Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
DENTSPLY TRIAD VLC BONDING AGENT

PROPER SHIPPING NAME
METHYL METHACRYLATE MONOMER, STABILIZED

PRODUCT USE
Dental bonding agent.

SUPPLIER
Company: DENTSPLY (AUSTRALIA) PTY LTD
Address:
11- 21 Gilby Road
Mount Waverley
VIC 3149
AUSTRALIA
Telephone: 1300 55 29 29
Emergency Tel: 1300 55 29 29 (Hours of operation:
Monday - Friday 9:00 am - 5:00 pm EST; General
information only)
Fax: +61 3 9538 8260

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

POISONS SCHEDULE
None

RISK
- Highly flammable.
- Harmful if swallowed.
- Irritating to eyes respiratory system and skin.
- May cause SENSITISATION by skin contact.
- Harmful to aquatic organisms may cause long-term adverse effects in the aquatic environment.
- Vapours may cause drowsiness and dizziness.

SAFETY
- Keep away from sources of ignition. No smoking.
- Do not breathe gas/fumes/vapour/spray.
- Avoid contact with eyes.
- Wear suitable protective clothing.
- Use only in well ventilated areas.
- Keep container in a well ventilated place.
- Do not empty into drains.
- To clean the floor and all objects contaminated by this material use water and detergent.
- Keep container tightly closed.
- Keep away from food drink and animal feeding stuffs.
- In case of contact with eyes rinse with plenty of water and contact Doctor or Poisons Information Centre.
- If swallowed IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).
- This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl methacrylate</td>
<td>80-62-6</td>
<td>60</td>
</tr>
<tr>
<td>tetrahydrofurfuryl methacrylate</td>
<td>2455-24-5</td>
<td>30</td>
</tr>
<tr>
<td>hexanediol dimethacrylate</td>
<td>6666-59-3</td>
<td>10</td>
</tr>
</tbody>
</table>
Section 4 - FIRST AID MEASURES

SWALLOWED
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

EYE
- If this product comes in contact with the eyes:
  - Immediately hold eyelids apart and flush the eye continuously with running water.
  - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN
- If skin contact occurs:
  - Immediately remove all contaminated clothing, including footwear.
  - Flush skin and hair with running water (and soap if available).

INHALED
- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN
- Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
- Foam.
- Dry chemical powder.

FIRE FIGHTING
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.

FIRE/EXPLOSION HAZARD
- Hot organic vapours or mist are capable of sudden spontaneous combustion when mixed with air even at temperatures below their published autoignition temperatures.
- The temperature of ignition decreases with increasing vapour volume and vapour/air contact times and is influenced by pressure change.
- Liquid and vapour are highly flammable.
- Severe fire hazard when exposed to heat, flame and/or oxidisers.
  - Combustion products include: carbon dioxide (CO2), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.

FIRE INCOMPATIBILITY
- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

HAZCHEM: 3YE

Personal Protective Equipment
Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
- Remove all ignition sources.
- Clean up all spills immediately.

MAJOR SPILLS
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
- Most acrylic monomers have low viscosity therefore pouring, material transfer and processing of these materials do not necessitate heating.
- Viscous monomers may require heating to facilitate handling. To facilitate product transfer from original containers, product must be heated to no more than 60 deg. C. (140 F.), for not more than 24 hours.
- Avoid all personal contact, including inhalation.

continued...
- Wear protective clothing when risk of exposure occurs.
- DO NOT allow clothing wet with material to stay in contact with skin.

**SUITE CONTAINER**
- Packing as supplied by manufacturer.
- Plastic containers may only be used if approved for flammable liquid.
- For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C).

**STORAGE INCOMPATIBILITY**
- Contamination with polymerisation catalysts - peroxides, persulfates, oxidising agents - also strong acids, strong alkalies, will cause polymerisation with exotherm - generation of heat.
- Polymerisation of large quantities may be violent - even explosive.
- Avoid storage with reducing agents.

**STORAGE REQUIREMENTS**
- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.

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### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE CONTROLS**

<table>
<thead>
<tr>
<th>Source</th>
<th>Material</th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
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<tbody>
<tr>
<td>Australia Exposure Standards</td>
<td>methyl methacrylate</td>
<td>50</td>
<td>208</td>
<td>100</td>
<td>416</td>
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<tr>
<td></td>
<td>(Methyl methacrylate)</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The following materials had no OELs on our records:
- tetrahydrofurfuryl methacrylate: CAS:2455-24-5
- hexanediol dimethacrylate: CAS:6606-59-3

**PERSONAL PROTECTION**

**RESPIRATOR**
Type ANO-P Filter of sufficient capacity

**EYE**
- Safety glasses with side shields
- Chemical goggles.

**HAND/FEET**
- Wear chemical protective gloves, eg. PVC.
- Wear safety footware or safety gumboots, eg. Rubber.

**NOTE:**
- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

**OTHER**
- Overalls.
- PVC Apron.

**ENGINEERING CONTROLS**
- For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion-resistant.

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### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE**
Clear yellow flammable liquid; partly mixes with water.

**PHYSICAL PROPERTIES**
- Liquid.
- Molecular Weight: Not Applicable
- Melting Range (°C): -48
- Solubility in water (g/L): 1.5%
- pH (1% solution): Not Available
- Volatile Component (%vol): 20
- Relative Vapour Density (air=1): >1
- Lower Explosive Limit (%): 2.1
- Autoignition Temp (°C): 26
- Boiling Range (°C): 100
- Specific Gravity (water=1): 1.08
- pH (as supplied): Not Available
- Vapour Pressure (kPa): 49
- Evaporation Rate: 3.1
- Flash Point (°C): 16 Seta Closed Cup
- Upper Explosive Limit (%): 12.5
- Decomposition Temp (°C): Not Available

continued...
Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY
- Presence of incompatible materials.
- Product is considered stable. For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

METHYL METHACRYLATE:
- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY
- Oral (rat) LD50: 7872 mg/kg
- Inhalation (human) TCLo: 125 ppm
- Dermal (rabbit) LD50: >5000 mg/kg
- Inhalation (rat) LC50: 3750 ppm *
- Dermal (rabbit) LD50: 35500 mg/kg *

IRRITATION
- Skin (rabbit): 10000 mg/kg (open)
- Eye (rabbit): 150 mg

CHRONIC HEALTH EFFECTS
- May cause SENSITISATION by skin contact.

TOXICITY AND IRRITATION
- Not available. Refer to individual constituents.

METHYL METHACRYLATE:
- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TETRAHYDROFURFURYL METHACRYLATE:
- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

DENTAXEDIOI DIMETHACRYLATE:
- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.

Where no "official" classification for acrylates and methacrylates exists, there has been cautious attempts to create classifications in the absence of contrary evidence. For example

Monakly or monoacylates of acrylic acids should be classified as R36/37/38 and R51/53

No significant acute toxicological data identified in literature search.

continued...
Based on the available oncogenicity data and without a better understanding of the carcinogenic mechanism the Health and Environmental Review Division (HERD), Office of Toxic Substances (OTS), of the US EPA previously concluded that all chemicals that contain the acrylate or methacrylate moiety (CH2=CHCOO or CH2=C(CH3)COO) should be considered to be a carcinogenic hazard unless shown otherwise by adequate testing. This position has now been revised and acrylates and methacrylates are no longer de facto carcinogens.

### Section 12 - ECOLOGICAL INFORMATION

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. This material and its container must be disposed of as hazardous waste.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Ecotoxicity</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
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<td>No data</td>
<td>Limited quantities: 1 L</td>
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<td>methyl methacrylate</td>
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<tr>
<td>tetrahydrofurfuryl methacrylate</td>
<td>Toxic</td>
<td>No data</td>
<td>No data</td>
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<tr>
<td>hexanediol dimethacrylate</td>
<td>Toxic</td>
<td>No data</td>
<td>No data</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Section 13 - DISPOSAL CONSIDERATIONS

- Consult manufacturer for recycling options and recycle where possible.
- Consult State Land Waste Management Authority for disposal.

### Section 14 - TRANSPORTATION INFORMATION

Labels Required: FLAMMABLE LIQUID
HAZCHEM: 3YE (ADG7)

**ADG7:**

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<th>Class or division:</th>
<th>3</th>
<th>Subsidiary risk:</th>
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<tr>
<td>UN No.:</td>
<td>1247</td>
<td>UN packing group:</td>
<td>II</td>
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<tr>
<td>Special provisions:</td>
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<td>Packing Instructions:</td>
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<tr>
<td>Notes:</td>
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<td>Portable tanks and bulk containers:</td>
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</table>

**Land Transport UNDG:**

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<th>Class or division:</th>
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<th>Subsidiary risk:</th>
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<tr>
<td>UN No.:</td>
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<td>UN packing group:</td>
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**Air Transport IATA:**

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<td>UN/ID Number:</td>
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<td>Packing Group:</td>
<td>II</td>
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**Maritime Transport IMDG:**

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<td>EMS Number:</td>
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<td>Limited Quantities:</td>
<td>1 L</td>
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Shipping Name: METHYL METHACRYLATE MONOMER, STABILIZED

continued...
Section 14 - TRANSPORTATION INFORMATION

POISONS SCHEDULE: None

REGULATIONS
Regulations for ingredients

methyl methacrylate (CAS: 80-62-6) is found on the following regulatory lists;

tetrahydrofurfuryl methacrylate (CAS: 2455-24-5) is found on the following regulatory lists;
"Australia Inventory of Chemical Substances (AICS)"

hexanediol dimethacrylate (CAS: 6606-59-3) is found on the following regulatory lists;
"Australia Inventory of Chemical Substances (AICS)"

No data for Dentsply Triad VLC Bonding Agent (CW: 4613-10)

Section 16 - OTHER INFORMATION

Denmark Advisory list for selfclassification of dangerous substances

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS</th>
<th>Suggested codes</th>
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<tbody>
<tr>
<td>tetrahydrofurfuryl methacrylate</td>
<td>2455-24-5</td>
<td>Xn; R22 R43</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>R52/53</td>
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Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references. A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

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This is the end of the MSDS.