



Material Safety Data Sheet

Bone Cement

META BIOMED CO., LTD.

1. Identification of the substance/preparation and of the company/undertaking

- Product Name	: PMMA Bone Cement
- Product Line	: NTCem, NTCem-Violet, NTCem-Yellow, NTCem-Mixer, NTCem-Spine
- Product Number	: 880638789901, 880638789902, 880638789903, 880638789904 880638789906
- Relevant identified uses of the substance or mixture and uses advised against	: Bone Cement
- Supplier	: META BIOMED CO., LTD. Head Office) 270, Osongsaengmyeong 1-ro, Osong-eup, Cheong-won-gun, Chungcheongbuk-do, Korea Tel : (82-43) 216-0433, 0434 Fax : (82-43) 216-0438

2. Hazards identification

EMERGENCY OVERVIEW

WARNING: May irritate eyes, skin and respiratory tract. OSHA classifies this material as Particulates, Not Otherwise Classified

- Primary route(s) of entry	: Eye, skin and respiratory tract.
- Eyes	: Powder and liquid components may be irritating to the eyes.
- Skin	: May cause skin irritation and sensitization. The degree of reaction may vary significantly between individuals and on the amount and duration of exposure
- Inhalation	: Powder may be irritating to the respiratory system. Liquid vapour may cause irritation of the respiratory tract, dizziness, headache and anaesthetic effects based on exposure.
- Ingestion	: Liquid components may be toxic if swallowed.
- Chronic Exposure	: Repeated exposure of high concentration levels of the liquid components may cause adverse effects on lungs, heart, kidney and liver.
- Reproductive effects	: Un known.
- Mutagenicity	: Un known



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3. Composition/information on ingredients

Information on hazardous ingredients			
Substances(Synonyms)	CAS No.	w/w %	EC Number
Poly methyl methacrylate	9011-14-7	60~90%	
Zirconium dioxide	1314-23-4	20~40	215-227-2
Barium sulfate	7727-43-7	0~20	231-784-4
Benzoyl peroxide	94-36-0	1~3	202-327-6
Methyl methacrylate	80-62-6	90~99	
N,N-Dimethyl-p-toluidine	99-97-8	<5	202-805-4

4. First aids measures

- Eye contact	: Rinse immediately with plenty of water and seek medical advice(Powder/Liquid)
- Skin contact	: Wash immediately with plenty of water and get medical attention if irritation develops or persists(Powder/Liquid)
- Inhalation	: Remove individual to fresh air and obtain medical attention(Liquid)
- Ingestion	: Seek medical advice(Powder/Liquid). Do not induce vomiting.
- General advice	: Consult a physician. Show this safety data sheet to the doctor in attendance.

5. Fire fighting measures

<u>Extinguishing media</u>	
- Suitable	: Water, Foam, Carbon Dioxide, Dry Chemical
- Not suitable	: N/A
- Special fire fighting procedures	: Avoid extinguishing methods which may generate dust clouds. Water stream can disperse dust into air, producing a fire hazard and possible explosion hazard if exposed to ignition source.
- Unusable fire/explosion hazards	: Polymer dust is combustible. The explosive limits of the polymer particles suspended in air are approximately those of coal dust. Firefighters should wear self-contained breathing apparatus.
- Hazardous thermal (de)composition products	: Methyl Methacrylate Monomer and Oxides of Carbon and Sulfur when burned.
- Protection of fire fighters	: Wear self-contained breathing apparatus and full protective gear.



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6. Accidental release measures

- **Personal precautions** : ventilate area of leak or spill. Before cleaning any spill or leak, individuals involved in spill cleanup must wear appropriate personal protective equipment. Wear appropriate personal protective equipment(e.g., goggles, gloves). Remove any contaminated clothing and wash thoroughly before reuse.
- **Environmental precautions** : Avoid discharge into water courses or onto the ground.
- **Methods for cleaning up** : Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container.

7. Handling and storage

- **Handling** : Use in well ventilated areas. Avoid contact with skin, eyes and clothing. Avoid breathing dust. Use good personal hygiene and housekeeping.
- **Storage** : Store in a cool, dry location, away from direct sunlight, other light sources, or sources of intense heat. Material should be stored in secondary containers as appropriate. Keep container closed to prevent water absorption and contamination.

