SAFETY DATA SHEET

Product: Ultra High Molecular Weight Polyethylene – homopolymer
Revision Number: 05 Date: 10.26.2015

1- IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND COMPANY/UNDERTAKING

Product name: Idealis500, UTEC3040, UTEC3041, UTEC4041, UTEC5040, UTEC5041, UTEC6540, UTEC6541, UTEC6540G, UTEC3040WS, UTEC6540WS, UTECMMG, UTECMMG – 3, UTECMMG – 6, IDEALISMMG, UTEC6549, IDEALIS509, IDEALIS509, UTEC4040, UTEC5041F

Company: BRASKEM
Address: Centro Prod. PE2 Camaçari
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CEP 42810-280 Camaçari – BA - Brazil
Telephone number: 55(71) 3413-3800

2- HAZARDS IDENTIFICATION

Most important hazards: Not classified as hazardous.

Product effects
Adverse effects to the human health: Dust may cause respiratory irritation if inhaled.

Environmental effects: Product is persistent at aquatic environment, may cause long-term effects; however it does not fit as chronically hazardous to the aquatic environment according to GHS criteria.

Physical and chemical hazards: Not classified as physical hazards.
Classification of the substance or mixture: Not classified as hazardous.

Label elements according to Regulation 1272:2008 (GHS)
Symbol: Not applicable.
Signal word: Not applicable.
Hazard Statement: Not applicable.
Precaution Statement: Not applicable.
3- COMPOSITION/INFORMATION ON INGREDIENTS

Substance
Chemical name: Ethylene homopolymer
Synonyms: Ultra High Molecular Weight Polyethylene, UHMWPE
CAS n°: 9002-88-4
Ingredients or impurities that contribute to the hazard (%m): It does not have ingredients or impurities that contribute to the hazard classification.

4- FIRST-AID MEASURES

Inhalation: In case of inhalation of dusts or vapors at high temperatures, remove the victim to fresh air and keep it in rest. Seek medical attention. Take this SDS.
Ingestion: Rinse the victim's mouth with plenty of water. DO NOT INDUCE VOMITING. Seek medical attention. Take this SDS.
Skin contact: No health risks concerning skin contact at room temperature. In case of contact with the hot product and if irritation happens, wash with plenty of water. Remove clothing impregnated with the product. Seek medical attention. Take this SDS.
Eye contact: Wash with running water for at least 15 minutes, keeping the eyelids open. Remove contact lenses if that is the case. Seek medical attention. Take this SDS.

Most important symptoms and effects, both acute and delayed: In case of dust formation and inhalation, may cause cough and sneezing.
Indication of any immediate medical attention and special treatment needed: Avoid contact with this product while helping the victim. Keep the victim in rest and warm. Do not provide anything to an unconscious person. The symptomatic treatment should include, above all, measured of support as correction of hydroelectrolytic and metabolic disturbances and respiratory
5- FIREFIGHTING MEASURES

Fire Extinguishing Media: CO₂, dry chemical powder, foam or water mist.

Special hazards arising from the substance or mixture: When in a fire, may produce irritating and toxic gases like carbon monoxide and dioxide. When heated produces respiratory sensitizers gases and/or fumes.

Advice for firefighters: Cool closed containers with pulverized water. Firefight at safe distance. Evacuate area. Use self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

6- ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Control of dust: Apply ventilation or exhaust system, mist or other proper procedure.

Removal of ignition sources: Product is not flammable. Ignition sources should be removed preventively.

Provision of sufficient ventilation: Use in a well ventilated area.

Prevention of inhalation and skin, mucous membranes and eyes contact: Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation and contact with eye. Use appropriate personal protective equipment as indicated in – Section 8.

Environmental precautions: Do not let this chemical enter the environment (soil, waterways and groundwater). Do not dispose directly on the environment or the sewer.

Methods and material for containment and cleaning up: Use a vacuum cleaner to collect the residue or another method that does not generate dust. Place the material into appropriate containers and remove to a safe place.

7- HANDLING AND STORAGE

Precautions for safe handling: Handle in a well ventilated area or with a general system of local ventilation/exhaustion. Avoid dust formation. Avoid contact with eyes and clothing; avoid breathe dust of the product. Remove ignition sources and heat. Do not smoke. Use exposure control measures and personal protective equipment as indicated in Section 8.

Hygiene advice: Do not eat, drink or smoke when using this product. Wash hands before
eating, drinking, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities:
Keep the product in its original packaging and in a cool, dry, safe from direct sunlight and fireproof place. Keep the containers tightly closed. Keep away from food. Keep away from children.
Incompatibilities: fluorine, strong acids, strong oxidizers.

Packaging materials:
The polyethylene resin, being an inert material, can be packaged in 25kg bags and big bags.

