ThermoFisher SCIENTIFIC

The world leader in serving science

MSDS# 8399 COVER SHEET

26158	Pierce® Chromatin Prep Module
Component #	Description
1861744	Membrane Extraction Buffer
1861745	Nuclear Extraction Buffer
1862229	Micrococcal Nuclease (ChIP Grade)
1862228	MNase Digestion Buffer
1862230	MNase Stop Solution
78443S	Halt Protease & Phosphatase Inhibitor Cocktail EDTA-Free (100X)
1862223	Glycine Solution (10X)
1862224	PBS (20X)
1862780	Proteinase K Solution
1862186	DTT, 500mM, lyophilized

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 Scientific
The world leader in serving science

Material Safety Data Sheet

MEB

1. Product and company identification

Product name : MEB
Synonym : Membrane Extraction Buffer
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 : 1861744 1862569 1901967
MSDS # 8158
Validation date : 10/27/2011.
Print date : 10/27/2011.
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.
Color : Colorless.
Odor : Odorless.
Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.
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
Chronic effects : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.

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

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.
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 : None known.
See toxicological information (Section 11)

3. Composition/information on ingredients

There are no 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 if symptoms occur.
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 if symptoms occur.
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 if symptoms occur.
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 if symptoms occur.
Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.
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 : No specific data.
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.

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

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. 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. 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. 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.

Storage : Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F). 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

Canada

Occupational exposure limits

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 : 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. 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

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

MEB

8. Exposure controls/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.
Color : Colorless.
Odor : Odorless.
pH : 7.4 to 7.6
Dispersibility properties : Dispersible in the following materials: cold water and hot water.
Solubility : Soluble in the following materials: cold water and hot water.

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

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.

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

11. Toxicological information

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

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.

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.

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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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

MEB

13. Disposal considerations

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 : Not regulated.

U.S. Federal regulations : **TSCA 8(a) PAIR**: Nonidet P-40 Substitute
TSCA 8(a) IUR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): At least one component is not listed.

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: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Water Act (CWA) 311: sodium hydroxide

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 : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

United States inventory (TSCA 8b) : At least one component is not listed.

Canada

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

Canadian lists

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

MEB

15. Regulatory information

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : At least one component is not listed.

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.

Intemational 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 : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

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 : **10/27/2011.**

Date of issue : 10/27/2011.

Date of previous issue : 10/11/2011.

Version : 1.01

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

Part of Thermo Fisher Scientific
The world leader in serving science

Material Safety Data Sheet

NEB

1. Product and company identification

Product name : NEB

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 : 1861745 1862570 1901964

MSDS # 8159

Validation date : 10/27/2011.

Print date : 10/27/2011.

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.

Color : Colorless.

Odor : Odorless.

Signal word : WARNING!

Hazard statements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Precautionary measures : Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep container tightly closed. 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 : Irritating to respiratory system.

Ingestion : No known significant effects or critical hazards.

Skin : Irritating to skin.

Eyes : Irritating to eyes.

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: 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.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
sodium chloride	7647-14-5	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. 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.

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:
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).

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. 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.

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

NEB

7. Handling and storage

Storage : Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F). 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

Canada

Occupational exposure limits
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.

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.

Color : Colorless.

Odor : Odorless.

pH : 7.4 to 7.6

Dispersibility properties : Dispersible in the following materials: cold water and hot water.

Solubility : Soluble in the following materials: cold water and hot water.

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

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
sodium chloride	LD50 Dermal LD50 Oral LDLo Intra-arterial	Rabbit Rat Guinea pig	10000 mg/kg 3000 mg/kg 300 mg/kg	- - -

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
sodium chloride	Eyes - Moderate irritant Eyes - Moderate irritant Skin - Mild irritant	Rabbit Rabbit Rabbit	- - -	24 hours 100 milligrams 10 milligrams 24 hours 500 milligrams	- - -

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sodium chloride	-	-	-	None.	-	None.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
sodium chloride	Unscheduled DNA Synthesis (UDS) Other Mutation Test Systems Cytogenetic Analysis DNA Damage - Micronucleus Test DNA Damage Cytogenetic Analysis	Subject: Mammalian-Animal Subject: Mammalian-Animal Subject: Mammalian-Animal Subject: Mammalian-Animal Cell: Somatic Subject: Mammalian-Animal Cell: Somatic Subject: Mammalian-Animal Cell: Somatic Subject: Mammalian-Animal Cell: Somatic Subject: Mammalian-Animal	Positive Positive Positive Positive Positive Positive Positive Positive

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

11. Toxicological information

	Cytogenetic Analysis	Cell: Somatic Subject: Mammalian-Animal Cell: Somatic	Positive
	DNA Inhibition	Subject: Mammalian-Human Cell: Somatic	Positive

Conclusion/Summary : Not available.

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium chloride	Positive - Subcutaneous Positive - Subcutaneous Positive - Subcutaneous Positive - Intraperitoneal	Mouse Mouse Mouse Rat	2500 mg/kg 1900 mg/kg 1900 mg/kg 1710 mg/kg	10 days During Pregnancy 11 days During Pregnancy 10 days During Pregnancy 13 days During Pregnancy

Conclusion/Summary : Not available.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
sodium chloride	-	Positive	-	Woman - Female	Unreported: 27 mg/kg	15 weeks During Pregnancy
	Positive	-	-	Rat	Oral: 56400 mg/kg	- During Pregnancy
	Positive	-	-	Rat	Parenteral: 10 mg/kg	1 days During Pregnancy
	-	Positive	-	Rat	Unreported: 500 mg/kg	4 days During Pregnancy
	-	-	-	Rat	Oral: 145 g/kg	- During Pregnancy
	-	Positive	-	Rat	Unreported: 50 mg/kg	6 days During Pregnancy
	-	Positive	-	Mouse	Subcutaneous: 13440 mg/kg	- During Pregnancy
	Positive	-	-	Mammal - species unspecified	Unreported: 480 mg/kg	48 days During Pregnancy
	-	Positive	-	Mammal - species unspecified	Unreported: 6 g/kg	18 weeks During Pregnancy
	-	-	-	Rat	Intraperitoneal: 10 g/kg	- During Pregnancy

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

11. Toxicological information

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary : Not available.

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
sodium chloride	-	-	-	None.	-	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

Product/ingredient name	Result	Species	Exposure
sodium chloride	Acute EC50 2430000 ug/L Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 402600 to 469200 ug/L Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1042 mg/L Fresh water	Crustaceans - Ceriodaphnia dubia - <24 hours	48 hours
	Acute LC50 1000000 ug/L Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/L Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

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

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

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 : Irritating material
Target organ effects

U.S. Federal regulations : **TSCA 8(a) IUR Exempt/Partial exemption**: Not determined
United States inventory (TSCA 8b): At least one component is not listed.
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) 311: sodium hydroxide

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

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

State regulations

Massachusetts	:	None of the components are listed.
New York	:	None of the components are listed.
New Jersey	:	None of the components are listed.
Pennsylvania	:	None of the components are listed.
United States inventory (TSCA 8b)	:	At least one component is not listed.

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	:	At least one component is not listed.

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.

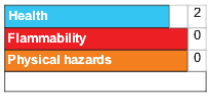
International regulations

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 : 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	:	**10/27/2011.**
Date of issue	:	10/27/2011.
Date of previous issue	:	10/11/2011.
Version	:	1.01
Prepared by	:	MSDS (Regulatory Specialist)

Indicates information that has changed from previously issued version.

Notice to reader

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

NEB

16. Other information

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

Thermo SCIENTIFIC

The world leader in serving science

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

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

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

. %012#(3" 4 $: ! "#$%&'()"*#'+&, +

) 199'&$% : <=+$> %(?", =+$(@#"+ABC0#
D"+$#+(E"%B#=A%%FG
D0H1$E%(005
J %#+K5%& L(M(100- 4
NA1B+; (@B&B+.
. 04821. 8 535(%$
. - - 8 5366 5/ 6

! "31"" 2#1 %% : <=+$> %(?", =+$(@#"+ABC0#
D"+$#+(E"%B#=A%%FG
D0H1$E%(005
J %#+K5%& L(M(100- 4
NA1B+; (@B&B+.
. 04821. 8 535(%$
. - - 8 5366 5/ 6

5 / 0$: - - . . / 01(0. 1/ / / 2(0. 1/ 3. / (0. 1/ 456(02- 0530

!) ,) (O . 03-

6"'&0"#& 3(0"#& : 0- 7 37 - 008

. %&#(0"#& : 0- 7 37 - 008

; $<9 / 3<&="$(3" 4 $: ! @D@F3 +F"'&B&&3(@Q+#'&'", BR

5 > ? ! @ ? 5 :
ABB8CDCDEFEBB
GH(@ I. ?(H) :
JEF8KDJ8FAAJ

! "#&%&'(1<$< : $"$%## (# $(&3<#%2#& 3
=/ / L'$#"/ %@% 9$%'30
&#&3 0$0(1<$8(G# $%M&$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+/ TS%&M

. - +<&2"'(<# #& : 9": *": 8

5 / '/ % : V'+&$8

G0/ % : H; %&+, , 8

) &?3"'(M/ %0 : VWN<M) X

>"Q'%0(<# #&4 $3#< : ! W(VWN@$JU S@DM V<HJ Y(<J W/<L(SYS(W(O(@Z M(MJ M<V<M) 8(VH) <W(M@
! W<SJ M%0{<[W<(VW) (VWN@$(<W\ \ S<(HJ \ W) (OW W S8

. %2" 1#& 3" %(4 $" <1 %< : O%(A%0[$+&B+^ &Q2&(%(> "; B(N, +(%'AQT'B+(&, +: * &B+(^ +AB'&B%A8(O%(A%0[+&B(; $'A<(%$
, > %K+(T =+A(*, "AF(B+", (Q8% * #B(M'# %, (#%'A&B+#T'B+(+G-, L(, K'A(&A; (#*%&"AF8(Z++Q
#%'A&B'A+$(EF=B(# % +; 8((_ &, =(B+%8% F='G(&B+$(=&A; '"AF8

G) >R$-5) (<# #1 < : <=", (> &B+$'&(", (#%'A, "; +$+; (=&L&$, % , (] G(B+(H(@(W([&L&$, (V% > * A'#&E%'A(@B&A; &$,
F? 2(V? J (020- 8) / - - R8

; / 1#&<(/ %($3#% : O+$> &(#%'A&B+#B(SG+(#%'A&B+#B(M=&&E%'A@(M\F+, E%'A8

/ #&3#&'(" 21#&(- $"'# ($**$2#<

I3-"'"'#&& 3 : ! % +$&B+'G("$&B&B'AF(B'A(B+(+(S+, Q(S&B'&G(, G B+> 8

I3P$<#&& 3 :) %(KA%0'A(, "FA'C'#&AB+(G+#B(%(&(#'SEB+&(=&L&$, , 8

) L&8 : ! % +$&B+'G("$&B&B'AF(B'A(B+(+(, K'A8

? +$< : ! % +$&B+'G("$&B&B'AF(B'A(+(+G-, 8

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

5 - %3&2($**$2#< : V%'A&B'%A (> &B+$'&(B+&(#'&A(#&*, +(B&$F+B%'&F&A(; &> &F+8

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

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

5 "2&&/ P$3 2&#+ :) %(KA%0'A(, "FA'C'#&AB+(G+#B(%(&(#'SEB+&(=&L&$, , 8

! 1#' P$3 2&#+ :) %(KA%0'A(, "FA'C'#&AB+(G+#B(%(&(#'SEB+&(=&L&$, , 8

@$%# P$3 2&#+ :) %(KA%0'A(, "FA'C'#&AB+(G+#B(%(&(#'SEB+&(=&L&$, , 8

, T'/ 94 $3#"'($**$2#< :) %(KA%0'A(, "FA'C'#&AB+(G+#B(%(&(#'SEB+&(=&L&$, , 8

Y$'%&&#+($**$2#< :) %(KA%0'A(, "FA'C'#&AB+(G+#B(%(&(#'SEB+&(=&L&$, , 8

@ %$#/ %" 3< : V%'A&B'A (> &B+$'&(T ='#=(> &G&#&* , +(; &> &F+(B%(B+(0%%'"AF(%$F&A, a(K", A+G L("^+$L
F&, B%'A&B+, B%A'(B&#+B(" QD+$(S+, Q(S&B%&G(B&#+B(, K'A(L(+G+, 8

GT$%&U9 / <1%(<&P3<S<+4 9# 4 <

I3-"'"'#&& 3 : W ^+$, +(, G> QB%> , (> &G("A#* ; +(B+(0%%'"AFa
$+, Q(S&B%&G(B&#+B(S&B%A
#%% F='AF

I3P$<#&& 3 :) %(, Q+#'"Q#(, &B&8

) L&8 : W ^+$, +(, G> QB%> , (> &G("A#* ; +(B+(0%%'"AFa
'$&B&B'A
$+; A+, ,

? +$< : W ^+$, +(, G> QB%> , (> &G("A#* ; +(B+(0%%'"AFa
'$&B&B'A
T &B+$'AF
$+; A+, ,

! $0&("'(2/ 30&&& 3< : D$+'+! ", B'AF(, ", %& +$, ("A^ %^"AF(&AG&B&$F+B%&F&A, (> +AB%A+; ("A(B+", (! @D@&, (] +"AF(&B
" PP%%T" #&0(=+(/ T$% : $', K(> &G(] +(&FF$&^ &B+; (] G(%& +$ +I Q%& * $+(B%(B+", (Q8% * #B
$U9 / <1%

) $$(# U&2/ '/ P&2"'(&* '/ % "#& 3(\ $2#& 3(7 7W

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

H3 &&50() #'#&<

Z" 4 $	5 R) (3 1 4 =$%	[
F'G#+$%	41". 0'4	34((14

5 "3" 0"

Z" 4 $	5 R) (3 1 4 =$%	[
F'G#+$%	41". 0'4	34((14

@ $%(" %(3/ (" 0 0&& 3"'(&P%$0 &$3#<(9 %<$3#M- &- NM&# $(# $(21%&3#L3 / M'$0 P$(/ '(# $(<199'&$%' 30(&8(# $
2/ 32$3#%#& 3<("99'&2" ='$M' %(2" <<&&$0(" <(- " Q'%/ 1<(# (- $"'# (/ '%# $(S3T&&34 $3#(" 30(- 32(%\ 1&&(%9 / %&&P(&8
&<(<$2#& 38

C8(Y&/6#(" &0(4 $" <1 %$<

? +$(2/ 3# 2# : V=+#H<(C&(&A; (S+> %+(&AG#%A&B+#B(+A, +, &((M > +; "&B'G(C", =(+G-, (T 'B+(Q+A&B(%(T &B+$
C%(&B(+&, B04(> "A" B-, (,(%##&, "%A&"G("(B'AF(B+(+(" QD+$(&A, ("%(+$(+G+"', &((\ +B> +; "#&
&B&A(E"%A (> > +; "&B'GB

) L&8(2/ 3# 2# : M(#&, +(%(#"%A&B+#B("> > +; "&B'G(C", =(, K'A(T 'B+(Q+A&B%(T &B+$(C(&(&B(+&, B04(> "A" B-,
T ="+(S+> %"AF(#%A&B> "A&B+; (#"%B="AF(&A(, =%+, &((_ &, =(#"%B="AF((, +C%+(S+*, +&((V"+&A
, =%+, (B+%8% F='G(, +C%+(S+*, +&((\ +B> +; "#&(&B&A(E"%A("> > +; "&B'GB

I3-"'"'#&& 3 : ! %+(+I Q%+; (Q+$, %A(B'A(G+, =(&$&((M(A^%(&((, S+&B+"AF((,"(Q, $+&B+"AF((,"(, ("$+F*"&$%(&"C
$+, Q(S&B%&G(&$&+, E%'#"$, I(Q8%", +(&$EQ'A"&;(S+, Q(S&E%'A(%(&(F+A((, G(E&"A+; (Q+$, %AA+'8
9%% +A(EF=B#%&"AF(, *#=(&, (&(#%'&&(B+L((+E%'&(T &'; E(, &A, &((\ +B> +; "#&((&B&A(E"%A
"> > +; "&B'GB

I3P$<#&& 3 : _ &, =(%(B> % B+(T 'B+(T &B+$&((O%(A%0'A(A; * #+(^ %> 'B'AF(* A+, , (; "$+#B-; (B+(, %, %] G> +; "#&
Q+$, %AA+'&((() +^ +$(F^ +(&AG&B"AF((] G> % B+(B+(&A(* A#%A, #"% , (Q+$, %A&((\ +B> +; "#&
&B&A(E"%A("> > +; "&B'GB

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

C&(Y &%#&(" &0(4 $" <1 %$<

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

:) %&##EP#A(_ =&"(] +(EB\<+A("A* %" "AF(&A&]Q+$ %A&'(S', K(%&(T 'B=% B[* 'EB] '+(EB&"A"AF$(MB> &G] +(; &AF+3%& , (B\E&=+(Q+$ %#A(Q3% " , "AF(&', (B\F"^+(> % B= B%> % B+(S+, * , #'EB&P#A8

Z / #&<(# (9- +<&2& 3

:) %, Q+#"C#(B+&B +AB[(<$+&B[G> Q3% &E#&" Q&(V %#EB\#B2%, %A(B+&B> +AB[Q+#"&", B ''> > +; '&B+'G'(T(;&$F+(: * &AEB+; (=&^+[] ++A("AF+, B+; (%&"A=&+; 8

K&(Y &%$X'&P- #&3P(4 $" <1 %$<

Y" "4 4 " =&&#+(/ *(# $(9 %012#

: IM\(&(C$+(%&"(Q=+&B+; L(&(Q$+, , * $+("A#$+&, +(T "'(%##" $(&A; (B+(#^A\EB"A+$(> &G] * $, B

?.U#&P1&<- &3P(4 $0&

) 1&#' ='$

: N, +(&A(+I B^AF* ", ="AF(&F+AE), * 'EB] '+(C%&B+(, * $B% A; "AF(C$+8

Z / #(<1&#' ='$

:) %A+(KA%$T A8

) 9$2&' ($U9/ <1 %(- " 'C(' %<

: D$% QB3(", %&B+(B+(, #+A+(] Q$+> %"AF(&' (Q+$, %A, (3% (B+(^ '#"A'EB3%Q2B+("/A#": +AE'C B+$+(", (&(C$+$(] %&##EP#A(, =&" (] +(EB\<+A("A* %" "AF(&A&]Q+$ %A&'(S', K(%&(T 'B=% B[* 'EB] '+

>" 'C(' %/ 1<(# $ %" "'

: O+#"% Q2% 'EP#A(Q3% * #B (> &Q"A#* ; +(B+(C% %' "AF(> &B+$'&', a

0$2/ 4 9/ <&& 3(9 %012#<

: #&$] %A(; '% " , +

#&$] %A(> %#% "; +

) 9$2&' (9 %#&2#&'$

: ?'$+' CF=B+$ (, =% " ; (T +&$] &QQB%Q&$&B+(Q3%B+#B^+(+: * "Q> +AB]&A; (, +' C#%#EB"A+; (] $+&B"AF

$\ 1&4 $3#(" %'#&X'&P- #&%

: &QQ&$&B3, (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(&A&]Q+$ %A&'(S', K(%&(T 'B=% B[* 'EB] '+(EB&"A"AF8 S^ &#" &B+(, * $B% A; "AF(&$+&, $((Z ++Q" AA+#+, , &$3]&A; (" AQB%B+#B; (Q+$, %AA+'(C$%> +AB+$"AF$(O%A^&B+& #=(%(T &'K(B+$% F=(, Q(";+: (> &B+$'&$(W % (] $+&B"AF(^ &Q2&(%&(> ", B D$%"; +(&; +: * &B+(^ +AB\&EP#A&(__ +&$]&QB%Q&$&B+(Q+$, %A&(Q3%B+#B^+(+: * "Q> +AB[P ++(@+#EP#A(. R8

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

: W %(; ", Q+$, &(%Q, Q(" +; (> &B+$'&$(&A; ($' A%Q2&A; (#'%&B+#B[T 'B=, %'L(T &B+$T &G L(; $&"A, &A; (, +T +$, $(MA%$&> (B+(+(S+' +"&A&B<" B+%&B+, ("Q3B=+(Q3% * #B=&, (#&$, +; (+A^ '$'A> +AB& Q3% * EP#A(P? +T +$, L(T &B+$T &G L(, %'(%&'$R8

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

) 4 "'' (<9 &

: @B\Q("+&K('Q(T 'B^% B$', K&(! % +(#'%&B&"A+$, (Q3% (, Q("(&$+&$(W.Q2B'&#=($+'+&, +(Q3% * Q(T "A; $(([D$^+ +AB+AB\Q"AB%, +T +$, L(T &B+$'#'% $, +, L(] &, +> +AB (%&#'%2CA+; (&$+&, $(_ &, = , Q(" &F+, ("AB\&A(+(C' +AB&B+&B> +AB\Q.&AB'%Q2B'#++; (&, (%<'% T , $((V '%&B"A'A&A; (#'%+#B , Q(" &F+(T 'B=(A'%A '#'%] *, " , B] ' +L(&] , '%] +AB> &B+$'&'(+B'F$, &A; L(+&$B+L(^ +$> '#" ''B=(% : "B3% &#+'% , (+&$B+(&A; (Q&#+("A(#'%&B"A+$(Q3%[, "", Q3%, &(&###'%&, "AF(B%['%#&;(S+F*' &EP#A, P.++(, +#EP#A(06R](O", Q3%, +(%Q"'%&(&"'#+A, +; (T &, B+(; ", Q3%, &(#'%&B##B%&((V '%&B&> "A&B+ &] , '%] +AB> &B+$'&(> &Q2B% +(B+(, &> +(=&U&$] (&, (B+(, Q(" +; (Q3% * #B(] '%&#+&, ++(, +#EP#A 0(Q&(+> +$F+A#G(#'%&B##B%AC&> &EP#A(&A; (, +#EP#A(06(Q&(T &, B+(; ", Q3%, &'8

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

>" 30' &3P

: D* EP#A(&QQB%Q&$&B+(Q+$, %A&'(Q3%B+#B^+(+: * "Q> +AB[P ++(@+#EP#A(_ R((S.&B^AF(L(; $'A%'AF(&A; _> %%'AF(, (=% " ; (] +(Q3%+"] 'B+; ("A(&$+&, (T =+$+(B+", (> &B+$'&$(", (=&A; '+; L(, B%&+; (&A; Q3%#+, , +; 3(_ %&+G+$ (, =% " ; (T &, =(=&A, , (&A; (Q&#+(] +Q3%+(+&B^AF(L(; $'A%'AF(&A (, > %%'AF8 J +> %+(#'%&B> "A&B+; (# %&"AF(&A; (Q3%B+#B^+(+: * "Q> +AB[+Q3%+(+AB+$'AF(+&B^AF(&$+&, 8 O%(A%&"AF+, B[(W % (#'%&B##B[T 'B^(+G+, L(, %'A(&A; (#'%&+"AF3(W % (] $+&B"AF(^ &Q2&(%&(> ", B N, +(%^A'GT 'B^(&, +: * &B^(^ +AB\&EP#A&(__ +&$]&QB%Q&$&B+(S+, Q(3%B+&(T =+A(^ +AB\&EP#A(", "A&, +: * &B+$(Z ++Q"A(B^+(%$F"A'&(#'%&B"A+$(%(&A(&QQB%+; (&B+$'&$B^+(> &(Q3%+(&

#'%&(Q&E['+(> &B+$'&'L(+&QBEF=EG#'% +; (T =+A(A%&[A(", +&(S.> QB[#'%&B"A+$(S+B&'A Q3% * #B&+, ", * +(&A; (#&A(] +(=&U&$, % , &((C%&A'%&+" , +(#'%&B"A+$8

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

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

) # %P$

: @B\&+("A(&##'%&, &A#+(T 'B=('%#&'($+F*' &EP#A, &((@B\&+("A(%&F"A&'(#'%&B"A+$(Q3%B+#B=; (3%> : "$+#B], * A"F=B^A(&; $3(#'%%(&A; (T +' ' ^+AB &B$; (&$+&(&T &3(Q3%> ("A#'%> Q&E] '+(> &B+$'&', P.++(, +#B^A(0- R&A; (3%% (&A; (; $'A%3(Z++Q#'%&B"A+$(B=E(G#'% +; (&A; (, +&+; (* ,AB(($+&, G 3%$", +&(V %&B"A+$ (B+&B=&' +(] ++A(%Q+A+; (> * , B] +(#&$+C" 'G$+, +&+; (&A, (K+Q3' Q3F=B B\(Q$^+ +AB] +&\&F+&(Q3%[A%'&(#'%&B"A+$ B((N, +(&Q3%Q&$&B+(#'%&B"A> +AB B\&' % (+A' $'A> +AB\(#'%&B> "A&B'%&8

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

H3&$0() #'#&<

I3P%0&$3#	?.U9/ <1 %$(' & &<
F'G#+$%	R5_ I> (\H3 &$0() #' #&<\W <_ V\4(0- (> F7> b R5_ I> (@ 6 (\H3 &$0() #' #&<N[D$E$E7EW <_ V\4(0- (> F7> b[. (=% $P\ R(]' %$> a(M=&; &] '+(Q$#EP\A G) > R(. ?^ (\H3 &$0() #' #&<N] EE7EW <_ V\4(4(> F7> b[. (=% $P\ R(]' %$> a(J +, Q[$$] '+(Q$#EP\A ((<_ V\4(04(> F7> b[. (=% $P\ R(]' %$> a(<%$&(; * , B G) > R(. ?^ (7EA\E(\H3 &$0() #' #&<N\FS'EA\E\W <_ V\4(4(> F7> b[. (=% $P\ R(]' %$> a(J +, Q[$$] '+(Q$#EP\A ((<_ V\4(0- (> F7> b[. (=% $P\ R(]' %$> a(<%$&(; * , B G) > R(. ?^ (\H3 &$0() #' #&<\W <_ V\4(04(> F7> b[. (=% $P\ R(]' %$> a(<%$&(; * , B R5_ I> (@ 6 (\H3 &$0() #' #&<\W <_ V\4(0- (> F7> b[. (=% $P\ R(]' %$> a(<%$&((Q&$E#" '&B+, G) > R(. ?^ ((\H3 &$0() #' #&<\W(Z / #&<(; $<9 &%=' $<_ V\4(04(> F7> b[. (=% $P\ R8

5" 3" 0"

G2219" #& 3"' ($U9/ <1 %$(' & &<		@ R(\A(- / 1%W			) @^ (\F)K(4 &<W			5 $&&P			
I3P%0&$3#	^ &#)^ 4 $	994	4 P$# '	G# $%	994	4 P$# '	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(C&B+ L(&'$ 'C' $'IC'AF(%&(&'$ G-; (S+, Q'S&B&(#%+ Q(C'AF(T 'B+(&A(&QQB%&+; , B&A; &$, ('Q&$'; K(&, , +, , > +A&B'A; '#&B+, (B", (", (A+#+, , &$C&(J + , Q'S&B&(, +`+#B'%A(> * , B] + ] & +; (%A(KA%'&' A'%&(&AB#'Q&B+; (+I Q%* $+('+^+', L(B+=(=&L&$, , (%Q(B+=(Q&% * #(&A; (B+=(, &G-T %&'CAF("> 'B (%Q(B+=(, +`+#B+; ($+, Q'S&B&(

>" 30<

V=+> '#&' $+, ", B&AB("> Q+$\ "%, (F' %+, (#%+ Q(C'AF(T 'B+(&A(&QQB%&+; (, B&A; &$, (, =%' ; (] + T %&A(&B&"(B+ +, (T =+A(=&A; '"AF(#=+> '#&(Q&% * #B (''Q&('$, K(&, , +, , > +A&B'A; '#&B+, (B=", (", A+#+, , &$C&

?+$<

@&G-B&+G-T +&$(#%+ Q(C'AF(T 'B+(&A(&QQB%&+; (, B&A; &$, (, =%' ; (] +(", +; (T =+A(&('$, K&, , +, , > +A&B'A; '#&B+, (B=", (", (A+#+, , &$C&B&(&^% ; (+I Q%* $+(B%(" : * ", (, Q&, =+, L(> ", B (%; * , B 8

) L&

D+$, %A&(Q&%&#B+ +(+: * "Q> +A&B'C&(B+(] % G, =%' ; (] +(, +`+#B-; (] &, +; (%A(B+=(B&, K[ ] +'AF Q+$'C&> +; (&A; (B+=('$', K, ("A* %+ +; (&A; (, =%' ; (] +(&QQB%&+; (] G&(, Q+#'&' ; B] +C&G+(=&A; '"AF B=", (Q&% * #B

?3T&%34 $3#' ($U9/ <1 % 2/ 3#%' <

S> " , , '%A, (S%+ (^+A&B&B'A(%&('T %&'Q(Q&%&+, , (+: * "Q> +A&], =%' ; (] +(#=+#&(+; (B](+A, * $+(B=+G #%+ Q(G'T 'B+(B=+(S+: * "S+> +A&](%Q=+A^ 'S%A> +A&&(Q&%&+#B'A('+F" ' &B'A'&(](MA(, %+ +(#&, +, L C> +(, #S']] +$,](CB+$, (%&(+A"A'=+$'AF(> % 'C'+&B'A, (B(&B=+(Q&%&+, , (+: * "Q> +A&T '" (] + A+#+, , &$C&B(&$+; * #+(+> ", , '%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

7B&') #' =&$+(" 30 ('%$" 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; 'EA\ (%&, E%&R F+(&A; (* , +L(=&L&$, % , (; +#%> Q%* EA\(Q&% * #B (, =%' ; A%&] +(Q&% * #+; 8

. / <<&=&$+(/ *(- " Q' %/ 1 < %" 2#& 3 <

NA; +$(A%$> &(#%A; 'EA\ (%&, E%&R F+(&A; (* , +L(=&L&$, % , (S+&#EA\ (T '"(A%&%## $8

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

H3&&0() #' #5 <

R21#5(# U&2&+

. %0 12#&B P%0 &$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	9O4- (O+$> & 9O4- (H$&X	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#&B P%0 &$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	@'] `#=$'A'#(<O4- (H$&X @' ] `#=$'A'#(<O4- (H$&X	J &B J &B	01. - - (> F7KF 21(F7KF	/ . (; &G V%A\B^ * % , 6-(; &G M&B+$> 'EB-AB

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

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

9'G(@F+A#+(J +, +&$#=@@@@@@@CH(E'% (005(@@@@@@@@@@@@@@@@@@@@J %#<C& L%@@@@(P 04R21. '- 535(@@@@@(TTT B#+> %@%>
D'+$#=(E '%@#=A%%FG%A#3(@@@@@5535() 8! +$; '&A(J %&; (@@@@@@@@@100- 4(@@@@@@@(P 04R21. '5601(? &)

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

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

. %0 12#&B 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 " %

) %&8^ &' &] '+8

) $3<&$&5%

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

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

. %0 12#&B P%0 &$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	S: * "^ % #&'(((H$&X ('(<O9 %	! % , +	. 58!(F7KF	/ 4(T ++K M&B+$> 'EB-AB

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

5 '" <<&2" #& 3

. %0 12#&B P%0 &$3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z @	G) >R
F'G#+$%	`	`	`	`	`	) %A+8

! 1# P$3 &$&+

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

. %0 12#&B P%0 &$3#(3" 4 $	@&<#	?U9$%# $3#	; $<1'#
F'G#+$%	VCB\F+A+B#(WA&G ", O) W\A=] 'EA\	@] g+#a[& > > &"&A'WA'> & @] g+#a[& > > &"&A'[* > &A	D%'B+ D%'B+

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

@&%# P$3 &$&+

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

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

. %0 12#&B 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$+C%&B>; a / . - (> F7KF N A$+C%&B>; a . 1/ (> F7KF N A$+C%&B>; a 01 - - > F7KF N A$+C%&B>; a 002(> F7KF	0(; &G / (; &G 0(; &G 0(; &G 0(; &G

5 / 32' 1<& 3 $} 14 4 " %

) %&8^ &' &] '+8

5 " 3 " 0 "

R21#5(# U&2&+

. %0 12#&B P%0 &$3#(3" 4 $	; $<1'#	) 9$2&5<	, / <$	?U9/ <1 %
F'G#+$%	9O4- (O+$> & 9O4- (H$&X	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 +, +&$#=@@@@@@@CH(E'% (005(@@@@@@@@@@@@@@@@@@@@J %#<C& L%@@@@(P 04R21. '- 535(@@@@@(TTT B#+> %@%>
D'+$#=(E '%@#=A%%FG%A#3(@@@@@5535() 8! +$; '&A(J %&; (@@@@@@@@@100- 4(@@@@@@@(P 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#+$%	SG+, ((! ": ('$EBAB @K'A'((! ": ('$EBAB	J &]] 'B J &]] 'B	` `	/ 3(=%$, (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+B+(WA&'G ", O) W%=']'EB%A	@] g+#B@! &> > &"'8A'WA'> & @] g+#B@! &> > &"'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#+$%	` ` ` ` ` `	` D%'B+ + ` ` ` D%'B+ +	` ` ` ` ` `	J &@(! &+ + J &@(! &+ + J &@(! &+ + ! &> > &(', Q+#"+, * A, Q+#"C+; ('(! &+ + J &@(! &+ +	N A$+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'#&A#+(C&+#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# $%' 0T$'%$(' $ "'$2#< :) %(A'A9'8' A(, 'FA'C'#&A#+(C&+#B) (%@#$'B#&'(=&L&$, , 8

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

a " <#&(0&9/ <"' : <=+(F+A+$&B'#A'%(T & B+(, =%' ; (] +(&^ %, +; (%(> "A"> 'U+; (T =+$+^ +$(Q&%, ,] ' +8((@FA'C'#&AB ; * &AEB+, (%(T & B+(Q&% * #B@$+, ,+; ("A'&(, * 'B&] '+(+(C" +AB@$+&@> +AB(Q&AB@(O", Q&% +(%@, * $Q" , (&A; (A%'A' $+#G#' &] ' + Q&% * #B(^ '&(&("#+A, +; (T & B+(, ' ; Q&% &('+F", '&B'#A'(&A; (&AQ$+F"%A&' ('%#&'(&" B+'%B@$+: " "$+> +AB 8 & B+(Q&#+&F"AF(, =%' ; (] +($+#G#'+; 8((M#'A+$&B'#A'%(' &A; C'(, =%' ; (%A'G] +(#'%A, ", +$+; "T =+A($+#G#'"AF(", (A%@G>&, ,] '+8((<=", (> &B+$'&(;&A; ('B(#'%A@&"A+$(> * , B] +(; ", Q&% +; (%(7A'(& , &G-(T &@((V&$+(, =%' ; (] +(B&+A(T =+A(=&A; "'AF(+> Q&+: (#'%A@&"A+$, (B+&@=&^ +(A%@(++A #'+&A+; (%@$'A, +; (% B((S> Q&B#'%A@&"A+$, (%(" A+$, (> &Q$+B&"A, %> +(Q&% * #B&+, ", * +, 8 W'%, (; ", Q+$, &'(%(, Q" +; (> &B+$'&((&A; ($' A%@(Q&A; (#'%A@&#+B'T 'B+(, %'&(T &B+$'T &G L(; $&"A, &A; (, +T +$, 8

, &<9/ <"' '(<- / 1' 0(=$(&(" 22/ %" 32$(M#+ ("99' &" ='$(%P&' 3"' !Q3" #&' 3"' ("30(/ 2"' ("' M<("30(%$P1' " #&' 3 <8

; $"$%(# () $2#&' 3 U:(>RZ , ^IZ _ (RZ , () @G; R_ ?("30() $2#&' 3 (A'(?b. G) H; ?(5 GZ @ G^) S ?;) GZ R^ (. ; G@' 5 @GZ */ %' 0 0 &#&' 3"'(- " 30' &$P(&3 */ %4 " #&' 3 ("30(9 %#52#&' 3 (/ *($4 9'/ +$$<8

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

; $P1'" # % &3*/ %4 " #&' 3	HZ (314 =$%	. %9$%<- &@9 &$P 3" 4 $	5 '" <<$<	. _c
. G@5 '" <<&@" #&' 3	) %@ $+F" ' &B+; 8	`	`	`
IR@RX _ ; (5 '" <<	) %@ $+F" ' &B+; 8	`	`	`

D\ (a D&#K'AF(F$'%Q

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

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

H3 &&0 () # #&<

>5) (5'"<<&&2"" #&8 3 : N&EBEBAF(> &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(FEDSFBDCSF77SF7D($U#%$4 $'+(- " Q' %/ 1<(<1=<#' 32$<a() %QB% * #B (T +$+(C% A; 8
) R; R(FEDSFBDQ($4 $'%P$32+(9' " 33&8P(" 30 (3/ #&8&2" #&8 3a() %QB% * #B (T +$+(C% A; 8
) R; R(FEDSFBDCSF77SF7D(,- " Q' %/ 1<(2- $4 &2"'' <a(F G#+$%
) R; R(F77SF7D(!) ,) (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(] ED :) %@ ", B+;
5 '" <<(\() 1=<#' 32$<

5'$" 3 (R&(R2#\() $2#&8 3(] ED :) %@ ", B+;
5 '" <<(\\() 1=<#' 32$<

, ?R(^ &#\(5 - $4 &2"'' < :) %@ ", B+;
V %21%/ %5 - $4 &2"'' <W

, ?R(^ &#\\(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 $M(g / % :) %A+(%QB+(#%> C@A+AB(&$+(", 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(0U(L5`DJ HDW)' S<J M19

H3 &&0 () # #&<(&8T$3# % :) %@ +B+$> "A+; 8
V@ 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+(%QB+(#%> C@A+AB(&$+(", B+; 8

5 ?. R(@ U&(<1=<#' 32$< :) %A+(%QB+(#%> C@A+AB(&$+(", B+; 8

5 "3" 0" (&8T$3# % :) %@ +B+$> "A+; 8

@ &(9% 0 12#(- " <[=$$3 (2"" <<&&$0 (&8(" 22/ %" 32$(M&# (# $(- " Q' %(2%&$%& (/ "(# $(5 / 3#%'' $0 (. % 0 12#<(; $P1'"" #&8 3<
" 30 (# $(!) ,) (2/ 3# &8<(""' (# $(&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$3# %#(\RI5) \#) %@ +B+$> "A+; 8
5 - &8" (&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 9&8$<(&8T$3# %#(V I5 5) \#) %@ +B+$> "A+; 8

9'G(@F+A#+(J +, +&$#=((((((((DH(E'¼ (005((((((((((((((((((((J '%#<D& L#9((((P 04R21. '- 535((((((((TTTB#+$> '%#'%>
D'+$#=(E'%B#=A%%FG%#9((((((5535() 8! +$; '&A(J '%&. ((((((((((100- 4((((((((P 04R21. '5601(? &I

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

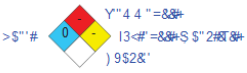
7] 8(G#. $'%(&8*/ %# "#&8 3

^ "=$'('%$\ 1&$4 $3#< : ! V\Y(V\W\N@$(J S@D\M V\<HJ Y(<J V\W<\(SYS(V\Y O(@Z M(MJ M\V\<M\) 8((V\H) <V\W\@
! V\<SJ N\9@'(<[V\<[V\W) (V\W\N@$(<V\J \ S<(HJ \ V\] (O\V\' V\W S8

>" Q' %/ 1<(! " #5 %&' :
I3*/ % " #&8 3 () +<#&4 (V\H) 8R8\V

@ $(21<# 4 $'%&<(%<9/ 3<&' $(*/ %0$#5 %4 &8&R(# $(. . ?(2/ 0$('/ %# &(4 "#5 %&' 8

Z" #&8 3"' (Y&8(. %#5 2#&8 3 :
R<</ 2&#&8 3 (\H) 8R8\V



, "#5(/ *(9%$T& 1<(&<<1$:) %Q&+^"% , (^&"; &EP\A8
6 $%&8 3 : 0
. %9" %0 (=+ : ! @D@F# +F*' &B%&G@D+#'&"; B+

I30&2" #5<(&8*/ % " #&8 3(# "#- " <(2- " 3P$0("%4 (9%$T& 1<' +(&<<1$0 (T$%&8 38

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

@ (# $(=$<#(/ *(/ 1%&.3 / M'$0 PSN# $(&8*/ % " #&8 3(2/ 3# &8$0 (- $%&8(&("221%#&8>/ M\STS'%B3$& $%# $("=/ T$\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" =&&#+(/ "(" 3+(4 " #5 %&' (&<(# $(<' $(%<9/ 3<&=&&#+(/ "(# $(1<$%R' (4 " #5 %&' <(4 " +(9%$<$3#
13L3/ M3(- " Q' %0<("30 (<- / 1'0 (=$(1<$0 (M&# (2" 1#& 3 8R' # / 1P- (2$%# &8(- " Q' %0<(" %(0$<2%&=$0 (- $%&8 N\MS(2" 33/ #
P1" %3#5$(# " #(# $<$(" %(# $(/ 3'+(- " Q' %0<(# " #(\U&=#8

9'G(@F+A#+(J +, +&$#=((((((((DH(E'¼ (005((((((((((((((((((((J '%#<D& L#9((((P 04R21. '- 535((((((((TTTB#+$> '%#'%>
D'+$#=(E'%B#=A%%FG%#9((((((5535() 8! +$; '&A(J '%&. ((((((((((100- 4((((((((P 04R21. '5601(? &I

Thermo SCIENTIFIC

C#?0(+/(=>%?? +(@&>%?(AB% "/'B
The world leader in serving science

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

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

78(. %012#("30(2/ 4 9" 3+(80$3#&&2" #& 3

. %012#(3"4 $	:	! " #$%(&') %&"+, (- . //'%(	
) 199'&%	:	=>%?? +(@&>%(AB% "/'B C'%2E%(- '+"%E>, +D-) E C9F 9(- +G)11H I +EJ/+0<KL (31185 M.'"%<(A"#"% 2159%G2$%HCH(+0 2889?HC97H47	
		! "31"'2#1 %%	: =>%?? +(@&>%(AB% "/'B C'%2E%(- '+"%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%68149	
. %&#(0"#&		5676%8149	
; $<9 / 3<&-'$(3"4 $		! A&A(AP%E#D&	
		5>?! @?5: ABB8DDDEFEBB GH(@ I. ?(H) : JEF8%DJ8FAAJ	
		! "#&%&'(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<(80$3#&&2" #& 3

?4 $%&32+/ TS%&M		
. - +<&2"'(<# #&	:	:';. '<9
5 / ' / %	:	U+D-D7%$9UD#09
G0 / %	:	F <+D7%$9
>"P' %(<# #&4 $3#<	:	" F =(QTCQU=Q&(=F(CI F &MUQ(AIV" L@UW =(W&XQI AQ(YQW =Y(Q@@U=A(Z YQ" =YQI QUF! ! Q" &Q&(L" A=I MU=LF" A(@F I (MAQ(W Q(@F : : FZ Q&9
G) >R9-5) (<# #1 <	:	Z >'D%">'$(? #"%0#!D$(, +"(B+, $'<%0#&(>#$#0<+. $([E"%>%F AYWY#$#0<(U+? ? . , 'B#"+, A'#, <#0<(\4NU@ (1N1891488]K">'$(! A&A(B+, '#', $(^#D#[D%', /+0' #"+, (B0"B#!0'+("%> $#/%>#, <D) (#, <(P0+P"%(. $'%+/(">%¶F0+<. B'9=>'$(! A&A(S>+. B<([%(0(#', %<(#, < #^#"B#[D%/+0(%? PD+E#&&(#, <(+">%(. $'%&$(+/(">'$(P0+<. B'9
; / 1#&<(/ "($3#%	:	&%0? #!(B+, "#B'%(QE"%B+, "#B'%[. >##"+, 9[.) %"+, 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<$9
5"%8& / Q&3 &8#+	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0*B#!D>#S#0<$9
! 1# Q&3 &8+	:	" +(J, +R, ($') , '/'B#, '(%/'%$S(+(]E0*B#!D>#S#0<$9

$ %&') (* +) ' -+ / (0 122) 3

D8(> " P' %0<(80$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%$(-8Q3<S<+4 9# 4 <

I3-"'"#& 3	:	" +($P%$/'E(<#'#9
I3Q&<#& 3	:	" +($P%$/'E(<#'#9
) L&	:	" +($P%$/'E(<#'#9
? +$<	:	" +($P%$/'E(<#'#9
! $0 &"'(2/ 30 &&3 < "QQ%T" #&0(=+(/ T$% $U9 / <1%	:	" +, %J, +R, 9

) $$(# U&2 / ' / Q&"'(&*/ %4 "#& 3(\/ $2#& 3(77W

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

@ $'%(" %(3 / (&Q%$0&$3#<(9 %<$3#M- &- NM&# &(# $(21'%&3#L3 / M'$0Q&(// '(#. $(<199'&$%' 30(&(# $(2/ 32$3#%#& 3< "99'&2" = $N(" %(2" "<<&&$0(" <(- " P' %0/ 1<(## (- $"'# (/ %## $(($3T&& 34 $3#("30(- 32(%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%0(%E"/0<$9(V %(? %<'B#D #"'% "+, (' /($E? P'+? $(+EB 09
) L&(2/ 3## 2#	:	L (B#$%(+/(B+, "#B'(K? ? %<'#"%&E/(D$>($J', (R'">(F[D% 'E(+/(R#"%0(/+Q(#"'[D#$'(15(? ', . "% R>'D%0? +^',) (B+, "#' ', #"%<(EB+">',) (#, <($>+%$9(Z #$>(EB+">',) ([%+0?%0% $%9([D#, $>+%&(">+0+.) >[]L [%+0?%0% $%9((V %(? %<'B#D#"'% "+, (/($E? P'+? $(+EB 09
I3- "'"#& 3	:	! +^%(%P+$%<(P%$+, (*+(/0%&>(#'09([/(, +"[[0%#">',) K'/([0%#">',) ($('00%) . B#Q+Q'/ 0%&P 0#"+Q E[#'00%'[+EB 0&K'P0+^'<'9#'0"/ B#]0%&P0#"+, (+Q+Q E, % ([E["0#', %<(P"%$+, . %9 : ++$% (*) >"(EB+">',) ($. B>(#$%(#B+D#'0K(*%([%Q(+Q(R#'$"[#, <9((V %(? %<'B#D#"'% "+, (/ $E? P'+? $(+EB 09
I3Q$<#& 3	:	Z #$>(+. '(? +. ">(R'">(R#"%9(&+(, +"(', <. B%^+? '",) (. , D%$$(<'0%$%<('+(<+(S+([E(? %<'B#D P%$+, . %9([" %%J) ^%#, E>',) ([E(? +. ">("+(#, (. , B+, $B+. $(P%$+, 9((V %(? %<'B#D #"'% "+, (' /($E? P'+? $(+EB 09
. %#&2#& 3(/ "(*&#X' &0$%	:	" +(#B"+, (S>#[]L %'#J% (', ^ +B',) (#, E[P%$+, #[]0$J(+Q(R'">+. "($. '"#[D%'0#', ',) 9
[/ #&<(# (9- +<&2& 3	:	" +($P%$/'E("0%#"? % "9(=0%#"($E? P'+? #"B#]E9(U+, "#B'(P+'$+, ("0%#"? % "($P%$B#D$* '? ? %<'#"%9E"/(B#J) %, . #, *"*&(>#^%9[%%(',) %&"%<(+Q', >#D%<9

K8(Y&%$X&Q- #&8Q(4 $" <1%$<

Y"'"4 4 "=&&#+(/ "(# $(9%012# ?U#&Q1&<- &QJ4 $0&	:	L (#(/'0%+Q'/(>%#"%<K#(P0%$S. 0%(, E0?#$%(R'0]+EB 0#, <(">%(B+, "#', %(? #E[. 0$"9
) 1&#'=$	:	M$%#, (%$3',) . '$>',) (#) % "($. "## [D%/+Q(">%($. 00+. , <,) (/'0%9
[/ #(<1&#'='$	:	" +, %J, +R, 9
) 9$2&'($U9 / <1%(- "P' %<(	:	C0+? P'0[E'$+B#"%">%$E#% %[E(0%? +^',) (#[]P%$5+, $(/0+? (">%^'B, 'E+/(">%', B<% %'(/ ">%0#'$(#(/'0%9(" +(#B"+, (S>#[]L %'#J% (', ^+B',) (#, E[P%$5+, #[]0$J(+Q(R'">+. "($. "## [D% "0#', ',) 9
>"P' %/ 1<(## $% "' 0$2/ 4 9/ <&& 3(9 %012#<	:	" +($P%$/'E(<#'#9
) 9$2&'(9% #&2#E'$ $Z1&4 $3#"/ %'8&X'&Q- #&%	:	@(0%/') >"9$(S>+. B<(R'#0(#FP0+P0#"%(F0+"%E"^%% . 'P? % "(#, <($%0 E+, "#', %<([0%#">',) #F+"#'0#". $(\AU- V%(R'">(#(/. [D?#E%(_P "%E9(+(P"%0#"%<(", (P+$"^%(P0%$S. 0%(? +<%9

$ %&) (* +) ' -+ / (0 122) 3

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

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

: " +(#B"+, (>=#[[%'*#J% (, ^ +-B',) (#, E[P%6$+, #[[0$J(+0[R'">+. *($, "*# [D%'0#', ',) 9 Q^#B #"%($. 00+. , <',) (#0%*$9(' `%6P(. , , %#&$#Œ#, <(. , P0+*%6%<(P%6$+, . %(/0+? %, "%0,) 9(&.+(, +"(*+. B>(+0R#D(">0+.) >(SP D%<(? #"%0#9(C. *(+, (#FP0+P0#*%(P%6$+, #D P0+*%6^ %(%. 'P? % "(\$%&A%6'+, (2]9

?3T8&34 $3#' (9%2" 1#& 3<

: V\#+'<(<'$P%6$#D+/(SP D%<(? #"%0#D#, <(0 . +//(#, <(B+, *#B(R'">(S+'D0R#*%0R#E$K(<0#', $ #, <(S%R*%6$9(L /+0? (">%(0D%6#, *(#. ">+0"*%(/(">%#P0+<. B*(>#$(E#. $%<(% ^ 0+, ? % *#D P+D0 "+, (\$*R%6$K(R#"*%0R#E$(S+'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%((VD%0 #^*^%0B(+0'/(R#*%0', $+D [D%(#[$+0((R'">(#, (, . %0'(<(E? #*%0#D(#, < P#B#, '[+0(P0+B%8<(#$(/+(D%R$9((U+, *#', (#, <(B+D%B(*(SP D0B) %(R'">(, +, B+? [. $*[D%K #[$+0[% '(? #*%0#D(%9 9$#, <(K%#0*>K(*%0' 'B D*%(+0(<'#*+? #B%. $(%'#0*>(#, <(P#B#D%. B+, *#', %0(/+0(<'$P+$#D(#E0+0<',) (*+(D+B#*(D%) . D#*+, $(\$*%6($*6#', (17]9(&'$P+$%(+/(^'#(# D#% $%<(R#$*%<'$P+$#D(B+, *(#E+0((" +*%($%6($*6#'+, (1(/+0(*% %0) % EE(B+, *#B' ', /+0? #*+, (#, <(\$*6#', (17(/+0(R#$*%(<'$P+$#D

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

>" 30'&8Q

: C. *(+, (#FP0+P0#*%(P*%6$+, #[[P0+*%6#*^%% . 'P? % *(\$*%(A%6'+, (2]9(Q#*,) K<0, J',) (#, < S? +J',) ($>+. D%([%(P0+>'['*%<(', (#0%#$(R>%P%(">'S(? #*%0#[D$(>#, <D%<(%$*+0%<(#, < P0+B*%$%<9(Z +0[%6$($>+. D%(R#$>(>#, <$(#, </(#B%[%+0%(%#*,) K<0, J',) (#, <($? +J',) 9 I %? +*%(B+, *#? ', #*%<(EB>',) (#, <(P0+*%6#*^%% . 'P? % *([%+0%(% *%0,) (%#*,) (#0%#$9

) # %Q$

: A*+0%[%R'8% (">%(/+D#R',) (*%? P*%0#*. 0%$a(4(*+(2tU,(\75$(*+(C8$Cb(%9(A*+0%(, #EB+0<#, E%(R'">(D+B#D0%. B#*+, $9(A*+0%(, (+0) . #(B+, *#', %(P0+*%6*%</0+? (<'0%6* $. _D >*(', (#(<(E<B+#D#, <(R%D0.*% "B#*%<(#0%#K#R#E(/0+? (', B+? P#*[D%? #*%0#B(\$*%8 $*%6#'+, (18](#, </(+++<(#, <(<0 , J9(' %6P(B+, *#', %(*') >"B(EB+$*%<(#, <($*#B%<(, . *(D%#*<E(/+0 . $%(U+, *#', %$(">*#'(>#^%([%% (+P%%<(?. $*([%E$H0%. D(%0%#B%<(#, <(J%P(. P0) >(*(+ P0%% *(B%J#) %(&+(, +*(S*+0%(, (. . B#[%8<(B+, *#', %6$((M$%##FP0+P0#*%(B+, *#', ? % *(*+ #^+'<(% ^0+, ? % *#(D+, *#? ', #*+, 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#+$. 0%D? '*$H(P%6$+, #[D(R+0J F(B#EP%(#*? +$P>%0% +0['+B) 'B#[D? +, '*+0,) (? #*E[%0% . '0%<(*+(<%*%0? ', %">%%/%E*^% %$(+/(">%* % "B#" +, +0(+*>%([B+, *0+D? *#$. 0%(#, <G+0(">%, %E%$S *E(*+(. $%(0%P 0#*+(E[P0+*%E*^%% . 'P? % *9

?3Q8$$S*%8Q(4 $" <1 %<

: " +(SP*%B#[D % *B#*+, (0% . '0%? % *$9(V ++<() % %#[D % *B#*+, ($>+. D%([%$. /'[*% *(*+ B+, *0+D(R+0J %Q*%G*+$. 0%*+(#*([+0 %B+, *#? ', #, *$9(L/(">'$(P0+<. B*(B+, *#', $(',) 0%<'% *$ R'*>(%G*+$. 0%D? *$K($*%P0+B*%$S(% EB>$. 0%K(B+B#D%&>#. $*(^% *B#*+, (+0+*>%0 %) ', %0,) (B+, *0+B%(*+(J %%(R+0J %Q*%G*+$. 0%([%G+R(#, E(D%G+? ? % <%(+0(S*#*. *+0E D? *$9

>+Q&3$(4 $" <1 %<

: Z #$>(>#, <$K(+0%#0? $(#, <(/(#EP%(*>+0+.) >D#(#/*%Q>#, <D) (B>%? B#[D*0+<. B*$K([%+0% %#*,) K(S? +J',) (#, <(. $',) (*>%B#*+0E(#, <(#*(*>%% <(+/(*>%(R+0J',) (P%0+<9((\FP0+P0#*% %B>, ', . %($>+. D%([%. $%<(*+(0%? +*%P+*% *#D(E(B+, *#? ', #*%<(EB>*>',) 9(Z #*$> B+, *#? ', #*%<(EB>*>',) ([%+0%0% $',) 9(Q, $. 0%(>#*(%E%R#$>($*#*+, $(#, <($#/%E($>+R%$ #0%(EB#$%*+(*>%(R+0J $*#*+, (D-E#*+, 9

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

: /%AB*% B%(*$*#EB>((((((((CF(- +G11H(((((((((((((((+BJ/+0<%L ((((215)(%82_8HOH((((((RRR9>%0? +$B+? C*%B%(- '+*%B>, +G) E(L B9((((7HOH(' 9(*0<'#, ((+#<((((((((31185((((((((215)(%82_H13(@#G

$ %&) (* +) ' -+ / (0 122) 3

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

; $<9&%# %

: M$%(#(P0+P*Q((B/ '*%<#'0 P. 0/E,) (+0(#' 0./%<(0%&P0#*+0(B+? P((E,) (R'*>(#, (#FP0+^%< $'#, <#0<('/(#(0$J(#$$%&$? % *(', <'B#*%(">'$('(, %B%&$#Œ$((I %&P 0#*+0($%B&'+, (? . $*[% [#$%<(+, (J, +R, (+0(#, "B P#*%<(%E*+$. 0%(D%%&$K(*>%<#$#0<$(+/(*>%(P0+<. B*(#, <(*>%%&#/% R+0J',) (D' "$(+/(*>$%B%&*>%<(0%&P 0#*+09

>" 30<

: U>%? 'B#D0%&$'#, "K,? P%0^*+. $() B^%&(B+? P((E,) (R'*>(#, (#FP0+^%<($'#, <#0<($>+. D%([% R+0 (#"(#D(?. %&(R>% (>#, <D) (B>%? 'B#D(P0+<. B*$('(/(#(0$J(#$$%&$? % *(', <'B#*%(">'$('$, %B%&$#Œ$

?+$<

: A#/%E[%B%R%#0(B+? P((E,) (R'*>(#, (#FP0+^%<($'#, <#0<($>+. D%([% $%<(R>% (#(0$J #$$%&$? % *(', <'B#*%(">'$('$(', %B%&$#Œ[*+(#^+'<(%G+$. 0%(*+(D . '<(SP#B*$>%K(? 'S*$(+0 <. $*$9

) L&

: C%&$+, #[D*0+*%6*^%% . 'P? % *(+0(*>%[+<E($>+. D%([%$%B%6*%<([#$%<(+, (*>%(*#$J([%,) P%0+0? %(#, <(*>%0$J $(', ^ +B%<(#, <($>+. D%([% %#FP0+^%<([E(#(SP%B#E$*([%+0%(>#, <D) ">'$(P0+<. B*9

?3T8&34 $3#' ($U9/ <1 %$ 2/ 3#%' <

: Q? 'S$'+. $(/0+? (^%, *B#*+, (+0(R+0J (P0+B%6$S(%, . 'P? % *($>+. D%([%(B>%E0J %<(*+(% $. 0%(*>%E B+? P((E(R'*>(*>%(0%, . '0% *$(+/(% ^0+, ? % *#(D*0+*%6*+, (D% $(B#*+, 9(L ($+? %(E#$*%6K /. ? %$(E0. [[%$K(/'D%6$(+0(%>) ', %0,) (? +<'/'B#*+, $(*+(*>%(P0+B%6$S(%. 'P? % *(R'(D[% , %B%&$#Œ*+(0%<. B%(%? 'S$'+, $(*+(#EB%(P*#[D%(D8*%89

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

. - +<&2"' (<#'#&

: :', . '<9

5/ ' / %

: U+D+D%$$9(UD%#09

G0/ %

: F <+D%$9

9>

: H92(*+(29!

