

Section 1. Identification

Product Name: LBT-100 Water Based Laser Marking Material

Code: LBT-100, Water based Paste or Liquid Laser Bonding Additive

Supplier/Manufacturer: Laser Bonding Technology
5336 Vincent Avenue
Los Angeles, CA 90041

In case of emergency
CHEMTREC: 1 800 424 9300
(OUTSIDE US): 1 703 527 3887
COMPANY: 1 844 577 7772

Chemical name: Mixture of Water. Molybdenum Trioxide, Pyrophyllite and Black Pigment

Synonym: Additive/filler ceramics, paint, ink, etc.

Material uses: Laser additive bonding and marking material.

Relative identified uses of the substance or mixture and uses advised against: Not applicable

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Section 2. Hazards identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture:
CARCINOGENICITY (inhalation) -Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE)
(respiratory tract) (inhalation) - Category 1

GHS label elements:

Hazard pictograms:



Signal words: Danger Warning

Safety Data Sheet

Laser Additive Marking Material, LBT-100

Hazard statements:

May cause cancer if inhaled.

Causes damage to organs through prolonged or repeated exposure if inhaled (respiratory tract).

Dust or spray may cause eye irritation.

Precautionary Statements:

General:

Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Avoid excessive dust generation. Avoid breathing dust. Use only with adequate ventilation.

Prevention:

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Response:

Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.

Storage:

Store locked up. Store in a dry place.

Disposal:

Dispose of contents and container in accordance with all local, regional, national and international regulations. Prevent exposure to dust of product.

Hazards not

otherwise classified:

May cause mechanical eye or skin irritation in high concentrations. Product may become slippery when wet.

Section 3. Composition/information on ingredients

Substance/Mixture:

Mixture

Chemical name:

Laser Additive Marking Material or Ink

Ingredient name	CAS number	% by weight
Water	7732-18-5	50 - 55
Molybdenum Trioxide	1313-27-5	9 - 11
Hydrated aluminum silicate mineral (Substance):	Mixture	12 - 14
Quartz	14808-60-7	3 - 5
Pyrophyllite	12269-78-2	5 - 7
Mica	12001-26-2	3 - 5
Kaolin clay	1332-58-7	1 - 1.5

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First Aid Measures

Description of necessary first aid measures

Eye contact:	Flush with plenty of water for at least 15 minutes, occasionally lifting upper and lower eyelids. If irritation develops and persists, seek medical attention.
Skin contact:	Flush skin with plenty of water. Seek medical attention if irritation develops.
Inhalation:	Move to fresh air. If respiratory distress develops, seek medical attention.
Ingestion:	Unlikely to be toxic by ingestion. Rinse mouth out with water. Do not induce vomiting unless directed to do so by medical personnel. Seek medical attention if significant quantities have been ingested or symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	Molybdenum Trioxide is a potential eye irritant. May cause irritation.
Skin contact	No known significant effects or critical hazards.
Inhalation	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	Molybdenum Trioxide is a potential eye irritant. May cause irritation.
Skin contact	No known significant effects or critical hazards.
Inhalation	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treat symptomatically

Specific treatments No specific treatment.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes or dust are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Unsuitable extinguishing media: This product is not combustible.

Use an extinguishing agent suitable for the surrounding fire. No restrictions on extinguishing media for this product.

Specific hazards arising from the mixture

No specific fire or explosion hazard. This product is not flammable and does not support fire.

Hazardous thermal decomposition products

There are no hazardous decomposition products.

Special protective actions for fire-fighters

Product may become slippery when wet.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment

For emergency responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of large amounts of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small Spill: Minimize dust generation. Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor

Large Spill: Minimize dust generation.

Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water ways, basements or confined areas. Avoid dust generation.

Do not dry sweep.

Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective Measures: Put on appropriate personal protective equipment (see Section 8).

Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing.

Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

Do not store in unlabeled containers.

Use appropriate containment to avoid environmental contamination.

Recommended Storage

Store away from direct sunlight in dry conditions.

