

Material Safety Data Sheet

Material Name: Avatrel 7584P Photodefinable Polymer/US-Canada-Japan

Document: AVA7584P

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Avatrel 7584P Photodefinable Polymer

Company Identification: Promerus LLC
9921 Brecksville Road
Brecksville, OH 44141-3289
United States of America

Phone Number: 330-328-8186

Emergency Phone Number: 24 HR CHEMTREC U.S. 800-424-9300
24 HR CHEMTREC Int'l 703-527-3887

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
110-43-0	2-Heptanone	50-70
Not Available	Cyclic olefin polymer	30-50
Not Available	Additive 2	1.5-3
Not Available	Additive 1	1.5-3
Not Available	Additive 3	0.01-1

Component Information/Information on Non-Hazardous Components

This product has been evaluated using criteria specified in 29 CFR 1910.1200 (Hazard Communication Standard)

Japan: This Safety Data Sheet has been prepared in compliance with JIS Z7250.

IN US: The cyclic olefin polymer in this product meets the requirements of the TSCA Polymer Exemption.

IN CANADA/JAPAN: THIS MATERIAL IS SOLELY FOR RESEARCH AND DEVELOPMENT USE. It is not known to be on the DSL/NDSL or METI Inventories and cannot be distributed by itself or as part of another product in commerce. Its use is to be by or under the supervision of a technically qualified person. The physical, chemical and toxicological properties of this substance have not been fully determined.

*** Section 3 - Hazards Identification ***

Emergency Overview

Product is a colorless liquid with a fruity odor.

Combustible liquid

This product is irritating to the eyes and skin. This product may cause irritation to the respiratory system. Excessive inhalation of this material causes headache, dizziness, nausea and incoordination. May be harmful if absorbed through the skin. May cause skin sensitization. May be harmful if swallowed. Small amounts of this product, if aspirated into the lungs, may cause mild to severe pulmonary injury. This product is photosensitive.

Target Organs

Eyes, Skin, Central Nervous System, Nerves, Liver, Kidney.

Potential Health Effects: Eyes

This product is irritating to the eyes. Symptoms may include reddening, itching and inflammation.

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Potential Health Effects: Skin

This product is irritating to the skin. Symptoms may include redness, edema, drying, defatting and cracking of the skin. This product may be absorbed through the skin and cause harm. May cause skin sensitization.

Potential Health Effects: Ingestion

Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision. Small amounts of this product, if aspirated into the lungs, may cause mild to severe pulmonary injury.

Potential Health Effects: Inhalation

Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Repeated or prolonged exposures may cause bronchitis and laryngitis. May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Medical Conditions Aggravated by Exposure

Chronic respiratory or skin conditions may temporarily worsen from exposure to this product. Liver and nervous system disorders may be aggravated by exposure to this product.

HMIS Ratings: Health: 2 Fire: 2 Physical Hazard: 0 Pers. Prot.: D

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.

First Aid: Skin

For skin contact, wash immediately with soap and water. If irritation persists, get medical attention. Wash contaminated clothing before reuse. Contaminated leather articles, including shoes, that cannot be decontaminated should be discarded.

First Aid: Ingestion

If the material is swallowed, get immediate medical attention or advice. Do not induce vomiting. Prevent aspiration of material into lungs.

First Aid: Inhalation

If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. If symptoms persist, get medical attention.

First Aid: Notes to Physician

This material, if aspirated into the lungs, may cause chemical pneumonitis. Treat the affected person appropriately.

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

Hot vapor or mists may be susceptible to spontaneous combustion when mixed with air. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes. Therefore, ignition may occur below published ignition temperatures. Use of this product in processes involving elevated-temperatures, vacuum if subject to sudden ingress of air, sudden escape of vapor or mist, etc., must be thoroughly evaluated to assure safe operation. Exposing closed containers to heat may cause excessive pressure resulting in explosive rupture.

Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back.

