

**MATERIAL SAFETY DATA SHEET**

Product: Polyethylene

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**1. Product and Company Identification**

Product Name	Polyethylene
Internal Identification code of the product	LDPE, MDPE, MLDPE, LLDPE, HDPE
Address	<p>Braskem S.A.</p> <p><b>Braskem S.A. - Unidade Triunfo</b>            BR 386 - Rodovia Tabai canoas, Km 419 s/n° Via Contorno 1216 - Polo Petroquímico - Triunfo Rio Grande do Sul - Phone: (0xx51) 457-5400 Fax: (0xx51) 457-1336</p> <p><b>Braskem S.A. - Unidade Polietileno Camaçari</b>            Rua Eteno, 1582 Pólo Petroquímico - Copec 42810-000 Camaçari - BA Brasil Tel. (0XX71) 3634-3700 Fax (0XX71) 3634-3797 / 3811 / 3819</p> <p><b>Braskem – Polialden Petroquímica S.A.</b>            Rua Hidrogênio, 3520 Pólo Petroquímico - Copec 42810-000 Camaçari - BA Brasil Tel. (0XX71) 3632-6460 Fax (0XX71) 3632-1266</p> <p><b>Braskem S.A. – Commercial Office</b>            Av. das Nações Unidas, 4777 05477-000 - São Paulo - SP Phone: (11) 3443-9000 Fax: (11) 3023-0415</p>
Company Phone	(11) 3443-9000
Emergency Number	(51) 457-5400
Fax	(51) 457-1084

**2. COMPOSITION / INFORMATION ON INGREDIENTS**

Substância:	<i>Polyethylene Resin</i>
Chemical Name	Low Density Polyethylene, Linear Low Density Polyethylene, Medium Density Polyethylene, Medium Linear Density Polyethylene, High Density Polyethylene
Synonym	LDPE, MDPE, MLDPE, LLDPE, HDPE
CAS Number	009002-88-4 (homopolymer) ; 25087-34-7 (ethylene -1- butene copolymer) 25213-02-9 (ethylene -1- hexene copolymer)
Ingredients that contribute to hazard	Not applicable. Inert substance.

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**3. HAZARDS IDENTIFICATION**

Important hazardous effects	Stable product. It doesn't offer hazard in its normal handling and storage state
Product effects	The product is harmless to human contact and non-biodegradable. It can be reused in case of loss if not contaminated by any other external agent. It does not present specific hazard.
<ul style="list-style-type: none"> <li>• Health effects</li> </ul>	The product does not offer risks in its normal state. It should not be swallowed. Combustion and decomposition may produce hazardous fumes. Avoid breathing dust or vapor. Hot or molten material can cause thermal burns if in contact to the skin. In powder form, may cause mechanical irritation if in contact to the eyes.
<ul style="list-style-type: none"> <li>• Environmental effects</li> </ul>	Non-biodegradable product. It can be packed and reused if necessary.
<ul style="list-style-type: none"> <li>• Physical and Chemical Hazards</li> </ul>	<p>No risks to operators have been reported when handling the product in room temperature conditions. Protection equipment is not required during handling due to the non-chemical reactivity characteristics of the product</p> <p>When in direct combustion, it generates flames, produces water, carbon dioxide and in lack of oxygen it also generates carbon monoxide. The products from fire are irritant and toxic. High combustion temperatures (from 400°C to 700°C) can form other products such as; aldehydes and hydrocarbonates.</p> <p>Fine powder may become a dust explosion hazard if suspended in air.</p>
<ul style="list-style-type: none"> <li>• Specific Hazards</li> </ul>	NA – Inert Substance.
Chemical Product Classification	Product not classified as hazardous by UNO
Emergency Overview	The product is not flammable in normal conditions, but it may ignite when in direct contact with flames. In case of fire, evacuate all personnel from affected area and follow the procedures of item 4 – First Aid Section

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**4. EMERGENCY AND FIRST AID PROCEDURES**

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## First Aid Procedures:

- Inhalation: The material is not expected to present inhalation hazard in normal temperature conditions. Overheating can produce fumes such as; propene and ethene monomers, low molecular weight polymers and their products of oxidation. Very low levels of other products such as, aldehydes and acids may be generated. At processing, natural ventilation or local exhaust are recommended in the working area.
- Skin Contact Risks not known when the material is in room temperature conditions. Contact with overheated material will cause thermal burns.
- Eyes Contact Health hazards are not known. Mechanical irritation may be caused. In this case, immediately flush eyes with water (abundantly). Safety glasses are recommended in the working area.
- Ingestion Chemical products should not be ingested. No adverse health effects are expected from ingestion of polyethylene resins. However, it may cause throat obstruction when swallowed. In case of accidental occurrence, get medical attention.

**5. FIRE FIGHTING MEASURES**

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- Appropriate extinguishing media In case of fire, evacuate all personnel from affected areas. Observe fumes from burning material. In combustion, Polyethylene produces class A fire which should be extinguished with water spray, foam, dry chemical or Carbon Dioxide (CO<sub>2</sub>).
- Fire Fighters Protection Fire fighters and others exposed to products of combustion should wear full protective clothing including Self-Contained Breathing Apparatus (SCBA). Personnel without this protection should evacuate the area to prevent exposition to fumes. In confined or non-ventilated areas SCBA should also be used for cleaning the area after fire fighting.
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**6. ACCIDENTAL RELEASE MEASURES.**

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## Personal Precautions

- Sources of Ignition Removal: Sources of ignition should be removed from contact with resin provenient from spilling or release.
- Dust Control Polyethylene is commercialized as pellets. The use of masks is not necessary. However, when consumed in dust form, protecting masks approved by MTE (Brazilian work and employment organization) should be used.
- Exposure Controls (inhalation, skin, eyes and mucus): Already described in item 4 – First Aid Mesures.

## Environment Protection

If possible, stop leaking. Keep the product away from public sewer system and waterways.

## Cleaning Methods

Clean up by vacuuming or wet sweeping for reusing or disposal.

- Waste Disposal

Landfill or incineration in compliance with federal, state and local regulations. According to NBR – 10004 (solid remains classification by ABNT) polyethylene resins are not considered hazardous for disposal. When incinerated attention to gas produced.

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**7 HANDLING AND STORAGE**

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## Handling:

- Technical Measures:
  - Prevention of Personal Exposition Natural ventilation is required and respiratory protection is not necessary if pellets are being handled. If the product is in its powder form, avoid inhalation of the dust generated by the powder. Inspect handling system regularly for possible accumulation of dust. Eating or drinking in the areas where the product is handled should be avoided.
  - Prevention of Fire and Explosions: The product is not flammable but it may ignite when in contact with flames.
  - Safe Handling: Protective gloves are required when handling hot material during product processing. Safety glasses are recommended in all working areas. Do not smoke where polymer dust is present.

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| <ul style="list-style-type: none"> <li>• Safe Handling Orientation:</li> </ul>                                    | <p>Not Applicable. The products is inert and it doesn't present incompatibility with other products.</p>   |
| <p>Storage:</p>   | <p>Maximum storage period: 15 months</p>   |
| <ul style="list-style-type: none"> <li>• Appropriate Technical Measures:</li> <li>• Storage Conditions</li> </ul> | <p>Not Applicable</p> <p>The products should be stored in cool, well-ventilated area away from sun rays.</p>   |
| <ul style="list-style-type: none"> <li>• Adequate:</li> </ul>   | <p>It is recommended the storage of 55 sacks on each wood broad bench (1.375 tons) in pallets with appropriate devices for moving. The limit of two piled up pallets should be observed.</p> |
| <ul style="list-style-type: none"> <li>• Incompatible Materials and Products:</li> </ul>                          | <p>Store away from concentrated acids, chlorinated solvents and aromatic compounds.</p>  |
| <ul style="list-style-type: none"> <li>• Safe Package Materials:</li> </ul>                                       |  |
| <ul style="list-style-type: none"> <li>• Recommended:</li> </ul>  | <p>Polyethylene resin is an inert material and can be packed in polyethylene bags</p>  |