Close container after use.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Molybdenum Trioxide	OSHA PEL (United States). 3 mg Molybdenum Trioxide / m ³ , equivalent to 2 mg Mo/m ³
	TWA respirable fraction formula: 13 mg/m ³ /
quartz	ACGIH TLV (United States). TWA 0.025 mg/m ³ from respirable fraction
	OSHA PEL (United States). TWA respirable fraction formula: 10 mg/m ³ / %
pyrophyllite	SiO ₂ +2 ACGIH TLV (United States). TWA 0.025 mg/m ³ from respirable fraction
	OSHA PEL (United States). TWA: 15 mg/m ³ total dust; 5 mg/m ³ respirable
mica	dust (PNOR) ACGIH TLV (United States). TWA: 10 mg/m ³ total dust; 3 mg/m ³ respirable
	dust (PNOS) OSHA PEL (United States). TWA 3 mg/m ³ from respirable fraction
kaolin clay	ACGIH TLV (United States). TWA 3 mg/m ³ from respirable fraction
	OSHA PEL (United States). TWA 3 mg/m ³ from respirable fraction
	OSHA PEL (United States). TWA 5 mg/m ³ from respirable fraction
	ACGIH TLV (United States). TWA 2 mg/m ³ from respirable fraction

Appropriate engineering controls

Environmental exposure controls If user operations generate dust, fumes, gas, vapor or mist, use process enclosures. Local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measurers

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are

close to the workstation location.

Eye and face protection Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. Recommended: splash goggles.

Skin protection

Hand protection Protective gloves should be worn under normal conditions of use.

Section 9. Physical and Chemical Properties

Appearance

Physical state	Semi-liquid paste or Solid.
Color	Dark Grey to Black.
Odor	None
pH	6.9 [Conc.(% w/w): 10%]
Melting point	N/A
Boiling point	N/A
Flash point	Product is not combustible.
Evaporation rate	N/A
Vapor pressure	N/A
Vapor density	N/A
Relative density	Unknown
Solubility in water	Slightly
Viscosity	N/A

Section 10. Stability and Reactivity

Reactivity	Non- reactive
Chemical stability	The product is stable
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data
Incompatible materials	No specific data
Hazardous Decomposition Products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11: Toxicological information

Acute toxicity

KAOLIN CLAY: oral LD50, rat: 149 g/kg (Federation of American Societies for Experimental Biology, 1977; as cited by Cosmetic Ingredient Review, 2003). Not sufficient for classification.

Irritation/Corrosion

CRYSTALLINE SILICA: Not irritating to the skin or eyes based on OECD 404 and 405 studies, respectively (EUROSIL, 2008).

KAOLIN CLAY: Not irritating to the skin or eyes based on OECD 404 and 405 studies, respectively (European Kaolin and Plastic Clays Association, 2005).

Exposure to high levels of any dust may result in mechanical irritation of the respiratory tract, skin and eyes; not sufficient for classification.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Conclusion/Summary

CRYSTALLINE SILICA: Silica dust, crystalline, in the form of quartz is classified by IARC as Group 1 (carcinogenic to humans) based on "sufficient evidence" in occupationally exposed humans and sufficient evidence in animals. Crystalline silica of respirable size is classified by the NTP as a known human carcinogen. In its 2013 Proposed Rule on respirable crystalline silica, "OSHA preliminarily concludes that the human data provides ample evidence that exposure to respirable crystalline silica increases the risk of lung cancer among workers", while NIOSH identifies various crystalline or fused silicas a potential occupational carcinogens. However, not all epidemiologic and animal studies have demonstrated a cancer association and some uncertainty exists concerning the cancer classification of crystalline silica. For example, in Europe, a recent review concludes that crystalline silica should not be classified as a carcinogen since silicosis of the lung is the key endpoint for classification (Morfeld, 2010).

Classification

Product/ingredient	OSHA	IARC	NTP
quartz	(a)	1	Known to be a human carcinogen.
kaolin clay (b)	-	-	-

(a) OSHA does not have a set list of carcinogens or potential carcinogens, but defers to the IARC and NTP classifications. For quartz, see OSHA's qualitative statement in text above. (b) Classified by ACGIH as A4 (not classifiable as a human carcinogen).

Reproductive toxicity

Not available.

Teratogenicity

KAOLIN CLAY: No fetal effects in rats in the absence of maternal toxicity (Patterson et al, 1977).

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

KAOLIN CLAY: Inhalation of respirable kaolin clay dust can cause kaolinosiis, a form of pneumoconiosis.

CRYSTALLINE SILICA: Inhalation of respirable crystalline silica dust can cause silicosis, a form of progressive pulmonary fibrosis.

High levels of exposure to any dust may aggravate pre-existing respiratory conditions.

Section 12. Ecological information

Conclusion on the environmental classification and labelling

Molybdenum trioxide is not hazardous to the aquatic environment as:

- The lowest acute reference values for fish, invertebrates and algae are > 100 mg Mo/L.
- The lowest aquatic NOEC for these three trophic levels is > 1 mg Mo/L (i.e., 43.2 mg Mo/L for the rainbow trout).
- There is no evidence for bioaccumulation or bio-magnification in the environment.

