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	Version 1
1 Identification	
Product identifier	
Product name: Perchloric acid, 70%	
Stock number: 10983 CAS Number:	
7601-90-3 EC number:	
231-512-4	
Index number: 017-006-00-4	
Relevant identified uses of the substance or mixture and uses advised against. Identified use: SU24 Scientific research and development	
Details of the supplier of the safety data sheet	
Manufacturer/Supplier: Alfa Aesar	
Thermo Fisher Scientific Chemicals, Inc. 30 Bond Street	
Ward Hill, MA 01835-8099	
Tel: 800-343-0660 Fax: 800-322-4757	
Email: tech@alfa.com www.alfa.com	
Information Department: Health, Safety and Environmental Department Emergency telephone number:	
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866)	<del>)</del> 28-0789.
2 Hazard(s) identification	
Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)	
GHS03 Flame over circle	
Ox. Liq. 1 H271 May cause fire or explosion; strong oxidizer.	
GHS05 Corrosion	
Skin Corr. 1A H314 Causes severe skin burns and eye damage. Hazards not otherwise classified No information known.	
Label elements GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS) Hazard pictograms	
GHS03 GHS05	
Signal word Danger Hazard statements	
H271 May cause fire or explosion; strong oxidizer.	
H314 Causes severe skin burns and eye damage. Precautionary statements	
P221 Take any precaution to avoid mixing with combustibles. P283 Wear fire/flame resistant/retardant clothing. P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.	
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rins.	ina.
P405 Store locked up. P501 Dispose of contents/container in accordance with local/regional/national/international regulations.	
WHMIS classification	
C - Oxidizing materials D2B - Toxic material causing other toxic effects	
E - Corrosive material F - Dangerously reactive material	
Classification system HMIS ratings (scale 0-4)	
(Hazardous Materials Identification System)	
HEALTH       I       I       Health (acute effects) = 4         FIRE       I       Filammability = 0       I         Reactivity I       Physical Hazard = 3	
Other hazards	
Results of PBT and vPvB assessment PBT: Not applicable.	
vPvB: Not applicable.	
3 Composition/information on ingredients	
Chemical characterization: Substances CAS# Description:	
7601-90-3 Perchloric acid	
Concentration: ≤100% Identification number(s):	
<b>EC number:</b> 231-512-4	(Contd. on page 2)
	USA

(Contd. of page 1)

# Product name: Perchloric acid, 70%

Index number: 017-006-00-4

### 4 First-aid measures

## Description of first aid measures

**General information** Immediately remove any clothing soiled by the product. **After inhalation** Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice. After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek medical treatment. Information for doctor

Most important symptoms and effects, both acute and delayed Causes severe skin burns. Indication of any immediate medical attention and special treatment needed No further relevant information available.

## 5 Fire-fighting measures

Extinguishing media Suitable extinguishing agents Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam. For safety reasons unsuitable extinguishing agents Halocarbon extinguisher Special hazards arising from the substance or mixture This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. If this product is involved in a fire, the following can be released: Hydrogen chloride (HCI) Advice for firefighters Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit.

### 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures Wear protective equipment. Keep unprotected persons away Ensure adequate ventilation Environmental precautions: Do not allow product to reach sewage system or any water course. Methods and material for containment and cleaning up: Use neutralizing agent. Dispose of contaminated material as waste according to section 13. Dispose of contaminated material as waste according to section 13. Ensure adequate ventilation. Absorb with liquid-binding material. **Prevention of secondary hazards:** Acts as an oxidizing agent on organic materials such as wood, paper and fats Keep away from combustible material. **Reference to other sections** See Section 7 for information on safe handling See Section 8 for information on personal protection equipment. See Section 13 for disposal information. **Protective Action Criteria for Chemicals PAC-1:** 0.61 ppm **PAC-2:** 6.7 ppm **PAC-3:** 40 ppm 7 Handling and storage Handling Handling Precautions for safe handling Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace. Prevent formation of aerosols. Information about protection against explosions and fires: Protect from heat. Substance/product can reduce the ignition temperature of flammable substances. This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Conditions for safe storage, including any incompatibilities

Storage Requirements to be met by storerooms and receptacles: Store in a cool location.

Information about storage in one common storage facility: Store away from flammable substances. Store away from neducing agents. Do not store with organic materials. Store away from metal powders. Store away from strong bases. Store away from amines. Further information about storage conditions: Keep container tightly sealed. Store in cool, dry conditions in well sealed containers. **Specific end use(s)** No further relevant information available.

