# SAFETY DATA SHEET

## According to Regulation (EC) No 1907/2006 and 453/2010 (REACH)

*Print date: 27-Jul-2015* *Revision Number: 1* *Revision date: 27-Jul-2015*

## 1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY

| | |
|---|---|
| **Trademark:** | NORYL™ |
| **Product Code:** | 630 - 111 |
| **Product Description:** | Polyphenylene ether [CASRN 25134-01-4] |
| **Product Type:** | Commercial Product |
| **Recommended use:** | May be used to produce molded or extruded articles or as a component of other industrial products. |
| **Company:** | SABIC Innovative Plastics B.V.<br>Plasticslaan 1<br>P.O. Box 117<br>4600 AC Bergen op Zoom<br>The Netherlands |
| **Manufacturer:** | SABIC Innovative Plastics US LLC<br>1 Noryl Avenue<br>Selkirk, New York 12158<br>United States |
| **Emergency Telephone Number:** | Bergen op Zoom +31(0)164-292911 (24/24) |
| **Emergency Transportation/CHEMTREC (24 HOUR):** | 800 424-9300 (USA)<br>+1 703-527-3887 (globally, outside USA) |
| **E-mail:** | webinquiries@sabic-ip.com |
| **Website Address:** | **www.sabic-ip.com** |

## 2. HAZARDS IDENTIFICATION

The additives in this product (if any) are bound in a thermoplastic resin matrix. In accordance with GHS for the classification of the product, the hazard potential may be assessed with respect to the physico-chemical form and/or bioavailability of the individual components in the thermoplastic resin.

Where GHS classifications are shown below, these are based on the individual components in the thermoplastic resin matrix. Under the typical use conditions for the resin, these hazardous components are unlikely to contribute to workplace exposure. Please read the entire safety data sheet and/or consult an EHS professional for a complete understanding.

### Classification of the substance or mixture

**REGULATION (EC) No 1272/2008**

**Not hazardous** Not classified

**Classification according to EU Directives 67/548/EEC or 1999/45/EC**

### CLP/GHS-Labeling

GHS Labeling not required

**Precautionary Statements**

No GHS specific Precautionary Statements required - observe all other warnings and handling instructions in this SDS.

### Other hazards which do not result in classification:

**SABIC Emergency Overview**

• Powder with slight or no odor
• WARNING! FORMS COMBUSTIBLE DUST CONCENTRATIONS IN AIR (DURING HANDLING AND PROCESSING)
• Take precautionary measures against static discharges. During processing, dust may form explosive mixture in air.
• Spilled material may create slipping hazard
• Can burn in a fire creating dense, toxic smoke
• Molten plastic can cause severe thermal burns
• Fumes produced during melt processing may cause eye, skin, and respiratory tract irritation. Severe over-exposure may result in nausea, headache, chills, and fever. See below for additional effects.
• Powder can cause mechanical irritation if dusts are generated.

**Other Information:** Cool skin rapidly with cold water after contact with molten material. Heating can release hazardous gases. Hazardous fumes can also occur in post-processing operations.

**Processing Issues:** Processing vapors may cause irritation to the eyes, skin, and respiratory tract. In cases of severe exposure, nausea and headache can also occur. Grease-like processing vapor condensates on ventilation ductwork, molds, and other surfaces can cause irritation and injury to skin.

**Aggravated Medical Conditions:** MEDICAL RESTRICTIONS: There are no known health effects aggravated by exposure to this product. However, certain sensitive individuals and individuals with respiratory impairments may be affected by exposure to components in the processing vapors.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Product Type** Mixture

**HAZARDOUS COMPONENTS:**

| Chemical Name | CAS Number | Weight % | Classification (67/548/EEC): | GHS Classification (EC) No. 1272/2008 [CLP]: |
|---|---|---|---|---|
| Toluene | 108-88-3 | 0.1-0.3 | F;R11<br>R67<br>Repro cat 3;R63<br>Xi;R38<br>Xn;R48/20-65 | Flam. Liq. 2 (H225)<br>Repr. 2 (H361)<br>Asp. Tox. 1 (H304)<br>STOT RE 2 (H373)<br>Skin Irrit. 2 (H315)<br>STOT SE 3 (H336) |

**For the full text of the H-phrases, if mentioned in this section, see Section 16.**

The non-hazardous components and exact percentage (concentration) of the composition have been withheld as a trade secret.

This product consists primarily of high molecular weight polymers which are not expected to be hazardous. The ingredients in this product are present within the polymer matrix and are not expected to be hazardous.