. &<9$%&<&<&#+(9% 9$%&$<

: &'$P*%$([D%(, (">%(/+D#R',) (? #*%0#B(B+D(R#*%0(#, <(>+*(R#*%09

) / '1=&&#+

: A+D([D%(, (">%(/+D#R',) (? #*%0#B(B+D(R#*%0(#, <(>+*(R#*%09

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

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

: =>%(P0+<. B*(S(*'#[D%9

5/ 30 &&3 <(# (" T/ &)

: " +(SP%B/'B(<#'*#9

I32/ 4 9" #&<'$(4 " #5%&' <

: " +(SP%B/'B(<#'*#9

>" P' %/ 1<(0$2/ 4 9/ <&&3 9 % 012#<

: M, <%(, +0? #(B+, <'*+, $(+/(*'+0#) %#, <(. $%(>#'$#0<+. $(<%B+? P+$*'+, (P0+<. B*$(S>+. D< , +*([%(P0+<. B*<9

. / <<&<&&#+(/ *(- " P' %/ 1< %" 2#&3 <

: M, <%(, +0? #(B+, <'*+, $(+/(*'+0#) %#, <(. $%(>#'$#0<+. $(0%#B*+, $(R'(D, +*(+EB 09

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

H3,&$0() #' #$<

R21#&(# U&2&#+

5/ 32'1<&3$ 14 4 " %

: =+(*>%[%'(+/(+. (U, +R(D%<) %(">%(*+GB+B+) 'B#([P0+P%0'*%(+/(*>'$(P0+<. B*(>#^%, +*([%% *>+0+.) >D#', ^%'*') #*%<9

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

5/ 32'1<&3$ 14 4 " %

: " +*(#^#B#[D%9

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

5/ 32'1<&3$ 14 4 " %

: " +*(#^#B#[D%9

) $3<&&$%

5/ 32'1<&3$ 14 4 " %

: " +*(#^#B#[D%9

5" %2&0/ Q&3&&#+

5/ 32'1<&3$ 14 4 " %

: " +*(#^#B#[D%9

: /%AB*% B%(*$*#EB>((((((((CF(- +G11H(((((((((((((((+BJ/+0<%L ((((215)(%82_8HOH((((((RRR9>%0? +$B+? C*%B%(- '+*%B>, +G) E(L B9((((7HOH(' 9(*0<'#, ((+#<((((((((31185((((((((215)(%82_H13(@#G

$ %&) (* +) ' -+ / (0 122) 3

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

5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
@$%# Q&3&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
; $9%012#&T$(## U&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
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[D9@
!%&#' #& 3$ / %& <&3
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
) $3<&#&$%
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
5 " %&(# / Q&3&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
! 1# Q&3&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
@$%# Q&3&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
; $9%012#&T$(## U&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@

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

? 2 / # U&2&+ : " +(J, +R, ($) , '/'B#, *(%/%B'$(+0[B0*B#[D>#$#0<$9
H3&&50() #'#&<
RZ1" #&(S2/ # U&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
. $%&<#&32$%$Q%0" =&&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
5 " 3 " 0 "
RZ1" #&(S2/ # U&2&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
. $%&<#&32$%$Q%0" =&&+
5 / 32'1<&3$ 14 4 "% : " +"(#^#'B[D9@
G# $'%0T$%$($""$2#< : " +(J, +R, ($) , '/'B#, *(%/%B'$(+0[B0*B#[D>#$#0<$9

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

^ " "<#&(0&>9 / <"' : =>%) % %B#"+, (+/(R#$"%($>+. B<([%(#^+'<%<(+0(? ' , '? ' S%<(R>%D%è %Q(P+$$'[D9@(A') , '/'B#, * ; . #, *"" %(+/(R#$"%(P0+<. B'($(%<. %&($>+. B<(, +"([%<'$P+$%<(+/(^ '#(">%/+. D$%R%Q[. * P0+B'%$%<(' , (#($. '"#[D9(%/D % "(''0%#"? % "(P B, "9(&'$P+$"%+/($. 0FD$(#, <(, +, .0%EEEB#[D% P0+<. B'$(^"#(#(DE% $%<(R#$"%<'$P+$#[D>+, "0#B'+0$(&'$P+$#D+/(">'$(P0+<. B'(%$+D "+, $ #, <(#, E[[E.P0+<. B'$($>+. B<(#"(#[D]"? %(B+? PB(R">(">%0% . '0%? % "$(+/(% ^'0+, ? % "#D P0+"%B'+, (#, <(R#$"%<'$P+$#[D>%'$B"+, (#, <(#, E[0%'+, #[D>B#[D#. ">+0"E(0% . '0%? % "$9 Z #$"%(F#EI#) ' ,) ($>+. B<([%(0%EEEB>%<9((L B, %&#"+, (+0(B#, </"[D$>+. B<(+, B([%B+, $'<%0%< R>% (0%EEEB) ('$(, +'(/%#'$[D9&(=>'$(? #"%0#B[#, <(" "$(B+, "#", %Q? . $"([%<'$P+$%<(+/(, (# $#/%&R#E$((Q? P"E(B+, "#", %$(+0(D %$(? #E(0%#', ($+? %(P0+<. B'(0%'<. %$9((V# +'<(<'$P%Q$#D +/($P'D%<(? #"%0#B[#, <(0 , +//(#, <(B+, "#B'(R" >($+'B(R#"%QR#E$K<0#', $(#, <('$%R%$9

: '/%AB'% B'%('%$"#B>(((((((((CF(- +G11H((((((((((((((((+BJ/+0<%L ((((215)(N82_8HOH(((((((RRR9>%0' +B+? C'%B'%(- '-+"%B>, +G) E(L B9((((((7HOH(' 9(%0<'#, ((+#=<(((((((((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 */ %& " "#& 3("30(9 %#%2#& 3(/ */($4 9' / +$$<8

7C8(@%3<9/ %#(&*/ %& " "#& 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#EJ',) () 0+. P

7K8(; $Q1' " "# % (&*/ %& " "#& 3

H3&&50() #'#&<
>5) (5 ' " <<&&2" "#& 3 : " +"(0%) . B#"%<9
H8) 9(Y0%' (%$Q1' " "#& 3 < : @ 5 R(AV'\WH; (?U$4 9#$ " "%&' (U4 9#& 3 a(" +"(<%%0' , %< H3&&50() #'#$<(&3T$3# %(\@ 5 R(A=\W\WB+? P+, % "$(#0%(D$"%<(+0(%&9 P"%<9
) R; R(FEDSFBC$F77$F7D($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(FEDSFBC$F77$F7D(- " P' %) / 1<(2- $4 &2" "<a(" +(P0+<. B'$(R%0%)/+. , <9
) R; R(F77$F7D(!) ,) (0&#%&=1#& 3(X(2- $4 &2" "(&3T$3# %)(X(- " P' %(&0 $3#&&2" "#& 3a(" + P0+<. B'$(R%0%)/+. , <9

5 '$" 3(R&(R2#(() $2#& 3 77D\=\W" P' %) / 1<(R&% . / " 1# ' 3#<(\'\-R. <W : " +"(D$"%<
5 '$" 3(R&(R2#() $2#& 3(\ BD 5 " " <<(!() 1=<# ' 32$< : " +"(D$"%<
5 '$" 3(R&(R2#() $2#& 3(\ BD 5 " " <<(!!() 1=<# ' 32$< : " +"(D$"%<
. ?R() &#!(5 - $4 &2" "< V %21%) / %6 - $4 &2" "<W : " +"(D$"%<
. ?R() &#!(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$"%<9
H3&&50() #'#$<(&3T$3# % \W(B+? P+, % "$(#0%(D$"%<(+0(%&9 P"%<9 \@ 5 R(A=W
5 " 3 " 0 "
^ >! I) (\5 " 3 " 0 " W : " +"(B+, "0+D$%<(, <%(Z Y! LA(\U#, #'<#]9
5 " 3 " 0 & 3 (&#< : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
5 " 3 " 0 & 3 ([. ; I : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9
5 ?. R(@ U&2(<1=<#' 32$< : " +, %+/(">%(B+? P+, % "$(#0%(D$"%<9

: '/%AB'% B'%('%$"#B>(((((((((CF(- +G11H((((((((((((((((+BJ/+0<%L ((((215)(N82_8HOH(((((((RRR9>%0' +B+? C'%B'%(- '-+"%B>, +G) E(L B9((((((7HOH(' 9(%0<'#, ((+#=<(((((((((G1185(((((((((215)(N82_H713(@G

$ %&) (* +)' -+ / (0 12} 3

7K8(; $Q1'"# %(&8*/ %4 "#& 3

5"3"0"(&8T$3# % : VIDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9

@ &(9% 0 12#(- "<{=$$3(2'" <<&&$0(&8("22/ %"32$(M&# (# $(- "P' %(2"&5%& (/ *(# $(5 / 3#%' '$0(. %012#<(; $Q1'"#& 3< "30(# $(!) ,) (2/ 3# &8<("'"(# $(&8*/ %4 "#& 3(%Z1&$0(=+(# $(5 / 3#%"'$0(. %012#<(; $Q1'"#& 3<8

[3#5%"#& 3"'(%Q1'"#& 3<

I3#5%"#& 3"'(&#< : R1<#%'&(&8T$3# %4(\R!5) \&W\IDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9
5 - &8"(&8T$3# %4(V?5) 5 \&W\IDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9
c"9"3(&8T$3# %4aV\IDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9
d / %"(&8T$3# %4aV\IDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9
[$M(e$"'"30(I3T$3# %4(/ *(5 - $4 &2"'<(\[el/ 5 \&W\IDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9
. - &&99&8$<(&8T$3# %4(V I5 5) \&W\IDE+? P+, % "$(#0%D$"%<(+0%&9? P"%<9

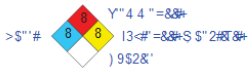
7\ 8(G# $%(&8*/ %4 "#& 3

] "=$'(%Z1&$4 $3#< : " F =(QTCQU=Q&(=F(QI F &MUQ(A!V" L@UW =(V\&XQI AQ(YQW =Y(Q@@DU=A(Z YQ" =YQ(I QUF! ! Q" &Q&(L" A=I MU=LF" A(@FI (MAQ(W Q(@F : : FZ Q&9

>"'P' %4/ 1<(! "#5%&' :
I3*/ %4 "#& 3() +<#54 (\H9 8R8/V

@ $(21<# 4 $%&<(%$<9/ 3<&*'$(*/ %0$#5%4 &8&IQ(# $(. . ?(2/ 0$(*/ %# &(4 "#5%&'8

["#& 3"'(Y&5(. %#52#& 3 :
R<</ 2&#& 3(\H9 8R8/V



, "#5(/ *(9%&#&8Q : K\$F\$DE7D8

, "#5(/ *(&<<1$: 56I6&8149

, "#5(/ *(9%T& 1<(&<<1$: " +(P0%'+. $(^#D<#"+, 9

6$%&8 3 : 1

. %9" %0(=+ : ! A&A(AP%&3#D$*

I30&2"#5<(&8*/ %4 "#& 3(#. "#- "<(2- "3Q$0("%4 (9%T& 1<'+(&<<1$0(T$%&8 38

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

@ (# $(=$<#/ *(/ 1%L3 / M'$0Q$N# $(&8*/ %4 "#& 3(2/ 3# &8$0(- $%&8(&("221%#5&8[>/ M$T$%&3$&# $%# $("=/ T$X3"4 $0 <199'&%&3/ %'3+(/ *(&#<(<1=<&8& %&<N' <<14 $<("3+('&'=&&#+(M- "#</ T%(/ %# $("221%2+(/ %2/ 4 9'$+5 3$<<(/ *(# $ &8*/ %4 "#& 3(2/ 3# &8$0(- $%&8 8
Y&8"'(0$+5%4 &8"#& 3(/ *(<1&'=&&#+(/ *("3+(4 "#5%&'(&<(# $(</ '$(%$<9/ 3<&-&&#+(/ *(# $(1<$%R'(4 "#5%&'<(4 "+(9%<$3# 13L3/ M3(- "P' %(<("30(<- / 1'0(=$(1<$0(M&# (2"1#& 3&R'# / 1Q- (2$%' &(- "P' %(<(" %(0$<2%&-$0(- $%&8N\5(2"33/ # Q1" %3+5$(# "#' $'<$(" %(# $(/ 3'+(- "P' %4<(# "#$U8<+8

K\$F\$DE7D8 #"'#

:'^%AB'% B'%('%*'#<B>%(((((((CF(- +G11+H((((((((((((((((((+EU/+0<+L ((((\215](\N82_8HCH(((((((RRR9>%0' +B+? C'<%B'%(- '+*'B>, +9) E(L B9((((((7HCH(' 9(*0'<'#. ((+#=<(((((((((G1185((((((((((\215](\N82_H'13(@8G

Thermo SCIENTIFIC

B#=(& &, <%=>) &'-$-<%=& @% (-A@

The world leader in serving science

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

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

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

. %012#&9"4 $	: ! " #$%& () * &) + (-) .		
) 199('$%	: ; <%=>) &'-$-<%&. @% (-A@ B-%=@&C-) (%@.) + DE BfF 7&C) G&/ H I) @A = k&8&/ / 45 M -(% & (#(% 0/ 57M10ZHOHC8, = 0447DHOZ3H23	! "31*"2#1 %%	: ; <%=>) &'-$-<%&. @% (-A@ B-%=@&C-) (%@.) + DE BfF 7&C) G&/ H I) @A = k&8&/ / 45 M -(% & (#(% 0/ 57M10ZHOHC8, = 0447DHOZ3H23
5 / 0$	: / 012234		
!) ,) &0	0301		
6"('0"#/ 3&0"#&	: 5G3624/ 27		
. %3#&0"#&	: 5G3624/ 27		
; $<9/ 3<=(5&9"4 $	! ' P' & * %@#+$(5 > ?! @ ? 5 : AEB8CDCDEFEBB GH@ I . ?&!) : JEF8<DJ8FAAJ	! "#&%'(& <$<	; $"$%#' &# $&3<#%2#/ 3 =/ / L($#&/ %9 % 9S%& 30 '3#&30$0&8 <$8&G# $%M' <$N 2/ 3#* 2#&<199('$%#/ %&<9$2' *"2 "99('2"*#/ 3<8
. %012#&#9$	: 8-9, -: 7		

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

?4 $%&32+& T$%'$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 VYQ<K&V QP.F&" V" LI V8&PV; V7
. %2" 1#/ 3" %&I $" <1%<	: P) &) (&5-%#(<%&-#") -&+& -$(7&&P) &) (&#(I&. = J&+&>) J %&I <% & $-. D&<-$& + : , @7] #$<&<) + , D<-E&#A%&-#. : + D7
G) >R3-5) &-# #1 <	: ; <-$& +#(%=#-&$&@. $-: %% &-#F#=) , S&EE&<%&F' VW&V#F#= &J) > > , . -@(-) . & (#. : #=: ZI'N&J?I &.IV 47I 244[7
; / 1#&<& *&3#%	: P%=> #-&@. (#@&OEP>&@. (#@7&. <-##(-) . 7& D%(-) . 7
/ #&3#" (& 21#&& $" (#. &"*$2#<	
I3-"("#/ 3	: QG') $, -%&) & %@> *) $-(-) . & + : , @5& #E3@, $%#&-%#-(<&-#F#= 7& %=) , S&#W@5& #E S%& %##E% &9,-+ T -. D&%G') $, -%7
I3Q5<-#/ 3	: ") &I .) T . &-D. A@. (&%W@5&, -&@-(-@-&-#F#= $7
) L'3	: ") &I .) T . &-D. A@. (&%W@5&, -&@-(-@-&-#F#= $7
? +$<	: ") &I .) 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'#+	: ") &I .) T . &-D. A@. (&%W@5&, -&@-(-@-&-#F#= $7

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

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

! 1#' Q5 3'2'#+	: ") &I .) T . &-D. A@. (&%W@5&, -&@-(-@-&-#F#= $7
@5%# Q5 3'2'#+	: ") &I .) T . &-D. A@. (&%W@5&, -&@-(-@-&-#F#= $7
. T(/ 94 $3#' (&*"$2#<	: ") &I .) T . &-D. A@. (&%W@5&, -&@-(-@-&-#F#= $7
Y$%&(#-&*"$2#<	: ") &I .) 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
! $0'2" (&/ 30'#/ 3 < "QQ%T'"#&0&-+& T$% $U9/ <1%	: B=%%G$(-. D&-$) = %&& \ ) +-. D&#. E&#-D%&) -D#. $&- %(-) . % & &<-$& ' P' &#$&%. D&#(=$J&- #E&S%&#DD-#\#(% &E&$ \ %=%G') $, -%&) &<-$&-+ : , @7

) $$&# U2/ (/ Q2" (&3*/ %& "#/ 3&J $2#/ 3&7W

F8&5 / 4 9/ <'#/ 3S3*/ %& "#/ 3& 3&3Q?$0'$3#<

H3'#&0&-#'#&<

Z"4 $	5 R) &14 =$%	[
%<-E=% %$-$Z) QEP%(<-E=% % -(-=+ [(%=#Z#@&-(@#@ [	1HOQ^5	/ 4&&24

5"3"0"

Z"4 $	5 R) &14 =$%	[
%<-E=% %$-$Z) QEP%(<-E=% % -(-=+ [(%=#Z#@&-(@#@ [	1HOQ^5	/ 4&&24

@ $%&-%&I / &00'#/ 3" (&3Q?$0'$3#-&I %<$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

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

?+$&2/ 3# 2#	: U<%@&\-&#. : &%>) \ %&#. E&@. (#@&% $%&-&> > % #(%E&-+ $<&E%&$T -(<&-+% (E&) A&T #(%= A) =&#(&#$(&.5&- . , (%-&(@#$-) . #-E&M-. D&<%&. * * %&#. : &+ T %&&E%-+ $-&&Y %&- % -@+ #((%-(-) . &> > % #(%E7
) L'3&2/ 3# 2#	: L &@#$%&.A&@. (#@&> > % -#(%E&-+ $<&J-. &T -(<&-% (E&) A&T #(%&) =&#(&#$(&.5&- . , (% T <-%&%>) \ -. D&@. (#> -. #(% &@) (<-. D&#. : &<) %-&-. #$<&@) (<-. D&$%) A) =%&% $%&J-+&#. $<) %&&<) + , D<-E&$%) A) =%&% $%&Y %&- % -@+&#((%-(-) . &> > % #(%E7
I3-"("#/ 3	: !) \ %&G') $% & %&) . &) &%%<-&#=-&&) (&$-%#(<-. D&&$-%#(<-. D&&$-%#(<-. D&&$-%#, #=&) =&A =%&* -#() -E&#=%&(&.@@-$-&<+ \ -. %&#-(-A@#-E%&* -#(-) . &,-&) QED% &$E&(#-. % & %&) . . %#7 8)) $% &D<(&@ (<-. D&. @&$&#&@ +#=&(-%&$%&) &) =&(#-$(S#. : 7&Y %&- % -@+&#((%-(-) . -> > % #(%E7
I3Q5<#/ 3	:] #$<&, (&-) , (<&T -(<&T #(%=&P) &) (& : , @&.) > (-. D&. -%$S&.-=%@% &) &) &) &$E&- % -@+ * %&) . . %#&. % %&D\ %#. E(<-. D&$E&-) , (<&) #. &. @. $@ , S&-%&) . 7&Y %&- % -@+ #((%-(-) . &> > % #(%E7
. %#&2#/ 3& *&'%#&'0$%	: ") &#@) . &<-#&S%&#J% & \ ) +-. D&#. E&<%&) . #-&-$J&-&T -(<) , (&, (#S-%&-#-. - D&&(& #E S%&#. D%) , S&) &<-%&) . & + \ -: - . D&#-. &) &O\ %&-) , (<*() ^>) , (<&%, $@#(-) . 7
Z / #&<&# &9- +<'2"*3	: L &@#$%&.&. <-#-#(-) . &.&.%@> *) $-(-) . &+) : , @&. &#&-%&E> *() > $&- #E&S%&.%#E% 7 ; <%&G') $% & %&) . & #E&.%% &) &$%&1%(&. . : %&- % -@+&, = .%+#. @&A) -&O0&-) , -&7

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

K8X'"%X'Q- #3Q&4 $" <1%<

Y("4 4 "=' (#-&*&# $&9%012# : L &#&-%& =&-&%*&#(% I&#& =%$, =%& @*#'$%T -#& @@=&#. : &<'%@. (#-. %&- #E&, -$(7
?U#3Q1'<- '3Q& $0'"
) 1'# =($: M$%&#. &%G- D, -$<-. D#D% (&, -(#S-%&\-&<'%&, =) , . : -. D&-%7
Z / #&-1'# =($: ") . %&\ ) T. 7
) 9$2' "(&U9/ <1%& "P' %< : B+) > *(-E&$) #(%&<'%&@% %$E&%>) \- . D&-#& %$) . $&%) > &<'%&.@ -(E&) A&<'%&. @ % (&A (<'%*&$&#&=%&&) &#@) . &<-#+&$%&#J% & . \ ) +-. D&#. E&' %$) . #-&<$J&) -T&-(<), (&, (#S-%
(-#-. - D7
>"P' %/ 1<&# $%& "(: P'%@> *) $-(-) . &+) : , @&&> #E&. @ : %&<'%&\-+T - D& #(%-#-&_
0$2/ 4 9/ <#/ 3&9%012#< @-=$) . &-) G: %
@-=$) . &+) .) G: %
. -(-) D% &G: %&
) 9$2' "(&9%#&2#T$: ?-=%AD<('%&$&<) . + &T %#-&#* *+) = *-=#(%&+) (%@\ %&9, -* > % (&#. : &%*A@. (#-. % &>=%#(<-. D
$\ 1'94 $3#&/ %#'%X"Q- #&% #* *-##-(, .$&Z UCV[&T-(-<&#&\-H&#@&* -%@&) * %#(% & &) $-(-\%#&-=%$, -=%&) : %7

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

. $%/ 3" (&9%2" 1#/ 3< : ") &#@) . &<-#+&$%&#J% & \ ) +-. D&#. E&'%$) . #-&<$J&) -T&-(<), (&, (#S-%&-#- . D7
Q\#@#(%&. =) , . : -. D&#-%#$T&. %$ & . *(%@&$#-E&#. : &. * =) (%@% & %$) . %@&+) >
% (%#. D7&P) &) (&) . @&) &-T#+U&<=) . D<&$" -#% & #(%#+R&\/) -: &-=%#(<-. D&.#*) =&) -&- -$(7
B+) \ -: %#. %9. #(%& % (-#+(-) . 7&) %#-&#* *+) * =#(%&=%$" -#() -&T <% & % (-#+(-) . &$
-. #. %9. #(%&E&, (&) . &#* *+) * =#(%& %$) . #-&+) (%@\ %&9, -* > % (&$%&. %@) . &0[7
?3T'%34 $3#'(&9%2" 1#/ 3< : V\) - &-$" %$#-&) A&$" -#% & #(%+#-&# . : &< .) A&#. : &@. (#@&T -(<$) -H&T #(%T #E$H&-#-. $
#. : &'%T '%$7&. A => &<'%&9#%#. (&#, (<) =(-%$&A%<'%&+) : , @&+#$&@#. $% &\ +) . > % (#+
*) +(-) . &$%T %$%H&#(%T #E$H&) -&-#&#=7
! $# / 0<&/ %&($" 3'3Q&9
) 4 "((&9'((: ' () * &#J&&T -(<) , (&-$J 7&&) \ %&@ . (#-. %$&%) > &$" -#&#-%#'&&P-+ (%T -(<&T #(%&#. : &+) * &*
-A&T #(%*$) + S%#&&V+(%= #(-\ %E H&) -&A&T #(%*-. $) + S%#&#S$) =S&T -(<&#. &. %#&-E&. #(%=#&#. :
* #@&. &#. &* *+) * =#(%T #$(%&-$*) $#-&@. (#-. %=7&P-$*) $%&.A&.#-&&@&-$% &T #$(%
: -$*) $#-&@. (=#@) =7
^ " %$&9'((: ' () * &#J&&T -(<) , (&-$J 7&&) \ %&@ . (#-. %$&%) > &$" -#&#-%#'&&/* * +) #@&%#&$%&%) >
. *T - . 7&&=%% (&% (=E&. () &%T %$H&T #(%&@ . =%#&#&#$%% (%$&-=&@ . A. % &=%#$7&&. #$<
$* -#&D%&&. () &#. &&#% (&-%#(> % (& #. (&-&+) @% #$%&.+) T $7&U) . (#-. &#. : &@-#%@
$* -#&D%&T -(<&.) . ^@> S. $(-$%#&#SS) =$% (& #(%=#&&D7&#. : K&#+(<&.%=- -@-#%&=
: #() > #@%) . $&#=(<&#. : &#@%&. &@ . (#-. %&@-&-$*) $#-&#@@) = -. D&) &#@=$%D. #(-) . $
Z5%&$%@) . &3[7&P-$*) $%&.7&.#&&%@%$%&T #$(%&.$*) $#-&@. (=#@) =&U) . (#> - #(%
#SS) =$% (& #(%=#& #E&) $%&<%&#> %&=#F#= &$5&<%&* -#% &+) : , @&T) (%&$%&$%@) .
/ &%-=&% %D% @&@. (#@& A => #(-) . &#. : &$%@) . &.3&\-&T #$(%&.$*) $#-7

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

>"30(3Q : B, (&, &#* *+) * =#(%& %$) . #-&+) (%@\ %&9, -* > % (&$%&. %@) . &0[7&Q#(- D#& = J-. D&#. :
$>) J-. D$<) . + &$%& +<-S-(% & &=#$&T <%#&<-S& #(%=#-&$&#. : #% !&&() =% &#. :
* +) @&$% 7&&) =J%$&<) . + &T #$<&#. : S&# : &#@&$%&-+%&#(-. D!&= J-. D&#. : &>) J-. D7
! %) \ %&@ . (#> - . #(% &@ (<-. D&#. . & +) (%@\ %&9, -* > % (&$%&-=%&% (%-. D&#(-. D&=%#$7
P) &) (&. D*&(7&A\ ) - &@ . (#@T -(-<E*E%&J-. &#. : &@ (<-. D7&A\ ) - :&$=%#(<-. D&.#*) +) -&- -$(7
* %& &. &<-%& =D- #-&@ . (#-. %&) -&#. &#* *+) \ % &#-(%= #(-\ %&-#.) %&) > &#&@> * #(-$%
> #(%=#+&) % (&D<(E&@ $% &T <% &) (& &$%&@> * (E&@. (#-. %&$&%&-#. &+) : , @&$%&-. , %
#. : &@. &$%&=#F#=) , $7&P) &) (&%$%@. (#-. %7

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

>"30(3Q : B, (&, &#* *+) * =#(%& %$) . #-&+) (%@\ %&9, -* > % (&$%&. %@) . &0[7&Q#(- D#& = J-. D&#. :
$>) J-. D$<) . + &$%& +<-S-(% & &=#$&T <%#&<-S& #(%=#-&$&#. : #% !&&() =% &#. :
* +) @&$% 7&&) =J%$&<) . + &T #$<&#. : S&# : &#@&$%&-+%&#(-. D!&= J-. D&#. : &>) J-. D7
! %) \ %&@ . (#> - . #(% &@ (<-. D&#. . & +) (%@\ %&9, -* > % (&$%&-=%&% (%-. D&#(-. D&=%#$7
P) &) (&. D*&(7&A\ ) - &@ . (#@T -(-<E*E%&J-. &#. : &@ (<-. D7&A\ ) - :&$=%#(<-. D&.#*) +) -&- -$(7
* %& &. &<-%& =D- #-&@ . (#-. %&) -&#. &#* *+) \ % &#-(%= #(-\ %&-#.) %&) > &#&@> * #(-$%
> #(%=#+&) % (&D<(E&@ $% &T <% &) (& &$%&@> * (E&@. (#-. %&$&%&-#. &+) : , @&$%&-. , %
#. : &@. &$%&=#F#=) , $7&P) &) (&%$%@. (#-. %7

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

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

5" 3" 0"
G2219" #/ 3" (&U9/ <1%$&4 '#<
") &&?) $. =%&> -(&#+%&.) T. 7
5 / 3<1(#&/ 2" (&1# / %#$<&/ %&22$9#' =($&U9/ <1%$&4 '#<8
; $2/ 4 4 $30$0&4 / 3'# %3Q 9%2$01%$< : L&%<-$&+) : , @&@. (#- .$& D-%-%($&T -(<&%G*) $. =%&> -(5%&<%&5) . #-H&T) =J * #(@%#(>) $* <'%%
) =E>) +) D-(@-#-&.) . -() = . D& #E&$%&#%. -=% &) & %(%=- . %&<'%&%%@) % %$$&.A&<'%&.%(-#+(-)
.) =&-(-<%&@. (=) -&- %#$. =%&#. : G) =&<'%&.%@$&$-(E&) &$%&#$"&* -#() -=E&+) (%@\ %&9. -*> % (7
?3Q3$$%3Q&$ $" <1%$< : ") &* %'@#-&.% (-#+(-) . &#9. -=% % ($7&X)) : &D% %#-&.% (-#+(-) . &<'), + &$%&. A@&%(&)
@. (+) &T) =J %&%G) $. =%&) &#-=S) = %@. (#> - . #. ($7&X&A<-S&+) : , @&@. (#-. $&. D=% -% ($
T -(<&G) $. =%&> -(5H&.$ %&+) @&$&% @ $. =%H&@ @#&G#. $(&.% (-#+(-) . &.$-(<=
% D- %#-. D&@. (+) -&) &/ %&$&T) =J %&%G) $. =%&%+) T &#. E&$%@> > % : % &.-&(#(. () =E
+> -($7
>+Q3&4 $" <1%$< :] #$<&#. : $H&) =%#=> $&#. : &#(@&<) +) . D<E&#A%&&#. : + D&@%> -@#&+) : , @$H&$%A) =%
%#(-. D#&>) J-. D&#. : &.$-. D&<'%&#) =E&#. : &#(&<-%&. : .$) A&<-%&T) =J-. D&%=) : 7&A/* * +) *-=#(%
(%@-. 9. %&$<) . + &$%&.$% &) &%>) \ %&) (% (#+E&@. (#> - . #(% &@ (<-. D7&A. #$<
@. (#> - . #(% &@ (<-. D&$%A) -=%&%. $-. D7&A. $. =%&-#(&A&E&$<) T %$
#-=%&@ $%&) &<'%&T) =J $(#(-) . &+ @-(-) . 7
$%/ 3" (&9%#&2#/ 3
; $<9'%# % : M$%#&+) * %+E&A((% I&#-=* , -=Æ. D&-=&#-=A% &%$* -#() -&@> * +E. D&T -(<&#. &#* *+) \ %
$(#. , #-= &&#&-$J&#$S%$> % (& : -@(%&<-$&$& %@&$#-E&&. %$* -#() -&%%#@) . &- . $(&$%
S#$% &. &J .) T. &) -&#. (-@ #(% &&G*) $. =%#& %&#&<-%&-#F#= $&) A&<-%&+) : , @&#. : &<-%&#A%
T) =J-. D&>) $&) A&<-%&%#@%&#%$* -#() =7
>"30< : U<-%> -@#+-=&-$(#. (I&> * %\-) . $&D+) \ %&@) > * +E. D&T -(<&#. &#* *+) \ % &(#. : #= &<-) . + &$%
T) = &#(&#+&> %&T <% &#. : + D&@%> -@#&+) : , @$&%#&-$J#&$%&$> % (& : -@(%&<-$&$& %@&$#-E&) &#\) -. &G*) $. =%&) &%9, - :&* #$<-%G#&-.$(5&+=
: , $(7
?+$< : ' #A%(E&%@T %#-&@) > * +E. D&T -(<&#. &#* *+) \ % &(#. : #= &<-) . + &$%&.$% &T <% &#&-$J
#$%$&$> % (& : -@(%&<-$&$& %@&$#-E&) &#\) -. &G*) $. =%&) &%9, - :&* #$<-%G#&-.$(5&+=
: , $(7
) L'3 : B%$) . #-&+) (%@\ %&9, -* > % (&%+=&<'%&$) : E&$<) , + &$%&%#@% &$#$% &+ , &<-%#$J&$% . D
* %A+) => % &#. : &<-%&-$J&$. \ ) + % &#. . &<) , + &$%&#* * +) \ % &E&#&$* %@#+%(&$%A+%&#. : + D
(<-$&+) : , @7
?3T'%34 $3#'(&U9/ <1% 2/ 3#%(< : Q> -$$-) . $&%) > & % (-#+(-) . &+-&) +) &+) @&$$&%9, -* > % (&<) , + &$%&@%@% &) &% $, +%&<%E
@) > * +E&T -(<&<%&%9. -=% % ($&A&% \ +) . > % (#-&+) (%@) . &%D-$+#(-) . 7&. &) > %&@$%K
A> %&@ SS%&%&#%&$&-=&% D- %#-. D&) : A-@(-) . $&) &<-%&+) @&$&%9, -* > % (&T -+&%
. %@&$#-E&) &%, (@&%- -$$-) . $&) &#@&$ (#$%&%\%&7

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

. - +<'2" (&-#' #& : 8-9, -: 7
5 / (/ % : U) +) =#&$7
G0/ % : F :) =#&$7
9> : H-%) &07
, '<9$%'=' (#-&9%9$%#$< : P-$* %$-$%& &<-%&) +) T -. D& #(%=#-&_&@+ &T #(%&. : &) (&T #(%7
) / (1='(#- : ') +) =#& &<-%&) +) T -. D& #(%=#-&_&@+ &T #(%&. : &) (&T #(%7

7B&9 #' ='('#-&'30&$" 2#T'#-

5 - $4 '2" (&-#' ='(#- : ; <%&.*) : , @&$&(#$%7
5 / 30'-#/ 3<&# &T/ '0 : ") &* %@A&-#(#7
I32/ 4 9" #=($& "#&%'(< : ") &* %@A&-#(#7
>"P' %/ 1<&0$2/ 4 9/ <#/ 3 9%012#< : M : %&.) => #-&@. : -(-) . $&) /&&() #-D%&. : & $%&-#F#=) , $&. %@> *) $-(-) . &+) : , @&$&<) , + .) (&5%&<) : , @%7

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

7B8 #' ='('#-& 30&$" 2#T'#-

. / <<'='{'#-&'*&"P' %/ 1< : M . %&) => #-&@. : -(-) . S$) A&() =#D%#. : & S%&-#R#=) , S&%#@) . S&I -#&) (& @@=7
%" 2#/ 3<

