&@> *) . % ($&=%&$(% 7
5 ?. R&@ U2&1=<#' 32$< : ") . %& A&<%&@> *) . % ($&=%&$(% 7
5 " 3" 0" &3T$3# % : V+&@> *) . % ($&=%&$(% & =&&%> * (% 7

@ '<&%012#& " <&$$3&2(" <<" $0&3&22/ %" 32$&M# &$& " P' %&2%#5%' & *& $&5 / 3#%((0& %012#<& $Q1 (" #/ 3< "30& $&) ,) &/ 3#' 3<& ((& $&3*/ %4 "#/ 3&5\ 1'%$0&+& $&5 / 3#%((0& %012#<& $Q1 (" #/ 3<8

I3#5%" #/ 3" (&$Q1 (" #/ 3<

I3#5%" #/ 3" (& <#< : R1<#%(" &3T$3# %&RI5) V&V+&@> *) . % ($&=%&$(% & =&&%> * (% 7
5- '3" &3T$3# %&V? 5) 5 V&V+&@> *) . % ($&=%&$(% & =&&%> * (% 7
"9" 3&3T$3# %_&) (& %%> -. % 7
/ %" &3T$3# %_&) (& %%> -. % 7
Z$M& $" (" 30&3T$3# %& *&5 - $4 '2" (<&Z I/ 5 V&V+&@> *) . % ($&=%&$(% & =&&%> * (% 7
. - '(99' 3$<&3T$3# %&V I5 5) V&V+&@> *) . % ($&=%&$(% & =&&%> * (% 7

7] &&G# $%&3*/ %4 "#/ 3

^ " =$(&&\ 1'%$4 $3#< : UF " ; VL" ' & V; QI LV8& VW; & VX &JVM Q& VI YQ &I YV" &V! VYQ&CV QP&" " V" I! V8&PV; V7

>" P' %/ 1<& "#5%' (:
I3*/ %4 "#/ 3&+<#$4 &H8 &R8/V

>$" (#	4
Y(" 4 4 " =' (#+	4
. - +<' 2" (& " P' %/ <	4

@ $&21<# 4 $%&<&$<9/ 3<' =($&/ %&0$#5%4 '3'3Q&# $& . ?&/ 0$&/ %&# '<& "#5%' (8

Z "#/ 3" (&' %&$& %#52#/ 3 :
R<</ 2" #/ 3&H8 &R8/V

$ % ( ) & +- & , ./ 4) 1

7] &&G# $%&3*/ %4 "#/ 3

, "#5& "&9 %3#3Q : KFD7D8
, "#5& "&<<1$: 5&3&24/ 27
, "#5& "&9 %$T'/ 1<&<<1$: ") &=%&-) , $&#+ #(-) . 7
6 $%&/ 3 : /
. %&9 " %$0 &+ : ! ' P' & " %@#+$(

I30'2" #5<&3*/ %4 "#/ 3& "#& " <&2- "3Q$0 &%4 &9%$T'/ 1<(+&<<1$0 &T$%&/ 38

Z/ #2$&/ &5" 0$%

@ & $&$<#&'&1%&3/ M($0Q$N& $&3*/ %4 "#/ 3&2/ 3#' 3$0 & $%$'3&<& 221%#$&/ M$T$%&&$'# $%& $&=/ T$X3"4 $0 <199('$%&/ %&3+& *&#<&1=<0'" %$<N& <<14 $<&3+&" =' (#+&-"#</ T%&/ %& $&221%2+&%&/ 4 9($#&3$<<&*& $ '3" / %4 "#/ 3&/ 3#' '3$0& $%$'38
Y'3" (&$#$%4 '3" #/ 3&*&1'#' =' (#+& *&3+&I "#5%' (&<& $&/ ($&5&<9/ 3<=' (#+& *& $&<$%&R((& "#5%' (<& " +&9 %$<$3#13L3/ M3& " P' %9 <&30&- / 1(0&$&<$0&M#.&2" 1#/ 3&R(# / 1Q- &$%$' '3& " P' %9 <&%0<2%=$0& $%$'3&M$&2" 33/ # Q1" %3#$$&# " #&# $<$&%$& $&3(+& " P' %9 <&# " #&$U<#8

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&' (")$#*,+"#",(- $$#

! "#$%&' (")$"+*,' -) +. - "$"+*,/0- 12'3) (,3) 45$"#

78. %012#;"30,2/ 4 9" 3*,&0$3#&,&2" #&% 3

. %012#3"4 $	: ! "#$%&' (")$"+*,' -) +. - "$"+*,/0- 12'3) (,3) 45$"#		
(199'&%%	: % *(H) ,I +- *(,=4† 0$U# ' †(4*.; 1)$4- 0) # KL ' (M(C,) N.: : 7 O) 45L) (GP!D,?: : 6> Q0'$ G=$"$'+ 8: >G28©5797,) (866©79G:7@<	! "31)"2#1%%	: % *(H) ,I +- *(,=4† 0$U# ' †(4*.; 1)$4- 0) # KL ' (M(C,) N.: : 7 O) 45L) (GP!D,?: : 6> Q0'$ G=$"$'+ 8: >G28©5797,) (866©79G:7@<
5 / 0$	: 667899: ,667899: ; ,667899<,667899<=,667899>,6678997,: 8?: @6,: 8?: @8: ,: 8?: @@ : 8?: @9,: A6: ?A?		
! (+(,O	7879		
6"'!0" #& 3,0" #&	: 7[@@E@[@@: : C		
. %@#0" #&	: 7[@@E@[@@: : C		
; $<9/ 3<&*$,3"4 $	& =R=,=. *41'#+$ 5>?! @ ?5:	! "#$%&',1<$<	: $)$%@#,# $,&@<#%&2#&,3
	AEB8DDCDEFFEB GH(@ I+ ?,H(: JEF3'CDJ8FAAU		=/ / L'$#,)/ %@%9$%'30 @#&30$0,1<$8,G# $'%#&$N 2/ 3#'2#;<199'@$%@/ %<9$2@&@2 "99'@2" #& 3<8
. %012##9$	: DEF'GC		

D@>"Q'%0<,&0$3#&,&2" #&% 3

?4 $%$32* / T$%&M

. -* <@2"',<#' #&	: DEF'GC	
G0/ %	: MG)(# ++C	
(&P3"',M/ %	: T UOV/V\WK	
>"Q'%,,<#' #&4 $3#<	: ! UO&,I QD,/I ,/V! UDSR,MO,=T UDDMT SRC,3 UQ=S=,OS=' /OU%MOY,%OU3 %PSYS UVR,=Z /V,/OO/%J%MVC,& UY,; S,! UO&,I QD,/I ,U; =MO; SR,% OMQMW ,=Z/VC 3 MV%J/V=,& U%SO/UD,% U%3 UV,3 UQ=S,%JOWS%MOWUV,RU& UWSC,=Q=' S3 % 3 UV3 SO,! U[UOR,\,3 MV%J/V=,& U%SO/UD,T ! /3 ! ,& UY,3 UQ=S,3 UV3 SOC	
. %2" 1#& 3"%,4 $" <1%<	: R) ,0) $-"0G# ,F0S#' '#+" J' $L,. (*4" F$) 0+,-"`*,,2*"0,(*"G"0GF0G' (+$) ) GC,M2$'10 +. *41' #'0+$(F4$) 0+,2* J) (*,F+* C,R) ,0) $2(*"'$ *,`".,) (,) (,H +$C,R) ,0) $'0K* +$C,Q+*,) 0#L a '$,"G EF"'$',* 0S# $) 0C,R) ,0) $* "$PG(105,) (,+H) 5*,a- * 0,F+0K,$ '+,. () GF4$C,U`) '63 4) 0$' 4$a '$ ,*L* +P+5'0,"0G4#) $ '0KC,U`) '63. () # 0K* G4) 0$' 4$a '$,*L* +P+5'0,"0G 4#) $ '0KC,Z * *. ,4) 0$' 0* (,$K<-$#L,4#) +" GC,Q+*,. * (+) 0"# . () $ '4$1 * ,* EF'1 H * 0$"+,(* EF'1* GC T `"+-,$) () FK<-#L,"J$' (,-" 0G#0KC	
G(>R$-5 (,<#' #1<	: % '+H `"$ (1#'+,4) 0+1G' (* G- "] " (G) F+,2L,$ *,M=! U,! "] " (G3) H H F0'1#" $) 0,=$ 0G' (G ^@A,3 I O,: A 6C@6_C		
; / 1#&</),$3#%	: R* (H `"#4) 0$' 4$CSL* ,4) 0$' 4$C)0- "#$) 0C!0K* +$) 0C		

./#&3#&',"21#& - $"'#.,$,))$2#<

$ %&') * + '. % . ,* 0- / 10 %% . . ,230454 - +,6 - 78' %&

D@>"Q'%0<,&0$3#&,&2" #&% 3

I3- "'`" #&% 3	: %) N#!,2L,'0- "# $) 0C,/((!$"$D!K$) ,(* +. !("$) (L,+L+$"H C	
I3P$<#&% 3	: %) N#!,)I,+a "# a * GC	
(L&&	: ! "(H,JF#!0,4) 0$'4$a !$,+5!0C,/((!$"$D!K$) ,+5!0C	
? *$<	: /((!$"$D!K$) ,*L* +C	
./#&3#&',"2- %3&& - $"'#.,$))$2#<		
5 - %3&2.$))$2#<	: 3) 0$"!0+,H `"$"(!'#$ "$,4" 0,4" F+*,$"(K"$) (K" 0,G'H `"K*C	
5" %2&&/ P$3&2&#	: 3) 0$"!0+,H `"$"(!'#a - !#- ,H `"L,4" F+*,4" 04* (C,O!+5,) ,J 4" 04* (,G'. * 0G+,) 0,GF("$) 0,"0G #'*#) J * N) +F(* C	
! 1#' P$3&2&#	: V) ,50) a 0,+K0!'#!" 0$*,J!* 4$+,) (,4(!$#!" #- "] " (G+C	
@$%# P$3&2&#	: V) ,50) a 0,+K0!'#!" 0$*,J!* 4$+,) (,4(!$#!" #- "] " (G+C	
+T'/ 94 $3#' ,$))$2#<	: V) ,50) a 0,+K0!'#!" 0$*,J!* 4$+,) (,4(!$#!" #- "] " (G+C	
Z$%&&# ,$))$2#<	: V) ,50) a 0,+K0!'#!" 0$*,J!* 4$+,) (,4(!$#!" #- "] " (G+C	
@ %P$#/ %P' 3<	: 3) 0$"!0+,H `"$"(!'#a - !#- ,4" F+*+,G'H `"K*,$),$ * ,J) # a !0K) (K" 0+b- * " (F* $ C 3) 0$"!0+,H `"$"(!'#a - !#- ,H `"L,4" F+*,G'H `"K*,$),$ * ,J) # a !0K) (K" 0+b5!G0* L+P K" +$) !0$" +$0" #$("4$FF. . * ((,(* +. !("$) (L,$"4$P+5!0P2) 0* +P4* !0$"#0* (`) F+,+L+$"H ,^3 V=_P * L * P# 0+,) (,4) (0* " C	
GT$%$V9 / <1%,<$P3<S*4 9# 4 <		
I3- "'`" #&% 3	: UG * (+*,+LH. $) H +,H " L,!04#FG' ,$ * ,J) # a !0Kb (* +. !("$) (L,$"4$,!(!'$"$) 0 4) FK<-!0K	
I3P$<#&% 3	: V) ,+. * 41!#,G' $' C	
(L&&	: UG * (+*,+LH. $) H +,H " L,!04#FG' ,$ * ,J) # a !0Kb !(!'$"$) 0 (* G0* ++	
? *$<	: UG * (+*,+LH. $) H +,H " L,!04#FG' ,$ * ,J) # a !0Kb . " !0,) (,!(!'$"$) 0 a "$' (!0K (* G0* ++	
! $0&2"',2/ 30&&3<	: ' (** N#$0K,G#) (G' (+,!0`) # !0K" 0L,$' (K" $) (K" 0+,H * 0$) 0* G,!0,$ +,& =R=," +2* !0K" $	
"PP%T" #50,=* ,/ T$%	(#5,H " L,2* ," K'Q" ` "$ G,2L,) ` * (* N ,) +F(* ,$) ,$ +,. () GF4$C	
$V9 / <1%		

($$,# V&2/ '/ P&2"',&3)/ %4 "#&% 3,\W$2#&% 3,77X

F85 / 4 9/ <&&% 3$&3)/ %4 "#&% 3,/ 3,&8P%$0 &$3#<

H3 &&50,(# #&%<

["4 $	5 R(,314 =$%	\
G+) GFH ,c\K#L4* () . -) +. - "$'	8: A\8<\6	<\,>
G+) GFH ,G+ LG) K* 0. L() . -) +. - "$'	77>8\: ?\A	: .\,<
=) GFH ,JF) ('G'	778: \9A\9	: .\,<
$'+) GFH ,$' $"') N) ` "0" G' $'	: <7@\<A\?	: .\,<

5" 3" 0"

["4 $	5 R(,314 =$%	\
G+) GFH ,G+ LG) K* 0. L() . -) +. - "$'	77>8\: ?\A	: .\,<
=) GFH ,JF) ('G'	778: \9A\9	: .\,<
$'+) GFH ,$' $"') N) ` "0" G' $'	: <7@\<A\?	: .\,<
%L. +0,'0- 2'3) (P. "04(* "$#,2" +#	A687\76\:	6C,\,:

F8 5 / 4 9/ <&&8 & 3 5 &8) / % 4 " #& 3 , / 3 , & 8 P % 0 & 5 3 # <

@ $ % ; " % , 3 / ," 0 0 & & 3 " ' . & 8 P % 0 & 5 3 # < ; 9 % < $ 3 # M - & 2 - N M & < & 8 , # $, 2 1 % & 3 # L 3 / M ' $ 0 P $ /) # $, < 1 9 9 ' & % ' 3 0 . & 8 , # $ 2 / 3 2 $ 3 # % # & 3 < , " 9 9 ' & " = ' $ N ' % , 2 " ' < < & 8 & 0 , " < , - " Q ' % / 1 < , # , - $ " ' ' # . / % # . $, $ 3 T & & 3 4 $ 3 # " 3 0 , - $ 3 2 $, %] 1 & & , % 9 / % & & P , & 8 # & < , < $ 2 # & & 3 8

C & Z & % # ; " & 0 , 4 $ " <1 % <

? * $, 2 / 3 # ' 2 # : 3 - * 4 5 , J) (," 0 G (* H) ` * ," 0 L , 4) 0 $ ' 4 5 # 0 + * + C / H H * G t ' $ ' # ± , J # + - , * L * + , a ' $ . . # 0 $ ± ,) J a " $ ' (J) (," $ # " + 5 : > , H ' 0 F $ ' + F) 4 4 " +) 0 " # ± , # & 5 0 K & * , F . . * (," 0 G # a * (, * L * # G + K , W ' $ H * G # " # " $ # ' 0 $) 0 , ' H H * G t ' $ # , C

(L & ± , 2 / 3 # ' 2 # : / 0 , 4 " + " ,) 4) 0 $ ' 4 5 P ' H H * G t ' $ ' # ± , J # + - , + 5 ' 0 , a ' $, . # 0 $ ± ,) J a " $ ' (, J) (," $ # " + 5 : > , H ' 0 F $ ' + a - ' # , (* H) ` ' 0 K , 4) 0 $ ' H ' 0 " $ ' G , 4 # $ ' 0 K , " 0 G + -) * + C T . " + - , 4 # $ ' 0 K , 2 * J) (* , (* F + * C , 3 # " ' 0 + -) " + , $) ( ) F K - # ± , 2 * J) (* , (* F + * C , W ' $ H * G # " # " $ ' 0 $) 0 , ' H H * G t ' $ # , C

I 3 - " ' " " # & 3 : &) ` * , * N) + * G . * (+) 0 , $) , J (* + - , " ' (C / J 0) $ 2 (* " $ ' 0 K P ' 1 2 (* " $ ' 0 K ± - , ' ((K F # (,) (, ' ((* + , T " $) (L , " ((* + $) 4 4 F (+ P : ( ) * ' (2 , " (($ % % ' ' # (* + , T " $) 0 ,) (,) N L K * 0 , 2 L $ " ' 0 * G , * (+) 0 0 * # C D)) + * 0 , $ K - $ ' #) $ * 0 K + F 4 - , * + , " , 4) # # (P $ t * P 2 * # $) (, a " ' # $ 2 " 0 G C , W ' $ H * G # " # " $ ' 0 $) 0 ' H H * G t ' $ # , C

I 3 P $ < # & 3 : T " + - ,) F $ H) F $, a ' $, a " ' $ ' (C , R) , 0) $ ' 0 G F 4 * , `) H ' $ 0 K , F 0 # + + , G [* 4 $ ' G $) , G) , +) , 2 L _ H * G # " # . * (+) 0 0 * # C , V * ' * (, K 1 * , " 0 L $ - ' 0 K , 2 L H) F $, $) , " 0 , F 0 4) 0 + 4) F + , . * (+) 0 C , W ' $ H * G # " # " $ ' 0 $) 0 , ' H H * G t ' $ # , C

. % # & 2 # & 3 , /) ,) & % # ' & 0 $ % : V) , " 4 $) 0 , + - " # & 2 * , $ ' 5 * 0 , ' 0 `) # ' 0 K , " 0 L , . * (+) 0 " # (' # 5 ,) (, a ' $) F $ + F $ ' 2 # , $ (" ' 0 ' 0 K C , / J ' $ ' # + F + . * 4 $ ' G , $ " $, J F H * + , " (* , + $ # # . (* + ' 0 $ F $ * , (* + 4 F * (, + -) F # & a * " ' (, " 0 , " . . ( ) . (1 $ ' , H " + 5 ,) (+ * # & 4) 0 $ ' 0 * G , 2 (* " $ ' K * . . " (" $ F + * C / $ H " L _ 2 * , G ' 0 K * ( ) F + , 9 , $ * , . * (+) 0 , . ( ) ` ' G 0 K " ' G $ ) K 1 * , H ) F $ ' \ $ ) \ H ) F $ , ( * # F + 4 ' $ " ) 0 C , T " + - , 4 ) 0 $ ' H ' 0 " $ ' G , 4 # $ ' 0 K , $ ) ( ) F K - # ± , a ' $ , a " $ ' ( 2 * J ) ( * , ( * F H ) ` ' 0 K , ' $ F) (, a * " (J < #) * + C

[/ # & < ; # ' , 9 - * < & 2 & 3 : V) , + . * 4 ' 1 # ! , $ * " ' $ H * 0 $ ' C , % * " $ + L H . . $) H " $ # ' # ± C , 3) 0 $ ' 4 $ . .) ' +) 0 , $ * " ' $ H * 0 $ + . * 4 ' # # + $ ' H ' G t ' $ # ± , ' 1 # ' (K * , ' E F " 0 $ $ # + , - " ' * , 2 * * 0 , ' 0 K * + $ ' G) (, ' 0 - " # ' G C

K & Z & % $ Y) & P - # & & P , 4 $ " <1 % <

Z " " 4 4 " = & & # ' , /) , # $, 9 % 0 1 2 # : / 0 , " , J (* ,) (, ' 1 ' - * " $ ' G P , " , . (* + # F (, ' 0 4 (* " * + * , a ' # #) 4 4 F (, " 0 G $ * , 4) 0 $ ' 0 * (, H " L , 2 F (+ & C

? \ # & & P 1 & & - & & P , 4 $ 0 & &

(1 & # ' = ' $: Q + * , " 0 , * N $ 0 K F * ! - ' 0 K , " K * 0 $ + F $ ' 2 # , J) (, $ * , + F (( ) F 0 G 0 K , J (* C

[/ # < 1 & # ' = ' $: V) 0 * , 5 0) a 0 C

(9 $ 2 & ' , $ \ 9 / <1 % , - " Q ' % < : ' ( ) H . $ & ± , ! +) # $ ' , $ * , + 4 * 0 * , 2 L (* H) ` ' 0 K , " & ± . * ( + ) 0 + J ( ) H , $ * , ` 4 ' 1 ' 0 ' & ± ,) J $ * , ' 0 4 ' 1 3 ' 0 $ ' 1 J $ * (* , ! + " , J (* C , V) , " 4 $) 0 , + - " # & 2 * , $ ' 5 * 0 , ' 0 `) # ' 0 K , " 0 L , . * (+) 0 " # (! + 5 ,) (, a ' $) F $ + F $ ' 2 # $ " ' 0 ' 0 K C

> " ' Q ' % / 1 < , # $ % & , " ' ' 0 $ 2 / 4 9 / < & & & 3 , 9 % 0 1 2 # < : R * 4) H . ,) + $) 0 , . () C F 4 $ > , H " L , ' 0 4 # ' G " , $ * , J) #) a ' 0 K , H " $ ' (1 ' # & b 4 " (2) 0 , G) N ' G " 4 " (2) 0 , H) 0) N ' G " , -) + , -) (F + ,) N ' G " + - " #) K " 0 " $ ' G 4) H . ,) F 0 G + H * $ #) N ' G " + (9 $ 2 & ' , 9 % # & 2 # & ' $ $] 1 & & 4 $ 3 #) / % 9 & & $ Y) & P - # & % : ! (* \ U K - $ ' (+ , -) F # & a * " (, " . . ( ) . (1 ' $ " , . * E F 1 H * 0 $ " 0 G + * # & 4) 0 $ ' 0 * G 2 (* " $ ' 0 K " . . ' (" $ F + ^ = 3 ; U _ a ' $, " , J F #) ' 4 * \ . ' 1 4 * ,) . * (" $ ' G ' 0 . ,) + ' $! * , . (* + # F (* , H) G ' C

U & R 2 2 & 0 $ 3 # ' , % ' $ " <$, 4 $ " <1 % <

. $ % / 3 " ' , 9 % 2 " 1 # & 3 < : V) , " 4 $) 0 , + - " # & 2 * , $ ' 5 * 0 , ' 0 `) # ' 0 K , " 0 L , . * (+) 0 " # (' # 5 ,) (, a ' $) F $ + F ' $ ' 2 # , $ (" ' 0 ' 0 K C S " 4 F " $ ' , + F (( ) F 0 G 0 K (" * + C Z * * . . F 0 0 * 4 * + " (L " 0 G F 0 . ( ) $ * 4 $ ' G . , * (+) 0 0 * # & J) H * 0 $ ' (0 K C , R) , 0) $ $ F 4 - .) (, a " # & , $ ' ( ) F K - , + . ' # F G H " $ ' (1 ' # C , R) . 0) $ 2 (* " $ ' , ' " .) (,) (, H ' # K " 0 " $ ' G . . . . . ? - : 6 > , ... " & : 3 > _ A ? & ! 7 < : ? , ! ^ N

$ %&') * + ' . % . ,* 0- / 10 %% . . ,2 3 0 4 5 4 - + , 6 - 7 8 ' 9 %&

U & R 2 2 & 0 $ 3 # ' , % ' $ " <$, 4 $ " <1 % <

? 3 T & & 3 4 $ 3 # ' , 9 % 2 " 1 # & 3 < : U ` ) G , G # . * ( + " # ) J + . ' # # G H " $ ' ( 1 ' # " 0 G ( F 0 ) J , " 0 G 4 ) 0 $ ' 4 $ a $ ' , + ) ' # P a " $ ' ( a " ' L + F Q " ' 0 + " 0 G + " a * ( + C / 0 J ) ( H , $ * , ( " # " ' " 0 $ " F $ ) ( $ # + , J , $ * , . ( ) G F 4 $ - " + , 4 " F + # G * 0 ` !) 0 H * 0 $ # .) # # $) 0 , ^ + " a * (+ P a " $ (a " L + P +) ' #) (," (_ C

! $ # / 0 <) / % 2 ' $ " 3 & P . 1 9

(4 " " , < 9 & : = $) . # " ' 5 , J ± a ' $) F $ (' + 5 C , &) ` * , 4) 0 $ ' 0 * (+ , J ( ) H , + . ' # # ' (" " C , R . ' # F $ ' , a ' $, a " ' $ ' (, " 0 G H) . , F . ' (J ± a " $ ' (\ +) # F 2 # ' C , J ± & (0 " $ t * # L F) (, J ± a " ' $ ' (\ 0 +) # F 2 # ' F ' 2 +) (2 , a ' $, . " ' 0 , 0 * ($ Q L H " ' $ ' (1 # " 0 G . # 4 * , ' 0 , " ' . . ( ) . (1 ' $ ' , a " + $ ' , G + .) + ' # 4) 0 $ " 0 * (C , R ' + .) + " ,) J ` 1 ' , . " # 4 * 0 + " G a " + $ ' G + .) + " # 4) 0 $ " " 4 $) (C

^ " % P $, < 9 & : = $) . # " ' 5 , J ± a ' $) F $ (' + 5 C , &) ` * , 4) 0 $ ' 0 * (+ , J ( ) H , + . ' # # ' (" " C , U . . ( ) " 4 - . (* # " + * , J ( ) H F . a ' 0 C ,' (" " * 0 $ * 0 $ L ' 0 $) , + " a * (+ P a " ' $ " (, 4) F (+ * + P 2 " + * H * 0 $ +) (, 4) 0 J ' 0 * G " (" " + C , T " + - + . ' # # K " + , 0 $) , " 0 , * J # F * 0 $ $ * " " $ H * 0 $. # 0 $) (. . ( ) 4 * * G " + J ,) #) a + C , 3) 0 $ ' 0 , " 0 G 4) # # 4 $ + . ' # # K " + , 0 $) , " 0 , * J # F * 0 $ $ * " " $ H * 0 $. # 0 $) (. . ( ) 4 * * G " + J ,) #) a + C , 3) 0 $ ' 0 , " 0 G 4) # # 4 $ + . ' # # K " + , a $. , 0) 0 \ 4) H 2 F + $ 2 # F ' 2 +) (2 * 0 $ H " $ ' (1 # " (# C + ' 0 G P * " ($. P * (H ' ± F # & .) (G t ' $ H " * 4 ") F + , * " ($. , " 0 , G + .) + " # 4) 0 $ " " 4 $) (C , 3) 0 $ ' H ' 0 " $ ' G " 2 +) (2 * 0 $ H " $ ' (1 ' # ± ! " L . .) + * , $ * , + " H * , - "] * " (G " + , $ * , + . ' # # . G . ( ) G F 4 $ C , V) $ ' b + * * , - + * 4 $) 0 : , J) (, * H * (K * 0 4 L , 4) 0 $ ' 4 $ ' 0 J) (H * " $) 0 , * " 0 G + * 4 $) 0 , : < , J) (, a " + $ ' , G + .) + " # C

J 8 > " 3 0 ' & & P , " 3 0 , < # % P $

> " 3 0 ' & & P : ` F $) 0 , " . . ( ) . (1 ' $ " . . * (+) 0 " # . ( ) $ ' 4 $ ' ± * , * E F ' 1 H * 0 $ ^ + * * . = * 4 $) 0 , 8 C , S " $ ' 0 K P G (0 5 ' 0 K , " 0 G + H) 5 ' 0 K , + -) F # & 2 * " . . ( ) - ' 2 ' $ G ' 0 , " (* " * , a - * (* , $ ' + , H " $ ' (1 ' # + , - " 0 G # G P + $) (* G " 0 G . ( ) 4 * + + * C C , T ` ) ( 5 * ( + , + - ) F # & a * " + . , - " 0 G + , * 0 G J ' 4 * , 2 * J ) ( * , ' * " $ 0 K P G ( 0 5 ' 0 K , " 0 G + H ) 5 ' 0 K C O * H ) ` * , 4) 0 $ H ' 0 " $ ' G , 4 # $ ' 0 K , " 0 G . ( ) $ * 4 $ ' * , * E F ' 1 H * 0 $ 2 * J) (* , " 0 $ ' (0 K * " $ 0 K " (* " + C U `) ' ($ * N) + F (* , \ ) 2 $ ' 0 , + . * 4 ' # ' 0 + $ [F 4 $] 0 + 2 * J) (* , F + * C , R) , 0) $ K * $ ' 0 , * L " + ,) (,) 0 , + 5 ' 0 ,) (4 #] $ ' 0 K C , R) , 0) $ 2 (* " $ * , ' " .) (,) (, H ' + $ C , Q + * ,) 0 ± , a ' $, ." G ' E F " ' $ " * 0 $ # ' $] 0 C , T * " (, " . . ( ) . (1 ' $ ' , (* + . ' 1 " $ (, a - * 0 , " 0 $ # ' $] 0 , + . 0 " G ' E F " ' $ ' C , Z * * . . ' 0 , $ *) (' K ' 0 " # 4) 0 $ ' 0 * (,) (, " 0 , " . . ( ) " G " # $ (0 " $ 1 * , H " G ' , J) H , " , " 4) H . " $ 2 # , H " $ ' (1 ' # 5 * . $ $ K - $ ± , 4 # + " G a - * 0 , 0) $ ' 0 , F + * C , S H . $ L 4) 0 $ ' 0 * (+ (" $ ' 0 , . ( ) G F 4 $ (" + ' G F * , " 0 G 4 " 0 , 2 * - "] " (G) F + C , R) , 0) $ (* F + * , 4) 0 $ ' 0 " 0 ' (C

(# % P $: = $) (* , 2 * $ a * " 0 , $ * , J) # # a ' 0 K , $ H . , * (" $ F (* + b @ $) , 8 < 3 , ^ < > ' 2 , $) , 9 ? ' G d _ C , = $) (* , ' 0 * 4 4) (G ' 0 4 * , a ' $, # 4 * # (* K F # * $) 0 + C , = $) (* , ' 0 ,) (K ' 0 " # 4) 0 $ ' 0 * (, . ( ) $ 4 $ G , J) H , G (* 4 $ + F 0 # # < $ ' 0 , " , G L P 4)) (* " 0 G a * # # * 0 $ # ' $ " G " (* " P ' a " L J) H , ' 0 4) H . . " $ 2 # , H " $ ' (1 ' # # , ^ + * * + * 4 $] 0 , ' 6 . " 0 G J)) G " 0 G G] ' 0 5 C , Z * * . . 4) 0 $ ' 0 * (, $ < ' $ L 4 # + * G " 0 G + * " # G F 0 $ # (* " G L J) (F + * C , 3) 0 $ ' 0 * (+ , $ * " $ - " ' * , 2 * * 0 ,) . * 0 * G H F + $ 2 * 4 * (* , F # ± _ (* + * " # G " 0 G 5 * . $ F . (< - $ $] . (* ' * 0 $ # " 5 " K * C , R) , 0) $ + $ (* , ' 0 , F 0 # 2 * # G 4) 0 $ ' 0 * (+ C , Q + * , " . . ( ) . (1 ' $ ' , 4) 0 $ ' 0 H * 0 $ $] " ') ' (3 * 0 ` ' 0] 0 H * 0 $ # 4) 0 $ ' H ' 0 " $) 0 C

A 8 ? V 9 / <1 % $, 2 / 3 # % ' < $ 9 $ % / 3 " ' , 9 % # & 2 # & & 3

H 3 & & 5 0 , (# ' # & < | I 3 P % 0 & & 3 # | ? \ 9 / <1 % , ' & & | | =) G F H , J F) (1 G ' | G (> R , . ? ^ . _ D \ W 3 & & 5 0 , (# ' # & < ! N] 7 9 $ D E B U K & ' % ' U b @ @ > H K B H e 8 , -) F (^ + C) (H b R F + $! (> R , (# ' 3 0 " % , R & & A N 3 & & 5 0 , (# ' # & < > K & ' % ' U b @ @ > H K B H e 8 , -) F (^ + C R 5 ` I > , @ 6 , \ N 3 & & 5 0 , (# ' # & < ! N J S E B 7 E K & [/ # & < , " < Z ' % ' U b @ @ > H K B H e P ^ " + I _ 8 , -) F (^ + C [I G (> , ; ? ^ , \ M 3 & & 5 0 , (# ' # & < ! N J S E B E E K & [/ # & < , " < Z ' % ' U b @ @ > H K B H e P ^ " + I _ : 6 , -) F (^ + C G (> R , . ? ^ , \ N 3 & & 5 0 , (# ' # & < ! N J S E B 7 E K & [/ # & < , " < Z ' % ' U b @ @ > H K B H e P ^ " + I _ 8 , -) F (^ + C G (> R , . ? ^ , 7 E A E \ W 3 & & 5 0 , (# ' # & < ! N J S ' F E A E K & [/ # & < , " < Z ' % ' U b @ @ > H K B H e P ^ " + I _ 8 , -) F (^ + _ C

J $ U S U $ D B 7 7 8 : "] :

D t ' , = 4 ' ! 0 4 * , O * , + " ' (4 - . . . . . ' M - ,) N : , 7 , ... O) 4 5 J (G F D , . . . ^ 8 : > _ A ? & ! 6 7 9 7 . . . . . , a a s G * (H) (&) H ` ' ! (4 * ,:] $ * 4 - 0) # j K L _ 0 4 C _ . . . . < 7 9 7 , V Q & * (G ! 0 , 0) ' G . . . . . ? - : 6 > , ... ^ 8 : > _ A ? & ! 7 < : ? , ! ^ N

$ %&') * + ' . % . ,* 0- / 10 %% . . ,2 3 0 4 5 4 - + ,6 - 78 ' %&

A8? V9/ <1%$,2/ 3#%'<$9$%/ 3"' ,9 % #$2#& 3

5 " 3 " 0 "

G2219" #& 3 "' ,$ V9 / <1 %$,' & ! &(		@ R ,\ % - / 1 %X			(@^ ,\ % K 4 &9 <X			5 $ & & P			
I3P%9 0 & 3 #	^ &#3"4 $	994	4 PS! a	G# $%	994	4 PS! a	G# $%	994	4 PS! a	G# $%	[/ #& 3 <
=) GFH ,JF) ('G* P' +J	Q=,U3 W! ,@@@: 6 U: ,9@@6A : 3, A@@: 6 MV, 7@@: 6 h 3, 7@@68	\ \ \ \ \	@ @ @ @ @	\ \ \ \ \	\ \ \ \ \	\ \ \ \ \	\ \ \ \ \	\ \ \ \ \	\ \ \ \ \	\ \ \ \ \	fUg

[/ #& <:,fUg' +,I

5 / 3 <1'#,' / 2"' ,"1# / %&&$ <,)/ %' 22$9 #' =' $,$ V9 / <1 %$,' & ! &(8

; $2/ 4 4 $30 $0 ,4 / 3& ! %&P 9 %2$01 %$<

: /J,$ *+,. () GF4$4) 0$ '0+,0K{* Gf 0$+,a '$,*N) +F(*,#H 1%P. * (+) 0" #Pa) (5. # 4* ,"$H) +. - *('
) (,2 1) # K1#" #H) 0'$ ('0K,H "' L,2* ,(* EF1* G$) ,G' $' (H 0* ,$ *,* J! 4$1 * 0* ++,) J,$ *,. * 0$ # $1 0
) (,) $ * (,4) 0$1) #H * " +F(* +," 0 C$) (,$ *,0* 4" ++ &L,$) ,F+*,(* +. 1"' $) (L. () $' 4$1 *,* EF1 H * 0 $ C

?3 P& $ $ %& P,4 $" <1 %$<

: Q+*,) 0#L,a '$,"G* EF" '$' ,* 0$ # $1 0 C,Q+*,. () 4* ++,* 04# +F(* +P# 4" #* N +" F+$,` * 0$ # $1 0,) (
) $ * (,* 0K'D* * (' 0K,4) 0$1) #+,$) ,5* * . ,a) (5+*(,* N) +F(*,$,"1 2) (0* ,4) 0$' H '0" 09-,2* # a ,* 0L
(* 4) H H * 0G* G) (,+$ ' $ F$) (L,#H ! $ +C

> * P& $ 3$,4 $" <1 %$<

: T "+ - ,-" 0G+P,) (*" (H +," 0G,J' 4* ,$) () FK- #L,". J& (,-" 0G#0K,4- * H '1#" #, () GF4$+P2* ,) (*
* " $D K P+H) 5 'D K" 0G F+'0K,$ * ,# ' " $) (L," 0G" $& * ,* 0G) ,J,$ * ,a) (5 'D K. * (1) GC,U. . () . (1' $
$' 4- 0 'EF" +,+-) F#& 2* ,F+* G$) ,(* H) ` * ,.) $' 0 $' #L,4) 0$' H '0" $' G4# $ ' 0K C,T "+-
4) 0$' H '0" $' G4# $ ' 0K,2* ,J (* ,(* F+'0K C,S 0+F(* ,$ " $ * L* a " +- ,+$ ' $) 0+," 0G+" J' $L,+-) a * (-
" (* ,4# +* ,$,$ * ,a) (5+$ ' $) 0 ,# 4" $1 0C

, $%/ 3"' ,9 % #$2# & 3

; $<9 &%# %

: Q+*,". , . () . * (#L,J!& GP' 1\ F(1L 0K) (," 1\J' G(* +. 1" $) (,4) H . #L 0K,a '$ -,"0," . . () ` * G
+$' 0G' (G 1# ",(1+5," ++* ++H * 0$ 1 0G#" $' +,$ 1+,1+ 0* 4* ++" (LC,O* +. 1" $) (,+* # 4$1) 0 ,H F+$2*
2" +* G) 0,50) a 0) (," 0$#1 1 " $ G * N) +F(*,# ' * #+F$ * ,- "] " (G+,) J,$ * ,. () GF4$" 0G $ * ,+" J'
a) (5 'D K,#H 1'$+,) J,$ * ,+* # 4$' G(* +. 1" $) (C

> " 30 <

: 3 - * H 1#" #(* +1#$' 0$ P H . * (` 1 F+,K# ` * +,4) H . #L 0K,a '$,"0," . . () ` * G+$' 0G' (G+-) F#& 2*
a) (0," $" #$H * +,a - * 0,- " 0G#0K,4- * H 1#" #. () GF4$+,1\" ,(1+5," ++* ++H * 0$ 1 0G#" $' +,$ 1+,1+
0* 4* ++" (LC

? * $<

: =" J' $L,* L* a * " (,4) H . #L 0K,a '$,"0," . . () ` * G+$' 0G' (G+-) F#& 2* ,F+* G,a - * 0," ,(1+5
" ++* ++H * 0$ 1 0G#" $' +,$ 1+,1+,0* 4* ++" (L,$,"`) 1& * N) +F(*,$) ,#EF1 G+. # +- * +P H 1+$+,) (
GF+$ C

(L&

: ' *(+) 0" #. () $' 4$1 * ,* EF1 H * 0$ J) (,$ *,2) GL,+-) F#& 2* ,+* # 4$' G2" +* G,) 0,$ *,$' +5,2* 0K
. * (J) (H * G" 0G,$ * ,(1+5+,1 0 ') # * G" 0G +-) F#& 2* ," . . () ` * G 2L," ,+- * 41 '#+$2* J) (* ,- " 0G#0I
$ 1+,. () GF4$C

? 3 T & % 34 $ 3# " ,$ V9 / <1 % 2 / 3#%' <

: SH 1+1) 0+,J() H ,` * 0$ # $1 0,) (,a) (5,. () 4* ++,* EF1 H * 0$ +-) F#& 2* ,4- * 45* G$) ,* 0+F(*,$ * I
4) H . #L,a '$,$ *,(* EF1* H * 0$ +,) J,* 0 ` 1) 0H * 0$' # . () $' 4$1 0,# K1#" $) 0C,/0,+) H *,4" +* +P
JFH * ,+4 (F22* (+PJ%$ (+,) (,* 0K'D* * (' 0K,H) G U#" $') 0+,$) ,$ *,. () 4* ++,* EF1 H * 0$ a 1#2*
0* 4* ++" (L,$) ,(* GF4* ,* H 1+1) 0+,$) ,"44* . $' 2# ,# ' * #+C

E8. - * <&2" ' ," 30 ,2 - $4 &2" ' ,9 % 9 $ % &$ <

. - * <&2"' ,<#' #$

: DEF' GC

G0 / %

: MG) (# ++C

(/ '1=&&#

: =) #' 2#' ,' 0 ,$ * ,J) #) a '0K,H " $ ' (1' #b4) #G a " $ ' (C

D t', =4 † 04*, O' +*" (4- ..... ` M ,:) N ; . 7 ,..... O) 45 J (GF D ,..., *8: > _ A'8 \ 6797 ....., a a a G * (H) G) H
` † (4* ,:) $' 4- 0) # kL_64 C ,.... <797, V G& * (G' 0,0) " G ,..... ,? ; . 6> ,..... ,*8: > _ A'8 \ 7 <: ?, I " N

$ %&') * + ' . % . ,* 0- / 10 %% . . ,2 3 0 4 5 4 - + ,6 - 78 ' %&

7B8(# =&&#," 30 ,%" 2#&T &#

5 - $4 &" ' ,<#' =&&#

: % * ,. . () GF4$ '1+,+$' 2# C

5 / 30 &&& 3 <# ," T / &0

: V) ,+. * 41 !!4, G' $' C

I32 / 4 9" #&- ' $,4 " #5 %&' <

: V) ,+. * 41 !!4, G' $' C

> " Q' %/ 1<,0 $2 / 4 9 / <&&& 3 9 % 0 12 #<

: Q0 G' (,0) (H " #4) 0G$1) 0+,) J,+$,(" K* ," 0G F+* P- "] " (G) F+,G' 4) H .) +$1) 0,. () GF4 $ +,+-) F#G 0) $2* ,. () GF4* G C

. / << &-&&# /) ,- " Q' %/ 1<

: Q0 G' (,0) (H " #4) 0G$1) 0+,) J,+$,(" K* ," 0G F+* P- "] " (G) F+,(* " 4$1) 0+,a ' ## 0) $) 44F(C

%$" 2#& 3 <

778@ V&2/ '/ P&2" ' ,&&)/ %4 " #& 3

H 3 &&0 ,(# #& <

R 21#& # V&2&#

. % 012#&$ P%$0 &$ 3 #,3" 4 $	; $<1'#	(9$2&$<	+/ <$	?'V9/ <1 %$
G+) GFH G+ LG() K* 0. L() . . -) +. - "$'	D3 >6 ,/0- " # $1) 0,RF+$+," 0G,H '+$+	O" $	i 6G-8 ,H K$H D	9,-) F(+
=) GFH ,JF) ('G* $ '+) GFH ,$' $" ') N) ` " 0" G' $'	DR>6 ,M(" # DR>6 ,M(" # DR>6 ,M(" #	O" $ O" $ O" $	: 866 ,H K$H K < ,H K$H K <<6 ,H K$H K	\ \ \

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

5 - % 3&# V&2&#

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

I %&# #& 3 $ & / %& <& 3

. % 012#&$ P%$0 &$ 3 #,3" 4 $	; $<1'#	(9$2&$<	(2/ %	?'V9/ <1 %$	G=<$ %" #& 3
=) GFH ,JF) ('G*	SL* +,\ ,&) G' ("$' ,'('$ 0$	O" 22 '$	\	\	\

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

($3 <&&& 5 %

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

5 " %&8/ P$3 &&#

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

5 "' <<&&" #& 3

. % 012#&$ P%$0 &$ 3 #,3" 4 $	R5 ` I>	IR; 5	?. R	[IG(>	[@	G(>R
=) GFH ,JF) ('G* $ '1+) GFH ,$' $" ') N) ` " 0" G' $'	U9 \	< \	3 \	\ V) 0* C	`) ++2# \	\ V) 0* C

! 1# P$3 &&#

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

@&%# P$3 &&#

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

; $9 % 012#&T $ # V&2&#

5 / 32 '1 <& 3 $ 14 4 " %

: V) $" ' ` " #' 2# C

5 " 3 " 0 "

R 21#& # V&2&#

. % 012#&$ P%$0 &$ 3 #,3" 4 $	; $<1'#	(9$2&$<	+/ <$	?'V9/ <1 %$

D t', =4 † 04*, O' +*" (4- ..... ` M ,:) N ; . 7 ,..... O) 45 J (GF D ,..., *8: > _ A'8 \ 6797 ....., a a a G * (H) G) H
` † (4* ,:) $' 4- 0) # kL_64 C ,.... <797, V G& * (G' 0,0) " G ,..... ,? ; . 6> ,..... ,*8: > _ A'8 \ 7 <: ?, I " N

$ %&') * + ' . % . ,* 0- / 10 %% . . ,2 3 0 4 5 4 - + , 6 - 7 8 ' %&

778@ V&/ '/ P&" ' ,&)/ %4 "#& 3

G#) GFH G# LG( ) K" 0. L( ) . -) + . - "$"	D3 >6, /0- "# $4) 0,RF+$+," 0G H 1#$-	O" $	i 6G>8, HK€D	9, -) F(+
=) GFH ,JF) ('G" $ 1#) GFH ,$" $") N) ` " 0" G" $	DR>6, M(" # DR>6, M(" #	O" $ O" $	: 866, H K€$K <: ,H K€$K	\ \
	DR>6, M(" #	O" $	<<6, H K€$K	\

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

5 - % 3 &2 # V&2&#

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

I %&&# #& 3 $ / % <& 3

. % 012#€$P%0&3#3" 4 $	; $<1'#	(9$2&<	(2/ %	?\9/ <1%	G=<$%"# & 3
=) GFH ,JF) ('G"	SL* +, \, &) G" ("$" ,1('$ 0$	O" 22'$	\	\	\

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

($ 3 <&#&C&5 %

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

5 " 9&8& / P$ 3 &2&#

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

5 " " <<&,&2" #& 3

. % 012#€$P%0&3#3" 4 $	R5 ` I>	IR; 5	?. R	[IG(>	[@	G(> R
=) GFH ,JF) ('G" $ 1#) GFH ,$" $") N) ` " 0" G" $	U9 \	< \	3 \	\ V) 0 * C	') ++'2#	\ V) 0 * C

! 1# P$ 3 &2&#

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

@&%# P$ 3 &2&#

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

: $ 9 % 012#&T$ # V&2&#

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

7D8? 2/ '/ P&" ' ,&)/ %4 "#& 3

? 2/ # V&2&# : V) ,50) a 0, +K0 1#4 " 0$ * J/ * 4$ +,) (,4('$4" # - "] " (G+C

H 3 &$0 (# #&<

R] 1" #&2 $ 2/ # V&2&#

. % 012#€$P%0&3#3" 4 $	; $<1'#	(9$2&<	?\9/ <1%
=) GFH ,JF) ('G"	U4F$' ,S3 >6,@'@HKED U4F$' ,S3 >6,8>6666, FK€D.I (* +- ,a " $ (	U#K" * U#K" * ,\ ,=4* 0 * G' +H F+ +F2+. 4\" $F+,\ ,SN) 0 * 0$" #K() a $. - " +*	A?, -) F(+ 7@) F(+
	U4F$' ,S3 >6,A8666, FK€D.I (* +- ,a " $ (	R" . - 0 1', \ ,R" . - 0 1', H " K0" , \ V *) 0 " $' ,\ ,?, $) ,@, -) F(+	98, -) F(+
	U4F$' ,D3 >6,i <66666, FK€D.& " (0 * ,a " $ (	3 (F+$' 4 * " 0 +, \ ,3 (" 0K) 0,4(" 0K) 0, \ UGF#&	98, -) F(+
	U4F$' ,D3 >6,>: 666,$) ,?8666, FK€D.I (* +- a " $ (	I 1#- ,\ ,M04) (- L04- F+,HL5 1#+, \ >8G',HH ,\ ,: @ ,K	A?, -) F(+
	3 - ( ) 0 1#, VMS3 ,; : 6666, FK€D.I (* +- ,a " $ (	R" . - 0 1', \ ,R" . - 0 1', H " K0" , \ ,j k@ -) F(+	98, -) F(+
$ 1#) GFH ,$" $") N) ` " 0" G" $	U4F$' ,D3 >6,: ?>66,$) ,: A>66, FK€D.I (* +- a " $ (	I 1#- ,\ ,M04) (- L04- F+,$+- " a L$+4- " \ ,I (L, \ ,6C>,K	A?, -) F(+

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

. $ %&&+#&32 $ 9 $ P%0" = &&#

5 / 32'1 <& 3 $ 14 4 " % : V) $"" ` " #2# C

G# $%' 0T$%&,$)) $2#<

: V) ,50) a 0, +K0 1#4 " 0$ * J/ * 4$ +,) (,4('$4" # - "] " (G+C

7F8 + &<9/ <" ' ,2/ 3 <&0$%#& 3 <

b " <#&, 0&<9/ <"' : % * ,K" 0 * ("$") 0,) J a " +$ ' , +) F#G 2 * , " ` ) 'G" G) (, H '0 'H 1 * G a - * (* ` * (,) ++2# C, = K0 1#4 " 0$ EF" 0$8F + ,) J a " +$ ' , . () GF4$(" + 'GF" +, + -) F#G 0) $2 * , G#-) +* G) J, ` 1', $ * , J F#+* a * ( , 2F$ . () 4 * ++* G '0 , " , +F '$' 2#, * J/#* 0$ $ " " $+1 * 0$ . # 0$C, R 1#- ) +* , ) J, +F( . #+," 0 G 0) 0 \ (" 4L4# 2# . () GF4$+; ` 1', " ,#4!* 0 +* G a " +$ ' , G#-) +" #4) 0$ "' 4$) (C, R 1#-) +" #) J, $ 1#-, () GF4$P+) #F$) 0 + " 0G" 0L, 2L\ . () GF4$+, +) F#G " $" #$H * +,4) H . #L, a '$ ' , $ * , (* EF '(* H * 0$+,) J * 0 ` 1) 0H * 0$ # . () $'4$) 0, " 0G a " +$ ' , G#-) +" ## K1#* $) 0, " 0G " 0L, (* K) 0" ## 4" #" F$) (!&, (* EF '(* H * 0$+C T " " +$ ' , . " 45" K'0K +-) F#G 2 * (* 4L4 # 'GC, /04 !0 * ("$) 0,) (, # 0G!'#+-) F#G) 0#, 2 * , 4) 0 + 'G' (* G a - * 0, (* 4L4#!0K, 1#, 0) $J, " " +2# C, % 1#, H " $ (' 1 #" 0G, $+, 4) 0$ " 0 * (, H F+$2 * , G#-) +* G) J, '0, " +", J * , a " LC, 3 "(* , + -) F#G 2 * , $ ' 5 * 0, a - * 0 - " 0G#0K * H . $ 't G4) 0$ " 0 * (+, $ "$- " * , 0) $2 * * 0 4# " 0 * G) (, ('0+* G) F3C, SH . $L, 4) 0$ " 0 * (+) (, #0 * (+ H " L (* $ '0, +) H * , . () GF4$(* + 'GF" +C U `) 'G, G#- * (+" #) J, +. 1#' GH " $ (' 1 #" 0G (F0) J, " 0G, 4) 0$ '4$a '$, +) 1#, a " '$ (a " L+P, G" '0 + " 0G+* a * (+C

+ &<9/ <" ', <- / 1'0 , =$, &$, " 22/ %" 32$, M&# , " 9 9 '&2" = ' $, %P& 3 " ' N3 " #& 3 " ' , " 30 , ' / 2 " , ' " M<, " 30 , %P1 ' " #& 3 <8

; $)$%## , ($2#& 3 , J : > R[+ ^ I[` , R[ + , ( @G ; R ` ? , " 30 , ($2#& 3 , A , ? c . G(H ; ?, 5 G[@ G ^ (S ?, (G[R ^ , . ; G@? 5 @G[ )/ %' 0 0 &&, 3 " ' , - " 30 ' &P, &)/ %4 " #& 3 , " 30 , 9 %#&2#& 3 , /) , $ 4 9 ' / * $ $ <8

7C8@%3 <9/ %#&)/ %4 "#& 3

. $P1 '" # % &)/ %4 " #& 3	H[, 314 = $%	. %9 $ %<- &9 9 &P 3 " 4 $	5 ' " <<$<	. ` d
+ G@5 ' " <<&,&2" #& 3	V) $ (* KF# ' $ GC	\	\	\
IR@R\+ ` ; ,5 ' " <<	V) $ (* KF# ' $ GC	\	\	\

7C8@%3 <9/ %#,&8)/ %4 "#& 3

' W ,b' "45 0 K,K( ) F.

