



Calibra® Abutment - Base Paste

Dentsply Sirona

Chemwatch: 5673-75

Version No: 2.1

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Chemwatch Hazard Alert Code: 3

Issue Date: 29/04/2024

Print Date: 30/04/2024

S.GHS.USA.EN.E

SECTION 1 Identification

Product Identifier

| | |
|-------------------------------|--------------------------------|
| Product name | Calibra® Abutment - Base Paste |
| Chemical Name | Not Applicable |
| Synonyms | Calibra Abutment Resin Cement |
| Chemical formula | Not Applicable |
| Other means of identification | Not Available |

Recommended use of the chemical and restrictions on use

| | |
|--------------------------|--|
| Relevant identified uses | Self-curing dental luting cement. Use according to manufacturer's directions. |
|--------------------------|--|

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

| | |
|-------------------------|---|
| Registered company name | Dentsply Sirona |
| Address | 38 West Clarke Avenue Milford DE 19963-1805 United States |
| Telephone | 302-422-4511 |
| Fax | Not Available |
| Website | http://www.dentsplysirona.com |
| Email | Charlotte.Barker@dentsplysirona.com |

Emergency phone number

| | | |
|-----------------------------------|---------------------------|-------------------------------------|
| Association / Organisation | CHEMTREC | CHEMWATCH EMERGENCY RESPONSE (24/7) |
| Emergency telephone numbers | 1-800-424-9300 (24 hours) | +1 855-237-5573 |
| Other emergency telephone numbers | Not Available | +61 3 9573 3188 |

Once connected and if the message is not in your preferred language then please dial 01

Una vez conectado y si el mensaje no está en su idioma preferido, por favor marque 02

SECTION 2 Hazard(s) identification

Classification of the substance or mixture

NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

| | |
|----------------|--|
| Classification | Skin Corrosion/Irritation Category 2, Sensitisation (Skin) Category 1, Serious Eye Damage/Eye Irritation Category 1, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Germ Cell Mutagenicity Category 2, Carcinogenicity Category 1A, Specific Target Organ Toxicity - Repeated Exposure Category 2, Hazardous to the Aquatic Environment Long-Term Hazard Category 3 |
|----------------|--|

Label elements

| | |
|---------------------|--------|
| Hazard pictogram(s) | |
| Signal word | Danger |

Hazard statement(s)

| | |
|------|--|
| H315 | Causes skin irritation. |
| H317 | May cause an allergic skin reaction. |
| H318 | Causes serious eye damage. |
| H335 | May cause respiratory irritation. |
| H341 | Suspected of causing genetic defects. |
| H350 | May cause cancer. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H412 | Harmful to aquatic life with long lasting effects. |

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

| | |
|------|--|
| P201 | Obtain special instructions before use. |
| P260 | Do not breathe mist/vapours/spray. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves, protective clothing, eye protection and face protection. |
| P261 | Avoid breathing mist/vapours/spray. |
| P273 | Avoid release to the environment. |
| P202 | Do not handle until all safety precautions have been read and understood. |
| P264 | Wash all exposed external body areas thoroughly after handling. |
| P272 | Contaminated work clothing must not be allowed out of the workplace. |

Precautionary statement(s) Response

| | |
|----------------|--|
| P305+P351+P338 | IF IN EYES: Rinse cautiously 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. |
| P310 | Immediately call a POISON CENTER/doctor/physician/first aider. |
| P312 | Call a POISON CENTER/doctor/physician/first aider/if you feel unwell. |
| P314 | Get medical advice/attention if you feel unwell. |
| P333+P313 | If skin irritation or rash occurs: Get medical advice/attention. |
| P302+P352 | IF ON SKIN: Wash with plenty of water and soap. |
| P304+P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| P332+P313 | If skin irritation occurs: Get medical advice/attention. |
| P362+P364 | Take off contaminated clothing and wash it before reuse. |

Precautionary statement(s) Storage

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|-----------|--|
| P405 | Store locked up. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |

Precautionary statement(s) Disposal

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| P501 | Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation. |
|------|--|

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

| CAS No | %[weight] | Name |
|-------------|-----------|--|
| 105883-40-7 | <10 | urethane dimethacrylate monomer |
| 3290-92-4 | <10 | trimethylolpropane trimethacrylate |
| 41637-38-1 | <10 | bisphenol A dimethacrylate, ethoxylated |
| 868-77-9 | <10 | 2-hydroxyethyl methacrylate |
| 13463-67-7 | <10 | titanium dioxide |
| 109-16-0 | <5 | triethylene glycol dimethacrylate |
| 1709-71-3 | <5 | 2-hydroxy-3-acryloyloxypropyl methacrylate |

SECTION 4 First-aid measures

Description of first aid measures

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|-------------|--|
| Eye Contact | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none">▶ 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.▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.▶ Transport to hospital or doctor without delay. |
|-------------|--|

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|---------------------|---|
| | <ul style="list-style-type: none"> ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. |
| Skin Contact | <p>If skin contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately remove all contaminated clothing, including footwear. ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation. |
| Inhalation | <ul style="list-style-type: none"> ▶ If fumes or combustion products are inhaled remove from contaminated area. ▶ Lay patient down. Keep warm and rested. ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▶ Transport to hospital, or doctor, without delay. <p>Following uptake by inhalation, move person to an area free from risk of further exposure. Oxygen or artificial respiration should be administered as needed. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. A physician should be consulted.</p> |
| Ingestion | <ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. |

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Fire-fighting measures**Extinguishing media**

- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.
- ▶ Water spray or fog - Large fires only.