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% %&&Z GE%<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 "%&' 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% %&&Z GE%<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 "%&' 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%@$&) -&@-(-@ &-#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# $%&0T$%$&*"$2#< : ") &.) T . &-D . A@ . (&%A%@$&) -&@-(-@ &-#R#= $7

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

_ " <-#&&'<9/ <" (: ; <%&D% %#(-) . &,A&I #$(%&<-) , + &$%&\ ) - % &, -&- . -> -R% &I <%% %<&,) $$-S-#/&&. -D . A@ . (
9 , #. (,(-) %&$,A&I #$(%&=) : . @&$%&- . %&&<-) , + &,) (&$%&. $*) $% &,A&. #&<%&), -&'%I %&&. (
* =) @&$% &. &#&, -(#S-#/&&A% % (&-%#(> % (& #. (X&P-$*) $%&,A&, -= + $.&#. : &,) . ^-%@&@#S-%
* =) :. @&&. #&#&@& $% &I #$(%&-$*) $-#-&@. (-#(@) -X&P-$*) $-#-&), A&<-$&-=) : . @&&) + (-) . $
#. . &# E&&E" =) . @&&<-) , + &#(&#-&> %&&@> " E&I -(<&<-%&#9 . -%& % ($&,A&& \ =) . > % (#+
* =) (%@) . &#. . &I #$(%&-$*) $-#-&#D.&-#(-) . &# : &. E&%&) . #-&@ (&#@, (<) =(E&%&, -%& % ($7
] #$(%&-#@-#D- D&<-) , + &$%&=%&@% X&. @ %#(-) . &) -&#. : A-&<-) , + &) . E&%&@. $- %&%
T <% &%@&@. D&&&,) (&&#$-S-#&&, <-$& #(%-=-#&#. : &($&@. (#- %&&, . $(&$%&-$*) $% &,A&. &
$-#A&I #E&&J#-=&<-) , + &$%&#J% &I <% &#. : + D&% * (-% &@. (#- %&$&<#(&-#\ %&,) (&$%&
@#&#. % &) -&-. $% &, . (X&P> * (E&@. (#- %$&) -&- %$&& #E&$%#-. &) > %&-=) : . @&$%&- . , %7
V\ ) - &.$* %&-#-&) ,A&* -#% &+ #(%-#&#. : &- .) A&#. : &@. (#@&I -(<&) -I&I #(%&I #E&I&-#-. $
#. : &$%I %57

, '<9/ <" (&- / 1(0&-$&3&'22/ %" 32$&/I +- &99("2" =(&-$&Q/ 3" (I&" #/ 3" (&30&/ 2" (&" M<&30&$&Q1("#/ 3<8
; $*$%&# &,$2#/ 3&I :&-RZ . ^IZ ` &RZ . &,@&; R ` ?&30&,$2#/ 3&A&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

; $Q1("# % '3"/ % " #/ 3	HZ &I 14 =$%	. %9$%&-'99'3Q 3"4 $	5 ("<<$<	. ` b
. G@&("<<"2"#/ 3	") (=)D, #(% 7	^	^	^
IR@RX ` ; &("<<	") (=)D, #(% 7	^	^	^

BY b&$#@-. D&D = , *

7K&, $Q1("# %&3*/ %& " #/ 3

H3'#&0& #'#&<

>5) &("<<"2"#/ 3 : ; #-D%&, -D#. &A%@$

H& &X'0%(&$Q1("#/ 3< : @ 5 R&X V&H; &U&4 9#S " %&" (&U&4 9#/ 3_&) (&%%>- . %
H3'#&0& #'#S<&3T$3# %&@ 5 R&=V&V+R@> *) . % ($&=5&%(% &,-&&3% * (% 7
) R; R&EDDFBC$F77$F7D&U#%4 $(+& " P' %/ 1<&1=<#' 32$< &) & =) : . @$&T %9&, . : 7
) R; R&EDDFBC&4 $%&32+$(" 33'3Q&30&/ #*'2"#/ 3_&) & =) : . @$&T %9&, . : 7
) R; R&EDDFBC$F77$F7D& " P' %/ 1<&-$4 '2" (<_
%<E% %S$Z GE%<E% % {=+ [(%=#-@(-@ @ [
) R; R&F77$F7D&) .) &I '<#%=1#/ 3&&Z-$4 '2" (&3T$3# %&& " P' %&0$3#*2"#/ 3_
%<E% %S$Z GE%<E% % {=+ [(%=#-@(-@ @ [_&P%#E% &I@=) . -@&%#+(-&=#R#=

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

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

5 ($" 3&R'%R2#&, $2#/ 3 : ") (&%(%
77D\=\&"P' %/ 1<&R'%
. / ((1#' 3#<&\- R. <W

5 ($" 3&R'%R2#&, $2#/ 3&, ED : ") (&%(%
5 (" <<&&, 1=<#' 32$<

5 ($" 3&R'%R2#&, $2#/ 3&, ED : ") (&%(%
5 (" <<&!&, 1=<#' 32$<

, ?R& '<#&&5 - $4 '2" (< : ") (&%(%
V %21%/ %& - $4 '2" (<W

, ?R& '<#&! &5 - $4 '2" (< : ") (&%(%
\P.<<$3#" (& - $4 '2" (<W

) #' #&,&%Q1("#/ 3<

! " <<" 2- 1<$#< : ") . %&, A&<*%&@> *) . % (5&#=%&5(% 7
Z $M& / % : ") . %&, A&<*%&@> *) . % (5&#=%&5(% 7
Z $M&.$%$+ : ") . %&, A&<*%&@> *) . % (5&#=%&5(% 7
. $33<+(T" 3" : ") . %&, A&<*%&@> *) . % (5&#=%&5(% 7
H3' #&0&,#' #&<&3T$3# % : V+&@> *) . % (5&#=%&5(% &, =&&C&% * (% 7
V@ 5 R&=W

5 " 3" 0"

_ >! I) &5 " 3" 0" W : U-#$5&P^2C_& #(%=#-&@, $- D&) (<%&) G@&A%@5&Z) G@7

5 " 3" 0" " 3&<#<

5 " 3" 0" " 3&Z . ; I : ") . %&, A&<*%&@> *) . % (5&#=%&5(% 7
5 ?. R&@ U2&<1=<#' 32$< : ") . %&, A&<*%&@> *) . % (5&#=%&5(% 7
5 " 3" 0" &3T$3# % : V+&@> *) . % (5&#=%&5(% &, =&&C&% * (% 7

@ ' <&9% 0 12#& " <&<$$3&(" <<" $0&3&22/ %" 32$&/f# &- 5& " P' %&2%#5%" & *&- 5&5 / 3#%(($0 & %0 12#<&, $Q1("#/ 3< "30&- 5&) ,) &2/ 3#' 3<& ((&- $&3*/ %4 "#/ 3&5\ 1' %0&<+&- 5&5 / 3#%(($0 & %012#<&, $Q1("#/ 3<8

I3#5%&" #/ 3" (&5Q1("#/ 3<

I3#5%&" #/ 3" (&<#< : R1<#%(" &3T$3# %&RI5) W&V+&@> *) . % (5&#=%&5(% &, =&&C&% * (% 7
5 - ' 3" &3T$3# %&&V75) 5 W&V+&@> *) . % (5&#=%&5(% &, =&&C&% * (% 7
" 9" 3&3T$3# %_&) (& %%> -. % 7
/ %" &3T$3# %_&) (& %%> -. % 7
Z $M& $" (" 30&3T$3# %& *5 - $4 '2" (<&Z I/ 5 W&V+&@> *) . % (5&#=%&5(% &, =&&C&% * (% 7
. - ' (' 99' 3$<&3T$3# %&V I5 5) W&V+&@> *) . % (5&#=%&5(% &, =&&C&% * (% 7

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

^ " =$(&5\ 1' %4 $3#< : UF " ; VL" ' & V; QI LV8& W; & VX &JVM Q& VI YQ; &F I YV" &PV! VYQH&CV QP&F "
V" L\ V8&PV; V7

>" P' %/ 1<& "#&%' (:
I3*/ %4 "#/ 3&, +<#&4 &/H&, 8R&W

@ $&21<# 4 $%&<&5<9 / 3<' =($&/ %0$#&5%4 ' 3' 3Q&# $& . . ?&/ 0$&/ %&# ' <& " #&%' (8

Z " #/ 3" (&' %& %#&2#/ 3 :
R<</ 2" " #/ 3 &/H&, 8R&W

KF'SDE7D8 7"#

8-A&, @', @& '%*#=@ FF.©) GE / H) @A= H&-&&&/ 5[&N!0*4HO-H TT7(<*#=) ?@>
B-?=@&C-) ?(@.) + DE&, @ HO-&. &. *!=. #. &) #= / / 45 /5[&N!0*H-8/ 1&#G

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

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

>$" (# Y(" 4 4 " =' (' #+
I3<#' =' (' #+S $" 2#T' #+
) 9$2" " (

, "#&& *&9%3#3Q : KF'SDE7D8
, "#&& *&<<1$: 56 24/ 27
, "#&& *&9%T' / 1<&<<1$: ") & =%-) , $&#+ #(-) . 7
6 $%/ 3 : /
. %9" %0&+ : ! ' P' & * %@#+&(

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

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

@ &+ $&-$<#&, *& 1%&, 3/ M($0Q5N&+ $&3*/ %4 "#/ 3&2/ 3#' 3$0 & $%' 3&<&' 221%#&8&-/ M$T$%&8$'# $%&+ $&=/ T$X3 " 4 $0 <199('$%&8/ %& 3+& *&#<&1=<'0' " %$<N& <<14 $<&' 3+&' =' (' #+&/ - " #=/ T%&/ %&+ $&' 221%2+& %&2/ 4 9 ($#&3$<<& *&+ $ '3*/ %4 "#/ 3&2/ 3#' 3$0 & $%' 38
Y' 3" (&9$#&%4 ' 3" #/ 3& *&-1' #' =' (' #+& *&' 3+& " #&%' (&<&+ $&=/ (5&&<9 / 3<' =' (' #+& *&+ $&(<$%&R((& " #&%' (<& " +&9%&<$3# 13L3/ M3& " P' %0<&, 30&- / 1(0&=$& <$0&/M+ &2" 1#/ 3&R(# / 1Q- &2$%#' 3& " P' %0<&, %&0$<2%=$0 & $%' 3N&M$&2" 33/ # Q1" %3#&$&+ "#&+ $<$& %&+ $& 3(+& " P' %0<&+ " #&$U <#&

KF'SDE7D8 #"#

8-A&, @', @& '%*#=@ FF.©) GE / H) @A= H&-&&&/ 5[&N!0*4HO-H TT7(<*#=) ?@>
B-?=@&C-) ?(@.) + DE&, @ HO-&. &. *!=. #. &) #= / / 45 /5[&N!0*H-8/ 1&#G

Thermo SCIENTIFIC

The world leader in serving science

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

! "#$%&' ( )$"+*,' -) +. - "$ +*,/0- 12'3) (,3) 45$' 1#

78. %012#;"30,2/ 4 9" 3*,&0$3#&,&2" #&% 3

. %012#3"4 $	: ! "#&* ' ( )$" +*,' -) +. - "$ +*,/0- 12'3) (,3) 45$' 1#		
(199'&%%	: % * (H) ,I 1+- * (,=4 1 0$U1# ' 1 (4* ,; 1)$ 4- 0) # KL ' (M(,) N.: : 7 O) 45,) (GP!D,?: : 6> Q0'$ G=$'$'+ 8: >@?8©797,) (866©79G:7@	! "31")"2#1%%	: % * (H) ,I 1+- * (,=4 1 0$U1# ' 1 (4* ,; 1)$ 4- 0) # KL ' (M(,) N.: : 7 O) 45,) (GP!D,?: : 6> Q0'$ G=$'$'+ 8: >@?8©797,) (866©79G:7@
5 / 0$	: 667899: ,667899: ; ,667899<,667899<=,667899>,6678997,: 8?: @6,: 8?: @?: ,: 8?: @@ : 8?: @9,: A6: ?A?		
! (+(,O	7879		
6"'!0" #&% 3,0" #&	: 7©@E©6: : C		
. %@#0" #&	: 7©@E©6: : C		
; $<9/ 3<&<' $,3 "4 $	& =R=,=. * 41' #+$		
	5 >?! @ ?5 : AEB©DDCEEFEB GH(@ I+ ?,H(: JEF3'©DJ8FAAU	! "#$%&',1<$<	: $)$%@#,# $,&@<#%2#&% 3 =/ / L'$#,)/ %@%9$%'30 @#&30$0,1<$8,G# $'%M&$N 2/ 3#'2#;<199'@$%@/ %<9$2@&@2 "99'@2" #&% 3<8
. %012##9$	: D!EF'©C		

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

?4 $%$32* / T$%&M

. -* <@2"',<#' #&	: D!EF'©C
G0/ %	: MG)(# ++C
(&P3"',M/ %	: T UOV/VVK
>"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,% OMQMV ,=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$' 0 +. * 41' #'0+$(F4$) 0+,2* J) (*,F+* C,R) ,0) $2( *"' $ * ,`".) (,) (,H 1+$C,R) ,0) $ 0K* +$C,Q+* ,) 0#L a $,"G EF"'$',* 0$# $) 0C,R) ,0) $* "$PG(05,) (,+H) 5* ,a- * 0,F+0K,$ 1+,. () GF4$C,U`) 13 4) 0$' 4$a '$ ,*L* +F+5 0,"0G 4#) $ 0KC,U`) 13. () # 0K* G4) 0$' 4$a '$,*L* +F+5 0,"0G 4#) $ 0KC,Z * * . ,4) 0$' 0* (,$K- $#L,4#) +" GC,Q+* ,. * (+) 0"# . () $ 4$1 * ,* EF1 H * 0$" +,(* EF1 * GC T `" +- ,$) () FK- #L,"J$' (,- " 0G#0KC
G(>R$- 5 (,<#' #1<	: % 1+H " $ (1#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#&</),$3#%	: R* (H " #4) 0$' 43©SL* ,4) 0$' 4$©0- " # $) 0C!0K* +$) 0C		

./ #&3#&',"21#& - $"'#. ,$))$2#<

$ %&') * + '. % . ,* 0- / 10 %% . . ,2 3 0 4 5 4 - +,6 - 78' %&

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

I3- "'`" #&% 3	: %) N#1,2L,'0- "# $) 0C,/((' $"$D!K,$) ,(* +. 1(" $) (L,+L+$" H C	
I3P$<#&% 3	: %) N#1,)I,+a" #) a * GC	
(L&&	: ! " (H,JF#1 0,4) 0$' 4$a '$,+5 10C,/((' $"$D!K,$) ,+5 10C	
? *$<	: /((' $"$D!K,$) ,* L* +C	
./ #&3#&',"2- %3&2 - $"'#. ,$))$2#<		
5 - %3&2,$))$2#<	: 3) 0$" 10+,H " $" ('1'#$ " $,4" 0,4" F+* ,$ (K" $) (K" 0,G' H " K* C	
5" %2&)/ P$3&2&#	: 3) 0$" 10+,H " $" (' 1'#a - 1!- ,H " L,4" F+* ,4" 04* (C,O 1+5,) ,J 4* 04* (,(G' . * 0G+,) 0,GF(" $) 0,"0G #' * #) ,J * N) +F(* C	
! 1#' P$3&2&#	: V) ,50) a 0,+K0 1!#" 0$* ,J* 4$+,) (,4(' $#" #- "] " (G+C	
@$%# P$3&2&#	: V) ,50) a 0,+K0 1!#" 0$* ,J* 4$+,) (,4(' $#" #- "] " (G+C	
+T' / 94 $3#' ,$)) $2#<	: V) ,50) a 0,+K0 1!#" 0$* ,J* 4$+,) (,4(' $#" #- "] " (G+C	
Z$%&&#' ,$)) $2#<	: V) ,50) a 0,+K0 1!#" 0$* ,J* 4$+,) (,4(' $#" #- "] " (G+C	
@ %P$#/ %P' 3<	: 3) 0$" 10+,H " $" (' 1'#a - 1!- ,4" F+* +,G' H " K* ,$) ,$ * ,J) #) a 1DK) (K" 0+b- * " (F* $ C 3) 0$" 10+,H " $" (' 1'#a - 1!- ,H " L,4" F+* ,G' H " K* ,$) ,$ * ,J) #) a 1DK) (K" 0+b5 10* L+P K" +$) 10$" +$0" #$(" 4$FF. . * ((,(* +. 1(" $) (L,$" 4$P+5 10P2) 0* +P4* 0$" #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 1DKb (* +. 1(" $) (L,$" 4$,1((' $) 0 4) FK< 1DK	
I3P$<#&% 3	: V) ,+. * 41#, G' $' C	
(L&&	: UG * (+* ,+LH . $) H +,H " L,'04#FG' ,$ * ,J) #) a 1DKb 1((' $) 0 (* G0* ++	
? *$<	: UG * (+* ,+LH . $) H +,H " L,'04#FG' ,$ * ,J) #) a 1DKb . " 1D,) (,1((' $) 0 a " $' (1DK (* G0* ++	
! $0 &2"',2/ 30 &&,3 < "PP%T" #50,=* ,/ T$% $V9 / <1%	: ' (* * N+$DK,G+) (G' (+,1D` ) # 1DK," 0L,$' (K* $) (K" 0+,H * 0$) 0* G,1D,$ +,& =R=," +,2* 1DK," $ (+5,H " L,2* ," K4(" ` " $' G,2L,) ` * (* N ,) +F(* ,$) ,$ +,. () GF4$C	

($$,# V&2/ '/ P&2"' ,&3)/ %4 "#&% 3 ,\W$2#&% 3,77X

F85 / 4 9/ <&&% 3S&3)/ %4 "#&% 3,/ 3,&8P%$0 &$3#<

H3 &&50,(# #&<

[" 4 $	5 R(,3 14 =$%	\
G+) GFH ,c\K#L4* () . -) +. - "$'	8: A\8<\6	<\,>
G+) GFH ,G+ LG) K* 0. L() . -) +. - "$'	77>8\: ?\A	: ,\,<
=) GFH ,JF) ('1G'	778: \9A\9	: ,\,<
$ 1+) GFH ,$' $") N) ` " 0" G' $'	: <7@ \<A\?	: ,\,<

5" 3" 0"

[" 4 $	5 R(,3 14 =$%	\
G+) GFH ,G+ LG) K* 0. L() . -) +. - "$'	77>8\: ?\A	: ,\,<
=) GFH ,JF) ('1G'	778: \9A\9	: ,\,<
$ 1+) GFH ,$' $") N) ` " 0" G' $'	: <7@ \<A\?	: ,\,<
%L. +0,'0- 12'3) (P. " 04(" " $#,2" +1#	A687\76\:	6C,\,:

$ %&') * + ' . % . , * 0 - / 1 0 %% . . ,2 3 0 4 5 4 - + , 6 - 7 8 ' 9 %&

F8 5 / 4 9 / <&&& 3 5 &8) / % 4 " #& 3 , / 3 , &8 P % 0 8 $ 3 # <

@ $ % ; " % 3 / ," 0 0 &&& 3 "' . &8 P % 0 8 $ 3 #< ; 9 % <$ 3 #M- &2- NM & 8 , # $,2 1 % 3 #L3 / M' $ 0 P $ /) # $, <1 99 ' 8 $ % ' 3 0 , 8 , # $ 2 / 32 $ 3 # % # & 3 <, " 99 ' & " = ' $ N ' % $,2 " ' <<8 $ & 0 , " <,- " ' Q ' % / 1 <, # . , $ "' ' # . / % # . $,3 T & & 3 4 $ 3 # " 3 0 , - $ 3 2 $, %] 1 & & , % 9 / % & 3 P , & 8 # & <, <$ 2 # & 3 8

C& Z & % # " 8 0 , 4 $ " <1 % <

? * $, 2 / 3 # ' 2 # : 3 - * 4 5 , J) (," 0 G (* H) ` * ," 0 L , 4) 0 $ ' 4 $ # 0 + * + C / H H * G t ' $ ' # ., J # F + ., * L * + , a ' $ . . # 0 $,) J a " $ ' (J) (," $ # " + $: > , H ' 0 F $ ' + F) 4 4 " +) 0 " # & , # & 5 0 K , $ * , F . . * (," 0 G # a * (, * L * # G + C , W ' $ H * G # " # " $ & ' 0 $) 0 , ' H H * G t ' $ # , C

(L & 8 , / 2 / 3 # ' 2 # : / 0 , 4 " + " ,) 4) 0 $ ' 4 $ P ' H H * G t ' $ ' # , , J # F + - , + 5 ' 0 , a ' $, . , # 0 $,) J a " $ ' (, J (," $ # " + $: > , 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 # ( , ) ( , ' ( ( * + , * ( ' $ ) ( L , " ( ( * + $ ) 4 4 F ( + P : ( ) ` ' G " , " ($ & % ' (# (* + , * (' $) 0 ,) (,) N L K * 0 , 2 L $ " ' 0 * G , * (+) 0 0 " # (D)) + " 0 , $ K - $ + #) $ ' 0 K + F 4 - , " + , " , 4) # ' (P $ % 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 " # € , 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 # G , a * " ' (, " 0 , " . . ( ) . (1 $ ' , H * ' + 5 ,) (+ * # & 4) 0 $ ' 0 * G , 2 (* " $ ' 0 K , " . " (" $ F + * C / $ H " L , 2 * , G ' 0 K * ( ) F + , $, $ * , * (+) 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 ) ( * , ( * 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 1 ' # # $ ' H 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 * 1 - ' 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 ' 0 ' 1 & ,) J $ * , ' 0 4 ' 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 # ' F G ' , $ * , J) #) & ' 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 ' $ ' , . ( ) $ ' 4 $ ' * , * 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 * # , U) H * 0 ' $ ' (0 K C , R) , 0) $ ' $ F 4 - .) (, a " # & , $ ( ) F K - , + . ' # ' G H " $ ' (1 ' # C , R) . 0) $ 2 (* " $ * , ' " .) (,) (, H ' # ' $ C ' ( ) ` ' G ' , " G ' E F " $ ' , * 0 $ # $) 0 C , T * " (, " . . ( ) . (1 ' $ ' , (* + . ' (" $ (, a - * 0 , ' * 0 $ # $) 0 , ' + ' 0 " G ' E F " $ ' C , ' F $) 0 , " . . ( ) . (1 ' $ ' , . * ( ) 0 " # . ( ) $ ' 4 $ ' * , * E F ' 1 H * 0 $ ^ + * * , = * 4 $) 0 , 8 _ C

$ %&') * + ' . % . , * 0 - / 1 0 %% . . ,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 ' $ , + ) ' # ' 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 * (+ ' # 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 ' 1 F $ ' , a ' $, a " ' $ ' (, " 0 G H) . , F . ' (a " $ ' (\ +) # F 2 # ' C , U & $ ' (0 " $ ' 1 # , F) ' (, (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 ' , " , # # ' 0 + ' G a " + $ ' G + .) + " # 4) 0 $ " 4 $) (C

^ " % F $, < 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 * + , a ' $. , 0) 0 \ 4) H 2 F + $ 2 # F ' 2 +) (2 * 0 $ H " $ ' (1 ' # " (8 C + ' 0 G P * " ($. F * (H ' 1 F # & .) (G t ' $ H " 4 *) F + , * " ($. , " 0 G . # 4 * , ' 0 , 4) 0 $ ' 0 * (, J) (, G + .) + " # " 4 4) (G ' D K , $) , # 4 * # (* K F # $) 0 + ^ + * " . + * 4 $) 0 . : < , C , R + .) + * ,) J ' 1 , " , # # ' 0 + ' G a " + $ ' , 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 , 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 `) ' G * N ,) + F (* , \ ) 2 $ ' 0 , + . * 4 1 ' # ' 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 # L _ a ' $, " G ' E F " $ " * 0 $ # ' $) 0 C , T * " (, " . . ( ) . (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 * (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 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 * (, $ K - $ # 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 . (K - $ $] . (* ' * 0 $ # " 5 " K * C , R) , 0) $ + $ (* , ' 0 , F 0 # 2 * # G 4) 0 $ ' 0 * (+ C , Q + * , " . . ( ) . (1 ' $ ' , 4) 0 $ ' 0 H * 0 $ $) " ') ' G * 0 ` ' 0) 0 H * 0 $ # 4) 0 $ ' H 0 " $) 0 C

A8? V9 / <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 7 $ D E B U K 8 ' G t ' Ub @ @ > , H K B H e 8 , -) F (* + C) (H b R F + $! (> R , (# ' 3 0 " % , R & & A N 3 & & 5 0 , (# ' # & < > K 8 ' G t ' Ub @ @ > , H K B H e 8 , -) F (* + C R 5 ` I > , @ 6 , \ N 3 & & 5 0 , (# ' # & < ! N J S E B 7 B K 8 [/ # & < , " < Z 8 ' G t ' Ub @ @ > , H K B H eP ^ " + I _ 8 , -) F (* + C [! G (> , ; . ? ^ , \ W 3 & & 5 0 , (# ' # & < ! N J S E B E E K 8 [/ # & < , " < Z 8 ' G t ' Ub @ @ > , H K B H eP ^ " + I _ : 6 , -) F (* + C G (> R , . ? ^ , \ N 3 & & 5 0 , (# ' # & < ! N J S E B 7 B K 8 [/ # & < , " < Z 8 ' G t ' Ub @ @ > , H K B H eP ^ " + I _ 8 , -) F (* + C G (> R , . ? ^ . 7 E A E \ W 3 & & 5 0 , (# ' # & < ! N F S ' E A E K 8 [/ # & < , " < Z 8 ' G t ' Ub @ @ > , H K B H eP ^ " + I _ 8 , -) F (* + _ C

J $ U $ 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 ' 0 & \ 6 7 9 7 ,.....,a a a ' G * (H) ' @) H
` ' ! (4 * ,:) $ ' 4 - 0) # k L _ 0 4 C ,.....<7 9 7 , V Q & * (G ! 0 , 0) ' G ,.....,.....? : - 6 > ,.....,.....^ 8 : > _ A ' 6 ! 7 < : ? , ! ^ N

$ %&') * + ' . % . . ,* 0 - / 10 %% . . ,2 3 0 4 5 4 - + , 6 - 7 8 ' %&

A8? V9/ <1%$,2/ 3#%'<$9$%/ 3"' ,9%#$2#&3

5"3"0"

G2219"#&3"' $V9/ <1%$,'&! &$<		@ R,\#& - / 1%X			(@^,\#K4 &0<X			5 S&&P			
I3P%0&3#	^&#3"4 $	994	4 PS! a	G#. $%	994	4 PS! a	G#. $%	994	4 PS! a	G#. $%	[/ #'#&.3<
=) GFH ,#F) ('G* P' +J	Q=,U3:W! ,@@$: 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$4) 0$' 1'0+,1K)*G*0$+,a '$,"N) +F(" ,#H 1'#P. *(+) 0"#Pa) (5. # 4* ,"$H) +. - *('
) (,21 # K1#" #H) 0'$ (1'K,H"' L,2" ,(* EF1*G$) ,G' $" (H 1'0* ,$ * ,"J!' 4$1 * 0* ++,) J,$ * ,' * 0$# $1 0
) (,) $ * (,4) 0$1) #H * " +F(" +," 0@$) (,$ * ,0* 4" ++1L,$) ,F+" ,(" + ,1"' $) (L. () $' 4$1 * ,* EF1 H * 0$C

?3P%0&$$%&P,4 $"<1%$< : Q+" ,) 0#L,a '$,"G* EF"' $" ,' * 0$# $1 0C,Q+" . . () 4* ++,* 04# +F(" +P# 4" #" N +"F+$;' *0$# $1 0,) (
) $ * (,* 0K'0' * ' (1'K,4) 0$1) #,.$) ,5* * . ,a) (5+'(,* N) +F(" ,$,"1'2) (0* ,4) 0$' H '0" 0$9;,2* # a ,"0L
(* 4) H H * 0G* G) (,+$' F) (L,#H-1 $#C

>* P&3,4 $"<1%$< : T "+ - ,"0G+P,) (*" (H+," 0G,J' 4* ,$) () FK- #L,".J$ (,-" 0G#0K,4- * H 1'#, () GF4$+P2* ,) (*
* "$D1K2+H) 5'0K" 0GF+'0K,$ * ,#' " $) (L," 0G" $$ * ,* 0G,) J,$ * ,a) (5'0K. * (1) GC,U. . () . (1'$
$' 4- 0'EF" +,+-) F#&,2* ,F+* G$) ,(* H) " . .) $' 0 $1' #L,.4) 0$' H '0" $" G-4#) $ '0K C,T " +-
4) 0$' H '0" $" G4,# $ '0K,2* ,) (* ,(* F+'0K C,S0+F(" ,$ " $ * L* a " + - ,+$' $1) 0+," 0G+" J' $L,+-) a * (-
"(* ,4#) +" ,$,$ * ,a) (5+$' $1) 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$,'0G#'" $' +,$ '+,'+,'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) (5'0K,#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$+,1\" ,(1+5," ++* ++H * 0$,'0G#" $' +,$ '+,'+,
0* 4 * ++" (LC

?* $< : =" J' $L,* L* a * " (,4) H . #L'0K,a '$,"0," . . () ` * G+$' 0G' (G+-) F#&2* ,F+* G,a - * 0," ,(1+5
"++* ++H * 0$,'0G#" $' +,$ '+,'+,0* 4* ++" (L,$) ," `) 'G* N .) +F(* ,$) ,#EF'G+. # +- * +P'H '+$+,) (
GF+$+C

(L&$: ' * (+) 0" #. () $' 4$1 * ,* EF1 H * 0$,J) (,$ * ,2) 'G,.+-) F#&2* ,+* # 4$' G2" +* G,) 0,$ * ,$' +5,2* '0K
. * (J) (H * G" 0G,$ * ,(1+5+,'0') # * G" 0G +-) F#G2* ," . . () ` * G,2L," ,+- * 41'#+$2* ,) (* ,- " 0G#0I
$ '+,. () GF4$C

?3T&%34 $3#" ,$V9/ <1%$ 2/ 3#%' < : SH '1+-) 0+,J() H ,` * 0$# $1 0,) (,a) (5,. () 4* ++,* EF1 H * 0$,+-) F#G2* ,4- * 45* G$) ,* 0+F(* ,$ * I
4) H . #L,a '$,$ * ,(* EF1* H * 0$+,) J,* 0` ' () 0H * 0$' # . () $' 4$1 0,# K1#" $) 0C,/0,+) H * ,4" +* +P
JFH * ,+4 (F22* (+PJ!$ (+,) (,* 0K'0' * ' (1'K,H) G1#" $') 0+,$) ,$ * ,. () 4* ++,* EF1 H * 0$a '#2*
0* 4 * ++" (L,$) ,(* GF4* ,* H 1'+-) 0+,$) ," 44* . $' 2# ,#' * '#C

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

. - * <&2"' ,<#' #$: DEF'GC
G0/ % : MG) (# ++C
(/ '1=&&# : =) #'2#' , '0 ,$ * ,J) #H a '0K,H "$ ' (1'#b4) #G,a "$' (C

D!', =4 *'04*' ,O' ,+*' (4- ..... ' M,:,) N ; . 7 ,..... O) 45J) (GF'D,...,*8: >_A'8\6797 ,..... ,a a a 'G * (H) 'G) H
` !(4*'.:) $'4- 0) # kL_64C,.....<797, V'GL * (G!' 0,0) ' G,..... ,?- : 6>,..... ,*8: >_A'8\7<: ?,I ' N