7K8; $P1'"# %,&8)/ %4 "#& 3

H3 8&5 0 .(# #&<

>5 (,5 '" <<8,&2" #& 3 : %) N#I,H "$' (1'#
/((' $ 0 K,H "$' (1'#
3 " (4 !0) K" 0
%' (K" $') (K" 0,* JJ' 4 $+

H8(8Z$ 0 $ %' ,%P1'"#& 3 < : @ 5 R,A/W(X, RI; b8(1+) GFH ,$ '$(") N\ ` "0" G' $'
@ 5 R,A/W(IH; ,?V\$4 9+#$ "%#&", $ V\$4 9+#& ,3 bV) $G' $' (H !0* G
H3 8&5 0 .(# #&<,&8T$3# %,V@ 5 R,A=)%U$# " +$) 0* ,4) H.) 0* 0$1+,0) $#+$' GC
5 / 4 4 $'%2$,2/ 3#%' ,&+#,9%$21%/ %=) GFH ,JF) (1'3'
(R; R,FEDSFBCSF77'5F7D,$ V#+#$4 $' * ,- "Q' %/ 1<,<1=<# ' 32$<b V) ,. () GF4$+,a * (* ,J) F0GC
(R; R,FEDSFBC,$4 $'%$32* ,9''' 33&8P," 30 ,3/ #&,&2" #& 3 bV) ,. () GF4$+,a * (* ,J) F0GC
(R; R,FEDSFBCSF77'5F7D,- " Q' %/ 1<,2- $4 ,&2"'' <b=) GFH ,JF) (1'3' n$(1+) GFH
$' $(") N\ ` "0" G' $'
(R; R,F77'5F7D,! (+(,0&+#&-1+#& 3 ,Y2- $4 ,&2"' ,&8T$3# %,Y- " Q' %,,&8 $ 3+#,&2" #& 3 b
=) GFH ,JF) (1'3' b/HH * Gf' $,^" 4F$' ,-+ * "+$,- "] " (GFR* # L* G^4- () 0 1+,_- * "+$,- "] " (Gm
$(1+) GFH ,$' $(") N\ ` "0" G' $' b R* # L* G^4- () 0 1+,_- * "+$,- "] " (G
5 '$" 3 ,b " #5 %R2#\5'b RXF77b=) GFH ,JF) (1'3'

5 '$" 3 ,R,&R2#,($2#& 3 : V) $+#$' G
77D/A#X(>" Q' %/ 1<,R,8%
. / " 1# 3#<,\WR. <X

5 '$" 3 ,R,&R2#,($2#& 3 ,UBD : V) $+#$' G
5 '" <<I ,(1=<# ' 32$<

5 '$" 3 ,R,&R2#,($2#& 3 ,UBD : V) $+#$' G
5 '" <<II ,(1=<# ' 32$<

+ ?R,^ &#I ,5 - $4 ,&2"' < : V) $+#$' G
W%21%/ %5 - $4 ,&2"' <X

+ ?R,^ &#II ,5 - $4 ,&2"' < : V) $+#$' G
W/<<$3#&' ,5 - $4 ,&2"' <X

(# #5 ,%P1'"#& 3 <

! " <<" 2- 1<$+#< : % * ,J) +# a '0K,4) H.) 0* 0$+," (*, +#+$' G b=MR/Q& ,I DQMO/RS
[$M,e / % : % * ,J) +# a '0K,4) H.) 0* 0$+," (*, +#+$' G b=) GFH ,JF) (1'3'
[$M,f $%$* : % * ,J) +# a '0K,4) H.) 0* 0$+," (*, +#+$' G b=MR/Q& ,I DQMO/RS
. $ 3 3<*' T" 3 & : % * ,J) +# a '0K,4) H.) 0* 0$+," (*, +#+$' G b=MR/Q& ,I DQMO/RS,^VUI _

H3 8&5 0 .(# #5 <,&8T$3# % : U$# " +$) 0* ,4) H.) 0* 0$1+,0) $#+$' GC
V@ 5 R,A=X

5 " 3 " 0 "

b >! I(,V$" 3 " 0 " X : 3 # ++,R\ : ; b& " $ (1'#4 " F+ 0K,1+H * Gf' $," 0G,+* (1 F+,$ N#I,* JJ' 4$+,^%) N#I_C
3 # ++,R\@ b& " $ (1'#4 " F+ 0K) $ * (,$ N#I,* JJ' 4$+,^n * (L,$ N#I_C
3 # ++,R\@ b& " $ (1'#4 " F+ 0K) $ * (,$ N#I,* JJ' 4$+,^%) N#I_C

5 " 3 " 0 &3 ,' &+#<

5 " 3 " 0 &3 ,[. ; I : % * ,J) +# a '0K,4) H.) 0* 0$+," (*, +#+$' G b=) GFH ,JF) (1'3' nn " 0" GFH
5 ?. R,@ V$2,<1=<# ' 32$< : % * ,J) +# a '0K,4) H.) 0* 0$+," (*, +#+$' G b/0) (K" 0 1+,JF) (1'3' +
5 " 3 " 0 " ,&8T$3# % : U$# " +$) 0* ,4) H.) 0* 0$1+,0) $#+$' GC

$ %&') * + ' . % . ,* 0- / 10 %% . . ,2 3 0 4 5 4 - +,6 - 78' %&

7K8; $P1'"# %,&8)/ %4 "#& 3

@ &,9% 0 12#- " <,=$$3,2" " <<8,&$0 ,&8," 22/ %" 32$,M8# ,# $,- " Q' %9,2%&$%&,./),# $,5 / 3#%' " $0 ,. %0 12#<,; $P1'"#& 3 <
" 30 ,# $,! (+(,2/ 3# &3<,"'', # $,&8)/ %4 "#& 3,%] 1&$0 ,=* ,# $,5 / 3#%" $0 ,. %0 12#<,; $P1'"#& 3 <8

I3#5%8" #& 3"' ,%P1'"#& 3 <

I3#5%3" #& 3"' ,' &+#< : R1<#%' &,,&8T$3# %,\R!5 ( )%V) $G' $' (H !0* GC
5 - &8" ,&8T$3# %,\R!5 (5)%V) $G' $' (H !0* GC
f " 9" 3 ,&8T$3# %b\V) $G' $' (H !0* GC
g / %$" ,&8T$3# %b\V) $G' $' (H !0* GC
[$M,,$'''' 30 ,I3T$3# %,/),5 - $4 ,&2"'' <,\W_I/ 5)%V) $G' $' (H !0* GC
. - &$9 8$ <,&8T$3# %,\WI5 5 ( )%V) $G' $' (H !0* GC

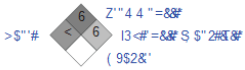
7U8G# $%&8)/ %4 "#& 3

^ "=$' ,%$] 1&$4 $3#< : ! UO&I QD,/I ,,/V! UDSR;MO,=T UDDMT SRC,3 UQ=S=,OS=' /OU%MOY,%OU3 %PSYS
UVR,=Z/V,/OO/%U%MVC,&,UY,; S,! UO&I QD,/I ,U; =MO; SR,%I OMQW! ,=Z/VC
3 MV%U/V=,& U%SO/UD,% U%3 UV,3 UQ=S,%UOWS%MOWUV,RU&,UWSC,=Q=' S3 %
3 UV3 SO,! U[UOR,\,3 MV%U/V=,& U%SO/UD,T ! /3 ! ,& UY,3 UQ=S,3 UV3 SOC

>" Q' %/ 1<,! " #5 %&' :
I3)/ %4 "#& 3,(* <#5 4 ,\Wl8(8R8(

@ $,21 <# 4 $%&<,%<9/ 3 <&'$,)/ %0 $+#5 %4 &8&P,# $,. . ?,2/ 0$,)/ %# &<,4 " #5 %&' 8

[" #& 3"' Z&5,. . %#5 2#& 3 :
R<</ 2& #& 3,\Wl8(8R8(



+" #5, /),9%&8#&8P : JUSB778
+" #5, /),&<<1$: 7@@B@@. : C
+" #5, /),9%T& 1<,&<<1$: V) ,. (* ') F+, ' " #G' $) 0C
6 $%&(3 : :
. %9" %0,=* : & = R=,=. * 41' #+$
◤ I30 &2" #5 <,&8)/ %4 "#& 3,# " #- " <,2- " 3P$0,)%4 ,9%T& 1<* ,&<<1$0 ,T$%&(38
[/ #&2$,# ,%" 0 $%

@ ,# $,:=$<#/),/ 1%L3,/ M' $0 PS\N# $,&8)/ %4 "#& 3,2/ 3# ,&8$0 ,- $%&8,&;" 221%#&8>/ MSTS%&8$,&# $%# $," =/ TS'&8" 4 $0
<199 '&%&8,/ %" 3*,./),&#<,<1=<<80 &%&<!)' <<14 $<," 3*," & = &&# ,M-" #=/ T%&/ %# $," 221%2*,./ %2/ 4 9' $+&3$<<,/),# $
&8)/ %4 "#& 3,2/ 3# ,&8$0 ,- $%&8 38
Z&8"' ,0$+&5%4 ,&8" #& 3,2/),<1&# =&&# ,/),"3*,4 "#5 %' ,&,,# $,</ '$,%<9/ 3 <&=&&# ,/),# $,1<$%R' ,4 "#5 %' <,4 "* ,9%<$3#
13L3/ M3,- " Q' %<," 30,<-/ 1' 0,=$,1<$0 ,M&# ,2" 1#& 38R' # / 1P- ,2$%# &8,- " Q' %<," %,0$<2%&-$0 ,- $%&8 NM$,2" 33/ #
P1' %3 #5$,# " ## $<$," %,# $,/ 3* ,- " Q' %<,# " #$V&#8

D!', =4 † 04*, O' +*" (4- ..... ' M,:) N:. ; 7, ... O) 45-J (GF!D,...,*8: >_A?8\6797 ..... ,a a a !3 * (H) !@ H
` † (4*:.) $'4-0) # kL,04C,.....<797, V!3L * (!5F!0,0)' G, ... ,?: - 8>, ... ,*8: >_A?8\7<: ?,! ^ N

Thermo SCIENTIFIC

The world leader in serving science

! $%& () * + - & / (0 1 ' ,

& '0$ *' - #3 &4 $" 1%$

("4 4 " '(#+&*'&# $& %012#
#3 1' - '3 & $0'"

) 1'# ($
/ #& 1'# ($
) $2'"(& / 1%$& " "%0

" "%/ 1 &# $%4 "(
0$2/ 4 / '#/ 3 & %012#

) $2'"(& %#&2# $
$ 1' 4 $3#&/ %#"% *' - #&%

& 22'0$3# (&#$($" $&4 $" 1%$

. $%/ 3" (& %2" 1#/ 3

3 '%34 $3#(& %2" 1#/ 3

! $# / 0 &/ %2($"'3'3 &4

) 4 "((& '((

"%$& '((

& "30('3 &30&# % $

"30(3

) # % $

& / 1%$&2/ 3#%($%/ 3" (& %#$2#/ 3

5 "3" 0"
221 "#/ 3" (& / 1%$&4 '#

5/ 3 1(#&/ 2" (&1# / %#$ &/ %&22$ # ($& / 1%$&4 '#

$2/ 4 4 $30$0&4 / 3'# %3
%2$01%$

3 '3$$%3 &4 $" 1%$

+ '3&4 $" 1%$

. $%/ 3" (& %#&2#/ 3

$ '%# %

"30

+$

) '3

3 '%34 $3#(& / 1%$
2/ 3#%(

& - + '2" (&'30&2- $4 '2" (& % $%#$

. - + '2" (&#'#&
5/ (/ %
0/ %
. ' $%' '(#+&.% $%#$
) / (1 '(#+

7 &) #' '(#+&'30&$" 2# '#+

5 - $4 '2" (&#' '(#+
5/ 30'#/ 3 &# & / '0
32/ 4 "# ($& "#5%' (
" "%/ 1 &0$2/ 4 / '#/ 3
%012#
. / ' '(#+&'&" "%/ 1
%"2#/ 3

! $%& () * +, - & / (0 1 ¥ ,

77 & / '2/ (/ '2" (&3*/ %4 "#/ 3

3'#50& #'#5

21#5& '2'#

. %012#'3	%0'$3#& "4 $	$ 1(#	) $2'$	, / $	/ 1%
%(*)" +		7 4" & %	/	3" & 5	

5/32(1 '/3) 14 4 "% -/&)% %6

5 - %3'2& '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

%& #/3 5/ %& '/3

5/32(1 '/3) 14 4 "% -/&)% %6

) $3 '# $%

5/32(1 '/3) 14 4 "% -/&)% %6

5" %2'3/ $3'2'#

5/32(1 '/3) 14 4 "% -/&)% %6

! 1# $3'2'#

5/32(1 '/3) 14 4 "% -/&)% %6

$%# $3'2'#

5/32(1 '/3) 14 4 "% -/&)% %6

$ %012# $& '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

5" 3" 0"

21#5& '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

5 - %3'2& '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

%& #/3 5/ %& '/3

5/32(1 '/3) 14 4 "% -/&)% %6

) $3 '# $%

5/32(1 '/3) 14 4 "% -/&)% %6

5" %2'3/ $3'2'#

5/32(1 '/3) 14 4 "% -/&)% %6

! 1# $3'2'#

5/32(1 '/3) 14 4 "% -/&)% %6

$%# $3'2'#

5/32(1 '/3) 14 4 "% -/&)% %6

$ %012# $& '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

7 & 2/ (/ '2" (&3*/ %4 "#/ 3

2/# '2'# -&*- *&) *))(*/& +(/ & &)/)(%& 6

3'#50& #'#5

1"#2&2/# '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

$%' #&32$ 0$ %0" '(#

5/32(1 '/3) 14 4 "% -/&)% %6

5" 3" 0"

! $%& () * +, - & / (0 1 ¥ ,

7 & 2/ (/ '2" (&3*/ %4 "#/ 3

1"#2&2/# '2'#

5/32(1 '/3) 14 4 "% -/&)% %6

$%' #&32$ 0$ %0" '(#

5/32(1 '/3) 14 4 "% -/&)% %6

$%& 0 $%$&*"$2# -&*- *&) *))(*/& +(/ & &)/)(%& 6

7 & ' / "(&2/ 3 '0$%#/ 3

" #&&0' / "(+& +" + /)-*& & /+& -. %& +& -) + & &)*)) + & + + + &-) %6&&) *))(*/ . */)+ & & /+& - . (/&+) . + & - . %& - /& +&) - + & &) & +& - %& + + &. / - (+ + &*& & &)/ %& & %+*/& + / +*/& %' /&&) - +& & % & * &- * +(' (% % - . (/ &) & &&%+* + & /+&) - %& - */ (/- &&&) - %& &) & - . (/ & - %) - * * & *' & - . (/ & - . %& /& %& + &) & +& -) + +*/ & &*) - * +*/ % - /+(/) * & * & /+&) - %&) %/) * & * & *' & +) * %& (%& . / -)/ & + .) + +*/ 6 /+& ( )* & - . %& + & +(' (% &&* ()* + /)- * & &% *)%& - . %& * %& + & - *) + + +* & +(' (% & & - /& +) %&&) & /+) %& * & /& - * /)* + & . /& +&) - + & & * & & +& ' &&& +& - . %& + & +* & * % & /)+ & & - */)* + & /& +& - /& ++* (% * + & &)* + & . /&& / & - * /)* + & &%+ & ' & +/)* & - +& - . (/& +) . + 6 -) &) + % & &)%& & /+) %& * & *- & * & - * / (/&)/ & -)%& /+ ' &)* * & + + 6

, ' / "(& - / 1 (0& $&3& 22/ %" 32$& '# & ('2" ($&%$ '/3" (&" #/ 3" (&30&/ 2" (&" &30&%$ 1("#/ 3

$*$%& & $2#/ 3& & , & , & &30& $2#/ 3& & .) &$) .) & 5

/ %& 00'#/ 3" (& " 30(3 &3/ % "#/ 3& 30& %#52#/ 3& *$4 (/ +$$

7 & %3 / %&&3*/ %4 "#/ 3

$ 1("# % '3*/ % "#/ 3	&14 $%	. % $%& - ' 3" 4 $	5(" $	.
, &(" '*"2"#/ 3	-/ + . %/+ 6			
, &("	-/ + . %/+ 6			

$ && ( )* & -.

7 & $ 1("#/ %&3*/ %4 "#/ 3

3'#50& #'#5

5) &(" '*"2"#/ 3)/ /)* & /+) % +/& *& +(/

) & 0%(&$ 1("#/ 3) 5 & " & & $4 #. "%"(& $4 #/ 3 & - /& +/+)* + 3'#50& #'#5 &3 $3# %&) 5 & & %%- -*+*/ & +&%/+ & & + /+ 6

) & 77 7 & #$4 $(+& " "%/ 1 &1 #'32$ & - & - . (/ & + +& . * 6

) & &4 $%$32+& ("33'3 &30&/ #"2"#/ 3 & - & - . (/ & + +& . * 6

) & 77 7 & " "%/ 1 &- $4 '2"(& %(*)" +

) &77 7 &) ,) &0' #% 1#/ 3&&2- $4 '2" (&3 $3# %&& " "%&0$3#"2"#/ 3 %(*)" + & +) /+& (. /+ & + % &

5($" 3& '%& 2#&$ $2#/ 3 -/&%/+

77 & " "%/ 1 & '%

. / ((1#' 3# & .

5($" 3& '%& 2#&$ $2#/ 3& -/&%/+

5(" & &1 #'32$

5($" 3& '%& 2#&$ $2#/ 3& -/&%/+

5(" & &1 #'32$

! $%& ()*+,-&/(01#,

7 & $ 1("# %&3*/ %4 "#/ 3

! $%& ()*+,-&/(01#,

7 & # $%&3*/ %4 "#/ 3

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&' () "*$#+(, "#" () - $$#

! " # ($ %&(%))* +

78(. %012#(" 30 (2/ 4 9" 3 +(&0$3#&%2" #&% 3

. %012#(3" 4 $	:	! " # ($ %&(%))* +	
) +3/ 3 +4	:	$, - . / , 0 1* (%))* +* 2 (&0365* 6(7" #	
) 199' &%	:	B, * +C - (D4 , * +(&E+ 5 1+E $ 4 +E" (%4 1* E 5- 3 FG $ 7+ H 7% I (77= J - E+}- +2 6U@ 77" M N5 4 1* 2 (& 0 1* . 87M<; 87 =: =(- + 8" " 78=: '8=! 9	! " 31*" 2#! %%	: B, * +C - (D4 , * +(&E+ 5 1+E $ 4 +E" (%4 1* E 5- 3 FG $ 7+ H 7% I (77= J - E+}- +2 6U@ 77" M N5 4 1* 2 (& 0 1* . 87M<; 87 =: =(- + 8" " 78=: '8=! 9
5 / 0 $	:	""! 89: 8(78; 7; 77(78; 7; <8(78; ! ! 7=(78; ! ! ! : (7<" 78";	
!) .) (O		=; MM	
6"' &0" #& 3(0" #$	:	7>78 +" 7! ?	
. %&#0" #$	:	7>78 +" 7! ?	
; $<9 / 3 <&=' $(3" 4 $		O &P &(&/ * E+0 4 1	
		5 > ?! @ ?5 : ABB8CDC8EFBB GH@ I, ?(H) : JBF8+CDJ 8FAAJ	! "#$%&' (1 <$< : $ "$'%#(# $(&<#%2#& 3 =/ / L'$#"/ %9 %9$%' 30 &#$30 $0(1<$8(G# $'%1&<$N 2/ 3# 2#(<199' &$%&/ %<9$2&& "99' &" #& 3 <8
. %012#(#+9$	:	@A -2?	

D8(> " Q' %0 <(&0$3#&%2" #&% 3

?4 $%E$32+(/ T$%&M		
. - +<&" ' (<# #&	:	@A -2? (\/ 3 0 +(. / 0 +K36F(3# A -2? \/W
5 / ' / %	:	V- 3 -8 . . ?
G0 / %	:	H2- -8 . . ?
) &?3" ' (M/ %	:	X YJ RLRZ [
>" Q' %0 (<# #&4 $3#<	:	VYN&Q&(J Q&$\LJ YB HJ \ (BJ YVB6(Q\ Q(YRP (&] LR(LJ J LBYB\LH R?((VHR BY\R& OYBQJ LY@E^ YB(VYR(VYN&Q(BYJ Z QB(HJ Z YR(PYOYZ Q?
. %2" 1#& 3" %(4 $" <1 %<	:	P- (5- 1_ -# 0 1 * (b0 / - +(- +(C 4 1?(N. * (- 5 3 S 4 (02* A 0 1* (b* 5 1 4 0 1 4 5 ?(P- (5- 1* 0 1 6 2 +5 K(- + _C - K* (S, * 5 (' . 45F(1 4 (/ + 2' E1?((Y b- -2(E- 5 1 0 E1 S 4 ((* G . 6(. K45 (052(E3 1 .45F?(() * * / E- 5 1 0 4 5* +(1 F, 1 3 3 E3 . * 2?((X 0. , (1 - + ' F, 3 3 4 0)1* +(, 052 3 6F?
G) > R9 > 5) (<# #1 <	:	B, 4 (C 0 1* +0 2 4 (E- 5. 4 2* -# 2 (, 0 T0 +2 - ' . (_G 1 * (H & ^ Y(^ 0 T0 +2(V- C C ' 5 4 E0 1 4 5 (& 1 0 5 2 0 -2 '! <(VDJ (7<7" 7?! " " a?	
; / 1 #5 <(/ *($3#%	:	P* +C 0 3(E- 5 1 0 E1?(Q\3 (E- 5 1 0 E1?(L5, 0 3 0 1 4 5 ?(L5 F* . 1 4 5 ?	
/ #5 3 #&' (" 2 1 #5 (- $" ' # ($ ** $2 #<			
I3 - " ' " #& 3	:	L+#D 1 5 F(1+ (-# . / 4 0 1 + G, G 1* C ?	
I3 P$ <#& 3	:	R- (K5- S5 (. 4 F5 4 ED 5 (*))* E1 (- +(E+#ED 3 , 0 T0 +2 . ?	
) L&	:	L+#D 1 5 F(1+ (. K45 ?	
? +$<	:	L+#D 1 5 F(1+ (* G . . ?	
/ #5 3 #&' (2 - %3 2(- $" ' # ($ ** $2 #<			

$%&( ) * () +,,- .

D8(> " Q' %0 <(&0$3#&%2" #&% 3

5 - % 3 2(S** $2#<	:	V- 5 1 0 4 5. (C 0 1* +0 3 (1 0 1 E0 5 (E0' . * (1 0 +F* 1(- +F 0 5(20C 0 F* ?
5 " %2&/ P S3 2&#+	:	R- (K5- S5 (. 4 F5 4 ED 5 (*))* E1 (- +(E+#ED 3 , 0 T0 +2 . ?
! 1# P S3 2&#+	:	R- (K5- S5 (. 4 F5 4 ED 5 (*))* E1 (- +(E+#ED 3 , 0 T0 +2 . ?
@ %# P S3 2&#+	:	R- (K5- S5 (. 4 F5 4 ED 5 (*))* E1 (- +(E+#ED 3 , 0 T0 +2 . ?
, T' / 94 $3#" ($** $2#<	:	R- (K5- S5 (. 4 F5 4 ED 5 (*))* E1 (- +(E+#ED 3 , 0 T0 +2 . ?
YS %&#+ ($** $2#<	:	R- (K5- S5 (. 4 F5 4 ED 5 (*))* E1 (- +(E+#ED 3 , 0 T0 +2 . ?
@ %P$#/ %P" 3<	:	V- 5 1 0 4 5. (C 0 1* +0 3 (S, 4E. (ED' . * . (20C 0 F* (1+ (1 * ()- 3 B S 4 5F(- 4F 0 5. d(* G . ? V- 5 1 0 4 5. (C 0 1* +0 3 (S, 4E. (C 0 G ED" . * (20C 0 F* (1+ (1 * ()- 3 B S 4 5F(- 4F 0 5. d(. K45 6(. 1+ C 0 E, ?
GTS %&U9/ <1 %(<$P3 <S<+4 9 # 4 <			
I3 - " ' " #& 3	:	Y2b* + * (. GC / 1+ C . (C 0 G(45 E3 2* (1 * ()- 3 B S 4 5Fd +* . / 4 0 1 + G 1 4 0 E1(4+#D 1 4 5 E- ' F, 45F	
I3 P$ <#& 3	:	R- (. / * E4 4E2 0 1 0 ?	
) L&	:	Y2b* + * (. GC / 1+ C . (C 0 G(45 E3 2* (1 * ()- 3 B S 4 5Fd 4+#D 1 4 5 +* 25* . .	
? +$<	:	Y2b* + * (. GC / 1+ C . (C 0 G(45 E3 2* (1 * ()- 3 B S 4 5Fd / 0 4 5(- +(4+#D 1 4 5 S 0 1* +45F +* 25* . .	
! $0 &" ' (2/ 3 0 &#& 3 < "PP %T" #& 0(=+(/ T$% $U9/ <1 %	:	$ -# c! 4 1 4 5F(24 - -2* + (45 b- 3 b 4 5F(05 G(1 0 -F* 1(- -F 0 5. (C * 5 1 4 5* 2(45(1 4 (O &P &(0. (_ * 4 5F(01 +1 K(C 0 G(_ * (0 FF-0 b 0 1* 2(_G(- b* -c* ! / - . ' -# (1+ (1 4 (/ + 2' E1?	

) $$(# U&2/ ' / P&" ' (&8 */ %1 " #& 3 (N/ $2#& 3 (77W

F8(5 / 4 9/ <&#& 3 S&8 */ %1 " #& 3 (/ 3 (&8 P%$0 &$3#<

H3 &$0 () #' #&<

Z " 4 $	5 R) (3 1 4 =$%	[
. - 24 C (E, 3 +2*	=; : =o7: dM	7" (q! "
. - 24 C (24 G2+ F* 5 - +(, - . / , - . / , 0 1*	=MM8c8" c=	7(q 9

@ $%(" %(3 / (" 0 0 &#& 3 " ' (&P %0 &$3#:(9 %<$3#(M- &2- N M8# &8 (# $(21%%$3#L3 / M' $0 P$(// *(# $(<199' &$%' 3 0 (&8(# $ 2/ 32$3#%#&. 3<(" 99' &2" ='$N' %(2" <<&$&0 (" <(- " Q' %1 / 1<(# (- $" ' # (/ %# $(S3 T&&34 $3#(" 30 (- 32(%\ 1 8&$(%9 / %&0 F(8 # &<(<$2#&. 38

C8(Y&%6#(" &0 (4 $" <1 %<

? +$(2/ 3# 2#	:	V, * E+(}- +(052(+* C - b* (05 G E- 5 1 0 E1(3 5. * . ?((LC C * 24 0 1* 33)) 3 . , (* G . (S4 1 (/ 3 5 1 3(-)(S0 1* +)- +(0 1(3 0. 1 7(M C 4 5' 1* . 6(- E E0. 4 50 3 3(3 4 1 5 F(1 * (' / / * +(052(3 S* +(* G 32. ?((Z * 1(C * 24 E0 3 0 1 1* 5 1 4 5(4 C C * 24 0 1* 33?
) L&(2/ 3# 2#	:	L5(E0. * (-)(E- 5 1 0 E1?64 C C * 24 0 1* 33)) 3 . , (K45(S4 1 (/ 3 5 1 3(-)(S0 1* +(}- +(0 1(3 0. 1 7(M C 4 5' 1* . S, 4? (+* C - b 4 5F(E- 5 1 0 C 4 5 0 1* 2(E3 1 .45F(052(. , - * . ?(X 0. , (E3 1 .45F(_ *)- +* (+* . * ?((V3 05 . , - * . (1 - + ' F, 3 3 (_ *)- +* (+* . * ?((Z * 1(C * 24 E0 3 0 1 1* 5 1 4 5(4 C C * 24 0 1* 33?
I3 - " ' " #& 3	:	O - b* (* ! / - . * 2(// * + - 5(1 - ()-# . , (04?(L)(5 - 1_ -# 0 1 .45F(8 4)(_ -# 0 1 .45F(4 (4+# F 3 0 +(- +(4 +# . / 4 0 1 + G 1 0 +# . 1(- E E: + 6(// + b 4 2* (0 +#4 E0 1* # . / 4 0 1 4 5(- ?(+ - ! G F* 5(_ G(1 4 0 .45* 2(/ * + - 55* 3? @ -. * 5(1 F, 1 E3 1 .45F(. ' E (0. (0(E- 3 8 1 4 1# 6(_ * 3(- +(S0 4 1 052?((Z * 1(C * 24 E0 3 0 1 1* 5 1 4 5 4 C C * 24 0 1* 33?
I3 P$ <#& 3	:	X 0. , (-' 1(C - ' 1, (S4 1 (S0 1* +2((P- (5- 1 4 52' E* (b- C 4 1 5F(' 5 3 . . (24# E1* 2(1+ (2- (. - (_ G C * 24 E0 3 / * + - 55* 3((R* b* +(F+b* (05 G 1 .45F(_ G C - ' 1, (1+ (05(' 5E- 5. E4* . (// * + - 5?((Z * 1(C * 24 E0 3 0 1 1* 5 1 4 5(4 C C * 24 0 1* 33?

$%&( ) * () +,,- .

C&(Y&/&#(" &0(4 $" <1 %$<

. %#&2#&& 3(/ *(" &&#%' &0$ % : R- (0E14 5(. . 03[_ * (1 0K* 5 (4 5b- 3 4 5F(05 G/ * + - 503 +4 K(- +(S 4[- ' 1(. ' 40_ 3 (1 +0 4 5 4 5F ?(L)(4[4 . ' _ / * E1* 2(1 0 1) C * . (0 +[. 1&9/ +[. * 5 1 6 (1 * (+[* . E * +(_ . - ' 3((S * 0 +(05(0/ / + / +0 1* (C 0 . K(- + * 3(E- 5 1 0 4 5 * 2(_ +[0 1 . 4 5F(0 / / 0 +0 1 . ?((L)(C 0 G[_ * (205F* + ' . (1 (1 * (/ * + - 5(/ + b 2 4 5F(0 4 2(1 F 4 5 * (C - ' 1 c1 cC - ' 1 (+[. ' . E 4 0 1 4 5 ?

Z / #&<(# (9 - +<&2&3 : R- (. / * E 4 4E(1+[0 1C * 5 1?((E+[0 1(GC / 1 C 0 1 4E0 3 3(?(V- 5 1 0 E1(/ - 4 - 5(1+[0 1C * 5 1(. / * E 4 0 3 4 1 4 C C * 2 4 0 1 3 3 4 (3 0 4 F* (A' 0 5 1 &&#. (, 0 b* (_ * * 5 (4 5F* . 1 * 2(- +(&, 0 3 2 ?

K&(Y&/&$X'&P- #&&P(4 $" <1 %$<

Y" * 4 " =&&#(/ *(# $(9 % 0 1 2 # ?(L&&P1&=- &&P(4 $0 && : L5(0()4# (- +4(, * 0 1* 2 6 0(/ # . . ' + (4 5E+* 0. * (S-4&- EE +(052(1 * (E- 5 1 0 4 5 * +(C 0 G[_ ' + 1?

) 1&#' =' $: N. * (05(* I 1 6 5F ' 4 , 4 5F(0F* 5 1(. ' 40_ 3 ()- +(1 * (. ' + ' * 52 4 5F()4# ?

Z / #(<1 &#' =' $: R- 5* (K5- S5?

) 9 $ 2 &' ($ U9 / <1 %(- " C[' %< : $ + C / 1 G 3 4 - 3 0 1* (1 * (. E* 5 * (_ G+[* C - b 4 5F(0 3 3(/ * + - 5. ()+ C (1 * (b 4 E 5 4 G - +(C 4 1 6[_ * (/ + E * . . (5 E 3 . ' +[. 6 3 E 0 3[* I . 0' . . 1 b* 5 1 4 0 1 4 5(- +(- 1 * +(* 5 F 4 5 * * 4 5F(E- 5 1 + 3 1 (K* * / (S - +K* +(* I / - . ' +[* (1 - (0 4 [_ - +5 * (E- 5 1 0 C 4 5 0 5 1 (_ * 3 S(05 G+[E- C C * 5 2 * 2(- +(. 1 0 1 1 - +G 3 C 4 1 ?

>" C['%/ 1 <(# $ %' ' 0 $ 2 / 4 9 / <&&# 3 (9 % 0 1 2 #< : P * E- C / - . 4 1 4 5(/ + 2' E1 (C 0 G[+5E3 2 * (1 * ()- 3 [S 4 5F(C 0 1* +0 3 d / , - . / , - . + . (- I 4 2 * . , 0 3 F * 5 0 1 2 (E- C / - ' 5 2 . C * 1 0 3[- I 4 2 * > I 4 2 * .

) 9 $ 2 &' (9 % #&2#&[$ $ \ 1 &4 $ 3 #(" / %'&&X'&P- #&% : D4# g4F, 1* + (. , - ' 3 2(S * 0 1(0/ / + / +0 1* (/ + 1* E1&b* (* A' 4 C * 5 1(052(. * 3(E- 5 1 0 4 5 * 2(_ +[0 1 4 5F 0 / / 0 +0 1 . (`&V%Ya(S4[ (0(1` 3[)0E2 ' d' 4 E2 ' (- / * +0 1* 2(4 5(/ - . 4 &b* (/ +' . . +* (C - 2 * ?

] &(R22&0$3# ' (%$' $" <$(4 $" <1 %$<

. $%/ 3 "' (9 %2" 1 +&3 < : R- (0E14 5(. . 03[_ * (1 0K* 5 (4 5b- 3 4 5F(05 G/ * + - 503 +4 K(- +(S 4[- ' 1(. ' 40_ 3 (1 +0 4 5 4 5F ?
Qb0E. 0 1* (. ' ++ " 52 4 5F(0 +[0 . ?((] * * / (55 * E2 ' . . 0 +G 3 (052(. 5/ + 1* E1* 2(/ * + - 55 * 3[)+ C * 5 1* +5F?((P- (5- 1(1 ' E (-. +(S 0 3 K(1 + * F, (. / 4[2 (C 0 1* +0 3[(Yb- 4 2(_ +[0 1 4 5F(b0/ - +(- +(C 4 1? $ + b 2* (02* A' 0 1* (b* 5 1 4[0 1 4 5 ?((X * 0 +(0/ / + / +0 1* (+[* . / 4 0 1 +(S, * 5(b* 5 1 4[0 1 4 5(4 4 5 0 2 * A' 0 1* ?((S '] (- 5(0/ / + / +0 1* (/ * + - 503[/ + 1* E1&b* (* A' 4 C * 5 1(. * * (&* E1 4 5(8 a?

? 3T&&34 $3# ' (9 %2" 1 +&3 < : Yb- 4 2(24 / * + 03 -)(. / 4[2 (C 0 1* +0 3 052(+5 -))(052(E- 5 1 0 E1(S4[(. - 4&(S 0 1* +5 0 G 62 4 0 4 5. 052(. * S * + ?((5)- +C (1 * (+[3 'b 05 1 0' . 1 - +4[+. (4((1 * (/ + 2' E1(. 0. (E0' . * 2(* 5b4+ 5C * 5 1 0 3 / - 3[1 4 5(. * S * + 6(S 0 1* +5 0 G 6(. - 4[- +(0 4 a?

! $# / 0 <(*/ %2' $" 3&&P(1 9

) 4 " " (<9 & : &1 / (3 0 K(4(S4[- ' 1+4 K?(O - b* (E- 5 1 0 4 5 * + ()+ C (. / 4[0 0+[0 ?((P-(S 4[(S 0 1* +052(C - / (' / 4(S 0 1* +c - 3 _ 3 ?(Y3[* +5 0 1b* 3 G[- +4(S 0 1* +G5. - 3 _ 3 6(0 _ - + _ (S 4[(05(4 5* +[2+G(C 0 1* +0 3 052 / 3 0E2 (4 5(05(0/ / + / +0 1* (S 0. 1* (24 / - . 0 3[E- 5 1 0 4 5 * +[(P-4 7 - *(-)(b 4 0((3[E* 5. * 2(S 0. 1* 24 / - . 0 3[E- 5 1 4 0 E1 +?

^ " %P$(<9 & : &1 / (3 0 K(4(S4[- ' 1+4 K?(O - b* (E- 5 1 0 4 5 * + ()+ C (. / 4[0 0+[0 ?((Y// + - 0E (+* 3 0 . * ()+ C ' / S 4 5 2 ?(S +* b* 5 1(* 5 1+K(4 5 - 1 (. * S * + 6(S 0 1* +E - ' +* . 6[_ 0 . * C * 5 1 (- +(E- 5) 4 5 * 2(0+[0 . ?((X 0. , . / 4[0 F * . (4 5 1 (05(*)) 3 * 5 1(1+[0 1C * 5 1(/ 3 0 5 1(- +(/ + E * * 2[0. ()- 3[S. ?((V- 5 1 0 4 5(052(E- 3[E1 . / 4[0 F * (S 4[(5 - 5 4 E C . ' . 1+[3 ?[0 . . - + * 5 1(C 0 1* +0 3[* F ?(. 052 6(* 0+1 6(b* <C 4 E- 3[* (- + 2 4 0 1 C 0 E2 - ' . (* 0 +1 (052(/ 3[E* (4 5(E- 5 1 0 4 5 * +(). - +(24 / - . 0 3 0 E E- 4 2 4 5 F(1 (3 E0 3[+ F * 3[1+[5. ' . * * (. * E1+ 5(79 a((P 4 / - . *(-)(b 4 0((3[E* 5. * 2(S 0. 1* (24 / - . 0 3[E- 5 1 0 E1 - 4(V- 5 1 0 C 4 5 0 1* 2 0 . . - + * 5 1(C 0 1* +0 3(C 0 G[/ - . * (1 * (. 0C * (. 0T0 4 2(0. (1 * (. / 4[2 2(/ + 2' E1(R- 1* +[. * * (. * E1+ 5 7((]- +(* C * +F * 5E3[E- 5 1 0 E1(4 5)- +C 0 1+ 5 (052(. * E1+ 5(79())- +(S 0. 1* (24 / - . 0 3 ?

J&(>" 3 0 ' &&P(" 3 0 (<# %P$

>" 3 0 ' &&P : $ ' 1- 5(0/ / + / +0 1* (/ * + - 503 (/ + 1* E1&b* (* A' 4 C * 5 1(. * * (&* E1+ 5(8 a((Q 0 1 5F 6 2 +5 K 5F(052 . C - K 5 F(_ . - ' 3 2(_ * (/ + , 4 4 2(4 5(0+[0 . (S, * +[(1 4 (C 0 1* +0 3 4 (. 052 3 2 6(. 1- +[2(052 / + E * . . * 2 ?((X - +K * + (. , - ' 3 2(S 0. , (. 052. (052()0E2 (_ *). +[(* 0 1 5F 6 2 +5 K 5F(052(. C - K 5 F ? J * C - b* (E- 5 1 0C 4 5 0 1* 2(E3 1 4 5F(052(/ + 1* E1&b* (* A' 4 C * 5 1(_ *). +[(* 5 1* +5F(* 0 1 5F(0+[0 . ? P- (5- 1 4 5F* . 1?((Yb- 4 2(E- 5 1 0 E1(S4[(* G ' . 6[. K 5(052(E3 1 4 5F ?((Yb- 4 2(_ +[0 1 4 5F(b0/ - +(- +(C 4 1? N. * (- 5 3[S 4[(02* A' 0 1* (b* 5 1 4[0 1 4 5 ?((X * 0 +(0/ / + / +0 1* (+[. / 4 0 1 +(S, * 5(b* 5 1 4[0 1 4 5(4 4 5 0 2 * A' 0 1* ?((] * * / (4 5(1 * (- +4F 4 5 0 3[E- 5 1 0 4 5 * +(- +(05(0/ / + b* 2(0 3[* 4 5 0 1b* (C 0 2* ()+ C (0 E- C / 0 1 4 3 (C 0 1* +0 3[K* / 1+F, 1 3[E3 . * 2(S, * 5(5- 1 4 5(' . * ?((QC / 1 3[E- 5 1 0 4 5 * +(1* 0 4 5

7S'AS0E7D8 / "#

@" (&5+ 5E* (J * . * 0 +E. ((((((((($ H(%+ I (77=(((((((((((((((((((J - B(- +2 8&@(((' 87M&(<; 8 d' =. =((((((($SS%"(* +C - 'E- C $ 4 +2* (%4 + 'E 5 - 3 FG(5E*(((((($=: =(R7O* +E4 5(J - 02(((((((((((; 77 * M(((((((((' 87M&(<; 8 o=97; (D0I

$%&( ) * () +,,- .

