SAFETY DATA SHEET
TOKUYAMA UNIVERSAL BOND BOND A

1. Identification

Product identifier

Product name
TOKUYAMA UNIVERSAL BOND BOND A

Recommended use of the chemical and restrictions on use

Application
Dental adhesive. For dental professionals only.

Details of the supplier of the safety data sheet

Supplier
Tokuyama Dental America, Inc.
740 Garden View Ct., Suite 200 Encinitas,
CA 92024 U.S.A.
Tel: (877) 378 3548 (Toll-Free)
Tel: (760)942-7211
Fax: (760)942-7212

Contact Person
http://www.tokuyama-dental.com/tdc/contact.html

Manufacturer
Tokuyama Dental Corporation
38-9, Taitou 1-chome, Taitou-ku, Tokyo
110-0016, Japan
TEL: +81-3-3835-2261
FAX: +81-3-3835-2265

Emergency telephone number

Emergency telephone
California Poison Control System - San Francisco Division
San Francisco General Hospital
Bldg 5 Rm 2A21, 1001 Potrero Ave, San Francisco
Emergency telephone number: +1 800 222 1222
E-mail address: coadmin@calpoison.org
http://www.calpoison.org

National Capital Poison Center
3201 New Mexico Ave, Ste 310, Washington DC
Emergency telephone number: +1 800 222 1222
Telephone number: +1 202 362 3867
Facsimile number: +1 202 362 8377
E-mail address: pc@poison.org
http://www.poison.org

2. Hazard(s) identification

Classification of the substance or mixture

OSHA Regulatory Status
This Product is Hazardous under the OSHA Hazard Communication Standard.

Physical hazards
Flam. Liq. 2 - H225

Health hazards

Environmental hazards
Not Classified

Label elements
TOKUYAMA UNIVERSAL BOND  BOND A

Contains

ACETONE, 2-PROPENOIC ACID, 2-METHYL-, (1-METHYLETHYLIDENE)BIS[4,1-PHENYLENOXY(2-HYDROXY-3,1-PROPANEDIYL)] ESTER, 2-HYDROXYETHYL METHACRYLATE, TRIETHYLENE GLYCOL DIMETHACRYLATE

Other hazards

Hazards not otherwise classified (HNOC)

Not applicable.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>ACETONE</th>
<th>30-60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 67-64-1</td>
<td></td>
</tr>
</tbody>
</table>
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2-PROPENOIC ACID, 2-METHYL-, (1-METHYLETHYLIDENE)BIS[4,1-PHENYLENEOXY(2-HYDROXY-3,1-PROPANEDIYL)] ESTER
CAS number: 1565-94-2

2-HYDROXYETHYL METHACRYLATE
CAS number: 868-77-9

TRIETHYLENE GLYCOL DIMETHACRYLATE
CAS number: 109-16-0

METHACRYLOXYALKYL ACID PHOSPHATE
(PHOSPHORIC ACID MONOMER)
CAS number: 52628-03-2

2,6-DI-tert-BUTYL-p-CRESOL
CAS number: 128-37-0
M factor (Chronic) = 1

4. First-aid measures

Description of first aid measures

General information
Get medical attention if any discomfort continues. Show this Safety Data Sheet to the medical personnel.

Inhalation
Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention.

Ingestion
Rinse mouth thoroughly with water. Give a few small glasses of water or milk to drink. Never give anything by mouth to an unconscious person. Keep affected person under observation. Get medical attention.

Skin Contact
Wash skin thoroughly with soap and water. In the event of any sensitization symptoms developing, ensure further exposure is avoided. Get medical attention if symptoms are severe or persist after washing.

Eye contact
Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if any discomfort continues.

Protection of first aiders
First aid personnel should wear appropriate protective equipment during any rescue.

Most important symptoms and effects, both acute and delayed

General information
The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation
May cause drowsiness or dizziness.

Skin contact
Irritating to skin. May cause an allergic skin reaction. Repeated exposure may cause skin dryness or cracking.

Eye contact
Irritating to eyes.
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Notes for the doctor

Treat symptomatically.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media
Highly flammable gases or vapors. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Special hazards arising from the substance or mixture

Specific hazards
Highly flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up. Vapors may be ignited by a spark, a hot surface or an ember. Vapors may form explosive mixtures with air. Fire-water run-off in sewers may create fire or explosion hazard.

Hazardous combustion products
Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors. Irritating gases or vapors. Carbon monoxide (CO). Carbon dioxide (CO2).

Advice for firefighters

Protective actions during firefighting
Avoid breathing fire gases or vapors. Evacuate area. Keep upwind to avoid inhalation of gases, vapors, fumes and smoke. Ventilate closed spaces before entering them. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. If a leak or spill has not ignited, use water spray to disperse vapors and protect men stopping the leak. Control run-off water by containing and keeping it out of sewers and watercourses.

Special protective equipment for firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Standard Firefighter's clothing including helmets, protective boots and gloves will provide a basic level of protection for chemical incidents.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions
Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Evacuate area. Provide adequate ventilation. No smoking, sparks, flames or other sources of ignition near spillage. Promptly remove any clothing that becomes contaminated. Avoid inhalation of dust and vapors. Use suitable respiratory protection if ventilation is inadequate. Avoid contact with skin and eyes.

Environmental precautions

Environmental precautions
Avoid discharge into drains or watercourses or onto the ground.

Methods and material for containment and cleaning up

Methods for cleaning up
Wear protective clothing as described in Section 8 of this safety data sheet. No smoking, sparks, flames or other sources of ignition near spillage. Eliminate all ignition sources if safe to do so. Use only non-sparking tools. Contain and absorb spillage with sand, earth or other non-combustible material. Collect and place in suitable waste disposal containers and seal securely. Do not allow material to enter confined spaces, due to the risk of explosion. Wash thoroughly after dealing with a spillage. For waste disposal, see Section 13.

Reference to other sections
For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.
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7. Handling and storage

Precautions for safe handling

Usage precautions
Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating and lighting equipment. Use only non-sparking tools. Ground/bond container and receiving equipment. Take precautionary measures against static discharges. Avoid breathing gas, fume, vapours or spray. Handle all packages and containers carefully to minimize spills. Avoid the formation of mists. Keep container tightly sealed when not in use. Do not handle broken packages without protective equipment. Keep away from food, drink and animal feeding stuffs.

Advice on general occupational hygiene
Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Take off contaminated clothing and wash before reuse. Wash contaminated clothing before reuse.

Conditions for safe storage, including any incompatibilities

Storage precautions
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed, in a cool, well ventilated place. Store locked up. Keep only in the original container. Protect containers from damage. Store away from the following materials: Oxidizing materials. Organic peroxides/hydroperoxides.

Specific end use(s)
Specific end use(s)
The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Control parameters

Occupational exposure limits

ACETONE
Long-term exposure limit (8-hour TWA):  ACGIH 250 ppm  594 mg/m³
Short-term exposure limit (15-minute):  ACGIH 500 ppm  1187 mg/m³
A4
Long-term exposure limit (8-hour TWA):  OSHA 1000 ppm  2400 mg/m³

2,6-DI-tert-BUTYL-p-CRESOL
Long-term exposure limit (8-hour TWA):  ACGIH 2 mg/m³ inhalable fraction and vapor
A4
ACGIH = American Conference of Governmental Industrial Hygienists.
A4 = Not Classifiable as a Human Carcinogen.
OSHA = Occupational Safety and Health Administration.

Exposure controls

Appropriate engineering controls
Provide adequate ventilation. Use explosion-proof electrical, ventilating and lighting equipment. Observe any occupational exposure limits for the product or ingredients.

Eye/face protection
Wear tight-fitting, chemical splash goggles or face shield.

Hand protection
Wear protective gloves. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, gloves should comply with OSHA 1910.138 and be demonstrated to be impervious to the chemical and resist degradation. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.
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Other skin and body protection
Wear appropriate clothing to prevent repeated or prolonged skin contact.

Hygiene measures
Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product. Take off immediately all contaminated clothing and wash it before reuse.

Respiratory protection
Ensure all respiratory protective equipment is suitable for its intended use and is NIOSH approved. Check that the respirator fits tightly and the filter is changed regularly. Gas and combination filter cartridges should comply with OSHA 1910.134. Full face mask respirators with replaceable filter cartridges should comply with OSHA 1910.134. Half mask and quarter mask respirators with replaceable filter cartridges should comply with OSHA 1910.134.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless ~ Yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not available.</td>
</tr>
<tr>
<td>pH</td>
<td>Not available.</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Initial boiling point and range</td>
<td>&gt;35°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>-17.6°C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.968</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>No information available.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not available.</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

Reactivity
The following materials may react violently with the product: Oxidizing materials. Organic peroxides/hydroperoxides. See the other subsections of this section for further details.
**TOKUYAMA UNIVERSAL BOND BOND A**

**Stability**
Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.

**Possibility of hazardous reactions**
The following materials may react strongly with the product: Oxidizing materials. Organic peroxides/hydroperoxides.

**Conditions to avoid**
Vapors may form explosive mixtures with air. Containers can burst violently or explode when heated, due to excessive pressure build-up. Static electricity and formation of sparks must be prevented.

**Materials to avoid**
Oxidizing materials. Organic peroxides/hydroperoxides.

**Hazardous decomposition products**
Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors. Irritating gases or vapors. Carbon monoxide (CO). Carbon dioxide (CO2).

### 11. Toxicological information

<table>
<thead>
<tr>
<th>Information on toxicological effects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routes of exposure</strong></td>
<td>Skin, Eyes, Ingestion, Inhalation, Health effects: See section 4.</td>
</tr>
<tr>
<td><strong>Acute toxicity - oral</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td>Notes (oral LD₅₀)</td>
<td></td>
</tr>
<tr>
<td><strong>Acute toxicity - dermal</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td>Notes (dermal LD₅₀)</td>
<td></td>
</tr>
<tr>
<td><strong>Acute toxicity - inhalation</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td>Notes (Inhalation LC₅₀)</td>
<td></td>
</tr>
<tr>
<td><strong>Skin corrosion/irritation</strong></td>
<td>Skin Irrit. 2 - H315, Irritating to skin.</td>
</tr>
<tr>
<td><strong>Animal data</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Serious eye damage/irritation</strong></td>
<td>Eye Irrit. 2 - H319 Causes serious eye irritation.</td>
</tr>
<tr>
<td><strong>Respiratory sensitization</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Skin sensitization</strong></td>
<td>Skin Sens. 1 - H317 May cause an allergic skin reaction.</td>
</tr>
<tr>
<td><strong>Germ cell mutagenicity</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Genotoxicity - in vitro</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Carcinogenicity</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>IARC carcinogenicity</strong></td>
<td>Some of the ingredients are listed or exempt. IARC Group 3 Not classifiable as to its carcinogenicity to humans.</td>
</tr>
<tr>
<td><strong>NTP carcinogenicity</strong></td>
<td>Some of the ingredients are listed or exempt.</td>
</tr>
<tr>
<td><strong>OSHA Carcinogenicity</strong></td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td><strong>Reproductive toxicity</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Reproductive toxicity - fertility</strong></td>
<td></td>
</tr>
</tbody>
</table>
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Reproductive toxicity - development
Not available.

Specific target organ toxicity - single exposure
STOT - single exposure
STOT SE 3 - H336 May cause drowsiness or dizziness.

Target organs
Central nervous system

Specific target organ toxicity - repeated exposure
STOT - repeated exposure
Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard
Not available.

Toxicological information on ingredients.

SILICON DIOXIDE

Carcinogenicity
IARC carcinogenicity
IARC Group 3  Not classifiable as to its carcinogenicity to humans.

NTP carcinogenicity
Reasonably anticipated to be a human carcinogen.

OSHA Carcinogenicity
Not listed.

2,6-DI-tert-BUTYL-p-CRESOL

Carcinogenicity
IARC carcinogenicity
IARC Group 3  Not classifiable as to its carcinogenicity to humans.

NTP carcinogenicity
Reasonably anticipated to be a human carcinogen.

OSHA Carcinogenicity
Not listed.

12. Ecological Information

Toxicity
No information available.

Acute toxicity - fish
Not available.

Acute toxicity - aquatic invertebrates
Not available.

Acute toxicity - aquatic plants
Not available.

Persistence and degradability
The degradability of the product is not known.

Bioaccumulative potential
No data available on bioaccumulation.

Partition coefficient
Not available.

Mobility in soil
Volatile liquid. The product contains organic solvents which will evaporate easily from all surfaces.

