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### MSDS# 0831 COVER SHEET

28340	Surfact-Pak Detergent Sampler
Component #	Description
1854560	CHAPS
1854540	Octyl β-Glucoside
1854530	Octyl β-Thioglucoside
0028314	Surfact-Amps X-100
0028316	Surfact-Amps 35
0028320	Surfact-Amps 20
0028324	Surfact-Amps NP-40
0028328	Surfact-Amps 80
0028332	Surfact-Amps X-114
0028336	Surfact-Amps 58

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



Part of Thermo Fisher Scientific

## Material Safety Data Sheet

CHAPS

### 1. Product and company identification

Product name Synonym

Chemical formula

Supplier

: CHAPS

G.But. 1-Propanaminium, N.N-dimethyl-N-(3-sulfopropyl)-3-[[(3 alpha, 5.beta, 7. alpha, 12. alpha, 1-3.7, 12-trihydroxy-24-oxocholan-24-yl]amino]-, inner salt; 3-[dimethyl(3-{([(3.6,5 π.α,8,9 8,12α.14ξ,17ξ,20ξ)-3.7, 12-trihydroxy-24-oxocholan-24-yl]amino]propyl]ammonipropane-1-sulforate Manufacturer

Ca2HseN2O7S Thermo Fisher Scientific

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

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

: Thermo Fisher Scientific

0028299 0028299B 0028300 1854560 1861114 1862285 1877350 1891382 RM2197

MSDS# 0359 1/13/2011. Validation date Print date 1/13/2011. Responsible name MSDS Specialist

CHEMTREC: In case of emergency 800.424.9300

**OUTSIDE US** 202.483.7616 Material uses Refer to the instruction

booklet for proper and intended use. Otherwise contact supplier for specific applications.

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Product type : Powder

#### 2. Hazards identification

Emergency overview

Physical state Solid, [Powder.] Color White. Signal word CAUTION!

MAY BE HARMFUL IF SWALLOWED. MAY CAUSE RESPIRATORY TRACT, EYE Hazard statements AND SKIN IRRITATION.

Do not ingest. Avoid breathing dust. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after Precautionary measures

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. OSHA/HCS status

: Dermal contact. Eye contact. Inhalation. Ingestion.

Routes of entry Potential acute health effects

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#### 2. Hazards identification

Slightly irritating to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : Harmful if swallowed.

Slightly irritating to the skin. Skin Slightly irritating to the eyes. Eyes

Potential chronic health effects

Chronic effects Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Carcinogenicity No known significant effects or critical hazards. Mutagenicity No known significant effects or critical hazards No known significant effects or critical hazards Teratogenicity **Developmental effects** : No known significant effects or critical hazards. : No known significant effects or critical hazards Fertility effects

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

Adverse symptoms may include the following: irritation

watering redness

Medical conditions aggravated by over-exposure : None known

See toxicological information (Section 11)

#### 3. Composition/information on ingredients

Name	CAS number	%
1-Propanaminium, N,N-dimethyl-N-(3-sulfopropyl)-3-[[(3\alpha,5\beta,7\alpha,12\alpha)-3,7,12-trihydroxy-24-oxocholan-24-yl]amino]-, inner salt	75621-03-3	98 - 100

Canada

CAS number 1-Propanaminium, N,N-dimethyl-N-(3-sulfopropyl)-3-[[( $3\alpha$ ,5 $\beta$ ,7 $\alpha$ ,12 $\alpha$ )-3,7,12-trihydroxy-24-oxocholan-24-yl]amino]-, inner salt 75621-03-3 98 - 100

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 rep

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#### CHAPS 4. First aid measures 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. Eye 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 throughly before reuse. Get medical attention immediately. Skin contact 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 Inhalation 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. Ingestion : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Protection of first-aiders Notes to physician 5. Fire-fighting measures Flammability of the product : Fine dust clouds may form explosive mixtures with air. Extinguishing media Suitable : Use dry chemical powder Not suitable Do not use water jet. 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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Special exposure hazards Hazardous thermal Decomposition products may include the following materials: decomposition products carbon monoxide nitrogen oxides sulfur oxides Special protective Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. equipment for fire-fighters 6. Accidental release measures 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 fouch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate wentilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8). 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). **Environmental precautions** Methods for cleaning up

Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Use spark-proof tools and explosion-proof equipment. 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 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 dust. Avoid the creation of dust when handling and avoid all possible sources of ignifion (spark or flame). Prevent dust accumulation. 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 lightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Empty containers retain product residue and can be hazardous. Do not reuse container. : Store between the following temperatures: 20 to 25°C (68 to 77°F). Store in accordance Storage Store between the following temperatures: 20 to 25°C (68 to 77°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct surlight in a dry, cool and well-ventilated area, away fron incompatitise materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept puright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. 8. Exposure controls/personal protection **United States** Ingredient Exposure limits 1-Propanaminium, N,N-dimethyl-N-(3-sulfopropyl)-3-[[(3α,5β,7α,12α)-3,7,12-trihydroxy-24-oxocholan-24-yl]amino]-, inner salt ACGIH (United States). TWA: 10 ppm Occupational exposure limits
No exposure limit value known. Consult local authorities for acceptable exposure limits. 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. Recommended monitoring procedures Use only with adequate ventilation. If user operations generate dust, furnes, gas, vapor or mist, use process enclosures, local exhaust vertilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment. Engineering 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. Hygiene measures 1/13/2011. 4/9 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

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6. Accidental release measures

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Small spill

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: Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

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#### CHAPS

### 8. Exposure controls/personal protection

### Personal protection

Respiratory

Hands

Eyes

: 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.

: 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 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. If operating conditions cause high dust concentrations to be produced, use dust

goggles 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

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, furme 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 : Solid. [Powder.] Color Molecular weight 614.89 g/mole Molecular formula C32H58N2O7S 6 [Conc. (% w/w): 1%]

Melting/freezing point 157°C (314.6°F)

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

#### 10. Stability and reactivity

Chemical stability

: The product is stable.

Conditions to avoid

: Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation.

Incompatible materials

: Reactive or incompatible with the following materials: oxidizing materials

Hazardous decomposition products

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

Possibility of hazardous

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

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#### 11. Toxicological information

#### United States

Acute toxicity

To the best of our knowledge, the toxicological properties of this substance have not been thoroughly investigated.

Chronic toxicity

: Not available

: Not available.

Conclusion/Summary Irritation/Corrosion

Conclusion/Summary : Not available Sensitizer

Conclusion/Summary Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name ACGIH OSHA 1-Propanaminium, N,N-dimethyl-N-(3-sulfopropyl)-3-[[(3α,5β,7α,12α)-3,7,12-trihydroxy-24-oxocholan-24-yl]amino]-, inner salt None

Mutagenicity

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 substance have not been thoroughly investigated.

: Not available

**Chronic toxicity** 

Conclusion/Summary Irritation/Corrosion

Conclusion/Summary : Not available

Sensitizer

Conclusion/Summary : Not available

Carcinogenicity

Conclusion/Summary : Not available

Classification

	Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NIP	OSHA
	1-Propanaminium, N,N-dimethyl-N-(3-sulfopropyl)-3- [[(3α,5β,7α,12α)-3,7,12-trihydroxy-24-oxocholan-24-yl]amino]-, inner salt	-	-	-	-	-	None.
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Conclusion/Summary : Not available

1/13/2011.

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#### CHAPS

### 11. Toxicological information

Conclusion/Summary : Not available Reproductive toxicity Conclusion/Summary : Not available

### 12. Ecological information

**United States** 

: No known significant effects or critical hazards

Aquatic ecotoxicity

Conclusion/Summary Persistence/degradability

Conclusion/Summary

: Not available. : Not available

Canada **Aquatic ecotoxicity** 

Conclusion/Summary

Persistence/degradability

Conclusion/Summary

Other adverse effects

: Not available : Not available

: 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 oontractor. Disposal of this product, solutions and any by-products should at all times compty 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

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#### 15. Regulatory information

United States
HCS Classification

U.S. Federal regulations

: Not regulated

: Not listed

TSCA 8(a) IUR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b): Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/3043/11/312 hazardous chemicals: No products were found. SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed Class I Substances Clean Air Act Section 602 : Not listed Class II Substances

DEA List I Chemicals (Precursor Chemicals) DEA List II Chemicals (Essential Chemicals) : Not listed

State regulations Massachusetts

: This material is not listed. **New York** : This material is not listed **New Jersey** : This material is not listed : This material is not listed. Pennsylvania : Not determined.

United States inventory (TSCA 8b)

Canada

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

Canadian lists Canadian NPRI

: This material is not listed. : This material is not listed.

CEPA Toxic substances Canada inventory

: Not determined.

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

International regulations

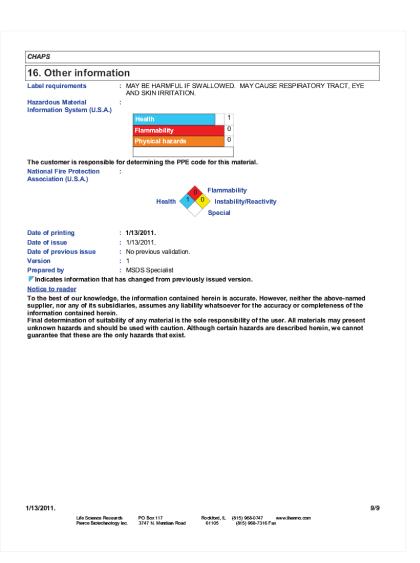
International lists

Australia inventory (AICS): Not determined.
China inventory (IECSC): This malerial is listed or exempted.
Japan inventory: Not determined.
Korea inventory: Not determined.
Korea inventory: Not determined.
New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted.
Philippines inventory (PICCS): Not determined.