Hazardous Combustion Products

Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Extinguishing Media

Dry chemical, foam, carbon dioxide. Use water to cool fire-exposed containers and to protect personnel.

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Fire Fighting Equipment/Instructions

Use self-contained breathing apparatus (SCBA) and full bunker turnout gear in a sustained fire. Wear protective clothing ensemble as defined in NFPA 1500 (2002, or as updated).

NFPA Ratings: Health: 2 Fire: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Absorb spill with inert material (e.g., vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Clean-Up Procedures

Combustible liquid. Eliminate all ignition sources. Ventilate the area. If spill is large, be prepared to isolate the hazard area. Deny access to the spill area to persons who are not involved in the cleanup and/or who have not been properly trained in spill management of hazardous/combustible liquids. Absorb spill with inert material. Shovel material into appropriate container for disposal. Put material in suitable, covered, labeled containers. Ventilate the contaminated area.

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid contact with skin and eyes. Avoid prolonged or repeated skin contact with this material. Avoid breathing vapors or mists of this product. Use this product with adequate ventilation. This product is photosensitive. Please handle only under yellow light conditions. Keep away from heat, sparks, flames and direct sunlight. DO NOT cut, puncture or weld on or near this container. Do not apply pressure to this container. Containers should be bonded and grounded during transfer of material. Wash thoroughly after handling.

Storage Procedures

Store in a cool, dry, and well-ventilated area. Store in combustible storage area and away from heat and open flame. Avoid storing containers in direct sunlight as vapors may accumulate in the headspace creating pressure. Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Keep container upright, when not in use, to prevent leakage. Open containers carefully and slowly. Emptied container may contain residual vapors or liquid which may ignite or explode. Do not reuse empty container without commercial cleaning or reconditioning.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

Keep all exposures to a minimum.

B: Component Exposure Limits

2-Heptanone (110-43-0)

ACGIH	50 ppm TWA
OSHA	100 ppm TWA; 465 mg/m ³ TWA
NIOSH	100 ppm TWA; 465 mg/m ³ TWA

Engineering Controls

Ventilation should effectively remove and prevent buildup of any vapor or mist generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear chemical goggles, add face shield (if splashing is possible)

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Personal Protective Equipment: Skin

Use chemical resistant protective clothing

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of aerosols or mists, appropriate NIOSH approved respiratory protection must be provided. Use respiratory protection in accordance with your company's respiratory protection program, local regulations or OSHA regulations under 29 CFR 1910.134

Personal Protective Equipment: General

Eye wash fountain and emergency showers are recommended.

*** Section 9 - Physical & Chemical Properties ***

Appearance:	Colorless liquid	Odor:	Fruity
Physical State:	Liquid	pH:	Not available
Vapor Pressure:	2.6 mm Hg @ 20°C (68°F) (2-Heptanone)	Vapor Density:	3.9 (2-Heptanone)
Boiling Point:	149-150°C (300-302°F) (2-Heptanone)	Melting Point:	-35°C (-31°F) (2-Heptanone)
Solubility (H₂O):	4.3 g/L @ 20°C (68°F)	Specific Gravity:	0.815 (2-Heptanone)
Flash Point:	105.8°F (41°C) (2-Heptanone)	Flash Point Method:	Not available
Auto Ignition:	739°F (393°C) (2-Heptanone)	LFL:	1.11% (2-Heptanone)
UFL:	7.9% (2-Heptanone)	Molecular Weight:	114.19 g/mole

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under normal temperatures and pressures.

Conditions to Avoid

Keep away from heat, ignition sources and incompatible materials.

Incompatibility

Strong acids, strong bases and oxidizing agents.

Hazardous Decomposition

Upon decomposition, this product emits peroxides, carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

No toxicity studies have been conducted on this product. As with all chemicals for which test data are limited or do not exist, caution must be exercised through the prudent use of protective equipment and handling procedures to minimize exposure.