Results of PBT and vPvB assessment
TOKUYAMA UNIVERSAL BOND BOND A

Results of PBT and vPvB assessment

This product does not contain any substances classified as PBT or vPvB.

Other adverse effects

None known.

13. Disposal considerations

Waste treatment methods

General information

The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Disposal methods

Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labeled with their contents. Incineration or landfill should only be considered when recycling is not feasible.

14. Transport information

General

For limited quantity packaging/limited load information, consult the relevant modal documentation using the data shown in this section.

UN Number

UN No. (IMDG) 1133
UN No. (ICAO) 1133
UN No. (DOT) UN1133

UN proper shipping name

Proper shipping name (IMDG) ADHESIVES
Proper shipping name (ICAO) ADHESIVES
Proper shipping name (DOT) ADHESIVES

Transport hazard class(es)

DOT hazard class 3
DOT hazard label 3
IMDG Class 3
ICAO class/division 3

Transport labels

DOT transport labels
TOKUYAMA UNIVERSAL BOND  BOND A

Packing group
IMDG packing group II
ICAO packing group II
DOT packing group II

Environmental hazards
Environmentally Hazardous Substance No.

Special precautions for user
Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

EmS F-E, S-D

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

Regulatory Status This Product is Hazardous under the OSHA Hazard Communication Standard.

International Regulations

US Federal Regulations
SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities None of the ingredients are listed or exempt.

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA) The following ingredients are listed or exempt:
ACETONE
Final CERCLA RQ: 5000(2270) pounds (Kilograms)

SARA Extremely Hazardous Substances EPCRA Reportable Quantities None of the ingredients are listed or exempt.

SARA 313 Emission Reporting None of the ingredients are listed or exempt.

CAA Accidental Release Prevention None of the ingredients are listed or exempt.

FDA - Essential Chemical None of the ingredients are listed or exempt.

FDA - Precursor Chemical None of the ingredients are listed or exempt.

SARA (311/312) Hazard Categories Fire Acute Chronic

OSHA Highly Hazardous Chemicals None of the ingredients are listed or exempt.
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US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-I)
The following ingredients are listed or exempt:
SILICON DIOXIDE
Present.

California Air Toxics "Hot Spots" (A-II)
None of the ingredients are listed or exempt.

California Directors List of Hazardous Substances
The following ingredients are listed or exempt:
2,6-DI-tert-BUTYL-p-CRESOL
Present.
SILICON DIOXIDE
Present.
ACETONE
Present.

Massachusetts "Right To Know" List
The following ingredients are listed or exempt:
2,6-DI-tert-BUTYL-p-CRESOL
Present.
SILICON DIOXIDE
Present.
ACETONE
Present.

Rhode Island "Right To Know" List
The following ingredients are listed or exempt:
2,6-DI-tert-BUTYL-p-CRESOL
Present.
ACETONE
Present.

Minnesota "Right To Know" List
The following ingredients are listed or exempt:
2,6-DI-tert-BUTYL-p-CRESOL
Present.
SILICON DIOXIDE
Present.
ACETONE
Present.

New Jersey "Right To Know" List
The following ingredients are listed or exempt:
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2,6-DI-tert-BUTYL-p-CRESOL
Present.

ACETONE
Present.

Pennsylvania "Right To Know" List
The following ingredients are listed or exempt:

2,6-DI-tert-BUTYL-p-CRESOL
Present.

SILICON DIOXIDE
Present.

ACETONE
Present.

16. Other information

<table>
<thead>
<tr>
<th>Revision comments</th>
<th>This is first issue.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>11/20/2016</td>
</tr>
<tr>
<td>Revision</td>
<td>1</td>
</tr>
<tr>
<td>Hazard statements in full</td>
<td></td>
</tr>
<tr>
<td>H225 Highly flammable liquid and vapor.</td>
<td></td>
</tr>
<tr>
<td>H315 Causes skin irritation.</td>
<td></td>
</tr>
<tr>
<td>H317 May cause an allergic skin reaction.</td>
<td></td>
</tr>
<tr>
<td>H319 Causes serious eye irritation.</td>
<td></td>
</tr>
<tr>
<td>H336 May cause drowsiness or dizziness.</td>
<td></td>
</tr>
</tbody>
</table>

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