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"#1"%2". )")**%7"\\**\%#\$7 < W 943.!.]-1, 944.1 "E. 5"/9464.1 "\$444E.3" E.1".!.154/9482" 5"11 "32" +\* 5%4.1 "E. 5"%43.!.,1\$+", E.E. -,1". \$79484. %) 15",". + 1201. 38. . 5%61. +". - %496D1\$.-/</p> Y. "#7". "; , \*7%%2 \:'X%\$#V)/%6, "%28'3 #! 70\$#7 X&3 3!>%26'.)'", #; \$. / 01" < F,5. %) +"%3") - +%5 1#%14E %J3\$+,`. %5 J") 4 +%3,"D%1,4 @T"%280%, %28'3#/% (0%1>8# Y."70%1>8# < P+. %4#%D. E .! 1926\* B- . 4/ < 2 \* % \* "%+ 981", 4% "/ (;#1%8#T;.70\$#',!P!\$/7 < A4" E 3"98"96" \$1" 90. 94: 5. 98#% E 1", 5! 98583. 4#"5+78"E 90. 96! 5. #96190. 96! -. 5"96! "D 4 %95994. 988" 98: "59401583. 981. 5%" "\$.5! 98.5#%. 4#"515%+15. 985"D") "%6; "10\$ "41, 55! "98" "%5"5"1, 5. 4#8"E 198! 94 13,980,14%15%. %"5. 18; "D") "%4-L/982+. 1831". 4 +341#78 %6. 3984". J3" +. - %"5"1, 5. 4#8" "\$ ?! P! \$7 . 07"", #\$3 ! & / #1. 3 ; . 7%%2"; \$. / 01"7 < 2.!\*E3\*+,",\*5%24\*-)!"+%5.1#%5!\$)-.%10.%19\$6B,5I%5.1".4,1\$+a ! 140\*5%,\*J,-. ! 140\*5%5\*5\*J,-. (;#1%&;\$."#1"%\$# #[0%3#2").\$)%#VM&,"#\$7 < F,4 'H, D'. 4+%D') \$ '88. 14%334' 341", '824" ! !",' %),3E. 5 '%5- % 34! \* 5 "1,5 - '924 1"D,5! 133141") +%GQ&( U8/,D%% 384! . '3,! . %3. 41" - %6 '83" +,",' . '824 ++) 4 '55" - ./ K:'Q11%#2"! &\$#8#! 7#'3 #! 70\$#7 (\*\*\*) \*\*\*\*\* 17-54(D) \*\*\*\* 0.3 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 \*\*\* 0.5 - #\$7 21 & \$#11 0"%27 @25% 23 #2"! &; \$#1! 0"%27 #", . / 7"). \$18#! 2928"0; < \$\*`. %\*5",5. 49%\*E 943,5844 1.7% 1!) | E %494B.. 3%3 %E 1". 41816-%8!!. %6% - +151".-6%10. \$-5614". %\*5",5. 49% + %6314".34\*\*H8\*\*9%6-%613\$+,\*5"34\*\*H .\_\_),3E.57%8\_+3\*+. %4%15%38.5+.-%814". %+3\*+15%\*5"4!!."4 (3!887; 988 1!\$8#7; 988 J:'?!2/ 8/28'!2/ '7". \$!8# \$\frac{\pmax}{4}\$\$ \quad \text{NS}\$ \quad \quad \text{NS}\$ \quad \text{NS}\$ \quad \text{NS}\$ \quad \quad \quad \text{NS}\$ \quad \quad \quad \text{NS}\$ \quad \qu 9EREEEC9C

```
#$%() *+', $-./01
 J:'?!2/ 8228'!2/'7".$18#
                                                                                                                                             $\frac{G^*4}{86}\frac{94}{1}.$^*4.16!. $\frac{15}{18}.\text{TBS}(1.5\text{$\frac{1}{1}}.$^*6.4\text{$\frac{96}{18}}.$^*4.14!. $^*46.5\text{$\frac{96}{18}}.$^*4.15!. $\frac{15}{18}.$^*6.5\text{$\frac{1}{1}}.$^*6.5\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$\frac{96}{18}}.$^*4.15\text{$
        ". $ 8#
B:'@T; . 70$#'1. 2"$. &7F, #$7. 2! &; $. "#1"%2
  4! 2! / !
 < ^ 1-D3675-4984 1-E-4%5-981. 9D 47 | D36%H-43575-55 %D E | 1384-) | "-498. H4
.1"51 64E "L51 %5-%+51 %D 32 1" 44%5-%"D %5-%HD 32 "4_51 32 4" - /%334*341".
"! D5...) -49C7) $ % %+- % % E*- "32" 5", 136%5 5" E 51" - 98" D51 /% 140
! "5" [E 51" - 38" D51 %1 44 %) +51 6/845+) 4 %D1"%# B1+D861", 5+%5-%1H "950" B. 4+
14 %$+. % 9D 32" 4.+"1", 5-32 11", 5/
  ?*8%42#3#!70$#7
  - #$7, 2! & $. "#1"%2
                                                                                                                                       < P+, %%4*3, 4#/6", -6%,43) 4#/51 %4%,4H - % +3,41** 4%* E 3#/51 %3,"D%5%334* `. -
**15-14 %8%,%H,1%++, +HE, 5%6-1,1*, +90,+%%1, 1, +14#/%, +3,41** 7%, $1** 5%6 }+%0,
01+ - %6%6* B6%%56*(*),31** - %3** +4,5** . $4970. %21X14 +%490. %2** -)! *%6-%0, %61H
B*4_51 %E ;+%470. % 51*. - % +3,41** 4
        =#7: 9% " S*
                                                                                                                                       < QD. E.J. 1$4 + +"15"80E3, 4 ,") +%$" - +%" E.3#;51 %B (D%6%334" . - %"15-14 %40") $ %\\
B" 45%"%$87E. +%BD. 5\(\frac{1}{2}\)15. $51 %D. E.J. 1$\(\frac{1}{2}\)464 - )! "+\(\frac{1}{2}\)484,\(\frac{1}{2}\)4+. ++E. 5"\(\frac{1}{2}\)6-1, 1". +\(\frac{1}{2}\)D. +\(\frac{1}{2}\)6. \(\frac{1}{2}\)6. \(\frac{1}{2}\)7. \(\frac{1}{2}\)6. \(\frac{1}{2}\)7. \(\frac{1}{2}\)6. \(\frac{1}{2}\)7. \(\frac{1}{2}\)7. \(\frac{1}{2}\)6. \(\frac{1}{2}\)7. \(\frac{1}{2}\)6. \(\frac{1}{2}\)7. \(\frac{1}\)7. \(\frac{1}{2}\)7. \(\frac{1}{2}\)7. \(\frac{1}{2}\)7. \(\f
        212/7
                                                                                                                                       < GIH #%# B. 14%*E 3#51 %B,T0%5%334**. - %"15-14 %D") $ %B, %+: %BD 5%%4+L
1++ +E_ 5%6-!1" +%D-1%*S.! ++14#% %t*. %13*+) 4 % % $ ]. - %133 +D. +0% +*%4
-) +*+7%663. 41"51 %t*5- "," 5+%1) +- %D| D%) +%*51. 5*41", 5+%% %. %4t*-)!. - 6%+. %) +"
| "II $ +"
         @#7
                                                                                                                                        < A. 4+*51$$4*".!", %_),3E.5$$8490.90*.#%D*)$ 90.% $!".*$1+.-%590.90*.498.5!
3.444E.*, %45-90.96.4.4.%6*$.-%65-90")$ 90.%334*...90#%%3.!,1$+70.H4*2015-$5!
"D.+304*-)!"
       (L%2
                                                                                                                                       (*VE_++*5+78**E% 5"S1"*5%485*4_%4f!. ++%_) 3E.5"%07") $ 90, 780_!L. - 78 %6+) 4 70 #

!*E3878_179.0 % ) 4 E 5"4%466.4"5E 5"584" !" 1"*5%1_481"*5/%86%E %61+.46

!#E. %4 4 00.44865_4%4%61.5. 4.51 %5" - 11 1"*5%8 %0.784"! ++%_) 3E.5"35,380.

5.!. ++14785 %-) !. %E.++"5+78 %1!. 3"105 %5. 39
         @ S% 23 #2"! &#T; . 70$#
1. 2"$. &7
F:'-, *7%! &! 2/ '1, #3 %! &; $.; #$"\$7
     * 7%! &7"! "#
                                                                                                                                 < G* $-/%A* B- . 4/Z
            . 8#10 & $10 M#9%b., "
                                                                                                                                < 8; 8/: ?%@3*$
                 &#10&$). $3 0&
                                                                                                                                   < Q⇔R89 O
                                                                                                                                < 2.!*E3*+".*5% E3. 41") 4 a%7; % %7>eQ%8<?/>% %<: /8eFU
        #&%8R$##P%8": . %2"
```

