(Complies with ISO 11014-1)

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MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Product name	**PETLIN LD** *
Product code	PE-LD
Chemical name	Polyethylene (low density)
Manufacturer	PETLIN (MALAYSIA) SDN BHD Level 16, Tower 1, PETRONAS Twin Towers, Kuala Lumpur City Centre, 50088 Kuala Lumpur, MALAYSIA
Emergency telephone number	(60) 9 8305373

* Trade name of PETLIN (MALAYSIA) SDN BHD

2. Composition/Information on Ingredients

This chemical product is a preparation

Common chemical name	Low Density Polyethylene
Formula	$(-CH_2 - CH_2-)_n$
Generic name	Polyolefines
CAS number	9002-88-4
Synonym(s)	LDPE
Components contributing to the hazard	None

3. Hazards Identification

Specific hazards:

Inhalation	When/if inhaled, fines may cause mechanical irritation of the respiratory tract ; Coughing
Skin contact	Material is unlikely to cause irritation, but if contact with molten material occurs, treat as for thermal burn (see Section 4)
Eye contact	Fines can cause mechanical irritation; Red eyes.
Ingestion	No hazard

The material is not classified as being a dangerous preparation according to the EEC-Directive 88/379 and the subsequent amendments (see Section 15).

R(isk) phrases: Not applicable

4. First-Aid Measures

Inhalation	When fumes of molten material have been inhaled : - move person to fresh air as quickly as possible - rest in half upright position

- loosen clothing
- keep warm

In case of respiratory problems move person to first aid station for medical treatment.

Skin contact

Any molten material on the skin/burns be cooled (off) as quickly as possible by means of cold water. Cover the wound with sterile cloth and move person to first aid station or hospital for medical treatment.
Attention : never pull off the molten material from the wound.

Eye contact

Any material entering the eye should be flushed out with copious volumes of water.

Ingestion

No danger of toxicity, this material is biologically inactive (see Section 11).

5. Fire-fighting Measures

Extinguishing media: Water, water/foam, CO_2, ABC fire extinguishing powder.

On fire	*Extinguishing medium*	*Method*	
Processing plant	Polymer	Water/foam	Spray cooling
	Equipment	CO_2	CO_2 snow extinguisher
		ABC powder	ABC powder extinguisher
Storage	Bags	Water,	Spray cooling
	Bulk silo	Water/foam	Fire hose jet
		Cooling with water	
Transport	Lorry / pallets	Water,	Spray cooling
	Bulk car	Water/foam	Cover fire side
		Water/foam	

Not to be used for reasons of safety: Not applicable

Specific Hazards :

Solid

Treat the material as a solid that can burn. Moulded parts or solid granules generally burn slowly with a low smoke density and flaming drips, carbon monoxide and irritating oxygen containing organic substances are released.

Product fines

A spark can ignite an explosive concentration of product fines in air (see Section 7 and 9).

Vapours

Hot vapours - from heated material - plus air can be extremely inflammable in the case of stochiometric mixtures.

Combustion products

No harmful additives are present with respect to the material (see Section 10).

Protection for the fire-fighters

Does not approach fire in confined space without positive pressure self contained breathing apparatus and full bunker gear: bunker coats, helmets with face shield, gloves, rubber boots.
Note: Cool fire exposed containers with water.

6. Accidental Release Measures

Personal precautions

Apply ample grounding with respect to dust explosion danger caused by released dust (see Section 7). Protection of skin/ eye/ hand (see Section 8).

Environmental precautions

For disposal considerations

Cleaning up methods

Shovel or sweep up, use special industrial vacuum cleaner to suck possible fines/dust. Avoid generating dust clouds. Put into

containers for reclaiming or disposal.

7. Handling and Storage

Handling Precautions

General precautions	For safe polymer processing the material should be completely dry.
Personal protection	For more information on personal protection when handling the material (see Section 8).
Hygiene measures	Adequate washing facilities, with supplies of mild soap and hand cleanser should be available at all working locations. Solvents should never be used as hand cleansers. Smoking, eating and drinking in working and storage areas should be prohibited.

Technical measures

Ventilation: general mechanical	A ventilation system should be installed where: - melt processing of the material is carried out; - solid material is being grinded or machined; - any high temperature processing is carried out (e.g. Sealing)
Ventilation: local exhaust	It is advised to install local exhaust ventilation in the vicinity of processing machines.
Prevention of dust generation	*Suppression*: optimize the piping system used for pneumatic transport (surface, corners, length, velocities) *Filtering*: take extreme care of dust explosion danger and apply local grounding where the presence of fines plus static electricity in or near the pneumatic transport lines is very likely. Note: When handling the granulate normally dust will not be a problem with respect to breathing. During regrinding operations the use of a dust mask is advised.
Prevention of fire and explosion	See 'Storage' under this section.

Storage

Technical measures	Owing to the electrostatic properties of the material and its fines a grounding installation for storage silos and pneumatic transport is obligatory. Other ways of prevention with respect to electrostatic hazards are: inerting i.e. Lowering oxygen concentration by means of nitrogen supply, control of transport speed, etc.
Storage conditions	Avoid prolonged storage in open sunlight, high temperatures and/or high humidity as this could well speed up alteration and consequently loss of quality of the material and this could lead to unforeseen dangers. Keep polymer completely dry for good processing (in spite of increased static danger). Stack pallets only two high when storing, in order to prevent collapsing. Slip agent containing material should only be stacked two high after checking the integrity of the packaging.
Incompatible products	Not applicable

8. Exposure Controls & Personal Protection

Control parameters	Threshold Limit Value (TLV): a provisional TLV (TWA 8 hours) is advised in accordance with the TLV of non-toxic nuisance dust: - 10 mg/m^3 for inhalable dust - 5 mg/m^3 for respirable dust.