J&(>" 3 0 ' &&P(" 3 0 (<# %P$

/ + 2' E1(+[. 4 2' * (052(E0 5(_ * (. 0T0 - 2 - ' . ?((P- (5- 1(+[* . * (E- 5 1 0 4 5 * +?

) # %P$: &1 +[(. * 5 * * 5(1 * ()- 3[S 4 5F(1 * C / * +0 1 +[. ((] * (1 (! M&V(; 8(1 (==eDa?(&1 +[(5((0E5 +205E* S 4 1 (3 E0 3[+ F ' 3 0 1 4 5 . ?((&1 +[(5(- +4F 4 5 0 3[E- 5 1 0 4 5 * +(/ + 1* E1* 2(])+ C (2 4* E1(_ * 5 3F_ 1 4 5((0 2 +G 6 E- - 3 0 5 2(S * 3 b 5 * 5 1 4[0 1* 2(0 +[0 6 0 S 0 G[)+ C (4 5E- C / 0 1 4 3 (C 0 1* +0 3 (. * * (. * E1 4 5(7" a[0 5 2) - - 2(0 5 2(2 +6 K?((] * * / (E- 5 1 0 4 5 * +1F, 1 G[E3 . * 2(0 5 2(_ * 5 1 4[0 1* 2 G 3[)- +(. * ?((V- 5 1 0 4 5 * + 1 , 0 1[, 0 b* (. * 5(- / * 5 * 2(C ' . 1[_ * (E0 +*] 3 G[+(. * 0 3 2(0 5 2(K* / 1[' / +F, 1 1- (/ +' b * 5 1[3 0 K 0 F * ? P- (5- 1[. 1- +(4 5(. 5 3[. * 3 2(E- 5 1 0 4 5 * + ?((N. * (0 / / + / +0 1* (E- 5 1 0 4 5 C * 5 1 1- (0 b- 4 2 * 5 b 4 + 5 C * 5 1 0 3[E- 5 1 0 C 4 5 0 1 4 5 ?

A&(? U9 / <1 %$(2 / 3#%' <$9 $%/ 3" ' (9 % #&2#&& 3

5 " 3 " 0 "

G2219" #&& 3 "' ($U9 / <1 %(& &<

R- (* I / - . ' # (3C 4[0 3 * (K5- S5?

5 / 3 <1 ' #(/ 2 "' (" 1 # / %&&$<(*/ % 22$9 #' =' $($U9 / <1 %(' & &<8

; $2 / 4 4 $3 0 $0(4 / 3 &# %&P 9 %2 $0 1 %< : I)(1 4 1(/ + 2' E1(E- 5 1 0 4 5 . (4 5F * 2 4 * 5 1 (S 4[(* I / - . ' * (3C 4[6(/ * + - 503[S- +4(/ 3 0E2 (0 1C - . / , * # - +(_ 4 3 F+E0 3[C - 5 4[- +5F(C 0 G[_ * (+# A' 4# 2(1+(2* 1* +C 4 5 * (1 * (* ()) * E1&b* 5 * . . (-)(1 * (b* 5 1 4[0 1 4 5 - +(- 1 * +(E- 5 1+ 3[C * 0 . ' * . (052> +(1 * (5* E* . . 4 1 G 3+(. _ * (+# . / 4 0 1 +(3(/ + 1* E1&b* (* A' 4 C * 5 1?

?3P&$$%&&P(4 $" <1 %< : N. * (- 5 3[S 4[(02* A' 0 1* (b* 5 1 4[0 1 4 5 ?((]((. ' * +(- / * +0 1 4 5. (F* 5 * 4 0 1* (2' . 1 6[) C * . 6[F 0. 6(b0/ - + - +(C 4 1 6[_ * (/ + E * . . (* 5 E 3 . ' +[. 6 3 E 0 3[* I . 0' . . 1 b* 5 1 4[0 1 4 5(- +(- 1 * +(* 5 F 4 5 * * 4 5F(E- 5 1+ 3 1 (K* * / (S - +K* +(* I / - . ' +[* (1+(04+_ - +5 * (E- 5 1 0 C 4 5 0 5 1 (_ * 3 S(05 G+[E- C C * 5 2 * 2(- +(. 1 0 1 1 - +G 3 C 4 1 ?

> +P&3(4 $" <1 %< : X 0. , (. 052. 6[)- +[0 +C . (052()0E2 (1 - + ' F, 3 3 0)1* +(. 052 3 6F(E * C 4 E0 3[/ + 2' E1 6[_ * (+ * 0 1 5 F 6[. C - K 5 F(052(' . 4 5F(1 * (3 0 b 0 1 +G 052(0 1 (1 * (* 52(-)(1 * (S - +K 5 F(/ * + 4 2?((Y) / + / +0 1* 1* E. 5 4 \ * . (. - ' 3 2(_ * (' . * 2(1+(+* C - b* (/ - 1* 5 1 4 0 3 G[E- 5 1 0 C 4 5 0 1* 2(E3 1 4 5F ?((X 0. , E- 5 1 0C 4 5 0 1* 2(E3 1 4 5F(_ *) - +[(+* . 4 5F ?((X 0 (K * * / (S - +K* +(* I / - . ' +[* (1 (04+_ - +5 * (E- 5 1 0C 4 5 0 5 1 (_ * 3 S(05 G+[E- C C * 5 2 * 2(- +(. 1 0 1 1 - +G 3 C 4 1 ?

_ $%/ 3 "' (9 %#&2#&& 3

; $<9 &%&# % : N. * (0/ / + / * +G 3)4 1* 2 6(0 4 d ' * +(Q 5 F(- +(0 4 e)* 2(+[. / 4 0 1 +(E- C / 3 6 5 F(S 4[(05(0/ / + b* 2 . 1 0 5 2 0 +2 4 [(0(+4 1 K(0. . * . . C * 5 1(4 2 4 E0 1* . (1 4 (4 (5* E* . . 0 +G 3[(J * . / 4 0 1 +(. * 3 E1 4 5(C ' . 1[_ * _ 0. * 2(- 5 ((K 5 - S 5(- +(0 5 1 E3[0 1* 2(* I / - . ' +[(3 b* 3 6(1 * (. 0T0 - 2 - (-)(1 * (/ + 2' E1(052(1 * (. 0)* S - +K 5 F(3C 4[(-)(1 * (. * 3 E1* 2(+[. / 4 0 1 +(- ?

> " 30 < : V, * C - E0 2 +[. 4 1 0 5 1 6[4 C / * +b 4 ' . . (F 3 b* . (E- C / 3 3 6 F(S 4[(05(0/ / + b* 2(. 1 0 5 2 0 +2(. , - ' 3 2(_ * S - +5(0 1 0 3[1+C * . (S, * 5(. 0 5 2 3 6 F(E * C 4 E0 3[/ + 2' E1 (4)(0(+4 1 K(0. . * . . C * 5 1 4 5 2 4 E0 1* . (1 4 (4 5* E* . . 0 +G?

?+$< : &0)* 1[* (3 S * 0 +(E- C / 3 6 5 F(S 4[(05(0/ / + b* 2(. 1 0 5 2 0 +2(. , - ' 3 2(_ * (. * 2(S, * 5(0(+4 1 K 0. . * . . C * 5 1 4 5 2 4 E0 1* . (1 4 (4 (5* E* . . 0 +G 3 +(0 b- 4 2(* I / - . ' +[(1+(3[A 4 2(. / 3 0. , * . 6[C 4 1 (- + 2' . 1?

) L&0 : $ * + - 503[/ + 1* E1&b* (* A' 4 C * 5 1()- +(1 * (_ - 2G[_ , - ' 3 2(_ * (. * 3 E1* 2(_ 0. * 2(0 - 5 ((1 * (10. K(_ * 5F / * +)- +C * 2(052(1 * (+4 K(4 5 b- 3b* 2(052(. , - ' 3 2(_ * (0/ / + b* 2(_ Q0(. / * E0 3[+ 1(_ *)- +[(. 052 3 6F 1 4 (/ + 2' E1?

?3T&&34 $3# ' ($U9 / <1 % 2/ 3#%&' < : Q C 4 . 4 5. ()+ C (b* 5 1 4[0 1 4 5(- +(S - +K(/ + E* . . (* A' 4 C * 5 1(. , - ' 3 2(_ * (E. * E K* 2(1 - (* 5 . ' +[(1 * G E- C / 3 3[S 4[(1 * (+[A 4# C * 5 1 (-)(* 5 b 4 + 5 C * 5 1 0 3[/ + 1* E1 4 5 (3 F 4 3 0 1 4 5 ?((15(. - C * (E0 . * . 6]' C * (. E+___ * + 6)4[# + (- +(* 5F 4 5 * * +5F(C - 2 4 E0 1 4 5. (1 (1 * (/ + E* . . (* A' 4 C * 5 1(S 4[_ * 5 * E* . . 0 +G 1* (+# 2' E* (* C 4 . 4 5. (1 (0E2 / 10_3 (3 b* 3 ?

E&(. - +<&2" ' (" 30(2 - $4 &2" ' (9 % 9 $ % &$<

. - +<&2" ' (<# #& : @A 4[2 ?(L\3 0+(. / 0 +G 3 6F(3A 4[2 ?\V

Y" " <- (9/ &# : U$ + 2' E1(2 - * . (5 - 1(. ' . 1 0 4 5(E- C _ ' . 1 4 5 ?\V

5 / ' / % : V- 3 -3 . . ?

G0/ % : H2 - -3 . . ?

9 > : =?M

, &<9 $ % &- &&#+(9 % 9 $ % #&$< : Q0. 4[G24 / * + 4_3 (4 5(1 * ()- 3 S 4 5F(C 0 1* +0 3 d(E- 2(S 0 1* +(052(. - 1 $ 0 1* +?

7S'AS0E7D8 0"#

@" (&5+ 5E* (J * . * 0 +E. ((((((((($ H(%+ I (77=(((((((((((((((((((J - B(- +2 8&@(((' 87M&(<; 8 d' =. =((((((($SS%"(* +C - 'E- C $ 4 +2* (%4 + 'E 5 - 3 FG(5E*(((((($=: =(R7O* +E4 5(J - 02(((((((((((; 77 * M(((((((((' 87M&(<; 8 o=97; (D0I

$%&( ) * () +,,- .

E8(. - +<&" '(" 30(2- $4 &" '(9%9$%#&$<

) / '1=&&#+ : Q0 .4&(. - 3 _3'(45(1 *()- 3# S-5F(C 0 1* +03 d(E- 3'(S0 1* +(052(, - 1S0 1* +?

7B8() #' =&&#+(" 30(%$" 2#&T&#+

5 - $4 &" ' (<#' =&&#+ : B, * (/ + 2' Et\4 (. 10_3 ?
5 / 30 &&\ 3 <(# ("T/ &\ : R- (. / * Et\-E(2010?
I32/ 4 9" #&<' $(4 " #&%&' < : R- (. / * Et\-E(2010?
>" 'C\' %/ 1 <(0$2/ 4 9/ <&&\ 3 9%012#< : N52* +(5- +C 03(E- 524## 5. (-)(. 1- +0F* (052(' . * 6(, 0T0 +2- ' . (2* E- C / - . 4## 5(/ + 2' Et\ (, - ' 3' 5- 1(_ * (/ + 2' E' 2?
. / <<&-&&#+(/ *(- " C\' %/ 1 < %" 2#&\ 3 < : N52* +(5- +C 03(E- 524## 5. (-)(. 1- +0F* (052(' . * 6(, 0T0 +2- ' . (+ 0Et\4 5. (S-4$5- 1(- EE' +?

778(@ U&2/ ' / P&" '(&8*/ %4 " #&\ 3

H3.&&50() #' #&\<

R21#&\(# U&2&#+

. %012#&$P%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	. / <$	?U9 / <1%
. - 24 C (E 3 +42* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	@P\M' (P* +C 03 @P\M' (H +03 @P@ (I5 1+0c0 +1* +03 @P\M' (P* +C 03 @P\M' (H +03	J 0 __ 4\ J 01 Z ' 45* 0(/ 4F J 0 __ 4\ J 01	7" " " " (C F>K F 9" " " (C F>K F 9" " (C F>K F f =<: " (C F>K F 8! <" (C F>K F	c c c c c

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 - % 3 2(# U&2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

I%&#' #&\ 3 <$ / %& <&\ 3

. %012#&$P%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	) 2/ %	?U9 / <1%	G=<$%" #&\ 3
. - 24 C (E 3 +42* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	QG' . (q(O - 2* +0 1* (4+40 51 QG' . (q(O - 2* +0 1* (4+40 51 &K5 (q(O -42 (4+40 51 QG' . (q(O -42 (4+40 51 QG' . (q(O -42 (4+40 51	J 0 __ 4\ J 0 __ 4\ J 0 __ 4\ ^ ' C 05 J 0 __ 4\	c c c c c	! : (, - ' + (7" " C 43F +0C . 7" (C 43F +0C . ! : (, - ' + (M " C 43F +0C . M' (C 43F +0C . 7M' C 43F +0C .	c c c c c

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

) $3 <&&\ 3 %

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 " %&$/ P$3 2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 '" <<&&2" #&\ 3

. %012#&$P%0&$3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
. - 24 C (E 3 +42* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	c c	c c	c c	R- 5* ? R- 5* ?	c c	R- 5* ? R- 5* ?

! 1# P$3 2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

@$%# P$3 2&#+

$%&( ) * () +,,- .

778(@ U&2/ ' / P&" '(&8*/ %4 " #&\ 3

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

. $9 %012#&T$(# U&2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 " 3 " 0"

R21#&\(# U&2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 - % 3 2(# U&2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

I%&#' #&\ 3 <$ / %& <&\ 3

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

) $3 <&&\ 3 %

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 " %&$/ P$3 2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 '" <<&&2" #&\ 3

. %012#&$P%0&$3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
. - 24 C (E 3 +42* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	c c	c c	c c	R- 5* ? R- 5* ?	c c	R- 5* ? R- 5* ?

! 1# P$3 2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

@$%# P$3 2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

. $9 %012#&T$(# U&2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

7D8(? 2/ ' / P&" '(&8*/ %4 " #&\ 3

? 2/ # U&2&#+ : R- (K5- S5(. 4F54ED5 1*)* E\1 (- +(E+##ED3(, 0T0 +2. ?

H3.&&50() #' #&\<

R\ 1" #&2($2/ # U&2&#+

. %012#&$P%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	?U9 / <1%
. - 24 C (E 3 +42* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	YE 1* (Q\M (! : 9" " " " " (F>@D+# . , (S0 1* + YE 1* (Q\M (: " ! ; " " (1+ (; <! " " (F>@ D+# . , (S0 1* + YE 1* (@'M (7" : ! (C F>@D+# . , (S0 1* + YE 1* (@'M (7" " " " " " (F>@D+# . , (S0 1* + V , + 54E(RHQ\V (" '97: (F>@D+# . , (S0 1* + V , + 54E(RHQ\V (7" " (C F>@D+# . , (S0 1* + YE 1* (@'M (78; " " " (F>@D+# . , (S0 1* +	Y3F0* (qR0b+E 3(. * C 45' 3 C P0 / , 54 0(qP0 / , 54 0(C 0F50 V+ . 10E' 05. (qV* +4 20 / , 54 0 2' _ 40(q ! : (, - ' + D4 _ (qO - + 5* (. 0I 01## (q@+b0* P0 / , 54 0(qP0 / , 54 0(// ' 3 I D4 , (qZ 0C _ ' . 40(, - 3 + - K4(qY2' 3I D4 , (qZ 0C _ . 40(0)) 54 (qY2' 3I	<; (, - ' + : 8(, - ' + : 8(, - ' + <; (, - ' + ! 7(20G 8(S* * K <; (, - ' +

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

. $%&<#&32$%$P%0" =&&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

5 " 3 " 0"

R\ 1" #&2($2/ # U&2&#+

5 / 32' 1 <&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

$%&( ) * () +,,- .

7D8(?2/ '/ P&"'(&*/ %4 "#&3

. $%&#&32$$P%0"=&&#

5/32'1<&3$.14 4 "%: R-1(0b04(0_3?

G# $%'0T$%$($""$2#<: R-(K5- S5(.4F54ED51("))"E1(- +(E+4ED3(, 0T0-€.?

7F8(, &<9/ <"'(2/ 3<&0$%#&3<

` "<#5(0&9/ <"': B, *(F"5*+0!4 5(-)(S0. !(. , -' 3?(_*(0b-€2*2(-+(C-5+C-4"2(S, *+b*+)/-. . 4.3?(&-F54ED51 A'.05.1#!. (-)(S0. !(/+2' E1(+#. .€2"'*. (. , -' 3?(5-1(_*(24/-. *2(-)(b40(1*()-"3, *S*+(_' 1 /+E"..*2(-5(0(. ' 4D_3(*))3*51!#*01C*51/ 3D5?(P4/-. *(-)(. ' +/3. (052(5- 5c+#EDED0_3' /+2' E1(b40(0(3E"5. "2(S0. !(24/-. 03E-5+40E1-+(P4/-. 03-)(1 4(/+2' E!6(, -3 !#5. 052(05G(_G(/+2' E1(, . -' 3?(0'103!#C*. (E-C/ 3G(S-4((1*(+#A'.4#C*51(-)("5b4+5C*5'03 /+!E!4 5(052(S0. !(24/-. 03?F4 3D!4 5(052(05G+#"F4.503?3 ED3(0' 1-+#G+#A'.4#C*51? X 0. !(/0E+0F-5F(. , -' 3?(_*(+# EDE+3 2?((L5E5*-0!4 5(-+(3052)-8(, . -' 3?(-5 3G(_*(E-5. €2*+#"2 S, *5(+# EDE36F(4 (5-1(!*0. 4.3"?(B, 4 (C-0!+#0?052(4!(E-5 1-0-5*+(C' . 1(_*(24/-. *2(-)(-5((0 . 0)*(S-0G?(V0+#(, . -' 3?(_*(?D!C*5(S, *5(, 052?6F(*C/1#?2(E-5 1-0-5*+(!(. 0!(_0b*(5-1(_**5 E3 05*2(-+(+5. *2(-' 1#(QC/ 1G?E-5 1-0-5*+(-+(?5*+(C-0G+#*10-5(. -C*(/+2' E!(+#. €2"'*. ? Yb-€2(24/*+03(-)(. / -4F?2(C-0!+#0?052(+5-))(052(E-5 1-0E!(S-4!(. -4(S-0!+#-5-0G(2-0-5. 052(. *S*+?

, &<9/ <"'(<- /1'0(=$(&$("22/ %"'32$(M&#-("99'&"'='$(%P8(3"'"N3"'#&(3"'('30(/2"'('M<("30(%P1'"#&(3<8

; $"$%## () $2#&(3(U:(>RZ, ^IZ_(RZ, , () @G; R_?("30() $2#&(3(A:(?a. G) H; ?(5 GZ@ G^) S?;) GZR^(, ; G@?5 @GZ */ %'0 0 0&&(3"'(-"30'&3P(&*/ %4 "#&(3("30(9%#&2#&(3(/ *($4 9'/+$$<8

7C8(@%3<9/ %#(&8*/ %4 "#&3

; $P1'"# % &3*/ %4 "#&3	HZ(314 =$%	. %9$%<-&9 9&P 3"4 $	5'"<<$<	. _b
. G@5'"<<&&2"#&3	R-1 -#F'30!2?	c	c	c
IR@RX _ ; (5'"<<	R-1 -#F'30!2?	c	c	c

$Z (d$.0E+5F(F+' /

7K8(; $P1'"# %(&8*/ %4 "#&3

H3&$0() #'#&<

>5) (5'"<<&&2"#&3: L+#D!5F(C0!+#03 B0-F*!(- -F05(*))*E!

H8) 8(Y0%'(%$P1'"#&3<: @ 5R(AV'V\H; (?U&4 9#S "%#&'($U&4 9#&3d[R-1(2*!*!C-5*2 H3&$0() #'#&<(&8T$3# %4(V@ 5R(A=W(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2?

) R; R(FEDS*FBCS*F77S*F7D($U#%$4 $'+(-"(Q'%/1<(<1=<#'32$<d(R-(/+2' E!(S*-#()-'52?) R; R(FEDS*FBO($4 $%P$32+(9'"33&8P("30(3/#&&2"#&3d(R-(/+2' E!(S*-#()-'52?) R; R(FEDS*FBCS*F77S*F7D(-"(Q'%/1<(2-$4 &2"'<d(-24 C(E, 3+42*) R; R(F77S*F7D(!.) ,) (0&#%&=1#&3()(2-$4 &2"'(&8T$3# %4()(-"(Q'%(&8)$3#&&2"#&3d . -24 C(E, 3+42* d(LC C*240!*('0E!*a(, *03((, 0T0-€8(P*3!G'2('E, +54Ea(, *03((, 0T0-€

5'$"3(R&(R2#(() $2#&3 77D\#\#&*"(Q'%/1<(R&% ./"1#'3#<(\#R. <W: R-1(3!*2

5'$"3(R&(R2#(() $2#&3(] ED 5'"<<(!(() 1=<#'32$<: R-1(3!*2

5'$"3(R&(R2#(() $2#&3(] ED 5'"<<(!!() 1=<#'32$<: R-1(3!*2

, ?R(^ &#(!(5 - $4 .&2"'< V %21%/ %6 - $4 .&2"'<W: R-1(3!*2

7S'AS0E7D8 3"#

@*(&8*5E*(J *, *0-€.((((((($H(%-!(77=((((((((((((((((((J - B\)- -2%&@((('87M&(<; 8d=:=((((((SS$?(*-C-'E-C $*4-€2*(%4*!E.5-3 FG(E8?((((((S=:=(R?O*-€4E-05(J - 02((((((((((: 77'M((((((((('87M&(<; 8o=97; (D0!

$%&( ) * () +,,- .

7K8(; $P1'"# %(&8*/ %4 "#&3

. ?R(^ &#(!(5 - $4 .&2"'<: R-1(3!*2

V@<<$3#&'(5 - $4 .&2"'<W:

) #'#&(!%&P1'"#&3<

! "<<"2-1<$##<: R-5*(-)(1*(E-C/-5*51(0-#(3!*2?

Z$M(f / %: R-5*(-)(1*(E-C/-5*51(0-#(3!*2?

Z$M(c$%$+: R-5*(-)(1*(E-C/-5*51(0-#(3!*2?

.$33<+'T"3&: R-5*(-)(1*(E-C/-5*51(0-#(3!*2?

H3&$0() #'#&<(&8T$3# %4(V@ 5R(A=W: Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2?

5"3"0": R-1(E-51+3!2('52*+(X^OL&('V05020a?

5"3"0"&3(&#<

5"3"0"&3(Z..; I: R-5*(-)(1*(E-C/-5*51(0-#(3!*2?

5?. R(@U&2(<1=<#'32$<: R-5*(-)(1*(E-C/-5*51(0-#(3!*2?

5"3"0"(&8T$3# %: Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2?

@&(9%012#(-"<(=$$3(2"'"<<&&$0(&8("22/ %"'32$(M&8(#$(-"(Q'%(2%&$%&(/*(#$(5/3#%&''$0(.%012#<(;$P1'"#&3<"'30(#$(!),) (2/3#'&3<(""'(#$(&8*/ %4 "#&3(%$\1&$0(=+(#$(5/3#&%"$0(.%012#<(;$P1'"#&3<8

I3#&%$"#&3"'('(&#<

I3#&%$"#&3"'('(&#<: R1<#%'&'(&8T$3# %4(VR!5)\W(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2? 5-&$"(&8T$3# %4(V?5)5\W(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2? c"9"3(&8T$3# %4d(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2? d/%$"(&8T$3# %4d(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2? Z$M(e$'''30(I3T$3# %4(/*(5-$4 &2"'<(\Z el/5\W(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2? . -&$9$8$<(&8T$3# %4(V!5)\W(Y3[E-C/-5*51(0-#(3!*2(-+(*I*C/!*2?

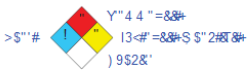
7](8(G# $%(&8*/ %4 "#&3

^"=$'(%$\1&$4 $3#<: VYN&Q&(J Q&$LJ YB!HJ \(EIJ YVB6(Q\Q(YRP(&](IR(IJ J IBYB!LHR?((VHRBYIR& OYBQJ LY@E^ YB(VYR(VYN&Q(BYJ Z QB(HJ Z YR(PYOYZ Q?

>"Q'%/1<(! "#5%&': I3*/ %4 "#&3() +<#$4 (VH8) 8R8\/V

@$(21<# 4 $%&<(%<9/3<&<$'$(*/ %(0$&#5%4 &8&8P(#$(. . ?(2/ 0$(*/ %#+&(4 "#5%&'8

Z"#&3"'(Y&8(. %#&2#&3 R<<//2&#&3(\H8) 8R8\/V:



, "#5(/ *(9%8#&8P: 7S'AS0E7D8

, "#5(/ *(&<<1$: 7>78$"7!?

, "#5(/ *(9%$T&1<(&<<1$: R-(/+#b4'. (b032014 5?

6$%&3: 7

. %9"%0(=+: O&P&(&/ *E40(3(1

7S'AS0E7D8 4"#

@*(&8*5E*(J *, *0-€.((((((($H(%-!(77=((((((((((((((((((J - B\)- -2%&@((('87M&(<; 8d=:=((((((SS$?(*-C-'E-C $*4-€2*(%4*!E.5-3 FG(E8?((((((S=:=(R?O*-€4E-05(J - 02((((((((((: 77'M((((((((('87M&(<; 8o=97; (D0!

$%&( ) * () +,,-.

7] 8(G# $%(83*/ %4 "#8 3

I308"#5<(8*/ % "#8 3(# "#(- "<(2- "3P$0(*%4 (9%T8 1<'+(8<1$0(T$%8 38

Z/ #82$(# (%"0$%

@(# $(=$<#/ *(/ 1%L3/ M'$0P$N# $(8*/ %4 "#8 3(2/ 3#' 8$0(- $%$8(8("221%#58>/ MT%3$8# $%# $("=/ T$X3"4 $0 <199'8%3/ %'3+(/ *(8<(<1=<8 8%5<N' <<14 $<("3+('8=88+(M- "#</ T%/ %# $("221%2+(/ %2/ 4 9'$#53$<<(/ *(# $ 8*/ %4 "#8 3(2/ 3#' 8$0(- $%$8 8
Y8"'(0$#5%4 8"#8 3(/ *(<18"=88+(/ *("3+(4 "#5%8'(8(# $(</'$(%5<9/ 3<8=88+(/ *(# $(1<$%R'(4 "#5%8'<(4 "+(9%5<$3# 13L3/ M3(- "Q'%<("30(<- / 1'0(=$(1<$0(M8 (2"1#8 3R'# / 1P- (2$%8(- "Q'%<("%(0$<2%8=$0(- $%$8N M$(2"33/ # P1"%3#5$(# "## $<$("%(# $(/ 3'+(- "Q'%<(# "#($U8#8

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&'()"*$#+', "#')-$$#

! "#$%&()*$#+,-./,0&1234)3'3&5667 8

78. %012#"30'2/49"3+'&0$3#&&2"#&3

. %012#3"4 $: ! ""#$%&()*$#+,-./,0&1234)3'3&5667 8

) 199(&% : "),7&'2),'0",13"0
@ 0,' %3 0) 18&. %
@? ?&'99
/&0 &-# ':9965
1'3,-' 3 3 2
:95?;:'5 '&
:66? ?= <=

! "31""2#!%% : "),7&'2),'0",13"0
@ 0,' %3 0) 18&. %
@? ?&'99
/&0 &-# ':9965
1'3,-' 3 3 2
:95?;:'5 '&
:66? ?= <=

5/0$: 9:;<9:;
!),)' : <;
6"(&0"#& 3'0"#& : =><=><69<?
. %&#0"#& : =><=><69<?
; $<9/3<&=(5'3"4 $: 8 ! ' (,0"$23
5>?! @?5:
A 8 8
@, ?',):
8 8 AA

! "#&%&(1<$< : $"$'%#''# $'&&<#%2#&3
=//(($#"/ %9%95%'30
&#&30$0'1<$8' # $% &<$
2/3#'2#<199(&%/ %<9$2&&2
"99(&2"#&3<8

. %012##+9$: @&A-,?

8>" "%0<'&0$3#&&2"#&3

?4 $%$32+/ $%&
. -+<&2"(<'#&
5/(/%
0/%
)&3"(/%
>" "%&'<'#&4 $3#<
. %2"1#&3"%'4 $"<1%<
) > >5)'<'#1<
; /1#&</"$3#%
/#&3#&((" 21#&)-$"(#'$**$2#<
3-"("#&3
3 $<#&3
)&
?+$<
/#&3#&((2-%3&2'-$"(#'$**$2#<

: &$-? %23$1,'(&A-,?
:)"3?
: 3 10)?
: /
: /8 ' ' ! ?' '/ @/ " / '"/ "# ' ! '
/ / " " ?' " '8 " / '" "' ' '" / "' / '! 8 ?
: ! &1&3 , 3,'-423'! &1&3"1,23' 2,'&1%'A"3' -, 4 3,' ,13$ 3&1?'! &1&3, 3#
-"1'&,'27&,'A),1'42"1'3,"2(&-403' &'-'0&13 03A"3', %2#2"1'1-'0$&3"1?
,,('0&13"1,'3')3%0$2,-?' 2)'3,&&4)$% 3 ')1-3!?
: ")"2'7 3 *$"2'0&12",,-')+-&4 2' %3,' ' +-' &7 7 41'0 3&1' 3 1- -
<' /'9 9679<66?
: %'0&13 03' 1) $ 3&1? 1 ,23&1?

: "3 3'1 '3&,2(* 3&%2%23 7?
: "&'0"*'2A $&A,-?
: "3 3'1 '3&2 "1?
: "3 3'1 '3&,%2?

$%&&()*+,-./012/3*4566766'899:;

8>" "%0<'&0$3#&&2"#&3

5-%3&2'$**$2#< : &13"12'7 3*$3 30 1'0 42,'3 ,3& 1'-7 ,?'/,(,3-'&'(8&&1,-*1) $3&1'&-4237 %$ -'3&0) &1'0',2(* 3&%* "3 3&1?

5"%2&&/ $3&&#+ : & 18A1'2* 1"*0 13, ,03'&'0 "30 $) + -2?

! 1#' $3&2&#+ : & 18A1'2* 1"*0 13, ,03'&'0 "30 $) + -2?

@&%# $3&2&#+ : & 18A1'2* 1"*0 13, ,03'&'0 "30 $) + -2?

,$ $(//94 $3#'("$**$2#< : & 18A1'2* 1"*0 13, ,03'&'0 "30 $) + -2?

$%#&&#+'$**$2#< : & 18A1'2* 1"*0 13, ,03'&'0 "30 $) + -2?

@%$#/%"3< : &13"12'7 3*$A)'0)'042,2'-7 ,'3&3),'&&&A"1'& 12'7 40&42'7,7 1,2#
4((,',2(* 3&%3 03#2"1#,%2#0,13 $1, &42'2%23 7' ?

$%&9/<1%'<&3<<+49#4<

3-"(" #&3 : -,2,'2%'(3&7 2'7 %"10$#-,'3,'&$&A"1
,2(* 3&%3 03* "3 3&1
0&4)"1

3 $<#&3 : &2(,0"'0-3?

)& : -,2,'2%'(3&7 2'7 %"10$#-,'3,'&$&A"1
* "3 3&1
,-1,22

?+$< : -,2,'2%'(3&7 2'7 %"10$#-,'3,'&$&A"1
("1'&'* "3 3&1
A 3 "1
,-1,22

! $0&2"('2/30&&3< : @,,"23"1'-'2&-,2"1&$"1'1%3 ,3& 12'7,13&1,-'"1'3'2'8 ! ' 2',"1' 3
" % "#&0'=+'/ $% '2'7 %,' 3-'%&,,(&24,'3&3)'2'(&-403'
$9/<1%

)$$'# &/(/ &2"('&*'/%4 "#&3')$2#&3'77

85/49/<&#&3&&*/%4 "#&3'/3'&& %$0&$3#<

3&&0')#'#&<

"4 $	5)'314 =$%	
/# 9# -'7, 0('3&431, <#=-'&$	==:=9<=	:''966

5"3"0"

"4 $	5)'314 =$%	
/# 9# -'7, 0('3&431, <#=-'&$	==:=9<=	:''966

@$%'"%'3/'"00&&3"('&& %0&$3#<'9%<$3# -&-' &#&'#$'21%&3# 3/ ($0 $'/"#$'<199(&%'30'&'#$
2/32$3#%#&3<'"99(&2"=($'"%'2("<<&&&0'"'<-" "%/1<#'-$"(#'/'%#$'$'3 &&34$3#"30'-32'% 18&'%9/%&& '&
#&'<$2#&38

8 &%#"&0'4 $"<1%$<

?+$'2/3#'2# :),0'&'1-',7&,'1%0&13 03$12,27'7 7,-*3$%$12)',%2'A"3)'($13%&'A 3
&'3$,2395'7 "143 2#&00 2"&1 $%&'3"1'3),'4((,,'1-'$&A,',%$-27',37,-'0$
3 13&1'7 7,-*3$%

)&'2/3#'2# : 1'0 2,'&'0&13 03#'7 7,-*3$%$12)'2"1'A"3)'($13%&'A 3,'&'.3$ 2395'7 "143 2
A)'$',7&"1'0&13 7"1 3,-'0$&3)"1,'1-'2)&27' 2)'0$&3)"1,' ,&,',42,?' $ 1
2)&2'3)&&4)$%,&,',42,?',37,-'0$3 13&1'7 7,-*3$%

3-"("#&3 : 8&,',(&2,-'(,2&1'3&,2)',"7'1&3,3)"1#"',3)"1,"2*',4$'&'*
,2(* 3&%,238004 2#((&*-,'3"0"$,2(* 3&1'&,%,1"%3"1,-'(,2&11,$'
&&2,1'3)30$&3)"1'240)'2'0&$#3,#,$&'A'23 1-7',37,-'0$3 13&1
'7 7,-*3$%

$ %'&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

8 &%#" &0'4 $" <1%$<

3 $<#& 3 : 2)'&437 &4 3)'A"3)'A 3 ?'! &'1&3*1-40,' &7 *3'1 '41$ 22'-*, 03-'3&-&28' %7 , -'0 $ (, 2&1 1, $?', , ' + ' 1%)*1 * %7 &4 3)'3& 1'4 10&120'&42'(, 2&1?' , 37 , -'0 $ 3)1 3&1'7 7 , -* 3 $%?

. %#&2#& 3'/ *"*&%#" &0$% : &'03&1'2) $), '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A"3) &4 324'3 $'3 '1"1 ?' '3'2 242(, 03-'3) 3 47 , 2' , '23$)(, 2 13*3) , ', 204, '2) &4 $'A, ' 1' ((&(* 3 '7 2 '& 2, $ 0&13 *1, -' , 3)*1 ' ((3427' 37 %, '- 1, 842'3&3), '(, 2&1 '(& *-*1 ' *-'3& * , '7 &4 3) 3& 7 &4 3)' , 24 20'3 3&1?' 2)'0&13 7 *1 3-'0$&3)*1 '3) & &4) $%A"3)'A 3 , &, ' , 7 & *1 '*$#&'A, ' $&, 2?

/ #&<#'9-+<&2&3 : &2(, 0*'0 3, 3' , 13*"' , 32%7 (3&7 30 $&'8' &13 03(&2&1'3, 3' , 132(, 0*$23 *7 7 , -* 3 $%*$, ' 4 133, 2) , ' , , 1'*1 , 23-'&'*1) $-?

8 &$ *&--#&3 '4 $" <1%$<

("4 4 "=&3&*'/ "# $'9%012# : *1, '-4230$&4-2'7 %&7', ($2*, '7 * 3 , 2'A"3)' *?

? #&3 1&-&3 '4 $0&

) 1&#'=($: 2, '- %0), 7 '0 $(&A-, ?

/ #<1&#'=($: ! &'1&342, 'A 3, ', 3?

) 9$2&('$ 9/ <1%$'-" "%< : @&7 (3&%2&$ 3')*, '20, 1, ' %, 7 &*1 ' $(, 2&1 2' &7 '3), ' 0"1*3%&'3), '*10'-, 13* 3), , '2' (*, ?' &0 3&1'2) $), '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A"3) &4 324'3 $ 3 *1"1 ?'8 &, '0&13 *1, 2' &7 '*, ' '*')*2'0 1' , '-&1, 'A"3) &4 3 '2 ?' 2, 'A 3 2(%3&, , (' *, , (&2, -'0&13 *1, 2'0&8&$?

>" "%/ 1<# $%4"(0$2/ 4 9/ <3&&3'9%012#< : !, 0&7 (&2*3&1'(&-4032'7 %*10$1-, ')*, '&$&A"1 '7 3 * $2 0 &1'7 &1& *-, 0 &1'7 &1& *-, 24$4 '& *-, 2

) 9$2&('9%#&2#&$ $ 1&4 $3#"/ %'&$& *&-#&% : *, *) 3 2'2) &4 $'A, ' ((&(* 3 '(&3 03', ', 4"(7, 13 1-'2, $ 0&13 *1, -' , 3)*1 ((3412 'A"3)' '4$& 0, (*, 0, '&(, 3-'*1'(&2*3', '(, 224, '7 &-, ?

8 2280$3# ('%($" <$'4 $" <1%$<

. $%/ 3" ('9%2" 1#& 3< : &'03&1'2) $), '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A"3) &4 324'3 $'3 '1"1 ? 04 3'24 &41-*1 ' , 2?' , , ('411, 0 22 %1-'41('&3 03-'(, 2&1 1, $ &7 , 13 *1 ?'! &1&3&40)'&'A $'3) &4)'2('$-'7 3 * $")43&' $*1"3&1'2&4 0, 2?' & $, 2#27 &*1 '&' $7, 2"*1') + -' , ?'! &1&3 , 3), '-423?@&*-', -, 4 3 , 13$3&1?' , ' ((&(* 3', 2(* 3&'A), 1' , 13$3&1'2*1 -, 4 3 7'@3&1 ((&(* 3'(, 2&1 $(&3 03', ', 4"(7, 13 2, ' , 03&1': ?

? 3 &%34 $3#('9%2" 1#& 3< : &'-*2(, 2 $&'2('$-'7 3 * $ 1-'41&*1-'0&13 03A"3)'2&'$A 3 A %#- *12 1-'2, A, 2?' 1&7 3), ', $ 13 4 3) &3", 2**3), '(&-403) 2'0 42, -', 1 *&17, 13 $ (&$%3&1' 2, A, 2#A 3 A %#2&'$&' * ?

! $# / 0<*/ %2($"3&3 '19

) 4 "((' <9&(: 8&, '0&13 *1, 2 &7 '2('$, ?' 0447 '&'2A, ('4('7 3 * $ 1-'($0, '*1' -, 2* 1 3 -#$, $-'A 23 '0&13 *1, ?' 2, '2((&&'3&&$2' 1-', ($2*2&1 (&& , 4"(7, 13?! '2(82, '&' * ' '$0, 12, -'A 23'-2(&2 $0&13 03&?

"%$'<9&(: 8&, '0&13 *1, 2 &7 '2('$, ?' ((&0)', $ 2, ' &7 '4(A*1-?'@, , 13, 13%*13& 2, A, 2#A 3 '0&4 2, 2# 2, 7 , 13?&'0&1 *1, -' , 2?' 0447 '&'2A, ('4('7 3 * $ 1-'($0, '*1' -, 2* 1 3 -#$, $-'A 23 '0&13 *1, ?' &'-*0, 31 '-423%0&1-*3&12 1-(, , 13A*1-'-2(, 2 $?' 2, '2((&&'3&&$2' 1-', ($2*2&1 (&&', 4"(7, 13?! '2(82, &' * ' '$0, 12, -'A 23'-2(&2 $0&13 03&?' &3 '2, , '2, 03&1'9' &', 7, 10%0&13 03 *1 &7 3&1' 1-'2, 03&1'9= &'A 23'-2(&2 $?

, ' 0, 10, '/ , 2, 0) """""@ ' &'99 """""""""""""/ &0 &-# """ : 95 ' : : 6 """"AAA"3), 7 &7&7
@, 0, ' &3 0) 1&$ %10?"" = ' 8, *-* 1'/ &-"""""": 9965""""""""": 95 ' : : =9; '

$ %'&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

8>"30(&3 '"30'<# % $

>"30(&3 : @&3&1' ((&(* 3'(, 2&1 $(&3 03', ', 4"(7, 13 2, ' , 03&1': ?' 3 1 #- *1 *1 ' 1-27 &*1 '2) &4 $', '(&) * 3-'*1' , 2A), '3 '2 7 3 * $"2) 1-$-#23&, -' 1-(&0, 22, -?' &, 2'2) &4 $'A 2) ') 1-2 1-' 0, ', &, ', 3 1 #- *1 *1 ' 1-'27 &*1 ?/, 7 &, '0&13 7 *1 3-'0$&3)*1 ' 1-'(&3 03', ' 4"(7, 13 &, '*1 ', 3 1 ' , 2? ! &1&3, 3"1', %2&'&1'2 *1'&'0$&3)*1 ?'! &1&3, 3), '-423?'! &1&3*1, 23' &*-'3), 0, 3&1'&'-423A), 1') 1-3 1 ' 1-' &*-' $&(&22*3&3), '(, 2&1'(&*-*1 ' *-'3& * , '7 &4 3) 3& 7 &4 3)' , 24 20'3 3&1?' 2)'0&13 7 *1 3-'0$&3)*1 '3) & &4) $%A"3)'A 3 , &, ' , 7 & *1 '*$#&'A, ' $&, 2?

/ #&<#'9-+<&2&3 : &2(, 0*'0 3, 3' , 13*"' , 32%7 (3&7 30 $&'8' &13 03(&2&1'3, 3' , 132(, 0*$23 *7 7 , -* 3 $%*$, ' 4 133, 2) , ' , , 1'*1 , 23-'&'*1) $-?

) #%$: 3&, '*1' 00&- 10, 'A"3)'$&0$, 4$ 3&12?' 3&, '*1' '2, , 3, -' 1-' ((&, -' , ? 3&, '*1'&* *1 $0&13 *1, '(&3 03-' &7 '-* , 03241$) 3*1' -%0&8$, 1-'A, $, 13$3, - , # A % &7 '*10&7 (3' $'7 3 * $2' 2, , '2, 03&1'96' 1-' &&-' 1-'-*1 ?' $7 *1 3 $*1"3&1'2&4 0, 2?' ,(3, &7 '&*-*1 '7 3 * $2?' , , ('0&13 *1, '3) 3%0$&2, -1-'2, $-'413$, -%&'42, ?' &13 *1, 2'3) 3) , ' , 1'&, 1, -'7 423 , '0 , 4$%, 2, $-' 1-' , (34(*) 33$(, 13$, ?'! &1&32&, *1'41$, $-'0&13 *1, 2?' 2, ((&(* 3'0&13 *1 7, 133&' &-', 1 *&17, 13 $0&13 7 *1 3&1?

A8? 9/ <1%$'2/ 3#%(<9$%/ 3" ('9%#$2#&3

5" 3" 0"

2219" #&3" ('$ 9/ <1%$'(&1 &$<

&, (&24, '$7'3 $, ' 1&A1?

5/ 3<1(#(/ 2" ("1# / %&$&<*/ %'225$9# =($'$ 9/ <1%$'(&1 &$<8

: $2/ 4 4 $3 0$0'4 / 3&# %&3 9%2$01%$< : '3)*2(, &-403 0&13 *1Z*1 , -*, 13Z'A"3)', (&24, '$7'3 2#(, 2&1 $#A&, ($0, '3 7 &2( ), &'*3&, *0 $7 &1'3&*1 '7 %, , , 4"-'3&-, 3 7 *1, '3), , 03, 1, 22'&'3), ' , 13$3&1 &'&3), '0&13&$7, 24, 2 1-*&'3), '1, 0, 22'3%3&42, ', 2(* 3&%(&3 03', ', 4"(7, 13?

?3 &3$$%&3 '4 $" <1%$< : 2, '&1$%A"3)'-, 4 3', 13$3&1?' 42, '&(, 3&12, 1, 3'-423#47, 2# 2# (&&'7 2'3#42, '(&0, 22', 10$&24, 2#$&0 $,) 423, 13$3&1'&'&3), ', 1*1, *1 '0&13&$2 3&, , ('A&, ', (&24, '3&*&1, 0&13 7 *1 13Z', $&A' 1%, 0&7 7, 1-, -'&'23 3&3&%$7 '3Z7 "), ', 1*1, , *1 '0&13&$Z '$2&1, , -'3&, , ('2# (&'&-4230&10, 13 3&12 , $&A' 1%$&A, ', ($2*, '$7 '3Z7 2, ', ($2*&1 (&&', 13$3&1', 4"(7, 13?

>+ &3'4 $" <1%$< : 2)') 1-2#&, 7 2 1-' 0, '3&&4)$% 3 ') 1-3*1 '0), 7 '0 $(&-403#, &, , 3*1 #27 &*1 ' 1-'42*1 '3), '$ 3&%1-' 33), ' 1-'&'3), 'A&*1 '(, '&-?' ((&(* 3 3 0) 1* 4, 2'2) &4 $', '42, -'3&, 7 &, '(&3 13' $%0&13 7 *1 3-'0$&3)*1 ?' 2) 0&13 7 *1 3-'0$&3)*1 ' &, ' 42*1 ?' 124, '3) 3, %A 2)'23 3&12' 1-'2, 3%2) &A, 2 , '0$2, '3&3), 'A& 23 3&1'$&0 3&1?

_ $%/ 3" ('9%#&2#&3

; $<9&%# % : 2, '(&, $%*3 -# *(4*%*1 '&' *, -', 2(* 3&'0&7 ($%*1 'A"3)' 1' ((&, -23 1- -'*' '2, 22, 227, 13*1-'0 3 2'3) '2 2'1, 0, 22 %?' , 2(* 3&'2, $ 03&1'7 423, 2, -'&1' 1&A1'&' 1300'(3-', (&24, '$, $2#3), ') + -2'&'3), '(&-403 1-'3), '2, A& *1 '$7 *3Z'&'3), '2, $ 03-', 2(* 3&?