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Appropriate Individual Protection:

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| <ul style="list-style-type: none"> <li>• Respiratory Protection:</li> </ul>   | <p>None under normal processing if ventilation is adequate. If in powder form, approved half-face respirator is recommended.</p> |
| <ul style="list-style-type: none"> <li>• Eyes Protection:</li> </ul>          | <p>Safety glasses are recommended in any work area.</p>  |
| <ul style="list-style-type: none"> <li>• Skin and Body Protection:</li> </ul> | <p>Gloves are required when handling hot polymer.</p>  |

Hygiene Measures:

Eating and drinking should be avoided in the areas where the product is being handled.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Appearance:	Pellets shape or powder
Color :	Translucid or white
Odour :	Odourless or candle-like smell
pH :	Not Applicable
Specific teperature that may change the product physical state.	Melting Point 90°C – 120°C
Fulgurating Point	Not applicable

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Ignition Point:	350°C
Explosion Limits:	Not available
Density:	0,913 – 0,964 g/cm <sup>3</sup>
Solubility in water:	Insoluble
Solubility in other solvents:	Xylene

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**10 STABILITY AND REACTIVITY**

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Specific conditions:

- Instability: Polyethylene resins are stable. Depolymerization not observed.
- Hazardous Reactions: Not Applicable

Incompatible Materials or Substances:	Degradation of Polyethylene may result from the contact with certain chemical products such as; concentrated acids, chlorinated solvents or aromatic compounds. Changes in molecular structure may occur if the product is overheated, exposed to radiation like in long sun light exposition.
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Hazardous Products from Decomposition:	The products that result from polyethylene resins combustion should be considered toxic. Carbon Monoxide, which is asphyxiating, may be produced.
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**11. TOXICOLOGICAL INFORMATION**

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Information according to different exposition media:	Polyethylene does not appear to possess any toxicological properties. Carcinogenic, mutagenic, teratogenic, embriotoxic, toxic ar any other specific effects are not known.
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**12. ECOLOGICAL INFORMATION**

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Environmental Effects: Non pollutant and non biodegradable product. Effects on nature due to bioaccumulation are not known.

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**13. DISPOSAL CONSIDERATIONS**

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Disposal Methods:

- Product : Waste disposal in landfills or incineration in compliance with federal, state and local regulations. For waste disposal, polyethylene resins are not classified as hazardous according to NBR-10004 (ABNT). Dispose in accordance to federal, state and local laws. When incinerated observe gas generation.
  - Product Remains: Follow the same treatment of waste disposal methods.
  - Package to be used: Polyethylene bags should be reused in the working area, products transportation or recycled by specialized companies. Big Bag packages should be returned to Braskem.
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**14. TRANSPORT INFORMATION**

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National and International Regulations: For domestic transportation, polyethylene resins are not classified as hazardous by Brazilian Transportation Organization. According to UNO resolutions and to "Regulamentação do Transporte Rodoviário de Produtos Perigosos" (Regulation for Road Transportation of Hazardous Products), approved by law nº 96044/88, polyethylene is not considered hazardous.

Special Precaution Measures for Transportation: Loading should be protected to avoid humidity and product leaking.

Please consult the regulations of the importing country.

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**15. REGULATORY INFORMATION**

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Regulations: There are no specific regulations applicable to polyethylene resins.  
All the ingredients of this product comply with TCSA Inventory Regulations.

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**16. OTHER INFORMATION**

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Complementary Information: Risk Codes:  
– NFPA (1)  
– HMIS (2)  
– Health Risk 0  
– Flammability Risk 1  
– Reactivity Risk 0

Information Source: National Fire Protection Association (USA)  
Hazardous Materials Identification System, National  
Paint and Coatings Association (USA)

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