### 8 Exposure controls/personal protection

Additional information about design of technical systems: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

## **Control parameters**

Components with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace. Additional information: No data

(Contd. on page 3)

Product name: Perchloric acid, 70%

Froduct manie. Fercinionic acid, 7076		
(Contd. of page 2) Exposure controls Personal protective equipment General protective and hygienic measures The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages and feed. Remove all solied and contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment. Breathing equipment: Use suitable respirator when high concentrations are present. Recommended filter device for short term use: Use a respirator with multi-purpose combination (US) or type ABEK (EN 14387) as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU). Protection of hands: Impervious gloves Check protective gloves prior to each use for their proper condition. The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer. Material of gloves Butyl rubber, BR Penetration time of glove material (in minutes) >480 Giove thickness: 0.3 mm Eye protection: Tightily sealed goggles Full face protection Safety glasses with side shields / NIOSH (US) or EN 166(EU) Body protection: Protection		
9 Physical and chemical properties		
<ul> <li>Friysical and Chemical properties</li> <li>Information on basic physical and ch General Information Appearance: Form: Odor:</li> <li>Odor threshold:</li> </ul>		
pH-value:	Not determined.	
Change in condition Melting point/Melting range: Boiling point/Boiling range: Sublimation temperature / start:	-18 °C (-0 °F) 203 °C (397 °F) Not determined	
Flash point: Flammability (solid, gaseous) Ignition temperature: Decomposition temperature: Auto igniting:	113 °C (235 °F) Not determined. Not determined Not determined Not determined.	
Danger of explosion: Explosion limits: Lower: Upper: Vapor pressure: Density at 20 °C (68 °F): Relative density Vapor density Evaporation rate Solubility in / Miscibility with Water: Partition coefficient (n-octanol/water) Viscosity: dynamic: kinematic:	Heating may cause an explosion. Not determined Not determined 1.67 g/cm³ (13.936 lbs/gal) Not determined. Not determined. Fully miscible : Not determined. Not determined. Not determined. Not determined.	
Other information	No further relevant information available.	
10 Stability and reactivity Reactivity Heating may cause an explosion. May intensity fire: oxidizer. Chemical stability Stable under recommended storage conditions. Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications. Possibility of hazardous reactions Reacts with reducing agents Reacts with reducing agents Conditions to avoid No further relevant information available. Incompatible materials: Flammable substances Reducing agents Bases Amines Organic materials Metal powders Hazardous decomposition products: Hydrogen chloride (HCI)		
11 Toxicological information Information on toxicological effects Acute toxicity: Swallowing will lead to a strong corrosiv The Registry of Toxic Effects of Chemic	e effect on mouth and throat and to the danger of perforation of esophagus and stomach. al Substances (RTECS) contains acute toxicity data for this substance.	(Contd. on page 4)