## 4. FIRST AID MEASURES

**If Inhalation:** Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. If symptoms persist, call a physician.

**On skin contact:** Immediately cool the skin by rinsing with cold water after contact with hot material. Wash off immediately with soap and plenty of water. Consult a physician.

**On contact with eyes:** Immediately flush eyes with plenty of water for at least 15 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention if symptoms of burning, pain, and/or vision impairment remain. After initial flushing, remove any contact lenses. Due to fine particle size and water repellency, material remains abrasive and difficult to remove by washing.

**On ingestion:** No hazards which require special first aid measures.

**Precautions:** Processing vapors inhalation may be irritating to the respiratory tract. If symptoms are experienced remove victim from the source of contamination or move victim to fresh air and obtain medical advice.

**Notes to Physician:** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

**Autoignition Temperature:** 490 °C (914°F) estimated

**Explosive Limits**

**upper:** Not determined
**lower:** Not determined

**Explosive Properties:** Material is not sensitive to mechanical impact, but is sensitive to static discharge under dust cloud conditions Values below may vary by particle size distribution, morphology and grade. Using standard ASTM test methods, polyphenylene ether powder has the following properties:
Minimum Ignition Energy (MIE): 1.6 MJ (millijoules),
Deflagration Index, Kst: 225 (bar-m/sec) [classified ST-2 dust],
Volume Resistivity average: 2 x 10E14 (ohm-cm),
Maximum Pressure Output, Pmax: 6.4 (bar),
Maximum Pressure Rise Rate, dP/dt: not measured,
Minimum Oxygen Concentration: 12 (% O2)

**Suitable Extinguishing Media:** Use dry chemical, CO2, water spray or "alcohol" foam. Water is the best extinguishing medium. Carbon dioxide and dry chemical are not generally recommended because their lack of cooling capacity may permit re-ignition on larger resin fires (blobs, drools, etc.)

**Unsuitable Extinguishing Media for Safety Reasons:** Do not use a solid water stream as it may scatter and spread fire

**Hazardous Decomposition Products:** Fire will produce dense black smoke containing hazardous combustion products, carbon oxides, hydrocarbons fragments.

**Hazards from Combustion Products:** Fire will produce dense black smoke containing hazardous combustion products, carbon oxides, hydrocarbon fragments.

**Specific Hazards:** Take precautionary measures against static discharges During processing, dust may form explosive mixture in air Thermal decomposition can lead to release of irritating gases and vapors

**Special Protective Equipment for Firefighters:** Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products

## 6. ACCIDENTAL RELEASE MEASURES

**Clean up:** Use appropriate tools to gather spilled material into suitable containers for disposal while avoiding airborne dust. Dust deposits should not be allowed to accumulate on surfaces, as these may form explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Use non-sparking tools and equipment. If vacuum systems are used, electric motors must meet the required electrical classification.

**Personal Precautions:** Take precautionary measures against static discharges.

**Environmental Precautions:** Do not flush into surface water or sanitary sewer system. Material should not be released into the environment.

+135-3858-6433 (GuangDong)
+188-1699-6168 (ShangHai)
+852-6957-5415 (HongKong)

## 7. HANDLING AND STORAGE

**Handling:**

Handle in accordance with good industrial hygiene and safety practices. Provide for appropriate exhaust ventilation and dust collection at machinery. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Some product packaging, such as a "supersack" (flexible intermediate bulk container designed to hold up to approximately 2,000 kg), is designed to allow the packaging to be grounded before the product is removed. If the packaging is so designed, instructions for grounding are printed on the packaging. Check the packaging for, and follow, any instructions for grounding. During mixing operations, provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Polyphenylene ether contains approximately 20% fines (< 75 microns) and as such is an explosive dust. Use good and generally accepted engineering practices for processing an explosive dust. Preventive measures such as grounding/bonding, use of conductive devices are examples. NFPA Standards are an excellent reference. Values below may vary by particle size distribution, morphology and grade. Using standard ASTM test methods, polyphenylene ether powder has the following properties:
Minimum Ignition Energy (MIE): 1.6 MJ (millijoules),
Deflagration Index, Kst: 225 (bar-m/sec) [classified ST-2 dust],
Volume Resistivity average: 2 x 10E14 (ohm-cm),
Maximum Pressure Output, Pmax: 6.4 (bar),
Maximum Pressure Rise Rate, dP/dt: not measured,
Minimum Oxygen Concentration: 12 (% O2).