$ %&') * + ' . % . . ,* 0 - / 10 %% . . ,2 3 0 4 5 4 - + , 6 - 7 8 ' %&

7B8(# =&&#," 30,%$" 2#&T&#

5 - $4 &2"' ,<#' =&&# : % * ,. . () GF4$'1+,+$' 2# C
5 / 30 &&# 3 <# ," T/ &0 : V) ,+. * 41'#, G' $' C
I32/ 4 9" #&- $,4 "#5%&' < : V) ,+. * 41'#, G' $' C
>" Q' %/ 1<,0 $2/ 4 9/ <&&# 3 9%0 1 2#< : Q0G' (,0) (H " #4) 0G$#) 0+,) J,+$' ("K* ," 0GF+* P- "] " (G) F+,G' 4) H .) +$#) 0,. () GF4$+,+ -) F#G
0) $ 2* ,. () GF4* 'GC
. / <<&-&&# /) ,- " Q' %/ 1< %" 2#&3< : Q0G' (,0) (H " #4) 0G$#) 0+,) J,+$' ("K* ," 0GF+* P- "] " (G) F+,(* " 4$') 0+,a '#!0) $) 44F(C

778@ V&2/ '/ P&2"',&&)/ %4 "#&3

H3 &&$0.(# #&<

R21#&.# V&2&#

. %012#&3P%0&$3#,3" 4 $	; $<1'#	(9$2&$<	+/ <$	?'V9/ <1%$
G+) GFH G+ LG() K* 0. L() . . -) + . - "$'	D3 >6,/0- " # $!) 0,RF+$+," 0G;H '+$+ DR>6,M(" # DR>6,M(" # DR>6,M(" #	O" $ O" $ O" $ O" $	i 6G-8,H K$H : 866,H K$H K <: ,H K$H K <<6,H K$H K	9,-) F(+ \ \ \
=) GFH ,#F) ('G* $ '+) GFH ,$' $") N) ` " 0" G' $'				

5 / 32'1<&3$ 14 4 " % : V) $" ` ' # 2# C

5 - %3&.# V&2&#

5 / 32'1<&3$ 14 4 " % : V) $" ` ' # 2# C

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

. %012#&3P%0&$3#,3" 4 $	; $<1'#	(9$2&$<	(2/ %$	?'V9/ <1%$	G=<$%" #&.3
=) GFH ,#F) ('G*	SL* +,\,& ,) G' ("$' ,'(!'$ 0$	O" 22'$	\	\	\

5 / 32'1<&3$ 14 4 " % : V) $" ` ' # 2# C

($3<&&&$%

5 / 32'1<&3$ 14 4 " % : V) $" ` ' # 2# C

5" %&$0/ P$3,0&&#

5 / 32'1<&3$ 14 4 " % : V) $" ` ' # 2# C

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

. %012#&3P%0&$3#,3" 4 $	R5 ` I>	IR; 5	?. R	[IG(>	[@	G(>R
=) GFH ,#F) ('G* $ '+) GFH ,$' $") N) ` " 0" G' $'	U9 \	< \	3 \	\ V) 0* C	') ++2# \	\ V) 0* C

! 1# P$3,0&&#

5 / 32'1<&3$ 14 4 " % : V) $" ` ' # 2# C

@&%# P$3,0&&#

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"

R21#&.# V&2&#

. %012#&3P%0&$3#,3" 4 $	; $<1'#	(9$2&$<	+/ <$	?'V9/ <1%$

D!', =4 *'04*' ,O' ,+*' (4- ..... ' M,:,) N ; . 7 ,..... O) 45J) (GF'D,...,*8: >_A'8\6797 ,..... ,a a a 'G * (H) 'G) H
` !(4*'.:) $'4- 0) # kL_64C,.....<797, V'GL * (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&" ' ,&)/ %& " #& 3

G#) GFH G# LG() K" 0. L() . -) + . - "$"	D3 >6,/0- "# $&) 0,RF+$+," 0G H 1#$-	O" $	i 6G>8,HKED	9,-) F(+
=) GFH ,JF) ('G" $ 1+) GFH ,$" $ ") N) ` " 0" G' $	DR>6,M(" # DR>6,M(" #	O" $ O" $	: 866,H K5$K <: ,H K5$K	\ \
	DR>6,M(" #	O" $	<<6,H K5$K	\

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

5 - % 3 &2 # V&2&#

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

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

. % 0 1 2 #&3 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<&#&5 %

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

5 " 9 2 & / P$3 2 &#

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

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

. % 0 1 2 #&3 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

@5 %# P$3 2 &#

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

; $ 9 % 0 1 2 #&T$ # V&2&#

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

7D8? 2/ '/ P&" ' ,&)/ %& " #& 3

? 2/ # V&2&# : V) ,50) a 0,+1<0 1 4 " 0$* J/* 4$+,) (,4('$ 4 " # - "] " (G+C

H 3 &$5 0 (# #&5 <

R] 1 " #&2 $2/ # V&2&#

. % 0 1 2 #&3 P%0 &3 #3" 4 $	; $<1'#	(9$2&<	?\9/ <1%
=) GFH ,JF) ('G"	U4F$" ,S3 >6,@'@ H K E D U4F$" ,S3 >6,8>6666,FK E D,I (* +- ,a " $ (	U# K" * U# K" * ,\,=4* 0 * G' +H F+ +F2+, 1 1" $F+,\,SN) 0 * 0$" # K() a $. - " +*	A?,-) F(+ 7@) F(+
	U4F$" ,S3 >6,A8666,FK E D,I (* +- ,a " $ (	R" . - 0 1' ,\,R" . - 0 1' ,H " K0" ,\ V*) 0 " $' ,\,?,$) ,@ ,-) F(+	98,-) F(+
	U4F$" ,D3 >6,i <66666,FK E D,& " ('0 * ,a " $ (	3 (F+$' 4 * " 0+,\,3 (" 0K) 0,4("0K) 0,\ UGF#&	98,-) F(+
	U4F$" ,D3 >6,>: 666,$) ,?8666,FK E D,I (* +- a " $ (	I 1+- ,\,M04) (- L04- F+,HL5 1 H+,\ >8G',HH ,\,: @ ,K	A?,-) F(+
	3 - () 0 1 4,VMS3 ,.: 6666,FK E 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 E D,I (* +- a " $ (	I 1+- ,\,M04) (- L04- F+,$+- " a L$+4- " \,I (L,\,6C>,K	A?,-) F(+

J $ U $ U $ D B 778 >"1 :

D t', =4 † 0 4*, O' +,*" (4- ..... ` M,:,) N:,: 7, ... O) 45-J (GF D,...,"8: >_A"8\6797 ..... ,a a a G * (H) @ H
` † (4*:,:) $' 4- 0) # kL_64C, ... <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 ' %&

7D8? 2/ '/ P&" ' ,&)/ %& " #& 3

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

_ $ %&<#&3 2 $ 5 $ P%0 " = &#

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

5 " 3 " 0 "

R] 1 " #&2 $2/ # V&2&#

. % 0 1 2 #&3 P%0 &3 #3" 4 $	; $<1'#	(9$2&<	?\9/ <1%
=) GFH ,JF) ('G"	U4F$" ,S3 >6,@'@ H K E D U4F$" ,S3 >6,8>6666,FK E D,I (* +- ,a " $ (	U# K" * U# K" * ,\,=4* 0 * G' +H F+ +F2+, 1 1" $F+,\,SN) 0 * 0$" # K() a $. - " +*	A?,-) F(+ 7@) F(+
	U4F$" ,S3 >6,A8666,FK E D,I (* +- ,a " $ (	R" . - 0 1' ,\,R" . - 0 1' ,H " K0" ,\ V*) 0 " $' ,\,?,$) ,@ ,-) F(+	98,-) F(+
	U4F$" ,D3 >6,i <66666,FK E D,& " ('0 * ,a " $ (	3 (F+$' 4 * " 0+,\,3 (" 0K) 0,4("0K) 0,\ UGF#&	98,-) F(+
	U4F$" ,D3 >6,>: 666,$) ,?8666,FK E D,I (* +- a " $ (	I 1+- ,\,M04) (- L04- F+,HL5 1 H+,\ >8G',HH ,\,: @ ,K	A?,-) F(+
	3 - () 0 1 4,VMS3 ,.: 6666,FK E 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 E 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

_ $ %&<#&3 2 $ 5 $ P%0 " = &#

5 / 32'1<&3$ 14 4 " % : V) $" ` " # 2# C

G# $ %' 0 T $ %$,$)) $ 2 #<

: V) ,50) a 0,+1<0 1 4 " 0$* J/* 4$+,) (,4('$ 4 " # - "] " (G+C

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

b " <#5,0&<9/ <"' : % * ,K" 0 * ("$") 0,) J a " +$" ,+-) F#G 2 * ," ` ) 'G" G) (,H '0 'H 1 * G a - * (* ` * (,-) ++2# C,= 1<0 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$+;` 1',." ,#4 1* 0+* G a " +$" ,G# -) +'' #4) 0$ "' 4$) (C,R 1 +-) +'' #) ,J,$ 1+,. () GF4$P+) #F$) 0 + " 0G" 0L,2L\. () GF4$+,+-) F#G " $" #H$H * +,4) H . #L,a '$,$ * ,(" EF'(" H * 0$+,) ,J * 0` 1) 0H * 0$ # . () $'4$) 0," 0G a " +$" ,G# -) +'' ### K1+# $) 0," 0G "0L,(" K) 0" ### 4" #" F$) (1L,(" EF'(" H * 0$+C T " +$" ,." 45" K'0K+-) F#G 2 * (* 4L4 # GC,/04 1 0 * ("$) 0,) (,# 0G 1'#+-) F#G) 0#L,2 *,4) 0+G' (* G a - * 0 ,(* 4L4##0K,1+,0) $J,'' +2# C,% +,H " $ ('1 #" 0G,$+,4) 0$ '0 * (,H F+$2 * ,G# -) +* G) J,'0,," +'J* ,a " LC,3 "(* ,+ -) F#G2 * ,$' 5 * 0 ,a - * 0 - " 0G#0K * H . $1' G4) 0$" 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,I" 0G,4) 0$' 4$a '$,+) 1#;a " $ (a " L+P,Q" '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,&)/ %& " #& 3," 30 ,9%#&2#& 3 ,/),$4 9 '/ * $$<8

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

. $P1 '" # % &3)/ %& " #& 3	H[,314 =$%	. %9 $%<- 9 9 &P 3 "4 $	5 ' " <<$<	. ` d
+G@5 ' " <<&2&" #& 3	V) $ (* KF# $ GC	\	\	\
IR@R\+` ; ,5 ' " <<	V) $ (* KF# $ GC	\	\	\

J $ U $ U $ D B 778 ?"1 :

D t', =4 † 0 4*, O' +,*" (4- ..... ` M,:,) N:,: 7, ... O) 45-J (GF D,...,"8: >_A"8\6797 ..... ,a a a G * (H) @ H
` † (4*:,:) $' 4- 0) # kL_64C, ... <797, V G\ * (G# 0,0) " G, ... ?,: : 6>, ... ,"8: > _A"8\7<: ?,I " N

$ %&') * + ' . % . ,* 0- / 10 %% . .,2 0 4 5 4 - +,6 - 78' %&

7C8@%3 <9/ %#,&8)/ %4 "#& 3

' W ,b' "45 0 K,K( ) F.

7K8; $P1'"# %,&8)/ %4 "#& 3

H3 &$0 ,(#' #&<

>5 (,5 '" <<&,&2" #& 3 : %) N#I,H "$' (1'#
/((' $0 K,H "$' (1'#
3 " (4 !0) K" 0
%' (K" $) (K" 0,* JJ' 4 $+

H8(8Z0%' ,%P1'"#& 3 < : @(5 R,A/W(X, RI; b&('+) GFH ,$' $(") N) ` "0" G' $'
@(5 R,A/W(IH; .?V$4 9+#$ "%#&", V4 9+#& 3bV) $G' $' (H !0* G
H3 &$0 ,(#' #&<,&8T$3# %,V@(5 R,A=)%U$#" +$) 0* ,4) H.) 0* 0$+#,0) $#+#$' GC
5 / 4 4 $'%2$,2/ 3#%' ,' &+#,9%$21%/ %=) GFH ,JF) (1'3'

(R; R,FEDSFBCJF77$F7D,$V#*$4 $' * ,- "Q' %/ 1<,<1=<#' 32$<b V) ,.. () GF4$+,a * (* ,J) F0GC
(R; R,FEDSFBC,$4 $'%$32* ,9''' 33&8P," 30 ,3/ #&,&2" #& 3bV) ,.. () GF4$+,a * (* ,J) F0GC
(R; R,FEDSFBCJF77$F7D,- " Q' %/ 1<,2- $4 ,&2"'' <b=) GFH ,JF) (1'3' n&(1+) GFH
$' $(") N) ` "0" G' $'
(R; R,F77$F7D,! (+(,0&+#&-1+#& 3 ,Y2- $4 ,&2"' ,&8T$3# %,Y- " Q' %,,&8 $3+#,&2" #& 3 b
=) GFH ,JF) (1'3' b/HH * Gf' $' ,^'' 4F$' ,,- * '" #$, - "] " (GFR* # L* G^4- () 0 1#,,- * '" #$, - "] " (G m
$(1+) GFH ,$' $(") N) ` "0" G' $' b,R* # L* G^4- () 0 1#,,- * '" #$, - "] " (G

5 '$" 3 ,b " #$ %#R2#\5/b RXF77b=) GFH ,JF) (1'3'

5 '$" 3 ,R,&#R2#,($2#& 3 : V) $+#-$' G
77D/A#X(>" Q' %/ 1<,R,&%
. / " 1# 3+#<,\#R. <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

(#' #&,%P1'"#& 3 <

! " <<" 2- 1<$+#< : % * ,J) +# a '0 K,4) H.) 0* 0$+," (*, +#-$' G b=MR/Q& ,I DQMO/RS
[$M,e / % : % * ,J) +# a '0 K,4) H.) 0* 0$+," (*, +#-$' G b=) GFH ,JF) (1'3'
[$M,f $%$* : % * ,J) +# a '0 K,4) H.) 0* 0$+," (*, +#-$' G b=MR/Q& ,I DQMO/RS
. $3 3<*'T" 3 & : % * ,J) +# a '0 K,4) H.) 0* 0$+," (*, +#-$' G b=MR/Q& ,I DQMO/RS,^VUI _
H3 &$0 ,(#' #&<,&8T$3# % : U$# " +$) 0* ,4) H.) 0* 0$ +#,0) $#+#$' GC
V@ 5 R,A=X

5 " 3 " 0"

b >! I(,V$" 3 " 0 " X : 3 # ++,R\ : ; b& " $ (1'#4 " F+'0K,'+H * Gf' $," 0G,+* (1) F+,$) N#I,* JJ' 4 $+,^%) N#I_C
3 # ++,R\@ b& " $ (1'#4 " F+'0K) $ * (,$) N#I,* JJ' 4 $+,^m * (L,$) 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 '0 K,4) H.) 0* 0$+," (*, +#-$' G b=) GFH ,JF) (1'3' nn " 0" GFH
5 ?. R,@ V&2,<1=<#' 32$< : % * ,J) +# a '0 K,4) H.) 0* 0$+," (*, +#-$' G b/0) (K" 0 1#,,JF) (1'3' +
5 " 3 " 0 " ,&8T$3# % : U$# " +$) 0* ,4) H.) 0* 0$ +#,0) $#+#$' GC

$ %&') * + ' . % . ,* 0- / 10 %% . .,2 0 4 5 4 - +,6 - 78' %&

7K8; $P1'"# %,&8)/ %4 "#& 3

@ &,9%0 12#-" <,=$$3,2"" <<&,&$0 ,&8," 22/ %" 32$,M&# ,# $,- " Q' %0 ,2%&$%&,( ) ,# $,5 / 3#%'' $0 ,. %0 12#<,; $P1'"#& 3 <
" 30 ,# $,! (+(,2/ 3# &8<,"'', # $,&8)/ %4 "#& 3,%] 1&$0 ,=* ,# $,5 / 3#%" $0 ,. %0 12#<,; $P1'"#& 3 <8

I3#5%8" #& 3 "' ,%P1'"#& 3 <

I3#5%8" #& 3 "' ,' &+#< : R1<#%' &,,&8T$3# %,\R!5 ( )%V) $G' $' (H !0* GC
5 - &8" ,&8T$3# %,V@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

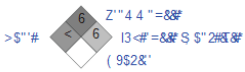
7U8G# $%&8)/ %4 "#& 3

^ "=$' ,%$] 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,%U OWS%MOWUV,RU&,UWSC,=Q=' S3 %
3 UV3 SO,! U[UOR,\,3 MV%U/V=,& U%SO/UD,T ! /3 1 ,& UY,3 UQ=S,3 UV3 SOC

>" Q' %/ 1<,! " #&%&' :
I3)/ %4 "#& 3,(* <#&4 ,\#I8(8R8X

@ $,21 <# 4 $%&,%<9/ 3 <&'$,)/ %0 $+#&%4 ,&8P,#. $,. . ?,2/ 0$,)/ %# -&,4 " #&%&' 8

[" #& 3 "' ,Z,&$,. . %+#&2#& 3 :
R<</ 2& #& 3 ,\#I8(8R8X



+" #$, /) ,9%&8#&8P : J$SUSSB778
+" #$, /) ,&<<1$: 7@@B@@. : C
+" #$, /) ,9%T& 1<,&<<1$: V) ,. (* ') F+,' " #G' $) 0C
6 $%&(3 : :
. %9" %0 ,=* : &=R=,=. * 41' #+$

◤ I30&2" #$+<,&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# ,&$0 ,- $%&8 ,&: " 221%#&8>/ MSTS*%&$,&# $%# $," =/ TS'\$" 4 $0
<199 ' (&%&8 / %" 3* ,/) ,&#<,<1=<<&0 &*%&<#)' <<14 $<," 3* ," ,& =&&# ,M-" #=/ T*%) / %# $," 221%2* " ,/ %2/ 4 9 ' $+#&3$<<,/) ,# $
&8) / %4 "#& 3,2/ 3# ,&$0 ,- $%&8 8
Z&8"' ,0$+#&*% 4 ,&8" #& 3,/) ,<1&#' =&&#' /),"3* ,4 " #&*%&' ,&:,# $,</ ' $,%<9/ 3 <&=&&#' ,/),# $,1 <$*%R' ,4 " #&*%&' <,4 " * ,9%&<$3 #
13L3 / M3,:- " Q' %0 <," 30 ,<-/ 1' 0 ,=$,1<$0 ,M&# ,2" 1#& 38R' # / 1P- ,2$*%# &8,:- " Q' %0 <," %,0$<2*%-$0 ,:- $*%&$NM$,2" 33 / #
P1'" %3 #&$,# " ## $<$," %,# $,/ 3 * ,:- " Q' %0 <,# " #$V&+#8

Thermo SCIENTIFIC

The world leader in serving science

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

& '0$ *' - #3 &4 $" 1%$

("4 4 " '(#+&*'&# $& %012#
#3 1' - '3 & $0'"
) 1'# ($
/ #& 1'# ($
) $2'"(& / 1%$& " '"%$

* & &) +& &)& + /+ && + . +&*(+ +&)%& ((. &* & +&- * /)* + & ' & . /6
+&* &+ /)* .))* & +*/&.)/ %&- & +&. - . *)* &) +6
- * +&*- *6
- /%& - %/+& +&(+* +&' &+ -)* & %&+ - * &- & +&)( )*)* & & +&+ ( )* & +&* ( ) +*/&
/ + +& & &) +&&. - & (/)* & %&+& +*&* - %)* & * '& + - * %&) & &)/ - . /&.)/ %
/)*)* 6

" '"%/ 1 &# $%& "(
0$2/ 4 / '#/ 3 & %012#

+(- -)- * & - . (/ & ' &* (% +& +& - %&)* & /+) %
(- * &)-) +
(- * & - * -) +
*)/ - +* &) +

) $2'"(& %#$2# $
$ 1' 4 $3#&/ %&* % *' - #&%

) +) /+ & - . %&& + & -) /+& - /+(/) +&# .) +* /&* &+%(- * /)* + & + /)*
/. & &)/ && %& (+)+(+& + /+ &* & -)/) +& + . +& - +6

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

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

- & (/) * & %& +& +* &* - %)* & *' & + - * %&) & &)/ - . /& .)/ %&)*)* 6
(. /+&. - . *)* & + &&. ++ & * * +(+ ' & * & * - /+(+ & + . - * * +%& -
+* /+)* &&. - & - /& . (& & %& - . &)%& & /+) &&. -) & + /)* & . & &) /6
-) +& + . /+& +* /)%)- * &&. + & -) /+& + .) /- & +* & +* /)%)- * &
)* + . /+&&. /& * & -) /+& + . * %& - /+(/) +& .) +* /& ++& +(/) - * &0 6

3 '%34 $3# (& %2" 1#/ 3

-) &) + %& &)%& & /+) %* & * - & * & - * / (/&)/ & -)%& /+ ' &)*
* & + + &&* - & +&+% * /& . / -)) + & & +& - . (/& & . + & *) - * +* / %
- %) - * & + + & /+ ' & -)%& &) 6

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

) 4 "((& '((

, /- &% &,&)/ - . /&) &&. - +& - * /)* + & - &)%& + &&.)%)+ &)/ & /+ & * & - &
) & /+ - % %&&. %+ * /) +%& &,& /+)* . % %& - &)/ & * &* + /& ' & /+) %*
%(+&* & * & -) /+& /+&) - %- * /)* + &&.) - + & &) & &%+ * + & /+
) - %- * / (/- 6

" '%$& '((

, /- &% &,&)/ - . /&) &&. - +& - * /)* + & - &)%& + &&. - (&+% +& -
.)* &&. + +* /&+ * / &* /- & + + & /+ &- . + & + +* / & &- *)* + & + &&.
%& + &* /- & * & %+ * /& + / +* /& %* /& & - (++ & & - %& &&. - * /)* & * &- %(/
%& +&)/ &- * (- . /) %& - +* /& /+) %#6 &. * & / & +)(%+&
) /- (+ - & / & * & %(+& * &- * /)* + & - &) - %((-)* & &%(%+ . %)- *
++& +(/)- * & 3 &&.) - +& &) & &&+ * + & /+&) - %- * / (/- &&. - * /)* /+
- +* /& /+) %& ' & - +& +& +& & & +& %)* & - . (/&& - /+ & +++& +(/)- *
! & & + +* (' &- * / (/& * - /)- * & * & +(/)- * & 3 & - & /+&) - %

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

"30(3

. /& * & -) /+& + - * %& - /+(/) +&) +* /& ++& +(/)- * &0 &&. /)* &)*)* &*
-)* & - %&& +& -))/+ &* & + & + +&) & /+) %& & * % &/- + &*
- (+ + &&. - + & - %& & * & * & (+& + - +& /)* &)*)* &* & -)* 6
+ - +& - * / .)* /+ &%& /)* & * & - /+(/) +&) +* /& + - +& * /+)* & + 6
- & - /& * + /&&. -) &- * / (/&)/ & * &)* & * & %/)* &&. -) & + /)* & - & &) /6
+& * %&)/ & + /+& +* /)%)- * &&. + & -) /+& + /- &)* & * & * /)* & * &
)* + . /+&&. ++ & * & +))* %& - * /)* + & & * & - + & %+ * /) +& + & - &
(- /) %& /+) %& + /&) /%& % + & * & +* & . /& +& + - %& * & * & + /&) /&
+ +* /& %& + &&. - & - /& /- +& * & % +& & - * /)* + &&. -) /+& - * /)* +* /&
-) & *) - * +* / %& - * /)* /) - * 6

) # % $

, /- +& +/ ++* & +& %)* & + /. + &2& &0 &34& & 16 &&. /- +& *
((- * (+&)/ &(%+ . %)- * &&. /- +& * &))* %& - * /)* + & - /+(/+ & - &) +(/
. * % /& * & & - - %& * & +%& +* /)%/+ & + & ' & - & * (- /) %& /+) %& ++
+(/)- * & " & * & - & * &)* &&. + & * & + %& * & * & + /&) /&
+ +* /& %& +&&. - & - /& /- +& * & % +& & - * /)* + &&. -) /+& - * /)* +* /&
-) & *) - * +* / %& - * /)* /) - * 6

7)+& ()+* (+& + + (&- &! - (- &7 &&0! 4 & 10 " @ + -&-
)+ (+&)-/+(* - % * &* (& & ( )) * & - ! ! ! 4 &0! 4 & 10 3! 1&

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

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

5 " 3" 0"
221 "#/ 3" (& / 1%$&4 '#
- & - . +&)& %+&* - * 6

5/ 3 1(#& / 2" (& 1# / %#$ & / %& 22$ # ($& / 1%$&4 '#

$2/ 4 4 $30$0& 4 / 3'# %3
%2$01%$

&) & - . (/& - * /)* & * +)+* / &)/ & - . +&%)/ & + - * %& - %(+&/ - + +
- &) %)(%& - *)-)* & ' & +&+ & .) + & & +/+)* +& +& +(/) +* + & & +&+* /)%)- *
- & / + & - * / - %& + . + & * 5 & +& +(+)/ & & +& +) /- ' & - /+(/) +& .) +* /6

3 '3$$%3 & $" 1%$

+& * %&)/ & + . /+&+* /)%)- * &&. & + & + /)- * & +* + /+&. / & + & & -
- &) / & +& - (+ & * (% . + & %(%& . /& +* /)%)- * & & / + & +*)* ++)* & - * / - %
/- & ++ & - + & +& - . +& - &) - * +& - * /)* * / & +% & +* ' & +(- +* + & & / . /- '
%)/ 6

+ '3& $" 1%$

& * & - + & * & (+& - - . %& /+ & * % & +)(% - . (/ & + - +
+ /)* & -)* & * &)* & +& % /- ' & * & /& +& * & & +& -)* & +) - &&. -) /+
/+(*) . + & - . %& &+& + & - & + /+* /) %& - * /)* /+ & %/)* & &&.) * & &
(- * /)* /+ & %/)* & + - +& +.)* &&. * . +& /& * + & /)- * & * & +/ & - +
+& % +& - & +& - / /)- * & %(/)- * 6

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

$ '%# %

+& & - + %&)/+ &) .)')* & &) + & +) /- & - %* &)/ & * & - +
/ * & & &) & + +* /&)(/+ &) & & +(+ ' &&. +) /- & +%(/)- * & . /& +
+ & * & * - * & & * /)( ) /+ & - . +& % +% & +& & & +& - . (/& * & +& +
-)* & %) & & +& +%(/+ & +) /- 6

" 30

+)(%+) / * /&) +)- & % + & - %* &)/ & * & - + & /+ * & & . - %& +
. * & /& %&) + & +* & * % & (+)(% - . (/ & &) & & + +* /& *)(/+ &) &
* +(+ ' 6

+$

, +/ & +' + & - %* &)/ & * & - + & /+ * & & - . %& +& + & +* & &)
+ +* /& *)(/+ &) & & +(+ ' & & -) & - . +& & %) & % + &) / &
. / 6

) '3

+ - * % - /+(/) +& .) +* /& - & +& - ' & - . %& +& +%(/+ & + & * & +& & +)*
+ - + & * & +&) & * - %+ & * & - . %& +& + & * & & +( ) %/& + - +& * %
/) & - . (/6

3 '%34 $3# (& / 1%
2/ 3#%(

))- * & - & +* /)%)- * & & - & - (+ & .) +* /& - . %& +& +(+ & & * . +& +'
(- %&)/ & +& + .) + +* / & & *) - * +* / %& - /+(/) - * &) %)- * & * & - +& +
. +& (. + &)%& & & *)* ++)* & -))(/) - * & & +& - (+ & & .) +* /&)%& +
* +(+ ' & & + . (+ &))- * & & ((+ / %& % +%6

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

. - + '2" (& #' #6
5/ (/ %
0/ %
. ' $%' '(#+& % $%#$
) / (1 '(#+

7) .) 6
- % % & % 6
- % 6
) +) %& * & +& - %&)* & /+) %& - %& /+ & * & - /& /+ 6
, - % %& * & +& - %&)* & /+) %& - %& /+ & * & - /& /+ 6

7 & #' '(#+& 30&$" 2# '#+

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

+& - . (/& & / %6
- & +( )) & / 6
- & +( )) & / 6
* + & - %+ *)/ - * & & /- +& * & + & - . & +(-)/ - * & - . (/ & - . %
* - /& +& - . (+ 6
* + & - %+ *)/ - * & & /- +& * & + & - . & + (/) - * & . ((. 6

7)+& ()+* (+& + + (&- &! - (- &7 &&0! 4 & 10 " @ + -&-
)+ (+&)-/+(* - % * &* (& & ( )) * & - ! ! ! 4 &0! 4 & 10 3! 1&

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

7 & $ 1("# %+&3*/ %4 "#/ 3

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

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

! " "2-1 $##	-*+& & +&- -*+*/ & +&%/+ 6
$ &/%	-*+& & +&- -*+*/ & +&%/+ 6
$ &$%$+	-*+& & +&- -*+*/ & +&%/+ 6
. $33 +("3'"	-*+& & +&- -*+*/ & +&%/+ 6
3'#$0&#'#5 &3 $3# %+) 5 &	%&- -*+*/ & +&%/+ & &+ + /+ 6

5"3"0"

!) &5"3"0"	-/&-*/-%5 &* +& , & * 6

5"3"0"'3& #

5"3"0"'3& .	-*+& & +&- -*+*/ & +&%/+ 6
5 . &/ '2&1 #'32$	-*+& & +&- -*+*/ & +&%/+ 6
5"3"0"&3 $3# %+	%&- -*+*/ & +&%/+ & &+ + /+ 6

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

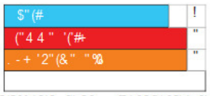
3#5%3"#/ 3"(&5 1("#/ 3

3#5%3"#/ 3"(& #	1 #%("&3 $3# %+& 5) & %&- -*+*/ & +&%/+ & &+ + /+ 6 5-'3"&3 $3# %+& 5) 5 & %&- -*+*/ & +&%/+ & &+ + /+ 6 " "3&3 $3# %+ & %&- -*+*/ & +&%/+ & &+ + /+ 6 / %5"&3 $3# %+ & %&- -*+*/ & +&%/+ & &+ + /+ 6 $ &$"("30&3 $3# %+& *&5-$4 '2"(& /5 & %&- -*+*/ & +&%/+ & &+ + /+ 6 . -'('3$ &3 $3# %+&. 55) & %&- -*+*/ & +&%/+ & &+ + /+ 6

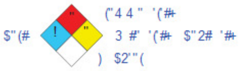
7 & # $%&3*/ %4 "#/ 3

" $(&5 1'%$4 $3# & , & , & & & & & 6&& , 7& & & , & $ & $ & $ & , & & 7 6

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



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



, "#5& *& %3#3	7
, "#5& *& 1$	4535"! 26
, "#5& *& %5 '/ 1 & 1$	-& +)-. & % /)*6

---

7 & # $%&3*/ %4 "#/ 3

6$%'/ 3 !

. %5 "%$0&+ , , & +() %/

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

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

/ &+ $&$ #&*& 1%&3/ ($0 $ &+ $&3*/ %4 "#/ 3&2/ 3#"3$0&$%5'3& &221%#5 &/ $ $%&3$'# $%&+ $& / $ 3"4 $0 1 ('$%&3/ %&3+& *&# &1 '0'"%$ &' 14 $ &3+&" '(#+& -"#/ $ $%&/ %&+ $&221%2+& %&2/ 4 ($#53$ & *&+ $ '3*/ %4 "#/ 3&2/ 3#"3$0& $%5'3
'3"(&2$#5%4 '3"#/ 3& *& 1'#' '(#+& *&3+&4 "#5%'(& &+ $&/ ($&&5 /3 ' '(#+& *&+ $&1 $%& ((&4 "#5%'(&4 "+& %5 $3# 13 3/ 3&" "%0 &30&-/ 1(0& $&1 $0& '# &2"1#/ 3 & (# / 1 -&2$%#'"3&" "%0 & %5&0$ 2% $0& $%5'3 & $&2"33/ # 1"%3#5$&+ "#&+ $ $& %5&+ $& 3(+&" "%0 &+ "#&5 ' #

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(% ! (77 = J - E#}- +2 6L@ 77" M N5 4!* 2 (& 0 1* . 87M<; 87 =: =(- + 8" " 78=: '9=! 9	! " 31*" 2#! 9 %%	:	B, * +C - (D4 , * +(&E+* 5 1%+E $ 4 +E" (%4 1* E 5 - 3 FG $ 7 H 7(% ! (77 = J - E#}- +2 6L@ 77" M N5 4!* 2 (& 0 1* . 87M<; 87 =: =(- + 8" " 78=: '9=! 9
5 / 0 $	:	""! 89: 8(78; 7; 77(78; 7; <8(78; ! ! 7=(78; ! ! ! : (7<" 78";			
!) .) (O		=; MM			
6"' &0" #& 3(0" #5	:	7>78 +" 7! ?			
. %&#0" #5	:	7>78 +" 7! ?			
; $<9 / 3<&<' 5(3" 4 $		O &P &(&/ * E+0 4 1			
		5 > ?! @ ?5 : AEBBCDCBEFEBB GH@ I, ?(H) : JBF8+CJB FAAJ	! " #5%&' (1 <$<	:	$*'$%#' (# $(&<#%2#& 3 =/ / L'$#*/ %9 %9S%' 30 &#&30 $0 (1<$&(G# $'%#&<$N 2/ 3# 2#(<199' &$%&/ %<9$2&&2 "99' &2" #& 3 <8
. %012#(#+9 $	:	@A -2?			

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

?4 $%E$32+(/ T$%&M		
. - +<&2" ' (<# #&	:	@A -2? (\/3 0 +(. / 0 +K3 6F(3A -2 ?/W
5 / ' / %	:	V- 3 -3 . . ?
G0 / %	:	H2- -3 . . ?
) &?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 ?2(N. * (- 5 3 S 4, (02* A 0 1* (b* 5 1 4 0 1 4 5 ?2 (P- (5- 1* 0 1 6 2 +5 K(- + _C - K* (S, * 5 (' . 45F(1 4 (/ + 2' E ?((Yb- 4 2(E- 5 1 0 E ?S 4! (* G . 6(. K&6 (052(E 3 1 .45F ?(() * * / E- 5 1 0 4 5* +(1 F, 1 3 3 E 3 . * 2 ?((X 0. , (1 - + ' F, 3 3 4 0)* +(, 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 ' 54 E0 1 4 5 (&: 0 5 2 0 -2 ' ! <(VDJ (7<7" 7?! " " a?
; / 1#5 <(/ *($3#%	:	P* +C 0 3 E- 5 1 0 E ?(Q\3 (E- 5 1 0 E ?(L5, 0 3 0 1 4 5 ?(L5F* . 1 4 5 ?
/ #5 3#&' (" 21#5 (- $" ' # ($ ** $2#<			
I3 - " ' " #& 3	:	L+#0 1 5F(1 + (* . / 4 0 1 + G, G 1* C ?			
I3P$ <#& 3	:	R- (K5 - S5 (. 4F 54 ED 5 (*))* E 1 (- +(E+#ED 3, 0 T0 +2 . ?			
) L&	:	L+#0 1 5F(1 + (. K&5 ?			
? +$<	:	L+#0 1 5F(1 + (* G . . ?			
/ #5 3#&' (2 - %3 2(- $" ' # ($ ** $2#<					

7S'AS0B7D8 ! "#

@* (&E+* 5E* (J *, * 0+E. (((((((($ H(%+ I (77 = ((((((((((((((((((((J - B\)- +2 6L@(((('87M&<; 8 d' =: =((((((((SSS?\ * +C - 'E- C $ 4 +E" (%4 1* E 5 - 3 FG(BE?((((((S=: =(R?O^ +E 4 0 5 (J - 02((((((((((((; 77" M(((((((((('87M&<; 8 o=97; (D0I

$%&( ) * () +,, - .

D&> " 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 05 (20C 0 F* ?
5 " % 2&/ P$3 2&'&+	:	R- (K5 - S5 (. 4F 54 ED 5 (*))* E 1 (- +(E+#ED 3, 0 T0 +2 . ?
! 1#' P$3 2&'&+	:	R- (K5 - S5 (. 4F 54 ED 5 (*))* E 1 (- +(E+#ED 3, 0 T0 +2 . ?
@ %#' P$3 2&'&+	:	R- (K5 - S5 (. 4F 54 ED 5 (*))* E 1 (- +(E+#ED 3, 0 T0 +2 . ?
, T' / 94 $3#" ($ ** $2#<	:	R- (K5 - S5 (. 4F 54 ED 5 (*))* E 1 (- +(E+#ED 3, 0 T0 +2 . ?
Y$ %&'&+ ($ ** $2#<	:	R- (K5 - S5 (. 4F 54 ED 5 (*))* E 1 (- +(E+#ED 3, 0 T0 +2 . ?
@ %P$#/ %P" 3<	:	V- 5 1 0 4 5. (C 0 1* +0 3 $S, 4E. (E0' . * . (20C 0 F* (1 + (1 * ()- 3 B S 4 5F(- +F 05. d[* G . ? V- 5 1 0 4 5. (C 0 1* +0 3 $S, 4E. (C 0 G E0" . * (20C 0 F* (1 + (1 * ()- 3 B S 4 5F(- +F 05. d[K5 6(. 1 + C 0 E, ?
GT$ %&U9 / <1 %(<$P3 <$<+4 9 # 4 <			
I3 - " ' " #& 3	:	Y2b* + * (. GC / 1 + C . (C 0 G 4 5 E3 2* (1 * ()- 3 B S 4 5Fd +* . / 4 0 1 + G 1 40 E 1 4+#0 1 4 5 E- ' F, 4 5F
I3P$ <#& 3	:	R- (. / * E4 4E 2 0 1 0 ?
) L&	:	Y2b* + * (. GC / 1 + C . (C 0 G 4 5 E3 2* (1 * ()- 3 B S 4 5Fd 4+#0 1 4 5 +* 25* . .
? +$<	:	Y2b* + * (. GC / 1 + C . (C 0 G 4 5 E3 2* (1 * ()- 3 B S 4 5Fd / 0 4 5 (- +(4+#0 1 4 5 S 0 1* +5F +* 25* . .
! $0 &'" (2/ 30 &&, 3 < "PP%T" #& 0 (=+(/ T$% $U9 / <1 %	:	$ -# c* I 4 1 5F(24 - -2* + (45 b- 3 b 5F(05 G 1 0 -F* 1 (- -F 05. (C * 5 1 4 5* 2 (45 (1 4 (O &P &(0. (_ * 5F(01 +4 K(C 0 G (_ * (0 FF-0 b 0 1* 2 (_G (- b* +c* I / - . ' -* (1 + (1 4 (/ + 2' E ?

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

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

H3 &&0() #' #&5 <

Z" 4 $	5 R) (3 1 4 =$%	[
. - 24 C (E, 3 +2*	=; : =o7: dM	7" (q["
. - 24 C (24 G2+ F* 5 - +[- / , - . / , 0 1*	=MM&d8" c=	7(q 9

@ $%(" %(3 / (" 0 0 &&, 3 " ' (&8 P%$0 &$3#:(9 %<$3#(M- &2- N(M&#- &8 (# $(21%%$3#L3 / M' $0 P$(// *(#- $(<199' &$%' 3 0 (&8 (# $ 2/ 32$3#%#&, 3 <(" 99' &2" =' $N(* %(2" <<&&$0 (" <(- " Q' %/ 1 <(# (- $" ' # (/ %# $(S3 T&&34 $3#(" 30 (- 32(%\ 1 8&$(%9 / %&0 F(&8 # &<(<$2#&, 38

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

? +$(2/ 3# 2#	:	V, * E+(). +(052(+* C - b* (05 G E- 5 1 0 E1(3 5. * . ?((LC C * 24 0 1* 33)) 3 . , (* G . (S4!, (/ 3 5 1 3 -)(S0 1* +). +(0 1 3 0. 1 7(M C 4 5' 1* . 6 - EE 0. 4 50 3 3 3 4 1 5F(1 * (* / / * +(052(3 S* +(* G 3 2. ?((Z * 1 C * 24 E0 3 0 1 1* 5 1 4 5 (4 C C * 24 0 1* 33?
) L& (2/ 3# 2#	:	L5(E0. * (-)(E- 5 1 0 E1 64 C C * 24 0 1* 33)) 3 . . , (K5 (S4!, (/ 3 5 1 3 -)(S0 1* +(). +(0 1 3 0. 1 7(M C 4 5' 1* . S, 4? (+* C - b 4 5F(E- 5 1 0 C 4 5 0 1* 2(E3 1 .45F(052(. , - *. ?(X 0. , (E3 1 .45F(_ *)- +* (+* . * ?((V3 05 . , - *. (1 - + ' F, 3 3 _ *)- +* (+* ' . * ?((Z * 1 C * 24 E0 3 0 1 1* 5 1 4 5 (4 C C * 24 0 1* 33?
I3 - " ' " #& 3	:	O - b* (* ! / - . * 2(/ * + - 5 (1 - ()- +* . , (04?(LV5 - 1_ -* 0 1 .45F6&(_ -* 0 1 .45F(4 (4+* F 3 0 +(- +(4 +* . / 4 0 1 + G 1 0 +* . 1 - EE + 6// + b 2* (0 +#4 E 0 1* . / 4 0 1 4 5 (- ?+(- ! G F* 5 (_ G 1 4 0 .45* 2(/ * + - 55* 3? @ - . * 5 (1 F, 1 E3 1 .45F(. ' E (0. (0 (E- 3 0 -6 1* 6_ * 3[- +(S0 4 1 052?((Z * 1 C * 24 E0 3 0 1 1* 5 1 4 5 4 C C * 24 0 1* 33?
I3P$ <#& 3	:	X 0. , (- ' 1 C - ' 1 (S4!, (S0 1* +?((P- (5 - 1452' E* (b - C 4 1 5F(' 53 . . (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?

7S'AS0B7D8 $"#

@* (&E+* 5E* (J *, * 0+E. (((((((($ H(%+ I (77 = ((((((((((((((((((((J - B\)- +2 6L@(((('87M&<; 8 d' =: =((((((((SSS?\ * +C - 'E- C $ 4 +E" (%4 1* E 5 - 3 FG(BE?((((((S=: =(R?O^ +E 4 0 5 (J - 02((((((((((((; 77" M(((((((((('87M&<; 8 o=97; (D0I

$%&( ) * () +,,- .

C8(Y8/%#(" &0(4 $" <1 %$<

. %#&2#&.3(/ *(*(8&#%' &0$%

: R- (0E¼ 5(. . 03]_ *(1()K* 5(-5b- 3¼5F(05G$/ * + - 503]+4 K(- +(S-4| - ' 1(. ' 40_3 (1+04-5-5F?(L)(4(4 . ' . / * E*. 2(1. 0 1'] C * . (0+* (. 1&$/ +* . * 5 %1 * (+* . E * +(. , - ' 3(()S* 0 +(05(0/ / + / +0 1* (C 0. K(- + * .3(E- 5 1045 * 2(. _+* 0 1. 4-5F(0/ / 0+0 1. .?((L)(C 0 G_ * (205F* + ' . (1 (1 * (/ * + - 5(/ + b-2-5F(0-42(1 F-5* (C - ' 1 c1 cC - ' 1 (+* . ' . E-40 ¼ 5?

Z / #&<(# (9 - +<&2&.3

: R- (. / * E¼-E1* 0 1C * 5 1?((B+* 0 1(. GC / 1 C 0 1E0 3&?((V- 5 1 0E1(/ - 4 - 5(1* 0 1C * 5 1(. / * E-0 2¼ 1 4C C * 240 1 3]+4(30-4* (A' 05 1## . (. 0b* (_ * * 5(-5F* . 1 * 2(- +(&. 03 2?

K8(Y8/%$X'&P- #&8P(4 $" <1 %$<

Y" * 4 " =&&#+(/ *(# $(9 % 0 1 2 #

: L5(0()4* (- +(4(. * 0 1* 2&0(/ * . . ' * (-5E=* 0. * (S-4$- EE. +(052(1 * (E- 5 1045 * +(C 0 G_ ' + 1?

?.U#&P1&=- &P(4 $0 &

: N. * (05(* I 1&5F ' 4 . ,-5F(0F* 5 1(. ' 40_3 ()- +(1 * (. ' . ++ ' 52-5F()4* ?

Z / #(<1 &* ='$

: R- 5* (K5- S5?

) 9$2&' ($U9/ <1 %(- " C(%<

: $ + C / 1G¾4 - 3 0 1* (1 * (. E* 5 * (_G+* C - b-5F(03]/ * + - 5. () + C (1 * (b-E-5 4G -)(1 * (-5-E2* 5 1(4 1 * +* (4 (0()4* ?((R- (0E¼ 5(. . 03]_ *(1()K* 5(-5b- 3¼5F(05G$/ * + - 503]+4 K(- +(S-4| - ' 1(. ' 40_3 1¼0-5-5F?

>" C(%/ 1<(# $%¼ "' '
0$2/ 4 9/ <&&.3(9 % 0 1 2 #<

: P* E- C / - . 4¼ 5(/ + 2' E1 (C 0 G-5-E3 2* (1 * ()- 3¼ S-5F(C 0 1* +0 3 d
/ , - . / , - + . (- I -2* .
. 03 F* 5 0 1 2(E- C / - ' 52.
C * 10 3 - I -2* > I -2* .

) 9$2&' (9 % #&2#&$
$\ 1.&4 $3#(" / %(8&X'&P- #&%

: D4# g4F, 1* + (. , - ' 3?((S* 0 +(0/ / + / +0 1* (/ + 1* E¼ b* (* A' 4 C * 5 1(052(. * 3(E- 5 1045 * 2(_ + F 0 1.5-F 0/ / 0+0 1 . (`&V%%a(S-4, (0(]` 3]0E² d' 4 E² (- / * +0 1* 2(5((/ - .4¼ b* (/ + ' . * + (C - 2 * ?

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

. $%/ 3 "' (9 %2" 1+&.3 <

: R- (0E¼ 5(. . 03]_ *(1()K* 5(-5b- 3¼5F(05G$/ * + - 503]+4 K(- +(S-4| - ' 1(. ' 40_3 (1+04-5-5F? Qb0E. 0 1* (. ' ++ ' 52-5F(0+* 0. ?((] * * / (.55 * E² . . 0 +G)052(. 5/ + 1* E1* 2(/ * + - 55 * 3]+ C * 5 1* +5F?((P- (5- 1(1 ' E. (- +(S-03¾(1 + * F. (. / 4]3 2(C 0 1* +0 3?(Yb- 4(- * 01-5F(b0/ - +(- +(C 4 1? $ + b-2* (02* A' 0 1* (b* 5 1¾0 1¼ 5 7((X * 0 +(0/ / + / +0 1* (+* . / 4-0 1 +(S. * 5(b* 5 1¾0 1¼ 5(4 4-502* A' 0 1* ?((S' ' 1(- 5(0/ / + / +0 1* (/ * + - 503]/ + 1* E1¾b* (* A' 4 C * 5 1(. * * (&* E¼ 5(8&?

? 3T&&34 $3#' (9 %2" 1+&.3 <

: Yb- 4?(24 / * + 03]-)(. / 4]3 2(C 0 1* +0 3?052(+ 5-))(052(E- 5 1 0E1(S-4|. (. - 4¾ (S 0 1* +5 0 G 62-4-5-052(. * S * + ?((5)- +C (1 * (+* 3 ' b-05 1 0(' 1 . - +4+* . (4((1 * (/ + 2' E1(. 0. (E0' . * 2(* 5b-4- 5C * 5 1 0 3 / - 3¼ 5(. * S * + 6(S 0 1* +5 0 G 6(. - 4¾ - +(04-e?

! $# / 0<(*/ %2' $" 3&8P(19

) 4 """(<9&

: &1 / (3 0 K(4(S-4| - ' 1+4 K?((O - b* (E- 5 1045 * + ()+ C (. / 4]3 0+* 0 1?((P-4 1* (S-4| (S 0 1* +052(C - / (* / 4(S 0 1* +c - 3 . 3 ' ?((Y3¾ +5 0 1¾b* 3G¾ - +(4(S 0 1* +G5. - 3 . 3 ' 6(0 . . - + . (S-4| (05(4-5* +(2+G)C 0 1* +0 3)052 / 3 0E² (-45(05(0/ / + / +0 1* (S 0. 1* (24 / - . 03E- 5 1045 * -+(P-4 7 . *(-)(b-0((3E² 5. * 2(S 0. 1* 24 / - . 03(E- 5 1+0 E1 +?

^ " %P$(<9&

: &1 / (3 0 K(4(S-4| - ' 1+4 K?((O - b* (E- 5 1045 * + ()+ C (. / 4]3 0+* 0 1?((Y// + - 0E (+* 3 0. * ()+ C * / S-4-2?((S +* b* 5 1(* 5 1+G4-5-1 (. * S * + 6(S 0 1* +E. ' + * . 6(. 0. * C * 5 1 (- +(E-5)-4-5* 2(0+* 0. ?((X 0. , . / 4]3 F* . (4-5-1 (05(*))3 * 5 1(1+* 0 1C * 5 1(/ 3 05 1(- +(/ + E* * 2(0. ()- 3¼ S. ?((V- 5 1045(052(E- 3¼ E1 . / 4]3 F* (S-4| (5- 5-5E- C . ' . 1¼ 3 ?40. . . - + . * 5 1(C 0 1* +0 3 * F?. 052(6* 0+1. 6(b* -C-E- 3¼ (- + 2-0 1 C 0 E² - ' . (* 0 +1. (052(/ 3]E² (4-5(E- 5 1045 * +)- +(24 / - . 03 0 E- -2-5F(1+(3 E0 3 ¼ F* 3 0 1¼ 5. ' . * * (. * E¼ 5(79a((P-4 / - . *(-)(b-0((3E² 5. * 2(S 0. 1* (24 / - . 03(E- 5 1 0E1 +?((V- 5 1 0C-4-0 1* 2 0 . . - + . * 5 1(C 0 1* +0 3 C 0 G_ * - . *((1 * (. 0C * (. 0T0-+2-(0. (1. * (. / 4]3 2(/ + 2' E1((R- 1* (4. * * (. * E¼ 5 7((- +(" C * +F* 5E3(E- 5 1 0E1(4-5)- +C 0 1¼ 5(052(. * E¼ 5(79()- +(S 0. 1* (24 / - . 03?

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

>" 30' &8P

: $' 1- 5(0/ / + / +0 1* (/ * + - 503]/ + 1* E1¾b* (* A' 4 C * 5 1(. * * (&* E¼ 5(8a((Q0 1¾5F(2+¾K¾5F(052 . C - K¾5F(. , - ' 3?(_ * (/ + , 4.4* 2(4¾(0+* 0. (S. * +* (1 4 (C 0 1* +0 3 4 (. 052 3 2(6. 1- +* 2(052 / + E* . . * 2?((X - +K* + (. , - ' 3?(S 0. . (. 052. (052()0E² (_ *). +* (* 0 1¾5F(2+¾K¾5F(052(. C - K¾5F? J * C - b* (E- 5 1 0C-4-0 1* 2(E3 1-4-5F(052(/ + 1* E1¾b* (* A' 4 C * 5 1(_ *). +* (* 5 1* +5F(* 0 1¾5F(0+* 0. ? P- (5- 1+5F* . 1((Yb- 4?(E- 5 1 0E1(S-4| (* G . 6(. K¾5(052(E3 1-4-5F?((Yb- 4?(_ +* 0 1-5F(b0/ - +(- +(C 4 1? N. * (- 5 3(S-4| (02* A' 0 1* (b* 5 1¾0 1¼ 5?((X * 0 +(0/ / + / +0 1* (+* . / 4-0 1 +(S. * 5(b* 5 1¾0 1¼ 5(4 4-502* A' 0 1* ?((] * * / (4-5(1 * (- +4F-5 0 3(E- 5 1045 * +(- +(05(0/ / + b* 2(0?((* 5 0 1¾b* (C 0 2* ()+ C (0 E- C / 0 1¾3 (C 0 1* +0 3¾K* / 1¾F, 1¾3E3 . * 2(S, * 5(5- 1¾5(' . * ?((QC / 1G¾E- 5 1045 * +(1* 1045

7S'AS0E7D8 / "#

@" (&5* 5E* (J * . * 0+E. ((((((((($ H(%• I (77=(((((((((((((((((((J - B(- +2¾&@(((' 87¼&(<; &d' =: =((((((SS$?\ * +C - 'E- C
$ 4 +2* (%4 * 'E. 5 - 3 FG(5E?(((((S=: =(R?O^ +E4 05(J - 02(((((((((: 77 ' M(((((((((' 87¼&(<; &0=97; (D0I

$%&( ) * () +,,- .

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

/ + 2' E1(* . 4 2' * (052(ED5(_ * (. 0T0-+2-(' . ?((P- (5- 1(* . * (E- 5 1045 * +?

) # %P$

: &1 + * (. * 5$ * * 5(1 * ()- 3]S-5F(1* C / * +0 1 * . d(] " (1 (! M&V(' ; 8(1 (==eDa?(&1 + * (4-((0EE- +205E² S-4| (3 ¹E0 3(* F ' 3¼ 1¼ 5. ?((&1 + * (4-(- +F-4-03(E- 5 1045 * +(/ + 1* E1 2(]+ C (2+* E1(. ' 5 3F_ 1+5(0(2+G6 E- - 3 0 52(S * 3¾b* 5 1¾0 1 2(0-* 0 6(0 S 0(G]+ C-(+5-E- C / 0 1¾3 (C 0 1* +0 3 (. * * (. * E¼ 5(7" a052) - - 2(052(2+¾K¾((] * * / (E- 5 1045 * +1F, 1¾E3 . * 2(052(_ * 0 3 2(. 5 1¾* 0 2G)-+(. * ?((V- 5 1045 * + 1, 0 1(. 0b* (_ * * 5(- / * 5 * 2(C ' . 1(_ * (E-+²) 3G¾* . * 0 3 2(052(K* / 1(' / +F. 1¹ (/ * b * 5 1(3 0K-0F * ? P- (5- 1(. 1- * (+5(. 5 3(. * 3 2(E- 5 1045 * + ?((N. * (0/ / + / +0 1* (E- 5 1045C * 5 1(1- (0b- 4-2 * 5b+ 5C * 5 1 0 3(E- 5 1 0C-4-0 1¼ 5?

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

5" 3" 0"

G2219" #&.3 "' ($U9/ <1 %(.&.$&-
R- (* I / - . ' * (3C-4(b0 3 * (K5- S5?

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

; $2/ 4 4 $30$0(4 / 3&# %&P 9 %2$0 1 %<

: I)(1 4 ((/ + 2' E1(E- 5 1045. (4-F* 2 4* 5 1 (S-4| (* I / - . ' * (3C-4.6(/ * + - 503](S- +¾/ 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 * (* ()) * E¹b* 5 * . . (-)(1 * (b* 5 1¾0 1¼ 5 - +(- 1 * +(E- 5 1+ 3(C * 0. ' * . (052> +(1 * (5* E² . . 4 1G¾1+(. * (+* . / 4-0 1 - +G)/ + 1* E¹b* (* A' 4 C * 5 1?

?3P8$$%&P(4 $" <1 %$<

: N. * (- 5 3G(S-4| (02* A' 0 1* (b* 5 1¾0 1¼ 5 7((L)(. * +(- / * +0 1¼ 5. (F* 5 * 4 0 1* (2' . 1¾] C * . G(F0. G(b0/ - + - +(C 4 1¾] . * (/ + E² . . (* 5E3 . ' * . 6(3 E0 3(* I . 0' . . 1(b* 5 1¾0 1¼ 5(- +(- 1 * +(* 5F-5 * * +5F(E- 5 1+ 3 1 (K* * / (S- +K* +(* I / - . ' * (1 (04+- +5 * (E- 5 1 0C-4-0 5 1(_ * 3 S(05G(+E- C C * 52 * 2(- +(. 10 1 1- +G 3C-4 1 ?

> +P&3(4 $" <1 %$<

: X 0. . (. 052. 6(]- +* 0 +C . (052()0E² (1 - + ' F. 3G0)1* +(. 0523 6F(E. * C-4-E0 3(/ + 2' E1 6(. *)- +* 0 1¾5F6(. C - K-5F(052(' . 4-5F(1 * (3 0b0 1 +G)052(0 1(1. * (* 52(-)(1 * (S- +K-5F(/ * +4 2?((Y) / + / +0 1* E. 5¾A * . (. , - ' 3?(_ * (' . * 2(1+(+* C - b* (/ - 1 5 1 0 3G¾E- 5 1 0C-4-0 1* 2(E3 1 4-5F?((X 0. , E- 5 1 0C-4-0 1* 2(E3 1 4-5F(_ *) - +* (+* . 4-5F?((Q5. ' +* (1 0 1(* G S0. , (. 1 0¼ 5. (052(. 0)* 1G¾(. , - S * + 0+* (E3 . * (1- (1 * (S- +K. 1 0¼ 5(3 ¹E0 1¼ 5?

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

; $<9 &%# %

: N. * (0(/ + / * +G3)4¹¹ 2(6 0 4&d ' +)Q5F(- +(0 4e)* 2(+* . / 4-0 1 +(E- C / 3]5F(S-4| (05(0/ / + b* 2 . 1 0 5 2 0 +2-(4 0(+4 K(0. . * . . C * 5 1(-4 2-E0 1* . (1 4 (4 (5* E² . . 0 +G3((J * . / 4-0 1 +(. * 3 E¼ 5(C ' . 1(_ * . 0. * 2(- 5(K5- S5(- +(05 1E3 1 0 1* 2(* I / - . ' * (3 b* 3 6(1 * (. 0T0-+2-(-)(1 * (/ + 2' E1(052(1 * (. 0)* S- +K-5F(3C-4 1 (-)(1 * (. * 3 1 E² 2(+* . / 4-0 1 +?

> " 30<

: V, * C-E0 3+* . 4 . 0 5 1¾4-C / * +b4 ' . (F-3 b* . (E- C / 3]5F(S-4| (05(0/ / + b* 2(. 1 0 5 2 0 +2-(. , - ' 3?(_ * S- +5(0 1 0 3¾1¾C * . (S, * 5(. 0523 6F(E. * C-4-E0 3(/ + 2' E1 (4)(0(+4 K(0. . * . . C * 5 1(-4 2-E0 1* . (1 4 (4 5* E² . . 0 +G?

?+$<

: &0)* 1G¾* G S * 0 +(E- C / 3]5F(S-4| (05(0/ / + b* 2(. 1 0 5 2 0 +2-(. , - ' 3?(_ * (. * 2(S, * 5(0(+4 K 0. . * . . C * 5 1(-4 2-E0 1* . (1 4 (4 (5* E² . . 0 +G3(1+(0b- 4?(* I / - . ' * (1- (3¾A- 4?(. / 3 0. , * . 6(C 4 1 (- + 2' . 1?

) L&8

: $ * + - 503](/ + 1* E1¾b* (* A' 4 C * 5 1()- +(1 * (_ - 2G]_ - ' 3?(_ * (. * 3 E¹ 2(_ 0. * 2(- 5(1 * (10. K(_ * -5F / * +)- +C * 2(052(1 * (+4 K (-5(b- 3¾* 2(052(. , - ' 3?(_ * (0/ / + b* 2(_ Q0(. / * E0 3¼ 1(_ *)- +* (. 052 3 6F 1 4 (/ + 2' E1?

?3T&&34 $3#' ($U9/ <1 %$ 2/ 3#%&' <

: QC 4 . 4 5. ()+ C (b* 5 1¾0 1¼ 5(- +(S- +K(/ + E² . . (* A' 4 C * 5 1(. , - ' 3?(_ * (E. * E¹C * 2(1- (* 5. ' * (1 * G E- C / 3]S-4| (1 * (+* A' 4 * C * 5 1(-)(* 5b+ 5C * 5 1(3 / + 1* E1¾ 5(3 F-4-3 1¼ 5?((L5(. - C * (E0. * . 6) ' C * (. E+___ * + 6)-4¹ + (- +(* 5F-5 * * +5F(C - 24-E0 1¼ 5. (1 (1 * (/ + E² . . (* A' 4 C * 5 1(S-4|_ * 5* E² . . 0 +G1+(+* 2' E² (* C 4 . 4 5. (1 (0E² / 10_3 (3 b* 3?

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

. - +<&2" ' (<# #&

: @A' 4?2(L\/3 0+(. / 0+4G6F(3A' 4?2\/W

Y" " <- (9/ &#

: U$ + 2' E1(2- * . (5- 1(. ' . 10-5(E- C _ ' . 14 5?\/W

5 / ' / %

: V- 3 -8 . . ?

G0/ %

: H2- -8 . . ?

9>

: =?M

, &<9$%&=&&#+(9 % 9$%#&$<

: Q0. 4G¾24 / * + 4_3 (4-5(1 * ()- 3¹ S-6F(C 0 1* +0 3 d(E- 2(S 0 1* +(052(. - 1$S 0 1* +?

7S'AS0E7D8 0"#

@" (&5* 5E* (J * . * 0+E. ((((((((($ H(%• I (77=(((((((((((((((((((J - B(- +2¾&@(((' 87¼&(<; &d' =: =((((((SS$?\ * +C - 'E- C
$ 4 +2* (%4 * 'E. 5 - 3 FG(5E?(((((S=: =(R?O^ +E4 05(J - 02(((((((((: 77 ' M(((((((((' 87¼&(<; &0=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 " #5 %&' < : R- (. / * Et\-E(2010?
>" 'Q' %/ 1 <(0$2/ 4 9/ <&&\ 3 9 %0 12#< : N52* +(5- +C 03(E- 524## 5. (-)(. 1- +0F* (052(' . * 6(, 0T0 +2- ' . (2* E- C / - . 4## 5(/ + 2' Et\ (, - ' 32 5- 1(_ * (/ + 2' E* 2?
. / <<&-&&#+(/ *(- " Q' %/ 1 < %" 2#& 3 < : N52* +(5- +C 03(E- 524## 5. (-)(. 1- +0F* (052(' . * 6(, 0T0 +2- ' . (+ 0Et\ 5. (S-4@5- 1(- EE' +?

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

H3.&&50() #' #&\<

R21#&\(# U&2&#+

. %0 12#&@P%0&\3#(3" 4 $	; $<1'#	) 9$2&\<	. / <$	?U9 / <1 %
. - 24 C (E 3 +2* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	@PM' (P* +C 03 @PM' (H +03 @P@ (I5 1+0c0 +1* +03 @PM' (P* +C 03 @PM' (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 5$ / %& <&\ 3

. %0 12#&@P%0&\3#(3" 4 $	; $<1'#	) 9$2&\<	) 2/ %	?U9 / <1 %	G=<$%" #&\ 3
. - 24 C (E 3 +2* . - 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 " %&8/ P$3 2&#+

5 / 32' 1<&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

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

. %0 12#&@P%0&\3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
. - 24 C (E 3 +2* . - 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 5$ / %& <&\ 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 " %&8/ P$3 2&#+

5 / 32' 1<&\ 3 $ 1 4 4 " % : R- 1 0b040_3 ?

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

. %0 12#&@P%0&\3#(3" 4 $	R5 _ I>	IR; 5	?. R	ZIG) >	Z@	G) >R
. - 24 C (E 3 +2* . - 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&#+

. %0 12#&@P%0&\3#(3" 4 $	; $<1'#	) 9$2&\<	?U9 / <1 %
. - 24 C (E 3 +2* . - 24 C 24 G2+ F* 5- +1 - / , - . / , 0 1*	YE 1* (QVM (! : 9" " " " " (F>@D+# . , (S0 1* + YE 1* (QVM (: " ! ; " " (1+ (; <! " " (F>@ D+# . , (S0 1* + YE 1* (@'M (7" : ! (C F>@D+# . , (S0 1* + YE 1* (@'M (7" " " " " " (F>@D+# . , (S0 1* + V, + 54E(RHQV(" '97: (F>@D+# . , (S0 1* + V, + 54E(RHQV(7" " (C F>@D+# . , (S0 1* + YE 1* (@'M (78; " " " (F>@D+# . , (S0 1* +	YJF0* (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 "%
G# $%'0T$%$($""$2#<

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

` "<#&(0&9/ <"'

, &<9/ <"'(<- /1'0(=$(&("22/ %"32$(M&#-("99'&""=$(%P8&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'&8P(&*/ %"#&3("30(9%#&2#&3(/ *($4 9'/ +$$<8

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

. $P1'"# % &8*/ %4 "#&3	HZ(314 =$%	. %9$%<-&9 9&8P 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<6F(F+' /

7K8(; $P1'"# %(&8*/ %4 "#&3

H3&&0() #'#&<

>5) (5'"<<&&2"#&3
H8) 8(Y0%'(%$P1'"#&3<

5'$"3(R&(R2#() $2#&3 77D\#\#*"Q'%/1<(R&% ./"1#'3#<(\#R. <W
5'$"3(R&(R2#() $2#&3[] ED 5'"<<II() 1=<#'32$<
5'$"3(R&(R2#() $2#&3[] ED 5'"<<III() 1=<#'32$<

, ?R(^ &#II(5 - $4 &2"'< V 9<<$3#&'(5 - $4 &2"'<W

3"#

$%&( ) * () +,,- .

7K8(; $P1'"# %(&8*/ %4 "#&3

. ?R(^ &#II(5 - $4 &2"'< V 9<<$3#&'(5 - $4 &2"'<W

) #'#&(%$P1'"#&3<
! "<<"2- 1<$#<
Z$M(f / %
Z$M(c$%$+
$33<+'T"3&
H3&&0() #'#&<(&8T$3# % V@ 5 R(A=W
5"3"0"
` >! I) (\5"3"0"W
5"3"0"0&3(&#<
5"3"0&3(Z. ; I
5?. R(@ U&2(<1=<#'32$<
5"3"0"(&8T$3# %

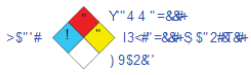
@ &(9%012#(-"<(=$$3(Z"'"<<&&$0(&("22/ %"32$(M&# (#$(-"Q'%(2%&$%& (/ *(# $(5/3#%'"$0(. %012#<(; $P1'"#&3< "30(# $(!) .) (2/3#'&3<("'"(# $(&8*/ %4 "#&3(%$\18$0(=+(# $(5/3#&"$0(. %012#<(; $P1'"#&3<8

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

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

^"=$'(%$\18$4 $3#<
>"Q'%/1<(! "#&%'
I3*/ %4 "#&3() +<#$4 (\H8) 8R&\/

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



, "#&(/ *(9%&#&P
, "#&(/ *(&<<1$
, "#&(/ *(9%T&1<(&<<1$
6$%&3
. %9"%0(=+

4"#

$%&( ) * () +,,- .

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

I30&2"#5<(&3*/ %4 "#8& 3(#- "#(- "<(2- "3P$0(*%4 (9%$T& 1<' +(&<<1$0(T$%&8& 38

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

@ (# $(=$<#/ *(/ 1%L3/ M'$0P$N#- $(&3*/ %4 "#8& 3(2/ 3#' &3$0(- $%$&3(&("221%#$8(>/ M$T$%M3$&#- $%# $("=/ T$X3"4 $0 <199'&$%M3/ %'3+(/ *(&#<(<1=<&0&%&5<N(' <<14 $<("3+('&=&&#+(M- "#</ T%(/ %# $("221%2+(/ %2/ 4 9'$#3<<(/ *(# $ &3*/ %4 "#8& 3(2/ 3#' &3$0(- $%$&38
Y&3"'(0$#5%4 &3"#8& 3(/ *(<1&#"=&&#+(/ *("3+(4 "#5%&'(&(# $(</ '$(%$<9/ 3<&=&&#+(/ *(# $(1<$%R'(4 "#5%&' <(4 "+(9%$<$3# 13L3/ M3(- "Q'%0<("30(<- / 1'0(=$(1<$0(M&#- (2"1#8& 38R'# / 1P- (2$%#' &3(- "Q'%0<("%$(0$<2%&=$0(- $%$&3NM$(2"33/ # P1"%3#$$(# "##- $<$("%$(# $(/ 3'+(- "Q'%3<(# "#($U&#8

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 $(K#HM/ / 1 E#AN(#"9Q75(. / / , Q R' &$%9(@@ $%8 0/ Q5 . 05 121(#" 0, , 5012$41- 4 1(SB (T(Q! B(U% $') (9<& % D/B <(T, . W, J	! "31*"2#1%%	: <=%> #(?&=%(@A% $&A(! &&A%(K&#$%A=' #@FH ! $L $(K#HM/ / 1 E#AN(#"9Q75(. / / , Q R' &$%9(@@ $%8 0/ Q5 . 05 121(#" 0, , 5012$41- 4 1(SB (T(Q! B(U% $') (9<& % D/B <(T, . W, J
5 / 0$	: , , - . / . , (/ 0. - 10,		
!) , ,) (B	: : , 1,		
6"'&0"#&,3(0"#&	: 23 3 , / 45		
. %&#(0"#&	: 23 3 , / 45		
; $<9/ 3<&-'$(3"4 $	: B @C@(E%F8(9$#"H(@ %A$(&$J UXYB<EYUW0, , 52- 25 4, , L 85'&9%R@(W, 45Q- 15!001	! "#&%&'(1<$<	: $"$%#((# $(&<#%2#&,3(=/ / >'$#*/ %@%9$%'30(&#&30$0(1<$((? # $%@&$A 2/ 3# 2#(<199'&%*/ %<9$2&&2("99'&2"#&,3<8
. %012#(#+9$	: 68'8&95		

D(E" F" %0<(&0$3#&&2"#&3

J4 $%C$32+(/ K$%&$@	
. - +<&2"'(<# #&	: 68'8&95
5 / ' / %	: U#@"'(&*5
?0 / %	: L 9#"(&*5
) &C3"'(@ %@	: \ 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 #"'(#"(> &$5((R*%#' (B(a &$=() 9%78) $%(%3@$&' 5((C#(' #$5%,$0D"&,N(#"(*> #N%(a =% (8*&F(5=&((I "#98A5((S` #&((A#' 5) A5a &=(%#&5 (D"N&,() ' 9(A@$5=&F5(+ %#& (A#' 5) & %(5&=5B(A@*"9)5(\ ) "={5=#"#0F=B() ;$%(=) ' 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#&<(/ *($3#%	: C%>) (P#' 5) A@(YH#(A#' 5) A@(P=) (5$&' 5(P F"%$&' 5		
. / #&3#&,'(" 21#&(- $"'# ($**$2#<			
G- "'"#&,3	: P"&) $&,F(5#("%(I &) 5#"H(*H'5%> 5((B) H(A) 8*%(*%*&&X) $&' ([H(&=) (5$&' 5		

$%&) *+, -) (.

D(E" F" %0<(&0$3#&&2"#&3

G(C$<#&,3	:] #(N #a' (*&F &&A) ' $%,%#$ (#"(A'&&A) (9=) Z) "9*5
) >&(	: P"&) $&,F(5#(*N&,5
J +$<	: P"&) $&,F(5#(%#%5
. / #&3#&'(2- %3&((- $"' # ($**$2#<	
5 - %3&((5*"$2#<	: U#' 5) &,*(>) $%&,(@=) $(A) ' (A) 8*%(5) "F"%(#"F) ' (9) >) F"%((L ' A%(" % *&&2"9(Q) (*%%%( ) (@&F&("%) A&&' (>) H(#AA8"(a =% (*8[*%78% $5((%M #*%9(5#(' %H(@a (G% %$5
5 "%2&(/ C$3(2&&#	:] #(N #a' (*&F &&A) ' $%,%#$ (#"(A'&&A) (9=) Z) "9*5
! 1#' C$3(2&&#	:] #(N #a' (*&F &&A) ' $%,%#$ (#"(A'&&A) (9=) Z) "9*5
S$%# C$3(2&&#	:] #(N #a' (*&F &&A) ' $%,%#$ (#"(A'&&A) (9=) Z) "9*5
, K'/ 94 $3#' ($**$2#<	:] #(N #a' (*&F &&A) ' $%,%#$ (#"(A'&&A) (9=) Z) "9*5
T$%&&#(5**$2#<	:] #(N #a' (*&F &&A) ' $%,%#$ (#"(A'&&A) (9=) Z) "9*5
S" %$&#(/ %(" 3<	: U#' 5) &,*(>) $%&,(@a =&=(>) H(A) 8*%(9) >) F%(5#(5=%,#(@a &F(#"F) ' *\W&5' %+f (0&' F*O (&,%%(F) "$"#&,$%6 $&,) (5((B) A&(0&I I %("%I &) 5#"H(5) A&(0' I &,(?%+#%5

?K$%&,C9/ <1%(<&C3<I <+4 9# 4 <

G- "'"#&,3	: S9` %"%(*H> I 5#> *(>) H(&A&9%($=%,#(@a &FW "%I &) 5#"H(5) A&(&"&) 5&(A#8F=&F a =%(&F() ' 9(["% $=&F(9&,&&8(5%%) "$=>)
G(C$<#&,3	:] #(*I %#&&(9) 5) 5
) >&(	: S9` %"%(*H> I 5#> *(>) H(&A&9%($=%,#(@a &FW &"&) 5&("%9' %*
J +$<	: S9` %"%(*H> I 5#> *(>) H(&A&9%($=%,#(@a &FW I) &(#"(&"&) 5&(a) 5%&&F "%9' %*
! $0&2"'(2/ 30.&&,3<("CC%K"#&0(=+(/ K$%& $C9/ <1%	: ! "%(%&&,5&,F("%I &) 5#"H(9&,#"9%"() ' 9(9&,#"9%"(&,` #G&F() ' H(#$=%(5) "F"%(#"F) ' *( > % 5&' %9(&,($=&(B(@C@&) *([ %&,F() 5("&N(> ) H([ %) FF") `) 5%9([H(#" %5T%M #"8"%(5#(5=&(I "#98A5
) $5(#' O&2/ ' / C&2"'(&8*/ %4 "#&,3(F) $2#&,3(77Q		

N&5 / 4 9/ <&&,3I&8*/ %4 "#&,3(/ 3(&C%0&3#<

V\8&$0() #' #&<

U"4 $	5H) (314 =$%	V
F(5#A%&#G ! "#$%&,) *%Q<"&&) A=&(> () (5&8> (*%&,%	Q T0/ TQ 4: 2Q T, / T.	2Q T(. Q / (T(4

5"3"0"

U"4 $	5H) (314 =$%	V
F(5#%&#G ! "#$%&,) *%Q<"&&) A=&(> () (5&8> (*%&,%	Q T0/ TQ 4: 2Q T, / T.	2Q T(. Q / (T(4

S- $%(" %(3/ (" 0 0&&,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

$%) *+, -) (.

L&T&%#(" &0(4 $" <1%<

J +$(2/ 3#' 2#
: U=%^\N{;#"()' 9("%» #` %)' H^#' $) A$(%. * %$ {(P> > %9&$%6{;(&* =(%#% (a &=(I (% $+(#;(a) $%(;#") $(%) *$(/ Q(> & 8$% (0#^A) *&') (6#(&$&.F(5-*%8I I %)' 9(@a %(%#%&0*$(V%6> %9&) (6) 3% 5&' (& > %9&.$%6B5

) >&(2/ 3#' 2#
: P (A) *%#;(A#' $) A$(& > %9&.$%6{;(&* =(*!N&(a &=(I (% $+(#;(a) $%(;#") $(%) *$(/ Q(> & 8$% (a =&$(*% » #` &.F(A#' $) > &.) $%9(A@$=&.F() ' 9(" =#*% $(\ ) *=(A@$=&.F[%#"*%("&* %((U(%) ' (* =#%($=#"#8F=6[%#"*%"&* %((V%6> %9&) (6 3% 5&' (& > %9&.$%6B5

G- """ #&.3
: B#' %*%M #*%9(I %" #` ($H(;"%=() &$((F( #$[ "%) $=&.FQ&[ "%) $=&.F(&,(&"%F8(}"(#"(& "%I &) $#"H() ""%$#A^8"" Q) "#` &9%) "$&8&.(G"%I &) $&' (#"(#MF% ([H($) &%9(I %"# ' %5 6##* %($F=$(A@$=&F(*8A=() *() (A#(G}"Q@&Q[%G#"(a) &$[ ) ' 95(V%6> %9&) (6 3% 5&' (& > %9&.$%6B5

G\C$<#& 3
: \ ) *=(#8$> #8$=(a &=(a) $%5(C#(#$[&.98A%(' #> &&.F(8' (% * (9&%A%9(}$(9#("#([H> %9&) (6 I %*#") %$([% %(F&%) ' H=&.F([H> #8$=($#() ' (8' A#' *A8#8(I %"#` $(V%6> %9&) (6) 3% 5&' (& > %9&.$%6B5

. %#&2#& 3(/ *("&%#R &0$%
:] #() A@$' (*= (6 %$) N% (&` #G&.F() ' H( %"#`) (6&N#"(a &=#8$*8&] (%($') & &.F5(F(%&.(* 8*I %#8%9(=) $(.8> %() "%" $&6 "%% $0&-%"%A6%(*=#8%9(a %) *() ' () I I "#\ "&$%>) * N(#"(* %$7A#' $) & %9(["%) $=&.F() I I) ") $)*$(F(%>) H[%9) ' F%#8*(9#($=%(%" # (I "#` $) & F() $%(9#( F& %> #8$=T$#T> #8$=("%8*A& 5#` 5

U/ #&<(# (9- +<&2& 3
:] #(*I *#%&%($%) $- % $((<"%) $"H> I 9#>) $&\ (6E((U#' $) A6(#&#' ($%) $> % $"I *#%&(&$(& > %9&.$%6B(&($"F%78) ' 5&8%(=) ' %[%((&.F%$%9(#"(&=) (9$5

Y&T&%$R&C- #&8C(4 $" <1%<

T'" 4 4 "=&&#(/ *(# $(9%0 12#
: P () (.&%#"(&(=%) $%9() (I "%* 8"%(&.A'%) * %a &(6#A^8") ' 9($=%#" $) & %(>) H[8"" $

J O&8C1 &- &C(4 $0 &

) 1&' ='$
: R* %) ' (%&&.F8&=&.F() F% $("8&] [(%(#"($=%* 8"'"#8` 9&.F(;&%6

U/ #(<1&' ='$
:] #` %N #a ' 5

) 9$2&' ($C9/ <1%(- "F' %8<
: ! "#> I $6(&#(=$%$=%*.A% %([H("%» #` &.F() (6 %"#` *(;"#> ($=%' &&.&#(#;($=%(&.A&% $&($=%(%&() (.&%([#() A@$' (*= (6 %($) N% (&` #G&.F() ' H( %"#`) (6&N#"(a &=#8$*8&] [(%($') & &.F5

E" F' %0/ 1<(# $%4 "'(
0$2/ 4 9/ <&&.3 (9%0 12#<
: C%#> I #" &&' (I "#98A$'(>) H(&.A&9%($=%(#(6a &.F(>) $%&.(GW A) "[#` (9&N&%
A) "[#` (> #` #N&%

) 9$2&' (9%#&2#&$(
$X1&04 $3#") / %'&&R&C- #&%
: ?&5(&.&=$%*(*=#8(9(a %) "() I I "#\ "&.$%("#$(A6&%(%78&> % $]) ' 9(*%(A#' $) & %9(["% $=&.F( ) I I) ") $8*(D(JKS.(a &=() (;8(6) A6(T &#(#&%("%*8*%> #9%

Z&H22&0$3#' '(%'$" <$(4 $" <1%<

. $%/ 3"'' (9%2" 1#& 3<
:] #() A@$' (*= (6 %$) N% (&` #G&.F() ' H( %"#`) (6&N#"(a &=#8$*8&] [(%($') & &.F5 Y` ) A6) $(%' 8"'"#8` 9&.F() "% * 5((+%% (8' ` %#6 * ) "H) ' 9(8' I "#$(A6$(I %"#` ' %(6"#> (% $%& F$((C#(" #$(8A=(#"(a) (6($="#8F=(*! &$6(>) $%&.(G(S` #$([ "% $=&.F( ) I #"(#"(> &$5 ! "#` &9%) 9%78) $%(% $6$$&' 5(\ %") (I I "#! "&.$%(%! &) $#"(a =% (* % $6$$&' (& (&) 9%78) $%((I 8$#` ( ) I I "#! "&.$%(%" #) (6 "#$(A6$.%(%78&> % $]D %%(@A6&' (0.5

J 3K&%34 $3#' (9%$2" 1#& 3<
: S` #&(9(&I %") (6#.(*! &$6(> ) $%&.(6) ' 9("8` #;(;) ' 9(A#' $) A&(a &=(*#&(a) $%(a) H' (9") &* ( ) ' 9(*% » %" $((P.#"> (5-%"%$%) ' $) 8$=#"&2& (&($=%("#98A$(=) *(A) 8*9(%` &#' > % $) (6 I #(6$&' (D %a %" (a) $%(a) H' (9 #(&#") (0.5

! $# / 0<("/ %2'$" 3&C(19
) 4 """(<9&
: (@$H (% N&(a &=#8$"&N&((B#' %(A#' $) &.%" (;"#> (*! &(6) "% 5((C&8$%(a &=(a) $%() ' 9(> #! (8I (&(a) $%T'#(6[(%((S(%`) $.%6(6#"(&(a) $%T&.*#(6[(%(Q) [*#"] (a &=() ' (& %$9"H>) $%&.(G' 9(I (6A%&.() ' () I I "#! "&.$%(a) * $%(9&I #*) (6#' $) A6#"5

$%) *+, -) (.

Z&H22&0$3#' '(%'$" <$(4 $" <1%<

[" %$(<9&
: (@$H (% N&(a &=#8$"&N&((B#' %(A#' $) &.%" (;"#> (*! &(6) "% 5((SI I "#) A=("%$) * %(."#> (8I a &.95(I "%.% $(% $TH(&.$#("% » %" (0a) $%(A#8'" % (( ) * %» % $' (#"(A#' .& 9%) "% * 5((\ ) *=(* I &$F%(&.$#() ' (%.&% $(5"% » % $I (" $#"(I "#A$&9() * (;#(6a » 5((U#' $) &.() ' 9(A#(6$5(* I &$F%(a &=(" #` T#» > [8*$(%(Q) [*#"["% $>) $%&.(%(6$5*) ' 9(0%) "5=(I %> &&(6(&#"(9&.$#») A@#8*(% "$=() ' 9(I (% $>) $%&.(%(6$5*) ' 9(0%) "5=(I %> &&(6(&#"((/ 4.J5(C&I #" %#(;(" &.() (&&% * %9(a) *$%(9&I #*) (6#' $) A6#"5((U#' $) > &) $%9( ) [*#"["% $>) $%&.(%(6$5*) ' 9(0%) "5=(I %> &&(6(&#"((/ 4.J5(C&I #" %#(;(" &.() (&&% * %9(a) *$%(9&I #*) (6#' $) A6#"5((U#' $) > &) $%9(@A6&' (/ (.#"(% » %F% A(H(A#' $) A&&.#*" >) $&' () ' 9(@A6&' (/ 4(#"(a) *$%(9&I #*) (6

\ &E" 30'&8C(" 30(<# %C$

E" 30'&8C
: ! 8$#` ( ) I I "#! "&.$%(I %" #`) (6 "#$A&&.%(%78&.> % $]D %%(@A6&' (0.5((Y) $&.F(0)" &N&.F() ' 9(* > #N&.F(" =#8(6([%(I "#=&.&8(9(&.() "% * (a =%(%$=&(>) $%&.(6&(=) ' 9(6$(0" $#"%(() ' 9(I "#A%&*9$5(\ #"N%" (*=#8(9(a) *=(=) ' 9 * () ' 9(.) A%([%#" "%(% $&.F(0)" &N&.F() ' 9(*> #N&.F5 E%» #` %(A#' $) > &) $%9(A@$=&.F() ' 9(I "#$(A&&.%(%78&.> % $]( %#" "%% $%&.F(% $&.F() "% * 5 ! %" #` * (a &=() (=&$#"H#;() * $=>) Q) (6$(F&%(#"(A=("#` &#("("%#% "% $"%I &) $#"H(9&.% * % * =#8(6(` #$[%(% » I (6H(9(&.() ' H("#A%* (&(a =&=(=$=&(() "#98A(&.(8* 9%5((C#(" #$(F%&.(%#%8(#"(#` (* N&.(#"(A@$=&.F5((C#(" #$(&.F%$((S` #$((["% $=&.F(` ) I #"(#"(> &$5((R* %#` (6(a &=( ) 9%78) $%(% $6$$&' 5(\ %") (I I "#! "&.$%(%! &) $#"(a =% (% $6$$&' (&(&) 9%78) $%((+%% (&($=%#"&.&) (6#` $) &.%(#") ( ) I I "#` 9(6) (6$(>) 9%(%#>) (A#>) I) $((6$(>) $%&.(6) N% 3=$6(A@* 9(a =% (#$&.(8* %((Y>) $(-(A#` $) &.%* (" %) &(I "#98A$%(%8%) ' 9(A) ' ([ % =) Z) "9#8* 5((C#(" #$(" %8* %(A#` $) &.%5

) # %C$
: @#" "%&.() A(#' 9) ' A%(a &=((6A) (5"%8(5$#` * 5((@#" "%&.(#"&.&) (6#' $) &.%(( "#$(A@9(;"#> ( 9&%A$* 8` (6=$&.() (9"H(#(6) ' 9(a %(6E % $6$$&' 9(() "% (0 a) H(;"#> (&.A#>)) $((&.$(6>) $%&.(5(D "%((@A6&' (/ , J() ' 9(.##9() ' 9(9"&.N&((+%% (A#' $) &.%(5$=$6(A@* 9(() ' 9(* "% (5(9(8` 5$( "% 9H(;#"(8* %((U#' $) &.%" (5=) $(=) ' %( %% (#! % %9(> 8* $( %A) "%8(6"% » (5(9() ' 9(N&.% $ 8I "&=$(5"(I "% » % $(5(N) F%((C#(" #$(" 5#" "&.(8` (6[%#(9(A#' $) &.%* 5((R* %) I I "#! "&.$%(A#' $) &.> % $(5"(H) ` #&(% ` &#' > % $) (6#' $) > &) $&' 5

_&J C9/ <1%(2/ 3#%' <I9$%/ 3" '(9%#$2#& 3

V&8&$0() #' #&<

GC%$0.&3#	J C9/ <1%(/ &. &#<
F6A%6#G	H5] (E (P\%8&$0() # #&<(3 ((<\ S\W/ , (> F3> b H5] (E (S(6 (P\%8&$0() # #&<AN DM7D(3 ((<\ S\W/ , (> F3> b(0(=#8™5(?#"> \/B &.$?) EH(. J [(P\%8&$0() # #&<AZIDM7M(3 ((<\ S\W(Q> F3> b(0(=#8™5(?#"> \/E%$ I &) [(%(") A6#' ((<\ S\W(Q> F3> b(0(=#8™5(?#"> \W:#$ (6$8* $?) EH(. J [(7^ _^(P\%8&$0() # #&<AN I 7^ _^ (3 ((<\ S\W(Q> F3> b(0(=#8™5(?#"> \/E%$ I &) [(%(") A6#' ((<\ S\W/ , (> F3> b(0(=#8™5(?#"> \W:#$ (6$8* $?) EH(. J [(P\%8&$0() # #&<(3 ((<\ S\W(Q> F3> b(0(=#8™5(?#"> \W:#$ (6$8* $ H5] (E (S(6 (P\%8&$0() # #&<(3 ((<\ S\W/ , (> F3> b(0(=#8™5(?#"> \W:#$ (6) "$&6(6$% ?) EH(. J [((P\%8&$0() # #&<(6(U/ #&<(;. $<9&%='$ ((<\ S\W(Q> F3> b(0(=#8™5

5" 3" 0"

$%( ) *+, -) (.

_8(J C9/ <1%$(2/ 3#%' <I9$%/ 3" ''(9%#&2#&3

? 2219" #&3"''($C9/ <1%'(& &<		Sa H(P(-/ / 1%Q			) SJ [(FfY(4 &<Q			5 S&&C			
GC%0&$3#	[&=#3" 4 $	994	4 Cl4 '	?# $%	994	4 Cl4 '	?# $%	994	4 Cl4 '	?# $%	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@&(" % *&&) $&' (
T/ % :(d dl &$[d:#$ @) "$&8@$%(d-E%I &) [@<> &$(d-P=) @[@<,") A&& (c%d> &$

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"(%& &' @ %"#') @a #"N @A%(
) $> #"I =%"(#"[&@F&) @> #' &' "&F(>) H[%"8%$@($#(9%@<> & %$=%(%.%A&& % * (#;(
$=%' % $@$& (#"(#$=%(A#' $"#@> %) * 8"% () ' 9 $"($=%' %"&* $=($#(8 * %"%I) &) $#"H(
I "#$A&& %(%'8&> % $[(E%%% A%(* =#8@([%>) 9%$#() I I "#I "&,$@> #' &' "&F(* $) "9" 5
E%%% A%($#' ( ) $&') (@F8&) ' A%&9#A& > % $' (.#"(> %&=#9 * (.#"(S=%(9%@<> &) $&' (#;(
=) Z) "9#8 * (* 8[* $) ' A%& (a &@ G$#([%"%'8&%95

J 3C&$$%&C(4 $" <1%<
: R * %#' G(a &=() 9%'8) $%' % $@$&' $([F(8 * %(#I %) $&' * (F% %) $%(98 * $() 8> %(@F) * (@) I #"(
#"(> &$@8 * %("#A%8 * (% A&' 8"% (@#A) (@M+) 8 * $' % $@$&' (#"(#$=%(% F& %&&.F(A#' $"#C(
$#(M%& (a #"M%(%M #* 8"%($#() &[#" %(A#' $) > &) ' $ ([%@a () ' H("%#=> > % 9%@(#"(*$) $@$#'H
@& @5

E+C&3$(4 $" <1%<
: \ ) * =(=) ' 9 * Q#"%"> * () ' 9(;) A%($=#"#8F=G((;9%(=) ' 9@&F(A=%> &) @ "#98A$ @[%#"%
% $&F@" > #!*&F() ' 9(8 * &F(S=%(G") $#"H() ' 9() $($=%% 9(#;(S=%a #"N&F(I %&#95
SI I "#I "&,$@$A=" &8%8 (* =#8@([%@ * 9%(9#("%> # " %(#3% $&(@#(A#' $) > &) $%9(A@$&-&F5
\ ) * =(A#' $) > &) $%9(A@$&-&F([%#"%"(%" &F$(Y * 8"%($=) $%#%a) * =("$ $&' * () ' 9(*) ;%@-(
* =#a %" () "%A@* %$#(S=%a #"N"$ $&' (@A) $&' 5

. $%/ 3"''(9%#&2#&3
; $<9&%# %
: R * %) (I "#I %@([&@%@() &I 8"8H&F(#") &I;%9("%I &) $#"(A#> I G&&F(a &=() ' () I I "#' %9("$) ' 9) "9(8) ("&N) * * %* > % $&9&) $%(S=&(&(' %A%&*) "H([U#' * &%&F(S=%( ) ") > %@%" (* I %A&&%9([H(S=%(F@' %>) ' 8;) A&8"%0A=%A\(
98"&F(8 * %(S=) $$=%(F@' %() "%" $&@%) && F(S=%(X("#$%A&%("#I %$&&5([%* =#8@([%
' #$%9(S=) $$=%(&> %$#(["%) N=" #8F=(.#"() ' H("F@' %>) $%&,@>) H[%9(&,%% $,#"(9&,%% $
F@' %>) ' 8;) A&8"%" 5([P (S=%A) * %(#.(> &,&8"%0A#' * &$&.F(#.(,(* %%) G * 8[* $) ' A%0@5=%
I "#$%A&$#' (&> %#;(S=%(F@' % (A) ' ' #$[%) A%8") $%E$%$&>) $%95

J +$<
: @ .%$([%f%a %) "(A#> I G&&.F(a &=() ' () I I "#' %9("$) ' 9) "9(* =#8@([%8 * %9(a =% ( ) ("&N(
) * * %* > % $&.9&) $%(S=&(&(' %A%&*) "H($#() ` * #$)(%M #* 8"%$#(G(8&([* I G * =% @> &$'(#"(
98 * $' 5([P(A#' $) A$&(I #* * &@Q&%#;#(@a &.F(I "#$%A&' (* =#8@([%(a #" ' @8' G&* (S=%
) * * %* > % $&.9&) $%() (=&=%(9%F"%&#;(I "#$%A&$ \@A=%> &) @' I G * =(F#FFG&5

) >$
: ! %" #') @ "#$%A&$.%(%78&> % $,#"(S=%([#9H(* =#8@([%* %&A&@%([ ) * %9(#' (S=%$) * 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%8 * (%78&> % $ * =#8@([%A=%A%9(@(%* 8"%
$=%f(A#> I G(a &=(S=%"%78&% % $' (#.(% ` &#' > % $ @ "#$%A&' (S(F&,G$&' $(P (*#> %
A) * % @8> %* A'8[[%" Q,&$8%* #' (%.F& %&&.F(> #9&&) $&' * ($#(S=%("#A%8 * (%78&> % $
a &@[% %#8 *) "H$#("%98A%#% &*&' *($#() A#% $ [G(%$& %55

LIDIDM7N8 2"! #

$%( ) *+, -) (.