2-Heptanone

Route of Exposure

Skin Contact Causes skin irritation.

Skin Absorption May be harmful if absorbed through the skin.

Eye Contact Causes eye irritation.

Inhalation Material is irritating to mucous membranes and upper respiratory tract. Harmful if inhaled.

Ingestion Harmful if swallowed.

Target Organ(s) or System(s)

Central nervous system, eyes, skin, respiratory system, and peripheral nervous system.

Signs and Symptoms of Exposure

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To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Can cause CNS depression.

Toxicity Data

Intraperitoneal, Rat LD50: 800 mg/kg

Oral, Mouse LD50: 730 mg/kg

Intraperitoneal, Mouse LD50: 400 mg/kg

Irritation Data

Skin, Rabbit: 14 mg/24 H (Remarks: Open irritation test)

3-glycidyoxypropyl trimethoxysilane

Toxicity Data

Oral, Rat LD50: 22600 ul/kg

Skin, Rabbit LD50: 3970 ul/kg

Irritation Data

Skin, Rabbit: 500 mg (Remarks: Open irritation test)

Eyes, Rabbit: 100 mg (Remarks: Mild irritation effect)

This product should be handled with the care usual when dealing with chemicals.

B: Component Analysis - LD50/LC50

2-Heptanone (110-43-0)

Test & Species

Oral LD50 Rat

Dermal LD50 Rabbit

Data

1670 mg/kg

12600 µL/kg

Carcinogenicity

A: General Product Information

No information available for the product.

B: Component Carcinogenicity

None of the components in Section 2 are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Chronic Toxicity

No information available for the product.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

No ecotoxicity testing has been conducted on this product.

2-Heptanone (110-43-0)

Physical Properties Affecting Ecotoxicity

BOD after 5 days: 1.77%

Acute Ecotoxicity Tests

Test Type: LC50 Fish

Species: Pimephales promelas (Fathead minnow)

Time: 96 H

Value: 126-137 mg/l

B: Component Analysis

2-Heptanone (110-43-0)

Environmental: If released to soil, calculated soil adsorption coefficients ranging from 44-285 indicate that 2-heptanone may display moderate to high mobility and it has the potential to leach into groundwater. Heptanone has the potential to biodegrade in soil. If released to water, 2-heptanone is expected to rapidly volatilize to the atmosphere. The half-life for volatilization from a model river 1 m deep, flowing at 1 m/sec with a wind speed of 3 m/sec is 8.4 hr.

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Physical If released to the atmosphere, 2-heptanone is expected to undergo a gas-phase reaction with photochemically produced hydroxyl radicals; the estimated half-life for this process is 1.9days

Other 2-Heptanone had a theoretical biological oxygen demand (BOD) of 1.4%, 2.4% and 4.8% after 6, 12 and 24 hr, respectively, when incubated with a activated sludge seed at an initial concentration of 500 ppm. 2-Heptanone underwent a 5 day theoretical BOD of 44%. In a screening study using a sewage seed, 2-heptanone had a 10-day BOD of 0.50 g/g

C: Component Analysis - Ecotoxicity - Aquatic Toxicity

2-Heptanone (110-43-0)

Test & Species	Data	Conditions
96 Hr LC50 fathead minnow	131.0 mg/L	flow-through

Environmental Fate

No ecological testing has been conducted on this product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

If discarded, this product is considered a RCRA ignitable waste, D001. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

Disposal Instructions

Dispose of waste by incineration, in accordance with local regulations and available facilities.
Liquids cannot be disposed of in a landfill.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: n-Amyl methyl ketone
UN/NA #: UN1110 **Hazard Class:** 3 **Packing Group:** III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information: Flash point 41°C

NOTE: For US ground transportation for non-bulk shipment (less than 119 gallons (450L)), this product can be re-classified as Not Regulated.

