

MATERIAL SAFETY DATA SHEET

SECTION 1: Product and Company Identification

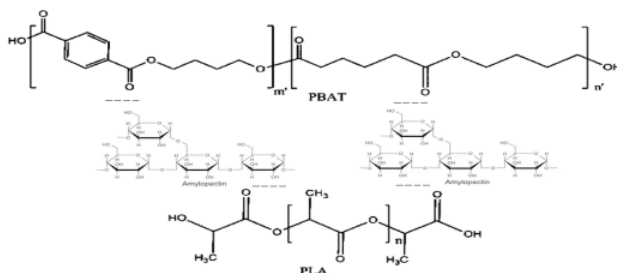
Product Name: MB230

Company Name: Green Whale Global Co.,Ltd.

Company Add: 2F, 650 Eonju-Ro Gangnam-Ku Seoul, Korea.

PhoneNumber: +82 3447 8801

Email: green@greenwhaleglobal.com



Formula:

SECTION 2: Composition /information on ingredients

Material
Bio Co-polyester in form of granular
Cassava starch in form of powder from cassava vegetal
Glycerine Vegetable oil (from modified Castor Vegetable oil in form of liquid)
Acrylic acid based copolymer in form of granular
Poly-caprolactone in form of granular

SECTION 3: Hazards Identification

EMERGENCY CASE: skin burned when contacted with melted product

MEDICAL POTENTIAL EFFECT: At processing temperatures above 325 deg C, fumes irritating to the eyes, nose and throat may be evolved. Exposure may result in redness, itching and tearing of the eyes and soreness in the nose and throat together with coughing.

SKIN CONTACT: No data are available. However, based on experience with handling these polymers, no unusual dermatitis problem is expected from routine handling. Molten polymer contacting the skin will cause thermal burns.

EYE CONTACT: Mechanical irritation only.

INGESTION: Not a probable route of exposure. Toxicity is predicted to be low.

CANCER EFFECT: No data are available

SECTION 4: First Aid Measures

First Aid

INHALATION: If exposed to fumes from overheating or combustion, move to fresh air. Consult a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

SKIN CONTACT: The compound is not likely to be hazardous by skin contact but cleansing the skin after use is advisable. If molten material gets on skin, cool rapidly with cold water. Do not attempt to remove material from skin. Obtain medical treatment for thermal burn.

INGESTION: If vomiting occurs, keep head lower than hips to prevent severe nausea. Consult a physician if necessary.

SECTION 5: Fire Fighting Measures

Flammability

- Ignition point: Not applicable
- Method used: Not applicable
- Flammable limits:

LEL: Not applicable

UEL: Not applicable

Dust air mixtures may ignite or explode, so the dust should not be stored to avoid any potential hazards that may cause the toxic dust caused by explosions

- **Fire Extinguishing media:** Water spray, foam making regular, dry chemical or carbon dioxide.
- **Guidelines for fire:** Bring all the equipment including a tunnel positive pressure self-contained breathing apparatus in any closed the fire space

SECTION 6: Accidental Release Measures

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Spill Clean Up

Sweep up to avoid slipping hazard.

SECTION 7: Handling and Storage

Handling: Care of processing of melting polymer, use protective gloves and safety glasses. Avoid contact with eyes. Avoid breathing dust. Container transport using mud and soil when transferring material to prevent dust explosions. Minimize the layer and dust accumulation

Storage: Preserved in a dry place away from ignition sources and excess heat.

SECTION 8: Exposure Controls/Personal Protection

Airborne exposure limits: None

Ventilation System: In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Personal respirators (NIOSH approved): For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (E.g. Lubricants, cutting fluids, glycerin, etc...) are present, use a NIOSH type R or P filter.

For emergencies or instances where the exposure levels are not known, use a full face positive pressure, air-supplied respirator.

Warning: air-purifying respiration does not protect workers in oxygen-deficient atmosphere.

Skin protection: wear protective gloves and clean body-covering clothing.

Eye Protection: use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 9: Physical and Chemical Properties

Product's Parameter	Description
Main components	Bio-polyester
Starch and bio-based content	~ 50% wt
Morphological	Light yellow circular cylinder pellets
Smell	Light smell of starch, no irritation
Density follows ASTM D792 standard	~ 1,15g/cm ³
Humidity at 150°C, measured in 3h	~ 0.12 %
Toxicity	Non-toxic (following part 313, title III of changed Amendments and Re-authorization law 1986 and 40 CFR part 372)
Processing temperature	150- 175°C
MI, 190 ⁰ C, 2.16kg	2.8-3.4 g/10 minutes

Carbon dioxide (CO ₂) generated	1433 mg/g compared with 3260mg/g of polyolefin
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SECTION 10: Stability and Reactivity

STABILITY: stable under ordinary conditions of use and storage

HAZARDOUS DECOMPOSITION PRODUCTS: sulfur or its oxide may form when heated to decomposition.

HAZARD POLYMERIZATION: not occur

CONDITIONS TO AVOID: no information found

SECTION 11: Toxicological Information

Material is not known to contain Toxic Chemicals and Heavy Metal under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986

Metals	Limit (ppm)	Content in sample (ppm)
Ti	44	9
Cd	<18	Not detected
Zn	250	6
Fe	21	3
Cr	<8	Not detected
Cu	24	3
Co	9	3.5
Pb	<1.8	Not detected
Sr	10.4	0.5
Hg	<1	Not detected
As	2	0.2
Cr	<0.6	Not detected

SECTION 12: Ecological Information

Environmental fate: no information found

Environmental toxicity: no information found

SECTION 13: Disposal Considerations

Waste Services: Handling, transport, storage and disposal must comply with laws and regulations, state / provincial and local application.

SECTION 14: Transport Information

Shipping Information
DOT

Proper Shipping Name: NA
Hazard Class: Not regulated

SECTION 15: Regulatory Information

Chemical weapons: none
Poison schedule: none

SECTION 16: Other Information

NFPA Rating: health:1 Flammability: 0 Reactivity: 0

Label Hazard warning: Caution! May cause irritation to skin, eyes, and respiratory tract. May be harmful if swallowed or inhaled.

Label precautions: Keep container closed. Use with adequate ventilation, avoid breathing dust.