Special hazards arising from the substrate or mixture

| | |
|-----------------------------|--|
| Fire Incompatibility | ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result |
|-----------------------------|--|

Special protective equipment and precautions for fire-fighters

| | |
|------------------------------|--|
| Fire Fighting | <ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ May be violently or explosively reactive. ▶ Wear full body protective clothing with breathing apparatus. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ Fight fire from a safe distance, with adequate cover. ▶ If safe, switch off electrical equipment until vapour fire hazard removed. ▶ Use water delivered as a fine spray to control the fire and cool adjacent area. ▶ Avoid spraying water onto liquid pools. ▶ Do not approach containers suspected to be hot. ▶ Cool fire exposed containers with water spray from a protected location. ▶ If safe to do so, remove containers from path of fire. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ Use water delivered as a fine spray to control fire and cool adjacent area. ▶ DO NOT approach containers suspected to be hot. ▶ Cool fire exposed containers with water spray from a protected location. ▶ If safe to do so, remove containers from path of fire. ▶ Equipment should be thoroughly decontaminated after use. |
| Fire/Explosion Hazard | <ul style="list-style-type: none"> ▶ Combustible. ▶ Slight fire hazard when exposed to heat or flame. ▶ Heating may cause expansion or decomposition leading to violent rupture of containers. ▶ On combustion, may emit toxic fumes of carbon monoxide (CO). ▶ May emit acrid smoke. ▶ Mists containing combustible materials may be explosive. <p>Combustion products include: carbon monoxide (CO) carbon dioxide (CO2) isocyanates and minor amounts of hydrogen cyanide nitrogen oxides (NOx) metal oxides other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.</p> |

SECTION 6 Accidental release measures**Personal precautions, protective equipment and emergency procedures**

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

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|---------------------|---|
| Minor Spills | <ul style="list-style-type: none"> ▶ Clean up all spills immediately. ▶ Avoid contact with skin and eyes. |
|---------------------|---|

Continued...

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| | <ul style="list-style-type: none">▶ Wear impervious gloves and safety goggles.▶ Trowel up/scrape up.▶ Place spilled material in clean, dry, sealed container.▶ Flush spill area with water. |
| Major Spills | <p>Minor hazard.</p> <ul style="list-style-type: none">▶ Clear area of personnel.▶ Alert Fire Brigade and tell them location and nature of hazard.▶ Control personal contact with the substance, by using protective equipment as required.▶ Prevent spillage from entering drains or water ways.▶ Contain spill with sand, earth or vermiculite.▶ Collect recoverable product into labelled containers for recycling.▶ Absorb remaining product with sand, earth or vermiculite and place in appropriate containers for disposal.▶ Wash area and prevent runoff into drains or waterways.▶ If contamination of drains or waterways occurs, advise emergency services. |

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

SECTION 7 Handling and storage

Precautions for safe handling

| | |
|-------------------|--|
| Safe handling | <ul style="list-style-type: none">▶ 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.▶ Do NOT use localised heat sources such as band heaters to heat/ melt product.▶ Do NOT use steam.▶ Hot boxes or hot rooms are recommended for heating/ melting material. The hot box or hot room should be set a maximum temperature of 60 deg. C. (140 F.).▶ Do NOT overheat - this may compromise product quality and /or result in an uncontrolled hazardous polymerisation.▶ If product freezes, heat as indicated above and mix gently to redistribute the inhibitor. Product should be consumed in its entirety after heating/ melting; avoid multiple "reheats" which may affect product quality or result in product degradation.▶ Product should be packaged with inhibitor(s). Unless inhibited, product may polymerise, raising temperature and pressure, possibly rupturing container. Check inhibitor level periodically, adding to bulk material if needed. In addition, the product's inhibitor(s) require the presence of dissolved oxygen. Maintain, at a minimum, the original headspace in the product container and do NOT blanket or mix with oxygen-free gas as it renders the inhibitor ineffective. Ensure air space (oxygen) is present during product heating / melting.▶ Store product indoors at temperatures greater than the product's freeing point (or greater than 0 deg. C. (32 F).) if no freezing point available and below 38 deg. C (100 F.).▶ Avoid prolonged storage (longer than shelf-life) storage temperatures above 38 deg. C (100 F.).▶ Store in tightly closed containers in a properly vented storage area away from heat, sparks, open flame, strong oxidisers, radiation and other initiators.▶ Prevent contamination by foreign materials.▶ Prevent moisture contact.▶ Use only non-sparking tools and limit storage time. Unless specified elsewhere, shelf-life is 6 months from receipt.▶ Avoid all personal contact, including inhalation.▶ Wear protective clothing when risk of exposure occurs.▶ Use in a well-ventilated area.▶ Prevent concentration in hollows and sumps.▶ DO NOT enter confined spaces until atmosphere has been checked.▶ DO NOT allow material to contact humans, exposed food or food utensils.▶ Avoid contact with incompatible materials.▶ When handling, DO NOT eat, drink or smoke.▶ Keep containers securely sealed when not in use.▶ Avoid physical damage to containers.▶ Always wash hands with soap and water after handling.▶ Work clothes should be laundered separately. Launder contaminated clothing before re-use.▶ Use good occupational work practice.▶ Observe manufacturer's storage and handling recommendations contained within this SDS.▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained. |
| Other information | <ul style="list-style-type: none">▶ Polymerisation may occur slowly at room temperature.▶ Storage requires stabilising inhibitor content and dissolved oxygen content to be monitored. Refer to manufacturer's recommended levels.▶ DO NOT overfill containers so as to maintain free head space above product.▶ Blanketing or sparging with nitrogen or oxygen free gas will deactivate stabiliser.▶ Store below 38 deg. C.▶ Store in original containers.▶ Keep containers securely sealed.▶ No smoking, naked lights or ignition sources.▶ Store in a cool, dry, well-ventilated area.▶ Store away from incompatible materials and foodstuff containers.▶ Protect containers against physical damage and check regularly for leaks.▶ Observe manufacturer's storage and handling recommendations contained within this SDS. |

Conditions for safe storage, including any incompatibilities

| | |
|-------------------------|--|
| Suitable container | <ul style="list-style-type: none">▶ Metal can or drum▶ Packaging as recommended by manufacturer.▶ Check all containers are clearly labelled and free from leaks. |
| Storage incompatibility | <ul style="list-style-type: none">▶ Avoid reaction with oxidising agents |

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|--|------------------|-------------------------------|----------|---------------|---------------|---------------|
| US OSHA Permissible Exposure Limits (PELs) Table | titanium dioxide | Titanium dioxide - Total dust | 15 mg/m3 | Not Available | Not Available | Not Available |

Continued...

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|--|------------------|---|---------------------|---------------|---------------|--------------------|
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 | titanium dioxide | Inert or Nuisance Dust: Total Dust | 15 mg/m3 / 50 mppcf | Not Available | Not Available | Not Available |
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 | titanium dioxide | Inert or Nuisance Dust: Respirable fraction | 5 mg/m3 / 15 mppcf | Not Available | Not Available | Not Available |
| US NIOSH Recommended Exposure Limits (RELs) | titanium dioxide | Titanium dioxide | Not Available | Not Available | Not Available | Ca; See Appendix A |

| Emergency Limits | | | |
|-----------------------------------|-----------|-----------|-------------|
| Ingredient | TEEL-1 | TEEL-2 | TEEL-3 |
| 2-hydroxyethyl methacrylate | 1.9 mg/m3 | 21 mg/m3 | 1,000 mg/m3 |
| titanium dioxide | 30 mg/m3 | 330 mg/m3 | 2,000 mg/m3 |
| triethylene glycol dimethacrylate | 33 mg/m3 | 360 mg/m3 | 2,100 mg/m3 |


| Ingredient | Original IDLH | Revised IDLH |
|--|---------------|---------------|
| urethane dimethacrylate monomer | Not Available | Not Available |
| trimethylolpropane trimethacrylate | Not Available | Not Available |
| bisphenol A dimethacrylate, ethoxylated | Not Available | Not Available |
| 2-hydroxyethyl methacrylate | Not Available | Not Available |
| titanium dioxide | 5,000 mg/m3 | Not Available |
| triethylene glycol dimethacrylate | Not Available | Not Available |
| 2-hydroxy-3-acryloyloxypropyl methacrylate | Not Available | Not Available |

| Occupational Exposure Banding | | |
|--|--|----------------------------------|
| Ingredient | Occupational Exposure Band Rating | Occupational Exposure Band Limit |
| urethane dimethacrylate monomer | E | ≤ 0.01 mg/m³ |
| trimethylolpropane trimethacrylate | E | ≤ 0.1 ppm |
| bisphenol A dimethacrylate, ethoxylated | E | ≤ 0.1 ppm |
| 2-hydroxyethyl methacrylate | E | ≤ 0.1 ppm |
| triethylene glycol dimethacrylate | E | ≤ 0.1 ppm |
| 2-hydroxy-3-acryloyloxypropyl methacrylate | E | ≤ 0.1 ppm |
| Notes: | Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health. | |

Exposure controls

| | | |
|----------------------------------|---|----------------------------------|
| Appropriate engineering controls | Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure. | |
| | Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant. | |
| | Type of Contaminant: | Air Speed: |
| | solvent, vapours, degreasing etc., evaporating from tank (in still air). | 0.25-0.5 m/s (50-100 f/min.) |
| | aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) | 0.5-1 m/s (100-200 f/min.) |
| | direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) | 1-2.5 m/s (200-500 f/min.) |
| | grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion). | 2.5-10 m/s (500-2000 f/min.) |
| | Within each range the appropriate value depends on: | |
| | Lower end of the range | Upper end of the range |
| | 1: Room air currents minimal or favourable to capture | 1: Disturbing room air currents |
| | 2: Contaminants of low toxicity or of nuisance value only. | 2: Contaminants of high toxicity |

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| | | | | | | | |
|--|---|--|---|--|---|--|---|
| | <p>3: Intermittent, low production.</p> <p>4: Large hood or large air mass in motion</p> <p>3: High production, heavy use</p> <p>4: Small hood-local control only</p> <p>Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p> | | | | | | |
| Individual protection measures, such as personal protective equipment |  | | | | | | |
| Eye and face protection | <ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59]. | | | | | | |
| Skin protection | See Hand protection below | | | | | | |
| Hands/feet protection | <p>NOTE:</p> <ul style="list-style-type: none"> ▶ 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. <p>General warning: Do NOT use latex gloves! Use only recommended gloves - using the wrong gloves may increase the risk:</p> <table> <tr> <td> <p>Exposure condition</p> <p>Short time use; (few minutes less than 0.5 hour)</p> <p>Little physical stress</p> </td><td> <p>Use of thin nitrile rubber gloves:</p> <p>Nitrile rubber (0.1 mm)</p> <p>Excellent tactility ("feel"), powder-free</p> <p>Disposable</p> <p>Inexpensive</p> <p>Give adequate protection to low molecular weight acrylic monomers</p> </td></tr> <tr> <td> <p>Exposure condition</p> <p>Medium time use; less than 4 hours</p> <p>Physical stress (opening drums, using tools, etc.)</p> </td><td> <p>Use of medium thick nitrile rubber gloves</p> <p>Nitrile rubber, NRL (latex) free; <0.45 mm</p> <p>Moderate tactility ("feel"), powder-free</p> <p>Disposable</p> <p>Moderate price</p> <p>Gives adequate protection for most acrylates up to 4 hours</p> <p>Do NOT give adequate protection to low molecular weight monomers at exposures longer than 1 hour</p> </td></tr> <tr> <td> <p>Exposure condition</p> <p>Long time</p> <p>Cleaning operations</p> </td><td> <p>Nitrile rubber, NRL (latex) free; >0.56 mm</p> <p>low tactility ("feel"), powder free</p> <p>High price</p> <p>Gives adequate protection for most acrylates in combination with commonly used solvents up to 8 hours</p> <p>Do NOT give adequate protection to low molecular weight monomers at exposures longer than 1 hour</p> <p>Avoid use of ketones and acetates in wash-up solutions.</p> </td></tr> </table> <p>Where none of this gloves ensure safe handling (for example in long term handling of acrylates containing high levels of acetates and/ or ketones, use laminated multilayer gloves.</p> <p>Guide to the Classification and Labelling of UV/EB Acrylates Third edition, 231 October 2007 - Cefic</p> <ul style="list-style-type: none"> ▶ Isocyanate resistant materials include Teflon, Viton, nitrile rubber and some PVA gloves. ▶ Protective gloves and overalls should be worn as specified in the appropriate national standard. ▶ Contaminated garments should be removed promptly and should not be re-used until they have been decontaminated. ▶ NOTE: Natural rubber, neoprene, PVC can be affected by isocyanates | <p>Exposure condition</p> <p>Short time use; (few minutes less than 0.5 hour)</p> <p>Little physical stress</p> | <p>Use of thin nitrile rubber gloves:</p> <p>Nitrile rubber (0.1 mm)</p> <p>Excellent tactility ("feel"), powder-free</p> <p>Disposable</p> <p>Inexpensive</p> <p>Give adequate protection to low molecular weight acrylic monomers</p> | <p>Exposure condition</p> <p>Medium time use; less than 4 hours</p> <p>Physical stress (opening drums, using tools, etc.)</p> | <p>Use of medium thick nitrile rubber gloves</p> <p>Nitrile rubber, NRL (latex) free; <0.45 mm</p> <p>Moderate tactility ("feel"), powder-free</p> <p>Disposable</p> <p>Moderate price</p> <p>Gives adequate protection for most acrylates up to 4 hours</p> <p>Do NOT give adequate protection to low molecular weight monomers at exposures longer than 1 hour</p> | <p>Exposure condition</p> <p>Long time</p> <p>Cleaning operations</p> | <p>Nitrile rubber, NRL (latex) free; >0.56 mm</p> <p>low tactility ("feel"), powder free</p> <p>High price</p> <p>Gives adequate protection for most acrylates in combination with commonly used solvents up to 8 hours</p> <p>Do NOT give adequate protection to low molecular weight monomers at exposures longer than 1 hour</p> <p>Avoid use of ketones and acetates in wash-up solutions.</p> |
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| Body protection | See Other protection below | | | | | | |
| Other protection | <ul style="list-style-type: none"> ▶ Overalls. ▶ P.V.C apron. ▶ Barrier cream. ▶ Skin cleansing cream. ▶ Eye wash unit. | | | | | | |