**Storage:**

Store in closed container in a dry and cool area. Keep away from heat sources and sources of ignition.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure limits:** No components with information, unless noted below

| **Chemical Name** | **Toluene**<br>**108-88-3** |
|---|---|
| **EU STEL** | 384 MGM3 100 ppm |
| **Germany (DFG) - MAK** | ARBEIT: 190 mg/m³ , 50 ml/m³ (ppm) ; SPITZ: 4(II) ; BEM: DFG , p_H , p_Y |
| **France - Valeurs Limites d'exposition (VLE)** | 550 MGM3 150 ppm |
| **France INRS (VME)** | 375 MGM3 100 ppm |
| **Netherlands OEL - MAC** | WNG_8: 150 mg/m³ ; WNB_15: 384 mg/m³ |
| **UK EH40 MEL (TWA)** | WEL_TWA: 191 mg/m³ , 50 ppm ; WEL_STEL: 384 mg/m³ , 100 ppm ; p_R: R63 , R65 , R67 , R38 , R11 , R48/20 ; COMMENTS: SKIN |
| **Spain - Valores Limite Ambientales - VLE** | VLA-ED: 50 ppm , 192 mg/m³ ; VLA-EC: 100 ppm , 384 mg/m³ ; NOTAS: dermica , p_r , VLB , VLI ; p_FR: R11 , R38 , R48/20 , R63 , R65 , R67 |
| **Denmark TWA Data - Threshold Limit Values (TLV):** | ANM: p_E , p_H ; GR: 94 mg/m³ , 25 ppm GRL: 25 ppm ; ANM: p_H |
| **Austria - MAKs** | 190 mg/m? MAK<br>50 ppm MAK |
| **Belgium OEL (TWA):** | 191 MGM3 |
| **Switzerland SUVA Limit Values at the Workplace Data - Time Weighted Average (TWA):** | MAK_Wert: 50 ppm , 190 mg/m³ ; Kurz_Wert: 200 ppm , 760 mg/m³ ; HSB: p_H , p_B ; Kol_RE: k_3RE ; Kol_SS: Grp_C ; Zeitl.: 4x15 min |
| **Sweden Threshold Limit Values Data -** | Anm: p_H; KTV: 400 MGM3 , 100 PPM ; NGV: 200 MGM3 , 50 PPM |
| **Portugal - TWAs** | VLE-MP: 50 ppm ; NOT: A_4, p_P, IBE; FUND: SNC |
| **Norway Exposure Limit Values Data - Threshold Limit Value:** | KONS: 25 ppm , 94 mg/m³ ; Anm: H (SKIN) |
| **Ireland Exposure Limit Values Data - Time Weighted Average (TWA):** | TWA 50 ppm , 188 mg/m³ ; STEL 100 ppm , 560 mg/m³ ; NOT IOELV, Skin |
| **Greece - OEL** | DT_1 100 ppm , 375 mg/m³ ; DT_2 150 ppm , 560 mg/m³ |
| **Finland Exposure Limit Values Data - Time Weighted Average (TWA):** | HTP_8: 50 ppm , 190 mg/m³ ; HTP_15: 100 ppm , 380 mg/m³ ; HOU: iho (SKIN) , liite 2 ; R-lauseet: R11 , R38 , R48/20 , R63 , R65 , R67 |
| **Luxembourg** | Valeurs limites - 8 heures 192 mg/m³ , 50 ppm ; Valeurs limites - Court terme 384 mg/m³ , 100 ppm ; Note: Peau |
| **Italy - OEL** | 192 MGM3 50 ppm |
| **Poland - OEL:TWAs** | 100 mg/m? NDS |

**SABIC Recommended Exposure Limits have been established for certain chemicals.*

**Engineering Measures to Reduce Exposure:** Handle in accordance with good industrial hygiene and safety practice. Provide for appropriate exhaust ventilation at machinery. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks. In the case of hazardous fumes, wear self-contained breathing apparatus. Wear face-shield and protective suit for abnormal processing problems. Processing fume condensate may be a fire hazard and toxic; remove periodically from exhaust hoods, ductwork, and other surfaces using appropriate personal protection. Use generally accepted industrial ventilation practices. System dust concentrations should be calculated to determine if explosion protection is required. For guidance, consult NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling and of Combustible Solids, 2006 edition.

