

PAO
SAFETY DATA SHEET

Revision History

Part Number	Revision	Date	Owner	Description of Change
73-00825-001	A	July 17, 2020	A. Wert	Added Supplemental Document
73-00825-001	B	Feb. 14, 2025	G. Patel	Content updated to EU 2020/878

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2020/878

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/ MIXTURE AND OF THE COMPANY/ UNDERTAKING

Product Name: ATI PAO-4

Preparation Date: August 20, 2015

Revision Date: Feb. 14, 2025

Recommended Use: Particle filter testing

Supplier: Air Techniques International UK
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2. HAZARD IDENTIFICATION

GHS Classification: Aspiration Hazard: Category 1. H304 – May be fatal if swallowed and enters airways.

GHS Labeling:

Symbol:



Signal Word: Danger

Precautionary Statements:

P101: If medical advice is needed, have product container or label at hand.

P102: Keep out of reach of children

P103: Read label before use.

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER OR doctor/physician

P331: Do NOT induce vomiting

P405: Store locked up

P501: Dispose of contents and container in accordance with local regulations

Other Hazards Not Classified: No significant hazards

US OSHA/HCS Status: Hazardous under OSHA Hazard Communication Standard Revised in 2024

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Identifiers	Concentration, Wt. %
Dec-1-ene, trimers hydrogenated	CAS#: 157707-86-3 EC: 500-393-3	100%

4. FIRST AID

Inhalation: If inhaled, move to fresh air. If victim has stopped breathing give artificial respiration, preferably, mouth to mouth. Contact a physician immediately.

Eyes: Flush with large amounts of cold water for at least 15 minutes. Do not let victim rub eyes. If irritation develops, contact a physician immediately.

Ingestion: Do not induce vomiting. If victim is conscious and able to swallow, promptly have victim drink water to dilute. Do not give sodium bicarbonate, fruit juices or vinegar. Never give anything by mouth if victim is unconscious or having convulsions. Contact a physician immediately.

Skin: Wash affected area with soap and water. Remove contaminated clothing. Launder contaminated clothing before re-use.

Most important symptoms and hazardous effects: May be fatal if swallowed and enter airways. Do not ingest. If swallowed, contact a physician immediately.

Indication of immediate medical attention and special treatment needed: If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Carbon dioxide, Dry chemical, Foam, Water spray

Specific hazards: Smoke, fumes and incomplete combustion products.

Specific protective equipment and precautions for fire fighters: Use water spray, dry chemical, foam or carbon dioxide. Water may be ineffective but should be used to keep fire exposed containers cool. If a spill or a leak has not ignited, use water spray to disperse the vapors. Water spray may be used to flush spills away from fire.

Perform only those firefighting procedures for which you have been trained. Firefighters should wear self-contained breathing apparatus in the positive pressure mode with a full-face piece where there is a possibility of exposure to smoke, fumes or hazardous decomposition products.

Flammability Properties:

Flash point: 210°C (Closed Cup)

Auto-Ignition Temperature: 324 to 362°C

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions: Do not allow spilled material to enter sewers or streams. If spills are likely to enter any drain, waterway or groundwater, contact the appropriate governmental agency.

Methods and materials for containment: Add dry material to absorb (if large spill, dike to contain). Using recommended protective equipment, pick up bulk of spill and containerize for recovery or disposal. Flush area with water to remove residues.

7. HANDLING AND STORAGE

Precautions for safe handling: Read label for instructions in use of product. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

Conditions for safe storage: Store in closed containers in a cool, dry well-ventilated area. Maintain closure of bungs. Store at temperatures between 5°C and 50°C. Do not reuse container. Avoid container damage while storing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters: No exposure limit value known.

Appropriate engineering controls: Proper protection and controls is dependent upon the potential exposure conditions. No special requirements are needed under ordinary conditions where adequate ventilation is available.

Individual protective measures:

Respiratory protection: Needed when airborne contaminant concentrations are at a level which cannot protect worker health. Then an approved respirator must be used. Selection of the respirator is dependent upon regulatory conditions. For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode.