#\$%() \*+', \$-./01

```
F:'-, *7%! &! 2/ '1, #3 %! &; $.; #$'\#7
( . 80>%%
                              < A 14", 1588" 14" S, 0 $ % 5 % D. 981 58" B, 51 55 1". 4, 15 21" $ 9561". 4745 - 975" "978 1". 4
9C:'("! >%%'! 2/ '$#! 1"%5%'
                              < CD. %34*-)! "%+%"10$/
                               4 . 2/ %%27'". '! S. %
621 3 1 1 "% 8# 3 1 "#$9% 87
                              < K. 1! "," . %4%6! * E 31",0 $ 923," D%10. 9%1 $25" B,51 9%2 1". 4,1 $-a. 
*J - X 51 9%2 1". 4,1 $-
?! P.$'. 07' / #1.3 ; .7%62 < P5- .4%*Æ13%'5-,";*5+%H%**4II . %5-%+. 6721X14 *) +%.!*E3*+,";*5%4*-)! "+%D*)$
5**% %4-)! -/
- . 77%%%%%'. )',!P!$/.07
$#! 1"%27
                             < P5- . 495* 4E 1996* 5- ,",* 5+%196"* 411 . %5- %+. 69201X14 *) +% 1! ",* 5+92,926* "%!!) 4/
99:'A. T%. & 8%! &2). $3!"%2
1 2 %#/ '( "! "#7
 Q10"#"". T%%
                              < C* %D. %3. +*%L*%) 4%6* B$ - I. 6%D. %5 J,! *$*! J. 1$%4* 3. 4", +%H*D,+%) 0+"15! . $21`. $6*"
0...5 %D* 4*) I D#%6*. +",I 1". - /
   4.21807%2R 033!$*
 4 . S. 2%". T%%
   4.21807%2R 033!$*
                              < W# "%6 1,$10$/
 655% "%2F4. $5. 7%2
4. 21807%2R 03 3 ! $*
                             < W# "% 1.$10$ /
 (#27%89#$
   4.21807%2R 033!$*
                             < W#"% 1.$10$/
 41.51% 8#2%
   4.21807%2R 033!$*
                             < W#"% 1,$10$/
 0"! 8#2%%
  4.21807%2R 033!$*
                             < W# "%6 1,$10$ /
 <u>A#9! ". 8#2%%</u>
4 . 21807%2R 03 3 ! $*
                             < W# "%6` 1,$10$/
 =#; $. / 01"%5#"". T%1%
   4.21807%2R.033!$*
                             < W# "% 1 $10$ /
4121/1
 Q10"#"". T%%
                             < C*90.98. +*%+%) 4½5*B$-1.6%0.%J,!*$! J, 1384*3.4", +%+140,+%) 0+"15!.5%1".95*"
0..5%0*4") | D64%6".+",| 1".-/
   4.21807%2R.033!$*
 4 $ 2%" T%%
   4.21807%2R 033!$*
                              < W#"% 1,$10$/
 655% "%2F4. $5. 7%2
   4.21807%2R 033!$*
                             < W# "% 1,$10$ /
   4 21807%2R 03 3 ! $*
                             < W#"% 1.$10$/
 4! $1%, 8#2%%
   4.21807%2R,033!$*
                              < W# "%6 1,$10$/
  0"! 8#2%%
   4.21807%2R 03 3 ! $*
                             < W#"% 1.$10$/
9EREFEC9C
```

```
#$%() *+', $-./01
99:'A. T%. & 8%! &2). $3!"%2
   A#9 ". 8#2%%
      4.21807%2R 033!$*
                                                                       < W*"% 1,$10$/
   =#; $. / 01"%#". T%%
      4.21807%2R 033!$*
                                                                        < W#"% 1,$10$/
9E:'@1. & 8%! &22). $3! "%2
                                                                        < W* 165* B5%, | 5, H 15"%HH! "+%4%4", ! 151201X14-+/
 @1. ". T%1%
12%#/'("!"#7
   Q[ 0! "%"#1. ". T%%
   4 21807%2R 03 3 LS*
                                                                       < W# "% 1 $10$ /
   - #$7%6"#21#R #8$ /! >%%
       4.21807%2R 033!$
                                                                       < W*"% 1,$10$/
 4121/1
   Q[ 0! "%;#1. ". T%%
    4.21807%2R 03 3!$*
    - #$7%6'#21#R#8$ /! > %%6
                                                                       < W#"% 1.$10$/
      4.21807%2R 033!$
   \tag{1,300}
A 1%86", \)", \", \", \$\/, \0.1\"\".\) < CD. %34" -\)! "%4% (\.\)! 41-1", 5%4 %E 4. % J,! %015%0. %4" -\)! "%+. 34
>%/ #63 /! "%2
   H", #$! / S#$7#'#))#1"7
                                                                            9G'+%; . 7! &1. 27%#$! "%27
                                                                       20 3. 5. 41" 5954日1+" 94D" ) 5 3. % * - - ** 475 5 E X - **BD 4 * . 43** ++ D5 / 785 I 5 H 15" ] 15", + 784*81+" 34** -) 15", + 784*81+" 34** -) 15", + 784*81+" 34** -) 15", + 784*81 -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 13** -) 1
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9RIREC99
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# #\$%%() \*%,-. '/ \$- 0,12 [:'X%\$#V)%3, "%28'3 #! 70\$#7 2/! \*E4\*-)"f6%5'.,!"-%E1#%6!\$./%//姚\$C)6+%E175|\$a !188\*6%7J// !158\*6%\*65'J./ -,\$15%)/-?! P! \$' . 07'", #\$3 ! & / #1. 3 ; . 7%%2'; \$. / 01"7 < F)9" H+("75%(", \$%(1,6%45454517) %45"7!")\sqrt{1}\sqrt{1}\sqrt{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\sqrt{3}\text{6\s (;#1%&;\$."#1"%\$# #Y0%3#2").\$)%#W/%\$,"#\$7 K:'Q11%#2"! &\$#8#! 7#'3 #! 70\$#7 \(\text{VY NL "}\)^ 6\(\text{1}\) 1382 \(\text{9}\) 16\(\text{N}\)^ 5\(\text{1}\) 5\(\text{1}\) 1383 \(\text{1}\) 16\(\text{1}\) 6\(\text{1}\) @25% 23 #2"! &; \$#1! 0"%27 #", . / 7"). \$18#! 2928"0; < R\*V/9%6"1)6/5 %96"E%4\9965109%11, E%8%C//4%4%E17/61%96.%\$1/96% ./- \+61"/.788 &/\$. %51."/%6"6"1\6/50%96-/%4141.45\*\*\98\*\$.%6.%\J4\$-\)"6"45\*\*H /b, \4E/6"0786.}4\*-/%\9%1\%1%\94/6-/.%61-7%)4\*-13%6"6"51!"\*8) (3!887:988 / D, JEC / 6 UTBs / 4 ~ / 7 WHN | 7 WB / 1 VBs / 4 / 1 VBs - 1 VBs - 5 1! \* 2 UBs / 4 VBs / 5 WB F VBs / 5 \! 98#7: 98 J:'?!2/ 8228'!2/ '7". \$18# \$\frac{1}{6}\$. \\ \frac{1}{6}\$ (". \$ 8# B:'@T; . 70\$#'1. 2"\$. &7R, #\$7. 2! &; \$. "#1"%2 4! 2! / ! H110; ! "%2! 8#T; . 70 \$# 88% 97 W\*96J4\*-, 5 %E) 961\$/ 966\* C80 4 . 270 & & 1! & 0", . \$%\$#7"). \$! 11#; "! > &##T; . 70 \$# &\$& %7: 9RIREC99

#\$%() \*%,-.'/\$-0,12 B:'@T: . 70 \$#'1. 2"\$. &7 R. #\$7. 2! &; \$. "#1"%2 C. P. / 50.59°C[1] (% , I.) 1."99 6 (78) 1" 60% 196 / 39.4 / 51."7 6. %/ 6 / 51."1 %, -"78/E | - 78/E - 78/E | - 78/E @28%2##\$%28'3#!70\$#7 2\*8%2#3#170\$#7 - #\$7. 2! &: \$. "#1"%2 < P. / %% % 6 4/ 589/8(\*) . 7% [5 4, 5]#[6+%65%]5 [H. 185 - 4]51\*\* 59% [E 439]6+%6]\*(%6% 4445\* V. ...\*16. 15. %8% % [1.4.-]4-E/65%]6, 1/1", % [3, 4%]6, 1/2.-158/35%]4, 4/51\*\* 59% \$1.1", 65% ... 1."%65%... 1."%65%... 1."%61%... 1. 3% V. 57% [/ %1.15.5." 3.4%]/ %65... 1."%66... % [/ %1.16.5." 3.4%]/ %65... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... 1."%66... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1.16.5." 3.4%]/ %65%... % [/ %1 =#7: 93 " S\* 212/7 < Z(/E)/1\$5/-)-"16"79/E4/50/", - % \$8" V/-%" E4\$#6+% \$6"/(%16% 445" V/. %"16.15 % (",\$ %2V/C\*56%"% \$8% E/-% \$6(/6% 16.\$)6+% (/E)/1\$% \$5.,!"-%4% \$924-1%--/--E/6"% 6.)!1"/-% }-% 6/!/--15#0 < G1H "#%# C/15%" E 4\$#6+96] (%69445" V. %16.15 %(", \$ %2 % / %6(/694%) L 1--/--E/6"%6.) 17/-%() %5%!/--15#% %V), %44"-, 5 % %36,) %431-(/-745)-"%5 ...-"096464/51"6+%6.))" 6-%1,-/%()+(%,-"%6"61/6"51")" 6-%5%/46".,!/.7%-/%-"." @#7 +\*++\$-0 :B/5 \*61948\*71;"\V %b, \HE/6"985%/%s\*, #%(\*, \$%U/%/\$1-1/. %6%/%19-L%U/6+ 4/31-E/. %6. %/%g-L-%go/\*\$//. %6. %(\*, \$%U/%45\*V . %#%%4/!)13, %U/15 %16. \$6+ "()-%5.,!"O @25% 23 #2"! 8#T; . 70\$# 1. 2"\$. 87 F:'-, \*7%! &! 2/ '1, #3 %! &; \$.; #\$'%7 < G\*\$, 0% Z 5#-"1\$96/% 4\* C. / 50 . \* 7%! &7"! '# 4. &\$ ()70 #&%28PJ\$##P%28"; . %2" < 8; ?% %3; AeZ %3>>0, % %O, 00eFT +%%;#\$7%%%%%°;\$.;#\$"%\*7 < 2)-4/5-)8\$ %6%/ %8\$ C)6+% 17 91\$ &% \$ %61"/ 5%6. % \* "%61"/ 50 < G\*\$ 85 %6% / 98 55 C)6+% 1"/ 5)1\$ a86\*\$ 961"/ 5%6. 96\* "961"/ 50 9C:'("! > %BV6'! 2/'\$#! 1"%5%6 4,#3 %4.87"!>%2% < D(/%45°.,!"%%"18\$0 < ] V) 19/78011" 678H6, ""36/6%16.\$6+%16.\$V) %1384" -- )83 %", 2/- %19/65116%415L "598EE | 1797811/196711, "pf.61978211-, 5/- %4+1/6-%31" 2"-11" 95/1(15/- 0987 %0/-) %96 "56/145" pf.67%- 1417 %1" %31" 91 /9%, 96-4%16-14 58-4%6, 6 | 6+%6 %26-6, 6+ 1 "6" 16/5 %16. %0, 142/ 6"%2 H 9/816-14 596+%2617 397869 V/6"%, "%4!", E, \$1" 60 4.2/ %%27'".'! S. % < K/11") V/% 576! \*E41") & 37% ) Y(% / 1981 S6C) 6+96:1"/5) 1\$ a \*J) ) Y) 6+96:1"/5) 1\$ 621. 3 : ! "%8#3 ! "#\$%87 < P6. / 976\*E 1986\*6. )')\*6-%-14%\*\*51+/%-6. %-/7%/1X15\*,-%/!\*E4\*-)')\*6%-6\*.,!"-%(\*,\$6\*\*%20%-0.5",!"-%(\*,\$ ?! F! \$1. 07'/#1. 3; . 798%2; \$. / 01"7 - . 77%%%%\*'. )',!P!\$/.07 \$#! 1"%27 < P6. / 5% 13% 6. )")\* 6-% 14% 51+/% 6. %-/7% 1X15 \*, -% 1!")\* 6-% 38% 1"%!!, 50 9RIREC99 

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```
#$%%() *%,-. '/ $- 0,12
99:'A. T%. & 8%! &2). $3!"%2
L 2%#/ '( "! "#7
Q10"#". T%%
                           4.21807%2R,033!$*
 4. $. 2%". T%%
  4.21807%2R 033!$*
                           < W# "%V1)$1.8$1.0
 655% "%2F4 . $5 7%2
  4.21807%2R.033!$*
                           < W# "%\V1\$1.8$ 0
 (#27%%#$
   4.21807%2R,033!$*
                           < W# "%V1)$18$10
 4! $1%. 8#2%%
  4.21807%2R 033!$*
                           < V# "%5V1)$18$ 0
  0"! 8#2%%
  4.21807%2R 033!$*
                           < V/# "%(V/1)\$1.8\$T ()
 A#$! ". 8#2%%
   4.21807%2R 033!$*
                           < V/* "%V1)$18$ 0
 =# $ / 0.1"%#" T%4%
   4.21807%2R 033!$*
                           < W# "%6V1)$18$F0
 Q10"#"", T%1%
                           < D* % / 9&/ - "%+%, 5±6" CS, +/ 7% / % J)! * $ +)! 19&5" 4/ 5"/ - %+7% } %, & "16! / %(1\v1 95" & // 6% * 5", +( $+)$6\v1 - ")+1" 7. 0</p>
  4.21807%2R 033!$*
 4. $. 2%". T%%
   4.21807%2R 033!$*
                           < W# "%5V1)$1.8$7.0
 655% "%2F4 . $5. 7%2
  4.21807%2R.033!$*
                           < W# "%5V1)$1.8$1.0
 (#27%%#$
   4.21807%2R.033!$*
                           < W# "%5V1)$18$ 0
 4! $1%. 8#2%%
   4.21807%2R 033!$*
                           < W* "%5V1)$1.8$7.0
  0"! 8#2%%
  4.21807%2R 033!$*
                           < W# "%V1)$1.8$ 0
 A#$! ". 8#2%%
  4.21807%2R 033!$*
                           < W# "%6V1)$18$ 0
 =#; $. / 01"%5#"", T%1%5
  4.21807%2R 033!$*
                           < W# "%6V1)$1.8$10
9E:'@J. & 8%! &22). $3!"%2
                           < W* 166* C6%)+6)+11.16"%HHI!"-%51%6(")!.151%1X15.-0
@1. ". T%%
 QY0! "%#1. ". T%%
4. 21807%2R 03 3!$*
                           < V# "%V1)$18$10
 - #$7%6"#21#R#8$! /! >%%
   4.21807%2R 033!$*
                           < W# "%IV1)$18$ 0
4! 2! / !
 QY0! "%#1. ". T%%
9RIREC99
```

```
#$%() *%,-.'/$-0,12
9E:'@1. & 8%! &22). $3! "%2
  4.21807%2R,033!$*
                                      < W# "%6V1)$18$30
  - #$7%6"#21#R #8$ /!>%2%
   4.21807%2R.033!$
                                     < W# "%V1)$18$10
                                       < W* 146* C6%)+6)H 16"%HH! "- %5%8)')! 15%1X15 - 0
9G'+%; . 7! &1. 27%#$! "%27
                                     1 ! 7'#' / %: . 7! &
+%; . 7! &7, . 0 & '>#'22'! 11. $/! 21# M% '!;; &4! >& $#$8%2! &42! "%2! &! 2/' & 1! && M7! 2/' $#80 & "%27
=#j#$". '(#1"%2'J<?QZ+\GZ^'QZ+\(A'='Q*@)2/'(#1"%2'B<@-2H(I=@4HZA=H\(R@=(HZQ\'-=HA@)IA9HZ).$!//%%2!&!2/%288'%2).$!. '%2'!2/';$."#1"%2'.)#3;&*##7:
9D:'A$! 27; . $"%2). $3 ! "%2
                           | Z'203 >#$ | - $.; #$7, %; 928
| 2! 3 #
                                                                        4 & 77#7
                         W#"
5'+, $17'.0
 +HA'4 & 77%% "%2
6QAQ\A/^ = '4 & 77
 B3 f% 11 L)6+% 5°, 4
9[:'=#80&". $*'%2). $3!"%2
1.2%#/'("!"#7
                                      < W* "956+, $1"/.0
 1 :( :'X#/ #$ 8$#80&"%27
                                     < A( 4 Q BU V6 = '@T#3; "R!$"%&#T#3; "%2 aNAN*"%/"/ 5E)6/
| 1 2%#/'("!"#7"%2$#2".$" UA( 4 Q B>\ANAN*"%/"/ 5E)6/.0
                                        (C=C)CCHECOLPEUPELLETTSH3 #8.* I.P.$ 0770-77121#74847945...|".%/5 98.6.0 (C=C)CCHECOLPEUPELLETTSH3 #8.* I.P.$ 0770-77121#74847945...|".%/5 98.6.0 (C=C)CCHECOLPEUPELLETH $7.071, #3.94 87887945...|".%/5 98.6.0 (C=C)CCHECOLPEUPEL, I.P.$ 0.71, #3.94 87887945...|".%/5 98.6.0 (C=C)CCHECOLPEUPEL, I.P.$ 0.74, #3.94 8782SH2".$"\V|I.P.$ "%#2"994!"%2.284745...|".%/5 98.6.0
   4 8#! 2'Q%SQ1""(#1"%2
99EU≯V?! P!$7 . 07'Q%S
- . 880"! 2"7'U*Q-7V
                                     < W# "%-"/.
   4 &#! 2"Q% Q1""(#1"%2"KCE < W* "%") "/ 4 & 77" 6( 0 > 7"! 2 1#7
   4 &#! 2'Q%$Q1""(#1"%2'KCE < W* "%}-"/.
4 & 77" 66( 0 > 7"! 2 1#7
   +@Q\\%"64,#3 %!&\
U$#10$7.$4,#3 %!&\V
                                     < W*"%","
9RIREC99
```

```
#$%%() *%,-.'/$-0,12
9[:'=#80&". $*'%2). $3!"%2
   + @Q'\ %" 664 , #3 %! &
U@77#2"%&4 , #3 %! &V
                                  < W "% "/
 ("!"#"$#80&"%27
                                  < W*6/%H%//%*E4*6/6"-%15/%$+"/.0
     ! 77! 1, 07#**7
                                < W* 6/%H% / %* E 4* 6/6"-%-5/%+"/.0
< W* 6/%H% / %* E 4* 6/6"-%-5/%+"/.0
   Z#Mtd SL
   Z#M*a#$7#*
    #227* 85! 2%
                                 < W*6/%H%//%*E4*6/6"-%45/%$+"/.0
  I 2,9##/"("!"#7"%2S#2".$*
UA(4,Q1B>V
                                < W* "%/ "/ Œ )6/ . 0
4!2!/!
] ? 6('U4!2!/!V
                                 < W* "%* 6"5" $$ . %6. / 5% _ R NG $$Z 161. 1T0
  4! 2! / %2' 876"7
4! 2! / %2' Z - = 6
                                < W* 6/%H%% / %* E 4* 6/ 6"-%15/%3+"/.0
62"#$2! "%2! &$#80&"%27
                                 < Q0.7°3 8% 28542"、$"\U$A (\ABA"%77 EF)6/.0
4、20 "$$542"、$"\U$A (\ABA"%7 EF)6/.0
a!:12 "$852"、$" $848" "% 7 EF)6/.0
b. 541 "$8542"、$" $848" "% 7 EF)6/.0
Z#Mr(#18.21' @ 542", $" \44, 143 M 8"\U$C6.4\B\$$6 E4*6/6"-%6/$$7. %5%]/E47'.0
-, %$6, 2247 "$2542", $"\U 644(\ABA" "%/7 EF)6/.0
  62"#$2! "%2! &&%"7
9K:'H", #$%2). $3!"%2
                                  < W D%/N BUZDU2%D %BK 2 PZU%BM/WMRMZ] WD%2^UKGU%UJ ND %FFUZDG%_UW
D_U%/UZ RRUW2U2%MMGDKPZDM WG%F K%PGU%;KU%F NN \ UZ0
 \!>#&3#Y0%#3 #2"7
?! F! $' . 07' ! "#$%&
62). $3 ! "%2'( *7"#3 'U :( :Q:V
                                          *7%!&!P!$/7
A, #107". 3 #$%5#7; . 27%8#). $/#"#$3 %2%86", #'--@1. /#'). $", %3! "#$%&
Z! "%2! &X 9#" - $. "#1"%2
Q77. 1%"%2' U :( :Q:V
                                                                X&33!>%%
                                                                  ) 627"!>%2%"R÷#!1"%S%%
                                                                 (;#1%&
 +! "#".)"; $%25"%28
                                 < 9FLIEC99:
+! "#". )'%70#
+! "#". )'; $#$%07'%70#
                                 < 8@@ 880
                                 < W* %45' V)* , - %/19, 1")* 60
5#$7%2
                                 < 8
 - S#· 1 S#/ '>*
                                 < R G2 G98K/ +, $1"* 5#9G4/! )1$, "T
 ▼62/9½! "#7'92). $3!"%2'",!",!7'1,!28#/')$3';$#$%07&'%70#/'$#$7%2:
9RIFEC99:
```



%#14\$12 7# 41 3 7#1 8375 358k

# ! "#\$%&'1(")\$#\*1+"#'1(,\$\$#

! "#\$%&'() \* +, - 1 (/ 00

```
: 1-%/02#1'3/12.4 "3*18\$3#8\&"#&3
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CAS number 9002-92-0

<del>%</del> 7 - 10

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Part of Thermo Fisher Scientific

## Material Safety Data Sheet

Manufacturer

# Product and company identification

Product name Supplier

Product No.

Surfact-Amps 35 Thermo Fisher Scientific

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

0028316 0028316B 1881060

MSDS# 2437 Validation date 5/18/2010. Print date 5/18/2010.

Responsible name MSDS (Regulatory Affairs) In case of emergency

CHEMTREC: Use of 800.424.9300 Substance/Preparation

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

Thermo Fisher Scientific

Thermo Fisher Scient Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 800.874.3723

#### 2. Hazards identification

Physical state OSHA/HCS status Liquid.

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

WARNING! Emergency overview

CAUSES EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

DAWAGE.

Harmful if swallowed. Severely irritating to eyes. Slightly irritating to the skin. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Do not get in eyes. Avoid contact with skin and clothing. Contains material that can cause target organ damage. Wash thoroughly after handling.

Dermal contact. Eye contact. Inhalation. Ingestion.

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Routes of entry

Potential acute health effects

Inhalation

No known significant effects or critical hazards.

Rockford, IL 61105

Harmful if swallowed. Ingestion Slightly irritating to the skin Skin

Severely irritating to eyes. Risk of serious damage to eyes.

Potential chronic health effects

Chronic effects Contains material that can cause target organ damage Carcinogenicity No known significant effects or critical hazards. Mutagenicity No known significant effects or critical hazards.

No known significant effects or critical hazards. Teratogenicity

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#### 2. Hazards identification

No known significant effects or critical hazards. Developmental effects Fertility effects No known significant effects or critical hazards.

Target organs

Contains material which causes damage to the following organs: the nervous system, skin, eyes.
Contains material which may cause damage to the following organs: kidneys, lungs, liver, bladder, gastrointestinal tract, central nervous system (CNS).

Over-exposure signs/symptoms

Inhalation No specific data Ingestion No specific data.

Adverse symptoms may include the following: irritation redness

Adverse symptoms may include the following: pain or irritation watering redness

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

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments

Classification Xir R41

Human health hazards Risk of serious damage to eyes.

See toxicological information (section 11)

#### 3. Composition/information on ingredients

United States Name Brij 35

Medical conditions

Preparation

Substance/preparation Ingredient name <u>%</u> EC number Classification 9002-92-0 7 - 10 Brij 35 500-002-6 Xn; R22 Xi; R41, R38

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

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in section 8.

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### 4. First aid measures

Inhalation

Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if have exposed person to restrict an. Ever person warm and at rest. In this urealing, in breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth respiration. It may be dangerous to the person providing aid to give mouth-to-mouth and the person provided and the person person provided and the person provided and the person provided and the person p

Ingestion

sucn as a coilar, le, bet or waistband.

Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention inmediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

Eye contact

tile, beit of wassuard.

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention. Chemical burns must be treated promptly by a physician.

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

Protection of first-aiders

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

See section 11 for more detailed information on health effects and symptoms

#### 5 . Fire-fighting measures

Flammability of the product Extinguishing media

Use an extinguishing agent suitable for the surrounding fire

Suitable

Not suitable None known

Special exposure hazards

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

Hazardous combustion

Decomposition products may include the following materials: carbon oxides

products

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).

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#### 6. Accidental release measures

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

Small spill

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

#### Handling and storage

Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate vertilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, keyt tighty dosed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

Container's retain product residue and can be nazardous. You'd refuse container.

Store between the following temperatures: 20 to 25 C (68 to 77 F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventitated 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 prightly or prevent leakage. Do not store in unliabeled containers. Use appropriate containment to avoid environmental containmation. environmental contamination.

#### 8 . Exposure controls/personal protection

No exposure limit value known

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

the first 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

Hygiene measures

or other control measures and/or the necessity to use respiratory protective equipment. 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. 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.

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NIOSH

None

OSHA

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Surfact-Amps 35 8. Exposure controls/personal protection 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 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, Eves gases or dusts. 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. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, furme scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels. Environmental exposure controls

### 9. Physical and chemical properties

Physical state Liquid. Color

Clear Colorless Solubility Soluble in the following materials: cold water and hot water

#### 10 . Stability and reactivity

Chemical stability

The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

No specific data.

No specific data

Incompatible materials Hazardous decomposition Under normal conditions of storage and use, hazardous decomposition products should

not be produced

products

Will not occur. Possibility of hazardous

### 11 . Toxicological information

#### United States Acute toxicity

Product/ingredient name Dodecan-1-ol, ethoxylated

Rat LD50 125 mg/kg 27 mg/kg 1000 mg/kg 8600 mg/kg 953 mg/kg Subcutaneous

Exposure

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Conclusion/Summary Chronic toxicity

Not available Not available

Conclusion/Summary Carcinogenicity

Conclusion/Summary Not available

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#### 11. Toxicological information Classification

Product/ingredient name Dodecan-1-ol, ethoxylated

Mutagenicity Conclusion/Summary Not available Conclusion/Summary Not available

Reproductive toxicity Conclusion/Summary Not available

<u>Europe</u>

Chronic effects No known significant effects or critical hazards. No known significant effects or critical hazards. Carcinogenicity Mutagenicity No known significant effects or critical hazards. Teratogenicity No known significant effects or critical hazards. No known significant effects or critical hazards. Developmental effects Fertility effects No known significant effects or critical hazards.

### 12 . Ecological information

Environmental effects No known significant effects or critical hazards.

United States

Aquatic ecotoxicity Conclusion/Summary

Not available Other adverse effects

No known significant effects or critical hazards.

#### 13. Disposal considerations

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solution sand any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

The classification of the product may meet the criteria for a hazardous waste.

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 CONTROL SPERSONAL 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.	-	-	-
5/18/2010	-			

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### 14 . Transport information

PG\* : Packing group

### 15 . Regulatory information

#### United States

HCS Classification

Irritating material Target organ effects

U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted. SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/31/13/12 hazardous chemicals: Dodecan-1-ol, ethoxylated SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Dodecan-1-ol, ethoxylated: Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Water Act (CWA) 307: No products were found

Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: No products were found. Clean Air Act (CAA) 112 regulated flammable substances: No products were found. Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Canada

WHMIS (Canada) Canadian lists

Not controlled under WHMIS (Canada).

CEPA Toxic substances: None of the components are listed. Canadian ARET: None of the components are listed. Canadian PREI: None of the components are listed. Canadian NPRI: None of the components are listed. Alberta Designated Substances: None of the components are listed. Ontario Designated Substances: None of the components are listed. Quebec Designated Substances: None of the components are listed.

Canada inventory: All components are listed or exempted Canada inventory

EU regulations

Hazard symbol or symbols



Risk phrases Safety phrases R41- Risk of serious damage to eyes.

\$26-In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. \$39-Wear eye/face protection.

International regulations

Australia inventory (AICS): All components are listed or exempted. China inventory (IECSC): All components are listed or exempted. Korea inventory (KECI): All components are listed or exempted. Philippines inventory (FCCS): All components are listed or exempted. Japan inventory (ENCS): All components are listed or exempted.

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#### 16. Other information

Label requirements

CAUSES EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

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 5/18/2010. Date of issue 5/18/2010. 7/27/2009. Date of previous issue 1.01

Indicates information that has changed from previously issued version

Full text of R-phrases referred to in sections 2 and 3 - Europe Full text of classifications referred to in sections 2 and R22- Harmful if swallowed.
R41- Risk of serious damage to eyes.
R38- Irritating to skin.
Xn - Harmful
Xi - Irritant

3 - Europe

#### 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 quarantee that these are the only hazards that exist.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

5/18/2010

3747 N. Meridian Rd. PO Box 117

(815) 968-0747 (815) 968-7316 Eav

8/8

23 of 44

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"2-\nd 4" 2 4G-\nd 4", 0/, 24Q\*K. @25% 23 #2"! &; \$#1! 0"%27 #", . / 7"). \$18#! 2928"0; < 1/, 8("4UQ! 0<, //28+UQ!, d'(5,#/49#"2H27 (+80,42 4K2-0, /"(! 0<(! 4/"24+N)7, 8(. 8 Q! 4/"24-c-"(6," #4/0"24) (20! 4/"29#+, c-"\(4c+2c!\) 0<(4#(#"2/\)20\(7c) 4/"24-(4#\) 8.45" (#4#(4882 829" (! 4+" (ND+8, +4(5, #/49#)29-0+, +"), 3\(3\)\(4(0" #+" N! 4+" (ND+8, +4(5, #/49#)28) (20! 4) (4(0" #+" N! 4+") (ND+8, +4(5, #/49#)28) (20! 4) (4(0" #+" N! 4+") (ND+8, +4(5, #/49#)28) (20! 4) (4(0" #+" N! 4+") (ND+8, +4(5, #/49#)28) (20! 4) (4(0" #+" N! 4+") (ND+8, +4(5, #/49#)28) (20! 4) (4(0" #+" N! 4+") (ND+8, +4(5, #/49#)28) (20! 4) (4(0" #+" N! 4+") (ND+8, +4(5, #/49#)28) (4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4(0" \*+4( (3!887;988 \(\text{N86}, +445, #/265, 2\text{X}\) \(\text{1/8} \) (14 \) (10 \text{1/8} \) (12 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) (1/8 \) ]!\$8#7; 988 J:'?!2/ 8/28'!2/ '7". \$!8# (". \$ 8#

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@ S% 23 #2"! &#T; . 70 \$# 1. 2"\$. &7

F:'-, \*7%! &! 2/ '1, #3 %! &; \$.; #\$'%7

~ 27 0+01 #4(2.7 (d"#)04/0 #(.21, 2U82.5"+4|" M @7 "#/(+<... +Nc"(5<"5U\*N/, ("#+.2"(/<"0.5, 7 8 -04) 0+(/"c"(2" M 02"7 "#/4", 3"#6/02 #7 "#4/482.7 5/0 #4." ?0-4/0 #4(|#4, 7 "(54#"+V 3 7 "(542 °C-2\*4\00072\*4, 2"#?#""2#?/("N054-0) #4/() (/"(82.5"++("M 057 "#/() 0+(c" #/5"+4424/), (2"N 5"("7 0+0) #4/() (455"8)4c-1(-"0" +4K")

#### 

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**PB/FE**C99: 4!"

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Part of Thermo Fisher Scientific

## Material Safety Data Sheet

Manufacturer

#### Product and company identification Product nam

Supplier

Product No.

Validation date

MSDS#

Print date

Surfact-Amps NP-40 Thermo Fisher Scientific

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

0028324 0797 5/18/2010. 5/18/2010.

Responsible name MSDS (Regulatory Affairs) CHEMTREC: 800.424.9300 In case of emergency Use of Substance/Preparation

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

Thermo Fisher Scientific

Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 800.874.3723

### Hazards identification

Physical state Odor

Liquid. [Clear to slightly hazy liquid.] Odorless

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

WARNING!

Emergency overview

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA

DANMGE, BASELI ON ANIMAL DATA.

Harmful if swallowed. Severely irritating to eyes. Irritating to respiratory system and skin. May cause sensitization by inhalation and skin contact. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Contains material that may cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

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

Potential acute health effects

Inhalation Irritating to respiratory system. May cause sensitization by inhalation.

Harmful if swallowed. Ingestion

Irritating to skin. May cause sensitization by skin contact Skin Eyes Severely irritating to eyes. Risk of serious damage to eyes.

Potential chronic health effects

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

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### Thermo

Surfact-Amps NP-40

#### 2. Hazards identification

Carcinogenicity No known significant effects or critical hazards. Mutagenicity No known significant effects or critical hazards. Teratogenicity No known significant effects or critical hazards. No known significant effects or critical hazards. Developmental effects Fertility effects No known significant effects or critical hazards.

Target organs Contains material which may cause damage to the following organs: endocrine.

Over-exposure signs/symptoms

Adverse symptoms may include the following: respiratory tract irritation

coughing wheezing and breathing difficulties asthma

No specific data. Ingestion

Adverse symptoms may include the following: irritation redness Skin

Adverse symptoms may include the following: pain or irritation watering redness

Medical conditions aggravated by over-exposure Pre-existing respiratory, skin and digestive disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by overexposure to this product.

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments Classification ; Xi; R41

Human health hazards Risk of serious damage to eyes

See toxicological information (section 11)

#### 3. Composition/information on ingredients

United States

Name Nonidet P-40 Substitute CAS number 9016-45-9

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Europe Substance/preparation Preparation

<u>%</u> EC number Classification Nonidet P-40 Substitute 9016-45-9 7 - 10 Xn; R22 Xi; R41, R37/38

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

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

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### 3. Composition/information on ingredients

Occupational exposure limits, if available, are listed in section 8

#### 4. First aid measures

Inhalation

Move exposed person to fresh air. If it is suspected that furnes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure.

Ingestion

Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed air. Keep person warm and at rest. If material has been swalablewed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vorniting unless directed to do so by medical personnel. If vorniting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention. Chemical burns must be treated promptly by a physician.

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-lo-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing or wear gloves.

See section 11 for more detailed information on health effects and symptoms

### 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 None known

Not suitable

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 there is a training.

Hazardous combustion Decomposition products may include the following materials: carbon oxides

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

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Large spill

Surfact-Amps NP-40

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 ventitation. 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).

pollution (sewers, waterways, soil or air). 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.

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

Handling and storage

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. Persons with a history of skin senstizzabin problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse containers

Storage

Store between the following temperatures: 20 to 25 C (68 to 77 F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventitated 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 puright to prevent leakage. Do not store in unlabeled containiers. Use appropriate containment to avoid environmental containiation.

environmental contamination.

#### Exposure controls/personal protection

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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.

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Incompatible materials

products Possibility of hazardous reactions

5/18/2010

Hazardous decomposition

No specific data.

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Pierce PO Box 117

#### Surfact-Amps NP-40 8. Exposure controls/personal protection 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. 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. Hygiene measures Personal protection 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. Respiratory 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 Hands Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. Eyes 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 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, furne scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels. Physical and chemical properties Liquid. [Clear to slightly hazy liquid.] Physical state Color Colorless Odorless Odor Solubility Easily soluble in the following materials: cold water and hot water 10 . Stability and reactivity The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur. Chemical stability Conditions to avoid No specific data.

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

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### Thermo

Surfact-Amps NP-40								
11 . Toxicological	informa	tion						
United States								
Acute toxicity							_	
Product/ingredient name Nonidet P-40 Substitute		Result LD50 De	ermal	Species Rabbit	Dose 2 mL/ka		Exposure	
Tromact To Caballato		LD50 De		Rabbit	2830 uĽ		-	
		LD50 Intraperi	topool	Rat	770 mg/l	кg	-	
		LD50 Oi		Rat	3500 mg	/kg	-	
		LD50 Or		Rat	1310 mg		-	
		LD50 Or LD50 Or		Rat Rat	4190 mg 4000 mg			
		LD50 O		Rat	2590 uL			
Conclusion/Summary	: Not availal	ble.						
Chronic toxicity								
Conclusion/Summary	: Not availal	ble.						
Carcinogenicity	. N-4							
Conclusion/Summary Classification	: Not availal	DIE.						
Product/ingredient name		ACGIH	IARC	EPA	NIOSH	NTP	OSHA	
Nonidet P-40 Substitute		-	-	-	None.	-	-	
Mutagenicity								
Conclusion/Summary	: Not availal	ble.						
Teratogenicity								
Conclusion/Summary	: Not availa	ble.						
Reproductive toxicity	. N-43-1							
Conclusion/Summary	: Not av ailal	oie.						
urope								
Chronic effects		•		or critical hazards				
Carcinogenicity		_		or critical hazards				
Mutagenicity		•		or critical hazards or critical hazards				
Teratogenicity Developmental effects		_		or critical hazards				
Fertility effects		_		or critical hazards				
12 . Ecological in			in circoto	or ormour ruseards	-			
Environmental effects			off acts or	critical hazards.				
United States	. NO KNOWN	signincant	ellectsol	Critical riazards.				
Aquatic ecotoxicity								
Conclusion/Summary	: Not availal	ble.						
Other adverse effects	: No know	n significar	nt effects	or critical hazards.				
		0						
5/18/2010.								6/9

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#### 13 . Disposal considerations

Waste disposal

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

The classification of the product may meet the criteria for a hazardous waste Hazardous waste

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 CONTROL SPERSONAL 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	-	-	-

PG\* : Packing group

#### 15 . Regulatory information

United States

HCS Classification

U.S. Federal regulations

Irritating material
Sensitizing material
Target organ effects
TSCA 8(a) PAIR: Nonidet P-40 Substitute
United States inventory (TSCA 8b): All components are listed or exempted.

SARA 30/23/4/311/21 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: Nonidet P-40 Substitute SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Nonidet P-40 Substitute: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Water Act (CWA) 307: No products were found. Clean Water Act (CWA) 311: No products were found

Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic)

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#### 15 . Regulatory information

Canada inventory: All components are listed or exempted.

CEPA Toxic substances: None of the components are listed. Canadian ARET: None of the components are listed. Canadian PRPI: The following components are listed. Canadian NPPI: The following components are listed. Ottario Designated Substances: None of the components are listed. Ontario Designated Substances: None of the components are listed. Quebec Designated Substances: None of the components are listed.

Canada inventory EU regulations

Hazard symbol or symbols



Risk phrases R41- Risk of serious damage to eyes.

Safety phrases S26-In case of contact with eyes, rinse immediately with plenty of water and seek

S39- Wear eye/face protection.

International regulations

International lists

Australia inventory (AICS): All components are listed or exempted. China inventory (IECSC): All components are listed or exempted. Korea inventory (IECSI): All components are listed or exempted. Philippines inventory (PICCS): All components are listed or exempted. Japan inventory (EICS): All components are listed or exempted.

#### 16 . Other information

Label requirements

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

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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.)

Flammability Instability Special

Date of printing 5/18/2010.

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### 16 . Other information

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Version : 1.02

Findicates information that has changed from previously issued version.

Full text of R-phrases referred to in sections 2 and 3 - Europe

1. R22- Harmful if swallowed.

R41. Risk of serious damage to eyes.

R37/39-Imitating to respiratory system and skin.

Xn - Harmful

Xi - Irritant

5/18/2010

#### Notice to reader

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

This product has been classified according to the hazard orderia of the CPR and the MSDS contains all the information required by the CPR.

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Part of Thermo Fisher Scientific

# Material Safety Data Sheet

Manufacturer

### Product and company identification

Product nam Supplier

Surfact-Amps™ 80 Thermo Fisher Scientific

Thermo Fisher Scienti Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723 0028328 0028328B

Product No. MSDS# 1243 Validation date 5/18/2010. Print date 5/18/2010. Responsible name

MSDS (Regulatory Affairs) CHEMTREC: Use of 800.424.9300 Substance/Preparation In case of emergency

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

Thermo Fisher Scientific

Pierro Fisher Scient Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747

800.874.3723

### Hazards identification

Physical state OSHA/HCS status Liquid.

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.

MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION Emergency overview

Slightly irritating to the eyes, skin and respiratory system. Avoid breathing vapor or mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

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

Potential acute health effects

Slightly irritating to the respiratory system.

Ingestion No known significant effects or critical hazards. Skin Slightly irritating to the skin.

Slightly irritating to the eyes Eyes

Potential chronic health effects

No known significant effects or critical hazards. Chronic effects No known significant effects or critical hazards. Carcinogenicity No known significant effects or critical hazards. No known significant effects or critical hazards. Mutagenicity Teratogenicity

No known significant effects or critical hazards. Developmental effects

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#### 2. Hazards identification

No known significant effects or critical hazards. Fertility effects

Over-exposure sign

Adverse symptoms may include the following: respiratory tract irritation coughing Inhalation

No specific data.

Skin Adverse symptoms may include the following: irritation

redness

Eyes Adverse symptoms may include the following: irritation

watering redness

Medical conditions None known.

aggravated by over-exposure

The preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments

Not classified.

See toxicological information (section 11)

#### 3. Composition/information on ingredients

United States

Name Tween 80

Substance/preparation

Preparation

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

#### First aid measures

Inhalation

Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Ingestion

waisband. Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vorniting unless directed to do so by medical personnel. It vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

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#### 4. First aid measures

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical

Eve contact

attention if irritation occurs.

Protection of first-aiders

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

See section 11 for more detailed information on health effects and symptoms.

### 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

Use an extinguishing agent suitable for the surrounding fire None known

Not suitable

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