8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Specific control parameters

- Occupational exposure limits:

<table>
<thead>
<tr>
<th>Chemical or common name</th>
<th>TLV – TWA (ACGIH, 2014)</th>
<th>PEL – TWA (OSHA)</th>
<th>REL – TWA (NIOSH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulates not otherwise regulated/classified</td>
<td>10.0 (mg/m³)</td>
<td>15.0 (mg/m³)</td>
<td>10.0 (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>3.0 (resp)</td>
<td>5.0 (resp)</td>
<td></td>
</tr>
</tbody>
</table>

- Other limits and values:
  - Polyethylene homopolymer:
    OEL – STEL (Russia) – 10mg/m³.

Appropriate engineering controls:
Provide mechanical ventilation or direct exhaustion to the external media. It is recommended safety shower and eye bath available near work site. The engineering controls measures are the most effective to reduce exposure to the product.

Individual protection measures, such as personal protective equipment

Eye/face protection: Protection goggles against dust. Avoid using contact lenses while handling this product.

Skin and hand protection: Natural rubber protective gloves. Suitable protective suit.

Respiratory protection: Respiratory protective equipment with filter against dust.

Thermal hazard: Complete air-ventilated suit, with air supply, or any thermo-resistant clothing available.

Environmental exposure controls:
Do not discharge directly into the environment or into the sewer system. The dilution water from fire fighting can cause pollution.
9- PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Translucent/ white powder</td>
</tr>
<tr>
<td>Odor</td>
<td>Not available.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not available.</td>
</tr>
<tr>
<td>pH</td>
<td>Not available.</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flashpoint</td>
<td>341°C*</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability</td>
<td>Non flammable.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapour density (Air=1)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapour Pressure (mm Hg)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.920 – 0.935g/cm³</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in water. Soluble in organic solvents.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>14.04 (estimated)</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>362.0°C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not available.</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not available.</td>
</tr>
<tr>
<td>Other information:</td>
<td>Maximum time of storage of UHMW is 30 months after production.</td>
</tr>
</tbody>
</table>

10- STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>Stable under normal conditions of handling and storage. Does not undergo depolymerization.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions:</td>
<td>Reacts violently with fluorine.</td>
</tr>
</tbody>
</table>
Incompatible materials: Fluorine, strong acids, strong oxidizers.
Conditions to avoid: High temperatures. Incompatible materials.
Hazardous decomposition products: Carbon monoxide and dioxide and other irritant chemical substances.

11- TOXICOLOGICAL INFORMATION
Acute toxicity: Non-toxic product.
LD₅₀ (oral, rats) > 8000mg/Kg
Skin corrosion/irritation: Not irritating.
Serious eye damage/irritation: Not irritating.
Respiratory or skin sensitization: In epidemiological studies, showed a very low skin sensitization potential (one subjects between 201 studied subjects)
Germ cell mutagenicity: There are not known germ cell mutagenicity effects.
Carcinogenicity: Not classifiable as carcinogen to humans (group 3 IARC)
Reproductive toxicity: There are not known reproductive toxicity effects.
STOT – single exposure: At dust form, may cause respiratory irritation with cough and sneezing.
STOT – repeated exposure: There are not known repeated exposure effects.
Aspiration hazard: There are not known aspiration effects.

12- ECOLOGICAL INFORMATION
Toxicity: There are not known ecological toxicity values.
Persistence and degradability: It is expected high persistence and slow degradability.
Bioaccumulative potential: It is expected moderated to high bioaccumulative potential. logKow = 14.04 (estimated)
Mobility in soil: Not available.
Results of PBT and vPvB assessment: Not available.

13- DISPOSAL CONSIDERATION
Product: Should be disposed as hazardous waste according to local legislations. The treatment and disposal should be evaluated specifically for each product.
Product waste: Recycle any unused portion of the material approved for use or return it to the manufacturer or supplier. For other methods, consult federal and state laws.

Contaminated packaging: Polyethylene package must be submitted to re-utilization in the working environment. Those may keep waste of the product and should be kept closed and sent to proper dispose. Recycle may be applied as long as followed the relevant laws. Big bag packages are returnable and may be returned to Braskem.

14- TRANSPORT INFORMATION

National and international regulations


UN number: Not classified as hazardous for transport.

Environmental hazards: Not hazardous.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Consult regulations:

15- REGULATORY INFORMATION


Restrictions: No use restrictions were found.

16- OTHER INFORMATION

BRASKEM warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is responsibility of the product user enterprise to promote the training of its employees and contractors about the possible risks arising from the product.

SDS elaborated by InterTox: February, 2011 – http://www.intertox.com.br
SDS reviewed by InterTox: October, 2011

** Data from database.

Abbreviations:
ACGIH – American Conference of Industrial Hygienists
CAS – Chemical Abstracts Service
LD50 – Lethal Dose 50%
IARC – International Agency for Research on Cancer
NIOSH – National Institute of Occupational Safety and Health
OEL – Occupational Exposure Limit
OSHA – Occupational Safety and Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average
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Bibliography: