

Triad Bonding Agent

Material no.		Version	3.1 / GB
Specification	144036	Revision date	17.02.2005
VA-Nr		Print Date	22.06.2009
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1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**Product information**

Trade name	:	Triad Bonding Agent
Company	:	DeguDent GmbH Postfach 1364 D-63403 Hanau
Telephone	:	+49 (0)6181/59-5767
Telefax	:	+49 (0)6181/59-5879
Emergency telephone number	:	+49 (0)180 / 23 24-555
Use of the Substance / Preparation	:	For dental use only.

2. COMPOSITION/INFORMATION ON INGREDIENTS**Information on ingredients / Hazardous components**

• methyl methacrylate	30% - 70%	
CAS-No.	80-62-6	EC-No. 201-297-1
	F; R11	
	Xi; R37/38	
	R43	
• tetrahydrofurfuryl methacrylate	20% - 40%	
CAS-No.	2455-24-5	EC-No. 219-529-5
	Xi	
	R36/37/38	
• 1,6-hexanediol dimethacrylate	2.5% - 25%	
CAS-No.	6606-59-3	EC-No. 229-551-7
	Xi, N	
	R36/37/38, R51/53	

See chapter 16 for text of risk phrases

3. HAZARDS IDENTIFICATION

Highly flammable.
Irritant
Irritating to respiratory system and skin.
May cause sensitization by skin contact.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
When heated, formation of explosive vapour/air mixtures.
Danger of bursting of closed systems to vigorous exothermic polymerization. Avoid uncontrolled polymerization.

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4. FIRST AID MEASURES**General advice**

Take off all contaminated clothing immediately.

Inhalation

Take affected persons out into the fresh air.
Obtain medical attention.

Skin contact

Wash off immediately with soap and plenty of water.
Obtain medical attention.

Eye contact

With eye held open, thoroughly rinse immediately with plenty of water for at least 5 minutes.
Consult an ophthalmologist.

Ingestion

Do not induce vomiting.
Have the mouth rinsed with water.
Have patient drink plenty of water in small sips.
Obtain medical attention.

Notes to physician

Specific therapy/antidote treatment: none known
If required, therapy of irritative effect.
If substance has been swallowed:
Allergic reactions of the skin are possible.
Treatment of allergic reaction if necessary.
Early endoscopy in order to assess mucosa lesions in the oesophagus and stomach which may appear. If necessary, suck away leftover substance.

5. FIRE-FIGHTING MEASURES**Suitable extinguishing media**

mist, carbon dioxide (CO₂), quenching foam - polar

Extinguishing media which must not be used for safety reasons

high volume water jet

Specific hazards during fire fighting

In case of combustion or decomposition of the product, the fumes produced lead to irritations or inflammations of the respiratory tract.

When heated, formation of explosive vapour/air mixtures.

Special protective equipment for fire-fighters

In the case of fire, wear respiratory protective equipment independent of surrounding air and chemical protective suit.

Further information

In case of fire cool containers or take them to a safe place.
Use water spray to cool unopened containers.

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6. ACCIDENTAL RELEASE MEASURES**Personal precautions**

Keep unauthorised persons away.
Wear personal protective equipment.
Avoid coming into contact with the following substance/substance classes: Product.

Environmental precautions

Prevent substance from entering soil, natural bodies of water and sewer systems.
Avoid penetration into drainage system or in rooms situated at a lower level because of danger of explosion.

Methods for cleaning up

Remove all sources of ignition.
Absorb with liquid-binding material (e.g. inert absorbent sand universal binder).
Pick up mechanically with a suitable device and collect in a suitable container.

Additional advice

Ensure explosion proofness.
Dispose of contaminated material as a waste in a correct manner.

7. HANDLING AND STORAGE**Handling****Safe handling advice**

Always close container tightly after removal of product.
Avoid light effect heat sun rays.
Vapours are heavier than air.
Only fill up to 90 % of the container as air is required to stabilize.

Advice on protection against fire and explosion

Product is flammable.
product is highly flammable.
Keep away from sources of ignition - No smoking.
Explosion-proof installations required.
Take precautionary measures against static discharges.

Storage**Requirements for storage areas and containers**

Keep containers tightly closed in a dry, cool and well-ventilated place.
Ensure there is good room ventilation.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Components with workplace control parameters****• methyl methacrylate**

CAS-No.	80-62-6	EC-No.	201-297-1
Control parameters	50 ppm 208 mg/m ³		Time Weighted Average (TWA):(EH40 OES)
Control parameters	100 ppm 416 mg/m ³		Short Term Exposure Limit (STEL):(EH40 OES)

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Engineering measures

Ensure suitable suction/aeration at the work place and with operational machinery.

Personal protective equipment**Respiratory protection**

If workplace exposure limit is exceeded apply Respirator with brown A-type filter.

Hand protection

Wear protective gloves made of the following materials: solvent-resistant material.

Glove material	butyl-rubber
Material thickness	0.5 mm
Break through time	60 min
Method	Source: GESTIS substance database (hazardous substance information system of commercial professional associations)

The suitability for a specific workplace should be discussed with the producers of the protective gloves.

The exact break through time can be obtained from the protective glove producer and this has to be observed.

preventive skin protection

Use barrier cream regularly.

Eye protection

goggles

Skin and body protection

Immediately change moistened and saturated work clothes.

Use suitable skin protective agents before handling product. Cleanse and apply cream to skin after work. Preventive skin protection recommended.

Hygiene measures

No eating, drinking, smoking, or snuffing tobacco at work. Wash face and/or hands before break and end of work.

If the limits at the workplace are exceeded and/or larger amounts are released (leakage, spilling, dust) the indicated respiratory protection should be used.

Avoid contact with skin and eyes.

After contact with skin, wash immediately with plenty of water.

If there is the possibility of skin/eye contact, the indicated hand/eye/body protection should be used.

9. PHYSICAL AND CHEMICAL PROPERTIES**Appearance**

Form	liquid
Colour	colourless
Odour	ester-like

Safety data

Melting point/range	-48.2 °C	
	related to substance:	methyl methacrylate

Boiling point/range	100.3 °C (1013 hPa)	
	Method: DIN 51 751	
	related to substance:	methyl methacrylate

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Flash point	10 °C Method: DIN 51 755 related to substance: methyl methacrylate
Ignition temperature	430 °C Method: DIN 51 794 related to substance: methyl methacrylate
Lower explosion limit	2.1 %(V) related to substance: methyl methacrylate
Upper explosion limit	12.5 %(V) related to substance: methyl methacrylate
Vapour pressure	38.7 hPa (20 °C) related to substance: methyl methacrylate
Density	0.94 g/cm ³ (20 °C) Method: DIN 51757 related to substance: methyl methacrylate
Water solubility	15.9 g/l (20 °C) related to substance: methyl methacrylate
Partition coefficient (n-octanol/water)	POW: 1.38 (measured) (literature value) related to substance: methyl methacrylate
Viscosity, dynamic	0.63 mPa.s (20 °C) Method: Brookfield method related to substance: methyl methacrylate

10. STABILITY AND REACTIVITY

Conditions to avoid	Avoid light effect / sun rays. Protect from heat sources of ignition.
Materials to avoid	Product polymerizes on contact with radical generating substances such as peroxides, azo compounds, heavy metal compounds, solutions.
Hazardous reactions	Danger of bursting of closed systems to vigorous exothermic polymerization. Avoid uncontrolled polymerization.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	LD50 Rat: > 5000 mg/kg Method: OECD Test Guideline 401 literature related to substance: methyl methacrylate
Acute inhalation toxicity	LC50 Rat: 29.8 mg/l / 4 h

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	(literature value) related to substance: methyl methacrylate
Acute dermal toxicity	LD50 Rabbit: > 5000 mg/kg literature related to substance: methyl methacrylate
Skin irritation	Rabbit / 24 h not irritating Method: Draize Test related to substance: methyl methacrylate
Eye irritation	Rabbit not irritating Method: Draize Test related to substance: methyl methacrylate
Sensitization	guinea pig: positive and negative literature related to substance: methyl methacrylate
Repeated dose toxicity	inhalative Rat Testing period: 2 years NOAEL: 25 mg/kg target organ/effect: irritative effects, skin linings literature related to substance: methyl methacrylate
	Oral Rat Testing period: 2 years NOAEL: 2000 mg/kg drinking water analysis no therapy-related results literature related to substance: methyl methacrylate
Gentoxicity in vitro	positive and negative literature related to substance: methyl methacrylate
Gentoxicity in vivo	no evidence of mutagenic effects literature related to substance: methyl methacrylate
Mutagenicity assessment	in vivo: no evidence of mutagenic effects
Carcinogenicity	inhalative Rat related to substance: methyl methacrylate
	Oral Rat related to substance: methyl methacrylate
	inhalative mouse related to substance: methyl methacrylate
	Oral mouse

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related to substance: methyl methacrylate

inhalative dog

related to substance: methyl methacrylate

Oral dog

related to substance: methyl methacrylate

carcinogenicity assessment

no evidence that cancer may be caused, literature.

related to substance: methyl methacrylate

teratogenicity assessment

no evidence of teratogenic properties

related to substance: methyl methacrylate

12. ECOLOGICAL INFORMATION**Elimination information (persistence and degradability)**

Biodegradability

Exposure time: 14 day

Result: 94 % Readily biodegradable.