Decomposition products may include the following materials: carbon oxides Hazardous combustion

products

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).

Large spill

pollution (sewers, waterways, soil or air). 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 eg, sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill

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

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#### 7. Handling and storage

Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. 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 ightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

Store between the following temperatures: 20 to 25 C (68 to 77 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.

#### Exposure controls/personal protection

Furone

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.

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

Hygiene measures

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.

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.

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

gases or dusts.

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.

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#### 8. Exposure controls/personal protection Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, furme 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. Dispersible in the following materials: cold water and hot water. Dispersibility properties Soluble in the following materials: cold water and hot water. Solubility 10 . Stability and reactivity The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur. Chemical stability No specific data. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Incompatible materials Hazardous decomposition products Possibility of hazardous reactions Will not occur. 11 . Toxicological information United States Acute toxicity Product/ingredient name Polyoxyethylenesorbitan Monooleate Result LD50 Species Rat Exposure Dose 6804 mg/kg LD50 Rat Intraperitoneal LD50 Rat Intraperitoneal LD50 Intravenous Rat LD50 Intravenous Rat LD50 Oral Rat TDLo Oral Rat 6804 mg/kg 1790 mg/kg 1790 mg/kg 34500 uL/kg 20 mg/kg Conclusion/Summary : Not available. Chronic toxicity Result Chronic TD50 Oral Product/ingredient name Polyoxyethylenesorbitan Monooleate Dose 42 g/kg TDLo Data Conclusion/Summary : Not available. Carcinogenicity Product/ingredient name Polyoxyethylenesorbitan Monooleate Result Equivocal -Subcutaneous -TDLo Dose 10 g/kg Equivocal - Oral - Rat TDLo 2163 g/kg 2 years Continuous Conclusion/Summary : Not available. Mutagenicity 5/18/2010. 5/8 Rockford, IL 61105 Biosciences Division 3747 N. Meridian Rd. Pierce PO Box 117 (815) 968-0747 (815) 968-7316 Fax

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DNA Inhibition    DNA Inhibition   Somatic Mammalian-Animal;   Equivoration   Somatic Mammalian-Animal;   Equivoration   Somatic	e Exposure : Multigenerationa
Conclusion/Summary : Not available.  Teratogenicity Product/ingredient name Maternal toxicity Polyoxyethylenesorbitan Monooleate Postive Rat Gallen Remailer Remailer Rat Postive Rat Rat Gallen Rat Coral Safe Rat Coral Safe Rat Postive Rat Rat Rat Rat Rat Rat Coral Safe Rat Rat Coral Safe Rat Postive Rat Coral Safe Rat Postive Rat Rat Coral Safe Rat Coral Safe Rat Rat Rat Coral Safe Rat Rat Coral Safe Rat Rat Coral Safe Rat Rat Coral Safe Rat Rat Coral Safe Rat Rat Rat Coral Safe Rat Rat Coral Safe Rat Rat Rat Rat Rat Rat Rat Rat Coral Safe Rat	Multigenerationa
Reproductive toxicity Product/ingredient name  Maternal Fertility Development toxici Polyoxyethylenesorbitan Monooleate  Postive Rat Female Rat Oral: 635 g/lg gl g	Multigenerationa
Product/ingredient name  Maternal toxicity  Polyoxyethylenesorbitan Monooleate  Polyoxyethylenesorbitan Monooleate  Postive  Post	Multigenerationa
Polyoxyethylenesorbitan Monooleate  Positive Positive Positive Positive Positive Positive Positive Positive Positive Rat Pemale Rat	Multigenerationa
Polyoxyethylenesorbitan Monooleate	ones: 4D POST
Positive Rat-Female UL/kg. Rat Oral: 1270 g/kg  Conclusion/Summary : Not available:  urope Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.	g
Conclusion/Summary : Not available.  Lurope Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.	
Conclusion/Summary : Not available :  Urope Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.	
Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.	
Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.	
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.	
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.	
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.	
Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.	
Fertility effects : No known significant effects or critical hazards.	
2 Ecological information	
nvironmental effects : No known significant effects or critical hazards.	
Inited States	
Aquatic ecotoxicity	
Conclusion/Summary : Not available.	
Other adverse effects : No known significant effects or critical hazards.	
3 . Disposal considerations	
Vaste disposal  The generation of waste should be avoided or minimized wherever poss surplus and non-recyclable products via a licensed waste disposal controf this product, solutions and any by-products should at all times comply requirements of environmental protection and waste disposal legislation local authority requirements. Avoid dispersal of spilled material and	ible Dienoce of
with soil, waterways, drains and sewers.	actor. Disposal with the and any regiona

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### 13. Disposal considerations

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROL SPERSONAL 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 available.	Not available.	Not available.	-

PG\*: Packing group

### 15 . Regulatory information

United States HCS Classification

U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: Polyoxyethylenesorbitan Monooleate

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

Polyoxyethylenesorbitan Monooleate: Immediate (acute) health hazard

Clean Water Act (CWA) 307: No products were found. Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found Clean Air Act (CAA) 112 regulated flammable substances: No products were found. Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Canada

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

Canadian lists

This product is not classified according to EU legislation.

CEPA Toxic substances: None of the components are listed. Canadian ARET: None of the components are listed. Canadian PRE: None of the components are listed. Canadian INPR: None of the components are listed. Alberta Designated Substances: None of the components are listed. Ontario Designated Substances: None of the components are listed. Quebec Designated Substances: None of the components are listed.

Canada inventory Canada inventory: All components are listed or exempted. EU regulations

Risk phrases

International regulations

International lists

Australia inventory (AICS); All components are listed or exempted. China inventory (IECSC): All components are listed or exempted. Korea inventory (IECSI): All components are listed or exempted. Philippines inventory (IECS): All components are listed or exempted. Japan inventory (ENCS): All components are listed or exempted.

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#### 16. Other information

Label requirements Hazardous Material Information System (U.S.A.) MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.



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

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



Date of printing 5/18/2010. Date of issue 5/18/2010 9/26/2008 Date of previous issue 1.01 Version

Indicates information that has changed from previously issued version.

Notice to reader

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

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CAS number 9036-19-5

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Part of Thermo Fisher Scientific

## Material Safety Data Sheet

# Product and company identification

Product nam Supplier

Triton X-114; Surfact-Amp X-114 Thermo Fisher Scientific Manufacturer

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

0028332 0028332B 1885280

Product No. MSDS# 0945 Validation date 6/4/2010. Print date 6/4/2010

Responsible name MSDS (Regulatory Affairs) In case of emergency

CHEMTREC: Use of 800.424.9300 Substance/Preparation

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

Thermo Fisher Scientific

Pierro Fisher Scient Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747

800.874.3723

### Hazards identification

OSHA/HCS status

Liquid.

, ...... This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

WARNING! Emergency overview

CAUSES EYE IRRITATION. MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Severely irritating to eyes. Slightly irritating to the skin and respiratory system. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not get in eyes. Avoid contact with skin and clothing. Contains material that can cause target organ damage. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. Dermal contact. Eye contact. Inhalation. Ingestion.

Routes of entry

Potential acute health effects Inhalation

Slightly irritating to the respiratory system. No known significant effects or critical hazards. Ingestion

Slightly irritating to the skin. Skin

Severely irritating to eyes. Risk of serious damage to eyes.

Potential chronic health effects Chronic effects

Contains material that can cause target organ damage Carcinogenicity No known significant effects or critical hazards. Mutagenicity No known significant effects or critical hazards. No known significant effects or critical hazards. Teratogenicity

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### Thermo

### Triton X-114; Surfact-Amp X-114

#### 2. Hazards identification

### Developmental effects

No known significant effects or critical hazards. Fertility effects No known significant effects or critical hazards.

Contains material which causes damage to the following organs: upper respiratory tract, skin, eyes. Target organs

Over-exposure signs/symptoms Inhalation : Adverse symptoms may include the following: respiratory tract irritation

coughing

No specific data. Inaestion

Adverse symptoms may include the following: irritation redness Skin

Adverse symptoms may include the following: pain or imitation watering redness

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

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments Classification : Xi; R36

Irritating to eyes

See toxicological information (section 11)

### 3. Composition/information on ingredients

#### United States

Name Polyethylene Glycol Octylphenyl Ether

Europe Substance/preparation : Preparation

Ingredient name

<u>%</u> EC number Classification 9036-19-5 7 - 10 Polyethylene Glycol Octylphenyl Ether

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

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit Occupational exposure limits, if available, are listed in section 8

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# 4. First aid measures

Inhalation

Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if have exposed person to restrict an. Ever person warm and at rest. In this urealing, in breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth respiration. It may be dangerous to the person providing aid to give mouth-to-mouth and the person provided and the person person provided and the person provided and the person provided and the person p

Ingestion

sucn as a coilar, le, bet or waistband.

Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention inmediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

Eye contact

tile, beit of wassuard.

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention. Chemical burns must be treated promptly by a physician.

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

Protection of first-aiders

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

See section 11 for more detailed information on health effects and symptoms

#### 5 . Fire-fighting measures

Flammability of the product Extinguishing media

Use an extinguishing agent suitable for the surrounding fire

Suitable

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. Decomposition products may include the following materials: carbon oxides

Hazardous combustion

products

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).

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Triton X-114; Surfact-Amp X-114

#### Accidental release measures

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

Small spill

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

#### Handling and storage

Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept ightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

product residue and can be riazzinous. Do into reuse container to see the Store between the following temperatures: 20 to 25 C (68 to 77 F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventitated 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 prightly or prevent leakage. Do not store in unliabeled containers. Use appropriate containment to avoid environmental containmation. environmental contamination.

#### 8 . Exposure controls/personal protection

No exposure limit value known

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

the third 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

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

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# Triton X-114; Surfact-Amp X-114

### 8. Exposure controls/personal protection

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

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

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

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, furme 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 Color

