

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

Trade Name (as labeled): ISO RESIN FLOW (Liquid)
Product Identifier (Part/Item Number): 5298

U.N. Number: 1247
U.N. Dangerous Goods Classification: Not applicable

Recommended Use: Self-curing methylacrylate polymer resin for making acrylic denture base

Restrictions on Use: For Professional Use Only

Manufacturer

Name: DENKEN-HIGHDENTAL Co., Ltd.
Address: 130, Ishigohri-cho, Ohyake, Yamashina-ku, Kyoto, JAPAN 607-8187
Telephone Number: +81-75-571-1000

Supplier

Name: Dentsoll, Inc.
Address: 3145 Reys Miller Rd. Suite A, Norcross, GA 30071, USA
Tel: +1-888-793-7477

Emergency Contact Telephone Number: 770-314-5226
Email address: info@snowrockusa.com

2. HAZARD IDENTIFICATION

Hazard Classifications: EC No 1272/2008

Flammable liquid Class 2 H225 Highly flammable liquid and vapour.
Skin Irritation Class 2 H315 Causes skin irritation.
Skin Sensitising Class 1 H317 May cause an allergic skin reaction
Severe eye damages/ eye irritation: Class 2
May cause skin allergic reaction or skin irritation
STOT SE 3 H335 May cause respiratory irritation.

Risk Statements: R36/37/38-Irritating to eyes, respiratory system and skin.



Hazard Pictograms:

Signal Word: danger

Hazard Statements:

- H225 Highly flammable liquid and vapour.
- H317 May cause an allergic skin reaction.
- H315 Causes skin irritation.
- H319 Causes serious eye irritation.
- H334 Symptoms or breathing difficulties if inhaled
- H335 May cause respiratory irritation.
- H336 May cause drowsiness or dizziness
- H361 Suspected of damaging fertility or the unborn child
- H372 Causes damage to organs through prolonged or repeated exposure

Precautionary Statements:

- P201 Obtain special instructions before use.
- P210 Keep away from heat/sparks/open flames/hot surfaces.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion proof electrical/ventilating/lighting/.../equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/fume/gas/mist/vapour/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
- P262 Do not get in eyes, on skin, or on clothing.
- P264 Wash...thoroughly after handling
- P271 Use only outdoors or in a well-ventilated area
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P281 Use personal protective equipment as required.
- P285 In case of inadequate ventilation, wear respiratory protection.
- P303+P361+P353 IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

Response Precautionary Statements

- P302+P352 IF ON SKIN: Wash with soap and water.
- P303+P361+P353 IF ON SKIN: Wash contaminated clothing before reuse. Rinse skin with water/shower.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in position comfortable for breathing.

P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P305+P351+P338 IF IN EYES: Rinse continuously with water for several minutes: Remove contact lenses if present and easy to do. Continue rinsing
 P308+P313 If exposed or concerned: Get medical advice/attention.
 P312 Call a POISON CENTER or doctor/physician if you feel unwell.
 P314 Get medical advice/attention if you feel unwell.
 P321 Specific treatment.
 P332+P313 If skin irritation occurs: Get medical advice/attention.
 P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
 P337+P313 If eye irritation persists: Get medical advice/attention
 P342+P311 If experiencing respiratory symptoms: Call a poison center or doctor/physician.
 P362 Take off contaminated clothing and wash before reuse
 P370+ P378 In case of fire: Use (...) for extinction.

Storage Precautionary Statements

P403+P233 Store in a dry place: Keep container tightly closed
 P403+P235 Store in a dry place. Keep cool.
 P405 Store locked up
 P501 Dispose of contents/containers in accordance with local/regional/national/international regulations.

Other Hazards or Dangers (NFPA)

Health 2
 Fire 3
 Reactivity 2
 Dust generation.
 Particular danger of slipping on leaked/spilled product.

Hazardous Material Identification System (HMIS) Rating

Health= 1/ Flammability=1/ Reactivity=0

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical characterization: Mixtures
Description: contains 93.25% or more methylmethacrylate

Substance Name	methylmethacrylate
Binomial Name	Methyl methacrylate
CAS Number	80-62-6
Content (%)	93.25%

Dangerous component		
CAS: 94-36-0	dibenzoyl peroxide	≤ 1.0%
EINECS: 202-327-6	Xi R36; Xi R43; E R2	
6	Org. Perox. B, H241; Eye Irritant 2, H319; Skin Sens. 1, H317	

4. FIRST AID MEASURES

Routes of Exposure	First Aid Instructions
Eye	If eye irritation persists, get medical advice/attention. If contacted with eye, rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
Skin	If slight contact with skin, prevent the area of contamination from spreading. Seek emergency medical care. If contacted with hot substance, in order to abate heat, submerge the affected area in a large pool of cold water or wash. If come in contact with the substance, wash skin and eyes in a running water for 20 minutes. Get rid of contaminated clothes and shoes, and quarantine the contaminated area. Take off contaminated clothes, and wash the clothes before using them again. If skin irritation or erythema occurs, get medical advice/attention.
Inhalation	If exposed to a large amount of dusts or fumes, clean with clean air. Remove victim to an area with fresh air. If there are other symptoms or coughs, get medical attention. If breathing is difficult, supply oxygen. If the person does not breathe, perform cardio pulmonary resuscitation. Get medical attention if symptoms persist.
Ingestion	Get emergency medical treatment.
Note to Physicians	Inform the medical personals regarding the subject substance, and instruct them to take necessary safety measures.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:	When trying to extinguish fire related with this substance, use alcohol resistant foam, CO ₂ , or spray water. If extinguishing by smothering, use dry sand or soils.
Specific Hazards Arising from the Chemical:	If heated, the container may explode. It may be harmful to inhale the substance. It may be ignited with heat, spark, or flame. Highly flammable liquid and vapor. Highly Flammable: It may easily ignite by heat, spark, or flames. If released or leaked, there is a danger of fire/explosion. There is a danger of vapor explosion inside, outside, or sewage. Its vapor may react with air to form an explosive mixture. Its vapor may reach back to the source of ignition and cause flash back. Its vapor may get transferred to the source of ignition, and may burn. During the process of burning, through pyrolysis or combustion, it may generate very hazardous gas. If inhaled or absorbed through skin, it might be toxic.
Precautions for	If leaked, it may cause contamination.

Fire Fighters:	<p>Rescuers must wear appropriate protective gears.</p> <p>In order to get rid of the fire fighting water, dig a ditch. Make sure that the substance does not get released.</p> <p>If not dangerous, remove the container from the area of fire.</p> <p>When trying to extinguish fire, make sure to keep a safe distance and evacuate from the area.</p> <p>If it is a large fire started by a tanker, use droid fire extinguishing equipment. If not available, leave the fire to burn.</p> <p>If contacted, it may cause skin or eye burns.</p> <p>If it is a fire started by a tanker, even after the fire is extinguished, cool the container with a large amount of water.</p> <p>In the event of a large fire by a tanker, if a pressure relief valve makes a high-pitched sound or the tanker's color changes, leave the area immediately.</p> <p>In the event of a large fire by a tanker, evacuate to a safe area if the tanker is in flames.</p>
Fire Fighting Procedures:	<p>If it is a fire started by a tanker, extinguish from a maximum distance, or use un-manned extinguishing equipments.</p> <p>If it is a fire started by a tanker, step away from the tanker that is burning in flames.</p>

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	<p>Do not touch or step on the leaked substance.</p> <p>Remove all sources of ignition.</p> <p>When using this substance, make sure all equipment are grounded.</p> <p>Avoid inhaling dusts, fumes, gas, mists, steams(...) sprays.</p> <p>If spilled, immediately wipe them off, and follow the precautionary statements.</p> <p>In order to decrease the chance of vapor formation, vapor suppressing foams may be used.</p> <p>If not dangerous, stop the leak.</p> <p>Do not handle or touch broken containers or leaks without wearing appropriate safety gears.</p> <p>Avoid contact with skin, eyes, or clothing.</p> <p>Prevent the diffusion by covering with a plastic sheet.</p> <p>Be mindful of substances and conditions that should be avoided.</p>
Environmental precautions	<p>Leaking may cause contamination.</p> <p>Prevent the substance from flowing into waterway, sewage, basement, or an enclosed area. Do not allow to flow into lakes, streams, ponds, groundwater or soil. Do not release to the environment. Report releases as required by local, state, and national authorities.</p>
Methods and material for containment and cleaning up:	<p>Collect any leaks. If a large amount of the substance is leaked, make a pond away from the leaks. Use inert substances (for example, dried sand or soil) to absorb spills, and place them into a chemical waste container.</p> <p>After absorbing the liquid, wash away the contaminated area with detergent and water.</p>