^ 8(. - +<&2" ''(" 30 (2- $4 &2" ''(9% 9$%#&$<

. - +<&2" ''(<#' #&	: 6&8 8&5
5 / ' / %	: U#@"G& * 5
? 0 / %	: L 9#"G& * 5
9E	: 0
, &9$%&-&&#-(9% 9$%&<	: C&I %" *&,G%&,(S=%;#@a &.F(>) $%&,G\(A#"G9(a) $%() ' 9(=#$(a) $%5

7M8() #' =&&#-(" 30 (%" 2#&K&&#-

5 - $4 &2" ''(<#' =&&#-	: <=%(I "#98A@([&(* $ [G%5
5 / 30&&.3 <(#' ("K/ &0	:] #(* I %#&&(9) $) 5
G2/ 4 9" #&=' $(4 " #$%&' <	:] #(* I %#&&(9) $) 5
E" F" %/ 1 <(0$2/ 4 9/ <&&.3 (9%012#<	: R' 9%(" #">) G(#' 9&&' * (#;(* $#") F%) ' 9(8 * %Q=) Z) "9#8 * (9%#+> I #" &&' (I "#98A@ (" =#8G(' #$[%(I "#98A@95
. / <<&-&&#-(/ * (- " F" %/ 1 <(%" 2#&.3 <	: R' 9%(" #">) G(#' 9&&' * (#;(* $#") F%) ' 9(8 * %Q=) Z) "9#8 * ("% A&' * (a &@ #$#A@"5

778(S/ O&2/ ' / C&2" ''(&8 * /%(" #&.3

V\8&$0() #' #&<
H21#&(# O&2&#-

. %012#&3C%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	, / <$	J C9/ <1%
F@A%#G	6C Q (C%>) G 6C Q (L ") G	E) $ E) $	f - / : , , (> F3\F / - , , , (> F3\F	T T

5 / 32' 1<&.3 I) 1 4 .4 " %
: <#(S=%([% $#;(#8"(N #a G9F%@&=%($#\M&#@F&) @ "#I %$3&(#;(,(S=&(I "#98A@=) ` %( #$[ %% ( $=#" #8F=G(&` % $&<) $%95

5 - % 3 &(# O&2&#-

. %012#&3C%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	, / <$	J C9/ <1%
F@A%#G	@[[TA="#' &(<C Q (L ") G @[[TA="#' &(<C Q (L ") G	E) $ E) $	/ . 0, , (> F3\F : . (F3\F	- 0(9) H*(U#' $&.8#8* 4, (9) H*(P $%> &@% $

5 / 32' 1<&.3 I) 1 4 .4 " %
:] #$) `) &$[G%5

G%$#' #&.3 I5 / %%<&.3

. %012#&3C%0&$3#(3" 4 $	; $<1'#	) 9$2&$<	) 2/ %$	J C9/ <1%$	? =<$%K' #&.3
F@A%#G	YH%(T(B &@(&'&@ ' $ @&.(T(B &@(&'&@ ' $	E) [[&$ E) [[&$	T T	- 2(=#8'"(Q , (> &@F") > * - 2(=#8'"(Q , (> &@F") > *	T T

5 / 32' 1<&.3 I) 1 4 .4 " %
:] #$) `) &$[G%5

) $3 <&@F5%

5 / 32' 1<&.3 I) 1 4 .4 " %
:] #$) `) &$[G%5

5 " %2&$ / C$3 &2&#-

5 / 32' 1<&.3 I) 1 4 .4 " %
:] #$) `) &$[G%5

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

. %012#&3C%0&$3#(3" 4 $	H5] (E	(&I; 5	J . H	U(3') E	US.	?) EH
F@A%#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% 0 12#8 $(# O82 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &[(95
5 "3" 0"
H21#5(# O82 8+

. %0 12#8 C%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) (8 "#I %2 8 (#;(5=8(I "#98A(=) ` %[ #$[ %% ( $=#"#8F=(8(& ` % 3 (F) $/95

5 - % 3 8 2(# O82 8+

. %0 12#8 C%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 2% $

5 / 32'1<8 3I) 14 4 "% :] #$) `) &[(95
(5 8#' #8 3I5 / %% <8 3

. %0 12#8 C%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

. %0 12#8 C%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% 0 12#8 $(# O82 8+
5 / 32'1<8 3I) 14 4 "% :] #$) `) &[(95

$%( ) *+, -) (.

7D8(J 2/ '/ C82" '(8*/ %4 "#8 3

J 2/ # O82 8+ :] #(N #a ' (*8' 8A) ' $'%, %#8 (#"(A'8A) (=) Z) "9*5
V8 8 5 0) #' #5 <
HX1" #2($2/ # O82 8+

. %0 12#8 C%0 8 3#(3" 4 $	; $<1'#	) 9$2 8<	J (9 / <1%
F(8A%#G	SA8 (9%UQ (Q' (9#(Q1(> G6(?"%=(a) 9%	?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+

. %0 12#8 C%0 8 3#(3" 4 $	; $<1'#	) 9$2 8<	J (9 / <1%
F(8A%#G	SA8 (9%UQ (Q' (9#(Q1(> G6(?"%=(a) 9%	?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 8<9 / <"' : <=9(F'% %) 9 8' (#;(a) *9(%" =#8 (9([%) ` #8 9 0(#"(> && 8'%9(a =%% %(I #"* 8(G5((C&I #* ) (G #;(5=&(I "#98A8 0"#8 9 8' * () ' 9() ' H[ [ H" "#98A8 (*=#8 (9() 5) (G8 % (/A#> I (G(a 8=(5=% "%7 8 8%> % $ (#;(% ` 8 #' > % 5) (G "#9 A8 ' () ' 9(a) *9(0 8 I #*) (G5F 8(G 8 ' () ' 9() ' H' "%7 8 ') (G8A) (G 8$=#"8=H'%7 8 8%> % $ 5((C&I #* %(#;(* 8"(8*() ' 9(' #' T'%A+A(G[(G("#98A8 (` 8() (G8% * %9(a) *9(0 8 I #*) (G+#' 5') A8 "5(\ ) * 9(' =#8 (9([#5[[%0 8 I #* %9(#;(8' 5'% 9 0(9#(5=%' %a %(8' G8 *(;8(G8(A#> I G8 ' 5a 8=(5=%' %7 8 8%> % $ 5((#;() (G 8$=#"8 8 8 (a 8=(;(8"8 9 8 5 \ ) * 9(0) A\) F 8 F(* =#8 (9([%' %A+A(9 5((P A8 %) 8' (#"(G' 9 8 =#8 (9(#' G([%A+#' * 8%%9 0(a =% (%A+A(8 F(8 ' #5[% * 8 (G8[(<=8 (>) 9%8 (G ' 9(8' (/A#' 5) 8 & %(> 8*5[%0 8 I #* 9(#;(8 (*) %(a) H5((U) "%* =#8 (9([%5) N% (a =% (=) ' 9(8 F(%- I 8 8 0(/A#' 5) 8 & %" (5=) 5=) ' %' #5[%% (A8) ' 9(#"(" 8 * 9(#8 5((Y> I 5+(A#' 5) 8 & %" (#"(8 %* (>) H'%) 8 (*#> %("#98A8 "% 8 8 %5 S ` #9(9 8 I %") (#;(*I 8 9(>) 9%8 (G ' 9(8' #;() ' 9(A#' 5) A8 a 8=(*#8 (a) %a) H' (0") 8 * ( ) ' 9(* %a %*5

, &<9/ <"' (<- / 1' 0(=5(8("22/ %" 32$(@# (" 9 9 ' 8" ='5(%C8 3 "' A3" #8 3 "' ("30(' / 2" '(" @<(" 30(%C1 '" #8 3 <8
; $"5 %# () $2#8 3(\ :(EHU, [(5I) (HU, () S? ; H] J ("30() $2#8 3(_:(J b . ?) W J (5 ? US; ? [ ) I. J ;) ? UH[(. ; ? SJ 5 SG'U(*/ %' 00 8 8 3"' (- " 30' 8 C(8*/ %4 "#8 3("30(9 %#2#8 3(/ *(5 4 9' / +$$<8

7L8(S%3 <9/ %#(8*/ %4 "#8 3

; $C1'" # %(8*/ % "#8 3	WJ(314 =$%	. %9 $%<- 89 8C(3" 4 $	5 '" <<$<	.] c
, ? S(5'" <<8 2" #8 3	] #5["%8 (5$ 9 5	T	T	T
(8I SHR] ; (5 '" <<	] #5["%8 (5$ 9 5	T	T	T

! V (W) A%8 F(F"#8I

7Y8(; $C1'"# %+(&3*/ %& "#&\ 3

V\8&50() #'#&<

E5) (5'" <<&&2" #&\ 3 : P"& $&.F(>) $%&.G
@% * &&\&.F(>) $%&.G
<) "F"%(#"F) * (%.%A$

V& &T0%'(%C1'"#&\ 3< : S) 5 H(_P Q(&V((J O&4 9#. "'%&' ($O&4 9#&\ 3\(Y #$9%@&> & %9
V\8&50() #'#&<(&HK$3# %+(F5) 5 H(_=Q(Y #$9%@&> & %95
) H; H(NMDINMLIN77INTD($OP%$4 $'+(- "F" %/ 1<(<1=<#' 32$<\(Y #(I "#98A$ (a %%(.#8' 95
) H; H(NMDINMLI$4 $%$32+(9'" 33&8C("30(3/ #&&2" #&\ 3\(Y #(I "#98A$ (a %%(.#8' 95
) H; H(NMDINMLIN77INTD(- "F" %/ 1<(2- $4 &2"' <\(YFGA%#Q(! "#$%&.) "%Q<"&&) A=&> ( )
(*8> (*%&.%
) H; H(N77INTD(!) ,) (0&#%&-1#&.3(R2- $4 &2"' <(&HK$3# %+(R- "F" %(&0$3#&&2" #&.3W
FGA%#Q(P> > %9&.$%(D A8$%\(=% (S=(=) Z) "9Q(C%$P-H%9(DA="#' &\(=% (S=(=) Z) "9 (! "#$%&.) "%O
<"&&) A=&> ( ) (*8> (*%&.%\(P> > %9&.$%(D A8$%\(=% (S=(=) Z) "9Q(C%$P-H%9(DA="#' &\(=% (S=(
=) Z) "9

5'$" 3(H&#H2#(() $2#&.3(77D :] #$(&.$%9
P=Q(E" "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<$##< : <=%(#Ga & F(A#>) #' %$'() "%(&.$%9\W6_UYEP Y(BPQ<
US@d / % :] #' %#.(S=%(A#>) #' %$'() "%(&.$%95
US@e$%$+ : <=%(#Ga & F(A#>) #' %$'() "%(&.$%9\W GP8&
. $33 <+'K" 3& : <=%(#Ga & F(A#>) #' %$'() "%(&.$%9\W GQ@T EL! S] Y<EP.6

V\8&50() #'#&<(&HK$3# %(:] #$(9%@&> & %95
P5) 5 H(_=Q

5"3" 0"

a E! Q (P5 "3" 0" Q : UQ$** (CT- SV(B) $%&.GA) 8* & F(#$=%(S#M&X(%.%#$ (D %H(S#M&A5
UQ$** (CT- KV(B) $%&.GA) 8* & F(#$=%(S#M&X(%.%#$ (D<#M&A5

5"3" 0& 3('&#<

5"3" 0& 3(U. ; G :] #' %#.(S=%(A#>) #' %$'() "%(&.$%95

5J . H(S/ O&2(<1=<#' 32$< :] #' %#.(S=%(A#>) #' %$'() "%(&.$%95

5"3" 0" (&HK$3# % :] #$(9%@&> & %95

S- &(9%.012#(- "<(=$$3(2"' <<&&$0(&("22/ %" 32$(@&# (# $(- "F" %(2%&$%&(/ '(# $(5 / 3#%&''$0(. %.012#<(; $C1'"#&\ 3<(
"30(# $(!) ,) (2/ 3# &<("''(# $(&'*/ %& "#&\ 3(%X1&$&0(=+(# $(5 / 3#%&''$0(. %.012#<(; $C1'"#&\ 3<8

G#&%8" #&\ 3"'(%C1'"#&\ 3<

$%&) *+, -) (.

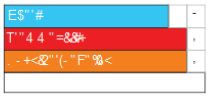
7Y8(; $C1'"# %+(&3*/ %& "#&\ 3

G#&%8" #&\ 3"'(&#< : H1<#%' &(&HK$3# %(PHG) Q(Y #$9%@&> & %95
5 - &" (&HK$3# %(R3 5) 5 Q(%G#A#>) #' %$'() "%(&.$%9(#"(%M%> I $%95
e" 9" 3(&HK$3# %\(%G#A#>) #' %$'() "%(&.$%9(#"(%M%> I $%95
f / %" (&HK$3# %\(Y #$9%@&> & %95
! "'" +<&(G HK$3# %(P E) (; $C&#%9Q(Y #$9%@&> & %95
US@g$"'" 30(G HK$3# %(// *(5 - $4 &2"' <(PUg G5 Q(%G#A#>) #' %$'() "%(&.$%9(#"(%M%> I $%95
. - &&9 &$%<(&HK$3# %(P G 5) Q(Y #$9%@&> & %95
S" &@ 3(&HK$3# %(P5) UUQ(Y #$9%@&> & %95

7Z8(? #- $%(&3*/ %& "#&\ 3

["=$'(%X1&$&4 $3#< : USR@Y@EY@ PES<L E_(<ESU<Q(Y_Y(S] C(@-P] (PEER-S<PL] 5(BS_(USR@Y(
S66YEVPU(EY@ PES<L E_(EYSU<PL] $(UL] <SP] @P S<YEP56(<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(# "#(- "<(2- "3C$0("%4 (9 %K& 1<'+(&<<1$0(K$%&.38
U/ #&2$(## (%$" 0$%

S/ (# $(=$<#(/ *(/ 1%>3/ @$0C$A# $(&'*/ % "#&.3(2/ 3#' &$0(- $%&$(&("221%#&E/ @&K$%)3$&# $%(# $("=/ K$R" 4 $0(
<19 9'&%&3/ %" 3+(/ *(&<(<1=<&0 &&<A" <<14 $<("3+('&=&&H(@. "#-/ K%'/ %(# $("221%2+(/ %2/ 4 9'$#&3$<<(/ *(# $(
&'*/ % "#&.3(2/ 3#' &$0(- $%&$8
T&"'(0$#%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(- $%&$A@5(2" 33/ #(
C1" %3#&$(# "#(# $<$("%(# $(/ 3'+(- "F" %<(# "#($O&#8

Thermo SCIENTIFIC

The world leader in serving science

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

! "#$%&()'$+,-./,0&123'4&3'5&'5667 8

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

.%012#3"4$	: ! ""#$%&()'$+,-./,0&123'4&3'5&'5667 8		
)199(&%	: "),7&'2),'0",13"0 @0,'&30)18&% @?7&'99 /&0&-#':9965 13-'3 3 2 :95?;:'5 '& :66?'?= <=	! "31""2#!%%	: "),7&'2),'0",13"0 @0,'&30)18&% @?7&'99 /&0&-#':9965 13-'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$2&@ "99(@"#&3<8
.%012##+9$	: @&A-,?		

8>""%0<'@0$3#&&2"#&3

?4$%$32+/ $%&$

.-+<@"(<'#&$	: &$-?%23'$1,'(&A-,?		
5/(/%	:)"3?		
0/%	: 310)?		
)&3"(/%0	: /		
>" "%0'<'#&4 $3#<	: /8 ' ' ! ?' '/ @/ " / '"/ "# ' ! ' / / " " ?' " '8 " / '" "' ' '" / "' / '! 8 ?		
.%2"1#& 3"%'4 $"<1%<	: ! &1&3 ,3,'-423'!&1&3*1,23' 2,'&1%'A"3' -,4 3',13$3&17'!&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!?		
)> >5)'<'#!#<	: ")'2'7 3,*$'2 0&12'-,,-')+-&4 2' %3,' ' +-' &7 7 41'0 3&1' 3 1- - <' /'9 9679<66?		
;/1#&</"$3#%	: %'0&13 03' 1) $3&1? 1,23&1?		

/#&3#&(" 21#&)-$"(#'$**$2#<

3-"("#&3	: "3 3'1 '3&',2(*3&,%2%2&3 7?		
3 $<#&3	: "&'0'*'2A $&A,-?		
)&3	: "3 3'1 '3&2 *1?		
?+$<	: "3 3'1 '3&,%2?		

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

$%'&()*+,-./012/3*4566'6'6'899:;

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%			

)$$'# &/(/ &"('&3*/%4"#&3')$2#&3'77

85/49/<&&&3&3*/%4"#&3'/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"('&3 %0&$3#<'9%<$3# -&-' &'&$'#$'21%&3# 3/ ($0 $'/"#$'<199(&%'30'&3'#$
2/32$3#%#&3<'"99(&"=($'"%'2("<<&&$0""<-" "%/1<#'-$"(#'/%#$'$'3 &&34$3#"30'-$32$'% 18&'%9/%&3 '&
&'<$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 $%&$'31 '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,' &,',42,7' $ 1 2)&2'3)&&4)$%,&,',42,7',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&$5#3,#,$&'A'23 1-7',37,-'0 $ 3 13&1 '7 7,-*3 $%?		

8 &%#" &0'4 $" <1%$<

3 $<#& 3 : 2)'&437 &43)'A*3)'A 3 ?'! &'183*1-40,' &7*31 '41$22'-*, 03-'3&-&28' %7 , -'0 $ (, 2&11, $?' , ' + ' 1%)*1 * %7 &43)'3& 1'410&120*42'(, 2&1?' , 37 , -'0 $ 3)138&1'*7 7 , -* 3 $%?

. %#&2#& 3'/ *"*&%#" &0$% : &'03&1'2) $, '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A*3)&4324'3 $'3 *1*1 ?' '3'2 242(, 03-'3) 3 47 , 2' , '23$%(, 2 13*3) , ' , 204, '2) &4$'A, ' 1' ((&(* 3 '7 2 '& 2, $ 0&13 *1, -' , 3)*1 ' ((3427' 37 % , '- 1 , &42'3&3) , '(, 2&1'(& *-*1 ' *-'3& * , '7 &4) 3& 7 &4 3) ' , 24207'3 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*'03 , 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 ' *, ?' & 03&1'2) $(, '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A*3)&4324'3 $ 3 *1*1 ?'8 &, '0&13 *1, 2' &7 ' *, ' '*')'2'0 1' , '-&1, 'A*3)&43 '2 ?' 2, 'A 3 2(%3&, , , (' *, , (&2, -'0&13 *1, 2'0&8&?

>" "%/ 1<# $%4 "(0$2/ 4 9/ <3&&3'9%012#< : !, 0&7 (&2*3&1'(&-4032'7 %*10$*-, '3), ' &$&A*1 '7 3 * 2 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 ((34'2 'A*3)' '4$ 0, (*, 0, '&(, 3-'*1'(&2*3 , '(, 224, '7 &-, ?

8 22&0$3# ('%($" <$'4 $" <1%$<

. $%/ 3" ('9%2" 1#& 3< : &'03&1'2) $, '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A*3)&4324'3 $'3 *1*1 ? 04 3'24 &41-*1 ' , 2?' , , ('411, 0, 22 % 1-'41(&3 03-'(, 2&11, $ &7 , 13 *1 ?'! &1&3&40)'&'A $'3 &4)'2('$-'7 3 * $")43&' $*1*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 43)&3', 2**3), '(&-403) 2'0 42, -', 1 *&17, 13 $ (&$#3&1' 2, A, 2#A 3 A %#28*$&' * ?

! $# / 0<*/ %2($"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(82 $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(82 $?

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 , &, ' 13 *1 ', 3*1 ' , 2? ! &1&3 , 3*1', %2&'&1'2 *1'&'0$&3)*1 ?'! &1&3 , 3), '-423?'! &1&3*1 , 23?' &*-'3), 0, 3&1'&'-423A), 1') 1-3*1 ' 1-' &*-'$&(822*3), '(, 2&1'(& *-*1 ' *-'3& * , '7 &4) 3&7 &4 3) ' , 24207'3 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*'03 , 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 ' *, ?' & 03&1'2) $(, '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A*3)&4324'3 $ 3 *1*1 ?'8 &, '0&13 *1, 2' &7 ' *, ' '*')'2'0 1' , '-&1, 'A*3)&43 '2 ?' 2, 'A 3 2(%3&, , , (' *, , (&2, -'0&13 *1, 2'0&8&?

>" "%/ 1<# $%4 "(0$2/ 4 9/ <3&&3'9%012#< : !, 0&7 (&2*3&1'(&-4032'7 %*10$*-, '3), ' &$&A*1 '7 3 * 2 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 ((34'2 'A*3)' '4$ 0, (*, 0, '&(, 3-'*1'(&2*3 , '(, 224, '7 &-, ?

8 22&0$3# ('%($" <$'4 $" <1%$<

. $%/ 3" ('9%2" 1#& 3< : &'03&1'2) $, '3 , 1'*1 &$*1 ' 1%(, 2&1 $ '2 '&'A*3)&4324'3 $'3 *1*1 ? 04 3'24 &41-*1 ' , 2?' , , ('411, 0, 22 % 1-'41(&3 03-'(, 2&11, $ &7 , 13 *1 ?'! &1&3&40)'&'A $'3 &4)'2('$-'7 3 * $")43&' $*1*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 43)&3', 2**3), '(&-403) 2'0 42, -', 1 *&17, 13 $ (&$#3&1' 2, A, 2#A 3 A %#28*$&' * ?

! $# / 0<*/ %2($"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(82 $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(82 $?

"%$'<9&(: 8&, '0&13 *1, 2 &7 '2('$, ?' ((&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(82 $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(82 $?

$%&() * +, -(-. / 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 , '204 , 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. - +<&" ('" 30'2- $4 &" ('9%9$%#&$<

. - +<&" ('<#' #& : &$- ? %23 $1, '(&A- , ?
5 / (/ % :) '3 ?
0 / % : 3 10) ?

7 8) #' =&&#-'" 30'%$" 2#& &#+

5 - $4 &" ('<#' =&&#+ : "), '(& - 403"2'23 $?
5 / 30 &&3 <#' '" / & : &*-'3 , '0 , 3&1'& '- 423A) , 1') 1-$1 ' 1-' &*-' $(&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/ <&&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/ (/ &" ('&3*/ %4 "#& 3

3&5 0') #'#5 <
21#5'# &2&#

. %012#& %0&3#3" 4 $	; $<1(#	) 9$2&<	, / <$	? 9/ <1%
/ # 9# - '7 , 0 (3K 43 1, <# - *&$	! 56' $	/ 3	66'7 >	

5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 - %3 2'# &2&#
5 / 32(1<&3) 14 4 "% : &3 *$ $?
%&#' #& 3 5 / %% <& 3
5 / 32(1<&3) 14 4 "% : &3 *$ $?
) $3<&&3 $%
5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 "%2&/ $3 2&#+
5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 (' <<&2" #& 3

. %012#& %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/ (/ &" ('&3*/ %4 "#& 3

5 "3" 0"
21#5'# &2&#

. %012#& %0&3#3" 4 $	; $<1(#	) 9$2&<	, / <$	? 9/ <1%
/ # 9# - '7 , 0 (3K 43 1, <# - *&$	! 56' $	/ 3	66'7 >	

5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 - %3 2'# &2&#
5 / 32(1<&3) 14 4 "% : &3 *$ $?
%&#' #& 3 5 / %% <& 3
5 / 32(1<&3) 14 4 "% : &3 *$ $?
) $3<&&3 $%
5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 "%2&/ $3 2&#+
5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 (' <<&2" #& 3

. %012#& %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/ (/ &" ('&3*/ %4 "#& 3

?2/ # &2&#+ : & 1&A1'2" 1*'0 13, , 03 2' & '0 "30 $) + - 2?
3&5 0') #'#5 <
1" #&2' $2/ # &2&#+

. %012#& %0&3#3" 4 $	; $<1(#	) 9$2&<	? 9/ <1%
/ # 9# - '7 , 0 (3K 43 1, <# - *&$	043 ' 56'< 666'3K=6666'4 > ' , 2) A 3	! ( ) 1* ' '! ( ) 1* '7 1 ' ' <) &4 2	: ') &4 2

5 / 32(1<&3) 14 4 "% : &3 *$ $?
$%&#5 32$ 0$ %0" =&&#+
5 / 32(1<&3) 14 4 "% : &3 *$ $?
5 "3" 0"
1" #&2' $2/ # &2&#+

. %012#& %0&3#3" 4 $	; $<1(#	) 9$2&<	? 9/ <1%
/ # 9# - '7 , 0 (3K 43 1, <# - *&$	043 ' 56'< 666'3K=6666'4 > ' , 2) A 3	! ( ) 1* ' '! ( ) 1* '7 1 ' ' <) &4 2	: ') &4 2

5 / 32(1<&3) 14 4 "% : &3 *$ $?
$%&#5 32$ 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' * ' ' 30, 12, - ' A 23 ' - ' 2(&2 $0&13 03& ?' ! ' 2(&2 $ &' 3 ' 2 ' (& - 403 # 28 $ 13 &12 1 - ' 1% 9 % (& - 403 2' 2) &4 $ ' 3 $ 37 , 2 0&7 (9 %A *3 ') 3 , ' , 4 * , 7 , 13 2' & ', 1 * &17 , 13 $ (&3 03 &1' 1 - ' A 23 ' - ' 2(&2 $ $, *2 $ 38 &1' 1 - ' 1 % , ' &1 $ $ &0 $ 43 & *3 % , 4 * , 7 , 13 2? 23 ' (0 *1 ' 2) &4 $ ' , ' , 0 9 $ - ?' 10 *1, 38 &1' & ' $ 1 - ' $2) &4 $ ' & 1 9 % , ' 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) &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 %# - *12 1 - ' 2, A, 2?

, &<9/ <" ('<- / 1 (0 '=$' &' " 22/ %" 32$' &- ' " 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 */ % 4 " #& 3	'314 =$%	. %9 $ %<- &0 9 &8 3" 4 $	5 (" <<$<	.
. @5 (" <<&8 2" #& 3	===5	* 3&1' . 4 $ 3 - 28$- #1 '&12? / # 9 # - '7 , 0 (3& 43 1, <#= - '&8 $ F 28 $-		
@ . ; ' 5 (" <<	===5	* 3&1' . 4 $ 3 - 28$- #1 '&12? / # 9 # - '7 , 0 (3& 43 1, <#= - '&8 $ F 28 $-		

@ ' ' @ 0 *1 ' &4 (

7 8; $ 1 (" # %' &8 */ %4 " #& 3

3&$0') #' #$ <

>5) ' 5 (" << &8 2" #& 3 : " & *0 '7 3 * $ '3 3 *1 ' 7 3 * $ " , 3 & 1', , 032

8) 8 $0 $ %(' % 1 (" #& 3 < : @ 5 'A " ' , ' ? $4 9 #. " %&8 ('$ $4 9 #& 3 ' &3 - , 3 7 *1, - 3&$0') #' #$ <' &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 / #&8 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 # %' '- " " %) ' &8 $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?""" = ' 78 , *- " 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&$0') #' #$ <& $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' & *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 */ % 4 " #& 3 ' % 1 8 $0 '=+' # $' 5 / 3 #% (($0', %012#<'; $ 1 (" #& 3 <8

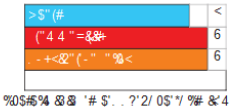
3#5 %" #& 3" ('% 1 (" #& 3 <

3#5 %8" #& 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

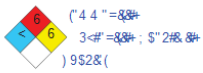
" =$(% 1 8 $4 $3 #< : / 8 ' ' ! ?' '/ @/ " / '" / " # ' ! '
/ / " " ?' " '8 " / '" " ' '" / "' / '! 8 ?

>" " %) / 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 $. % #5 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?""" = ' 78 , *- " 1/ & - """""": 9965""""""": 95 ' : : =9; '

$ %%&() * +, -(-. / 0 1 2 / 3 * 4 5 6 6 7 6 ' 6 ' 8 9 9 : ;

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

6 $ % & 3 : 9
. %9 " %0 ' = + : 8 ! ' (, 0 " $ 2 3

3 0 & 2 " # & < ' & 8 * / % 4 " # & 3 ' # " # - " < 2 - " 3 $ 0 ' * % 4 ' 9 % & 1 < (+ ' & < < 1 $ 0 ' $ % & 3 8
/ # & 2 $ ' # ' % " 0 $ %

@ ' # $ ' = $ < # ! * / 1 % 3 / ($ 0 $ ' # - $ ' & 8 * / % 4 " # & 3 ' 2 / 3 # ' & 8 $ 0 ' - $ % & 8 ' & ' " 2 2 1 % # & 8 > / $ $ % 3 $ & # $ % # $ ' " = / $ 3 " 4 $ 0
< 1 9 9 (& % 3 / % ' 3 + ' / * & # < ' < 1 = < & 8 & % & < ' " < < 1 4 $ < ' " 3 + ' (& = & 8 & # ' - " # < / $ $ % ' / % # $ ' " 2 2 1 % 2 + ' / % 2 / 4 9 ($ # & 3 $ < < ' / * " # $
& 8 * / % 4 " # & 3 ' 2 / 3 # ' & 8 $ 0 ' - $ % & 8 8
& 8 " (' 0 $ # & % 4 & 8 " # & 3 ' / * ' < 1 & # ' = & 8 & # + ' / * " ' 3 + ' 4 " # & 5 % & (' & < ' # $ ' < / ($ ' % < 9 ! 3 < & = & 8 & # + ' / * # $ ' 1 < $ ' % ((4 " # & 5 % & (< ' 4 " + ' 9 % < $ 3 #
1 3 / 3 ' - " " % 0 < ' " 3 0 ' < - / 1 (0 ' = $ ' 1 < $ 0 ' & # ' 2 " 1 # & 3 8 (# / ' 1 - ' 2 $ % # ' & 8 ' - " " % 0 < ' " % ' 0 $ < 2 % & = $ 0 ' - $ % & 8 ' $ ' 2 " 3 3 / #
1 " % 3 # & $ ' # " # # - $ < $ ' " % ' # $ ' / 3 (+ ' - " " % 0 < ' # " # $ & = # 8

7 8 #"#

, ' 0,10, ' / ,2, 0) """""""@ ' & ,'99 """""""""""""""""""/ &0 &,-# """ : 95 ' : : 6 """""AAA'3, 7 &'&&7
@. 0, ' %3 0) 1&% %10?""" = ' ?8 , *,* 1/ & , -""""""""; 9965""""""""" : 95 ' : : =9; '