Eye protection: No eye protection is needed under conditions of normal use. If there is a possibility that the product can be splashed into the eyes, then safety glasses with side shields or chemical goggles are required. Contact lenses should also not be worn if the product could be splashed into the eyes.

Hand protection: No gloves are required for single, short duration exposures. For prolonged or repeated exposures, wear rubber gloves.

Body protection: If product use involves single, short duration exposures, then no additional protective wear for covering the skin is required. For prolonged or repeated exposures to the skin, wear impervious, protective clothing including rubber safety shoes to avoid skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless liquid

Odor: Not available

Odor Threshold: Not available

pH: Not applicable

Melting point/freezing point: -70°C (Pour Point)

Initial boiling point and boiling range: 336 to 529°C

Flash Point (Method): 210°C (Closed Cup)

Evaporation Rate: Not available

Flammability (Solid, Gas): Not applicable

Upper/lower flammability or explosive limits: Not available

Vapor pressure: Not available

Vapor density: Not available

Relative density: 0.8 @ 15.5°C

Partition coefficient n-octanol/water: >10

Autoignition Temperature: 324 to 362°C

Decomposition Temperature: Not available

Viscosity: 17.4 cSt at 40°C

Water Solubility: Insoluble

10. STABILITY AND REACTIVITY

Chemical stability: Stable at normal conditions

Possibility of hazardous reactions: Not expected and hazardous polymerization will not occur

Conditions to avoid: Excessive Heat. High energy sources of ignition.

Incompatible Materials: Strong acids, bases and oxidizing agents.

Hazardous decomposition products: Carbon dioxide and carbon monoxide

11. TOXICOLOGICAL INFORMATION

Oral Toxicity (Rats): LD 50 Oral > 2000 mg/kg

Inhalation Toxicity: Not available

Skin Irritation: Not available

Dermal Toxicity: Not available

Eye Irritation: Not available

Aspiration Toxicity: May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

Skin Sensitization: Not available

Chronic Exposure Target Organ Effects: Not available

Carcinogenicity: This product present at a level of 0.1% or higher is not considered to be carcinogenic under ACGIH, IARC or EC.

12. ECOLOGICAL INFORMATION

Aquatic/terrestrial ecological toxicity:

Toxicity to daphnia: EL50 > 1000 mg/l WAF (similar material) (48 hours)

Toxicity to fish: LL 50 > 1000 mg/l (similar material) (96 hours)

Toxicity to micro-organism: NOEC 2 mg/l (similar material) (28 days)

Toxicity to aquatic plants: NEOLR 1000 mg/l WAF (similar material) (72 hours)

Toxicity to daphnia: NOELR: 125 mg/l WAF (similar material) (21 days)

Mobility: Not available

Persistence and degradability: Not available

13. DISPOSAL CONSIDERATIONS

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Product can be disposed of by burning in an enclosed, controlled burner for fuel value or disposal by supervised incineration. Such burning may be limited by the controlling authority. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at any licensed waste disposal site.

Precaution for disposal: All recovered material should be packaged, labeled, transported and disposed or reclaimed in conformance with Good Engineering Practices. Comply with all applicable governmental regulations. Avoid land filling of liquids. Reclaim where possible.

14. TRANSPORT INFORMATION

Not classified as hazardous for transport (ADR, AND, IMDG, IATA)

15. REGULATORY INFORMATION

EU Regulation (EC) No. 1907/2006 (REACH) Annex II, as amended by Commission Regulation (EU) 2020/878

Annex XIV (List of substances subject to authorization): None of the components are listed.

Substances of very high concern: None of the components are listed.

Annex XVII (Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles): Not applicable

European Inventory: Internationally listed or exempted under CAS# 68037-01-4. Listed in the EU under CAS # 157707-86-3.

16. OTHER INFORMATION

References and Sources: Information contained in this safety data sheet is based on Air Techniques International's owned data and public sources deemed valid or acceptable. The absence of data elements required by ANSI or 2001/58/EC indicates that no data meeting these requirements is available.