Respiratory protection

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

| Required Minimum Protection Factor | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|------------------------------------|----------------------|----------------------|-------------------------|
| up to 10 x ES | A-AUS P2 | - | A-PAPR-AUS / Class 1 P2 |
| up to 50 x ES | - | A-AUS / Class 1 P2 | - |
| up to 100 x ES | - | A-2 P2 | A-PAPR-2 P2 ^ |

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

Continued...

► Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

| | | | |
|--|---|---|----------------|
| Appearance | Coloured creamy viscous paste with characteristic sweet acrylic ester odour; does not mix with water. | | |
| Physical state | Non Slump Paste | Relative density (Water = 1) | 1.8-1.9 |
| Odour | Characteristic | Partition coefficient n-octanol / water | Not Available |
| Odour threshold | Not Available | Auto-ignition temperature (°C) | Not Available |
| pH (as supplied) | Not Applicable | Decomposition temperature (°C) | Not Available |
| Melting point / freezing point (°C) | Not Available | Viscosity (cSt) | Not Available |
| Initial boiling point and boiling range (°C) | Not Available | Molecular weight (g/mol) | Not Applicable |
| Flash point (°C) | Not Available | Taste | Not Available |
| Evaporation rate | Not Available | Explosive properties | Not Available |
| Flammability | Not Available | Oxidising properties | Not Available |
| Upper Explosive Limit (%) | Not Available | Surface Tension (dyn/cm or mN/m) | Not Available |
| Lower Explosive Limit (%) | Not Available | Volatile Component (%vol) | Not Available |
| Vapour pressure (kPa) | Not Available | Gas group | Not Available |
| Solubility in water | Immiscible | pH as a solution (1%) | Not Applicable |
| Vapour density (Air = 1) | Not Available | VOC g/L | Not Available |

SECTION 10 Stability and reactivity

| | |
|------------------------------------|--|
| Reactivity | See section 7 |
| Chemical stability | <ul style="list-style-type: none">► Unstable in the presence of incompatible materials.► Product is considered stable.► Hazardous polymerisation will not occur. |
| Possibility of hazardous reactions | See section 7 |
| Conditions to avoid | See section 7 |
| Incompatible materials | See section 7 |
| Hazardous decomposition products | See section 5 |

SECTION 11 Toxicological information

Information on toxicological effects

| | |
|--------------|--|
| Inhaled | <p>The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. No report of respiratory illness in humans as a result of exposure to multifunctional acrylates has been found.</p> <p>The vapour/mist may be highly irritating to the upper respiratory tract and lungs; the response may be severe enough to produce bronchitis and pulmonary oedema. Possible neurological symptoms arising from isocyanate exposure include headache, insomnia, euphoria, ataxia, anxiety neurosis, depression and paranoia. Gastrointestinal disturbances are characterised by nausea and vomiting. Pulmonary sensitisation may produce asthmatic reactions ranging from minor breathing difficulties to severe allergic attacks; this may occur following a single acute exposure or may develop without warning for several hours after exposure. Sensitized people can react to very low doses, and should not be allowed to work in situations allowing exposure to this material. Continued exposure of sensitised persons may lead to possible long term respiratory impairment.</p> <p>Inhalation hazard is increased at higher temperatures.</p> |
| Ingestion | <p>The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.</p> |
| Skin Contact | <p>This material can cause inflammation of the skin on contact in some persons.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>All multifunctional acrylates (MFA) produce skin disorders and sensitise the skin and inflammation. Vapours generated by the heat of milling may occur in sufficient concentration to produce inflammation.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> |
| Eye | <p>If applied to the eyes, this material causes severe eye damage.</p> |
| Chronic | <p>Studies show that inhaling this substance for over a long period (e.g. in an occupational setting) may increase the risk of cancer. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Strong evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.</p> <p>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.</p> <p>Based on experience with similar materials, there is a possibility that exposure to the material may reduce fertility in humans at levels which do not cause other toxic effects.</p> <p>Bisphenol A may have effects similar to female sex hormones and when administered to pregnant women, may damage the foetus. It may also damage male reproductive organs and sperm.</p> |