>"30< :), 7 '0 $, 2'23 13#*7 (, *3&2' $&, 2'0&7 ($%*1 'A"3)' 1' ((&, -'23 1- -'2) &4 $', A&1' 3 $&3?', 2A), 1') 1-3*1 '0), 7 '0 $(&-403 2*' * '2 ' 22, 227, 13*1-'0 3 2'3) '2 2'1, 0, 22 %?

?+$< : , 3%, %A, '0&7 ($%*1 'A"3)' 1' ((&, -'23 1- -'2) &4 $', '42, -'A), 1' '2 22, 227, 13*1-'0 3 2'3) '2 2'1, 0, 22 %3&, &*-', (&24, '3&$'4*'2($2), 2#7 '22'&-423?' '&(, 3*1 '0&1-'3&12'0 42, ')*)'-4230&10, 13 3&12'3&, '(&-40, -#42, '-423&, $2?

) &3 : @ 2&1 $(&3 03', ', 4"(7, 13 &3', '&-%2) &4 $', '2, $ 03&-', 2, -'&1'3), '3 2', *1(, &7, ', 1-'3), '2 2'*1 &$, -' 1-'2) &4 $', '((&, -' %'2(, 0*$23, &, ') 1-3*1 3) '2 (&-403?

, ' 0, 10, '/ , 2, 0) """""@ ' &'99 """""""""""""/ &0 &-# """ : 95 ' : : 6 """"AAA"3), 7 &7&7
@, 0, ' &3 0) 1&$ %10?"" = ' 8, *-* 1'/ &-"""""": 9965""""""""": 95 ' : : =9; '

$%'&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

A8? 9/ <1%'2/ 3#%(<9$%/ 3" ('9%#$2#&3

?3 &%34 $3#'($ 9/ <1% : 7 "22'&12 &7 ' , 13$ 3&1'& 'A& '(&0, 22' , 4\(7 , 132) &4$ ' , '0), 0 , -'3&, 124 , '3 , % 2/ 3#%(< 0&7 ($%A*3} ') , ' , 4*' , 7 , 132' & ' , 1 * &17 , 13 $(&3 03&1'$ *2$ 3&17' 1'2&7 ' , 0 2, 2# 47 , '20 4 , 2# *$, 2 & ' , 1 *1, , *1 '7 & -*'0 3&12'3K 3} , '(&0, 22' , 4\(7 , 13A*$, 1, 0, 22 %3& , - 40, ' , 7 "22'&12'3K 00, (3 $ '$, $2?

8. - +<&2" ('" 30'2- $4 &2" ('9%9$%#&$<

. - +<&2" ('<#' #& : &$- ? %23 $1, '(&A- , ?

5 / (/ % :)*3?

0/ % : 3 10) ?

7 8) #' =&(&#+'" 30'%$" 2#& &#+

5 - $4 &2" ('<#' =&(&#+ : "), '(& - 403*2'23 $?

5 / 30 &&K 3 <#' '" / &0 : &*-'3} , '0 , 3&1'& ' - 423A) , 1') 1-$1 ' 1-' &*-' $5(&22* $ '2&4 0, 2' & '* 1'3&1' 2(& ' $ 7 , ?'" , '(, 0 43&1 %7 , 24 , 2 *123, $ 03 &23 30' - '20) , 2?'" & &*-' *, &', ($2*'&1#- '22'(3 '23 30', $ 03'0'3%- 4 *1 '3 12, ' % &41- *1 ' 1-' &1- *1 0&13 *1, 2' 1-', 4\(7 , 13 , & , '3 12, *1 '7 3 * $'@, , 13 - 423 0047 4 $ 3&1?

32/ 4 9" #&-($'4 "#5%&(< : / , 03 , '& '"10&7 (3 $ 'A*3} ') , ' &$&A*1 '7 3 * $2 & '- *+1 '7 3 * $2

>" "%/ 1<0$2/ 4 9/ <&&K 3 9%012#< : 1-, '1&7 $0&1- *3&12' & '23& , ' 1-'42, #) + - &42' - , 0&7 (&2*3&1'(& - 403'2') &4$ 1&3 , '(& - 40, - ?

. / <<&-&(&#+'/ *' - " "%/ 1< %" 2#& 3 < : 1-, '1&7 $0&1- *3&12' & '23& , ' 1-'42, #) + - &42' , 03&12'A*$1&3&004 ?

778@ &2/ (/ &2" ('&3*/ %4 "#&K 3

3&5 0') #' #5 <

21#5 '# &2&#+

. %012#&3 %0&$3#3" 4 $	; $<1(#	) 9$2&5<	, / <$	? 9/ <1%
/ # 9# -*7 , 0 (3K 43 1, <#- *&$	! 56' $	/ 3	66'7 >	

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5 - %3 2'# &2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

%&#' #&K 3 5 / %% <&3

5 / 32(1<&3) 14 4 "% : &3 *$ $?

) $3<&&K $%

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5" %2&/ $3 2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5(" <<&2" #&K 3

. %012#&3 %0&$3#3" 4 $	5 >	; 5	?.	) >	@	) >
/ # 9# -*7 , 0 (3K 43 1, <#- *&$				&1, ?		&1, ?

! 1#' $3 2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

@&%# $3 2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

; $9%012#& $'# &2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

$%'&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

778@ &2/ (/ &2" ('&3*/ %4 "#&K 3

5" 3" 0"

21#5 '# &2&#+

. %012#&3 %0&$3#3" 4 $	; $<1(#	) 9$2&5<	, / <$	? 9/ <1%
/ # 9# -*7 , 0 (3K 43 1, <#- *&$	! 56' $	/ 3	66'7 >	

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5 - %3 2'# &2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

%&#' #&K 3 5 / %% <&3

5 / 32(1<&3) 14 4 "% : &3 *$ $?

) $3<&&K $%

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5" %2&/ $3 2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5(" <<&2" #&K 3

. %012#&3 %0&$3#3" 4 $	5 >	; 5	?.	) >	@	) >
/ # 9# -*7 , 0 (3K 43 1, <#- *&$				&1, ?		&1, ?

! 1#' $3 2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

@&%# $3 2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

; $9%012#& $'# &2&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

7 8?2/ (/ &2" ('&3*/ %4 "#&K 3

?2/ # &2&#+ : & 1&A1'2" 1*'0 13, , 03 2' & '0 *30 $) + - 2?

3&5 0') #' #5 <

1" #&2' $2/ # &2&#+

. %012#&3 %0&$3#3" 4 $	; $<1(#	) 9$2&5<	? 9/ <1%
/ # 9# -*7 , 0 (3K 43 1, <#- *&$	043 ' 56'< 666'3K=6666'4 >' , 2) A 3	! ( )1*' '! ( )1*'7 1 ' ' <)&4 2	: ') &4 2

5 / 32(1<&3) 14 4 "% : &3 *$ $?

$%&#<#&32$ 0$ %0" =&&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

5" 3" 0"

1" #&2' $2/ # &2&#+

. %012#&3 %0&$3#3" 4 $	; $<1(#	) 9$2&5<	? 9/ <1%
/ # 9# -*7 , 0 (3K 43 1, <#- *&$	043 ' 56'< 666'3K=6666'4 >' , 2) A 3	! ( )1*' '! ( )1*'7 1 ' ' <)&4 2	: ') &4 2

5 / 32(1<&3) 14 4 "% : &3 *$ $?

$%&#<#&32$ 0$ %0" =&&#+

5 / 32(1<&3) 14 4 "% : &3 *$ $?

$%'0 $%$'$ ""$2#< : & 1&A1'2" 1*'0 13, , 03 2' & '0 *30 $) + - 2?

$%'&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

7 8, &<9/ <" ('2/ 3 <&0 $ %#& 3 <

" <#&' 0 &>9 / <" (: ") , ' , 1, 3&1 '& ' A 23 ' 2) &4 $ ' , ' &*- , - ' & ' 7 *1 7 ' *+ , - ' A) , ' (&22* $?' * 1 * ' 0 13 4 ' 133', 2 & ' A 23 ' (& - 403 , 2*- 4, 2 2) &4 $ ' 1&3 , ' - ' 2(&2, - ' &' * ' 3 , ' &4 $2, A, ' 43 (&0, 22, - ' *1 ' '24 *3 $ ', $1, 133, 3', 13 ($ 13 *1 ' 2(&2, ' & ' 24 ($12 ' 1- ' 1&1 , 0 9 0 $ $ (& - 403 2' * ' ' $0, 12, - ' A 23 ' - ' 2(&2 $0&13 03& ?' 1 ' 2(&2 ' $ &, 3 ' 2 ' (& - 403 #28$ 1 3&12 1- ' 1% %(& - 403 2' 2) &4 $ ' 3 $ 37 , 2 0&7 ($ %A *) ' 3) , ' , 4 * , 7 , 13 2 ' & ', 1 * &1 7 , 13 $ (&3 03 &1 ' 1- ' A 23 ' - ' 2(&2 $ $, *2 $ 3&1 ' 1- ' 1% , ' &1 $ $ &0 $ 43 & *3 % , 4 * , 7 , 13 2? 23 ' (0 *1 ' 2) &4 $ ' , ' , 0 9 $ - ?' 10 *1, 3&1 ' & ' $ 1- ' $2) &4 $ ' & 1 $ % , ' 0 &12 *. , - A) , 1 ' , 0 9 $ 1 ' *2 1 &3 , 2* $?') ' 2 ' 7 3 * $ 1- ' *2 ' 0 &13 *1, ' 7 423 , ' - ' 2(&2, - ' & ' *1 ' 2 , ' A *2 ' , ' 2) &4 $ ' , ' 3 , 1 ' A) , 1 ') 1- $1 ' , 7 (3, - ' 0 &13 *1, 2 ' 3 3) , ' 1 &3 , , 1 0 $ 1, - ' & ' *12, - ' &4 3 ' 7 (3 %0 &13 *1, 2 ' & ' $1, 2 ' 7 % , 3 *1 ' 2 &7 , ' (& - 403 , 2*- 4, 2? &*- ' - ' 2(, 2 $ &, ' 2(*$ - ' 7 3 * $ 1- ' 41 & ' 1- ' 0 &13 03A *3 ' 2 & $ # A 3 A %2 # - *12 1- ' 2, A, 2?

, &<9/ <" ('<- / 1 (0 '=$' &8 " ' 22/ %" 32$' &- ' " 99 (&2 " =($ ' % &3 " ('3 " #& 3 " ("' 30 '(/ 2 " (" <" 30 ' % 1 (" #& 3 <8

; $ "$ %# ') $2#& 3 ' ;' > ' , ') @ ; ?' " 30 ') $2#& 3 ' A ' ? .) ; ?' 5 @) . ?;) ' . ; @ ' 5 @ */ % ' 0 0 &8& 3 " (- " 30 (&8 ' &8 */ % " #& 3 " " 30 ' 9 % #5 2#& 3 ' / " $ 4 9 (/ +$ $ <8

7 8@%3<9/ %#&8 */ %4 " #& 3

; $ 1 (" # % &8 */ % " #& 3	'314 =$%	% 9 $ %<- &8 9 &8 3" 4 $	5 (" <<$<	.
, @5 (" <<&2" #& 3	===5	* 3&1 ' , 4 $ 3 - 2&$- #1 '&12? / # 9# - '7 , 0 (3& 43 1, <#- - '8$F28$-		
@ , ; ' 5 (" <<	===5	* 3&1 ' , 4 $ 3 - 2&$- #1 '&12? / # 9# - '7 , 0 (3& 43 1, <#- - '8$F28$-		

@ ' ' @ 0 *1 ' &4 (

7 8; $ 1 (" # %' &8 */ %4 " #& 3

3&$0 ') #' #5 <

>5) ' 5 (" << &2" #& 3 : " & *0 '7 3 * $ '3 3*1 ' 7 3 * $ " , 3 & 1', , 032

8) 8 $0 $ %(' % 1 (" #& 3 < : @ 5 'A " ' ; ' ? $4 9 #. " %#& ('$ $4 9 #& 3 ' &3 - , 3 7 *1, - 3&$0 ') #' #5 <' &8 $3 # %' @ 5 'A= ' $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?
) ; ' 77 7 '$ #%$4 $(+' - " " %) / 1 <' 1 =<#' 32$< ' &(& - 403 2' A, , ' &41 - ?
) ; ' '$4 $%$32+' 9 (" 33&8 ' '" 30 '3 / #&2" #& 3 ' &(& - 403 2' A, , ' &41 - ?
) ; ' 77 7 '- " " %) / 1 <' 2 - $4 &2" (<' &(& - 403 2' A, , ' &41 - ?
) ; ' 77 7 '! ,) ,) '0 &#& 1 #& 3 ' '2 - $4 &2" (8 $3 # %' '- " " %) ' &0 $3 #& 2" #& 3 ' &
(& - 403 2' A, , ' &41 - ?

5 ($" 3 ' &% 2#') $2#& 3 : &3$23 -
77 = '>" " %) / 1 < &%
. / ((1#' 3#<' > . <
5 ($" 3 ' &% 2#) $2#& 3' : &3$23 -
5 (" << ') 1 =<#' 32$<
5 ($" 3 ' &% 2#) $2#& 3' : &3$23 -
5 (" << ') 1 =<#' 32$<

7 8 @#

, ' 0, 10, '/ , 2, 0) """""""@ ' & '99 ~~~~~~~~~~~~~~~~~~/ &0 & -# ~~~ : 95 ' : : 6 ~~~~~AAA'3 , 7 &0&7
@. 0, ' '&3 0) 18& %10?""""= ' ?8 , *- * 1/ & - ~~~~~~~: 9965~~~~~~~~~: 95 ' : : =9; '

$%'&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

7 8; $ 1 (" # %' &8 */ %4 " #& 3

. ? ' &# ' 5 - $4 &2" (< : &3$23 -
. %21%/ %6 - $4 &2" (<
. ? ' &# ' 5 - $4 &2" (< : &3$23 -
? <<$3#& ('5 - $4 &2" (<

) # #&' % 1 (" #& 3 <

! " <<" 2 - 1 <$## : &1, '& ') , ' 0&7 (&1, 13 2' , '$23 - ?
$ ' / % : &1, '& ') , ' 0&7 (&1, 13 2' , '$23 - ?
$ ' $ %$+ : &1, '& ') , ' 0&7 (&1, 13 2' , '$23 - ?
. $33 <+(" 3& : &1, '& ') , ' 0&7 (&1, 13 2' , '$23 - ?
3&$0 ') #' #5 <& $3 # % : $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?
@ 5 'A=

5 " 3 " 0 "

>!) ' 5 " 3 " 0 " : $ 22 '! 9 '8 3 * $0 42 *1 ' 7 7 , - * 3 ' 1 - ' 2, *&4 2' 3& *0', , 03 2' " & *0 ?
$ 22 '! < '8 3 * $0 42 *1 '&) , ' 3& *0', , 03 2' " & *0 ?

5 " 3 " 0 & 3 ' (&#<

5 " 3 " 0 & 3 ' . ; : &1, '& ') , ' 0&7 (&1, 13 2' , '$23 - ?
5 ?. '@ &' <1 =<#' 32$< : &1, '& ') , ' 0&7 (&1, 13 2' , '$23 - ?
5 " 3 " 0 "' &8 $3 # % : $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?

@ &' 9 % 012#- " <'=$$3 '2 (" <<&8&0 '&8 '" 22/ %" 32$' &' # $ ' - " " %' 2 %&5 %&' / " # $ ' 5 / 3 #% (($0', %012#<'; $ 1 (" #& 3 <
"30 '# $ '!) ,) '2/ 3 # &<' " (("# $ '&8 */ % " #& 3 '% 1&$0 '=+' # $ ' 5 / 3 #% (($0', %012#<'; $ 1 (" #& 3 <8

3&5 %" #& 3 " ('% 1 (" #& 3 <

3&5 %" #& 3 " ((&#< : 1 <#% (&' &8 $3 # %' 5) ' $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?
5 - &8 " '&8 $3 # %' ?5) 5 ' $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?
" 9 " 3 '&8 $3 # %' &3 - , 3 7 *1, - ?
/ %" '&8 $3 # %' &3 - , 3 7 *1, - ?
$ ' $ " (" 30 ' 3 $3 # %' / " 5 - $4 &2" (< / 5 ' $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?
. - &8 9 &8 $ <' &8 $3 # %' . 5 5) ' $0&7 (&1, 13 2' , '$23 - '& ', , 7 (3 - ?

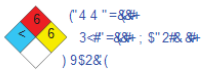
7 8 # $%&8 */ %4 " #& 3

" =$(% 1 &$4 $3 #< : / 8 ' ' ! ?' '/ @/ " / '"/ " # ' ! '
/ / " " ?' " '8 " / '" " ' '" / "' / '! 8 ?

>" " %) / 1 <' " #5 %(:
3*/ %4 " #& 3 ') +<#5 4 ' 8) 8 8

@ $' 21 <# 4 $ %& <' %<9 / 3 <&=($*/ %0 $ #5 %4 &8 &8 '# $' . . ?' 2 / 0 $' */ %# &' 4 " #5 %& (8

" #& 3 " (' &8 $. % #& 2 #& 3 :
<</ 2&#& 3 ' 8) 8 8



, " #5 ' / " 9 %8 #8 : 7 8
, " #5 ' / " &<<1 $: =><=><69<?
, " #5 / " 9 %$ & 1 <' &<<1 $: &(, '&4 2' $ 3&1?

7 8 A'#

, ' 0, 10, '/ , 2, 0) """""""@ ' & '99 ~~~~~~~~~~~~~~~~~~/ &0 & -# ~~~ : 95 ' : : 6 ~~~~~AAA'3 , 7 &0&7
@. 0, ' '&3 0) 18& %10?""""= ' ?8 , *- * 1/ & - ~~~~~~~: 9965~~~~~~~~~: 95 ' : : =9; '

$%&&()*+, -(-./012/3*4566'6'6'899: ;

7 8 # $%&3*/ %4 "#& 3

6$%& 3 : 9
. %$9"%$0'=+ : 8 ! ' (,0* $23

30&2"#$<&*/ %4 "#& 3'# "#- "<2- "3 $0'*%4 '9%$ & 1<(+'&<1$0' $%& 38
/ #&2$'# '%$"0$%

@'# $'=$<#/ "/1% 3/ ($0 $'# $'&*/ %4 "#& 3'2/ 3#'&$0'-$%&'&'"221%#$8>/ $ $%3$& $%# $'"=/ $ 3"4 $0
<199(&%3/ %'3+'/ "&<1=<&&%&<'"<<14 $<"3+'(&=&&+' -"#</ $ $%/ %# $'"221%2+'/ %2/ 4 9($#3<</ "# $
&*/ %4 "#& 3'2/ 3#'&$0'-$%&8
&"('0$#$%4 &"#& 3'/ "<1&'=&&+'/ ""3+'4 "#$%&('&'# $'</($'%$<9/ 3<&=&&+'/ "# $'1<$%8 ((4 "#$%&(<4 "+'9%$<$3#
13 3/ 3'-" "%<"30'<- / 1(0'=$'1<$0' &'2"1#& 38 (# / 1 -'2$%'&'-" "%<"%$'0$<2%&$0'-$%&' $'2"33/ #
1"%3#$$'# "## $<$'"%$'# $'/ 3(+'-" "%<# "#$ &#8

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&'-(")$#*-+"#'-(, $$#

! "#$%&' $( ) -*$ -+ , . , / 0 1 2 3 4 (5 6 2 7 6 / ! - 7 $ 8 - / & $ 9 : -! ; $ (<

78. %012#"30-2/ 4 9 "3* -&0$3#&)&2"#&% 3

. %012#3"4 $: ! "#$%& $( ) -*$ -+ , . , / 0 1 2 3 4 (5 6 2 7 6 / ! - 7 $ 8 - / & $ 9 : -! ; $ (<

(199'&5% : 8(5 & - $ 8(5/ 4 $ " #5 $ 4
. $ 54(-6 $ &# 48" &2& 3
-6 & - AAB
&4 &5 - -EAA=F
"$# ' -/ # # ( )
>AF DE> =BCB-&5
>== >BC @B?@

! "31)"2#1 %5% : 8(5 & - $ 8(5/ 4 $ " #5 $ 4
. $ 54(-6 $ &# 48" &2& 3
-6 & - AAB
&4 &5 - -EAA=F
"$# ' -/ # # ( )
>AF DE> =BCB-&5
>== >BC @B?@

5/0$: ==>?@A=-==>?@B=-==>?@C-==>?@DA-A>E=C>D-A>E=CD=-A>E=CD?-A>E=CD@A>E=CDC
A>E=D@D-A>E=DC=-A>EAAAF-A>EAAAE-A>E??C@A>D?A=C-A>D?A=F-A>D?A=B-A>D?A=>
A>D?A=D-A>D?E?@A>D?EDE-A>DE=D->CA?A=-->CAEC=-->CAEE==

! (+(- : BE?F

6"'&0"#&% 3-0"#5 : C0AC0?=AA

. %&#0"#5 : C0AF0?=AA

; $<9/ 3<&<"$-3"4 $: / / -* (92#&53-/ (4 $ 2 3 #<

5>?! @?5: : ! "#5%&'-1<$< : ; $)$%#' -# $-$9<#%2#&% 3
ABBBDDDEEFBB =/ / '$#)/ %9 % 9 $ % ' 30
@ +?- (: &5#&30$0-1<$8- # $% &<$
EF8 D 0FAA 2/ 3# 2#-<199'&5%9 / %-<9$28)&2
"99'&2" #&% 3<8

. %012##"9$: $ 9$

D8>" "%0<-&0$3#&)&2"#&% 3

?4 $%$32*-/ $%&5

. , * <&2"'-<#' #5 : $ 9$

(& 3"'- / %9 : !

>" "%9-<#' #5 4 $ 3#< : ! - ! / , - , / . ! - ! -, , -! -/ - ! – ! /
! , ! - +! - ! - ! / , - ! 1 , - 1 ! - ! ! 1 ,

. %2" 1#&% 3"%-4 $" <1%< : &-"&#%9(#5(- &5-&5- $)#-)(-&"2)-7 $ 6 - ' (9 #(- ("#&2#&" – &-"&#(#-' 55 -&5
): & (-7 8("-9) $ -#&5) - 5& 9 4#-! &$5 -4&"# 4#7 $ 6 - (3( ) -) $ -"' -4 2 & #5 $ – ((
4&"# $ (5+&5 6#2 3-4 2&) (' –) 8-#&8&5&9 8 2 - # 58 "' 25

(> >5 (-<# #1 < : 8 $)-: #(55 2 $)-4&") $ (5 (' -8 ; 5 &9) -9 $ -#&(- / +! -+ ; 5 - & : 9" $ # &" -/ # "' 5
"?D- -ADA= A?==<

; / 1#&<-/)-$3#% : (5: 248&"# 4#-, 3(-4&"# 4#- "8 2#&" - " ( ) #&"

/ #53#&" -" 21#&-. $"'# -$))$2#<

3, "'"#&% 3 : & (5 # 2 3 - $ 5 5 # 5 #&-#&(-5( ) $ 5 #&53-) 3) # :

3 $<#&% 3 : &- "&7"-) $ "$% "#((4#)-&5 4 - $ 5 #& 28 ; 5)

(&8 : & (5 # 2 3 - $ 5 5 # 5 #&-#&(-) $

?*$< : & (5 # 2 3 - $ 5 5 # 5 #&-(3( )

/ #53#&" -2. %3 &2-. $"'# -$))$2#<

5, %3 &2-$))$2#< : &"# $ ')-: #(55 2#& #4 "-4 9)(-# 5 (#&5 "-' : (

5" 9 2 &8/ $3 &2&# : &- "&7"-) $ "$% "#((4#)-&5 4 - $ 5 #& 28 ; 5)

$%&( ) *'+, -.'%/ 0102"3456+7) 482 $-9 '& -2) *"; < -$ -=*+>

D8>" "%0<-&0$3#&)&2"#&% 3

! 1#' $3 &2&#" : &- "&7"-) $ "$% "#((4#)-&5 4 5 $ & 28 ; 5)
@ $ %#' $3 &2&#" : &- "&7"-) $ "$% "#((4#)-&5 4 5 $ & 28 ; 5)

+$ $'/ 94 $3#"'-$))$2#< : &- "&7"-) $ "$% "#((4#)-&5 4 5 $ & 28 ; 5)
$%&&#' -$))$2#< : &- "&7"-) $ "$% "#((4#)-&5 4 5 $ & 28 ; 5)
@ %$#/ %"3< : &'"# $')-: #5 $ 27 8 $ 8-: 3-4 9)(-' : (-#&-#&(- &2&7 $ -&5 ") - $"(3) -2 5 (5
) #&&5 #( ) #5 2#5 4#-9 (5-$( ) $5 #&53-#5 4#-) $' -(3( )

$%$_9/ <1%-<& 3< <"4 9# 4 <

3, "'"#&% 3 : ! ' (9(-( ) 3: #&:) -: 3-$' 4 2 9' (-#&(- &2&7 $
5( ) $ #&53-#5 4# $ 5 $ #&"
4 & 9 8 $

3 $<#&% 3 : &-) (4 $ $ -' #

(&8 : ! ' (9(-( ) 3: #&:) -: 3-$' 4 2 9' (-#&(- &2&7 $
$ 5 $ #&"
5(' " ( ))

? *$< : ! ' (9(-( ) 3: #&:) -: 3-$' 4 2 9' (-#&(- &2&7 $
$ 5 $ #&"
7 # 5 5
5(' " ( ))

! $0&"'-2/ 30&&3< : 5((9 #5 -' 9 & 5 (9 -$' &2 $ - "3# 5 (#&5 ") -: ("#&" (' -$' #&$ - / / -) -% $ - #
" % "#50-=*-/ $% 5 9) -: 3-% - 5 #(' -%9 -& (5(&) 9 5 (#&-#&$ - 5& 94#

$ 9/ <1%$

($$-# &2/ ' / &"' -&)/ %4 "#&3-($2#&3-77

F85/4 9/ <&#&3 &)/ %4 "#&3-/ 3-&8 %$0&$3#<

3, &&50-(#' #5 <

"4 $	5 (-314 =$%	
2 4 (5 &2	FE>AF	CF--EF

5"3"0"

"4 $	5 (-314 =$%	
2 4 (5 &2	FE>AF	CF--EF

@ $%-"%-3/ -"00&&3"'-&8 %$0&$3#<-9%<$3# , &2. - &#; &8-# $-21%&3# 3/ '$0 $-/) #. $-<199'&5%'30-&8-# $
2/ 32$3#'%#&3<-"99'&2" ='$ -" %-2" <<&,&50-" <-, " "%/ 1<-# -, $"'#, -/ %#($-$3 &&34 $3#" 30-, 32-% 1&&5-%9 / %#&8 -&8
&<-<$2#&38

C8- &%#"&0-4 $" <1%<

?*$-2/ 3# 2# : 8(4 - &5- "' -5(: & (- "3-4&"# 4#2 ") ( ) – : : (' $ # 2 3 - 2) 8-(3( ) -7 $ &- 2 "#&-&-7 # 5
&5 #2) #AF-: $ 9#( ) -&44) $ &" 2 3 - 2 5 &5 -#&(-9 (5 "' -2&7 (5-(3(2 5) –1 (#: (' $ # 2
#"#&" -$: (' $ # 2 3

(&8-2/ 3# 2# : "-4) (-&-4&"# 4#-$: (' $ # 2 3 - 2) 8-) $ '-7 $ &- 2 "#&-&-7 # 5 - &5 #2) #AF-: $ 9#( )
7 8 $ 2 -5(; & $ -4&"# : $ #(' -4 2 &6 $ - "' -) 8&( ) --) 8-4 2 &6 $ -% &5[-5(9) (-- 2 "
) 8&( ) -#&8&8 8 2 - % &5(-5(9) (–1 (#: (' $ # 2 3 - 2 #"#&" -$: (' $ # 2 3

3, "'"#&% 3 : & (-(&" (' - (9 &" #&- 5( ) 8- $ -- -" &#9 6 # $ -$-9 6 # $ -9 $ 5 [92 5-8&5
5( ) $ 5 #&53- 5[ ) #&4 49 $ - 5& $ (- 5 6 $ &$ 25( ) $ #&" -&5-&3 ("-9 -#6 $ (' - (9 &" "(2
&&) ("-#6 6#4 2 &6 $ -) 948-) - -4 &2 5-# -%(2 #-&5-7 9 #% "" –1 (#: (' $ # 2 #"#&"
$: (' $ # 2 3

3 $<#&% 3 :) 8-&9#: &9#8-7 $ 8-7 # 5 – &" &#$' 94(- & $ 6 -9" 2)) -' $ (4 #' -#&-' &-) &-%9 - (' $ # 2
(9 &" "(2 – ((5- $ (- "3 # $ -%9 -: &9#8-#&- "-9" 4 &") 4 $ 9) - (9 &" –1 (#: (' $ # 2
#"#&" -$: (' $ # 2 3

$ %&( ) * '+, -.'%/ 0102"3456+7) 482 $ -9 '& -2) * '; < -$ =' * +>

C8 &%#" &0-4 $" <1%$<

. %#&2#& 3-/)-)&%#" &0$%

: &- 4#&" -)8 2$%(# ("-$ &2$ - "3- (5)&" 25$ -8577$8&8#) 9$ %2 -#5 $ $ -- #: 3 %'- " (5&9) -#&-#&(- (5)&" - 5& $ $ - $ -#&- $ (- &9#&-#&- &9#&-5( ) 9) 4$# #&"

/ #&<-# -9, * <&2&3

: &-) (4$$#-#&(# ("#-- 5(#) 3: #&- #&# 2$ -- &"# 4# &9)&" -#&(# ("#) (4$ 2)# $: (' $ # 2-$-$ 2 5 (- 9 "#&&) -8 (-%(("-$ ( ) #' -8 5 $ 8 2'

8 &%$)&, #&0 -4 $" <1%$<

'"4 4 "=&&#' -/) # $-9 %012#

: "- - 5(-8 5 5-$ -8(#' - - 5( )) 9 5(-$ 45( ) (-7 $2&4495- "' -#&(-4&" # $ (5: 3-%9 5)#

? #&0 1&: &0 -4 $0&

(1&#' ='$

:) (- "-(#& 9)8 $ - ("#) 9$# %2 (- 8 5 #&) (-) 9 5 &8 "' $ -5(

/ #<1&#' ='$

: &"(- "8 &7 "

(9$2&'-$ 9/ <1%-, " "%<

: 5&: #&3-$)&2 # -#&(-) 4(" (-%-$ -(: & $ - 2& (5)&") -5&: -#&(- $#5 $&8-&-#&(-$ 4$ ("#$ #&(5(-$) - - 5(-- & 4#&" -) 8 2$%(# ("-$ &2$ - "3- (5)&" 25$ -8577$8&8#) 9$ %2(#5 $ '$

>" "%/ 1<# $%& "'

: (4& &) $&&" - 5& 94#) -: 3-$ 42&' (-#&(- &2&7 $ -: # 55 2) 4 5%&" - 5&, $ (4 5%&" -: &" & $ (

(9$2&'-9%#&2#&, $ $ 1&94 $3#) / %)&&) &, #&%

: 5($ 6#(5) -) 8&&92 -7 (5 5&, 5& # - 5&# 4#&(-(9$: ("# "' -) (2 4&" # $ (' -9%(#&$' 5 #&) -*/ 6! <7 $&- - 9 2& 4($ 4 (-& (5 #' -$ - &) $&& (- 5( )) 9 5 (-: & (

8 22&0$3#'-%$'$" <$-4 $" <1%$<

. $%/ 3"'-9%2" 1#&3<

: &- 4#&" -) 8 2$%(# ("-$ &2$ - "3- (5)&" 25$ -8577$8&8#) 9$ %2 -#5 $ $. 49 #-) 9 5 5&9 "' $ - 5( ) – ((-9 "" (4( )) 53- "' -9" 5&# 4#' - (5)&" (2 5& ("# 5$ -- &" &##&948-857 2 -#&5&9 8-) $2' -: # 55 2-! &$ -9%(#&$' - &5-85: 9# - 5& $ (- ' (9 #- ("#2 #&" -- (5 5& 5& # - (5)&" 2 5&# 4#&(-(9$: ("#") (- / (4#&" -><

?3 &&34 $3#'-9%2" 1#&3<

: ! &$ -' 5) (5) 2&-) $2' -: # 55 2 "' -5)" & - "' -4&" # 4#7$&-) &$2-7 # 57 3) -' 5 $') "' -) (7 (5) – " &5 -#&(-5 2 "# 9#&&5&&) -$-#&(- 5& 94#&) -4 9) (' -(" 5$ ' ("# 2 &2)#&&" -") (7 (5) -7 # 57 3) -) &$2&$ $<

! $# / 0<-)/ %2'$" 3&0 -19

(4 "" <9&

: / #&, -2 -$-7 $&&9#5) -- & (-4&" # $ (5) -5&, -) $2 5 -- $2# -7 $&-7 # 5 "' -: & , -9 $-7 # 5) &2)%2 -! 2# 5' #&(2)-85$-7 # 5 $) &2)%2 - %) &5%7 $&- "-$ (5# 53-: # 55 2 "' 2 4(-$-"- 5& 55 # -7) # (-' $) &) 24&" # $ (5 – $) &) (-&- $ - -2)("') (-7) # (' $) &) 24&" # 5 4#&5

"%$-<9&

: / #&, -2 -$-7 $&&9#5) -- & (-4&" # $ (5) -5&, -) $2 5 -! 5& 48-5(2) (-5& 9 7 $' -- 5(("#("#53-$ #&-) (7 (5) -7 # 5 4 8 9 5) ( ) -%) (: ("# -85-4&" $ (' - 5( ) --) 8) $2 ( ) -$ #&- "-(2("#-#(# ("# 2 "#85 5&4((' -) - &2&7) – &" # $ - "' -4&2(4#) $2 (-7 $&-" &" 4& %) #&%2(- %) &5%("# : # 55 2(-) "' -(5&- (5 9 %2&# -85 $ #&, 4(&9) -(5&- "' - 2 4 (-$ -4&" # $ (5 -85 ' $) &) 2 44&5 $ -#&-2&4 25(92 #&") *) ( ) (4#&" -A@-- $) &) (-& - $ - -2&(") (' -7) # -' $ &) 24&" #5 4#&5-- &" # : $ # ' %) &2%("# : # 55 2 3- &) (-#(-) : (-8 ; 5 -) -#(-) $2' - 5& 94# -- &# -) ((-) (4#&" A- &5 (: (5 ("43-4&" # 4#$ &(#&" - "' -) (4#&" -A@&5 7) # -' $ &) 2

8>"30'&0 -"30-<# % $

>"30'&0

: 9#&" - 5& 5& # - (5)&" 2 5&# 4#&(-(9$: ("#") ((-/ (4#&" -><-, #& -' 5& $ - "') : & $ -) 8&92 -%) - 5&8$%&# ' -$ - 5( ) -7 8 (5(-#&) $: # 55 2) -8 $ "' 2 ') -#&(' - "' 5&#4 (5) -7 # 5 4 8 9 5) ( ) -%) (: ("# -85-4&" $ (' - 5( ) --) 8) $2 ( ) -$ #&- "-(2("#-#(# ("# 2 "#85 5&4((' -) - &2&7) – &" # $ - "' -4&2(4#) $2 (-7 $&-" &" 4& %) #&%2(- %) &5%("# : # 55 2(-) "' -(5&- (5 9 %2&# -85 $ #&, 4(&9) -(5&- "' - 2 4 (-$ -4&" # $ (5 -85 ' $) &) 2 44&5 $ -#&-2&4 25(92 #&") *) ( ) (4#&" -A@-- $) &) (-& - $ - -2&(") (' -7) # -' $ &) 24&" #5 4#&5-- &" # : $ # ' %) &2%("# : # 55 2 3- &) (-#(-) : (-8 ; 5 -) -#(-) $2' - 5& 94# -- &# -) ((-) (4#&" A- &5 (: (5 ("43-4&" # 4#$ &(#&" - "' -) (4#&" -A@&5 7) # -' $ &) 2

$ %&( ) * '+, -.'%/ 0102"3456+7) 482 $ -9 '& -2) * '; < -$ =' * +>

8>"30'&0 -"30-<# % $

(# % $

: &" &#) #&$(- %& (-#&(- &2&7 $ -#: (5 #5(- ?= .* C <-/ #&$ -$ - 44&5 "4(-7 $&& 2&4 25(92 #&") -/ #&$ (-$ -8 5 5 $ 24&" # $ (5 5&#4#4#' - 5&, -' 5(4#) 9" 2 5 8 #$ - ' 53 -4&&2 "' -7 (2(("#2 #(' - 5(- 7 3- 5&, -$ 4&: #&$ (-: #(5 2) -") ( ) -) (4#&" -A=<: "' - &&" ' -5 -- ((-4&" # $ (5#&8#2 3-42&) (' - "' -) (2' -9" #2 5(' 3- 8 5 9) (-- &" # $ (5) -#& # 8 (-%(("-&, ("(' : 9) # %-4 5(92 2-5) (2' - "' - (#9 5& 8 ##&- 5(("#2 (– & "&#) #&$ -$ -9" 2 %2 (' -4&" # $ (5) –) (- 5& 5& #-4&" # $: ("##&- &5 -(" 5&: ("# 2 4&" # : $ #2&"

A8? 9/ <1%$-2/ 3#%' < 9$%/ 3"'-9%#$2#&3

3&50-(#' #5<

3 %0&$3#	? 9/ <1%$-' & &#<
2$4(5&2	5 >- 3&50-(#' #5< 8 ! -A=-: 0 5 >-@ 6 - 3&50-(#' #5< -D DB7B 8 ! -A=-: 0 ->-8&9 5") <- &5 - "8 2 %(- 5 4#&" -/ ((-! ("' $ - 5 5 8-! -"8 2 %(- 5#&92 #(-)) -* .) < &5#8&) (: # 55 2) -#& # 5(-8 : 5 &9) -7 8 ("-' (&) $ (' -"3 7 8 (5(-$ -#&(- 5) $ #&53-#5 4 # (> -. ? - 3&50-(#' #5< - DB7B 8 ! -F-: 0 ->-8&9 5") <- &5 - ( ) $ %(- 5 4#&" -- ! -AF-: 0 ->-8&9 5") <- &5 - &# 2 9) # (> -. ? -7EAE: 3&50-(#' #5< -F 7EAE 8 ! -F-: 0 ->-8&9 5") <- &5 - ( ) $ %(- 5 4#&" -- ! -A=-: 0 ->-8&9 5") <- &5 - &# 2 9) # (> -. ? - 3&50-(#' #5< 8 ! -AF-: 0 ->-8&9 5") <- &5 - &# 2 9) # 5 >-@ 6 - 3&50-(#' #5< 8 ! -A=-: 0 ->-8&9 5") <- &5 - &# 2 5&9 2 #( ) (> -. ? – 3&50-(#' #5< 8 / #5 <-; $ <9 &%-' $! -AF-: 0 ->-8&9 5") <

5"3"0"

2219"#&3"'-$ 9/ <1%$-' & &#<		@ -A-, / 1%			(@ - 7 -4 &#<			5 $ & &			
3 %0&$3#	&#3"4 $	994	4 4	# $ %	994	4 4	# $ %	994	4 4	# $ %	/ #' #& 3 <
2$4(5&2	/ -! 1 + -?0"=A= / -! 1 + ! 6 -D0"==D 6 -D0"=A= -E0"=A= -E0"==>		A= A= A= A= @ A= A=								% @ - 4 4 ' (

@/ $ -) (") %& #&"
/ %4 :- "8 2 %(- 5 4#&" -/ ((-! ("' $ - - 5 5 8-! -"8 2 %(- 5#&92 #(-)) -* .) < &5#8&) (
: # 55 2) -#& # 5(-8 : 5 &9) -7 8 ("-' (&) $ (' -"3 7 8 (5(-$ -#&(- 5 #&53-#5 4 #- % &# 2 5#&92 #( ) - 4 $ # ' ( ) $ %2(
: $ # (: $ #

5 / 3<1' # / 2" "-" 1#(/ %#&$<-)/ % 22$ 9 # =' $-$ 9/ <1%$-' & &#<3

: $2/ 4 4 $30$0-4 / 3&# %&3 9%2$01%$<

: -#&$ - 5& 94#4&" # $) -$ 5 (' $ " #) -7 $&) -(&) 9 5(-2& $) - (5) & " 2-7 &5 2 4 (- # &) 8 (5 &5-%$&2&. $ 2 &" $&5& -: 3-%-5(9 5(" -#&-' (# 5: $ (-#&) -(- (4#& (" ( )) -& -#&) - ("#&2 #&$&" 5 4&" #&2: ( ) 9 5) - "' 0&5-#&) (-" (4 ( )) $&3-#&-9) -5 ( ) $ 5& #&53 - 5&#4#&5 (-(9$: ("#

?3 &$ $$%&3 -4 $" <1%$<

:) (-&" 2)-7 $&- ' (9 #(- ("#2 #&" -- -9) (5& (5 #&") - ("(5 #(: 9) #- 9: ( ) -) - &5 &5: 9 #-9) (- 5&4( )) -("42&) 95( ) -2&4 2(8 9) # ("#2 #&" -&5-&#&) (5-(" $ ((5& -4&" #&&2) #&- ((-7 &5 (5(8) 9 5(-#&- $7 %&5 (-4&" # : $ "#-%(2&7 - "3-5(4&. : ("' (' -&5-) # #&#&53 2& $ #

$%&( ) * '+, -.'%/ 0102"3456+7) 482 $-9 '& -2) * '; < -$ =' *+>

A8? 9/ <1%$-2/ 3#%' < 9$%/ 3"' -9%#$2#& 3

>* &3-4 $"<1%< :)8-8 "') - 8&(5)- "' - 4(-#8&8&9 8&2- # 5-8 "' 2$ -48(: $ 2 5& 94# -% 8&((#& -) : & $ - "' -9) $ -#8(-2 #&53- "' - ##8(-("' -&-#8(-7 &5 $ - (5&& –! 5& 5$ # # 48 "$ 9( ) -) 8&9 2 -%) -9) (' -#&-$ (: & (- &# "#& 2$ -4& "# : $ #(' -42&#8$ _) 8 4&" # : $ #' -42&#8$ -% 8&(-$) 9) $ --, ") 95(-#8 #(3(7) 8-) # #&") - "' -) (#8-) 8&7 ($) 5(-4 2&) (-#&-#8(-7 &5) # #&" -2&4 #&"

$%/ 3"' -9 %#$2#& 3

; $<9&%# % :)(- 5&(52$ - $#(' - $ 9$5 3$' -&5- $5 (' -$) $ #&5 4&: 2$5 -7 $#8- "- 5&(')# "' 5 -$- -5$ -)) ( )) : ("#$' $# #( ) -#8$ -$ -" (4( )) 53 – ( ) $5 #&5) (2 4 #&" -: 9) # % %) (' -&'- "&7" -&5- "#$# $ -#(' (&) 95(-2((2 -#8(-8 ; 5) -&-#8(- 5& 94# "' -#8(-) (7 &5 $' -2$ $#) -&-#8(-) (2 4#(' -5( ) $5 #&5

>" 30< : 8(: $# 2$( ) $ # "#-$ (5 $#9) - 2& ( ) -4& 2$5 -7 $#8- "- 5&(' -) # "' 5 -) 8&9 2 -% 7 &5' - # 2#5 ( ) -7 8("-8 "' 2$ -48(: $# 2 5& 94# -$- -5$ -)) ( )) : ("#$' $# #( ) -#8$ -$) "(4( )) 53

?* $< : / (#8-(3(7 (54& 2$5 -7 $#8- "- 5&(' -) # "' 5 -) 8&9 2 -% -9) (' -7 8("- -5$)) ( )) : ("#$' $# #( ) -#8$ -$ -" (4( )) 53 -#&- &5 -(&) 95(-#& 2$ 9$ -) 2) 8( ) -: $ # -&5 ' 9) #

(&$: (5) &" 2 5&#(4#5 (-(9$: ("# &5-#8(-% & 3-) 8&9 2 -% -) (2 4#(' -%) (' -&" -#8(-#) -% $ (5 &&_ (- "' -#8(-5$) -$ &2 (' - "' -) 8&9 2 -% - 5& (' -% & -) (4$ 2$ # % &&(-8 "' 2$ #8$) - 5& ' 94#

?3 &%34 $3#' -$ 9/ <1% 2/ 3#%' < : , $) $&") - 5& - ("#&2 #&&" -&5-7 &5 - 5&4( )) -(9$: ("#) 8&9 2 -% -48(4 ,(' -#&-(") 95(-#8(3 4& '2$-7 $#8-#8(-5(9$5(: ("#) & -(" 5&&" : ("# 2 5&# 4#&" -2(2 #&" -- ") & (-4) ( ) 9: (-) 4$ 2 % % 5) - $# 5) -&5-(" $' ((5$ -: & $5# #&") -#&-#8(- 5&4( )) -(9$: ("#7 $2 % "(4( )) 53-#&-5(' 94(-(: $) $&") -#&- 44(# %2 -2((2

E8. , * <&2" ' -" 30-2, $4 &2" ' -9% 9$%#&$ <

. , * <&2"' -<# #& : $ 9$

+ &-9$%&-&&# -9% 9$%#&$ < : $ (5) $%2 -$ -#8(- &2&7 $ -: #(5 2) -4&2 -7 #(5 "' -8&#7 #(5

(/ ' 1= &&# : ,) $2-) &2 % 2 -$ -#8(- &2&7 $ -: #(5 2) -4&2 -7 #(5 "' -8&#7 #(5

7B8(#' =&&# -" 30-%$" 2#& &#

5 , $4 &2"' -<# # =&&# : 8(- 5& 94#$ -) # %2

5 / 30 &&3 <-# -" / &) : &-) (4$$ -' #

32/ 4 9" #&<' $-4 " #&%&' < : &-) (4$$ -' #

>" "%/ 1 <-0 $2/ 4 9/ <&&3 9% 012#< : "' (5" &5 24&"' $#&") -&-) #&5 (- "' -9) (-8 ; 5 &9) -' (4& &) $#&" - 5& 94# -) 8&9 2 "&#%(- 5& 94('