7. HANDLING AND STORAGE

Precautions for Safe Handling	<p>Only adequately trained personnel should handle this product.</p> <p>For use in dentistry only. Be careful of high heat.</p> <p>When working with it, be mindful of engineering management and personal safety gears. Avoid inhaling dusts, fumes, gas, mist, steams (...) sprays.</p> <p>Handle it only in a well-ventilated area, or outside area.</p> <p>Keep ignition sources way- Do not smoke. Protect against electrostatic charges.</p> <p>Even after the container is empty, it may still contain residues. Therefore, follow all MSDS/label precautionary statements.</p> <p>Avoid contacts with the skin for an extensive period of time, or for a continuous period of time. After handling, wash hands thoroughly. Use with care when handling/storing. Be mindful of substances and conditions that need</p>
Conditions for Safe Storage	<p>Containers should be tightly sealed and stored in a well ventilated area. It should be stored in a cool, dry place. Be mindful of substances and conditions that need to be avoided. Store only in the original receptacle. Store away from strong oxidizing agents. Keep container tightly sealed. Store receptacle in a well ventilated area.</p>

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

The Chemical's Exposure Limits and Biological Exposure Limits	<p>Domestic Regulations- TWA- 50ppm 205mg/ m³ STEL-100ppm 410mg/m³</p> <p>ACGIH Regulations (2005)- TLV-TWA 500 ppm, 500mg/ m³, TLV-STEL 100ppm, 410mg/ m³</p> <p>Biological Exposure standards- No further relevant information available</p>
Ingredients with limit values that require monitoring at the workplace	<p>94-36-0 dibenzoyl peroxide</p> <p>Exposure limit for Long-term value: 5mg/m³</p> <p>80-62-6 methyl methacrylate</p> <p>Exposure limits for Short-term value: 416mg/ m³, 100 ppm</p> <p>Exposure limits for Long-term value: 208/ m³, 50 ppm</p>
Appropriate Engineering Controls	<p>Use ventilation that is adequate to keep employee exposure to airborne concentrations below exposure limits. The facility where this substance is stored or used must be equipped with washing facility and safety shower facility.</p>
Individual Protection Measures (PPE)	<p>Respiratory Protection: Wear a mask that has been certified by Korea Occupational Safety and Health Agency to be appropriate for the chemical characteristics.</p> <p>Eye Protection: chemical safety glasses with side shields or chemical goggles</p> <p>Hand Protection: protective gloves</p> <p>Body Protection: Information not available</p>

9. PHYSICAL AND CHEMICAL PROPERTIES

a. Appearance Characteristics Color	Fluid Colorless
b. Odor	99. HANDLING AND STORAGE Pungent Dust
c. Odor Threshold	0.21 ppm
d. pH	Not available

e. Melting/freezing point	-48°C
f. Initial boiling point and range:	105°C
g. Flash point (solid, gas)	10°C (O.C.)
h. Evaporation speed	3.1
i. Explosive limits	12.5/1.7%
j. Vapor pressure	3.9 kpa (20°C)
k. Solubility	1.6g/100ml (20°C)
l. Vapor density	3.5
m. Specific gravity	1.25
n. Partition coefficient: n-octanol/water:	1.38
o. Auto-ignition temperature	421°C
p. Decomposition temperature	240°C/464°F
q. Flammability	0.35 cP (25°C)
r. Molecular Weight	100.1

10. STABILITY AND REACTIVITY

Chemical Stability and Possibility of Hazardous Reactions:	Highly flammable liquid and vapor. May react strongly through polymerization to start an explosion or fire. May form explosive mixture at the ignition point or higher temperature. If heated, the container may explode. Highly flammable: can easily ignite with heat, spark, or flame. Leaked substances pose the danger of fire/explosion. Its vapors may explode outside, inside, or sewage. If inhaled or absorbed through skin, it may be toxic. In the event of fire, it may generate irritating, corrosive, and poisonous gas. Forms explosive gas mixture with air. Its vapor can reach back to the source of ignition and can flash back. Reacts with strong oxidizing agents, strong acids. Exothermic polymerization.
Conditions to Avoid:	Keep away from heat, spark, flame or ignition sources.
Incompatible materials:	Avoid combustible materials, reductants. Avoid strong oxidizing agents.
Hazardous Decomposition Products:	When it is burning, it may generate irritating, corrosive, poisonous gas through pyrolysis or combustion. Corrosive/poisonous fumes. When burned, it generates methacrylate monomer and oxides of carbon.