| | |
|---|---|
| **Hand Protection:** | Protective gloves should be worn. |
| **Eye Protection:** | Safety glasses with side-shields or chemical goggles. In addition, use full-face shield when cleaning processing vapor condensates from hood, ducts, and other surfaces. |
| **Respiratory Protection:** | When using this product at elevated temperatures, implement engineering systems, administrative controls or a respiratory protection program (including a respirator approved for protection from organic vapors, acid, gases, and particulate matter) if processing vapors are not adequately controlled or operators experience symptoms of overexposure. Use a respirator approved for protection from dust. |
| **Body Protection:** | Long sleeved clothing. |
| **Hygiene Measures:** | When using, do not eat, drink or smoke. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical State:** | Solid |
| **Appearance:** | Powder |
| **Color:** | Varies |
| **Odor:** | None or slight |
| **Melting point/range:** | This product does not exhibit a sharp melting point but softens gradually over a wide range of temperatures. |
| **Boiling point/range:** | Not applicable |
| **Autoignition Temperature:** | 490 °C (914°F) estimated |
| **Vapor Pressure:** | Negligible |
| **Water Solubility:** | Insoluble |
| **Evaporation Rate:** | Negligible |
| **Specific gravity:** | >1; (water = 1) |
| **Explosive Limits** | |
| **Explosion Limits** | Not determined |
| **upper:** | Not determined |
| **Explosion Limits** | 25 g/m³ |
| **lower:** | Not determined |
| **VOC content (%):** | Negligible |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability:** | Stable under ambient conditions. Hazardous polymerization does not occur. |
| **Conditions to Avoid:** | Avoid temperatures above 490°C. To avoid thermal decomposition, avoid elevated temperatures. Heating can result in the formation of gaseous decomposition products, some of which may be hazardous. Do not exceed melt temperature recommendations in product literature. Purgings of hot material should be collected in small, flat, thin shapes and quenched with water to allow for rapid cooling. Do not allow product to remain in barrel at elevated temperatures for extended periods of time. |
| **Hazardous Decomposition Products:** | Process vapors under recommended processing conditions may include trace levels of hydrocarbons, alkylphenols, aldehydes, Alcohols, aliphatic amines, dimethylcyclohexanone, trimethylanisole, dihydrobenzofuran. |
| **Incompatible Products:** | Strong acids, strong oxidizing agents. |

+135-3858-6433 (GuangDong)
+188-1699-6168 (ShangHai)
+852-6957-5415 (HongKong)

## 11. TOXICOLOGICAL INFORMATION

**LD50/oral/rat:** >15 g/kg

**LD50/dermal/rabbit:** >2 g/kg

**Subchronic Toxicity:** In a 13 week dust inhalation study, laboratory rats were exposed to up to 50 mg/m$^3$ PPE dust for 6 hrs/day for 13 weeks with a 13-week non-exposure recovery period. There was no evidence of systemic toxicity at the highest dose. Localized toxicity was observed in the lungs and regional lymph nodes of the 50 mg/m$^3$ exposure group. These findings decreased in severity in the 7 and 1 mg/m$^3$ exposure groups. A no adverse effect level for PPE is estimated to be 7 mg/m$^3$ and a no observable effect level is 1 mg/m$^3$.

**Primary Irritation:** Substance does not generally irritate and is only mildly irritating to the skin Not a skin sensitizer based on animal data PPE has acute eye irritation potential. A 100 mg single application of undiluted substance into the eyes of rabbits produced transient conjunctival redness and swelling (Draize method)

**IARC:** Not listed

**OSHA:** Not regulated

**NTP:** Not tested

**Remarks:** No additional information available

**Special Studies:** Polyphenylene ether: In two independent 2 year dietary studies, purebred beagles and laboratory rats were fed polyphenylene ether resin powder (up to 10% by weight in the animal diet). In both studies, there were no adverse effects on physical appearance, behavior, growth, food consumption, survival, clinical laboratory results, organ weights or gross or microscopic pathology. In a 6 month chronic inhalation study, rats and guinea pigs exposed 6 hrs/day to up to 300 mg/m$^3$ PPE dust developed no physical, nutritional, hematologic, clinical or pathological reaction except to lung tissue changes which consisted of macrophage accumulation, many of which were degenerative in the pulmonary alveoli. Polyphenylene ether is not a mutagen by Ames (Salmonella) Assay with and without activation.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity Effects:** Do not flush into surface water or sanitary sewer system.