Calibra® Abutment - Base Paste

| | | |
|--|--|--|
| | <p>Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates.</p> <p>The chemistry of reaction of isocyanates, as evidenced by MDI, in biological milieu is such that in the event of a true exposure of small MDI doses to the mouth, reactions will commence at once with biological macromolecules in the buccal region and will continue along the digestive tract prior to reaching the stomach. Reaction products will be a variety of polyureas and macromolecular conjugates with for example mucus, proteins and cell components.</p> <p>This is corroborated by the results from an MDI inhalation study. Following an inhalation exposure of rats to radiolabelled MDI, 79% of the dose was excreted in faeces. The faecal excretion in these animals was considered entirely due to ingestion of radioactivity from grooming and ingestion of deposited material from the nasopharyngeal region via the mucociliary escalator, i.e. not following systemic absorption. The faecal radioactivity was tentatively identified as mixed molecular weight polyureas derived from MDI. Diamine was not present. Thus, for MDI and diisocyanates in general the oral gavage dosing route is inappropriate for toxicological studies and risk assessment.</p> <p>It is expected that oral gavage dosing will result in a similar outcome to that produced by TDI or MDI, that is (1) reaction with stomach contents and (2) polymerization to solid polyureas.</p> <ul style="list-style-type: none"> Reaction with stomach contents is very plausibly described in case reports of accidental ingestion of polymeric MDI based glue in domestic animals. Extensive polymerization and CO₂ liberation resulting in an expansion of the gastric content is described in the stomach, without apparent acute chemical toxicity Polyurea formation in organic and aqueous phases has been described. In this generally accepted chemistry of hydrolysis of an isocyanate the initially produced carbamate decarboxylates to an amine which. The amine, as a reactive intermediate, then reacts very readily with the present isocyanate to produce a solid and inert polyurea. This urea formation acts as a pH buffer in the stomach, thus promoting transformation of the diisocyanate into polyurea, even under the acidic conditions. <p>At the absorptive tissues in the small intestine, these high molecular reaction products are likely to be of very low bioavailability, which is substantiated by the absence of systemic toxicity in acute oral bioassays with rats at the OECD limit dose (LC50>2 g/kg bw).</p> <p>The respiratory tract may be regarded as the main entry for systemically available isocyanates as evidenced following MDI exposures. A detailed summary on urinary, plasma and in vitro metabolite studies is provided below. Taken together, all available studies provide convincing evidence that MDI-protein adduct and MDI-metabolite formation proceeds:</p> <ul style="list-style-type: none"> via formation of a labile isocyanate glutathione (GSH)-adduct, then transfer to a more stable adduct with larger proteins, and without formation of free MDA. MDA reported as a metabolite is actually formed by analytical workup procedures (strong acid or base hydrolysis) and is not an identified metabolite in urine or blood <p>There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>Sensitisation may give severe responses to very low levels of exposure, i.e. hypersensitivity.</p> | |
| Calibra® Abutment - Base Paste | TOXICITY Not Available | IRRITATION Not Available |
| urethane dimethacrylate monomer | TOXICITY Not Available | IRRITATION Not Available |
| trimethylolpropane trimethacrylate | TOXICITY Dermal (rabbit) LD50: >3000 mg/kg ^[2] Oral (Rat) LD50: >5000 mg/kg ^[2] | IRRITATION Eye: no adverse effect observed (not irritating) ^[1] Skin (rabbit): 500 mg - mild * [Manufacturer] Skin: no adverse effect observed (not irritating) ^[1] |
| bisphenol A dimethacrylate, ethoxylated | TOXICITY Not Available | IRRITATION Not Available |
| 2-hydroxyethyl methacrylate | TOXICITY Dermal (rabbit) LD50: >3000 mg/kg ^[2] Oral (Rat) LD50: >=2000 mg/kg ^[1] | IRRITATION Eye (rabbit): SEVERE *post-exposure Eye: adverse effect observed (irritating) ^[1] Skin (rabbit): non-irritating* * Rohm & Haas Skin: no adverse effect observed (not irritating) ^[1] |
| titanium dioxide | TOXICITY dermal (hamster) LD50: >=10000 mg/kg ^[2] Inhalation (Rat) LC50: >2.28 mg/l4h ^[1] Oral (Rat) LD50: >=2000 mg/kg ^[1] | IRRITATION Eye: no adverse effect observed (not irritating) ^[1] Skin (human): 0.3 mg /3D (int)-mild * Skin: no adverse effect observed (not irritating) ^[1] |
| triethylene glycol dimethacrylate | TOXICITY dermal (mouse) LD50: >2000 mg/kg ^[1] Oral (Mouse) LD50: 10750 mg/kg ^[2] | IRRITATION Eye: no adverse effect observed (not irritating) ^[1] Skin: no adverse effect observed (not irritating) ^[1] |
| 2-hydroxy-3-acryloyloxypropyl methacrylate | TOXICITY Not Available | IRRITATION Not Available |
| Legend: | 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances | |

| | |
|------------------------------------|---|
| URETHANE DIMETHACRYLATE MONOMER | Aromatic and aliphatic diisocyanates may cause airway toxicity and skin sensitization. Monomers and prepolymers exhibit similar respiratory effect. Of the several members of diisocyanates tested on experimental animals by inhalation and oral exposure, some caused cancer while others produced a harmless outcome. This group of compounds has therefore been classified as cancer-causing. |
| TRIMETHYLOLPROPANE TRIMETHACRYLATE | (SD +/- 2591 mg/kg) ** [American Industrial Hygiene Association] |
| BISPHENOL A DIMETHACRYLATE, | The chemical structure of hydroxylated diphenylalkanes or bisphenols consists of two phenolic rings joined together through a bridging carbon. This class of endocrine disruptors that mimic oestrogens is widely used in industry, particularly in plastics. |

Calibra® Abutment - Base Paste

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|--|---|
| ETHOXYLATED | Bisphenol A (BPA) and some related compounds exhibit oestrogenic activity in human breast cancer cell line MCF-7, but there were remarkable differences in activity. Several derivatives of BPA exhibited significant thyroid hormonal activity towards rat pituitary cell line GH3, which releases growth hormone in a thyroid hormone-dependent manner. However, BPA and several other derivatives did not show such activity. Results suggest that the 4-hydroxyl group of the A-phenyl ring and the B-phenyl ring of BPA derivatives are required for these hormonal activities, and substituents at the 3,5-positions of the phenyl rings and the bridging alkyl moiety markedly influence the activities. Bisphenols promoted cell proliferation and increased the synthesis and secretion of cell type-specific proteins. When ranked by proliferative potency, the longer the alkyl substituent at the bridging carbon, the lower the concentration needed for maximal cell yield; the most active compound contained two propyl chains at the bridging carbon. Bisphenols with two hydroxyl groups in the para position and an angular configuration are suitable for appropriate hydrogen bonding to the acceptor site of the oestrogen receptor. In vitro cell models were used to evaluate the ability of 22 bisphenols (BPs) to induce or inhibit estrogenic and androgenic activity. BPA, Bisphenol AF (BPAF), bisphenol Z (BPZ), bisphenol C (BPC), tetramethyl bisphenol A (TMBPA), bisphenol S (BPS), bisphenol E (BPE), 4,4-bisphenol F (4,4-BPF), bisphenol AP (BPAP), bisphenol B (BPB), tetrachlorobisphenol A (TCBPA), and benzylparaben (PHBB) induced estrogen receptor (ER)alpha and/or ERbeta-mediated activity. With the exception of BPS, TCBPA, and PHBB, these same BPs were also androgen receptor (AR) antagonists. Only 3 BPs were found to be ER antagonists. Bisphenol P (BPP) selectively inhibited ERbeta-mediated activity and 4-(4-phenylmethoxyphenyl)sulfonylphenol (BPS-MPE) and 2,4-bisphenol S (2,4-BPS) selectively inhibited ERalpha-mediated activity. None of the BPs induced AR-mediated activity. |
| 2-HYDROXYETHYL METHACRYLATE | Dermal (rabbit): >5000 mg/kg* Effects persist beyond 21 days |
| TITANIUM DIOXIDE | <p>* IUCLID</p> <p>Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.</p> <p>Exposure to titanium dioxide is via inhalation, swallowing or skin contact. When inhaled, it may deposit in lung tissue and lymph nodes causing dysfunction of the lungs and immune system. Absorption by the stomach and intestines depends on the size of the particle. It penetrated only the outermost layer of the skin, suggesting that healthy skin may be an effective barrier. There is no substantive data on genetic damage, though cases have been reported in experimental animals. Studies have differing conclusions on its cancer-causing potential.</p> <p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.</p> |
| URETHANE DIMETHACRYLATE MONOMER & TRIMETHYLOLPROPANE TRIMETHACRYLATE & BISPHENOL A DIMETHACRYLATE, ETHOXYLATED & 2-HYDROXYETHYL METHACRYLATE & TITANIUM DIOXIDE & TRIETHYLENE GLYCOL DIMETHACRYLATE & 2-HYDROXY-3-ACRYLOYLOXYPROPYL METHACRYLATE | Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production. |
| URETHANE DIMETHACRYLATE MONOMER & BISPHENOL A DIMETHACRYLATE, ETHOXYLATED & TITANIUM DIOXIDE & 2-HYDROXY-3-ACRYLOYLOXYPROPYL METHACRYLATE | No significant acute toxicological data identified in literature search. |
| URETHANE DIMETHACRYLATE MONOMER & TRIMETHYLOLPROPANE TRIMETHACRYLATE & BISPHENOL A DIMETHACRYLATE, ETHOXYLATED & 2-HYDROXY-3-ACRYLOYLOXYPROPYL METHACRYLATE | 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 (CH ₂ =CHCOO or CH ₂ =C(CH ₃)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 <i>de facto</i> carcinogens. |
| TRIMETHYLOLPROPANE TRIMETHACRYLATE & BISPHENOL A DIMETHACRYLATE, ETHOXYLATED & 2-HYDROXYETHYL METHACRYLATE & TRIETHYLENE GLYCOL DIMETHACRYLATE & 2-HYDROXY-3-ACRYLOYLOXYPROPYL METHACRYLATE | The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested. |
| TRIMETHYLOLPROPANE TRIMETHACRYLATE & BISPHENOL A DIMETHACRYLATE, ETHOXYLATED & 2-HYDROXY-3-ACRYLOYLOXYPROPYL METHACRYLATE | UV (ultraviolet) / EB (electron beam) acrylates are generally of low toxicity. UV/EB acrylates are divided into two groups the "stenomeric" and "eurymeric" acrylates. Stenomeric acrylates are usually more hazardous than the eurymeric substances. Where no "official" classification for acrylates and methacrylates exists, there have been cautious attempts to create classifications in the absence of contrary evidence. For example Monoalkyl or monoarylestere of acrylic acids should be classified as R36/37/38 and R51/53 Monoalkyl or monoaryl esters of methacrylic acid should be classified as R36/37/38 |
| TRIMETHYLOLPROPANE TRIMETHACRYLATE & TITANIUM DIOXIDE | The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. |

Acute Toxicity



Carcinogenicity



Continued...

| | | | |
|-----------------------------------|---|--------------------------|---|
| Skin Irritation/Corrosion | ✓ | Reproductivity | ✗ |
| Serious Eye Damage/Irritation | ✓ | STOT - Single Exposure | ✓ |
| Respiratory or Skin sensitisation | ✓ | STOT - Repeated Exposure | ✓ |
| Mutagenicity | ✓ | Aspiration Hazard | ✗ |

Legend: ✗ – Data either not available or does not fill the criteria for classification
✓ – Data available to make classification

SECTION 12 Ecological information

| | | | | | |
|--|---------------|--------------------|-------------------------------|---------------|---------------|
| Toxicity | | | | | |
| Calibra® Abutment - Base Paste | Endpoint | Test Duration (hr) | Species | Value | Source |
| | Not Available | Not Available | Not Available | Not Available | Not Available |
| urethane dimethacrylate monomer | Endpoint | Test Duration (hr) | Species | Value | Source |
| | Not Available | Not Available | Not Available | Not Available | Not Available |
| trimethylolpropane trimethacrylate | Endpoint | Test Duration (hr) | Species | Value | Source |
| | LC50 | 96h | Fish | 2mg/l | 2 |
| | NOEC(ECx) | 768h | Fish | 0.138mg/l | 2 |
| | EC50 | 48h | Crustacea | >9.22mg/l | 2 |
| bisphenol A dimethacrylate, ethoxylated | Endpoint | Test Duration (hr) | Species | Value | Source |
| | NOEC(ECx) | 504h | Crustacea | >=0.022mg/L | 2 |
| 2-hydroxyethyl methacrylate | Endpoint | Test Duration (hr) | Species | Value | Source |
| | NOEC(ECx) | 504h | Crustacea | 24.1mg/l | 2 |
| | EC50 | 72h | Algae or other aquatic plants | 345mg/l | 2 |
| | EC50 | 48h | Crustacea | 380mg/l | 2 |
| | LC50 | 96h | Fish | >100mg/l | 2 |
| titanium dioxide | Endpoint | Test Duration (hr) | Species | Value | Source |
| | LC50 | 96h | Fish | 1.85-3.06mg/l | 4 |
| | BCF | 1008h | Fish | <1.1-9.6 | 7 |
| | EC50 | 72h | Algae or other aquatic plants | 3.75-7.58mg/l | 4 |
| | EC50 | 48h | Crustacea | 1.9mg/l | 2 |
| | NOEC(ECx) | 672h | Fish | >=0.004mg/L | 2 |
| | EC50 | 96h | Algae or other aquatic plants | 179.05mg/l | 2 |
| triethylene glycol dimethacrylate | Endpoint | Test Duration (hr) | Species | Value | Source |
| | EC50 | 72h | Algae or other aquatic plants | 72.8mg/l | 2 |
| | LC50 | 96h | Fish | 16.4mg/l | 2 |
| | NOEC(ECx) | 72h | Algae or other aquatic plants | 18.6mg/l | 2 |
| 2-hydroxy-3-acryloyloxypropyl methacrylate | Endpoint | Test Duration (hr) | Species | Value | Source |
| | Not Available | Not Available | Not Available | Not Available | Not Available |
| Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data | | | | | |

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
DO NOT discharge into sewer or waterways.

Persistence and degradability

| Ingredient | Persistence: Water/Soil | Persistence: Air |
|------------------------------------|-------------------------|------------------|
| trimethylolpropane trimethacrylate | HIGH | HIGH |
| 2-hydroxyethyl methacrylate | LOW | LOW |
| titanium dioxide | HIGH | HIGH |
| triethylene glycol dimethacrylate | LOW | LOW |

Bioaccumulative potential

| Ingredient | Bioaccumulation |
|------------------------------------|------------------------|
| trimethylolpropane trimethacrylate | MEDIUM (LogKOW = 4.39) |
| 2-hydroxyethyl methacrylate | LOW (BCF = 1.54) |
| titanium dioxide | LOW (BCF = 10) |
| triethylene glycol dimethacrylate | LOW (LogKOW = 1.88) |

Mobility in soil

| Ingredient | Mobility |
|------------------------------------|------------------------|
| trimethylolpropane trimethacrylate | LOW (Log KOC = 7533) |
| 2-hydroxyethyl methacrylate | HIGH (Log KOC = 1.043) |
| titanium dioxide | LOW (Log KOC = 23.74) |
| triethylene glycol dimethacrylate | LOW (Log KOC = 10) |

SECTION 13 Disposal considerations

Waste treatment methods

| | |
|------------------------------|---|
| Product / Packaging disposal | <p>Removal of bisphenol A (BPA) from aqueous solutions was accomplished by adsorption of enzymatically generated quinone derivatives on chitosan beads. The use of chitosan in the form of beads was found to be more effective because heterogeneous removal of BPA with chitosan beads was much faster than homogeneous removal of BPA with chitosan solutions, and the removal efficiency was enhanced by increasing the amount of chitosan beads dispersed in the BPA solutions and BPA was completely removed by quinone adsorption in the presence of chitosan beads more than 0.10 cm3/cm3. In addition, a variety of bisphenol derivatives were completely or effectively removed by the procedure constructed in this study, although the enzyme dose or the amount of chitosan beads was further increased as necessary for some of the bisphenol derivatives used.</p> <p>M. Suzuki, and E Musashi J Appl Polym Sci, 118(2):721 - 732; October 2010</p> <ul style="list-style-type: none">▶ DO NOT allow wash water from cleaning or process equipment to enter drains.▶ It may be necessary to collect all wash water for treatment before disposal.▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.▶ Where in doubt contact the responsible authority.▶ DO NOT recycle spilled material.▶ Consult State Land Waste Management Authority for disposal.▶ Neutralise spill material carefully and decontaminate empty containers and spill residues with 10% ammonia solution plus detergent or a proprietary decontaminant prior to disposal.▶ DO NOT seal or stopper drums being decontaminated as CO2 gas is generated and may pressurise containers.▶ Puncture containers to prevent re-use.▶ Bury or incinerate residues at an approved site. |
|------------------------------|---|

SECTION 14 Transport information

Labels Required

| | |
|------------------|----|
| Marine Pollutant | NO |
|------------------|----|

Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

| Product name | Group |
|--|---------------|
| urethane dimethacrylate monomer | Not Available |
| trimethylolpropane trimethacrylate | Not Available |
| bisphenol A dimethacrylate, ethoxylated | Not Available |
| 2-hydroxyethyl methacrylate | Not Available |
| titanium dioxide | Not Available |
| triethylene glycol dimethacrylate | Not Available |
| 2-hydroxy-3-acryloyloxypropyl methacrylate | Not Available |

14.7.3. Transport in bulk in accordance with the IGC Code

| Product name | Ship Type |
|------------------------------------|---------------|
| urethane dimethacrylate monomer | Not Available |
| trimethylolpropane trimethacrylate | Not Available |

| Product name | Ship Type |
|--|---------------|
| bisphenol A dimethacrylate, ethoxylated | Not Available |
| 2-hydroxyethyl methacrylate | Not Available |
| titanium dioxide | Not Available |
| triethylene glycol dimethacrylate | Not Available |
| 2-hydroxy-3-acryloyloxypropyl methacrylate | Not Available |

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

| |
|---|
| urethane dimethacrylate monomer is found on the following regulatory lists |
| Not Applicable |
| trimethylolpropane trimethacrylate is found on the following regulatory lists |
| US AIHA Workplace Environmental Exposure Levels (WEELs) |
| US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory |
| US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL) |
| bisphenol A dimethacrylate, ethoxylated is found on the following regulatory lists |
| US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory |
| 2-hydroxyethyl methacrylate is found on the following regulatory lists |
| US DOE Temporary Emergency Exposure Limits (TEELs) |
| US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory |
| titanium dioxide is found on the following regulatory lists |
| Chemical Footprint Project - Chemicals of High Concern List |
| International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs |
| International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans |
| International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS) |
| US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5 |
| US - California Proposition 65 - Carcinogens |
| US - California Safe Drinking Water and Toxic Enforcement Act of 1986 - Proposition 65 List |
| US - Massachusetts - Right To Know Listed Chemicals |
| US DOE Temporary Emergency Exposure Limits (TEELs) |
| US NIOSH Carcinogen List |
| US NIOSH Recommended Exposure Limits (RELs) |
| US OSHA Permissible Exposure Limits (PELs) Table Z-1 |
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 |
| US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory |
| triethylene glycol dimethacrylate is found on the following regulatory lists |
| US DOE Temporary Emergency Exposure Limits (TEELs) |
| US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory |
| 2-hydroxy-3-acryloyloxypropyl methacrylate is found on the following regulatory lists |
| Not Applicable |

Additional Regulatory Information

Not Applicable

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

| | |
|---|-----|
| Section 311/312 hazard categories | |
| Flammable (Gases, Aerosols, Liquids, or Solids) | No |
| Gas under pressure | No |
| Explosive | No |
| Self-heating | No |
| Pyrophoric (Liquid or Solid) | No |
| Pyrophoric Gas | No |
| Corrosive to metal | No |
| Oxidizer (Liquid, Solid or Gas) | No |
| Organic Peroxide | No |
| Self-reactive | No |
| In contact with water emits flammable gas | No |
| Combustible Dust | No |
| Carcinogenicity | Yes |
| Acute toxicity (any route of exposure) | No |
| Reproductive toxicity | No |
| Skin Corrosion or Irritation | Yes |


| | |
|--|-----|
| Respiratory or Skin Sensitization | Yes |
| Serious eye damage or eye irritation | Yes |
| Specific target organ toxicity (single or repeated exposure) | Yes |
| Aspiration Hazard | No |
| Germ cell mutagenicity | Yes |
| Simple Asphyxiant | No |
| Hazards Not Otherwise Classified | No |

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)
None Reported

US. EPCRA Section 313 Toxic Release Inventory (TRI) (40 CFR 372)
None Reported

Additional Federal Regulatory Information
Not Applicable

State Regulations

US. California Proposition 65
 **WARNING:** This product can expose you to chemicals including **titanium dioxide**, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov

Additional State Regulatory Information
Not Applicable

National Inventory Status

| National Inventory | Status |
|--|---|
| Australia - AIC / Australia Non-Industrial Use | No (urethane dimethacrylate monomer; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| Canada - DSL | No (urethane dimethacrylate monomer; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| Canada - NDSL | No (urethane dimethacrylate monomer; trimethylolpropane trimethacrylate; bisphenol A dimethacrylate, ethoxylated; 2-hydroxyethyl methacrylate; triethylene glycol dimethacrylate; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| China - IECSC | No (urethane dimethacrylate monomer) |
| Europe - EINEC / ELINCS / NLP | No (urethane dimethacrylate monomer; bisphenol A dimethacrylate, ethoxylated; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| Japan - ENCS | No (urethane dimethacrylate monomer) |
| Korea - KECI | No (urethane dimethacrylate monomer; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| New Zealand - NZIoC | No (urethane dimethacrylate monomer) |
| Philippines - PICCS | No (urethane dimethacrylate monomer; bisphenol A dimethacrylate, ethoxylated; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| USA - TSCA | No (urethane dimethacrylate monomer; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| Taiwan - TCSI | No (urethane dimethacrylate monomer) |
| Mexico - INSQ | No (urethane dimethacrylate monomer; trimethylolpropane trimethacrylate; bisphenol A dimethacrylate, ethoxylated; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| Vietnam - NCI | No (urethane dimethacrylate monomer) |
| Russia - FBEPH | No (urethane dimethacrylate monomer; bisphenol A dimethacrylate, ethoxylated; 2-hydroxy-3-acryloyloxypropyl methacrylate) |
| Legend: | Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration. |

SECTION 16 Other information

| | |
|---------------|------------|
| Revision Date | 29/04/2024 |
| Initial Date | 29/04/2024 |

Other information
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.

The 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. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

- PC - TWA: Permissible Concentration-Time Weighted Average
- PC - STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit,
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value

- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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