Persistence and degradability: Molybdenum disulfide is ubiquitous in the environment and is the naturally occurring base mineral used to produce molybdenum trioxide. Molybdenum trioxide, in turn, transforms to the non-toxic molybdate species under normal environmental conditions.

Bioaccumulation potential: Available BCF/BAF data for the aquatic environment show a distinct inverse relationship with the exposure concentration. This finding demonstrates that molybdenum is homeostatically controlled by these organisms up to the milligram range of exposure. Available information on transfer of molybdenum through the food chain indicates that molybdenum does not biomagnify in aquatic food chains. Although not homeostatically controlled in terrestrial plants and invertebrates, molybdenum is not largely concentrated from soil into plants or soil to invertebrates. There is no significant concentration increase from diet to mammals or birds. It is concluded that biomagnification is not significant in the terrestrial food chain.

Mobility: Molybdate originating from molybdenum trioxide is soluble in water and with its relatively low K_d value, the molybdate ions are leachable through normal soil and are mobile in sediment. Typical log K_d-values of 3.25 and 2.94 have been determined for sediment and soil, respectively.

PBT and vPvB assessment: The PBT and vPvB criteria of "Annex XIII to the Regulation" do not apply to inorganic substances, such as molybdenum trioxide. Therefore a PBT and vPvB assessment is not required.

Other Adverse Effects: Molybdate originating from molybdenum trioxide can contribute to the onset of molybdenosis (which is a molybdenum-induced copper deficiency) in ruminants such as cattle, deer, and sheep. The level and bio-availability of copper in the animal diet are critical factors in the onset of molybdenosis. The recommended minimum dietary Cu : Mo ratio threshold to prevent

molybdenosis is 1.30, i.e. there should be 30% more copper than molybdenum in the diet. Cu & Mo content in the diet can be monitored, and if the ratio is < 1.3 then provide Cu supplements such as copper sulphate enriched feeds or copper sulphate enriched salt blocks for ruminants to use ad libitum. If there are ruminants in the vicinity of your site, identify direct and diffuse air emission sources at your site and carry out and record emission minimization measures. Have an animal health check program in place (e.g. blood tests for copper) to verify that the measures are effective. Conversely, a lack of dietary molybdenum in the human population may increase oesophageal and gastrointestinal cancers.

Molybdenum trioxide will not contribute to ozone depletion, ozone formation, global warming or acidification.

Section 13. Disposal Considerations

Note: Data in this section is voluntarily in the U.S.A. but may be required in the EU and/or other countries.

(13.1)

Waste Treatment methods: (EU) According to the European Waste Catalogue, waste codes are not product specific but application specific. Waste codes should be assigned by the user based on the application in which the product is used. Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to local laws operating in their area.

(13.1.1)

Product/Packaging disposal: Containers may still present a chemical hazard or danger when empty. Clean container sufficiently well to ensure that residuals do not remain or reuse container to store the same product, and otherwise puncture containers, to prevent re-use, and bury at an authorized landfill.

(13.1.2)

Waste treatment-relevant information: Before disposing, try to reuse or recycling if possible. Where possible retain label warnings and SDS and observe all notices pertaining to the product. User should investigate reduction as a method. 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. Disposal to a sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority. Observe all label safeguards until containers are cleaned and destroyed.

Section 14. Transportation Information

UN number: Not Dangerous for Transport

UN proper shipping name: Not Dangerous for Transport

Transport hazard class: Not Dangerous for Transport

Packing group: Not Dangerous for Transport

Environmental hazards: Not Dangerous for Transport

Special precautions for user: Not Dangerous for Transport

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not Dangerous for Transport

Section 15. Regulatory Information

U.S. Federal regulations

United States inventory (TSCA 8b) All components are listed or exempted.

SARA 302/304

No products were found.

Composition/information on ingredients

SARA 311/312

Classification: Delayed (chronic) health hazard

State regulations

The following components are listed: SILICA, CRYSTALLINE, QUARTZ; mica; Kaolin

Massachusetts The following components are listed: SILICA, CRYSTALLINE, QUARTZ; mica; Kaolin

New York None of the components are listed.

New Jersey The following components are listed: SILICA, QUARTZ; QUARTZ (SiO₂); mica; KAOLIN

Pennsylvania The following components are listed: QUARTZ (SiO₂); Kaolin

California Prop. 65 WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

International regulations

International lists All components are listed or exempted.

Section 16. Other Information

Key to abbreviations

ATE = Acute Toxicity Estimate

BCF = Bioconcentration Factor

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

IATA = International Air Transport Association

IBC = Intermediate Bulk Container

IMDG = International Maritime Dangerous Goods

LogPow = logarithm of the octanol/water partition coefficient

MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

UN = United Nations

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