**Ecotoxicity - Invertebrate Data:** Ecological damages are not known or expected under normal use.

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **Waste from residues / unused products:** | Where possible recycling is preferred to disposal or incineration. Dispose of in accordance with local regulations. |
| **Contaminated Packaging:** | Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal. |
| **EWC waste disposal no:** | 702 - waste from the manufacture, formulation, supply and use of plastics, synthetic rubber and man-made fibres. |

## 14. TRANSPORT INFORMATION

**Transport Classification:** Not regulated as hazardous for shipment, unless noted below, under current transportation guidelines.

**DOT**

**ADR/RID/ADN**

**IMDG**

**ICAO**

**IATA-DGR**

## 15. REGULATORY INFORMATION

**This substance is classified and labelled according to Annex I of Directive 67/548/EEC, as amended.**

**International Inventories:**

| | |
|---|---|
| **TSCA (USA):** | Listed |
| **DSL (Canada):** | Listed |
| **EINECS/ELINCS (Europe):** | Listed |
| **ENCS (Japan):** | Listed |
| **IECSC (China):** | Listed |
| **KECL (Korea):** | Listed |
| **PICCS (Philippines):** | Listed |
| **AICS (Australia):** | Listed |
| **NZIoC (New Zealand):** | Listed |
| **REACH Information:** | For this product's REACH related information, please contact webinquiries@sabic-ip.com |

**Other Inventory Information:**
A "Listed" entry above means all chemical components are on the respective inventory list and/or a qualifying exemption exists for one or more components. A "Not listed" entry above indicates one or more components is restricted from import or manufacture into that country/region. Articles are exempt from registration and are therefore not listed on the national chemical inventories.

**SVHC (REACH Regulation (EC) No 1907/2006 and 453/2010, as amended):**
This product does not intentionally contain SVHC chemicals except as noted below. Incidental amounts of impurities, if present, would be below the threshold limit of 0.1% by weight.

**California Proposition 65:**
Components in this product known to the State of California to cause cancer and/or reproductive effects, are listed below:

| Chemical Name | Weight % | California Proposition 65: |
|---|---|---|
| Toluene<br>108-88-3 | 0.1-0.3 | Type of Toxicity: female ; Type of Reproductive Toxicity: developmental |

**RoHS EU Directive 2011/65/EU:**
The subject product is in compliance with EU RoHS Directive 2011/65/EU. All below chemicals are not employed in the manufacture of the product: a.Cadmium and its compounds, b.Lead and its compounds, c.Mercury and its compounds, d.Hexavalent chromium compounds, e.Polybrominated biphenyls (PBBs), f.Polybrominated diphenyl ethers (PBDEs including Deca-BDE). The trace levels of heavy metals may be present as impurities within threshold limits (<0.1% for Pb, Hg, Cr VI, and <0.01% for Cd). We are disclosing this information, to the best of our knowledge, based upon data from our raw material manufacturers.

## 16. OTHER INFORMATION

**Literary Reference:** Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.



www.sabic-ip.com
http://eur.sabic-ip.com/ordeur/pages/msds/MSDSSearch.jsp?app=sabic-ip

**SDS Scope:**
Europe: Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Regulation (EU) No. 453/2010. This document is also applicable in other countries and regions.

**Prepared by:** Product Stewardship & Toxicology

+135-3858-6433 (GuangDong)
+188-1699-6168 (ShangHai)
+852-6957-5415 (HongKong)

DISCLAIMER: This Safety Data Sheet [SDS] information is provided based on the Hazard Communication Regulations for your region or country and for the use of the persons required to receive this information under those regulations. The information is neither designed nor recommended for any other use or for use by any other person, including for compliance with other laws. SABIC Innovative Plastics does not warrant the suitability for use of this SDS for any other material or product not specifically identified herein. SABIC Innovative Plastics does not warrant the accuracy or authenticity of this SDS unless it has been obtained directly from SABIC Innovative Plastics, or posted or viewed on a SABIC Innovative Plastics website. Modification of this SDS, unless specifically authorized by SABIC Innovative Plastics, is strictly prohibited. This SDS is based on information that is believed to be reliable, but may be subject to change as new information becomes available. Because it is not possible to anticipate all conditions of use, additional safety precautions may be required. Since the use of this material is not under SABIC Innovative Plastics' control, each user is responsible for making its own determination as to the safe and proper handling of this material in its own particular use of this material. SABIC INNOVATIVE PLASTICS MAKES NO REPRESENTATION OR WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Each user should read and understand this information and incorporate it into individual site safety programs as required by applicable hazard communication standards and regulations.

**End of Safety Data Sheet**