Liquid

Slightly hazy and cloudy, colorless.

Solubility Partially soluble in the following materials: cold water and hot water.

### 10 . Stability and reactivity

The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid No specific data.

Incompatible materials

No specific data. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous decomposition products

Will not occur.

Not available

Possibility of hazardous reactions

### 11. Toxicological information

#### United States

#### Acute toxicity

Product/ingredient name
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetnamethylbutyl)phenyl]-.omega.-hydroxy-

LD50 Oral LD50 Oral LD50 Oral Rat Rat Rat 3600 mg/kg 2800 mg/kg 4190 mg/kg

Exposure

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Conclusion/Summary

Chronic toxicity Conclusion/Summary

Not available

Carcinogenicity

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### Thermo

#### Triton X-114; Surfact-Amp X-114

### 11 . Toxicological information

Conclusion/Summary Not available Mutagenicity Conclusion/Summary Not available Teratogenicity Conclusion/Summary Reproductive toxicity

Not av ailable Conclusion/Summary

Europe Chronic effects No known significant effects or critical hazards. Carcinogenicity No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. Mutagenicity Teratogenicity Developmental effects No known significant effects or critical hazards. No known significant effects or critical hazards. Fertility effects

#### 12. Ecological information

Environmental effects No known significant effects or critical hazards. United States

Aquatic ecotoxicity Conclusion/Summ

Not available.

No known significant effects or critical hazards. Other adverse effects

#### 13. Disposal considerations

Waste disposal

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Hazardous waste

The classification of the product may meet the criteria for a hazardous waste. 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 CONTROL SPERSONAL 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 available.	Not available.	Not available.	-

PG\*: Packing group

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### 15 . Regulatory information

#### United States

HCS Classification

Irritating material Target organ effects U.S. Federal regulations

TSCA 8(a) PAIR: Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: Poly(oxy-1,2-ethanediyl), alpha-[(1,1,3-lethanediyl), alpha-[(1,1,3-lethanediyl), alpha-[1,1,3-lethanediyl, alpha-[

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: ethylene oxide

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: ethylene oxide

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive		<u>kimum</u> eptable dosage
			leve	el
1,4-Dioxacyclohexane	Yes.	No.	30 g/day (ingestion) No.	
			30 g/day (inhalation)	
ethylene oxide	Yes.	Yes.	2 g/day (ingestion) 20	g/day (ingestion)
•			2 g/day (inhalation) 20	g/day (inhalation)

Canada WHMIS (Canada) Canadian lists

Class D-2B: Material causing other toxic effects (Toxic).

Canada inventory: All components are listed or exempted.

Class D-Zb: Naterial causing other toxic effects (1 oxic).

CEPA Toxic substances: None of the components are listed.

Canadian ARET: None of the components are listed.

Canadian NPRI: The following components are listed: Octylphenol and its ethoxylates

Alberta Designated Substances: None of the components are listed.

Ontario Designated Substances: None of the components are listed. Quebec Designated Substances: None of the components are listed.

Canada inventory EU regulations

Hazard symbol or symbols

Risk phrases R36- Irritating to eyes

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#### 15. Regulatory information

#### International regulations

International lists

Australia inventory (AICS): All components are listed or exempted. China inventory (IECSC): All components are listed or exempted. Korea inventory (IECSI): All components are listed or exempted. Philippines inventory (IECS): All components are listed or exempted. Japan inventory (ENCS): All components are listed or exempted.

#### 16. Other information

CAUSES EYE IRRITATION. MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE

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 6/4/2010. 6/4/2010. Date of issue Date of previous issue 5/18/2010 Version 1.02

▼Indicates information that has changed from previously issued version.

Full text of R-phrases referred to in sections 2 and 3 - Europe Full text of classifications referred to in sections 2 and 3 - Europe

R41- Risk of serious damage to eyes. R36- Irritating to eyes. R37/38- Irritating to respiratory system and skin.

Xi - Irritant

Notice to reader

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To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

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Part of Thermo Fisher Scientific

# Material Safety Data Sheet

Manufacturer

# Product and company identification

Product nam Supplier

Product No.

Validation date

Responsible name

MSDS#

Print date

Surfact-Amps 58; Brij 58 Thermo Fisher Scientific

Thermo Fisher Scienti Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723 0028336 1885260

1925 5/18/2010. 5/18/2010 MSDS (Regulatory Affairs)

CHEMTREC: Use of 800.424.9300 Substance/Preparation In case of emergency

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

Thermo Fisher Scientific

Pierro Fisher Scient Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747

800.874.3723

#### 2. Hazards identification

Physical state

Routes of entry

Liquid.

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.

MAY CAUSE RESPIRATORY TRACT AND EYE IRRITATION. Emergency overview

Slightly irritating to the eyes and respiratory system. Avoid breathing vapor or mist. Avoid contact with eyes. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Slightly irritating to the respiratory system. Inhalation Ingestion No known significant effects or critical hazards. Skin No known significant effects or critical hazards.

Slightly irritating to the eyes. Eyes

Potential chronic health effects

Chronic effects No known significant effects or critical hazards. Carcinogenicity No known significant effects or critical hazards. Mutagenicity No known significant effects or critical hazards. Teratogenicity No known significant effects or critical hazards. No known significant effects or critical hazards. Developmental effects Fertility effects No known significant effects or critical hazards.

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#### 2. Hazards identification

Over-exposure signs/symp

Adverse symptoms may include the following: respiratory tract irritation coughing Inhalation

No specific data. Ingestion No specific data

Eyes Adverse symptoms may include the following: irritation

watering redness None known

Medical conditions aggravated by over-exposure

The preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Not classified. Classification

See toxicological information (section 11)

#### 3. Composition/information on ingredients

United States

<u>Name</u> Surfact-Amps 58; Brij 58

Preparation

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

### First aid measures

Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or weighten of the provided of the provi

CAS number 9004-95-9

<del>%</del> 7- 10

Ingestion

Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Sup if the exposed person feels sick as vomiting may be dangerous. Do not induce vorniting unless directed to do so by medical personnel. If vomting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean

shoes thoroughly before reuse.

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#### 4. First aid measures

Eye contact

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

Protection of first-aiders

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

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

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

See section 11 for more detailed information on health effects and symptoms

training.

#### 5. Fire-fighting measures

Flammability of the product Extinguishing media

Suitable Use an extinguishing agent suitable for the surrounding fire

Not suitable

Special exposure hazards

Hazardous combustion products

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). 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

Environmental precautions

pollution (sewers, waterways, soil or air).

Decomposition products may include the following materials:

Large spill

pollution (sewers, waterways, soil or air).

Stop leak if without risk. Move containers from spill area. Approach release from

Stop leak if without risk. Move containers from spill area. Wash

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

Small spill

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

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## 7. Handling and storage

Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. 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 ightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

Store between the following temperatures: 20 to 25 C (68 to 77 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

Furone

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures Engineering measures

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.

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.

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

Hygiene measures

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.

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.

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

gases or dusts.

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.

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Skin

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#### 8 . Exposure controls/personal protection

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, furme 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

Clear Colorless

Relative density

Solubility Partially soluble in the following materials: cold water and hot water

#### 10 . Stability and reactivity

The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

Rat

2500 mg/kg

No specific data

Conditions to avoid

Incompatible materials No specific data.

Hazardous decomposition products

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

Possibility of hazardous reactions

Will not occur.

### 11. Toxicological information

United States Acute toxicity

Product/ingredient name Poly(oxy-1,2-ethanediyl), .alpha.-hexadecyl-.omega.-hydroxy-Species Mouse Exposure Dose 2602 mg/kg LD50 Oral

Conclusion/Summary

Conclusion/Summary : Not available Carcinogenicity

Conclusion/Summary : Not available

Classification
Product/ingredient name
Poly(oxy-1,2-ethanediyl), .alpha.-hexadecyl-.omega.-hydroxy-**ACGIH** IARC **EPA** None.

Mutagenicity

Conclusion/Summary : Not available Teratogenicity

Reproductive toxicity Not available

Conclusion/Summary

Europe 5/18/2010

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### Surfact-Amps 58; Brij 58

### 11 . Toxicological information

Chronic effects No known significant effects or critical hazards. No known significant effects or critical hazards. Carcinogenicity No known significant effects or critical hazards. Mutagenicity Teratogenicity No known significant effects or critical hazards. No known significant effects or critical hazards. Developmental effects Fertility effects No known significant effects or critical hazards.

#### 12. Ecological information

Environmental effects No known significant effects or critical hazards.

United States Aquatic ecotoxicity
Conclusion/Summary

Hazardous waste

Not available

Other adverse effects No known significant effects or critical hazards

#### 13. Disposal considerations

Waste disposal

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solution sand any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

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

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

### 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

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HCS Classification

U.S. Federal regulations United States inventory (TSCA 8b): All components are listed or exempted.

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#### Surfact-Amps 58; Brij 58

#### 15 . Regulatory information

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) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

#### Canada

WHMIS (Canada) Canadian lists

Not controlled under WHMIS (Canada).

CEPA Toxic substances: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: None of the components are listed.

Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed. Canada inventory: All components are listed or exempted.

#### Canada inventory EU regulations

Risk phrases

This product is not classified according to EU legislation.

#### International regulations

Australia inventory (AICS): All components are listed or exempted. China inventory (IECSC): All components are listed or exempted. Korea inventory (KECI): All components are listed or exempted. Philippines inventory (FCCS): All components are listed or exempted. Japan inventory (ENCS): All components are listed or exempted.

#### 16 . Other information

Label requirements

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

MAY CAUSE RESPIRATORY TRACT AND EYE IRRITATION.



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

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

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### Thermo

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### 16. Other information



Date of printing 5/18/2010 5/18/2010. Date of issue Date of previous issue 6/9/2009. 1.01

Indicates information that has changed from previously issued version.

#### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR

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