. / << &-&&# -/) -, " "%/ 1 < %" 2#& 3 < : "' (5" &5 24&"' $#&") -&-) #&5 (- "' -9) (-8 ; 5 &9) -5(4#&") -7 $2" &#&4495

778@ &2/ ' / &2" ' -&) / %& " #& 3

3&50 -(#' #&5 <

21#&-# &2&

. %012#&$ %0&3#3" 4 $	; $<1' #	(9$2&$ <	+/ <$	? 9/ <1%
2&4(5&2	F= (5 2 F= 5 2	# #	?AD==-: 0 A?E==-: 0	

5 / 32' 1 <&3 (14 4 " % : &-#8(-%) #&-&9 5 "&7 2 ' (#8(-#&, $#&2& $# 2 5&, (5#&) -&-#8$) - 5& 94#8 (-" &#% (" #8&8&9 8 2 3-$ ( ) #5 #('

5 , % 3 &2 -# &2&

. %012#&$ %0&3#3" 4 $	; $<1' #	(9$2&$ <	+/ <$	? 9/ <1%

C7 DB778 B'1 #

$(-/ 4$ " 4(- ( ) (5&8 ---------- -5 & -AAB ---------- &4 &5 - ----> AF<DE> =BCB ------ 7 7 7 #&(5 &4&:
. $ 5&(-5 $#4 &$ 48 " &2& 3-" 4 ------@BCB- - ("5 $ " - & ' ---------- EAA=F ---------- > AF<DE> B@E-

$%&( ) * '+, -.'%/ 0102"3456+7) 482 $-9 '& -2) * '; < -$ =' *+>

778@ &2/ ' / &2" ' -&) / %& " #& 3

2&4(5&2	/ 9%48 5&" $#- F= 5 2 / 9%48 5&" $#- F= 5 2	# #	AE>==-: 0 DE- 0	?>-' 3) &" #& 9 8 9) @-' 3) "# 5 $#&" #

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

%&#' #& 3 5 / %& <&3

%012#&$ %0&3#3" 4 $	; $<1' #	(9$2&$ <	(2/ %	? 9/ <1%	=<$%" #& 3
2&4(5&2	, 3( ) - - $2 -5 5$ "# / $' - - $2 -5 5$ "#	%&# %&#			

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

($3 <&&3 &$ %

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

5 " %2&3/ $3 2&#

. %012#&$ %0&3#3" 4 $	; $<1' #	(9$2&$ <	+/ <$	? 9/ <1%
2&4(5&2	, 9$ &4 2 - 5 2 - &	&9) (	>B F- 0	?F-7 (( ) "# 5 $#&" #

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

5 '" << &2" #& 3

. %012#&$ %0&3#3" 4 $	5 >	; 5	?.	(>	@	(>
2&4(5&2						&" (

! 1#' $3 2&#

. %012#&$ %0&3#3" 4 $	@$ <#	? 9$%&# $3#	; $<1' #
2&4(5&2	3#&, ("(#&-! " 2) $) ! - " 8 3 &&"	/ 9%(4#- : : 2$ " ! " $ 2 / 9%(4#- : : 2$ " +9: "	. &) $%5 (. &) $%5 (

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

@$ %# $3 2&#

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

: $9 %012#& $ #' &2&#

. %012#&$ %0&3#3" 4 $	! "#$%&" ' # &2&#	$%&$ &#	+$ $' / 9 4 $3# # &3	(9$2&$ <	+/ <$	? 9/ <1%
2&4(5&2		. &) $%5 (. &) $%5 (		# - 2(# - 2(# - 2(: : 2 -) (4$) 9") (4$$ ' - - 2(# - 2(	"5(&5#&' ?>=-: 0 5 2-A== : 0 "5(&5#&' >E?-: 0 "5(&5#&' AAD: 0 "5(&5#&' AE== : 0	?-' 3) A-' 3) A-' 3) A-' 3) A-' 3)

5 / 32' 1 <&3 (14 4 " % : &# $2 %(

5 " 3 " 0 "

21#&-# &2&

. %012#&$ %0&3#3" 4 $	; $<1' #	(9$2&$ <	+/ <$	? 9/ <1%
2&4(5&2	F= (5 2 F= 5 2	# #	?AD==-: 0 A?E==-: 0	

C7 DB778 C1 #

$(-/ 4$ " 4(- ( ) (5&8 ---------- -5 & -AAB ---------- &4 &5 - ----> AF<DE> =BCB ------ 7 7 7 #&(5 &4&:
. $ 5&(-5 $#4 &$ 48 " &2& 3-" 4 ------@BCB- - ("5 $ " - & ' ---------- EAA=F ---------- > AF<DE> B@E-

$%&( ) *'+, -.'%/ 0102"3456+7) 482$-9 '& -2) *'; < -$=* +>

778@ &2/ '/ &"'-&)/ %& "#& 3

5/32'1<&3 (144 "% : &-#&(-%) #&.-895 "&72' (#&(-#& $1&2& $& 2 5& (5%) -& #&$ - 5& 94#8 (-" &#%(" #&&&9 82&-$ ( ) #& #'

5 %32# &2&

. %012#& %0&3#3"4 $	; $<1'#	(9$2&<	+/ <$	? 9/ <1%
24(582	/ 9%485&"$1- F=- 5 2 / 9%485&"$1- F=- 5 2	# #	AE>==-: 0 DE- 0	?>' 3) &"#5 9&9) @=' 3) "#(5 $1#("#

5/32'1<&3 (144 "% : &# 52 %2(

%&2' #& 3 5/ %& <& 3

. %012#& %0&3#3"4 $	; $<1'#	(9$2&<	(2/ %	? 9/ <1%	=<$%"#& 3
24(582	, 3( ) - - 52 -5&$1"# / $'- - 52 -5&$1"#	%&2# %&2#			

5/32'1<&3 (144 "% : &# 52 %2(

($3<&&.$%

5/32'1<&3 (144 "% : &# 52 %2(

5"%&2/ $3&2&'

. %012#& %0&3#3"4 $	; $<1'#	(9$2&<	+/ <$	? 9/ <1%
24(582	, 9$&4 2 - 5 2 - &	&9) (	>B F- 0	?F-7 (( ) "#(5 $1#("#

5/32'1<&3 (144 "% : &# 52 %2(

5"'<<&2&" #& 3

. %012#& %0&3#3"4 $	5 >	; 5	?.	(>	@	(>
24(582						&"(

! 1# $32&#'

%012#& %0&3#3"4 $	@5<#	? 9$%1& $3#	; $<1'#
24(582	3#&. ("(#&1-! " 2!) $) ! - "8$%1&$&	/ 9%(4#- : : 2$" ! "$ 2 / 9%(4#- : : 2$" +9: "	. &) 9$5 (. &) 9$5 (

5/32'1<&3 (144 "% : &# 52 %2(

@$%# $3&2&'

5/32'1<&3 (144 "% : &# 52 %2(

: $9%012#& $ # &2&'

. %012#& %0&3#3"4 $	! "#$%&"' # &2&'	$%&&'	+$ $'/ 94 $3# # &3	(9$2&<	+/ <$	? 9/ <1%
24(582		. &) 9$5 (. &) 9$5 (		# - 2(# - 2(# - 2(# - 2(: : 2 -) (4$) 9") (45$)' - - 2	5 2-A== : 0 "5(&5#' ?>=-: 0 "5(&5#' >E?-: 0 "5(&5#' AE== : 0 "5(&5#' AAD-: 0	A' 3) ?-' 3) A' 3) A' 3) A' 3)

5/32'1<&3 (144 "% : &# 52 %2(

$%&( ) *'+, -.'%/ 0102"3456+7) 482$-9 '& -2) *'; < -$=* +>

7D8? 2/ '/ &"'-&)/ %& "#& 3

?2/ # &2&' : &- "&7 "-) $ "$$& "#((4#) -854 5$&& 28 ; 5)

3&&50-(#' #&5<

1"#&2-$2/ # &2&'

. %012#& %0&3#3"4 $	; $<1'#	(9$2&<	? 9/ <1%
24(582	! 49#(- F=-FA-#&-FB- 2!) - 5( ) 8-7 #(5	$)8- - "4&83" 489) -: 3 $)	DE-8&9 5)

5/32'1<&3 (144 "% : &# 52 %2(

$%&&<#&32$ 0$ %0" =&&'

5/32'1<&3 (144 "% : &# 52 %2(

5"3"0"

1"#&2-$2/ # &2&'

. %012#& %0&3#3"4 $	; $<1'#	(9$2&<	? 9/ <1%
24(582	! 49#(- F=-FA-#&-FB- 2!) - 5( ) 8-7 #(5	$)8- - "4&83" 489) -: 3 $)	DE-8&9 5)

5/32'1<&3 (144 "% : &# 52 %2(

$%&&<#&32$ 0$ %0" =&&'

5/32'1<&3 (144 "% : &# 52 %2(

$%0 $%&$-$))$2#< : &- "&7 "-) $ "$$& "#((4#) -854 5$&& 28 ; 5)

7F8+ &<9/ <"'-2/ 3<&0$%#& 3<

"<#&-0&9/ <"' : 8(- ("(5 #&&" -&-7) #(-) 8&8 9 2 -%(- &$ (' -8&- $'$ $ (' -7 8(5((5- &)) $9&(-/ $"$$& "# 9 "#&&$) -&-7) #(- 5&' 94## 5( ) $ 9( ) -) 8&8 9 2 -" &#%(- ' $ &) (' -&- $ -#&(- &8 2) (7 (5-%&# 5&4( )) (' -$'- -) 9$# 9&(-(2$) ("#&(# ("# 2"#-- $ &) (-&-) 95 2$) - "' -" &" 5(4342 9&(5&' 94#(- $ - -2&# (") (' -7) #(- ' $ &) 24&" #5 4#&5-- $ &) 2&-#&$) - 5&' 94#-) 82&#&&') "" - "3-%& 5&' 94#) -) 8&8 9 2 - # 2#&5 ( ) -4& 2!-7 $&-#&(-(9 5&(: ("#(-&-(" $&&' : ("# 2 5&## 4#&&' - "' -7) #(- ' $ &) 22($) 2 #&&' - "' - "3-5($&' 22&4 2 9#&&2$&$-(9 5&(: ("#) #(- 4 $' -) 8&8 9 2 -%(-(4342) ' – " 4$ (5 #&&' -&5 2 "' $2) 8&8 9 2 -&' 2!-%-4&') $ (5(' 78 (" -(4342 5 -$) -" &## ( ) $9&(-- 8$) -: #(5 2 " ' -$#) -4&' # $ (5: 9) #%(- ' $ &) (' -&-$ -) (-7 3 – 5(-) 8&8 9 2 -%(# ("-7 8(" -8 "' 2$ -(: #&' -4&' # $ (5) -#& #8 (-" &##%(" 42 "(' -&5-5$) (' -8 9#--, : #&-4&' # $ (5) -&5 2$ (5) -: 3-5(# $ -) & (- 5&' 94## 5( ) $ 9( ) ! &$ -' $) (5) 2&-) $2&' -: #(5 2 "' -#) " & - "' -4&' # 4#7 $&-) &8 2-7 #(5 7 3) -' 5 $') "' -) (7 (5)

+&<9/ <"' -<, / 1'0-=$-&-" 22/ %" 32$- &, -" 99' &" ='$-% & 3"' -3" #& 3"' -" 30-' / 2"' -' " <-" 30-% 1'" #& 3 <8

; $)$%#(-($2#& 3 - :-> + - +(@ ; ?-" 30-($2#& 3-A-? . (; ? -5 @ (. ?; (- . ; @ 5 @)/ %' 00&& 3"' -, " 30' &) -&) / % " #& 3 -" 30-9 %#$2#& 3-/) -$4 9' / * $$ <8

7C8-@% 3<9/ %#-&)/ %& "#& 3

; $ 1'" # % &)/ % "#& 3	-314 =$%	. %9$%<, &)9 &8 3" 4 $	5'" <<$<	.
+ @5'" <<&&" #& 3	&# 5(92 #'			
@ + ; -5'" <<	&# 5(92 #'			

. 1 - -: 4 $ - 5&9

$%&( ) *'+, -.'%/ 0102"3456+7) 482$-9 '& -2) *'; < -$-= *+>

7 8; $ 1'"# %-&3)/ %4 "#&% 3

3&%0-(# #&<

>5 (-5'" <<&%2" #&% 3 : ?@# #&" -: # 5% 2
5 (#&% "-((4#

8(8 0%' -% 1'" #&% 3< : @ 5 -A" - ; -? $4 9#. "'%&'-$ $4 9#&% 3 - &# (# 5 $'(' 3&%0-(#' #&<-&% $3# %- @ 5 -A= -! 2#4& &" ("#- 5(-2%#' -85((: #'
(; -FED FBC F77 F7D-$ #%$4 $'*-, " "%/ 1<<1=<#' 32$< - & 5% 94#) -7 (5(- &9"'
(; -FED FBC $4 $%$32* -9" "33&% -." 30-3/ #%&2" #&% 3 - & 5% 94#) -7 (5(- &9"'
(; -FED FBC F77 F7D-, " "%/ 1<-2, $4 &2"'<- 2#4(5&2
(; -F77 F7D! (+(-0 &#&-1#&% 3- -2, $4 &2"'-&% $3# %- -, " "%-&% $3#%&2" #&% 3
2#4(5&2 - : : (' $ #.-" 49# <8(2#8-8 ; 5 - (2 3(' -"485&' $%<8(2#8-8 ; 5

5'$" 3- &% 2#-($2#&% 3 : &#2%#'
77D = ->" "%/ 1<- &%
. / "1#' 3#<- > . <

5'$" 3- &% 2#($2#&% 3- ED : &#2%#'
5'" <<- -(1=<#' 32$<

5'$" 3- &% 2#($2#&% 3- ED : &#2%#'
5'" <<- -(1=<#' 32$<

+? - &# -5 , $4 &2"'< : &#2%#'
. %21%/ %5 , $4 &2"'<

+? - &# -5 , $4 &2"'< : &#2%#'
?<<$3#&' -5 , $4 &2"'<

(# #&-% 1'" #&% 3<

! "<<" 2, 1<$##< : 8(- &2&7 $ -4& &" ("#- 5(-2%#' -1 , , - /
$ - / % : &" (-&-#8(-4& &" ("#- 5(-2%#'
$ - $%$* : 8(- &2&7 $ -4& &" ("#- 5(-2%#' -1 2#4(5%
. $33<*' "3& : 8(- &2&7 $ -4& &" ("#- 5(-2%#' -A ? @ . ! ,

3&%0-(#' #&<-&% $3# % : ! 2#4& &" ("#- 5(-2%#' -85((: #'
@ 5 -A=

5"3"0"

>! (- 5"3"0" : &#4&" #&%2%' -9"' (5 + / -* " ' <

5"3"0&3-' &#<

5"3"0&3- . ; : &" (-&-#8(-4& &" ("#- 5(-2%#'

5?. -@ &-<1=<#' 32$< : &" (-&-#8(-4& &" ("#- 5(-2%#'

5"3"0"-&% $3# % : ! #2)#&" (-4& &" ("#$-" &#2%#' -5'- / -%9# 2%) 948-4& &" ("#- 5(-2%#' -5'- /

@ &-9% 012#, " <=$$3-2" "<<&%0-&-" 22/ %" 32$- &# -#, $-, " "%9-2"&%5%& -/)-# $-5 / 3#%' "$0-. %012#<-; $ 1'" #&% 3<
"30-# $-! (+(-2/ 3# &9<-"'"-# $-&%)/ %4 "#&% 3-% 1&%0-=* -# $-5 / 3#%" $0-. %012#<-; $ 1'" #&% 3<8

3#5%" #&% 3"'-% 1'" #&% 3<

3#5%" #&% 3"'-&#< : 1<#%' &-&% $3# %- 5 (-! 2#4& &" ("#- 5(-2%#' -85((: #'
5, &%" -&% $3# %- ?5 (5 -! 2#4& &" ("#- 5(-2%#' -85((: #'
"9" 3-&% $3# % - &#' (# 5 $'(
/ %$" -&% $3# % - &#' (# 5 $'(
$ - $"'" 30-3 $3# %-/)-5, $4 &2"'<- / 5 -! 2#4& &" ("#- 5(-2%#' -85((: #'
. , &&9 9&%$<-&% $3# %- . 55 (- &#' (# 5 $'(

C7 DB778 F'! #

$%&( ) *'+, -.'%/ 0102"3456+7) 482$-9 '& -2) *'; < -$-= *+>

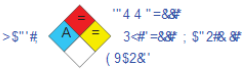
7 8- #, $%&3)/ %4 "#&% 3

"=$'-% 1&%4 $3#< : ! - ! / , - , / . ! - ! -, , -! -/ - ! – ! /
! , ! - +! - ! - ! / , - ! 1, - 1! - ! ! 1,

>" "%/ 1<! "#5%&' :
3)/ % "#&% 3-(" <#&4 - 8(8 8

@ $-21<# 4 $%&<-%<9/ 3<&'$-)/ %0$#5%4 &&& -#, $-. . ?-2/ 0$-)/ %#, &-4 "#5%&' 8

"#&% 3"'- &%-. %#5%2#&% 3 :
<</ 2&#&% 3- 8(8 8



+"#5-/)-9%&#&% : C7 DB778
+"#5-/)-&<<1$: C0ACD?=AA
+"#5-/)-9% & 1<-&<<1$: @?AE0?=AA
6$%&% 3 : A=A
. %9" %0-=* : / / -* (92#&3-/ (4$ 2%#<

30&2" #5<-&%)/ % "#&% 3 #, "#, " <-2, " 3 $0-)%4 -9% & 1<" *-&<<1$0- $%&% 38
/ #%2$-# -%" 0$%

@ -#, $-=$<#/)-/ 1% 3/ '$0 $ -#, $-&%)/ % "#&% 3-2/ 3# &$0-, $%&%-&-" 221%#58>/ $ $%3$&% $%#, $-"=/ $ 3" 4 $0
<19 9'&%3/ %' 3*-/)-&%<-1=<&% &%<-" <<14 $<-" 3*-'& =&&#' - , "#-/ $ $%)/ %#, $-" 221%2*-/ %2/ 4 9' $#5 3$<<-/)-# $
&%)/ % "#&% 3-2/ 3# &$0-, $%&% 8
&%" '-0$#5%4 &%" #&% 3-/)-<1&#' =&&#' -/)-" 3*-4 "#5%&' -&-# $-<-/ '$-%<9/ 3 <&=&&#' -/)-# $-1<$% '"-4 "#5%&' <-4 "*-9%<$3#
13 3/ 3-, " "%<-" 30-<, / 1'0-=$-1<$0- &# -2" 1#&% 38 '# / 1 , -2$%# &-, " "%<-" %-0$<2%&-$0-, $%&% - $-2" 33/ #
1" %3#5$-# "##, $<$-" %-# $-/ 3 *-, " "%<-# "#$ &-#&

C7 DB778 ! #'! #

Thermo SCIENTIFIC

The world leader in serving science

! "#$%&' '*(")$#+*, "#' *(- $$#

! "#$%&' $) *+$ *, -$ ./ 0123$ (3 0123(-&04 $5 *6 &' $78 *! 9 $ (:

78. %012#"30"2/ 4 9 "3+*0$3#%&2" #& 3

. %012#3"4 $	: ! "#$%& $) *+$ *, -$ ./ 0123$ (3 0123(-&04 $5 *6 &' $78 *! 9 $ (:		
(199'&5%	: , 5(-8 &'H-$ 5(-"6 2$ " #$%2 J $ -2("K $&# 25" &2&L 1 J ß&/E K&N'@@ O&2P&;&' CFE"?@@B S" $#' "6 ##'#) <@EEA?<E DCD"&- <; ; E-DCD=D=>	! "31)"2## %5%	: , 5(-8 &'H-$ 5(-"6 2$ " #$%2 J $ -2("K $&# 25" &2&L 1 J ß&/E K&N'@@ O&2P&;&' CFE"?@@B S" $#' "6 ##'#) <@EEA?<E DCD"&- <; ; E-DCD=D=>
5 / 0$	: ; ; <=>?@@?; A=B"@&?==CC"@A=>@@@A=EB@@A=EB=@A=EB?"@A=ED; *@A=B<@ @A=B<A"@A=BA?"@A=?@B"@A=D==@A?; A?		
! (, (*O	: D?=<		
6"'&0" #& 3"0" #$	: =3'3=, @E		
. %&#0" #$	: =3'3=, @E		
; $<9 / 3<&=' 5"3" 4 $	: U 6 V 6 *+O(L 7 0T#&-1"6 W 2$T0)#		
	5 > ?! @ ? 5 : A E B 8 C D C E F E B B G H @ I , ? "H(: J E F 8 K D J 8 F A A J	! "#$%&' "1 <$<	; $)$%#' "# $ *&9 <#%2#& 3 =/ / L '$#)/ %9 % 9 $ %' 30 &#&5 30 $0 *1 <$8 *G# $ %1&<$N 2/ 3 #' 2#<199 '&5%)/ %-9$2&)&2 "99 '&2" #& 3 <8
. %012##+9$	: F$G7$ E		

D8> " Q' %0 <*0$3#%&2" #& 3

?4 $%E$32+*/ TS%&M			
. - +<&2" ' *<# #&	: F$G7$ E		
(&P3" ' *M/ %8	: Z ! OYPA/ [		
>" Q' %9 *<# #&4 $3#<	: \ ! S6X6 *OX6 JRD! , MO] *, O! \ , Q'K] X *1 YV *6 ^ P(*ROOR ! , PMYE*\ MY, ! PY6 U ! , XOR P*, _ ! , *\ ! YA' ! S6X*, ! O/ X, *MO/ ! Y*V! U ! / XE		
. %2" 1#& 3" %*4 $" <1 %<	: V&*" &#%(T#5(* TV&-*&-*8 $ #E*S) (*&' 0*4 $65*T' (G*T#(* (" #&T#&E*E*V&*" &#(T#3 -$ P*&) 8 &P(*4 5 (" *7) $ L*#5$ *W& 72#E*! ' &$ *28" #T2#4 $65*(*1( ) Q) P5 *T*" ' 20&#5 $ LE*% ((W 2&" #T$ (-*#&L5#0*20&) (' E*Z T) 5*#5&-&7L50*T#(-5T*' ' 05 LE		
G(>R$>5 (*<# #!<	: , 5$ *8 T#(-$T0$ *28") $ (-(' *5T9T-' &7) *9 #*#5 (*M5 _ ! *_ T9T-' *\ &8 8 7" $ZT#&E" *6 #" ' T-' +=A*\ HO'@&@E@; ; :E		
; / 1#$<*/)*$3#%	: V(-8 T02&" #T2#EX1(*28" #T2#ER 5T0#&" ER L( ) #&" E		
/ #$3#&' *" 21#$*- $" '# *$))$2#<			
I3-' " ' *#& 3	: R-$#T#$ L*#&*-( ) V&T#&-1*) 1)# 8 E*XN/&) 7-(*#&* (2&8 V&) $#&E" *V&8 72#) *8 T*12T7) (*T*5(T@5 5T9T-' E*6 (-$&7) *(II (2#) *8 T*1*% * (0T*1(' *1&0&4 $ L*(N/&) 7-(E		
I3P$<#& 3	: Y&*P' &4 " ") $ L" $%2T" #(II (2#) *&-*2-$#&2T05T9T-') E		
(L&8	: R-$#T#$ L*#&*) P$' E		
? +$<	: R-$#T#$ L*#&*(1( ) E		
/ #$3#&' *2- %3 &2*- $" '# *$))$2#<			
5 - %3 &2*$))$2#<	: \ &" #T$ ') *8 T#(-$T0#5 T#2T" *2T7) (*#T-L(#&-LT" * T8 TL(E		
5 " 9 &8 / P$3 &2&8+	: Y&*P' &4 " ") $ L" $%2T" #(II (2#) *&-*2-$#&2T05T9T-') E		

D8$%5DE7D8 ! "1 #

F$(*6 2$ " 2(*O() (T-25 ********** U M*K&N@@P ********** "O&2P!&-' CFE"**<@$ *A?<. ; DCD"******** *4 4 4 BE(-8 &E&8
J $ -2("K $&# 25" &2&L 1*R2E******>DCDYEU(-$ $" *O&T ********** ?@@B ********** <"@$ *A?<. D>@*HTN

$ %&( ) +', - *.' %/ 0 - '12 3#5' % "2 3#5, 0) 36 ' &7 *8) +'9 : *$; '+, <

D8> " Q' %0 <*0$3#%&2" #& 3

! 1# P$3 &2&+	: Y&*P' &4 " ") $ L" $%2T" #(II (2#) *&-*2-$#&2T05T9T-') E		
@$%# P$3 &2&+	: Y&*P' &4 " ") $ L" $%2T" #(II (2#) *&-*2-$#&2T05T9T-') E		
, T' / 94 $3#" *$))$2#<	: Y&*P' &4 " ") $ L" $%2T" #(II (2#) *&-*2-$#&2T05T9T-') E		
Z$*%&&+*$))$2#<	: Y&*P' &4 " ") $ L" $%2T" #(II (2#) *&-*2-$#&2T05T9T-') E		
@ *P$#' *P" 3<	: \ &" #T$ ') *8 T#(-$T04 5$25*8 T*12T7) (* T8 TL(*&*#5 (*1&0&4 $ L*&-LT") aP5 " (1) Q05 (-Q LT) # &$' # ( ) #$ T0#*T2#E0'VW) -*-( ) V$T#&-1*#T2#Q) P$' Q(1( ) E		
GT$*%&V9 / <1 %*<&P3<$<+4 9# 4 _<			
I3-' " ' *#& 3	: ! ' ' (-) (*) 18 V&8) *8 T*1*$ 20" (*#5 (*1&0&4 $' La -( ) V$T#&-1*#T2#F$-$#T#&K' 2&7L5$ L		
I3P$<#& 3	: Y&*) W 2$&$2" T#*E		
(L&8	: ! ' ' (-) (*) 18 V&8) *8 T*1*$ 20" (*#5 (*1&0&4 $' La $-$#T#&K' -(' " ( ))		
? +$<	: ! ' ' (-) (*) 18 V&8) *8 T*1*$ 20" (*#5 (*1&0&4 $' La V/T$' &-*$-$#T#&K' 4 T#(-$' L -(' " ( ))		
! $0 &2" ' *2/ 30 &&3 < " PP%&T" #&0*=+*/ T$%/ $\V9 / <1 %	: J -(. (N$ #&' L* $ &-' (-) *$' ` &0 $' L*T" 1#T-L(#&-LT") *8 (" #&&" (' *$' *#5$) *U 6 V6 *T) *% $' L*T# -$) P*8 T1*% (*TLL-T" T#(' *%#*&' (-. (N/&) 7-(*#&*#5$) V&$' 72#E		

($$'#' V&2/ ' / P&2" ' *&8) / %4 " #& 3 *(V$2#& 3 *7 7X

F8*5 / 4 9 / <&&& 3 $&8) / %4 " #& 3 */ 3 *&8 P%$0 &$3#<

H3 &&0*(#' #5 <

[" 4 $	5 R(*3 14 =$%	\
L 0 12(-&0 . -$) -5 1' -&N1 8 (#5 10 T8 $' &8 (#5 T" (	B?. <@B DD. <?. @	=B'. *OB @ *>

5 " 3 " 0 "

[" 4 $	5 R(*3 14 =$%	\
L 0 12(-&0 . -$) -5 1' -&N1 8 (#5 10 T8 $' &8 (#5 T" (	B?. <@B DD. <?. @	=B'. *OB @ *>

@ $%*" %*3 / *" 0 0 &8& 3 " ' *&P%$0 &$3#<*9 %<$3#M- &- N/M&# &$ '# $*21%%$3#L 3 / M*$0 P$*Y) *#- $*<199 '&5%' 30 *&8 '# $ 2/ 32$3#%#&3 <*" 99 ' &2" =*$N' %*2" <<&,&$0 *" <-* Q' %/ 1<*# *- $" '# *' / %# $*$' 3T&&34 $3#" 30 *- 32*%] 1&5%*9 / %&8 P*$8 # &<*<$2#&38

C8*Z&%6#" &0*4 $" <1 %$<

?+$*2/ 3#' 2#	: \ 5(2P!&-*T" ' *(8 &' (*T" 1*28" #T2#0) ") ( ) E*R 8 (' $T# 0!'0') 5*(1( ) *4 $65 *V0 " #T*8 0 T#(-!&-*T#0 T) #@B*8 $ 7#( ) Q&22T) $&" T0!'0&#5' L*#5(*7 VW) -*T" ' *0&4 (-*(1(05) E*/ (#8 (' $ZT0 T#(" #&" *$8 8 (' $T# 0!E
(L&8*2/ 3#' 2#	: R*2T) (*8 I*2&" #T2#0&8 (' $T# 0!'0') 5*) P$*4 $65 *V0 " #T*8 I*4 T#(-!&-*T#0 T) #@B*8 $ 7#( ) 4 5 $0 *-(8 &' $ L*2&" #T8 $*T#(" 20&#5$ L*T" ') 5&( ) E*Z T) 5*20&#5$ L*%! &-(*-(7) (E*\ 0 T") 5&( ) *#5&-&7L50!'*% ! 8-(*-(7) (E*/ (#8 (' $ZT0T#(" #&" *$8 8 (' $T# 0!E
I3-' " ' *#& 3	: U &' (*(N/&) (' *V/-) &" *#&1-( ) 5*T$E*ER" &#*%(T#5$ LO&*%(T#5$ L*$ *$-(L7 0T-*&-*$ -( ) V$T#&-1*T--( ) #&227-) O/V&' $ (*T-#&2T0-( ) V$T#&K' *&-*&NIL(" *%#*#T$ (' *V/-) &" ' (0E F&&) (" *#&.5 *#20&#5$ L*) 725*T) *T*28&0T-O&% O2%(0#&-*4 T$) #/&" ' E*/ (#8 (' $ZT0T#(" #&" $8 8 (' $T# 0!E
I3P$<#& 3	: Z T) 5*&7#8 &7#5*4 $65*4 T#(-E*V&#" &#*$ ' 72(" *&* &") &*%#*8 (' $ZT0 V/-) &" ' (E*Y(' (-*L$ (*T" 1#5$ ' L*%#*8 &7#5*#&T" *7" 28") 2$&7) *V/-) &*E*/ (#8 (' $ZT0 T#(" #&" *$8 8 (' $T# 0!E		

D8$%5DE7D8 ="1 #

F$(*6 2$ " 2(*O() (T-25 ********** U M*K&N@@P ********** "O&2P!&-' CFE"**<@$ *A?<. ; DCD"******** *4 4 4 BE(-8 &E&8
J $ -2("K $&# 25" &2&L 1*R2E******>DCDYEU(-$ $" *O&T ********** ?@@B ********** <"@$ *A?<. D>@*HTN

$ %&( ) +', - *.'%/ 0 - 12 3 45' % "2 3 45, 0) 3 6 ' &7 *8) +'9 : *$; ' +, <

C8Z &%#" &0 *4 $" <1 %$<

. %#$2#& 3*/)*) &%#Y &0 $% : Y&*T2#&" *) 5T0%(*#TR(" *$` &0 $ L*T" 1*W(-) &" T0-$ P*&-*4 $5&7#) 7$#T*%(*#T$ $ LE*R*$#$) 7) W(2#(' *#5T#178 ( ) *T-(*) #$DW( ) ("#C#5(*-( ) 27(-*) 5&70 *4 (T-*T" *TWW&W$T#(*8 T) P*&-) (0.2&" #T$ (' *%(T#5$ L*TWT-T#) E*R#8 T1*%(* T" L(-&7) *#&*#5(*W(-) &" *W&' $ $ L*T$ *#& L$ (*8 &7#5.#& 8 &7#5*-( ) 7) 2$#T#&" E

[/ #$<*# *9 - +<&2&3 : R*2T) (*&I *$ 5T0T#&" *&I* (2&8 W&) $#&" *W& 72#) *$ *T1$(Q) 18 W#&8) *8 T1*%(* (0T1(' E , 5(*(N/W&) (' *W(-) &" *8 T1*" ((' *#&*%(*R(W#7" ' (-*8 (' $2T0) 7-` ($0T" 2(*1&-*C<*5&7-) E

K8Z &$Y)&P- #&3 P*4 $" <1 %$<

Z'"4 4 " =&&#*/)*# $*9 %012# : R*T*1$(*&-*$*5(T#(' C0T*W( )) 7-(*$ 2-(T) (*4 $0&227-*T" ' *#5(*2&" #T$ (-*8 T1*%7-) #E

?V#&P1&- &P*4 $0&

(1&#' ='$: S) (*T" *(N#$ L7$ 5$ L*TL("#) 7$#T*%(*1&-*#5(*) 7--&7" ' $ L1$(E

[/ #*<1&#' ='$: Y&" (*P' &4 "E

(9$2&' *$V9/ <1 %$*- "Q'%0< : J -&8 W#0I*$ &0T#(*#5(*) 2(" (*%I*-(8 & $ L*T0W(-) &") *1-&8 *#5(* 2 $#*&I*#5(*$ 2$ ("#$ #5(-(*$ *T1$(E*Y&*T2#&" *) 5T0%(*#TR(" *$` &0 $ L*T" 1*W(-) &" T0-$ P*&-*4 $5&7#) 7$#T*%(#T$ $ LE

>"Q'%0/ 1<*# $%4 "' 0$2/ 4 9/ <&&3 *9 %012#< : V(2&8 W&) $#&" *W& 72#) *8 T1*$ 20" (*#5(*1&0&4 $ L*8 T#(-$T0) a 2T-%&" * $&N$ (2T-%&" *8 &" &N$ ("$#&L(" *&N$ ( )

(9$2&' *9 %#$2#&T$ $] 1&4 $3#)/ %)&$Y)&P- #$% : H$(.I$ L5#(-) *) 5&70 *4 (T-*TWW&W$T#(*W&#(2#$ (*(G7$/8 ("#T" ' *) (0.2&" #T$ (' *%(T#5$ L TWT-T#7) *+6\ K! :*4 $5*T*170IT2(.V$ 2(*&W(-T#(' *$ *W&) $5 (*W( )) 7-(*8 & (E

U8R22&0 $3# ' *%$'$" <$*4 $" <1 %$<

. $%/ 3"' *9 %$2" 1#& 3< : Y&*T2#&" *) 5T0%(*#TR(" *$` &0 $ L*T" 1*W(-) &" T0-$ P*&-*4 $5&7#) 7$#T*%( *#T$ $ LE X`T27T#(*) 7--&7" ' $ L*T-(T) E*^ ((W7" " (2( )) T-1*T" ' *7" W&#(2#(' *W(-) &" " (0I-&8 ("#(-$ LE*V&" &##&725*&-*4 T0P*#5-&7L5*) V$0) ' *8 T#(-$T0E*! ` &$ *%(T#5$ L* TW&-*&-*8 $)#E J -& $ (*T (G7T#(* ("#$T#&" E*Z (T-*TWW&W$T#(*-( ) V$T#&-*4 5(" * ("#$T#&" *$) $ T' (G7T#(E*J 7#&" *TWW&W$T#(*W(-) &" T0W&#(2#$ (*(G7$/8 ("#+) ((*6 (2#&" *<:E

?3T&634 $3#' *9 %$2" 1#& 3< : ! ` &$ * $ W(-) T0&I*) V$0) ' *8 T#( -$T0T" ' *-7" &I*T" ' *2&" #T2#4 $5*) &$0)4 T#( -4 T1) Q -T$ ) T" ' *) ( 4 ( -) E*RI&-8 *#5( *-( 0( ` T" #T7#5&-$$) *$*#5(*W& 72#5T) *2T7) (' *(" ` $&" 8 ("#T0 W&0T#&" *+) (4 (-) Q4 T#(-4 T1) Q) &$0&-*T$:E

! $# / 0<*)/ %2' $" 3&P*19

(4 "" *<9 & : 6 #&W0) TP*$*4 $5&7#-$ PE*U & (*2&" #T$ (-) *1-&8 *) V$0T-(TE*V$7#(*4 $5*4 T#(-*T" ' *8 &W7W $*4 T#(-.) &0*%(E*! 0(-" T#5 (0IC&-*$*4 T#(-.$) &0*%(C0T*%) &-%4 $5*T" *$ (-#' -1*8 T#(-$T0T" ' W0T2(*$*T" *TWW&W$T#(*4 T) #(* $ W&) T02&" #T$ (-E*V$ W&) (*&I* $T*T*02(") (' *4 T) #(' $ W&) T02&" #T2#&-E

^ "%P$*<9 & : 6 #&W0) TP*$*4 $5&7#-$ PE*U & (*2&" #T$ (-) *1-&8 *) V$0T-(TE! W#&T25*-(0) T) (*1-&8 7W4 $' E*J -(` ("#("#1*$ #&*) (4 (-) Q4 T#(-*2&7-) ( ) Q0%7) (8 ("#) *&-*2&" I$ (' *T-(T) E*Z T) 5) V$0T L( ) *$ #&*T" *(I I0("##(T#8 ("#W0T"" #&-*W&2((' *T) *1&0&4) E*\ &" #T$ *T" ' *2&0) 2#) V$0T L(*4 $5*" &" .2&8 %7) #$0(C0T*%) &-%("# 8 T#(-$T0(E.E) T" ' Q(T-#5 Q(-8 $27#(*&- ' $T#&8 T2(&7) *(T-#5*T" ' *W0T2(*$*T" *TWW&W$T#(*-1&-*$ W&) T0T22&-' $ L*#&*0&2T0-(L70T#&") +) ((*) (2#&" *@:E*V$ W&) (*&I* $T*T*02(") (' *4 T) #(* $ W&) T02&" #T2#&-E*\ &" #T8 $T#(' T%) &-%("#8 T#(-$T08 T1*W&) (*#5(*) T8 (*5T9T-' *T) *#5(*) V$0) ' *W& 72#E*Y &#(a) ((*) (2#&" *@I&-*(8 (-L("2*2&" #T2#$ I&-8 T#("*T" ' *) (2#&" *@*1&-*4 T) #(* $ W&) T0E

J8>"30'&P*"30*<# %P$

>"30'&P : J 7#&" *TWW&W$T#(*W(-) &" T0W&#(2#$ (*(G7$/8 ("#+) ((*6 (2#&" *<:E*X T#$ LQ -$ P$ L*T" ') 8 &P$ L*) 5&70 *%(*W&5$8 $#(' *$ *T-(T) *4 5(-(*#5$ *8 T#(-$T0$ *5T" ' 0(' Q#&-(' *T" ' W&2( )) (' E*Z &-R*) 5&70 *4 T) 5*T" ') *T" ' *1T2(*%(I&-(*%-(T)) *T" ' *T#*#5(*(" ' *&I*#5(*4 &-R' T1E*V&" &#$ L( ) #E*! ` &$ *2&" #T2#4 $5*( 1( Q) P$ *T" ' *2&#5$ LE*! ` &$ *%(T#5$ L*TW&-*&-*8 $)#E S) (*&" 0*4 $5*T (G7T#(* ("#$T#&" E*Z (T-*TWW&W$T#(*-( ) V$T#&-*4 5(" * ("#$T#&" *$) $T (G7T#(E*^ ((W$*#5(*$-$ T02&" #T$ (-*&-*T" *TWW&W$T#(*T#(-" T#(*8 T#(-$T0*W&-*4 (#$ 2&" #T8 $T#(' *WPF(W#5$ L5#0I*20&) (' (*4 5(" *" &#*$ *) (E*X 8 W#1*2&" #T$ (-) *-(#T$

$ %&( ) +', - *.'%/ 0 - 12 3 45' % "2 3 45, 0) 3 6 ' &7 *8) +'9 : *$; ' +, <

J8>"30'&P*"30*<# %P$

W& 72#-( ) $ 7(*T" ' *2T" *%(*5T9T-' &7) E*V&" &#-(7) (*2&" #T$ (-E

(# %P$: 6 #&-(*$ *T22&-' T" 2(*4 $5*0&2T0-(L70T#&") E*6 #&-(*$ *&-$ $ T02&" #T$ (-*W&#(2#(' *1-&8 ' $-(2#*) $ 2#*$ *T*2&&0Q' -1Q4 (00*#$ #(' *T-(T*T4 T1*1-&8 *$ 2&8 WT#$ %0(*8 T#(-$T0) +) ((*) (2#&" *@:*T" ' *1&&' *T" ' *' -$ R*E*^ ((W*2&" #T$ (-*#$ L5#0I*20&) (' *T" ' *) (T0(' *7" #$0*-(T' 1*1&-*7) (E*\ &" #T$ (-) *#5T#*5T (*%((" *&W(" (' *8 7) #*%(*2T-(17001*-( ) (T0(' *T" ' *R(W#*7W-$ L5#*#&*W-(` ( "#*0( TRT L( E*V&" &#*)#&-( *$ *7" 0T%( 0( ' *2&" #T$ ( -) E*S) ( *TWW-&W$T#( *2&" #T$ ( -8 ( "#*#&*T` &$ *(" ` $-&" 8 ("#T0*2&" #T8 $T#&" E

A8? V9/ <1 %$*2/ 3#%'<$9 $%/ 3"' *9 %#$2#& 3

H3&$0*(#'#$<

?3P%$0&$3#	?V9/ <1 %$*& &<
L012(-&0	R5_ I>*WI3&$0*(#'#$<X8 , Z ! a@*8 L3 b R5_ I>*@6 *WI3&$0*(#'#$<NDSDB7BX8 , Z ! a@*8 L3 b*<*5&7-+) :BH&-8 aR5T0T*%(*1-T2#&" E6 ((*! WW" ' $N\ Q W-TL-TW6*! ER 5T0T*%(*J T-#&270T#(*UT)) *, Fc) *#J U d, Fc) :*1&-*#5&) (8 T#(-$T0 *#5T#T-(*5T9T-' &7) *4 5(" * (W&) $#(' *T" 14 5(-(*$ *#5(-( ) V$T#&-1*#T2#E G(>R*. ?^ *WI3&$0*(#'#$<NUSDB7BX8 , Z ! aB*8 L3 b*<*5&7-+) :BH&-8 aO( ) V$T*%(*1-T2#&" **, Z ! a@B*8 L3 b*<*5&7-+) :BH&-8 a, &#T0' 7) # G(>R*. ?^ *7EAE*WI3&$0*(#'#$<NFS7EAEX8 , Z ! aB*8 L3 b*<*5&7-+) :BH&-8 aO( ) V$T*%(*1-T2#&" **, Z ! a@*8 L3 b*<*5&7-+) :BH&-8 a, &#T0' 7) # G(>R*. ?^ *WI3&$0*(#'#$<X8 , Z ! a@B*8 L3 b*<*5&7-+) :BH&-8 a, &#T0' 7) # R5_ I>*@6 *WI3&$0*(#'#$<X8 , Z ! a@*8 L3 b*<*5&7-+) :BH&-8 a, &#T0WT-#&270T#( ) G(>R*. ?^ **WI3&$0*(#'#$<X8[/ #$<*, $<9 &%='$, Z ! a@B*8 L3 b*<*5&7-+) :E

5"3"0"

G2219"#& 3"' *$V9/ <1 %$*& &<		@ R*W*- / 1%X			(@*^*W*K*4 &<X			5$&&P			
I3P%$0&$3#	^ &#3"4 $	994	4 P$ '	G# $%	994	4 P$ '	G# $%	994	4 P$ '	G# $%	[/ #'#& 3<
L012(-&0	S6*! \ / R_*=3=; @ S6*! \ / R_ ! K*C3=; ; A K\ *A3=; @ MY*D3=; @ g\ *?3=; ; <	. . . .	@ @ @ @ > @ @	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .		e7f e6f e f*e2f e2f e f e7f e f

e>f6 P$ *) (") $#$T#&"
Z/ %4 :*eTfR 5T0T*%(*1-T2#&" E6 ((*! WW" ' $N\ Q W-TL-TW6*! ER 5T0T*%(*J T-#&270T#(*UT)) *, Fc) *#J U d, Fc) :*1&-*#5&) (8 T#(-$T0 *#5T#T-(*5T9T-' &7) *4 5(" * (W&) $#(' *T" 14 5(-(*$ *#5(-( ) V$T#&-1*#T2#E%, &#T0WT-#&270T#( ) *e2fU $#e fO( ) V$T*%(8 $#e(f8 $#

5/ 3<1'#' / 2"' *"1# / %&&$<*)/ %' 22$9#' ='$*$V9/ <1 %$*& &<8

; $2/ 4 4 $30$0*4 / 3&# %&P 9%2$0 1%$< : R*#5$ *W& 72#2&" #T$) *$ L-(' $ "#) *4 $5*(N/W&) 7-(*0$ $#) Q W(-) &" T0Q4 &-PW0T2(*T#8 &) W5(-(&-*%$&0&L$2T0*0$8 $#*%T07(*#5T#*-(1(-(*#5(*II(2#$ ((" ( )) *&I*#5(*) ("#$T#&" E*-( ) V$T#&-1*W&#(2#$ (*(G7$/8 ("#E

?3P&$$%&P*4 $" <1 %$< : S) (*&" 0*4 $5*T (G7T#(* ("#$T#&" E*R*7) (-&W(-T#&" *L(" (-T#(*' 7) #Q178 ( ) Q2LT) Q0TW&-*&-*8 $) #Q7) (*0&2T0(N5T7) # ("#$T#&" *&-*&#5(-*(" L$ ((-$ L*2&" #-&0) *#&*R(W*4 &-R(-*(N/W&) 7-(*%(0&4 *T$ 1-2&8 8 (" ' (' *(N/W&) 7-(*0$8 $#) E

$ %&( ) +', - *.' %/ 0 - '2 3#5 ' % "2 3#5, 0) 3(6 ' &7 '8) +'9 : *$; '+, <

A8? V9/ <1 %$*2/ 3#%' <$9 $%/ 3" '*9 %#$2#& 3

> +P&$ 3$'4 $" <1 %<

: Z T) 5*5T"') Q!&-(T-8) *T"' 'I T2(*#5 &-&7 L 5 0!*TI# -*5T"' 'Œ L *25 (8 $ZT0V&'& 72#(Œ% I &-((T-# LQ) 8 &F$ L*T"' *7) $ L '#5 ('Œ T-#&-1*T"' *T-##5 (*("' *&! *#5 (*4 & F$ L*W-$& E*! VW&'&VS T# # 25 "$&7 ( ) *) 5&7 0 *% *7) (' *#&*- (8 & ("V&# "-#Œ 0!*2& "-#T 8 $ T-# ' *2 0&#5 $ LE*Z T) 5 2& "-#T 8 $ T-# ' *2 0&#5 $ L*% I 8 -(- (7) $ LE*X*) 7 -(*#5 T-# (1(4 T) 5 *) -#*&") *T"' *) TI(-#*) 5 &4 (-) T-(*2 0&) (*#&*#5 (*4 & -F) -#*&" "0&2T-#&" E

_$%/ 3" '*9 %#$2#& 3

; $<9 &% -#

: S) (*T*V&'&V-Œ 1 $-#(' Œ T$ .V-$ 1$ L*&- *T$ .I (' *-( ) V$T-#&-*2 &8 V0!$ L*4 $#5 *T" *TVW'& (') -#"' ' T-' *$*T*-$) P*T) ( )) 8 (" -#$ ' $ZT-#( ) *#5 $ *$ *" (2( )) T-1E*O( ) V$T-#&-*) (Œ 2-#&" *8 7) -#*% %T) (' *&' *F* &4 " *&-*T" *#&2 1 Œ -#(*-( ) 7 -(*Œ ' (N/&) 7 -(*Œ ' (Œ Q!&5 (*5T9T-') *&! *#5 (*V&' 72-#*"' ' *#5 (*) TI(4 &-F5 ' L*Œ &#) *&! *#5 (*) (Œ Q! 2-#(' *-( ) V$T-#&-E

> " 30 <

: \ 5 (8 $ZT0-( ) $-#"' #Œ& W-' $R7) 'L Œ& ( ) *2 &8 V0!$ L*4 $#5 *T" *TVW'& (') -#"' ' T-' *) 5 &7 0 *% 4 &-" *T-#T Œ-#& ( ) *4 5 (" *5T"' Œ L *25 (8 $ZT0V&'& 72-#) *$*T*-$) P*T) ( )) 8 (" -#$ ' $ZT-#( ) *#5 $) *$) " (2( )) T-1E

?+$ <

: 6TI (-#*('Œ 4 (T-*2 &8 V0!$ L*4 $#5 *T" *TVW'& (') -#"' ' T-' *) 5 &7 0 *% *7) (' *4 5 (" *T*-$) P T) ( )) 8 (" -#$ ' $ZT-#( ) *#5 $) *$) " (2( )) T-1*#&*T ' &$ *(N/&) 7 -(*#&% Œ 3 7 $ *) V0T) 5 ( ) Œ 3 $-#) *&-') 7 -#E

(L&

: J (-) .&' T0V&-#(2-#5 (*(G7 $ V0 (" -#!&- *#5 (*%& 1*) 5 &7 0 *% *) (Q! 2-#(' *#) (' *&" *#5 (*-#T) P*% $ 'L V)' -!-&-8 (' *T"' *#5 (*-$) P) *$ ` &0 (' *T"' ') 5 &7 0 *% *TVW'& (' *) d *T*) V)' 2$ Œ 3 -#*% ! &-(*5T"' Œ L #5 $ *V&' 72-#E

?3T&%34 $3#' '*$V9 / <1 % 2/ 3#%' <

: X8 $) $&") *1-&8 *" ("-#&T-#&" *&-*4 &-P*VW&2( )) *(G7 $ V0 (" -#) 5 &7 0 *% *25 (2F*(' *#&*(") 7 -(*#5 (1 2&8 V0!*4 $#5 *#5 (*-(G7 $ (8 (" -#) *&! *(" ` $&' 8 ( " -#T Œ V&-#( 2-#&" *Q L $ ( Œ T-#&" E*R " ) &8 ( *2T) ( ) Q I 78 ( *) 2-7 %% -) Œ $#- ) *&-*( " L $ *( ( -$ L*8 &' $ZT-#&" ) *#&*#5 ( *V&2( ) ) *( G7 $ V0 ( " -#4 $ Œ 0 % " ( 2( ) ) T-1*#&-*-( ' 72 ( *( 8 $ ) $&" ) *#&*T22 ( V&T*%Q *Q ` ( ) Œ

E8'. - +<&2" '*" 30 *2- $4 &2" '*9 %9 $%#&$ <

. - +<&2" '*<-# -#&

: F$3 7 $ E

, &-9 $ %&-&&#-*" 9 % 9 $ %#&$ <

: V$) V)' -) $ Q! *$ *#5 (*1 &Œ 84 $ L*8 T-# -$T Q) d 2&0 *4 T-# (-*T"' ' *5&#4 T-# (-E

7B8'(#' =&&#-*" 30 *%$" 2-#&T&#-

5 - $4 &2" '*<-# =&&#-

: , 5 (*V&' 72-#$ *) -#*Q! E

5 / 30 &8& 3 <*# *" T/ &Q

: Y8*) W)' 2 3$2* T-#T E

I32/ 4 9 " #&-' $*4 " #5 %&' <

: Y8*) W)' 2 3$2* T-#T E

> " Œ' %/ 1 <*Œ $2/ 4 9 / <&8& 3 9 % Œ 12-#<

: S"' (-*" &-8 T Œ 28&" ' $R&") *&!*) #&-TL(*T"' *7) (Œ 5 T9T-' &7) *" (2&8 V&) $R&" 'V&' 72-# *) 5 &7 0 "&#*% *V&' 72(' E

. / <<&-&&#-*7)*- " Œ' %/ 1 <%" 2-#& 3 <

: S"' (-*" &-8 T Œ 28&" ' $R&") *&!*) #&-TL(*T"' *7) (Œ 5 T9T-' &7) *-(T2-#&") *4 $ Œ" &#&227-E

778*@ V&2/ ' / P&" '*&8) / %4 " #&& 3

H3 &&0*(#' #5 <

R21 #5 *#' V&2&#-

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	; $<1'#	(9 $2&5 <	, / <$	?V9 / <1 %
L Œ12(-8Œ0 , -$)-5 1' -8N1 8 (#5 10T8 $' &8 (#5 T" (	FV&; *V(-8 T0 FV&; *M-T0 FV&; *M-T0	OT# OT# OT#	h=@& ; ' *8 L3 PL @?; ; *8 L3 PL h>; ; ; *8 L3 PL	. . .