8. Exposure controls/personal protection

Ingredient name	CAS no.	Reference	LT Exp8hr	Date
Dibenzoyl peroxide	94-36-0	WEL.	5mg/m3	

- **Ingredient comments** : Workplace exposure limits(WEL), UK:
Barium compounds, as Ba: LTE 10mg/m3, STE 15mg/m3
Zirconium compounds, as Zr: LTE 5mg/m3, STE 10mg/m3
If decomposed, traces of:
Methyl methacrylate LTE 208mg/m3, STE 416mg/m3
- **Appropriate engineering controls** : When working with large quantities of product, provide adequate ventilation. Ensure that an eyewash station, sink or washbasin is available in case of exposure to eyes. Use good, local exhaust at processing equipment, including buffers, sanders, grinders and polishers.
- **Respiratory protection** : Provide sufficient ventilation for operations causing dust formation. During dust-raising work: use respiratory equipment with particle filter, type P2.



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- **Skin and body** : Use suitable protective gloves if risk of skin contact.
- **Hands** : Use suitable protective gloves.
- **Eyes** : Use tight fitting goggles if dust is generated.

9. Physical and chemical properties

- Physical state : powder, liquid	- Flammability(solid, gas) : no data available
- Color : white, violet, yellow	- Solubility in water : 1.59%
- Odor : Faint odor in bulk	- pH : Not determined
- Odor Threshold : no data available	- Flash point : no data available
- Boiling point : 100.5°C	- Autoignition temperature : no data available
- Melting/freezing point : 200°C	- Upper/Lower explosion limit : no data available
- Vapor pressure : 28mmHg(20°C)	- Viscosity : no data available
- Vapor density : 0.94	- Partition coefficient: n-octanol/water : no data available
- Specific gravity(H₂O=1) : 1.25 for MMA 4.5 for BaSO ₄	
- Decomposition temp. : no data available	
- Evaporation rate : 4(butyl acetate=1)	

10. Stability and reactivity

- Stability : Stable under normal temperature conditions. Decomposes at temperatures above 160°C. Will release trace quantity of methylmethacrylate vapour on decomposition.
- Condition to avoid : Avoid exposure to high temperatures(240°C) or direct sunlight.
- Materials to avoid : Strong oxidizing agents, Aluminum, and phosphorus.
- Hazardous decomposition products : Methacrylate Monomer and Oxides of Carbon when burned.

11. Toxicological information

- Acute toxicity : Benzoyl Peroxide: LD50 Oral-Rat=7710mg/kg Barium Sulfate: LD50 Oral-Rat=307~364mg/kg Methyl Methacrylate: LC50 Inhalation-Rat=3750ppm
- Skin effects : Powder and liquid components may cause irritation and sensitisation
- Eye effects : Powder and liquid components may be irritating to the eyes.
- Health warnings : May cause sensitization by skin contact.
- Respiratory or skin sensitisation : no data available



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- **Carcinogenicity** : None
- **Germ cell mutagenicity** : This product is not reported to produce mutagenic effects in humans.
- **Reproductive toxicity** : This product is not reported to cause reproductive effects in humans.
- **Specific target organ toxicity - single exposure** : This product is not reported to produce specific target organ toxic effects in humans.
- **Specific target organ toxicity - repeated exposure** : This product is not reported to produce specific target organ toxic effects in humans.
- **Aspiration hazard** : This product is not reported about aspiration hazard.

12. Ecological information

- **Toxicity** : For polymer: There is no specific data available for this product; however, very large releases of this product may be harmful or fatal to overexposed aquatic life.
- **Persistence and degradability** : no data available
- **Bioaccumulative potential** : The product does not contain any substances expected to be bioaccumulating. No bioaccumulation expected.
- **Mobility in soil** : the product is insoluble in water.
- **Other adverse effects** : Not known.

13. Disposal considerations

- **Product** : Dispose in a landfill or incinerate according to federal, state, and local regulations.
- **Contaminated packaging** : Dispose of as unused product.

14. Transport information

- UN number : N/A	- Packaging group : N/A
- UN proper shipping name : Not dangerous goods	- Environmental hazards : No
- Transport hazard class : Flammable	- Special precautions for user : no data available
- Sea transport IMDG/GGV sea class : N/A	

15. Regulatory information

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

- Symbol(s)



- Contains : Dibenzoyl peroxide
- Risk phrases : May cause sensitization by skin contact.
- safety phrases : Avoid inhalation and contact with skin and eyes.
Wear suitable gloves.
- Chemical Safety Assessment : For this product a chemical safety assessment was not carried out

16. Other information

The information contained in the Safety data sheet is correct to the best of our knowledge at the date of issue. It is intended as a guide for the safe use, handling, disposal, storage and transportation and is not intended as warranty or as a specification. The information relates only to the product specified and may not be suitable for combinations with other materials or in processes other than those specifically described herein.

HISTORY

- Revision No. : 0
- Date previous issue : 20-06-2014
- Date of issue : 20-06-2014
- Date of printing : 20-06-2014

- Prepared by : META BIOMED CO., LTD.