(Contd. on page 4) USA

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The inflation or corradius: Cuises service with damage.         General collimitation: Cuises service with the construction properties of this material is available from the EPA. IARC. NTP. OSHA or ACCHI.         Approductive to existing: No closes about the construction properties of this material is available from the EPA. IARC. NTP. OSHA or ACCHI.         Short in target cuipes system toxicity repeated septement: No diffect known.         Short in target cuipes system toxicity repeated septement: No diffect known.         Subscription of the construction of the construction of the construction of the construction.         Statistic statisty In information available.         Statistic society: - the frequency of thim advances of the construction of the construction of the construction available.         Statistic society: - the information available.         Basecurnal travel         Basecurnal travel         Advances of the optical information available.         Basecurnal travel         Basecurnal travel         Advances of the optical information available.         Basecurnal travel         Basecurnal travele more of long quantifies to neach ground t	Oral LD50 1100 mg/kg (rat)	
Standington: No sensitivity of setter known:	Skin irritation or corrosion: Causes severe skin burns. Eve irritation or corrosion: Causes serious eve damage.	
Carcinogenicity: No classification date on carcinogenic properties of this material is available from the EPA, (ARC, NTP, OSHA or ACCHH. Reproductive storily: No affects known. Specific target organ system toxicity - single acquere: No effects (nown. Appendix name: No official known. Appendix name: No official known. 212 Collegical Information Tracking Appendix toxicity: No further relevant information available. Presistence and degradability No further relevant information available. Presistence and degradability No further relevant information available. Mobility in soil No further relevant information available. Presistence and effect No further relevant information available. The applicable Presistence and effect No further relevant information available. The applicable Presistence and effect No further relevant information available. To not allow undillade product or large quantillies to reach ground water, water course or sewage system. Appendix not presistence and the substance of the substance of the substance of the substance of the applicable. Presistence and effect No further relevant information available. 13 Disposal considerations Recommended of classifies of notice relevant information available. 14 Transport information Doff MIOS, (ATA UN1873 Doff Adverse stepsing anne Const Adverse stepsing available. Const Adverse stepsing available. Cons	Sensitization: No sensitizing effects known.	
Specific target organ system toxifup - repeated exposure: No effects known.         Application hazard: No effects known.         Specific target organ system toxifup - repeated exposure: No effects known.         Additional toxicological information         Teclological information         Toxifup         Against toxicological information explaible.         Additional toxicological information explaible.         Mobility in sol by the further relevant information explaible.         Rescue to toxifup.         Mobility in sol by the further relevant information explaible.         Rescue toxifup.         Mobility in sol by the further relevant information explaible.         General Interse:	<b>Carcinogenicity:</b> No classification data on carcinogenic properties of this mat	terial is available from the EPA, IARC, NTP, OSHA or ACGIH.
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♦       ↓         Class       5.1 (OC1) Oxidizing substances         Label       5.1+8         ♦       ↓         ♦       ↓         ↓       ↓         Class       5.1 Oxidizing substances         Label       5.1/8         ↓       ↓ </td <td>Label</td> <td>5.1, 8</td>	Label	5.1, 8
Label       5.1+8       5         IMDG       Image: Second		
Label       5.1+8       5         IMDG       Image: Second		
Label       5.1+8       5         IMDG       Image: Second	Vace V	5.1 (OC1) Oxidizing substances
Image: Class Label S.1/8       5.1 Oxidizing substances 5.1/8         Image: Class Label S.1 Oxidizing substances 5.1 (8)       5.1 Oxidizing substances 5.1 (8)         Packing group DOT, ADR, IMDG, IATA I       I         Environmental hazards: Not applicable.       Not applicable.         Special precautions for user EMS Number: F-A, S-Q Acids Stowage Category Label Label Stowage Category Label	Label	
Label       5.1/8         IATA       5.1/8         IATA       I         Class       5.1 Oxidizing substances         Label       5.1 (8)         Packing group       I         DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		
Label       5.1/8         IATA       5.1/8         IATA       I         Class       5.1 Oxidizing substances         Label       5.1 (8)         Packing group       I         DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		
Label       5.1/8         IATA       5.1/8         IATA       I         Class       5.1 Oxidizing substances         Label       5.1 (8)         Packing group       I         DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		E 1 Ovidizing substances
Class Label       5.1 Oxidizing substances 5.1 (8)         Packing group DOT, ADR, IMDG, IATA       I         Packing group DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user EMS Number:       Warning: Oxidizing substances F-A,S-Q         Segregation groups Stowage Category       Acids D         Stowage Category       D         Stowage Category       SG16 Stow "separated from" class 4.1         (Contd. on page	Label	
Label       5.1 (8)         Packing group DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page	IATA	
Label       5.1 (8)         Packing group DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		
Label       5.1 (8)         Packing group DOT, ADR, IMDG, IATA       I         Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		E 1 Ovidining substances
Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page	Label	
Environmental hazards:       Not applicable.         Special precautions for user       Warning: Oxidizing substances         EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page	Packing group DOT. ADR. IMDG. IATA	I
EMS Number:       F-A,S-Q         Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		Not applicable.
Segregation groups       Acids         Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page		
Stowage Category       D         Segregation Code       SG16 Stow "separated from" class 4.1         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       (Contd. on page	Segregation groups	Acids
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable. (Contd. on page	Stowage Category	D
(Contd. on page		
		(Contd. on page USA



	Version 1
Product name: Perchloric acid, 70%	
	(Contd. of page 4)
Transport/Additional information:	
DOT Quantity limitations	On passenger aircraft/rail: Forbidden
	On cargo aircraft only: 2.5 L
Marine Pollutant (DOT): IMDG	No
Limited quantities (LQ)	0
Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
UN "Model Regulation":	UN 1873 PERCHLORIC ACID, 5.1 (8), I
15 Regulatory information	
Safety, health and environmental regulations/legislation spe GHS label elements The product is classified and labeled in acc Hazard pictograms	ecific for the substance or mixture cordance with 29 CFR 1910 (OSHA HCS)
GHS03 GHS05	
P405 Store locked up. P501 Dispose of contents/container in accordance National regulations All components of this product are listed in the U.S. Environmen All components of this product are listed on the Canadian Dome SARA Section 313 (specific toxic chemical listings) Substant California Proposition 65 Prop 65 - Chemicals known to cause cancer Substance is noi Prop 65 - Developmental toxicity, Substance is not listed. Prop 65 - Developmental toxicity, male Substance is not listed. Prop 65 - Developmental toxicity, male Substance is not listed. Information about limitation of use: For use only by technicall Other regulations.	ontaminated clothing. Rinse skin with water/shower. veral minutes. Remove contact lenses, if present and easy to do. Continue rinsing. with local/regional/national/international regulations. natal Protection Agency Toxic Substances Control Act Chemical substance Inventory. estic Substances List (DSL). ice is not listed. It listed. ted. d. ly qualified individuals. REACH Regulations (EC) No. 1907/2006. Substance is not listed. REACH Regulations (EC) No. 1907/2006. Substance is not listed.
	other information gathered by them, and should make independent judgement of suitability of this ety of employees. This information is furnished without warranty, and any use of the product not in any other product or process, is the responsibility of the user.
Department issuing SDS: Global Marketing Department Date of preparation/Revision: Print date, revision date and ver Abbreviations and acronyms:	

NTP: National Toxicology Program (USA) JARC: International Agency for Research on Cancer EPA: Environmental Protection Agency (USA) Ox. Liq. 1: Oxidizing liquids – Category 1 Skin Corr. 1A: Skin corrosion/irritation – Category 1A

USA