5 / 32' 1 <& 3 $ 14 4 " %

: . &*#5 (*%) #&!*&7 -*P" &4 Q! ' L(Œ 5 (*#&N2&&L $ ZT0V&'& V-#&) *&!*#5 $ *V&' 72-#5 T" (*" &#*% (" #5 &-&7 L 5 0!*$ " ( ) #&.T-#(' E

5 - % 3 Œ" #' V&2&#-

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	; $<1'#	(9 $2&5 <	, / <$	?V9 / <1 %

$ %&( ) +', - *.' %/ 0 - '2 3#5 ' % "2 3#5, 0) 3(6 ' &7 '8) +'9 : *$; '+, <

778*@ V&2/ ' / P&" '*&8) / %4 " #&& 3

L Œ12(-8Œ0	6 7 %25 -&" $2* , V&; *M-T0 6 7 %25 -&" $2* , V&; *M-T0	OT# OT#	@?<. ; *8 L3 PL A?*L3 PL	=<* T1) \ &' #&7 &7) >; * T1) R#(-8 $#(" #

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

I %&# #& 3 $ & / %& <& 3

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	; $<1'#	(9 $2&5 <	(2/ %	?V9 / <1 %	G=<$ %" #& 3
L Œ12(-8Œ0 , -$)-5 1' -8N1 8 (#5 10T8 $' &8 (#5 T" (	X 1( ) *. *U $) *$ -$#" # 6 F5' *. *U $) *$ -$#" # 6 F5' *. *U &' (-T-# *$ -$#" # 6 F5' *. *5 (` (-(*$ -$#" #	OT*8&# OT*8&# OT*8&# OT*8&#	. . . .	. . . .	. . . .

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

($ 3 <&#&&% %

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

5 " %2&$ / P$ 3 &8&+

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	; $<1'#	(9 $2&5 <	. / <$	?V9 / <1 %
L Œ12(-8Œ0 , -$)-5 1' -8N1 8 (#5 10T8 $' &8 (#5 T" (	X G7 $ &2T0 *M-T0 *. , V&;	U &7) (	<DE#L3 PL	=E*4 ((P) R#(-8 $#(" #

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

5 "' <<&$2" #& 3

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	R5 _ I >	IR; 5	?. R	[IG(>	[@	G(>R
L Œ12(-8Œ0 , -$)-5 1' -8N1 8 (#5 10T8 $' &8 (#5 T" (	.	.	.	.	.	Y&" (E Y&" (E

! 1#' PS 3 &2&+

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	@& <#	?V9 $ %& $ 3#	; $<1'#
L Œ12(-8Œ0	\ 1#&L (" (-#&2*1 " T Œ1) $) V Y! *R 5 $ &#&"	67 %(2#&UT8 8 T Œ&T" .! " $ 8 T0 67 %(2#&UT8 8 T Œ&T" ._ 78 T"	J &) $ 8 5 (J &) $ 8 5 (

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

@ &% # PS 3 &2&+

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

: $ 9 % Œ 12-#&$ T$ "# V&2&#-

. % Œ 12-#&$ P*% Œ 0&$ 3#3" 4 $	! " #& %8 "' ' # V&2&#-	Z$ *#&2&#-	, T' / 94 $3# # V&8	(9 $2&5 <	, / <$	?V9 / <1 %
L Œ12(-8Œ0	.	J &) $ 8 5 (	.	OT#. *UT Q	M-T Q!@(;	@ T1)
	.	.	.	OT#. *UT Q	8 L3 PL S "-(V&-#(' a	=" T1)
	.	.	.	OT#. *UT Q	=<; *8 L3 PL S "-(V&-#(' a	@ T1)
	.	J &) $ 8 5 (	.	OT#. *UT Q	<?=*8 L3 PL S "-(V&-#(' a	@ T1)
	.	.	.	UT 8 8 T0 (*) W(2$)	@ ; ; 8 L3 PL S "-(V&-#(' a	@ T1)
				7") W(2 3$ (' *: *UT Q	@@*8 L3 PL	

5 / 32' 1 <& 3 $ 14 4 " %

: Y8#T` T$ T9Q E

5 " 3 " 0 "

R21 #5 *#' V&2&#-

$ %&( ) +', - *.' %/ 0 - '2 3 4 5 ' % "2 3 4 5 , 0) 3 6 ' & 7 ' 8) + ' 9 : *$; ' +, <

778'@ V&2/ ' / P&" ' '*&8)/ %4 " #& 3

. %012#5 P%0 & 3#3 " 4 $	; $<1'#	(9$2&<	, / <$	?V9 / <1%
, -$ 4 5 1 ' -&N1 8 (#5 10 T 8 $' & 8 (#5 T " (L012(-80	FV&B; *M-T0 FV&B; *V(-8 T0 FV&B; *M-T0	OT# OT# OT#	h>; : ; '8 L3FL h=@&, ; '8 L3FL @?; , '8 L3FL	. . .

5 / 32 ' 1 < & 3 $ 14 4 " % : , &*#5 ("%) # &! *&7 -'P' &4 0 (' L(Q#5 ('*&N 2&&L $ 2 T 0 V& W(-#&) '&! *#5 $) *V& 72#5 T ' (" ' &#*% (" #5 &-&7 L5 0 !*$ ` ( ) #& T#(' E

5 - % 3 &2 "# V&2&#+

. %012#5 P%0 & 3#3 " 4 $	; $<1'#	(9$2&<	, / <$	?V9 / <1%
L012(-80	6 7%25 -8 " $2 ", VB; *M-T0 6 7%25 -8 " $2 ", VB; *M-T0	OT# OT#	@?<; ; '8 L3FL A?*L3FL	=<* T1) \ &' #5 7&7) >- * T1) R#(-8 $#(" #

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

!%&#' #& 3 5 ; / %& <& 3

. %012#5 P%0 & 3#3 " 4 $	; $<1'#	(9$2&<	(2/ %	?V9 / <1%	G=<$ %" #& 3
, -$ 4 5 1 ' -&N1 8 (#5 10 T 8 $' & 8 (#5 T " (L012(-80	6 F5 " * .*U & (-T# *$-$#T " # 6 F5 " * .*5 (' (-(*$-$#T " # X 1 ( ) * .*U $) *$-$#T " # 6 F5 " * .*U $) *$-$#T " #	OT%&# OT%&# OT%&# OT%&#	. . . .	. . . .	. . . .

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

($ 3 < &#&3 %

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

5 " 2 &8 / P$ 3 &2&#+

. %012#5 P%0 & 3#3 " 4 $	; $<1'#	(9$2&<	. / <$	?V9 / <1%
L012(-80	X G7 $ &2T0 : *M-T0 : *, VF&	U&7) (	<DEB L3FL	=B 4 ((P) R#(-8 $#(" #

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

5 ' " <<&#2 " #& 3

. %012#5 P%0 & 3#3 " 4 $	R5 _ I >	IR; 5	? . R	[IG(>	[@	G(>R
L012(-80 , -$ 4 5 1 ' -&N1 8 (#5 10 T 8 $' & 8 (#5 T " (	. .	. .	. .	. Y&" (E	. .	Y&" (E Y&" (E

! 1# P$ 3 &2&#+

. %012#5 P%0 & 3#3 " 4 $	@5 <#	?V9 $ %4 $ 3#	; $<1'#
L012(-80	\ 1#&L (" (#&2 "! " T0!) $ VY ! *R 5 %#&5 "	67%(2#!U T 8 8 T 0$T " . ! " $8 T 0 67%(2#!U T 8 8 T 0$T " . _ 78 T "	J &) $% (J &) $% (

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

@5 %# P$ 3 &2&#+

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

; $9 % 012#&T$ "# V&2&#+

. %012#5 P%0 & 3#3 " 4 $	! " #5 %8 " ' ' # V&2&#+	Z$ %#&8&#+	, T ' / 94 $ 3# # V&3	(9$2&<	. / <$	?V9 / <1%

D&$5D&E7D8 B'1 #

F$(*6 2$ " 2(*O) (T-2 5 ********** U M*K&N@&@* ********** ' O&2P!&- ` O R***** ><@$ *A?<. ; DOD******** 4 4 4 B#(-8 &#&8 8
J $ -2(*K $## 2 5 " &2&L 1 *R 2#******> DODYB U (-$ $" *O &T ********** ?@@ B********** <'-@$ *A?<. D>@ *HTN

$ %&( ) +', - *.' %/ 0 - '2 3 4 5 ' % "2 3 4 5 , 0) 3 6 ' & 7 ' 8) + ' 9 : *$; ' +, <

778'@ V&2/ ' / P&" ' '*&8)/ %4 " #& 3

L012(-80	.	.	.	OT#. *UT0(	S " -(V&-#(" a	=* T1)
	.	J &) $% (	.	OT#. *UT0(	M-T0@;	@ T1)
	.	.	.	OT#. *UT0(	S " -(V&-#(" a	@ T1)
	.	.	.	U T 8 8 T 0 . *) W(2$)	S " -(V&-#(" a	@ T1)
	.	J &) $% (	.	7 ") W(2 3$ ' * . *U T0(OT#. *UT0(	@@&*8 L3FL S " -(V&-#(" a	@ T1)

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

7D8*? 2/ ' / P&" ' '*&8)/ %4 " #& 3

? 2 / # V&2&#+ : Y&*P ' &4 " ') $ L " $ 2 T " #(I I(2#) *&-*2-$ 2 T 0 5 T 9 T -') E

H 3 &5 0 *(#' #5 <

R] 1 " #2 "S 2 / # V&2&#+

. %012#5 P%0 & 3#3 " 4 $	; $<1'#	(9$2&<	?V9 / <1%
L012(-80	! 27#(*F\ B; *E@#&*E D 8 0 F*H-( ) 5 *4 T#(-	H$) 5 *. *M " 2&-51 " 257) *8 1 P$)	A?*5&7-)

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

. $ %&#5 3 2 $ % $ P%0 " = &&#+

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

5 " 3 " 0 "

R] 1 " #2 "S 2 / # V&2&#+

. %012#5 P%0 & 3#3 " 4 $	; $<1'#	(9$2&<	?V9 / <1%
L012(-80	! 27#(*F\ B; *E@#&*E D 8 0 F*H-( ) 5 *4 T#(-	H$) 5 *. *M " 2&-51 " 257) *8 1 P$)	A?*5&7-)

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

. $ %&#5 3 2 $ % $ P%0 " = &&#+

5 / 32 ' 1 < & 3 $ 14 4 " % : Y&#T ` T$ 0 T%(E

G# $ *% 0 T$ %$ *$)) $ 2#< : Y&*P ' &4 " ') $ L " $ 2 T " #(I I(2#) *&-*2-$ 2 T 0 5 T 9 T -') E

7F8*, &<9 / <" ' *2 / 3 <8 0 $ %#& 3 <

a " <#5 *0 &<9 / <"' : , 5 (*L (" (- T#& " *&! *4 T) # ") 5 &7 0 *% (*T ` &$ ( ' *&-*8 $ ' $ ! $9 ( ' *4 5 ( -( ` (- *V&)) $ 9 (E*6 $ L " $ 2 T " # G7 T " #&$) *&! *4 T) # " V&$: 72#-( ) $ 7 ( ) ") 5 &7 0 *" &#*% (" $ V&) (' *&! " $ *#5 (*1&7 0) (4 (- *% 7 # V&$2( )) (' *$ *T *) 7 $ #$ 9 (*(I I 0 7 (" ##(T#& (" #*V 0 " #E*V$ V&) (*&!) 7 - V0) *T " ' ' *" &` -( 212 0 T 9 ( V&$ : 72#( *" $ *T *T 0 2 ( " ) ( ` *4 T) # (* $ V&) T 0 2&* #T 2#&-E*V$ V&) T 0 &! *#5 $ *V&$: 72#2) &0 7#&$ ") T " ' *T " 1*% ! .V&$: 72#(*) 5 &7 0 *T#T 0 H#&8 ( ) *2&8 V0 ! *4 $ 65 *#5 (*-(G7 $ (8 (" *# *&! *T " ' $&` 8 ( " " #T 0 V&$#( 2#$&` *T " ' ' *4 T) # (* $ V&) T 0 0 (L $ " T 0 0 &2T 0 T 7 #5 &-$#*-(G7 $ (8 (" " #E Z T) # *V T 2 PTL $ ' L *) 5 &7 0 *% (*-(212 0 ' E*T R 2$ (-T#&$ " &-*0T " ' ! $0) 5 &7 0 *&` 0 !*% *2&* ) $ ( - ( ' 4 5 ( " " *-( 212 0 $ L *$ ) " &#! ( T ) $ 9 ( E*: 5 $ *8 T#( -$ ! 0 T " ' ' *$ ) *2&* # ! $ ( - *8 7 ) #*% * " $ ) V& ) ( ' *&! *$ " *T ) T ( ' *4 T *E*\ T -( *) 5 &7 0 *% *#T H ` " *4 5 (" " 5 T " ' 0 $ L *(8) V&) ' *2&` #T $ ( - ) *#5 T#*5 T ( *" &#*% ( " 2 0 [ T " ( ' *&-*$ ) ( ' *&7 #E*X 8 V&!#*2&` #T $ (-) *&-*0$ (-) *8 T 1*-(#T $ ") &8 (*V&$: 72#-( ) $ 7 ( ) E ! " &$ " $) V(-) T 0 &*) V0 ! " *8 T#(-$! 0 T " ' ' *-7 " &! I T " ' ' *2&` #T 2#*4 $ 6 *) &8 2 4 T#(-4 T 1) Q -T$ *) T " ' ") (4 (-) E

, &<9 / <" ' *<- / 1 ' 0 *=$ *8 *" 22 / %" ' 32$ *M&# *" ' 99 ' &" =' $ *" *$ P&! 3 " ' ' N3 " #& 3 " ' ' *" 30 * / 2 " ' ' * " ' M<*" 30 *" %P1 ' " *#& 3 <8
; $) $ %# *($2#& 3 *) ' *> R[, ^ I [_ *R[, *(@G; R_ . ?*" 30 *($2#& 3 *A: *? b . G(H; ? *5 G[@ G^ (S ?; (G[R^ * . ; G@? 5 @G[
)/ %' 0 0 &#& 3 " ' *- " 30 ' &P*8) / %4 " #& 3 *" 30 ' 9 %#5 2#& 3 ') *$ 4 9 ' / +$$ <8

D&$5D&E7D8 C'1 #

F$(*6 2$ " 2(*O) (T-2 5 ********** U M*K&N@&@* ********** ' O&2P!&- ` O R***** ><@$ *A?<. ; DOD******** 4 4 4 B#(-8 &#&8 8
J $ -2(*K $## 2 5 " &2&L 1 *R 2#******> DODYB U (-$ $" *O &T ********** ?@@ B********** <'-@$ *A?<. D>@ *HTN

$ %&( ) +', - *.' %/ 0 - '2 3 4 5 ' % "2 3 4 5 , 0) 3 6 ' & 7 ' 8) + ' 9 : *$; ' +, <

7C8'@% 3 <9 / %#*&8)/ %4 " #& 3

: $P1'"# % &8)/ %4 " #& 3	H[*314 =$%	. %9$%<- &89 &8P 3"4 $	5 ' " <<$<	. _ c
. G@5 ' " <<8,&2" #& 3	Y&# -(L7 0 T#,' E	.	.	.
IR@RY _ ; *5 ' " <<	Y&# -(L7 0 T#,' E	.	.	.

J / j *&U T2P$ L*L-&7W

7K8'; $P1'"# %*&8)/ %4 " #& 3

H3 &8 &0 *(#' #&5 <

>5 ('5 ' " <<8,&2" #& 3	:	R-$T#&5' L*8 T#-$T 0 , T-L(#8-LT" *(II (2#)
H8[8Z$0 $ %' *%P1'" #& 3 <	:	@ 5 R*A\WM H; *?V&4 9#&5 " %&8,' $\V&4 9#&8 3 aY &#' (#(-8 $ ' (H3 &8 &0 *(#' #&5 <*&8T$3# %*\V@ 5 R*A=X&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E (R; R*FEDGFBC$F77$F7D*$\V#%&4 $'+*- " Q' %/ 1 <*<1 =<#' 32$ <aY &*\V&8; 72#) *4 (-(1&7"'' E (R; R*FEDGFBC$4 $%*6$32+*9 " " 33 &8P"" 30 *3 / #&,&2" #& 3 aY &*\V&8; 72#) *4 (-(1&7"'' E (R; R*FEDGFBC$F77$F7D*- " Q' %/ 1 <*2- $4 &2" ' <aL 0 (2(-8 0k , -9 +5 1' -&N18 (#5 10T8 $ 8& (#5 T" (
		(R; R*F77$F7D*1 (, (*0 &#&=1#& 3 *Y2- $4 &2" ' ' *&8T$3# %*Y- " Q' %*80 $3#&,&2" #& 3 a L0 (2(-&0aR8 8 (' $T#(*-H'27#(: *5 (T0 6 *5T9T-' OV(0 '1(' *-25-&" $2: *5 (T0 6 *5T9T-' k , -9 +5 1' -&N18 (#5 10T8 $ 8& (#5 T" (aR8 8 (' $T#(*-H'27#(: *5 (T0 6 *5T9T-'

5 '$" 3 *R&#R2#" ($2#& 3 77DA#\>" Q' %/ 1 <*R&% ./ " 1#' 3#<*\#R. <X	:	Y&#0 #('
5 '$" 3 *R&#R2#" ($2#& 3 *UED 5 '" << *1 *(1 =<#' 32$ <	:	Y&#0 #('
5 '$" 3 *R&#R2#" ($2#& 3 *UED 5 '" << *II *(1 =<#' 32$ <	:	Y&#0 #('
, ?R™ &#!*5 - $4 &2" ' < W%21%/ %5 - $4 &2" ' <X	:	Y&#0 #('
, ?R™ &#!II *5 - $4 &2" ' < W/<<$3#&,' *5 - $4 &2" ' <X	:	Y&#0 #('

(#' #&5 "%P1'" #& 3 <

! " <<" 2- 1 <$#<	:	, 5 (*1&0 &4 $' L*2&8 V&" ("#) *T-(*(8) #(' d/ F] \ XOR'X *U R&,
[$M*d / %	:	Y&" (*8 &1*&5 (*2&8 V&" ("#) *T-(*(8) #(' E
[$M*e $%$+	:	, 5 (*1&0 &4 $' L*2&8 V&" ("#) *T-(*(8) #(' d/ 0 (2(-$'
. $3 3 <+' T" 3&	:	, 5 (*1&0 &4 $' L*2&8 V&" ("#) *T-(*(8) #(' d/@&-Q. J OMJ ! YX, OR/MF
H3 &8 &0 *(#' #&5 <*&8T$3# % V@ 5 R*A=X	:	! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E

5 " 3 " 0 "

a >! I (*\5/" 3 " 0 " X	:	\ (0)) *V. =K&!UT#(-$T02T7) $' L*&#5 (-*#&N2*(II (2#) *+ &N2-E

5 " 3 " 0 & 3 * &#<

5 " 3 " 0 & 3 *[. ; I	:	Y&" (*8 &1*#5 (*2&8 V&" ("#) *T-(*(8) #(' E
5 ?. R*@ V&2*<1 =<#' 32$ <	:	Y&" (*8 &1*#5 (*2&8 V&" ("#) *T-(*(8) #(' E
5 " 3 " 0 " *&8T$3# %	:	! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E

@ &*9% 0 12#- " <"=$$3 '2 " " <<8,&5 0 *&#" 22/ %" " 32$ *M&# *# $*- " Q' %" 2*&#5 %&*/) *# $*5 / 3#%'' $0 *. %0 12#<*; $P1'"# &, 3 < " 30 *# $*1 (, (*2/ 3 # &3 <*" ' " # $*&8)/ %4 " #& 3 *%] 1&$0 "=+# $*5 / 3#%" $0 *. %0 12#<*; $P1'" #& 3 <8

D&\$5E7D8 D'1 #

F$(*6 2$ " 2(*O) (T-2 5 ********** U M*K&N@&@*********************** O&2P!&- O R*****<@$ *A?<. ; DDD******* 4 4 4 8E(-8 &E&8
J $ -2(*K $# 2 5 ' &2&L 1*R 2E*******> DDDYEU (-$ $" *O&T ********** ?@@ B********** <*-@*A?<. D-@*HTN

$ %&( ) +', - *.' %/ 0 - '2 3 4 5 ' % "2 3 4 5 , 0) 3 6 ' & 7 ' 8) + ' 9 : *$; ' +, <

7K8'; $P1'"# %*&8)/ %4 " #& 3

I3 #&5 &" #& 3 "' * &#<

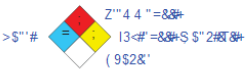
I3 #&5 &" #& 3 "' * &#<	:	R1 <#%' & *&8T$3# %*\R!5 (X&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E 5 - &8" " *&8T$3# %*\W 5 (5 X&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E e" 9 " 3 *&8T$3# %&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E f / %" *&8T$3# %&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E [$M*g$" ' " 30 *I3T$3# %*/) *5 - $4 &2" ' <*\Wg! / 5 X&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E . - &&9 &8$<*&8T$3# %*\M 5 5 (X&! (0288 V&" ("#) *T-(*(8) #(' *&-*(N(8 V#(' E

7U8'G#- $%&8)/ %4 " #& 3

^ " =$' *%$] 1&$4 $3#<	:	\ ! S6X 6 *OX 6 J R0! , MO] *, O! \ , CK] X *! YV '6 ^ R(*R0R ! , R/MYE*\ MY, ! R(*6 U ! , XOR F*, _ ! , *\ ! Y*\ ! S6X*, ! O/ X, *MO/ ! Y*V ! U ! / XE
>" Q' %/ 1 <1 " #5 %&'	:	
I3)/ %4 " #& 3 *(+<#5 4 *\W8(8R8X		

@ $*21 <# 4 $%&<*%<9 / 3 <&-$*)/ %0 $#5 %4 &8 &8P*# $*. . ?*2/ 0$*)/ %# &<*4 " #5 %&' 8

[" #& 3 "' *Z.8&*. %#5 2#& 3 R<</ 2&#& 3 *\W8(8R8X



, " #5 *))*9 %&#&8P	:	D&\$5E7D8
, " #5 *))*&<1 $	:	=3*3=; @+E
, " #5 *))*9 %T& 1 <*&<1 $	:	C3@@3=; @@E
6 $%& 3	:	@E =
. %9 " %0 *=+	:	U 6 V6 *+O (L7 0T#&-1*6 W(2$T0]#

◤I30 &2" #5 <*&8)/ %4 " #& 3 *#- " <*2- " 3P$0 *) %4 *9 %$T& 1 <' +*&<1 $0 *T$%& 38

[/ #2$*#" *%" 0$%

@ *# $*'=$<#*) *)*/ 1 %L 3 / M*$0 P$N*#- $*&8)/ %4 " #& 3 *2/ 3 *# &8$0 *- $%&8*&*" 221%#&8*>/ M$T$*%83$&# $%*# $*" =/ T$*\8 " 4 $0 <1 99 ' &%M3 / %3 +*/) *8&*<1 =<0 &%&<N" <<14 $<*" 3 +*" &=&8+M- " #-/ T%)/ %*# $*" 221%2 +*/ %2/ 4 9 ' $#&3$<<*/) *# $ &8)/ %4 " #& 3 *2/ 3 *# &8$0 *- $%&8
Z&8 " ' *0$#&%4 &8" #& 3*/) *<1 &#' =&&+*/) *" 3 +*4 " #&5 %&' *&-*# $*<//' $*%&<9 / 3 <&-&&+*/) *# $*1 <$*8R' *4 " #&5 %&' <*4 " +*9 %&<$3# 13 L3 / M3 *- " Q' %<*" 3 0 *<- / 1' 0 *=$*1 <$0 *M&# *2" 1#& 3 8R' # / 1P- *2$*#' &8 *- " Q' %<*" %*0$<2*&-$0 *- $%&8 NM$*2" 33 / # P1'" %3#&5 $*# " ### $<$*" %*# $*/ 3' +*- " Q' %<*# " #*$\V&<#8

D&\$5E7D8 ! #'1 #

F$(*6 2$ " 2(*O) (T-2 5 ********** U M*K&N@&@*********************** O&2P!&- O R*****<@$ *A?<. ; DDD******* 4 4 4 8E(-8 &E&8
J $ -2(*K $# 2 5 ' &2&L 1*R 2E*******> DDDYEU (-$ $" *O&T ********** ?@@ B********** <*-@*A?<. D-@*HTN

Thermo SCIENTIFIC

The world leader in serving science

$ &'(%) * +,+ . %) / ,0) 1%0+2 . 0* %4 5 (6 7 %0) 2) ,. 08

E;%' 8#%' 0%4 $" 81 &$8

A+$%/ 3#' 2#	= ! " +9T%&-%, >%+/ &* +%, 8%&,)69)%+, ' +' N%% / +>(6)+.8%A' " %8+' % ()" %.+,)8%&C% 6)+- C&-%)%+6')%I % (, A)+' ;%896' (& 6.8%()(, <%' +%XX+-%, >%&[+-%8+.(>' N%% +)% +>(96. 6))+,)(& % / +>(6)+.8M
) M3 %/ 3#' 2#	= # %96' +%&C%&,)69);% / +>(6)+.8%A' " %T(% ()" %.+,)8%&C% 6)+-%&-%)%+6')%I % (, A)+' [" (+%+/ &* (, <%&,)6/ (, 6)+>%.&)" (, <%, >%" &+' N%, 6' " %.&)" (, <%@-C&-+%+A' +N%.+6, ' " &+' % &-&A<" .8%@-C&-+%+A' +N%+)% +>(96.%))+,)(& % / +>(6)+.8M
73- " (" #/ 3	= W&* +%?X&' +>%+-' &, %&%+' " %(-N%C%&)%@+6)" (, <;%C%@+6)" (, <%%-+<A 6-%&-%C -+' X(-6)&-8%--+')%&99A-' ;%-&* (>+%-)(C9(6.%+' X(-6)(&, %-%?8<+, %@%6(, +>%+-' &, , +M N&&' +, %<")%.&)" (, <%A9" %' %%.6-;%+;%@.)%-%6( )@, >N%+)% +>(96.%))+,)(& (/ / +>(6)+.8M
739 $8#/ 3	= \ 6' " %A)% &A)" % ()" %6)+-N%&%&)% >A9+%&/ ()(, <%, .+' ' %(-+9)+>%&%&%@% +>(96. X+-' &, , +.N%+* +-%(* +%, 8)" (, <%@% &A)" %&%, %, 9&, ' 9(&A' %+-' &, N%+)% +>(96. 6))+,)(& % / +>(6)+.8M
. & #$2#/ 3%*%8#X" 0$8	= : &%9)(& %" 6.%@-%T+, % * &* (, <%, 8%+-' &, 6.%(T%-%()" &A)%A()6@+%6(, (, <N%C()% ' A' X+9)+>% 6)%A' +' %-+%)(..%-+' +,);% +%+' 9A+-%" &A>% +6-%, %XX-&X-(6)+% 6' T%- ' +.C9&,)6(, +>%@+6)" (, <%XX6-6)A' N%% 68%@-%6, <+-&A' %&% +%+-' &, %-&* (>(, <%(>%& <(* +% &A)" ')&/ &A)" %+' A' 9()6)(&, M
Z/ #$8% %- +8' 2"' 3	= # %96' +%&C% " 6.6)(& %&C%+9&/ X&' ()(&, %-&>A9)' % %%+;%8/ X)&/ ' % 68%@-%+.68+>M P" +%?X&' +>%+-' &, % 68%++>%&%@-%+X)%, >+-% +>(96.%A* +(.6, 9+%-%E%&A-' M

L;%' &$X" 9- #39%4 $" 81 &$8

Y(" 4 4 " ?' (#+%*% $%&' 012#	= # %%+%-%(C%+6)+>;%%-+' ' A-+% 9-+6' +% (.%99A-%, >%' +%&,)6(, +-% 68%@-A-')M
AU#391' 8- ' 39%4 $0'"	
) 1' #' ?($	= B' +%, %?)(, <A(" (, <%<+,)%A()6@+%-%' +%A--&A, >(, <%+M
Z/ #%1' #' ?($	= : &, +%, &[, M
) <$2' " (%U</ 81&%" Q' &08	= $-&/ X).8% &6)+%' +%9+, +%@%+/ &* (, <%..%+-' &, ' %&/ % +%9(, ()8%&C%' +% 9(>+,)%C)" +-+% %%+N%&%9)(& %" 6..%@-%T+, % * &* (, <%, 8%+-' &, 6.%(T%-%()" &A)%A()6@+)-6(, (, <M
@' Q' &0/ 18% $&4 " (0$2/ 4 </ 8' #/ 3%&' 012#8	= 3 +9&/ X&' ()(&, %-&>A9)' % 68% 9.A>+%' +%&.&[(, <% 6)+-(6.' a 96-@&, %(&?(>+ 96-@&, % &, &?(>+ , ()-&<+, %&?(>+'
) <$2' " (%&' #$2#T$ $\ 1' <4 $3#% &%&X" 9- #$8	= Q(-+' C(<")+-' %" &A>% +6-%XX-&X-(6)+%-&)+9)(* +%OA(X/ +,)%, >%+.C9&,)6(, +>%@+6)" (, < 6XX6-6)A' %W ! R25% ()" %%A.%9+' X(+9+%X+-6)+>% %&' ()(* +%-+' ' A-+% &>+M
) <$2' " (%4 " &M8%3%&$ - " Q' &08	= W68%/ ()%-()6)(, <%, >I&-%&?(9%V +' %, >+-%+%&, >()(&, ' M

] ;%R22' 0$3#' (%$($" 8$%4 $" 81 &$8

. $&/ 3" (%&$2" 1#/ 38	= : &%9)(& %" 6..%@-%T+, % * &* (, <%, 8%+-' &, 6.%(T%-%()" &A)%A()6@+%6(, (, <M Y* 69A6)+%A--&A, >(, <%-+6' N%++X%, , +9+' ' 6-8%, >%, X-&)+9)+>%+-' &, , +.%&/ +,)+-(, <N%&%&)%&A9" %-%6.T%' -&A<" %X(..+>% 6)+-(6.N%* &(>%@+6)" (, <%6X&-%-% ( )M $-&* (>+%>+OA6)+%+,)(.6)(&, N% +6-%XX-&X-(6)+%+' X(-6)&-%" +, %+,)(.6)(&, % (, 6>+OA6)+N%A)%, %XX-&X-(6)+%+-' &, 6.%-&)+9)(* +%OA(X/ +,)% ++%+9)(&, %EM
A3T' &' 34 $3#' (%&$2" 1#/ 38	= 2* &(>%(X+-' 6.%C%X(..+>% 6)+-(6.%, >%A, &C%, >%&,)69)% ()" %&(.;% 6)+-[68' ;%-6(, ' 6, >%+[+-' N%C&-/ %' +%+.+* 6,)%A)" &-()(+' %C%' +%-&>A9)%6' %6A' +>%, * (-&, / +,)6. X&.A)(&, % +[+-' ;% 6)+-[68' ;%&(.%-%(-5M

! $# / 08%/ &2($" 3' 39%<

KS : %FD F; : "! :

NG%9(+, 9+%+' +6-9' %[redacted] = %&?%DJ%[redacted] &9TC&> ;%N%EDI 5%FE' LJHJ%[redacted] [[M +-/ &%&/
$(-9+%(&)+9' , &.&<8% 9%[redacted]JHJ% M%A-(>(6, %6&&>%[redacted]DDLI %[redacted]EDI 5%FE' JVDF%6?

$ &'(%) * +,+ . %) / ,0) 1%0+2 . 0* %4 5 (6 7 %0) 2) ,. 08

] ;%R22' 0$3#' (%$($" 8$%4 $" 81 &$8

) 4 " ((%&<' ((	= 7)&X%+6T%C% ()" &A)%(TN%A&* +%&,)6(, +-' %&/ %X(..%-+6N%(.A)+% ()" %6)+-%, >% &X%X (C% 6)+-' " &A@+N%.)+-, 6)(* +.8;%-%C% 6)+-' (, ' &A@+;%@-&-@% ()" %, % +-)%-8% 6)+-(6.%, > X.69+% %, %XX-&X-(6)+%6')+%(X&' 6.%&,)6(, +-N%(X&' +%&C%(6%%@+, ' +>% 6')+ >(X&' 6.%&,)-69)&-M
^ " &$%&<' ((	= 7)&X%+6T%C% ()" &A)%(TN%A&* +%&,)6(, +-' %&/ %X(..%-+6N%XX-&69" %+.+6' +%&/ AX[(, >N%-+* +,)%,)-8%)&%+[+-' ;%6)+-%&A-' +' ;%@' +/ +,)' %-%&, C, +>%-+6' N%, 6' " ' X(.6<+' %)&%, %CA+,)%+6)/ +,)%.6,)%-%-&9++>%' %&.&[' N%&)6(, %, >%&.+9) ' X(.6<+% ()" %&, ' 9&/ @A')(@+;%@-&-@,)% 6)+-(6.%N%N%6, >;%6-)" ;%+-/ (9A()+%- >(6)&/ 69+&A' %6-)" %, >%.69+% %&,)6(, +-%(X&' 6.%99&->(, <%&%&96.%+<A6)(&, ' 0 ++%+9)(&, %V5N%(X&' +%&C%(6%%@+, ' +>% 6')+)+%(X&' 6.%&,)-69)&-N%&)6/ (, 6)+> 6@-&-@,)% 6)+-(6.% 68%&' +% +%6/ +%6Z6->%' % +%X(..+>%-&>A9))N%&)+&%++%+9)(& D%-%/ +-<+, 98%&,)69)% C&-/ 6)(& %, >%+9)(& %V%-% 6')+%(X&' 6.M

K;%@' 30('39%30%# &' 9$

@' 30('39	= $A)%, %XX-&X-(6)+%+-' &, 6.%-&)+9)(* +%OA(X/ +,)% ++%+9)(& %E5N%6)(, <;%-(, T(, <%, > ' / &T(, <%" &A>%@-%-&' (@+>%+-' %" +-+% (% 6)+-(6.%%6, >.+>;%)&+>%, > X-&9+' ' +>N%&-T+-' %" &A>%6' " %" %6, >' %, >%9+%@-C&-+%6)(, <;%-(, T(, <%, >%/ &T(, <M S+/ &* +%&,)6/ (, 6)+>%.&)" (, <%, >%-&)+9)(* +%OA(X/ +,)%@-C&-+%,)+-(, <%6)(, <%-+6' M 3 &%&)% <+')N%* &(>%&,)69)% ()" %8+' ;%T(, %, >%.&)" (, <N%* &(>%@+6)" (, <%6X&-%-% ( )I B' +%, .8% ()" %>+OA6)+%+,)(.6)(&, N% +6-%XX-&X-(6)+%' X(-6)&-%" +, %+,)(.6)(&, % (, 6>+OA6)+N%++X% % +%-(<(, 6.%&,)6(, +-%, %XX-&* +>)+-, 6)(* +% 6>+%&/ % 9&/ X6)(@+% 6)+-(6.;%+X)%<").8%.& +>% " +, %&)% A' +N%/ X)8%&,)6(, +-' %+)6(, X-&>A9)%+' (>A+%, >%6, %@+%6Z6->&A' N%&%&)%+A' %&,)6(, +-M
) # &' 9$	= 3 &%&)%)&-+%@&* +% +%.&[(, <%+' X-6)A-+;%GLH %HQ%)&-+% %99&->6, 9+% ()" .&96.%-<A6)(&, N%&-+% %-(<(, 6.%&,)6(, +-%-&)+9)+>% -&/ %(-+9)%A, .(<")% % 6-8;%&& 6, >% +.. * +,)(.6)+>%-+6;%[68%&/ %9&/ X6)(@+% 6)+-(6.%++%+9)(&, %L5%, >%&& 6, >%-(, TN%++X%&,)6(, +-%8%.&' +>%, >%+6.+>%,)(.%+6>8%&-%A' +N%&,)6(, +-' %6) " 6* +@+, %X+, +>%/ A')%@-%6-+CA.8%+' +6.+>%, >%+X)%X-(<")%&-%+* +,)%+6T6<+N%& , &)%)&-+%, .6@-+>%&,)6(, +-N%+%XX-&X-(6)+%&,)6(, / +,)%&* &%, * (-&, / +,)6. 9&,)6/ (, 6)(&, M

C;%U</ 81&$%/ 3#&' (8S<$&/ 3" (%&' #$2#/ 3

5" 3" 0"

I 221<" #/ 3" (%U</ 81&%4 '#8

: &%?X&' A-+%/ ()%6.A+%, &[, M

5/ 381(#%2" (%1# / &#$8% &%22$<#' ?($%U</ 81&%4 '#8;

>$2/ 4 4 $30$0% / 3' #' &39 <&' 2$01&$8	= #C% (%-&>A9)%&,)6(, ' % <-+>(+,)' % ()" %?X&' A-+%/ ()' ;%+-' &, 6.;%&-TX.69+%)/ &' X" +- &-%@&&<(96.% &, ()&-(, <% 68%@-%+OA(-+>%&%+)+-/ (, +%' +%+%C-9)(* +, +' ' %&C%' +%+,)(.6)(&, &-%)" +-%&,)-&.%/ +6' A-+' ;%, >%&-' ' +%' +%+9+' ' (8%&%' +%' X(-6)&-8%-&)+9)(* +%OA(X/ +,)M
A39'3$$&39%4 $" 81 &$8	= B' +%, .8% ()" %>+OA6)+%+,)(.6)(&, N%&%' +-%X+-6)(&, ' %+, +-6)+%A');%V +' ;%6' ;%6X&-%-% ( );%' +%-&9+' ' ' %, 9.&' A-+' ;%&96.%+ " 6A')%+,)(.6)(&, %&-%&)" +-%+, <(, ++-(, <%&,)-&.')&%+X%&-T+-%?X&' A-+%@&-%6(-@&-, +%&,)6/ (, 6,)' %@-.&[%, 8%+9&/ / +, >+>%&-%6)A)&-8%(/ ()' M
@+9' 3%4 $" 81 &$8	= \ 6' " %6, >' ;%-+-6-/ ' %, >%9+%&-&A<" .8%C+-%6, >(, <%" +/ (96.%-&>A9)' ;%@-C&-+ +6)(, <;%/ &T(, <%, >%' (, <%" +%6* 6)&-8%6, >%)%+%, >%&C%' +%&-T(, <%+-(&>N%XX-&X-(6)+)+9" , (OA+' %" &A>%@+%A' +>%&%&-+/ &* +%X&)+,)(.6)+>%&,)6/ (, 6)+>%.&)" (, <N%6' " 9&,)6/ (, 6)+>%.&)" (, <%@+C&-+%+A' (, <N%' A+%6)%+[6' " (, <%+6-% ( )%6(, >' %, >%6-)%&' +- 6-+%&' +%+%&-T)6)(&, %&96)(&, M

. $&/ 3" (%&' #$2#/ 3

KS : %FD F; ; "! :

NG%9(+, 9+%+' +6-9' %[redacted] = %&?%DJ%[redacted] &9TC&> ;%N%EDI 5%FE' LJHJ%[redacted] [[M +-/ &%&/
$(-9+%(&)+9' , &.&<8% 9%[redacted]JHJ% M%A-(>(6, %6&&>%[redacted]DDLI %[redacted]EDI 5%FE' JVDF%6?