11. TOXICOLOGICAL INFORMATION

Information regarding high probability of exposure	It may irritate, change blood pressure levels, cause difficulty breathing, cause headaches, cause drowsiness, cause dizziness, affect nervous system, or cause unconsciousness. It may cause irritation, allergic reaction, nausea, vomit, drowsiness, dizziness, cause loss of control, affect kidneys and liver.
Information on toxicological effects LD/LD50 80-62-6 methyl methacrylate	

Acute toxicity oral	LD50 7900 mg/kg (rat)
Acute toxicity skin	LD50 5000mg/kg Rabbit
Acute toxicity respiratory	LD50 7093 ppm 4hr Rat
Acute toxicity epidural injection	LD50 > 7500mg/ kg (white rat)
Acute toxicity abdominal injection	LD50 > 1328mg/kg (white rat)
Acute toxicity respiratory	LC50 > 3750ppm rat
Acute toxicity epidural injection	LD50 > 6300mg/kg rat
Acute toxicity abdominal injection	LD50 > 1000mg/kg rat
Acute toxicity respiratory	LDLo > 13g/ m ³
Acute toxicity respiratory	LDLo > 6550mg/kg
Acute toxicity respiratory	LD50 > 6300mg/kg guinea pig
Acute toxicity respiratory	LD50 > 7872mg/kg white rat
Skin corrosiveness or irritation	It causes skin irritation. Irritant to skin and mucous membranes. The result of rabbit skin irritation test reports that it causes a middle level irritation.
Severe damages to eyes or irritation	It causes irritation to eyes.
Respiratory Hyper-sensitivity	It reports respiratory sensitivity.
Skin Hyper-sensitivity	It reports skin hyper sensitivity.
Carcinogenic according to Occupational Safety and Health Acts	Not available
Carcinogenic according to the Dept. of Labor Law	Not available
IARC	Group 3
OSHA	Not available
ACGIH	A4
NTP	Not available
EU CLP	Not available
Germ Cell Mutagenicity	Negative- germ cell in vivo transformation test
Reproduction Toxicity	There is evidence that the amount of the substance that may cause mother rat to be poisoned (expire or loss of weight) may cause its infant to be poisoned as well.
Specific Target Organ Toxicity (single exposure)	Causes irritation in respiratory system. It may cause listlessness, fever, dizziness, nausea, headache, and drowsiness.
Specific Target Organ Toxicity (multiple exposures)	It has been reported to cause rhinitis, laryngitis, dysautonomia, neurasthenia, headache, dizziness, erethism, lack of concentration, and hypomnesia.
Toxicity if Taken	Not available

12. ECOLOGICAL INFORMATION

Ecological Toxicity: Aquatic/Crustacean/Fowl	Aquatic – LC50 191mg/l 96hrs.
Persistence and Degradability	Not data available
Bio-accumulative Potential	BCF 4.295 94.3%
Mobility in Soil	No data available
Other Adverse Effects	No data available

13. DISPOSAL CONSIDERATIONS

Disposal Method: Dispose the contents and its container in accordance with the disposal rules and regulations.

Precautions for Disposing: Dispose the contents in accordance with the disposal rules and regulations.

14. TRANSPORT INFORMATION

U.N. Identification Number	1247
U.N. Proper Shipping Name	Methyl methacrylate, monomer, stabilized
Transport Hazard Class	Class 3
Packing Group	2
Environmental Hazards	Not applicable
Marine Pollutant	Not applicable
Special Precautions for User (Fire or Release)	In the event of fire: F-E In the event of leak: S-D

15. REGULATORY INFORMATION

- A. Korean Industrial Safety and Health Act: exposure limit defined substance
- B. Toxic Chemicals Control Act: Not enough information
- C. Safety Control of Dangerous Substance Act: Category 4, Class 1 petroleum based (insoluble liquid) 2007
- D. Waste Management Rules and Regulations: No information
- E. U.S. Regulations under CLERCLA: 453.599kg 1000lb
- F. E.U. Classification Information: F; R11 Xi; R37/38R43
- G. E.U. Classification Information (Danger Word): R11, R37/38, R43
- H. E.U. Classification Information (Safety Word): S2, S24, S37, S46

16. OTHER INFORMATION

The information provided on this MSDS is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally binding contractual relationship.

Other reference materials:

IUCLID Chemical Data Sheet, EC-ECB

ECB-ESIS (European Chemical Substance Information System) (<http://ecb.jrc.it/esis>)

The Chemical Database, The Department of Chemistry at the University of Akron
(<http://ull.chemistry.uakron.edu/erd>)

TOXNET, U.S. National Library of Medicine (<http://toxnet.nlm.nih.gov>)

Corporate Solution from Thomson Micromedex (<http://csi.micromedex.com>)
International Chemical Safety Cards (ICSC) (<http://www.nihs.go.jp/icsc>)
ECOTOX Database, EPA (<http://cfpub.epa.gov/ecotox>)

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Other information: not available.