Method: OECD 301 C

related to substance: methyl methacrylate

Behaviour in environmental compartments**Ecotoxicity effects**

Toxicity to fish

LC50 *Lepomis macrochirus*: 191 mg/l / 96 h
literature

related to substance: methyl methacrylate

Oncorhynchus mykiss: > 79 mg/l / 96 h

Method: OECD 203

literature

related to substance: methyl methacrylate

Toxicity to daphnia

EC50 *Daphnia magna*: 68 mg/l / 48 h

Method: OECD 202

(literature value)

related to substance: methyl methacrylate

EC50 *Daphnia magna*: 49 mg/l / 21 d

Method: OECD 202 part 2

(literature value)

related to substance: methyl methacrylate

Toxicity to algae

EC50 *selenastrum capricornutum*: 170 mg/l / 96 h

Method: OECD 201

literature

related to substance: methyl methacrylate

Toxicity to bacteria

EC0 *Pseudomonas putida*: 100 mg/l

literature

related to substance: methyl methacrylate

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Further information on ecology

Further Information Prevent penetration into soil, stretches of water and drainage systems.

13. DISPOSAL CONSIDERATIONS**Product**

Disposal according to local authority regulations.

Uncleaned packaging

Disposal according to local authority regulations.

14. TRANSPORT INFORMATION**Land transport ADR/RID/GGVSE (Germany)**

Class	3
ADR/RID-Labels	3
UN-No	1247
Packaging group	II
orange warning plate	339 / 1247
Description of the goods (Technical name)	METHYL METHACRYLATE MONOMER, STABILIZED

Sea transport IMDG-Code/GGVSee

Class	3
UN-No	1247
Packaging group	II
EmS	F-E, S-D
Proper technical name (Proper shipping name)	METHYL METHACRYLATE MONOMER, STABILIZED

Air transport ICAO-TI/IATA-DGR

Class	3
UN-No	1247
Packaging group	II
Proper technical name (Proper shipping name)	Methyl methacrylate monomer, stabilized

Inland waterway transport ADN/ADNR/GGVBinSch (Germany)

Class	3
ADR/RID-Labels	3
UN-No/ Substance number	1247
Packaging group	II
Description of the goods (Technical name)	METHYL METHACRYLATE MONOMER, STABILIZED

Loading instructions/Remarks

IATA_C	ERG-Code 3L
IATA_P	ERG-Code 3L
IMDG	Clear of living quarters.
ADR	Measures as 2.2.3.2.2 ADR/RID/ADNR have been applied.
ADR	Observe listed materials regulation §7, paragraph 1 GGVSE
ADNR	Measures as 2.2.3.2.2 ADR/RID/ADNR have been applied.

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15. REGULATORY INFORMATION**Labelling according to EC Directives****hazard-defining component(s)**

- methyl methacrylate
- 1,6-hexanediol dimethacrylate

Symbol(s)	F Xi	Highly flammable Irritant
R-phrase(s)	R11 R37/38 R43 R52/53	Highly flammable. Irritating to respiratory system and skin. May cause sensitization by skin contact. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-phrase(s)	S24 S37 S46	Avoid contact with skin. Wear suitable gloves. If swallowed, seek medical advice immediately and show this container or label.

National legislation

employment restriction

The employment limitations under the protection of young persons act, the laws on pregnant women and young mothers and work at home is/are to be observed.

16. OTHER INFORMATION**Risk phrase (R phrase) texts**

- **methyl methacrylate**
R11 Highly flammable.
R37/38 Irritating to respiratory system and skin.
R43 May cause sensitization by skin contact.
- **tetrahydrofurfuryl methacrylate**
R36/37/38 Irritating to eyes, respiratory system and skin.
- **1,6-hexanediol dimethacrylate**
R36/37/38 Irritating to eyes, respiratory system and skin.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Further information

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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