$&'(%) * ++ . %) / ,0) 1%0#2 . 0* %# 5 (6 7 %0) 2) ,. 08

C;%AU</ 81&$%2&/ 3#&/ (8S<$&8/ 3" (%&/ #&2#/ 3

>$8<'&'# &+	= B' +%%-&X+-.8%)+>;%(-`XA+(@(, <%&-%(-`G->%#' X(-6)&-%&/ X.8(<%()" %, %XX-&*+> ')6, >6->%&%# T%& ' +' ' / +,)%>(96)+' %(' %+9+' ' 6-8M%&+' X(-6)&-%+.+9)(&, %,A')%@ @&' +>%, %, &(, %-%,)(9(X6)+>%?(&(A.+%* +.' ;%+%6Z6->' %&%+%-&>A9)%, >%+%&G [&-T(, <%(()' %&%+%+.+9)+>%#' X(-6)&-M
@ 308	= ! "+/ (96.`-+' ( )6,).% X+-*(&A' %,&*+' %&/ X.8(<%()" %, %XX-&*+>%)6, >6->%" &A>%@ [&-, %)%.%/ +' %"+, %6, >(, <%" +/ (96.%-&>A9)' %(&%(T%& ' +' ' / +,)%>(96)+' %(' %. +9+' ' 6-8M
A+$8	= 7 6G-)8%8+[+6-%&/ X.8(<%()" %, %XX-&*+>%)6, >6->%" &A>%@ %+>%" +, %%(T 6' ' +' ' / +,)%>(96)+' %(' %%+9+' ' 6-8%&%5*&(->%?X& A-+%&%(A(>%X.6 "+' ;%( ) ' %- >A') M
) M3	= $ +-' &, 6.%-&)+9)(* +%OA(X/ +,)%&-%+%&-8%" &A>%@%+.+9)+>%(5' +>%, %' +%5' T%@(, < X+-(&-/ +>%, >%' +%(T %*&*+>%, >%" &A>%@%%X-&*+>%@%%X+9)6.( )%@(&-+%6, >(, <)" (%-&>A9)M
A3T'&.34 $3# (%U</ 81&$ 2/ 3#&((8	= Y/ (' (&, ' %&/ %+,)(6)(&, %-%&-T%-&9+' ' %OA(X/ +,)%" &A>%@%" +9T+>%&%, ' A.+%+ 9&/ X.8%()" %+%+OA(-+/ +,)' %&%, *(-&, / +,)6.%-&)+9)(&, %+<(6)(&, %%, %&/ +%5' +' ; OA(+%9-A@&-' ;%)+-' %-%, <(, ++-(, <%.&-((96)(&, ' %&%+%-&9+' ' %OA(X/ +,)%(..%@ , +9+' ' 6-8%&%+>A9+%/ (' (&, ' %&%99+X)6@+%+'+.' M

G%- +8'2" (%30%2- $4 '2" (%&(<$&#$8

. - +8'2" (%#'#&	= N(OA(>M
Y(" 8- %/ '3#	= (&-&>A9)%&+' %&)%A \)6(, %&/ @&)(&, %I
5 / (/ &	= ! .+6-M
I 0 / &	= =>&-.+' ' M
<@	= J/M
) / (1?' (' #+	= 7 &.A@+% %+%&.&((, <% 6)+-(6.' a%&.>%6)+-%, >%&)%6)+-M

: D;%# ?'(#+%30%&$" 2#T'#+

5 - $4 '2" (%#' ?'(' #+	= P" +%-&>A9)% %)6@+M
5 / 30' #/ 38%% %T/ ' 0	= : &%X+9((9%6)6M
732/ 4 <" #?($% " #&$" (8	= : &%X+9((9%6)6M
@ Q' 80 / 18%$2/ 4 </ 8' #/ 3 <&(0 12#&	= B, >+-%&-/ 6.%&, >()(&, ' %Q%)&-6<+%, >%+;%6Z6->&A' %+9& X& ()(&, %-&>A9)' %" &A> , &)%@%-&>A9+>M
. / 88' ?' (#+%"%" Q' &0 / 18 &$" 2#/ 38	= B, >+-%&-/ 6.%&, >()(&, ' %Q%)&-6<+%, >%+;%6Z6->&A' %+69)(&, ' %(..%&)%99A-M

: : ;%B/ U'2/ (/ 9'2" (%3*/ &4 "#/ 3

J 3' #&0%#' #&8

R21#&%& U 2' ##

&(012#&S39&$0' $3#%&" 4 $	>$81(#	) <$2' $8	. / 8$	AU</ 81&$
+>+)(9%&9(>	N3 I L %&+-/ 6. N3 I L %-6.	S6) S6)	eGLLL % <R'< DFI E% <R'<	` `

5 / 32(18' / 3$ 14 4 " &+ = : &)%*6(6@+M

5 - &(3' 2%& U 2' ##

5 / 32(18' / 3$ 14 4 " &+ = : &)%*6(6@+M

7&&# ' #/ 3 $5 / &&(8' / 3

KS: $FD: F; <'1:

NG*$9(+. 9+%9+' +0-9' *▒▒▒▒▒▒▒▒=*$&?*5D,/*▒▒▒▒▒▒▒▒

$&'(%) * ++ . %) / ,0) %0+2 . 0* %4 5 (6 7 %0) 2) ,. 08

: : ;%B/ U'2/ (/ 9'2" (%3*/ &4 "#/ 3

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

B$&' # 9$3' 2'##

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

>$<&(012#T$%(U2'##

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

: F;%A2/ (/ 9'2" (%3*/ &4 "#/ 3

A2/ # U2'## = : &5%, &(, %(<, (Q96,)%Q3-9)' %-%-()96.%6Z6->' M

J 3'#50%# #58

R\ 1"#2%2/ # U2'##

. &(012#S39&0' $3#%" 4 $	>$81(#	) <$2'$8	AU</ 81&$
+>+)(9%9(>	29A)+%! I L%DM.LL.%<K%Q+' " %6)+-	2 .<6+%3+' / &>+' / A' ' A@X(96)A'	JG%&A.'
	29A)+%! I L%DM.LL.%<K%Q+' " %6)+-	3 6X'' , (6%3 6X'' , (6% 6<, 6% : +&, 6)+%<G-P%&A.'	HE%&A.'
	29A)+%! I L%DL.LL.%&%G.LL.%<K%Q+' " [6)+-	Q(' " %!&+X&/ (' % 69-8$" (-A'	UF%&A.'

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

.$&' 8#&32$!$9&' 0" ?' (##

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

5 " 3" 0"

R\ 1"#2%2/ # U2'##

. &(012#S39&0' $3#%" 4 $	>$81(#	) <$2'$8	AU</ 81&$
+>+)(9%9(>	29A)+%! I L%DM.LL.%<K%Q+' " %6)+-	2 .<6+%3+' / &>+' / A' ' A@X(96)A'	JG%&A.'
	29A)+%! I L%DM.LL.%<K%Q+' " %6)+-	3 6X'' , (6%3 6X'' , (6% 6<, 6% : +&, 6)+%<G-P%&A.'	HE%&A.'
	29A)+%! I L%DL.LL.%&%G.LL.%<K%Q+' " [6)+-	Q(' " %!&+X&/ (' % 69-8$" (-A'	UF%&A.'

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

.$&' 8#&32$!$9&' 0" ?' (##

5 / 32(18' / 3$ 14 4 "& = : &)%* 6(6@+M

I # $&%0T$&8$!%"" $2#& = : &5%, &(, %(<, (Q96,)%Q3-9)' %-%-()(96.%6Z6->' M

: H;%'8</ 8" (%2/ 38'0$&' #/ 38

` "8#&%'8</ 8" ( = P" +%+, +-6)&, %&Q%.6' )+%" &A>%@%" &(>+>%-% ( /' (Z+>%" +-+" +-%&' ' (@+H%%(<, (Q96, ) OA6, )()(+' %&Q%.6' )+%-&>A9)%+' (>A+' %" &A>%&)%@-%( X& +>%Q%(6% +%&A.%+[ + %@A) X-8)+" +>% %%A)6(@+%CA+, )%+6)/ +, )%.6, )%&( ' X& +%Q%A-X.A' %, >%&, `-+989.6@+ X-&>A9)' %(6!%%(0+, ' +>%.6')+%(X& 6.%&,)-69)&-H%&(X& 6.%Q%(' %-&>A9),%&A)&, ' 6, >%, 8%@ X-&>A9)' %' &A>%!%.%/ +' %&/ X.8%()" % +%+OA(-+/ +,)' %Q%, *(-&, / +,)6. X-&)+9)(&, %, >%6')+%(X& 6.%<(' .6)(&, %, >%, 8%+<(&, 6.%96.%A)" &-()8%+OA(-+/ +,)' M \ 6')+%69T6<(, <%" &A>%@%+989.+>H%% 9(+-6)(&, %-%, >Q.%" &A>%, .8%@-%&, ' (>+- +> [" +, %+989.(<%.%&)%9-6' (@+H%" (% 6)+-(6.%, >%' %&,)6(, +-%.A')%@-%(X& +>%Q% %' 6G-%-68H%&6-+%' &A>%@-%T+, %" +, %6, >.(, <%/ X)(+>%&,)6(+-' %'6)%6*+%&)%@+, 9.+6, +>%-%(, ' +>%A)H%/ X)8%&,)6(, +-' %-%(+-' % 68%+)6(, %& +%-&>A9)%+' (>A+' M 2*&>%(X+-' 6.%Q%G\(..+>% 6)+-(6.%, >%A, &Q%, >%&,)69)%0)" %&(.;%6)+-[68' ;%-6(, ' 6, >%+[+-' M

, '8</ 8" (%- / 1(0%$*%3 %22/ 80" 32$%#' # %<<('2" ?($%&9' / 3" (%&" #/ 3" (%30 % 2' (%' N8%30 %&91("#/ 38;

KS: $FD: F; >"!:

NG*%9(<, &+%&+' +5-9' *%&&&

$ &'(%) * ++ . %) / ,0) 1%0+2 . 0" %4 5(6 7 %0) 2) ,. 08

: L;% $91 (" # &+%3 */ &4 "# / 3

J 3'#&0%# #$8%3T$3# &+ = : &%+)+-/ (, +>M
\B) 5 R%?W

5 " 3 " 0 "

` @ 7) %5 " 3 " 0 " W = ! .6 ' ' %3 `GR&%6)+-(6.%6A' (, <%)" +-%&?(9%C-9)' %P&?(9%M

5 " 3 " 0 "' 3%&#8

5 " 3 " 0 "' 3%. >7 = : &, +%C% +%&/ X&, +,)' %-+%)+>M

5 A. R%/ U2%1?8# 32$8 = : &, +%C% +%&/ X&, +,)' %-+%)+>M

5 " 3 " 0 " %3T$3# &+ = 2..%&/ X&, +,)' %-+%)+>%-%?+/ X)+>M

B- '8%& 012#%" 8%$$3%(" 88' "$0%3%22/ &0 "32$%' # % $%" Q' &0 %&#&" %"% $%/ 3#&' (($0%& 012#8%$91 (" # / 38 "30% $%) ,) %/ 3#' 38%((% $%3 */ &4 "# / 3%\ 1'&0%+% $%/ 3#&' (($0%& 012#8%$91 (" # / 38;

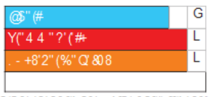
73#$&3 " # / 3 " (%$91 (" # / 38

73#$&3 " # / 3 " (%&#8 = R18#&' (" %3T$3# &+%R75) \&%2..%&/ X&, +,)' %-+%)+>%-%?+/ X)+>M
5- '3 " %3T$3# &+%A5) 5\&%2..%&/ X&, +,)' %-+%)+>%-%?+/ X)+>M
d" <"3%3T$3# &+&%&)%+)+-/ (, +>M
e/ &" %3T$3# &+&%&)%+)+-/ (, +>M
Z $N %$" (" 30 %3T$3# &+%"%- $4 '2" (8%Z f 7 5 \&%2..%&/ X&, +,)' %-+%)+>%-%?+/ X)+>M
. - '(' <<'3$8%3T$3# &+%' 75 5) \&%&)%+)+-/ (, +>M

:] ;% # $&%3 */ &4 "# / 3

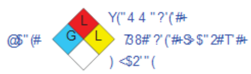
^ " ?$(%\ 1'&4 $3#8 = ! 2B7 Y7 %Y7$#$2 P= S^ %S2! P;%^ Y%: 3 %_# %S#P2P#- : M%2^ %Y%2 SWQBN #Q%\ 2 N=\ Y3 M%= : P2# 7 %2PYS#2 N%4 2P%2: %2B7 Y%2 S1 YP%S1 2: 32W21 YM

@ Q'&0/ 18% "#$&" (=
73 */ &4 "# / 3%+8#$4 %) :) ;R;W



B- $%218# 4 $&%8%$8</ 38'?($%' &%$#$&4 '3'39% $%. A%/ 0$% &% '8% "#$&" (;

Z "# / 3" (%' &$%&' #$2#/ 3 =
R88/ 2" # / 3%) :) ;R;W



, "#$%" %&3#39 = KS : $FD F;
, "#$%" %881$ = JKDKGLDGM
, "#$%" %&T'/ 18%881$ = : &%-+" (&A' %6.(>6)(&, M
6 $&' / 3 = D
. &< " &0%+ = W7 3 7 %X+9(6.( )
73 0'2" #8%3 */ &4 "# / 3% "#%" 8%- "39$0%&' 4 %&T'/ 18(+%881$0%$&' / 3;
Z / #2$% %" 0$&

KS : $FD F; @'

NG%9(+, 9+%+' +8-9' %=%&?%DJ%8TCL> ;%%ED %FE'LJHJ%[[M +-/ &%&/
$(+9+%(&)+9' , &&<8% 9%JHJ%%A-(>(6, %&&>%%EDLI %ED %FE'JVDF%6?

:] ;% # $&%3 */ &4 "# / 3

B/ % $%$8#%"%1&%/ N(09C% $%3 */ &4 "# / 3%/ 3#' '3$0%$&' 3%3%221&' #$;%@ NT&C%$' # $&% $%?/ T$X3 " 4 $0 81<<(' $&C%/ &%3+%"%&%1?8' 0'" &$&C%8814 $8%3+%" ?'(#+-%- "#&/ T&%' &% $%221&' 2+%&%/ 4 <($#$3$88%" % $ '3 */ &4 "# / 3%/ 3#' '3$0%$&' 3;
Y'3 " (%$#$&4 '3 " #/ 3%" %1'# ?'(#+%"%3+% " #$&" (%8% $%/ ($%8</ 38'?'(#+%"% $%&$&%(($% "#$&" (8% "+%&$8$3# 13M/ N3%" Q'&08%30%-/ 1(0%$%$0%' # %" 1#/ 3;%(# / 19- %$&' '3%" Q' &08%&%$82&?$0%$&' 3%$%"33/ # 91"&' 3#$$% "#% 8%&% $%3(+%" Q' &08% "#%U8#;

KS : $FD F; ! #'!

NG%9(+, 9+%+' +8-9' %=%&?%DJ%8TCL> ;%%ED %FE'LJHJ%[[M +-/ &%&/
$(+9+%(&)+9' , &&<8% 9%JHJ%%A-(>(6, %&&>%%EDLI %ED %FE'JVDF%6?

Thermo SCIENTIFIC

The world leader in serving science

$ %&) &) &&* +, - &+ * / .

C&(Y &%#&(" &0(4 $" <1 %$<

. %#&2#& 3(/ *(" &%#&' &0$ %

:) %&#EP/A(_ =&"() +(EB\+A("A* %" "AF(&AG&Q+$ %A&(S', K(%&(T 'B=% B(_ * 'EB) '+(EB&"A"AF$(NB> &G] +(; &AF+3%& , (B\G&+(Q+$ %A(Q3% ", "AF(&', (B\F"^+(> % B= B%> % B+(S+, * , #'EB&P/A8

Z / #&<(# (9- +<&2& 3

:) %, Q+#"O#EB+ &B +AB((<$+&B(G> Q3% &B#&" GB(V %#&B+RQ3% %A(B+&B> +AB(Q+#"&", B ''> > +; '&B+'G'(Q;&$F+(: * &AEB+; (=&^+[] ++A("AF+, B+; (%&("A=&+; 8

K&(Y &%$X'&P- #&0P(4 $" <1 %$<

Y" "4 4 " =&&#+(/ *(# $(9 %012#

: IM(&(C$+(%&"(Q=+&B+; L(&(Q$+, , * $+("A#$+&, +(T "'(%##" $(&A; (B+(#/A&B"A+$(> &G] * $ B

?LU&0P1&<- &0P(4 $0&

) 1&#' ='$

: N, +(&A(+I EPAF* ", ="AF(&F+AB(, * 'EB) '+(C%&(B+(, * $B% A; "AF(C$+8

Z / #(<1 &#' ='$

:) %A+(KA%$T A8

) 9$2&' ($U9/ <1 %(- " 'C(' %<

: D$%> Q$G$", %&B+(B+(, #+A+(] G$+> %"AF(&"(Q+$, %A, (Q3% (B+(+(^ '#"A'EB)%Q(B+(+("A#"; +AB(C B+ +$+(", (&(C$+9() %&#EP/A(, =&" (] +(EB\+A("A* %" "AF(&AG&Q+$ %A&(S', K(%&(T 'B=% B(_ * 'EB) '+

>" 'C(' %/ 1 <(# $ %" "'
0$2/ 4 9/ <&& 3(9 %012#<

: O+#"% Q2% 'EP/A(Q3% * #B (> &Q"A#" * ; +(B+(0% %' "AF(> &B+$"&', a #&$] %A(; "% ", + #&$] %A(> %#% ", +

) 9$2&' (9 %#&2#&'$
$\ 1&4 $3#("/ %'(&$X'&P- #&%

: ?'$+ 'CF=B+$ (_ =% " ; (T +&$] &QQB%Q&$&B+(Q3%B+#B' +(+: * "Q> +AB$&A; (_ +' C#%A"EB"A+; (] $+&B"AF &QQ&$&B , (R(/E.VR(' 'B+(&(C" '(Q&#+ 'C'+#+(%Q+&B$; ("A(Q% 'B' +(Q&+, , * $+(> % +8

] &(R22&0$3#' (%&' $" <$(4 $" <1 %$<

. $%/ 3"' (9 %2" 1#& 3<

:) %&#EP/A(, =&"() +(EB\+A("A* %" "AF(&AG&Q+$ %A&(S', K(%&(T 'B=% B(_ * 'EB) '+(EB&"A"AF8 S^ &#" &B+(, * $B% A; "AF(&$+&, $((Z ++Q" AA+#+, , &$G]&A; (" AQB%B+#B; (Q+$, %A+'(C$%> +AB+$"AF$(O%A%EB% #=(%$T &'K(B+$% F=(, Q(" +; (> &B+$"&$(W % (] $+&B"AF(^ &Q2&(%$(> ", EB D$%> "; +(&; +; * &B+(^ +AB &EP/A$(_ +&$] &QQB%Q&$&B+(Q+$, %A&(Q3%B+#B' +(+: * "Q> +AB(P ++(@+#EP/A(. R8 "&; +; * &B+$(D* EP/A(&QQB%Q&$&B+(Q+$, %A&(Q3%B+#B' +(+: * "Q> +AB(P ++(@+#EP/A(. R8

? 3T&34 $3#' (9 %2" 1#& 3<

: W % (; ", Q+$, &(%$, Q(" +; (> &B+$"&$(&A, ($' A%Q&A; (#'%EB+#T 'B+(, %'L(T &B+$T &G L(; $&"A, &A; (, +T +$, $((MA%$&> (B+(+(S+' +"&AE&$" B+$EB+, ("Q3B+(Q3% * #B=&, (#&$, +; (+A^ $'%A> +AB(Q3% * EP/A(P ++T +$, L(T &B+$T &G L(, %(9 %(&$T8

! $# / 0<(*/ %2' $" 3&P(19

) 4 "'' (<9 &

: @P&Q"+&K("Q(' 'B+% EB$', K&((! %+(#/%AEB("A+$, (Q3% (, Q(" (&$+&$((W.QQB'&#=(S+'+&, +(Q3% * Q(' "A; $((D$^+ +AB+AB(Q"AB%(, +T +$, L(T &B+$'#% $, +, L(] &, +> +AB (%(#/%CA+; (&$+&, $((_ &, = , Q(' &F+, ("AB(&A(+(C' +AB&B+&B> +AB(Q.&AB%Q(B'#++; (&, (% %T , $((V %AB"A(&A; (#%+#B , Q(" &F+(T 'B=(A%A '#%] " , 'E) '+L(&] , %(] +AB> &B+$'&(+(F8 , &A; L(+&$B+(^ +$> '#" 'B=(% : "B3% &#+% , (+&$B+(&A; (Q&#+("A(#/%AEB("A+$(Q&(, '", Q3% &(&###%, "AF(B%(%#&(S+F*' &EP/A, P ++(, +#EP/A(06R((O", Q3% +(%Q" "&(&(''#+A, + ; (T &, B+(; ", Q3% &(#/%AEB+#B%((V %AEB> "A&B+ &] , %(] +AB> &B+$'&(] > &Q2% +(B+(, &> +(=&U&$] (&, (B+(+(, Q(" +; (Q3% * #B(] %B+&, ++(, +#EP/A 0(Q&(+> +$F+A#G(#/%AEB+#B"AQ&> &EP/A(&A; (, +#EP/A(06((%$(T &, B+(; ", Q3% &'8

J&(> " 30' &8P(" 30(<# %P$

>" 30' &8P

: D* EP/A(&QQB%Q&$&B+(Q+$, %A&'(Q3%B+#B^ +(+: * "Q> +AB(P ++(@+#EP/A(_ R((S &B"AF(L(; $'A%CAF(&A; _ > %%CAF(, =%& " ; (] +(Q3%"] 'B+; ("A(&$+&, (T =+$+(B+", (> &B+$'&(, (" ; (=&A ';' L(, B%&+; (&A; Q3%# +, , +; 8(_ %&(+$, (, =%& "; (T &, =(=&A, , (&A; (Q&#+(] +Q%&(+&B"AF(L(; $'A%CAF(&A; (, > %%CAF'8 J +> %+(#/%AEB> "A&B+; (# %(B"AF(&A; (Q3%B+#B' +(+: * "Q> +AB(] +Q%&(+AB+$'AF(+&B"AF(&$+&, 8 O%(A#&(''AF+, B((V %, (# %AEB+#B(' 'B+(+G+, L(, %'A(&A; (# %(B"AF$((V %, (] $+&B"AF(^ &Q2&(%(> ", EB N, +(%"A'GT 'B+(&, +: * &B+(^ +AB &EP/A((_ +&$] &QQB%Q&$&B+(S+, Q(%&B%(T =+A(^ +AB &EP/A(" "A&; +: * &B+$(Z ++Q"A(B+ +(%$F"A%(#/%AEB("A+$(%(&A(&QQB%+ ; (&B+$A&B+ +(> & +(Q3%> (& #/%> Q&E] '+(> &B+$'&(L(+K QBEF=EG(#/%, +; (T =+A(A%(A(" , +$(S> QBE(#/%AEB("A+$, (S+B&'A Q3% * #B&+, ", * +(&A; (#&A(] +(=&U&$, % , $((O%(A%(&> " , +(#/%AEB("A+$8

$ %&) &) &&* +, - &+ * / .

J&(> " 30' &8P(" 30(<# %P$

) # %P$

: @P&+("A(&##"%& &A#+(T 'B+(" %#&'($+F*' &EP/A, $((@P&+("A(%&F"A&(#/%AEB("A+$(Q3B+#B+; (Q3%> ; "$+#B) * A"F=B"A(&(; $'3(#/%&(&A; (T +*' ' ^+AB &B$+; (&$+&(&T &Q(Q3%> ("A#/% Q&E] '+(> &B+$'&(, P ++(, +#B"A(0- R&A; (Q3% (&A; (; $'A%3(Z ++Q#/%AEB("A+$(B=E(&#/% +; (&A; (, +&+; (" ,AB($+&, G C%(" , +$(V %AEB("A+$, (B+&B+=&^+(] ++A("Q>+A+; (> * , EB, +#&$+C" 'G$+, +&+; (&A, (K+(Q3F=B EP/Q$+^ +AB+8\$F+$(Q+$, %A&(S', K(%&(T 'B=% B(_ * 'EB) '+

A&(? U9/ <1 %$(2/ 3#%' <$9 $%/ 3"' (9 %#&2#& 3

H3&$0() #'#&<

I3P%0&$3#	?U9/ <1 %(' & &<
F'G#+$%	R5_ I> (\H3&$0() #' #&<\W <_ W\40- (> F7> b R5_ I> (@6 (\H3&$0() #' #&<N[D$E$E7EW <_ W\40- (> F7> b(. (=% $P\ R(' ?%> a(U + , Q($&] ' +(Q$#EP/A G) > R(. ?^ (\H3&$0() #' #&<N[EE7EW <_ W\4(> F7> b(. (=% $P\ R(' ?%> a(U + , Q($&] ' +(Q$#EP/A ((<_ W\404(> F7> b(. (=% $P\ R(' ?%> a(<%&(, * , B G) > R(. ?^ (7EA\E(\H3&$0() #' #&<N\FS'EA\E <_ W\4(> F7> b(. (=% $P\ R(' ?%> a(U + , Q($&] ' +(Q$#EP/A ((<_ W\40- (> F7> b(. (=% $P\ R(' ?%> a(<%&(, * , B G) > R(. ?^ (\H3&$0() #' #&<\W R5_ I> (@6 (\H3&$0() #' #&<\W <_ W\40- (> F7> b(. (=% $P\ R(' ?%> a(<%&((Q$&EP#" '&B+, G) > R(. ?^ ((\H3&$0() #' #&<\W(Z / #$<(; $<9 &%=' $ <_ W\404(> F7> b(. (=% $P\ R8

5 " 3" 0"

G2219" #& 3"' ($U9/ <1 %(' & &<	@ R(\A(- / 1%W			) @^ (\7H(4 &<W			5$&&P			
I3P%0&$3#	^ &#)^ 4 $	994	4 P$# '	G# $%	994	4 P$# '	G# $%	994	4 P$# '	G# $%	Z / #' #& 3<
F'G#+$%	N@W\ N\(/ 7 - 0- N@W\ N\ WE(37 - - 2 EV(27 - 0- H) (57 - 0- eV(17 - - .	' ' '

$ %&) &) &&* +(, - &+ * / .

A&? U9/ <1 %$(2/ 3#%' <$9 $%/ 3" ' (9 % #$2#& 3

; $<9 &%# %

N, +(&(Q@%&+$(Q(CB#; L(&'$ Q' $'(Q'AF(%&(&'$ G-; (S+, Q'S&B%&(#%> Q(Q'AF(T 'B+(&A(&QQB%&+; , B&A; &$, ('Q&($', K(&, , +, , > +A@'A; '#&B+, (B", (", (A+#+, , &$Q3((J + , Q'S&B%&(, +'+#B%A(> * , B(+] & +; (%A(KA%'&' A'%&(&AB#'Q&B+; (+I Q%* $+('+^+', L(B+=(=&U&$, , (%Q(B+=(Q@% * #(&A; (B+=(, &G-T %&'AF("> 'B (%Q(B+=(, +'+#B+; ($+, Q'S&B%&

>" 30<

V=+> '#&' $+, ", B&AB("> Q+$\ "%, (F' %+, (#%> Q(G'AF(T 'B+(&A(&QQB%&+; (, B&A; &$, (, =%& '; (] + T %&A(&B&"(B+ +, (T =+A(=&A; '"'AF(#=+> '#&(Q@% * #B(''Q&($', K(&, , +, , > +A@'A; '#&B+, (B", (", A+#+, , &$Q3

?+$<

@&G-B(+G-T +&$(#%> Q(G'AF(T 'B+(&A(&QQB%&+; (, B&A; &$, (, =%& '; (] +(", , +; (T =+A(&($', K &, , +, , > +A@'A; '#&B+, (B", (", (A+#+, , &$Q3(B(&^ %; (+I Q%* $+(B(&" : * "; (, Q&, =+, L(> ", B (%$; *, B 8

) L&

D+$, %A&(Q@%&#B+ +(+: * "Q> +A@'C%&(B+(] % G, =%& '; (] +(, +'+#B+; (] &, +; (%A(B+(B&, K[ ] +'AF Q+$'C%&> +; (&A; (B+(+($', K, ("A* %+ +; (&A; (, '=%& '; (] +(&(QQB%&+; (] G&(, Q+#'&' ", B] +C%&+(=&A; '"AF B", (Q@% * #B

?3T&%34 $3#' '($U9/ <1 % 2/ 3#%' <

S> ", , '%A, (Q%> (^+AB(&B'%A(%&(T %&'Q(Q@%&+, , (+: * "Q> +AB, =%& '; (] +(#=+#&(+; (B'(+A, * $+(B(+G #%> Q(G(T 'B+(B+(S+: * "S+> +AB,(%Q+A^ '$%A> +A&K(Q@%&#B'%A('+F" ' &B'%A&(MA(, %> +(#&, +, L C> +(, #$']] +$, L((CB+$, (%&(+AF"A+ +$'AF(> % 'C'#&B'%A, (B(&B+(Q@%&+, , (+: * "Q> +AB(T "" (] + A+#+, , &$Q3(B(&$+; * #+(+> ", , '%A, (B(&$##+(Q&] '+(^+^+', 8

E&. - +<&2" ' (" 30 (2- $4 &2" ' (9 % 9 $ %#&$<

. - +<&2" '(<# #&

9", * ", 8

5 / ' / %

V' +&$8

G0 / %

H; %$+, , 8

9>

58!

, &-9$%&=&$+(9%9$%#&$<

O", Q+$, '] ' +('A(B+(($%'%T "'AF(> &B-$'&, , &#%, (T &B-$(&A; (=%(T &B-$8

7B8() #' =&$+(" 30 (%$" 2#&T &$+

5 - $4 &2" ' (<# ' =&$+

<=+(Q@% * #E'; (, E&] '+8

5 / 30 &$& 3 <(# (" T / &

) %, Q+#'C!(; &E&8

I32/ 4 9" #&=' $(4 " #5 %&' <

) %, Q+#'C!(; &E&8

>" Q' %/ 1 <(0 $2/ 4 9/ <&$& 3 9 %0 12#<

NA; +$(A^%> &(#^A; 'B'^A, (%(; B'&R'+(&A; (* , +L(=&L$5, % , (; +#^% > Q%' B'^A(Q5% * #B (, =%& '; A^%(] +(Q@% * #+; 8

. / <<&=&$+(/ *(- " Q' %/ 1 < %" 2#& 3 <

NA; +$(A^%> &(#^A; 'B'^A, (%(; B'&R'+(&A; (* , +L(=&L$5, % , ($+&#B'^A, (T "'(A^&(^##' $8

778(@ U&2/ ' / P&2" ' (&2*/ %4 " #&(3

H3&&0() #' #5 <

R21#5(# U&2&+

. %0 12#5B P%0&$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	9O4- (O+$> & 9O4- (H$&	J &B J &B	f / 02- - (> F7KF 0/ 1- - (> F7KF	` `

5 / 32' 1<& 3 $} 14 4 " %

<%(B+(] +, B%&(2% $(K^A%T ' +; F+L(B+(B%^ '#%%F'#&(Q@%&+$B+, (%(&B+", (Q@% * #B(=&^ +(A%&B] ++A B+%@% F=' G'A^ +, BF&B+; 8

5 - %3 &2(# U&2&+

. %0 12#5B P%0&$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	@'] ' #=$'A^#(<O4- (H$& @'] ' #=$'A^#(<O4- (H$&	J &B J &B	01. - - (> F7KF 21(F7KF	/ . (; &G V%A^B^ * % , 6-(; &G M&B+$> 'BB+AB

5 / 32' 1<& 3 $} 14 4 " %

) %, &$^ &' &] '+8

I %&' #& 3 $% / %& <& 3

9'G(@F+A#+(J +, +&$#=(((((((CH(E'¼ (005(((((((((((((((((J '%#<C& L%((((P 04R21. '- 535(((((((TT T B#+> '%#'%>
D'+$#=(E '%B#=A%%FG%A#3(((((5535() 8! +$; '&A(J '%&; ((((((((((100- 4(((((((((F 04R21. '5601(? &)

$ %&) &) &&* +(, - &+ * / .

778(@ U&2/ ' / P&2" ' (&2*/ %4 " #&(3

. %0 12#5B P%0&$3#(3" 4 $	; $<1'#	) 9$2&5<	) 2/ %	?U9/ <1 %	G=<$%" #& 3
F'G#+$%	SG+, (' (! "; ('$B&AB @K^A(' (! "; ('$B&AB	J &]] 'B J &]] 'B	` `	/ 3(=% $, (4 - - > ""F$&> , / 3(=% $, (4 - - > ""F$&> ,	` `

5 / 32' 1<& 3 $} 14 4 " %

) $3<$&C$%

5 " %&$/ P$3 &$&+

) %&$^ &' &] '+8

. %0 12#5B P%0&$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	S: * "^ %#&'(' ((H$&'(' (<O9 %	! %, +	. 58!(F7KF	/ 4(T ++K M&B+$> 'BB+AB

5 / 32' 1<& 3 $} 14 4 " %

) %&$^ &' &] '+8

5 '" <<&$2" #& 3

. %0 12#5B P%0&$3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
F'G#+$%	`	`	`	`	`	) %A+8

! 1# P$3 &$&+

. %0 12#5B P%0&$3#(3" 4 $	@&<#	?U9$%# $3#	; $<1'#
F'G#+$%	VCB%F+A+B%(WA&G ", O) W(A=']' 'B'^A	@] g+#a[&> > &"&A'WA'> & @] g+#a[&> > &"&A'[* > &A	D%'B'+ D%'B'+

5 / 32' 1<& 3 $} 14 4 " %

) %&$^ &' &] '+8

@&%# P$3 &$&+

5 / 32' 1<& 3 $} 14 4 " %

) %&$^ &' &] '+8

. $9 % 012#&T $(# U&2&+

. %0 12#5B P%0&$3#(3" 4 $	! "#&%8"' ' # U&2&+	Y$%#&$&+	, T'/ 94 $3# # U&8	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	` ` ` ` ` `	D%'B'+ ` ` ` D%'B'+ `	` ` ` ` ` `	J &B[(! &+ J &B[(! &+ J &B[(! &+ J &B[(! &+ ! &> > &(' (, Q+#"+, *A, Q+#'C+; ('(! &+	H$&:a[0 - - > F7KF N A$+C%&B>; a N A$+C%&B>; a N A$+C%&B>; a 002(> F7KF	0(; &G / (; &G 0(; &G 0(; &G 0(; &G

5 / 32' 1<& 3 $} 14 4 " %

) %&$^ &' &] '+8

5 " 3 " 0 "

R21#5(# U&2&+

. %0 12#5B P%0&$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	9O4- (O+$> & 9O4- (H$&	J &B J &B	f / 02- - (> F7KF 0/ 1- - (> F7KF	` `

5 / 32' 1<& 3 $} 14 4 " %

<%(B+(] +, B%&(2% $(K^A%T ' +; F+L(B+(B%^ '#%%F'#&(Q@%&+$B+, (%(&B+", (Q@% * #B(=&^ +(A%&B] ++A B+%@% F=' G'A^ +, BF&B+; 8

5 - %3 &2(# U&2&+

9'G(@F+A#+(J +, +&$#=(((((((CH(E'¼ (005(((((((((((((((((J '%#<C& L%((((P 04R21. '- 535(((((((TT T B#+> '%#'%>
D'+$#=(E '%B#=A%%FG%A#3(((((5535() 8! +$; '&A(J '%&; ((((((((((100- 4(((((((((F 04R21. '5601(? &)

$ %&) &) &&* +(, - &+ * / .

778(@ U&2/ ' / P&2" ' '(&3*/ %4 " "#&' 3

. %012#5&P%0&3#(3" 4 $	; $<1'#	) 9$2&<	, / <$	?U9 / <1%
F'G#+$%	@] `#=$%A'%#(<O4- (H$X< @ ] `#=$%A'%#(<O4- (H$X<	J &B J &B	01. - - (> F7KF 21(F7KF	/ . (; &G V%ABA* % , 6-(; &G MB+$> 'EB+AB

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

I%&#' #&' 3$ / %& <&3

. %012#5&P%0&3#(3" 4 $	; $<1'#	) 9$2&<	) 2/ %	?U9 / <1%	G=<$%" #&' 3
F'G#+$%	SG+, ((! ": ('$5EBAB @K^A'((! ": ('$5EBAB	J &]] 'B J &]] 'B	` `	/ 3(=%$, (4- - > ""F$X> , / 3(=%$, (4- - > ""F$X> ,	` `

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

) $3<&#C&%

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

5" %&$/ P$3&@&+

. %012#5&P%0&3#(3" 4 $	; $<1'#	) 9$2&<	, / <$	?U9 / <1%
F'G#+$%	S: * '^ %#&(('(H$X(('(<O9%	! %, +	. 5&4(F7KF	/ 4(T ++K MB+$> 'EB+AB

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

5 '" <<&@" #&' 3

. %012#5&P%0&3#(3" 4 $	R5 _ I>	IR: 5	?. R	Z!G) >	Z @	G) >R
F'G#+$%	`	`	`	`	`	) %A+8

! 1# P$3&@&+

. %012#5&P%0&3#(3" 4 $	@$<#	?U9$%4 $3#	; $<1'#
F'G#+$%	V'CB%F+A+EB%(WA&'G ", O) W(A=']'EB%A	@] g+#Ba(! &> > &"'8A\WA> & @] g+#Ba(! &> > &"'8A\[* > &A	D%'B'+ D%'B'+

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

@$%# P$3&@&+

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

; $9%012#&T$(## U&2&#+

. %012#5&P%0&3#(3" 4 $	! "#$%8"' ' # U&2&#+	Y$'%#&$#+	, T'/ 94 $3# # U&3	) 9$2&<	, / <$	?U9 / <1%
F'G#+$%	` ` ` ` ` `	` D%'B'+ ` ` ` D%'B'+	` ` ` ` ` `	J &B(! &'+ J &B(! &'+ J &B(! &'+ ! &> > &((, Q+#"+, * A, Q+#"C+; ((! &'+ J &B(! &'+	N A$+O#&B+; a / . - (> F7KF H$X&a(0- - > F7KF N A$+O#&B+; a . 1/ (> F7KF N A$+O#&B+; a 002(> F7KF N A$+O#&B+; a 01- - > F7KF	/ (; &G 0(; &G 0(; &G 0(; &G 0(; &G

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

$ %&) &) &&* +(, - &+ * / .

7D8(? 2/ ' / P&2" ' '(&3*/ %4 " "#&' 3

? 2/ # U&2&#+ :) %(A'A9'8' A(, 'FA'C'#&AB+(C3+#B (%@#$'B'#&'(=&L&$, , 8

H3,&&50() #' #&$<

R\ 1" #&2($2/ # U&2&#+

. %012#5&P%0&3#(3" 4 $	; $<1'#	) 9$2&<	?U9 / <1%
F'G#+$%	W#" B+(9V4- (40(B%(45(> ' 7(?$+, =(T &B+$	?", =('(H A#'%$=G#'=*, (> G<', ,	21(=%$,

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

. $%&<#&32$%$P%0" =&&#+

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

5 " 3 " 0 "

R\ 1" #&2($2/ # U&2&#+

. %012#5&P%0&3#(3" 4 $	; $<1'#	) 9$2&<	?U9 / <1%
F'G#+$%	W#" B+(9V4- (40(B%(45(> ' 7(?$+, =(T &B+$	?", =('(H A#'%$=G#'=*, (> G<', ,	21(=%$,

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

. $%&<#&32$%$P%0" =&&#+

5 / 32'1<&3$ 14 4 " % :) %@&^ &" &] '+8

G# $%0 0T$%$($""$2#< :) %(A'A9'8' A(, 'FA'C'#&AB+(C3+#B (%@#$'B'#&'(=&L&$, , 8

7F8(, &<9/ <" ' '(2/ 3 <80$%#&' 3 <

a " <#6(0&9/ <"' : <=+(F+A+$&B'%A(%(2T & B+(, =%' ; (] +(&^ %, +; (%(> "A"> 'U+; (T =+$+^ +$(Q2%, ,] ' +8((@FA'C'#&AB ; * &AEB+, (%(2T & B+(Q3% * #B(%+, +A, + ; (T & B+(, ' ; Q% &('+F", '&E'%A(&A; (&AQ$+F"%A$(('%#&'(&" B+'%EB$+: " "$+> +AB 8
& B+(Q&#+&F"AF(, =%' ; (] +($+#G#'+; 8((M#'A+$&B'%A('%(' &A; C'(, =%' ; (%A'G] +(#'%A, ", +$+;
"T =+A($+#G#'AF(", (A%8Q3-&, "] ' +8((<=", (> &B+$'&((&A; ('B (#'%A8&'A+$(> * , EB] +(; ', Q% +; (%(2'A(&
, &G-(T &3((V&$+(, =%' ; (] +(EB+A+A(T =+A(=&A; ''AF(+> QB+: (#'%A8&'A+$, (B+&B=&+ +(A%8(] ++A
#'+&A+; (%(B$'A, +; (%8 B((S> QB(#'%A8&'A+$, (%('A+$, (> &Q$+EB'A(, %> +(Q8% * #B&+, ", * +, 8
W'%, (; ", Q+$, &'(%(2, Q'"+; (> &B+$'&((&A; ($' A%(2&&A; (#'%A8&'#EB' 'B(, %'(\(T &B+$'T &G L(; $&'A
&A; (, +T +$, 8

, &<9/ <"' '(<- / 1' 0(=$(&3(" 22/ %" 32$(M&+ ("99' &" ='$(%P&' 3"' !(3" #&' 3"' ("30(/ 2"' ("' M<("30(%$P1' '" #&' 3 <8

; $"$%(# () $2#&' 3U:(>RZ, ^IZ_(RZ, () @G; R_?("30() $2#&' 3(A:(?b. G) H; ?(5 GZ @ G^) S ?;) GZ R^(, ; G@' 5 @GZ
/ %' 0 0 &&' 3"'(-" 30' &3P(&3/ %4 " "#&' 3("30(9 %#52#&' 3(/ *(5$4 9'/ +$$<8

7C8(@'%3<9/ %#(&3*/ %4 " "#&' 3

; $P1'" # % &3*/ %4 " "#&' 3	HZ (314 =$%	. %9$%<- &99 &3P 3" 4 $	5 '" <<$<	. _c
. G@5 '" <<&@" #&' 3	) %B $+F" '&B+, 8	`	`	`
IR@RX _ ; (5 '" <<	) %B $+F" '&B+, 8	`	`	`

D\ (a D&#K'AF(F$'%Q

$ %&) &) &&* +(, - &+ * / .

7K8(; $P1'"# %#(&8*/ %# "#&8 3

H3 &&0() # #&<

>5) (5'"<<&&2"#&8 3 : N8EBEBAF(> &B+$'&
<&$F+B@&F&A(+(G+#B

H8) 8(Y0%'(%$P1'"#&8 3< : @ 5 R(AV'\#H; (?U$4 9#S "'#&*'($U$4 9#&8 3a() %@ +B+$> "A+;
H3 &&0() #'#&<(&8T$3# %#(\@ 5 R(A=\#() %@ +B+$> "A+; 8
) R; R(FEDSFBCS$F77S$F7D($U#%$4 $'+(- "Q' %/ 1<(<1=<#' 32$<a() %(Q8% * #B(T +$+(C% A; 8
) R; R(FEDSFBC)$4 $%P$32+(9' "33&8P("30(3/ #&&2"#&8 3a() %(Q8% * #B(T +$+(C% A; 8
) R; R(FEDSFBCS$F77S$F7D(,- "Q' %/ 1<(2- $4 &2"'<a(F'G#+$%
) R; R(F77S$F7D(!) ,) (0 &#%&=1#& 3(X(2- $4 &2"'(&8T$3# %#(X(- "Q' %(&0$3#%&2"#&8 3a
F'G#+$%&a(M > +; '%B+(R&#" B+R=+&B+(=&L8$ \(O+'&G; (R#=$%&'#R=+&B+(=&L8$

5'$"3(R&(R2#(() $2#&8 3 :) %@", B+;
77D\#\#\#" Q' %/ 1<(R&%
. / "1#' 3#<(\#R. <W

5'$"3(R&(R2#() $2#&8 3(] BD :) %@", B+;
5'" <<l(() 1=<#' 32$<

5'$"3(R&(R2#() $2#&8 3(] BD :) %@", B+;
5'" <<(ll() 1=<#' 32$<

, ?R(^ &#l(5 - $4 &2"'< :) %@", B+;
V %21%/ %5 - $4 &2"'<W

, ?R(^ &#ll(5 - $4 &2"'< :) %@", B+;
\P <<$3#&' (5 - $4 &2"'<W

) #' #&(%$P1'"#&8 3<

! "<<" 2- 1<$##< : <=+((C%'%T"AF(#%> C@A+AB(&$+(", B+; a(\ 9YVSJ M\S(! M@<

Z $M(g / % :) %A+(%Q8+(#%> C@A+AB(&$+(", B+; 8

Z $M(d$%$+ : <=+((C%'%T"AF(#%> C@A+AB(&$+(", B+; a(\ 'G#+$'A

. $33<+'T" 3& : <=+((C%'%T"AF(#%> C@A+AB(&$+(", B+; a(0L/ L5`DJ HDW)` S<J M19

H3 &&0() #'#&<(&8T$3# % :) %@, +B+$> "A+; 8
\@ 5 R(A=W

5"3"0"

a >! I) (\5"3"0"W :) %@#%AB%+; (" A; +$[_ [! M@P\&A&; &R8

5"3"0 &3 (&#<

5"3"0 &3 (Z . ; I :) %A+(%Q8+(#%> C@A+AB(&$+(", B+; 8

5?. R(@ U&(<1=<#' 32$< :) %A+(%Q8+(#%> C@A+AB(&$+(", B+; 8

5"3"0"(&8T$3# % :) %@, +B+$> "A+; 8

@ &(9%0 12#(- " <(=$$3(2'" <<&&$0(&$("22/ %" 32$(M&# (# $(- "Q' %0(2%&$%&(/ "(# $(5 / 3#%''$0(. %0 12#<(; $P1'"#&8 3<
"30(# $(!) ,) (2/ 3# &$<("'"(# $(&8*/ %# "#&8 3(%\ 1&$0(=+(# $(5 / 3#%" $0(. %0 12#<(; $P1'"#&8 3<8

I3#5%8"#&8 3"'(%$P1'"#&8 3<

I3#&%8"#&8 3"'(&#< : R1<#%'&(&8T$3# %#(\R!5) \@ %@, +B+$> "A+; 8
5 - &$"(&8T$3# %#(V?5) 5\@ %@, +B+$> "A+; 8
d" 9" 3(&8T$3# %#a() %@, +B+$> "A+; 8
e / %$"(&8T$3# %#a() %@, +B+$> "A+; 8
Z $M(f $"'"30(I3T$3# %#(/ "(5 - $4 &2"'<(\Z f I / 5\@ %@, +B+$> "A+; 8
. - &&9 &$<(&8T$3# %#(V I5 5) \@ %@, +B+$> "A+; 8

7BCB778 7"! #

9'G(@F+A#+(J +, +$3#=(((((((CH(E"¼ (005(((((((((((((((((((J "##C&$ L#@(((((P 04R21. '- 535(((((((TT TB#+$> %@"%
D'+3#=(E"%@#=A%"FG\@#3(((((((5535() 8! +$; '&A(J "&; ((((((((((100- 4(((((((((P 04R21. '5601(? &\

$ %&) &) &&* +(, - &+ * / .