Personal protection equipment:

Respiratory protection	When TLV is accidentally exceeded (see Section 7 : Prevention Dust Generation)
Hand protection	When handling a hot melt, heat resistant gloves should be worn (e.g. When purging a processing machine).
Eye protection	When handling a hot melt, heat resistant face shields should be worn (e.g. When purging a processing machine).
Skin and body protection	The use of apron, boots and /or full protective suit is not prescribed here; it is up to the decision of the processor.

9. Physical and Chemical Properties

Polymer Properties:

Physical state	Solid (at +20^{o}C)
Form	Granulate
Colour	Colourless, natural opaque
Odour	Weak paraffinic
pH value	Not applicable
Relative density	915-935 kg/m^3
Bulk density	550-630 kg/m^3
Melting point/range	104-115^{o}C
Softening point/range	83-98^{o}C
Viscosity	Not applicable
Boiling point/range	Not applicable
Vapour pressure	Not applicable
Vapour density	Not applicable
Evaporation rate	Not applicable
Solubility in water	Insoluble
Solubility in other substances	Soluble only in some aromatic hydrocarbons and/or n-paraffines (>C_{14}) at high temperatures.
Partition coefficient (n-octanol)/water)	Not applicable
Miscibility	Not applicable
Volume conductivity	Low, danger of static charges

Safety Properties:

Decomposition Temp.	>300 ^{o}C
Flash point	>360 ^{o}C
Auto Ignition Temp.	>360 ^{o}C

Dust Explosive Properties:

Lower Explosion Limit (LEL)	Mandatory to remain <10 g/m^3 air (fines)
Minimum Ignition Temp.	410 ^{o}C
Dust Explosion Class (st)	St 1 (fines)

10. Stability and Reactivity

The material is chemically unreactive. Under certain conditions however hazardous reactions can take place.

Conditions to avoid:

Material fines	Material fines - accidentally released in air - can result in an explosive concentration (see Section6, 7 and 9).
Electrostatic loading	For information on safety measures regarding electrostatic loading see : Section 7 : Technical Measures : Prevention of dust generation
Dust/powder air mixtures	-

Gas/vapour air mixtures	At high temperatures (local hot spots) inerting should possibly be applied in order to strongly reduce oxygen concentrations. Stabilisation of the polymer results in inflammable gasses being formed only a higher than usual temperatures. Great care should be taken to process the material at moderate temperatures (i.e. well below +350^{o}C) in order to avoid explosive vapour/air mixtures.
Processing temperatures	Do not exceed 320^{o}C
Long term exposure	Do not expose for long period to temperatures above 80^{o}C. Do not expose to UV-light (see Sction 7).
Materials to avoid	Strong oxidising agents.
Hazardous decomposition	At processing temperatures some degree of thermal degradation will occur. Although highly dependent on temperature and environmental conditions a variety of decomposition products may be present in small amounts, ranging from simple inflammable hydrocarbons (e.g. Methane, propane) to toxic and/or irritating gases (e.g. Carbon monoxide, carbon dioxide, acids, ketones, aldehydes).
Changes in physical appearance :	Dust (and powder) fines can cause extremely dangerous situations compared with base material (see Section 6, 7 and 9). There is possibility of degradation to unstable products under normal circumstances. Only at extreme temperatures(above the decomposition temperature) degradation will occur.
Stabilization	None

11. Toxicological Information

Acute toxicity	None (LD_{50} oral rat>5000 mg/kg)
Local effects	None
Chronic toxicity	None
Sensitization	None
Specific effects (carcinoginity, mutagenicity, teratogenicity, narcosis)	None

12. Ecological Information

Mobility	None
Persistence/degradability:	Very low UV degradability
Bioaccumulation	None
Ecotoxicity:	There is no indication that this material is a risk to the environment.
Aquatic toxicity:	Insoluble non toxic solid material (no water hazard)

13. Disposal Considerations

This material - as well as the packaging there off - present no danger regarding toxicological and/or ecological considerations. It can be burnt in a controlled way or be disposed of via landfill, or it can be recycled for - possible less critical - non food applications.
Note: Additional national or regional provisions may be in force within this matter.

14. Transport Information

General precautions	Keep the material dry during transport
Special precautions	No special precautions have to be met. This material is not classified according to the recommendations of the UN (10th Edition) on the transport of dangerous goods.
GGVSee/IMDG-code	Not applicable
ICAOTI	Not applicable
IATA-DGR	Not applicable
RID/ADR	Not applicable
UN-number	Not applicable
GGVE/GGVS	Not applicable
ADNR	Not applicable

15. Regulatory Information

Labelling according to EC directive 88/379/EEC and subsequent amendments is not required.
According national legislation may be in force in this matter.

EC classification No dangerous preparation

16. Other Information

Recommend applications	Packaging, industrial
Technical information	For information on material safety contact: PETLIN (MALAYSIA) SDN BHD Level 16, Tower 1, PETRONAS Twin Towers Kuala Lumpur City Centre 50088 Kuala Lumpur MALAYSIA Tel : (60) 3 20517908 Fax : (60) 3 20519229