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EU SDS Supplemental Document

Use of PAO-4 when Testing Filters

The purpose of this supplemental document is to assist Air Techniques International's customers with safely using ATI-PAO-4 for filtration testing which is a specialized application for the only component present in ATI PAO-4, polyalphaolefin (PAO).

Introduction

ATI-PAO-4 is a polymer that is a liquid that is widely used by the lubricant industry.

This safety data sheet (SDS) is in compliance with the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals. Due to PAO-4's viscosity, the ATI PAO-4 SDS lists the product as an Aspiration Hazard – Category 1. The reason for this classification is that PAO-4 is present at a concentration greater than 10% of the Air Techniques International product and exhibits a kinematic viscosity less than 20.5 cSt (centistokes) at 40° C.

For this reason, the following health hazard pictogram must be shown on the SDS:



However, ***PAO is not an aspiration hazard when aerosolized during in filter testing.*** PAO is widely considered to be a safe material by the lubricant industry. There have been no safety issues including no issues related to aspiration reported by lubricant manufacturers and end users in the nearly 50 years PAO has been used.

Risk to Operator During Filtration Testing

Exposure risk when pouring oil into generator

During filtration testing, the only time that there is worker exposure to liquid ATI-PAO-4 is during the addition to the aerosol generator used in filtration testing. The safety precautions listed in the ATI-PAO-4 SDS Section 8 *Exposure Controls/Personal Protection* must be followed during this phase of the testing to minimize worker exposure.

Exposure risk when oil is aerosolized during filtration testing

ATI PAO-4 is aerosolized during filter testing which means that this product is diluted with air. The result is the formation of a polydisperse sub-micron PAO aerosol. The exposure for an end user, after dilution by the system air flow upstream of the filter is typically between 10 milligrams/cubic meter and 20 milligrams/cubic meter of ATI PAO-4.

A certifier downstream of the filter under test will be exposed to a level of ATI PAO-4 that is typically at maximum, less than 0.1% of the upstream aerosol concentration. This means that the maximum likely exposure downstream is 0.001 milligram/cubic meter of ATI PAO-4.

The average permissible exposure limits over an 8-hour period for mineral oil which is a hydrocarbon that has a similar composition to ATI PAO-4 is 5 milligrams/cubic meter which is 5,000 times higher than the typical exposure found in filtration testing.

Based on these values, a protective mask or other form of personal protective equipment will not be necessary when using PAO-4 in an aerosolized form during filter testing provided the levels remain below 5 milligrams/cubic meter. If the user will be working with ATI PAO-4 for an extended period of time, then please follow guidelines for “Personal Protection” in Section 8 of the SDS.

As an aerosol, ATI PAO-4 is present at a concentration that is significantly below the 10% concentration specified by GHS. The PAO aerosol is not in the liquid form so the viscosity requirement is not relevant. ***For these two reasons, the pictogram for ATI PAO-4 in the European SDS is not applicable to the use of ATI PAO-4 in filter testing.***

This analysis is relevant for filter testing users working with the two most common aerosol generators manufactured by Air Techniques International. These units are the Model ATI 5B/5C/5D thermal generators.

If the permissible exposure limit for mineral oil is updated in the future, these guidelines will change accordingly. Air Techniques International pledges to ensure that the safety of its customers is paramount.

Risk to Individuals in Heating ATI PAO-4 in Aerosol Generator

Proper use of the Model ATI 5B/5C/5D generators prevents the user from coming in contact with heated PAO. In its normal application, an adaptor and hose will be attached to the generator’s nozzle, enabling the aerosol produced to be injected directly into an HVAC duct.

Without the adapter and hose, ATI PAO-4 is heated in a sealed chamber in the aerosol generator and expelled under pressure through a nozzle. As the ATI PAO-4 leaves the nozzle, 7.6 centimeters away from the generator, the very center of the aerosol plume is 105° C, and rapidly cools to ambient temperature.