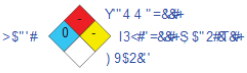
7] 8(G#. $'%(&8*/ %# "#&8 3

^ "=$'(%$\ 1&$4 $3#< : ! V#Y(V\#N@$(J S@D\M V#:HJ Y(<J V#V<!(SYS(V#Y O(@Z M(MJJ M#V#:M#) 8((VH) <V#M@
! V#:SJ N#@(<[V#:(V\#N (V\#N@$(<V#J \ S<(HJ \ V#J (OV#Y V#` S8

>"Q' %/ 1<(! "#5%&' :
I3*/ %# "#&8 3() +<#&4 (VH8) 8R8\/V

@ $(21<# 4 $'%&<(%<9/ 3<&' $("/ %(0$#5%4 &8$R(# $(. . ?(2/ 0$("/ %# &(4 "#5%&' 8

Z "#&8 3"'(Y8$(. %#5 2#&8 3 :
R<</ 2&#&8 3(VH8) 8R8\/V



, "#5(/ "(9%8#&8P : 7BCB778

, "#5(/ "(&<<1$: 0- 7 37 - 008

, "#5(/ "(9%T& 1<(&<<1$:) %Q5+^"% , (^&"; &EP\A8

6$%&8 3 : 0

. %9" %0(=+ : ! @D@F# +F"'&B8G@D+#'&"; B\

◤I30&2"#5<(&8*/ % "#&8 3(# "#- "<(2- "3P$0("%4 (9%T& 1<' +(&<<1$0(T$%&8 38

Z / #&2$(# (%" 0$%

@ (# $(=$<#(/ "(/ 1%&8 3/ M'$0P$N# $(&8*/ % "#&8 3(2/ 3# &8$0(- $%&8(&("221%#&8>/ M$TS'%B3$&# $%# $("=/ T$\3'4 $0
<19'&%B3/ %' 3+(/ "(&#<(<1=<&8&%&<N"<<14 $<("3+("&=&8#(M- "#-/ T%(/ %# $("221%2+(/ %2/ 4 9' $#&3$<<(/ "(# $
&8*/ % "#&8 3(2/ 3# &8$0(- $%&8 8
Y&8"'(0$#5%4 &8" #&8 3(// "(<1&8" =&8#(/ "("3+(4 "#5%&'(&<(# $(</ '$(%<9/ 3<&=&8#(/ "(# $(1<$%R'(4 "#5%&'<(4 "+(9%<$3#
13L3/ M3(- "Q' %0<("30(<- / 1'0(=$(1<$0(M&# (2" 1#& 3(R'# / 1P- (2$%# &(- "Q' %0<("%(0$<2%&=$0(- $%&8N\S(2" 33/ #
P1" %3#5$(# "#(# $<$("%(# $(/ 3'+(- "Q' %0<(# "#(U&=#8

7BCB778 ! #"! #

9'G(@F+A#+(J +, +$3#=(((((((CH(E"¼ (005(((((((((((((((((((J "##C&$ L#@(((((P 04R21. '- 535(((((((TT TB#+$> %@"%
D'+3#=(E"%@#=A%"FG\@#3(((((((5535() 8! +$; '&A(J "&; ((((((((((100- 4(((((((((P 04R21. '5601(? &\

Thermo SCIENTIFIC

!) "$#,(<=%> #(?&=%(@A% $&A

! "#$%&'() "*$#+(, "#' () - $$#

! "#$%&,) *%(+

78(. %012#("30(2/ 4 9"3+(&0$3#&&2"#&3

. %012#(3"4 $	: ! "#$%&,) *%(+		
) 199'&%	: <=%> #(?&=%(@A% $&A(! &&A%(K&#$%A=' #@&FH ! $L $(K#M(/ / 1 E#AN(#"9Q75(. / / , Q R' &$%9(@& $% 0/ Q5 . 05 121(#" 0, , 50125$1- 4 1(SB (T(Q! B(U% $') (>:& % D/B <(T, . W, J	! "31*"2#1%%	: <=%> #(?&=%(@A% $&A(! &&A%(K&#$%A=' #@&FH ! $L $(K#M(/ / 1 E#AN(#"9Q75(. / / , Q R' &$%9(@& $% 0/ Q5 . 05 121(#" 0, , 50125$1- 4 1(SB (T(Q! B(U% $') (>:& % D/B <(T, . W, J
5 / 0$	: , , - . / . , (/ 0. - 10,		
!) , ,) (B	: : , 1,		
6"'&0"#&3(0"#&	: 23 3 , / 45		
. %&#(0"#&	: 23 3 , / 45		
; $<9/ 3<&-'$(3"4 $	: B @C@(E%F8(>$#"H(@ %A$(&$J UXYB<EYUW0, , 52- 25 4, , L 85'&9%R@(W, 45Q 15#001	! "#&%&'(1<$<	: ;$"$%#(#.$(&<#%2#&3(=/ / >'$#*/ %@%9$%&'30(&#&30$0(1<$((? # $%@&$A 2/ 3# 2#(<199'&$%&/ %<9$2&&2("99'&2"#&3<8
. %012#(#+9$	: 68'8&5		

D(E" F" %0<(&0$3#&&2"#&3

J4 $%C$32+(/ K$%&$@	
. - +<&2"'(<# #&	: 68'8&5
5 / ' / %	: U#@"'(&* 5
?0 / %	: L 9#"(&* 5
) &C3"'(@ %0	: \ SE] F V^
E"F" %0(<# #&4 $3#<	: USR@Y@EY@ PES<L E_(<ESU<QY_Y(S] C(@+F (PEERS<PL] 5(B S_(USR@Y(S66YEVP(EY@ PES<L E_(EYSU<PL] 5(UL] <SF] @B S<YEP56(<X S<(US] (USR@Y(<SEVY<(L EVS] (CSB SVY5
. %2" 1#& 3" %#(4 $" <1%<	: C#(' #$["%$=%( ) I #"(#"(> &$((R*%#' (B(a &=() 9%78) $%(%3@$&' 5(C#(' #$%$0 9"&N(#"(*> #N%(a =% (8* &F($=&(I "#98A5((S` #&((A#' $) A&a &=(%#8 (Q'N&,() ' 9(A@$=&F5(+ %#& (A#' $) & %($&=$B(A@* 9$5(\ ) "={$=#"#0F=B() ;$%(=) ' 9@&F5
?) EHIE5) (<# #1 <	: <=&(>)) $%&(@&((A#' * &%%9(=) Z) "9#8*([H($=%L @(X S(X) Z) "9(U#> > 8' &%) $&' (@&) ' 9) "9(D : (U?E(/ : / , 5' - , , J5		
; / 1#&<(/ *($3#%	: C%>) (P#' $) A@(YH%(A#' $) A@(P=) (P$&' 5(P F"%$&' 5		
. / #&3#&'(" 21#&(- $"'# ($"*$2#<			
G - "'"#&3	: P"&) $&F(9#("%! &) $#"H(*H'$%> 5((B) H(A) 8*%(*%*&&X) $&' ([H(&=) (P$&' 5		

$%&) *+, -) (.

D(E" F" %0<(&0$3#&&2"#&3

G C$<#& 3	:] #(N #a' (*&F &&) ' $%,%#$ (#"(A'&&) (@=) Z) "9*5	
) >&i	: P"&) $&.F(9#(*N&5	
J +$<	: P"&) $&.F(9#(%#%5	
. / #&3#&'(2- %3&((- $"'# ($"*$2#<		
5 - %3&(($*"$2#<	: U#' $) &*(>) $%&,(@=) $(A) ' (A) 8*%($) "F"%(#"F) ' (9) >) F"%((L ' A%(" % *&&%9(Q) (*%%%( ) (B&F&("%) A&' (>) H(#AA8"(a =% (*8[*%78% $&(%M #*%9(9#(' %H(@a (G% %55	
5 " %2&/ C$3&2&#+	:] #(N #a' (*&F &&) ' $%,%#$ (#"(A'&&) (@=) Z) "9*5	
! 1#' C$3&2&#+	:] #(N #a' (*&F &&) ' $%,%#$ (#"(A'&&) (@=) Z) "9*5	
S$%# C$3&2&#+	:] #(N #a' (*&F &&) ' $%,%#$ (#"(A'&&) (@=) Z) "9*5	
. K'/ 94 $3#' ($"*$2#<	:] #(N #a' (*&F &&) ' $%,%#$ (#"(A'&&) (@=) Z) "9*5	
T$%&&#+($"*$2#<	:] #(N #a' (*&F &&) ' $%,%#$ (#"(A'&&) (@=) Z) "9*5	
S" %$#/ %C" 3<	: U#' $) &*(>) $%&,(@a =&=(>) H(A) 8*%(9) >) F"%$#(S=%,#(@a &F(#"F) ' *\W&9' %+f (08' F*O (&,%%(F) "$"#&,$%6 $&,) (@=) A&(@8 I %("%! &) $#"H($) A&(0' !&,(@%+%6 5	

?K$%&,C9/ <1%(<&C3<!<+4 9#' 4 <

G - "'"#&3	: S9` %"%(*H> ! $#> *(>) H(&A&9%($=%,#(@a &FW "'%! &) $#"H($) A&(&"&) $&# A#8F=&F a =%&(&F() ' 9(["% $=&F(9&,&&8 $&%) "$=>)	
G C$<#& 3	:] #(*! %*&&(9) $) 5	
) >&i	: S9` %"%(*H> ! $#> *(>) H(&A&9%($=%,#(@a &FW &"&) $&# "%9' %*	
J +$<	: S9` %"%(*H> ! $#> *(>) H(&A&9%($=%,#(@a &FW !) &(#"(&"&) $&# a) $%&&F "'%9' %*	
! $0&2"'(2/ 30.&& 3<("CC%K"#&0(=+(/ K$%& $C9/ <1%	: ! "%'%&&$&F("%! &) $#"H(9&#"9%"() ' 9(9&#"9%"(&`#G&F() ' H(#$=%($) "F"%(#"F) ' *(> % $&# %9(&(($=&(B@C@&) *([%&F() $"&N(>) H([%) FF") ') $%9([H(#" %T%M #"8"%($#(($=&(! "#98A5	
) $$(#/ O&2/ ' / C&2"'(&8 */ %4 "#& 3(F) $2#& 3(77Q		

N&5 / 4 9/ <&&& 3I&8 */ %4 "#& 3(/ 3(&8 C%0&$3#<

V\8&$50() #' #&<

U"4 $	5H) (314 =$%	V
F@A%&#G ! "#$%&,) *%Q<"&&) A=&i> () (P8> (*%&%	Q T0/ TQ 4: 2Q T, / T.	2Q T(. Q / (T(4

5 "3" 0"

U"4 $	5H) (314 =$%	V
F@A%&#G ! "#$%&,) *%Q<"&&) A=&i> () (P8> (*%&%	Q T0/ TQ 4: 2Q T, / T.	2Q T(. Q / (T(4

S- $%(" %(3/ (" 00&&& 3"'(&C%0.&3#<(9%<$3#(@ &2- A(@&= &0(# $(21%%3#(>3/ @$0 C$(// *(# $(<199'&$%(30(&0(# $(2/ 32$3#%&& 3<(" 99' &2" =' $A(" %(2" '' <<&&$0(" <(- " F" %0/ 1<(#' (- $"'# (/ %(# $($3K&&34 $3#(" 30(- 32(%X1&&(%9/ %&&C(&0(# &<($2#& 38

L8T8/&#(" 80(4 $" <1%<

J +$(2/ 3#' 2#
: U=%^N{;#")' 9("%» #` %)' H(A#' $) A$(%. * %$ {(P> > %9&$%6{;8*=(%#% (a &$=(I (% $H(#;(a) $%(;#") $(%) *$(/ Q(> & 8$% (0#AA) *&') (6H(8&&.F($=%$8 I %)' 9(@a %(%#%80*$(V%6> %9&) (6) 3% 3&' (& > %9&.$%6E5

) >8(2/ 3#' 2#
: P (A) *%#;(A#' $) A8(& > %9&.$%6{;8*=('*\N.(a &$=(I (% $H(#;(a) $%(;#") $(%) *$(/ Q(> & 8$% (a =8&#'%» #` &.F(A#' $) > &.) $%9(A8$=&.F() ' 9(" =#*% $(\ ) *=(A8$=&.F[%#*%("%8* %$(U(%) ' (* =#%($=#"#8F=6([%#*%"%8* %$(V%> %9&) (6 3% 3&' (& > %9&.$%6E5

G- """ #&.3
: B#' %(%M #*%9(I %(" #' ($H(;"%=() 8$((P(' #$['%) $=&.F(8&['%) $=&.F(&.(&"%F8(6"(#"(&('"%I &) $#"H() ""%$#A#8"" Q) '#' .8(%) '$8&8.(6"%I &) $8' (#"(#MF% ([H($) &.%9(I %"#' ' %5 6##* %.(8F=$(A8$=&.F(*8A=() *() (A#(6"Q8(6[%3#*(a) &$[ ) ' 95(V%> %9&) (6 3% 3&' (& > %9&.$%6E5

G\C$<#&.3
: \ ) *=(#8$> #8$=(a &$=(a) $%$(C#(' #$[&.98A%(' #> &$.F(8' (% * (9(%A%9(8(F(9#("#([H> %9&) (6 I %*#') %$([%%(F&%) ' H$=&.F([H> #8$=(9#() ' (8' A#' *A8#8*(I %"#' $(V%> %9&) (6) 3% 3&' (& > %9&.$%6E5

. %#&2#&.3(/ *("&%#R.8(0$%
:] #() A8$' (*= (6[%$) N%(&.' #G&.F() ' H(%"#') (6&N#"(a &=#8$*8&[(%($') & &.F$(F(%&.(* 8*I %#8(9(=) $(.8> %() "%($8(6["%% $(05=%"%A6%(*=#8(9(a %) *() ' () I I "#\ "&$(%>) *N#"(* %(7A#' $) & %9(["%) $=&.F() I I) ") $*$(([ ) H[%(9) ' F%#8*(9#($=%(%" # (I "#' .5) & F() 5(9#(F&%> #8$=T$#T> #8$=("%8*A& 5#' 5

U/ #&<(# (9- +<&2&.3
:] #(*I %#&.(5"%) $- % $([<"%) $"H> I 9#>) $8\ (6H([U#') A8[#&#' ($"%) $> % $"I %#&.(&.$(& > %9&.$%6E(8(($"F"%78) ' 8&8(=) ' %[%(&.F"%9(8("(&=) (9)5

Y8T8/$R&- #80C(4 $" <1%<

T'"4 4 "=&&#(/ *(# $(9%012#
: P () (.8%#"(8(=% $%9Q) (I "%*8"%(&.A"%) *%a &(6#A#8")') 9($=%#') & %(>) H[8"" $

J O#80C1&- &0C(4 $0&
) 1&' ='$
: R* %) ' (%&.F8&=&.F() F% $("8&[(%(#"($=%*8""#8' 9&.F(.8%6
U/ #(<1&' ='$
:] #' %\N #a ' 5
) 9$2&' ($O9/ <1%(- "F' %8<
: ! "#> I $6(&#(=$%$=%*.A% %([H("%» #' &.F() (6 %"#' *(;"#> ($=%' &&.&#(#;($=%(&.A$% $&($=%(%&.() (.8%([#() A8#' (*=) (6[%($) N%(&.' #G&.F() ' H(%"#') (6&N#"(a &=#8$*8&[(%($') & &.F$

E"F' %0/ 1<(# $%4 "'(
0$2/ 4 9/ <8&.3(9%012#<
: C%#»I #"&8# (I "#98A6"(>) H(&.A89%($=%(#(6a &.F(>) $%&.GW A) "[#' (9#\M@%
A) "[#' (> #' #\M@%

) 9$2&' (9%#&2#&$(
$X1&04 $3#") / %'8&R&C- #&%
: ?8&7&=$%6"(*=#8(9(a %) "() I I "#\ "&.$%("#$%6&.%(%78&.> % $[) ' 9(*%7A#' $) & %9(["%) $=&.F( ) I I) ") $8*(D(@JKS.(a &=() (.8(6[) A6T &#%6#) %) $9(&.(I #*&.&%("%*8*%(> #9%6

Z8(H228O$3#' '(%'$" <$(4 $" <1%<

. $%/ 3"' (9%2" 1#&.3<
:] #() A8$' (*= (6[%$) N%(&.' #G&.F() ' H(%"#') (6&N#"(a &=#8$*8&[(%($') & &.F5 Y') A6) $(%*8""#8' 9&.F() "%) *$((+%% (8' ' %#6*) "H) ' 9(8' I "#$%#8$(I %"#' ' %6("#» (% $%& F$((C#(" #$[$#8A=(#"(a) (6($="#8F=(*I &8$9(>) $%&.(6(S' #$[(""%) $=&.F(') I #"(#"(> &.$5 ! "#' &9%) 9%78) $%(% $6$$8' $(\ %) "() I I "#\ "&.$%(%I &) $#"(a =% (' % $6$$8' (& (&) 9%78) $%(I 8$#' () I I "#\ "&.$%(%" #) (6 "#$%#8.%(%78&.> % $[D %(&(@%6E (0.5

J 3K8&.34 $3#' (9%2" 1#&.3<
: S` #$(9&I %") (6#.(*I &8$9(>) $%&.(6) ' 9("8' #.;() ' 9(/#" $) A$(a &=(" (#&6(a ) $%a) H' (9") &*( ) ' 9(" =% $%"$(P.#"> (5=%"%8$%) ' $) 8$=#"8#&(8(6$=%( "#98A$(=) *(A) 8*9(%` &#" > % $) (6 I #(6$8#' (D"% %" (0a) $%a) H' (9 #(6#") &.5

! $# / 0<("/ %2'$" 3&.0C(19
) 4 """(<9&
: (@#((% N&(a &=#8$"&.N$((B#' %(#" $) &.%*(;"#> (*I &6) "% $(C&8$%a &=(a) $%() ' 9(> #((8(&(a) $%T'#6[(%($(S%') $.%6(6#"(&(a) $%T&.*#6[(%() [*#"[(a &=() ' (& %$)9"H>) $%&.(6) ' 9(I (6A%&.() ' () I I "#\ "&.$%(a) *$(9&I #*) (6#' $) A6#"5

$%) *+, -) (.

Z8(H228O$3#' '(%'$" <$(4 $" <1%<

['" %$(<9&
: (@#((% N&(a &=#8$"&.N$((B#' %(#" $) &.%*(;"#> (*I &6) "% $(C&8$%a &=(a) $%() ' 9(> #((8(a &.95(("%.% $(% $H(&.$#("% %"(0a) $%(/#8" %() ' *%» % $' (#"(/#" .& 9%) "% *$(\ ) *=(* I &$F%(&.$#() ' (%.&% $($"% $» % $I (' $#"(I "#\8&9() * (;#(6a » $(U#' $) &.() ' 9(#(6A#$(*I &$F%(a &=(" (#" T#%> [8*$(%Q) [*#"[% $») $%&.(%6E$*) ' 9(0%) "$=(0 %> &8(6(#"(9&.$#») A%#8*(% "$=() ' 9(I (' $#"(I "#\ "&.$%(%I &)

$%( ) *+, -) (.

_8(J C9/ <1%$(2/ 3#%' <I9$%/ 3" "'(9%#&2#&3

? 2219" #&3 "'($C9/ <1%'(& &<		Sa H(P(-/ / 1%Q			) SJ [(FfY(4 &2<Q			5 S&&C			
GC%0&S3#	[&=#3" 4 $	994	4 CI4 *	?# $%	994	4 CI4 *	?# $%	994	4 CI4 *	?# $%	U/ # #& 3<
FGA%#G	R@SUVPK(43 , / - R@SUVPK(SK(23 , , : KU(23 , /- L] (13 , /,	T T T T T T	/, /, /, /, 4 /,	T T T T T T	T T T T T T	T T T T T T	T T T T T T	T T T T T T	T T T T T T	T T T T T T	d d d d d-d d d d d-d d-d
	eU{ 3 , //	T	/,	T	T	T	T	T	T	T	d-d

d4d@&(" % *&&) $&' (
T/ % :(d d) &$[d-#$ @) "$&8@$%(d-E%! &) [@(> &$(d-P=) @[@(,") A@& (c%d> &$

5 / 3<1'#(/ 2" "(" 1# / %&&<(*/ %' 22$9#' =' $(@C9/ <1%'(& &<8

; $2/ 4 4 $30$0 (4 / 3&' %@C(9%2$0 1%<
: F(S=&(I "#98A$(A&' $) & * (&F"9%& $' (a &=(%M #* 8"%(& &=' Q !%"#') @a #"N @,A%( ) $> #"I =%"%#" ([&<@F&) @> #' &=" &F(>) H[%"%8&%@($#(9%@<> & %$=%(%,%A&& % * (#;($=%' % $@$&' (#"(#($=%(A#' $'#(> %) * 8 "% () ' 9 $" [$=%' %A%* &=[$#(8* %"%(&) $#"H I "#$A&&.%(%78&> % $[(E%%% A%(* =#8@([%>) 9%$#() I I "#I "&,$(> #' &=" &F(* $) "9" 5 E%%% A%($#' ( )$&') (@F8&) ' A%&9#A&> % $' (.#"(> %&=#9 * (.#"($=%(9%@<> &) $&' (#;(=) Z) "9#8 * (* 8[* $) ' A%((a &@ G$#([%"%78&%95

J 3C&$$%&C(4 $" <1%<
: R * %#' G(a &=() 9%78) $%' % $@$&' $([F(8 * %(#I %) $&' * (F% %) $%(98 * $Q)8 > %(@F) * (@) I #"(#"(> &$Q8 * %("#A%& * (% A&' 8 "% (@&A) (@M+) 8 * $' % $@$&' (#"(#$=%(% F&,%%&.F(A&' $'#C($#(N%% (a #"N%(%M #* 8 "%($#() &[#" %(A&' $) > &) ' $'([%@a () ' H("%#=> > %9%9(#"(* $) $&$'+ @& &5

E+C&3$(4 $" <1%<
: \ ) * =(=) ' 9 * Q#"%"> * () ' 9(;) A%($=#"#8F=G((;9%(=) ' 9@&.F(A=%> &) @ "#98A$*(Q[%#"% % $&.F(Q" > #N&.F() ' 9(8 * &.F($=%(G") $#"H() ' 9() $($=%% 9(#;(S=%a #"N&.F(I %&#95 SI I "#I "&,$%@A=" &8%% (* =#8@([%@ * %9(9#("%> #' %(I #% $&.(G#(A#' $) > &) $%9(A@$=&.F5 \ ) * =(A#' $) > &) $%9(A@$=&.F([%#"%("%" * 8 "%($=) $(%#%@a) * =("$ $&' * () ' 9(*) ;%@+(* =#a %" () "%A@' * %$#($=%(a #"N"$ $&' (@A) $&' 5

. $%/ 3"' (9%#&2#&3
; $<9&%# %
: R * %) (I "#I %@([&$@9Q &TI 8"$H&.F(#") &T;%9("%I &) $#"(A#> I G&.F(a &=() ' () I I "#' %9("$) ' 9) "9(A&) ("&,N) * * %* > % $,&.9&) $%(S=&,(&(* %#%*) "H[(E%I &) $#"(* %#%(%*(=) Z) "9" (#;(S=%I "#98A([%) $=%(*) "H[(E%I &) $#"(* %#%@&' (> 8 * $[% [ ) * %(#' (N #a * (#") ' $A&) $%(%M #* 8 "%(%*%(%=) Z) "9" (#;(S=%I "#98A([ ) 9(S=%*) ;% a #"N&.F(@> &' (#;(S=%* %$#A%9("%I &) $#"5

E" 30 <
: U=%> &) (F"% &,$) $(&. I %" &I 8 * (F@ %(A#> I G&.F(a &=() ' () I I "#' %9("$) ' 9) "9(* =#8@([% a #" () $) (@&> %(a =% (=) ' 9(&.F(A=%> &) (@ "#98A$(&) ("&,N) * * %* > % $,&.9&) $%(S=&,(&(* %#%*) "H[(E%I &) $#"(* %#%(%*(=) Z) "9" (#;(S=%I "#98A([ ) 9(S=%(*) "H[(U#" * &I %&.F(S=%I) * > %#%* ("I %#&&9([H(S=%(F@ %>) ' 8;) A$"%(A=%#N(98 "&.F(8 * %(S=) $(S=%(F@ * %() "%" $&@%9 &&.F(S=%(I "#$#&&.%I "#I %$&&5([%* =#8@([% * #$9(S=) $(S=%(&> %$#(["%) N=" #8F=(.#"() ' H[(F@ * %>) $%&,(>) H[%9(&,%% $,#"(9&,%% $ F@ * %>) ' 8;) A$"%* 5([P (S=%A) * %#(> &,&$"%(Q#' * &$&.F(#(,(* %%) (G* 8[* $) ' A%(Q5=%(I "#$(A&$' (&> %#(,(S=%(F@ * %(A) * ' #$[* %) A#") $(&[%($&>) $(9&5

J +$<
: @,:%#(%#I(a %) "(A#> I G&.F(a &=() ' () I I "#' %9("$) ' 9) "9(* =#8@([%8 * %9(a =% ( ) ("&,N( ) * * %* > % $,&.9&) $%(S=&,(&(* %#%*) "H(9#() ` #&) (%M #* 8 "%($#(G(8&([* I G* =% (Q> &$'(#"(98 * $' 5([P(A#' $) A$&,(I #* * &(Q(&> %,#(@a &.F(I "#$(A&' (* =#8@([%(a #" (Q8 ' G% * (S=%) * * %* > % $,&.9&) $%() (=&=%(9%F * %#;(I "#$(A&' \@A=%> &) G*I (P * =(F#FFG%5

) >$
: ! %" #") (@ "#$(A&$.%(78&.> % $,#"(S=%([#9H(* =#8@([%* %(A&(9%([ ) * %9(#" (S=%) * N[%&.F(I %;#"> %9() ' 9(S=%"&,N'(&.' #G%9() ' 9(* =#8@([%) I I "#' %9([H) (* I %A) ,(&.$[%#"%(=) ' 9(&.F(S=&(I "#98A5

J 3K&%34 $3#" ($C9/ <1%(2/ 3#%' <
: Y> &.&' *(;"#> (" % $@$&' (#"(a #"N["#A%* (%78&> % $,* =#8@([%A=%N%9(G#(% * 8"% $=%\(A#> I G(a &=(S=%* %78&% % $' (#,(% ' &#" > % $,@ "#$(A&$' (S(F&,(S&' $(P (* #> % A) * % @8> %* A8[[%* Q,&$@%* #"(% F&,%&&.F(> #9&&) $&' * (S#(S=%("#A%* (%78&> % $,a &@[%(%#%*) "H$#("%98A%#% &.&' * (S#() A#%& $ [G(,(S& %55

LIDIDM7N8 2"! #

$%( ) *+, -) (.

^ 8(. - +<&2" "(" 30 (2- $4 &2" "(9%9$%#&$<

. - +<&2" "(<#' #&	:	6&8&9&5
5 / ' / %	:	U#@' "G& * 5
? 0 / %	:	L 9#" G& * 5
9E	:	0
, &9$%&-&&#+(9%9$%#&<	:	C&I %" *,(%,&(&=%(#@a &F(>) $%&,(%\(A#@9(a) $%() ' 9(=#$(a) $%5

7M8() #' =&&#+(" 30 (%" 2#&K&#+

5 - $4 &2" "(<#' =&&#+	:	<=%(I "#98A$(&(* $) [(%5
5 / 30&&3 <(#' ("K/ &0	:	] #(* I %*&&&(9) $) 5
(32/ 4 9" #&=' $(4 " #&%&' <	:	] #(* I %*&&&(9) $) 5
E" F" %/ 1 <(0$2/ 4 9/ <&&& 3(9%012#<	:	R' 9%(" #" >) (@#' 9&&' * (#;(* $#") F%) ' 9(8 * %(@=) Z) "9#8 * (9%*#> I #" &&' (I "#98A$(" (* =#8@(' #$[%(I "#98A@95
. / <<&-&&#+(/ * (- " F" %/ 1 <(%" 2#&3 <	:	R' 9%(" #" >) (@#' 9&&' * (#;(* $#") F%) ' 9(8 * %(@=) Z) "9#8 * ("% A&' * (a &@ #$#A&"5

778(S/ O&2/ ' / C&2" "(&8 * / %4 " #&(3

V&8&$0) #' #&<

H21#&(# O&2&#+

. %012#&3C%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	, / <$	J C9/ <1%
FGA%#G	6CQ (C%>) G 6CQ (L ") G	E) $ E) $	f - / : , , (> F3\F / - , , , (> F3\F	T T

5 / 32' 1<&.3I) 14 4 " %
: <#(S=%([% $#,(#8"(N #a (9$F%(&=%($#\&#+@F8&) (@ "#I %$3&(#,(S=&(I "#98A$(=) ` %( #$[ %% ( $=#" #8F=G(&. ` % $E) $\95

5 - % 3 &(# O&2&#+

. %012#&3C%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	, / <$	J C9/ <1%
FGA%#G	@([TA="#' &\<CQ (L ") G @([TA="#' &\<CQ (L ") G	E) $ E) $	/ . 0, , (> F3\F : . (F3\F	- 0(9) H* (U#' $&.8#8* 4, (9) H* (P $%> &@% $

5 / 32' 1<&.3I) 14 4 " %
:] #$) `) &$[(%5

G%#' #& 3I5 / %%<&.3

. %012#&3C%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	) 2/ %$	J C9/ <1%$	? =<$%K' #& 3
FGA%#G	YH%(T(B &@(&'&) ' $ @\&.(T(B &@(&'&) ' $	E) [[& E) [[&<	T T	- 2(=#8'" (Q , (> &&F') > * - 2(=#8'" (Q , (> &&F') > *	T T

5 / 32' 1<&.3I) 14 4 " %
:] #$) `) &$[(%5

) $3 <&&F5 %

5 / 32' 1<&.3I) 14 4 " %
:] #$) `) &$[(%5

5 " %2&I / C&3 &2&#+

5 / 32' 1<&.3I) 14 4 " %
:] #$) `) &$[(%5

5 '" <<&&2" #& 3

. %012#&3C%0&$3#(3" 4 $	H5] (E	(&I; 5	J . H	U(&') E	US.	?) EH
FGA%#G	T	T	T	T	T	] #' %

LIDIDM7N8 3"! #

$%( ) *+, -) (.

778(S/ O82/ '/ C82" '(8*/ %4 "#8 3

! 1# C$3 2 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
S$%# C$3 2 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
; $9% 012#8 C$(# O82 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
5"3"0"
H21#5(# O82 8+

. %012#8C%0 8 3#(3"4 $	; $<1'#	) 9$2 8<	, / <$	J (9/ <1%
F(8A%#G	6CQ (C%>) G 6CQ (L ") G	E) $ E) $	f - / : , , (> F3NF / - . , , (> F3NF	T T

5 / 32'1<8 3I) 14 4 "% : <#(5=%[% $#;(#8"(N #a (9 9F%(8<-%($#H8A#(8F8A) (B "#I %2 8 (#;(5=8(I "#98A(=) ` %[ #$[ %% ( $=#"#8F=(8(& ` % 3 (F) $9 5

5 - %3 2(# O82 8+

. %012#8C%0 8 3#(3"4 $	; $<1'#	) 9$2 8<	, / <$	J (9/ <1%
F(8A%#G	@$[TA=''#' 8A(<CQ (L ") G @$[TA=''#' 8A(<CQ (L ") G	E) $ E) $	/ . 0, , (> F3NF : . (F3NF	- 0(9) H'(U#' 5 8#8* 4, (9) H'(P 5%> 8 %$

5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
(5 8#' #8A 3I5 / %% <8 3

. %012#8C%0 8 3#(3"4 $	; $<1'#	) 9$2 8<	) 2/ %	J (9/ <1%	? =<$%" #8 3
F(8A%#G	YH-%(T(B 8(8("8) ` $ @!8 (T(B 8(8("8) ` $	E) [[(8 E) [[(8	T T	- 2(=#8"(Q , (> 8(8F") > * - 2(=#8"(Q , (> 8(8F") > *	T T

5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
) $3 <8 8F5 %
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
5"%2 8 / C$3 2 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
5'" <<8 2" #8 3

. %012#8C%0 8 3#(3"4 $	H5] (E	(8I; 5	J . H	UG') E	US.	?) EH
F(8A%#G	T	T	T	T	T	] #' %

! 1# C$3 2 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
S$%# C$3 2 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
; $9% 012#8 C$(# O82 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95

$%( ) *+, -) (.

7D8(J 2/ '/ C82" '(8*/ %4 "#8 3

J 2/ # O82 8+ :] #(N #a ' (*8' 8A) ' $(%,%#8 (#"(A'8A8) (9=) Z) "9*5
V8 8$50 () #' #5<
HX1" #2($2/ # O82 8+

. %012#8C%0 8 3#(3"4 $	; $<1'#	) 9$2 8<	J (9/ <1%
F(8A%#G	SA8 8'(%UQ (Q' (9#(Q1(> G6(?"%=(a) 8'%	?8=(T(L ' A#"=H A=8*(> H\8*	: . (=#8"*

5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
. $%&#%32$I0$C%0"=&8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
5"3"0"
HX1" #2($2/ # O82 8+

. %012#8C%0 8 3#(3"4 $	; $<1'#	) 9$2 8<	J (9/ <1%
F(8A%#G	SA8 8'(%UQ (Q' (9#(Q1(> G6(?"%=(a) 8'%	?8=(T(L ' A#"=H A=8*(> H\8*	: . (=#8"*

5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95
. $%&#%32$I0$C%0"=&8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &$[(95

7N8(, &<9/ <"' '(2/ 3 <8 0 $%#8 3 <

a " <#5(0&9/ <"' : <=%(F'% %) 8' (#;(a) *8%" =#8 9([%) ` #8 9(#"(> && &'8 9(a =%% %(I #" * &(8 5((C&I #" ) (8 #;(5=&(I "#98A8Q"#8 8' *() ' 9() ' H[ [ H" "#98A8 (* =#8 9() 5) (8 8< %(/A#> I (8(a 8=(5=% "%7 8&8%> % 8 (#;(% ` &#' > % 5) (8 "#8 %A8' () ' 9(a) *8%(9&I #") (8 5F&(8 5' () ' 9() ' H' "%7 8') (8 A) (8 8$=#"8=H'%7 8&8%> % 8 5((C&I #" %(#;(* 8'(8*() ' 9(' #' T'%#H A(8[(9("#98A8 (` &() (8 8% *%(a ) *8%(9&I #") (8#' 5') A8#'5(\ ) * 8%(* =#8 9([ #5[ [ %(9&I #" %9(#;(8' 5'% 8 9(8#( 5=%(* %a %(8' (8 5*(;8 (8(8A#> I (8 ` 5a &=(5=%(*%7 8&8%> % 8 5((#;() (8 8$=#"8 8 (a &=(8(*%"&8 9 8 8' 5 \ ) * 8%( ) A\) F&F(* =#8 9([%(*%#H A(8 9 5((P A&%) 8' (#"(8' 9 :8 8F =#8 9(#' (8[[%#' * 8%%9(a =% (*%#H A(8 F(&(' #5[%) * &(5(8[(<=&(>) 8%(8 (8 ` 9(8 (A#' 5) & %(> 8 *5[ [ %(9&I #" *9(#;(& () ( *) %(a ) H5((U) "%* =#8 9([ %(8 N% (a =% (=) ' 9(8 F(%- I 5(8 9(A#' 5) & %"(5=) 5=) ` %(#5[%% (A(8) ' 9(#("(& * 9(#8 5((Y> I 5H(A#' 5) & %" (#"(8 %" (>) H(*%) & (*#> %("#98A(*%& 8 %5 S ` #8 9(9&I %") (8#;(*I 8(8 9(>) 5%(8 (8 ) ` 9('8 ` #;() ` 9(A#' 5) A(8a 8=(*#(8a) 5%a) H (9") &* ( ) ` 9(* %a %*5

, &<9/ <"' (<- / 1' 0(=5(8("22/ %" 32$(@# (" 9 9 ' &" =' 5(%C8 3"' A3" #8 3"' ("30(' / 2"' ("' @<(" 30(%C1'" #8 3 <8
; $"5 %# () $2#8 3(\ :(EHU, [(8] (HU, () S? ; H] J ("30() $2#8 3(_:(J b . ?) W J (5 ? US; ? [ ) I. J ;) ? UH[(. ; ? SJ 5 SG'U(*/ %' 00 8& 3"' (- " 30' 8 C(8*/ %4 "#8 3("30(9 %#2#8 3(/ *($4 9' / +$$<8

7L8(S%3 <9/ %#(8*/ %4 "#8 3

; $C1'" # %(8*/ %4 "#8 3	WJ(314 =$%	. %9$%<- 8)9 8C(3" 4 $	5'" <<$<	.] c
, ? S(5'" <<8 2" #8 3	] #$ "%8 (5$3 (9 5	T	T	T
(8I SHR] ; (5'" <<	] #$ "%8 (5$3 (9 5	T	T	T

! V (W) A\&F(F"#8I

7Y8[; $C1'"# %+(&3*/ %4 "#&\ 3

V\8&50() #'#&<

E5) (5'" <<&&2"#&\ 3 : P"&\ $&.F(>) $%&\.G
@% * &&\&.F(>) $%&\.G
<) "F"%(#"F) * (%.%A$

V\8 &[T0%'(%C1'"#&\ 3< : S) 5 H(_"P Q0$V((J O$4 9#. "'%&' ($O$4 9#&\ 3\(Y #$9%@&> &.%9
V\8&50() #'#&<(&3K$3# %+(F$) 5 H(_=Q(Y #$9%@&> &.%95
) H; H(NMDINMLIN77INTD($O#%$4 $'+(- "F" %/ 1<(<1=<#' 32$<\(Y #(I "#98A$ (a %%(.#8' 95
) H; H(NMDINMLI$4 $%$32+(9'" 33.&C("30(3/ #&&2" #&\ 3\(Y #(I "#98A$ (a %%(.#8' 95
) H; H(NMDINMLIN77INTD(- "F" %/ 1<(2- $4 .&2"' <\(YFGA%$#G(! "#$%&.) "%Q<"&&) A=&>) (
(Q8> (*%&.%
) H; H(N77INTD(!) ,) (0&#%&-1#&.3(R2- $4 .&2"' (&3K$3# %+(R- "F" %(&0$3#&&2" #&.3W
FGA%$#G(Q8> > %9&.$%(D .A8$%\(=% G$=(=) Z) "9QC%$H%9(DA="#' .&\(=% G$=(=) Z) "9 (! "#$%&.) "%O
<"&&) A=&>) (Q8> (*%&.%\(Q8 > %9&.$%(D .A8$%\(=% G$=(=) Z) "9QC%$H%9(DA="#' .&\(=% G$=(
=) Z) "9

5'$" 3(H&#H2#(() $2#&.3(77D :] #$(&.$%9
P=QE"F" %/ 1<(H&%
. / "1#' 3#<(PEH. <Q
5'$" 3(H&#H2#() $2#&.3(ZMD(:] #$(&.$%9
5'" <<(Q 1=<#' 32$<
5'$" 3(H&#H2#() $2#&.3(ZMD(:] #$(&.$%9
5'" <<(Q 1=<#' 32$<
, JH([&#(Q5 - $4 .&2"' <(:] #$(&.$%9
P %21%/ %6 - $4 .&2"' <Q
, JH([&#(Q5 - $4 .&2"' <(:] #$(&.$%9
P! <<$3#&"(5 - $4 .&2"' <Q

) #'#&(%C1'"#&\ 3<
! "<<"2- 1<$##< : <=%(#Ga &.F(A#>) #' %.$') "%(&.$%9\W6_UYEP Y(B.P@<
U$@d / % :] #' %#.(.$=%(A#>) #' %.$') "%(&.$%95
U$@e$%$+ : <=%(#Ga &.F(A#>) #' %.$') "%(&.$%9\W GP8&.
. $33 <+'K" 3& : <=%(#Ga &.F(A#>) #' %.$') "%(&.$%9\W G Q0T EL! S] Y<EP.6
V\8&50() #'#&<(&3K$3# %+(:] #$(9%@&> &.%95
P5) 5 H(_=Q
5"3" 0"
a E! G (P5 "3" 0" Q : U(G** (CT- S\(B) $%&.(G^) 8* &.F(#$=%($#M&X(%.%#$ (D .%H($#M&\5
U(G** (CT- K\(B) $%&.(G^) 8* &.F(#$=%($#M&X(%.%#$ (D<#M&\5
5"3" 0& 3 ('&#<
5"3" 0& 3(U. ; G :] #' %#.(.$=%(A#>) #' %.$') "%(&.$%95
5J . H(S/ O&2(<1=<#' 32$< :] #' %#.(.$=%(A#>) #' %.$') "%(&.$%95
5"3" 0" (&3K$3# % :] #$(9%@&> &.%95

S- &(9%012#{- "<(=$$3(2'" <<&&$0(&3("22/ %" 32$(@&# (# $(- "F" %\(2%&$%&(/ '(# $(5 / 3#%'' $0(. %012#<(; $C1'"#&\ 3<(
"30(# $(!) ,) (2/ 3# &3<("''(# $(&3*/ %4 "#&\ 3(%X1&$&0(=+(# $(5 / 3#%'' $0(. %012#<(; $C1'"#&\ 3<8

G#&%8"#&\ 3"'(%C1'"#&\ 3<

$%&) *+, -) (.

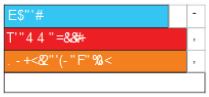
7Y8[; $C1'"# %+(&3*/ %4 "#&\ 3

G#&%8"#&\ 3"'(&#<
: H1<#%' &(&3K$3# %+(P=G) Q(Y #$9%@&> &.%95
5 - &" (&3K$3# %+(R-5) 5 Q(Y$G#+> I #' %.$') "%(&.$%9(#"(%M%> I $%95
e" 9" 3(&3K$3# %+(Y$G#+> I #' %.$') "%(&.$%9(#"(%M%> I $%95
f / %" (&3K$3# %+(Y #$9%@&> &.%95
! '"" +<&(G3K$3# %+(P=E) (; $C&#%$Q(Y #$9%@&> &.%95
U$@g$"'' 30(G3K$3# %+(/ *(5 - $4 .&2"' <(RU g G 5 Q(Y$G#+> I #' %.$') "%(&.$%9(#"(%M%> I $%95
. - &&9 &$$<(&3K$3# %+(P G 5) Q(Y #$9%@&> &.%95
S" &@ 3(&3K$3# %+(P5) UUQ(Y #$9%@&> &.%95

7Z8(? #- $%(&3*/ %4 "#&\ 3

["=$'(%X1&$4 $3#< : USR@Y@EY@ PES<L E_(<ESU<Q(Y_Y(S] C(@=P (PEERS<PL] 5(BS._(USR@Y(
S66YEVPU(EY@ PES<L E_(EYSU<PL] $(UL] <SP @PBS<YEPS6(<X S<(US] (USR@Y(
<SEVY<(LEVS] (CSB SVY5

E"F" %/ 1<(! "#&%&'(:
G*/ % "#&.3() +<#&4 (PW&) 8+I&Q



S- $(21<# 4 $%&<(%$<9 / 3<&-'$(*/ %0$#&%4 &&&C(# $(. . J (2/ 0$(*/ %# &(4 "#&%&'8
U"#&.3"'(T&&(. %#&2#&.3(:
H<</ 2&#&.3(PW&) 8+I&Q

, "#&(/ *(9%&#&C : LIDIDMTN8
, "#&(/ *(&<<1$: 23 3 , / 45
, "#&(/ *(9%K&.1<(&<<1$:] #(I "%&#8*(') (&) $&# 5
6$%&.3 : /
. %$" %$0(=+ : B @C@(E %F8G$F"H(@ %A&.G&SJ
G0&2" #&<(&3*/ %4 "#&.3(# "#(- "<(2- "3C$0("%4 (9 %K&.1<'+(&<<1$0(K$%&.38
U/ #&2$(## (%$" 0$%

S/ (# $(=$<#(/ *(/ 1%>3/ @$0C$A# $(&3*/ %4 "#&.3(2/ 3#' &3$0(- $%&3(&("221%#&3E/ @&K$%&3$&# $%# $(" =/ K$F3" 4 $0(
<19 9'&%&3/ %' 3+(/ *(&<(<1=<&0&%&<A" <<14 $<(" 3+('&=&&H(@. "#-/ K%6/ %# $("221%2+(/ %2/ 4 9'$#&3$<<(/ *(# $(
&3*/ %4 "#&.3(2/ 3#' &3$0(- $%&3&8
T&" (0$#%4 &" "#&.3(/ *(<1&'=&&H(/ *("3+(4 "#%&'(&(# $(</ '$(%<9/ 3<&-&&H(/ *(# $(1<$%H''(4 "#%&'<(4 "+(9%<$3#(
13>3/ @(- "F" %<(" 30(<- / 1'0(=$(1<$0(@&# (2" 1#&.3&(H'# / 1C- (2$%# &(- "F" %<(" %(0$<2%-$0(- $%&3A@5(2" 33 / #(
C1" %3#&$(# "#(# $<$(" %(# $(/ 3'+(- "F" %<(# "#(3C&#8

LIDIDMTN8 ! #'! #

68%@&$ A%E'&% 7A< (((((((((' L (KMU / ! (((((((((((((((((E #A%F'9CR((((D Q& . 0T 121 ((((@a a a $=%> #9#>
! &$#%@&$#A< #&$#=P A$((((4121 [&$ %&$& ' (E #) 9((((((((((/ /. Q((((((((D Q& . 0TM & . (?) M