TDG Information

Shipping Name: n-Amyl methyl ketone
UN/NA #: UN1110 **Hazard Class:** 3 **Packing Group:** III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information: Flash point 41°C

ICAO Information

Shipping Name: n-Amyl methyl ketone
UN #: UN1110 **Hazard Class:** 3 **Packing Group:** III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information: Flash point 41°C

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IATA Information

Shipping Name: n-Amyl methyl ketone
UN #: UN1110 Hazard Class: 3 Packing Group: III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information. Flash point 41°C

ADR Information

Shipping Name: Amyl methyl ketone
UN #: UN1110 Hazard Class: 3 Packing Group: III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information. Flash point 41°C

RID Information

Shipping Name: Amyl methyl ketone
UN #: UN1110 Hazard Class: 3 Packing Group: III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information: Flash point 41°C

IMDG Information

Shipping Name: Amyl methyl ketone
UN #: UN1110 Hazard Class: 3 Packing Group: III
Required Label(s): Flammable liquid
Additional Info.: Additional Shipping Information: Flash point 41°C

*** Section 15 - Regulatory Information ***

Additional Regulatory Information

A: General Product Information

IN US The cyclic olefin polymer in this product meets the requirements of the TSCA Polymer Exemption.

IN CANADA/JAPAN: THIS MATERIAL IS SOLELY FOR RESEARCH AND DEVELOPMENT USE. It is not known to be on the TSCA, DSL/NDL or METI Inventories and cannot be distributed by itself or as part of another product in commerce. Its use is to be by or under the supervision of a technically qualified person. The physical, chemical and toxicological properties of this substance have not been fully determined.

B: Component Analysis - Inventory

Component	CAS #	TSCA	Canada	EU	METI
2-Heptanone	110-43-0	Yes	DSL	EINECS	Yes

C: Japan List of Notifiable Chemical Substances

2-Heptanone (110-43-0)
Present

US Federal Regulations

A: General Product Information

No additional information available

B: U.S. EPA TSCA 12(b) Export Notification

This product contains a chemical or chemicals that require Export Notification.

C: Component Analysis

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4)

SARA 311/312 - Acute Health: Yes Chronic Health: Yes Fire: Yes Pressure: No Reactive: No

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State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
2-Heptanone	110-43-0	Yes	Yes	Yes	Yes	Yes	Yes

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
2-Heptanone	110-43-0	1 %

*** Section 16 - Other Information ***

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to develop appropriate work practice guidelines and employee instructional programs for your operation.

Key/Legend

ACGIH: American Conference of Governmental Industrial Hygienists
A1: Confirmed human carcinogen
A2: Suspected human carcinogen
A3: Animal carcinogen
DSL: Canadian Domestic Substances List
CAS No: Chemical Abstract Service Registry Number
EEC: European Economic Community
IARC: International Agency for Research on Cancer
Group1: Carcinogenic to humans
Group2A: Probably carcinogenic to humans
Group2B: Possibly carcinogenic to humans
Group3: Unclassifiable as a carcinogen to humans
JSOH: Japan Society for Occupational Health
LVE: Low Volume Exemption
METI: Ministry of Environment, Trade, and Industry
MSHA: Mine Safety and Health Administration
NIOSH: National Institute for Occupational Safety and Health
NDSL: Non-Domestic Substances List
NTP: National Toxicology Program
N/A: Not Applicable
N/E: None Established
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
PNOC: Particulates Not Otherwise Classified

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RTK: Right To Know

STEL: Short Term Exposure Limit (15 minute Time Weighted Average)

TLV: Threshold Limit Value

C: Ceiling limit

S: Skin notation refers to the potential significant contribution to the overall exposure by the cutaneous route including mucous membranes and the eyes and by direct skin contact with the substance

WEEL: Workplace Environmental Exposure Level

WHMIS: Canadian Workplace Hazardous Materials Information System

End of Sheet AVA7584P/rev'd 11/7/05