SAFETY DATA SHEET

Product: Crystal Polystyrene – PS GPPS

SECTION 1: DENTIFICATION	
GHS Product identifier:	Crystal Polystyrene – PS GPPS.
Other ways of identification:	U 249 / U 285 / U285G / U 286 / U 278 / U 288 / U 266 / U251.
Recommended use of the chemical and restrictions on use:	Resin from the thermoplastic group, whose characteristic lies in its easy flexibility or moldability under the action of heat, through the processes of extrusion, injection or thermoforming. Polystyrene is the raw material for the manufacture of disposable cups, household appliances, packaging, among others.
Supplier's details:	COMPANHIA BRASILEIRA DE ESTIRENO. Avenida Santos Dumont, 4444 – Jd. Conceiçãozinha – Guarujá – SP, Brazil. (+55 13) 3328-6455. COMPANHIA BRASILEIRA DE ESTIRENO. Rua Carlos Marcondes, 1200 – Jd. Limoeiro – São José dos Campos – SP, Brazil. (+55 12) 3203-5770.
Emergency phone number:	0800 110 8270 Pró-Química.

SECTION 2: HAZARD IDENTIFICATION	
Classification of the substance or mixture:	Product not classified as hazardous by the Classification System used.
Classification system adopted:	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), United Nations, 2023.
Other hazards which do not result in classification:	When the polymer is heated it may cause some effects to human health. Combustible solid. The flow of the product may generate static charges, which may result in sparks. It is recommended that grounding systems be used during unloading and transfers.
GHS label elements, including precautionary statements	
Pictograms:	Not applicable.
Signal word:	Not applicable.
Hazard statement(s):	Not applicable.
Precautionary statement(s):	Wash your hands after handling the product.

	Do not drink, eat or smoke while handling the product. It is recommended to use appropriate PPE when handling the product. Obtain information about the product before handling. Store the product in a suitable place. In case of emergency, proceed as indicated in the SDS.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCES	
Chemical identity:	Polystyrene.
Common name(s), synonym(s) of the substance:	Crystal Polystyrene - GPPS, PS.
CAS number:	9003-53-6 (Styrene polymer).
Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance:	There are no known impurities that contribute to the hazard.

SECTION 4: FIRST-AID MEASURES

Routes of exposure	
Inhalation:	Remove the victim to a ventilated area. If you feel unwell, contact a doctor. Take this SDS with you.
Skin:	Wash exposed skin with sufficient soap and water to remove the material. Seek medical attention if necessary. Take this SDS with you.
Eye:	Rinse thoroughly with water for several minutes. If you wear contact lenses, remove them if this is easy to do. If eye irritation occurs consult a doctor. Take this SDS with you.
Ingestion:	Do not induce vomiting. Do not give anything by mouth to an unconscious person. Wash the victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place him or her on the left side (up if possible) to keep the airway open and prevent aspiration. Keep the patient quiet and maintain a normal body temperature. Consult a POISON CENTER or physician. Bring this SDS.

Most important symptoms/effects, acute and delayed:	During processing, molten polymer in contact with the eyes can cause burns, and the vapors formed can cause irritation. Molten polymer can cause skin burns. Molten polymer can release vapors during processing, which when inhaled in excess can cause irritation of the respiratory system and mucous membranes.
Indication of immediate medical attention and special treatment needed, if necessary:	Avoid contact with the product when assisting the victim. Treatment for exposure should be directed at controlling the patient's symptoms and clinical condition. In case of contact with the skin, do not rub the affected area. The molten polymer can cause burns and stick to the skin. Do not attempt to remove the burned polymer, as this may worsen the burn. Cool the affected area with water and ice. A doctor should remove the plastic and treat the burn.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Suitable: Water fog, dry chemical, synthetic foam and carbon dioxide (CO_2). Not recommended: Direct water jets.
Specific hazards arising from the chemical:	Combustion of the chemical product or its packaging can form carbon monoxide (CO) and carbon dioxide (CO_2) and monomer vapors.
Special protective actions for fire-fighters:	Wear self-contained breathing apparatus with positive pressure and full protective clothing. Keep bystanders away and isolate the area at risk. If the material is molten, do not apply water in a solid stream. Use water mist or foam. Cool the surrounding areas to locate the fire zone. Hand-held carbon dioxide or dry chemical extinguishers may be used for small fires.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	Do not smoke. Avoid contact with the product. If necessary, use personal protective equipment as described in section 8.
For emergency responders:	Preventatively remove ignition sources. Use full PPE, with goggles with side protection, suitable protective gloves, closed shoes and safety clothing to protect the body. In the case of molten polymer, use

	heat-resistant PPE. Protective mask with filter against mists and vapors when heated, and against dust when the material is solid.
Environmental precautions:	Prevent the product from reaching soil and watercourses. Notify the relevant authorities if the product has caused environmental pollution (if it has reached watercourses or if it has contaminated soil or vegetation).
Methods and materials for containment and cleaning up:	Liquid material: Use natural or spill containment barriers. Place the material in appropriate containers. Absorb the remaining product with dry sand, earth, vermiculite, or any other inert material. Place the adsorbed material in appropriate containers and remove them to a safe place. For final disposal, proceed as per Section 13 of this SDS. Solid material: Collect the spilled product and place it in appropriate containers and remove it to a safe place. For final disposal, proceed as per Section 13 of this SDS.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	
Safe handling of the substance or mixture:	Avoid sources of ignition in areas where the product is handled. Handle in a ventilated area or with a general ventilation/local exhaust system. Avoid formation of dust (room temperature), mists and vapors (when heated/molten), and exposure to the product. Use personal protective equipment as described in section 8. Do not allow molten material to come into contact with eyes, skin or clothing.
General hygiene:	Wash your hands and face thoroughly after handling and before eating, drinking, smoking or using the toilet. Contaminated clothing should be changed and washed before reused. Remove contaminated clothing and protective equipment before entering eating areas.
Conditions for safe storage, including any incompatibilities	
Technical measures for prevention of fire and explosion:	Keep away from any flame or ignition source. Static charge build-up should be avoided during pneumatic loading and other mechanical handling operations. Keep equipment properly grounded.
Adequate conditions:	Store in a well-ventilated, dry, cool place away from sunlight. Keep the container closed. Containers that have been opened should be carefully resealed. Do not store in unlabeled containers. Use appropriate containment to prevent environmental contamination. See

	Section 10 for incompatible materials.
Packaging compatibilities:	It is recommended to keep them in their original packaging. We do not recommend stacking “Big Bags” (1250kg packaging) due to the risk of them tipping over, which could cause accidents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters	
Occupational exposure limit:	Not established.
Biological limit:	Not established.
Other limits and values:	Not established.
Appropriate engineering controls:	Provide mechanical ventilation and direct exhaust to the outside environment. These measures help to reduce exposure to the product. The product contains very small amounts of residual monomers and process chemicals, together with possible decomposition products that may arise during thermal processes. Since the identity and content of these components depend on the processing conditions, it is the responsibility of the user to determine appropriate protective or safety measures.
Individual protection measures, such as personal protective equipment (PPE)	
Eye/face protection:	Wear safety glasses. Wear panoramic glasses if there is potential for exposure to particles that could cause eye discomfort.
Skin protection:	Use protective gloves, in case of polymer casting processes, use gloves with thermal protection, suitable protective clothing and closed shoes.
Respiratory protection:	In case of dust formation, use respiratory protection equipment against dust – P2. In operations involving thermal processing, which may release vapors, it is recommended to use a mask with a respirator with a chemical filter for organic vapors. Based on the danger of inhalation of the product, a risk assessment must be carried out to adequately define respiratory protection taking into account the conditions of use of the product.
Thermal hazards:	In case of melting the polymer, it is recommended to use thermal

	protection and take care during handling as the product is slippery and can run and spread across the floor.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES	
Physical state:	Solid, granules, opaque.
Colour:	No available.
Odour:	Odorless.
Melting point/freezing point:	Not available.
Boiling point or initial boiling point and boiling range:	Not available.
Flammability:	Not available.
Lower and upper explosion limit /flammability limit:	Not available.
Flash point:	> 385°C.
Auto-ignition temperature:	> 435°C.
Decomposition temperature:	> 300°C.
pH:	Not applicable.
Kinematic viscosity:	Not available.
Solubility:	Soluble in aromatic hydrocarbon solvents.
Partition coefficient n-octanol/water (log value):	Not available.
Vapour pressure:	Not available.
Density and/or relative density:	0.65 g/cm³.
Relative vapour density:	Not available.
Particle characteristics:	Not available.
Other information:	Softening temperature: > 90°C. Glass transition temperature (Tg): 95 - 100°C.

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	No reactivity of the product is expected.
Chemical stability:	Product stable under normal temperature and pressure conditions.
Possibility of hazardous reactions:	Avoid the accumulation of dust from the decomposition products formed, which in certain concentrations in the air can become explosive.
Conditions to avoid:	High temperatures (above 300°C), heat, friction and contact with incompatible materials.
Incompatible material:	Strong oxidizing agents, strong acids and bases.
Hazardous decomposition products:	The polymer decomposes under fire conditions. The vapors may contain polymer fragments of varying composition, as well as toxic and/or irritating compounds. Processing of the polymer may generate smoke that may contain polymer fragments and other decomposition products, and mechanical handling may cause the formation of dust (risk of explosion).

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity:	The product is not expected to present acute toxicity via oral, dermal or inhalation routes.
Skin corrosion/irritation:	The product is not expected to cause skin irritation (in polymer form). In cases of polymer melting, contact may cause skin burns.
Serious eye damage/irritation:	The product is not expected to cause eye irritation (in polymer form). In the event of polymer melting, contact may cause eye burns.
Respiratory or skin sensitization:	The product is not expected to cause respiratory or skin sensitization.
Germ cell mutagenicity:	The product is not expected to cause germ cell mutagenicity. <u>High impact polystyrene:</u> Ames reverse gene mutation test (*in vitro*) – negative result.
Carcinogenicity:	The product is not expected to cause carcinogenicity. <u>Styrene-butadiene copolymers:</u> IARC classifies as group 3 - Not classified as carcinogenic to humans.
Reproductive toxicity:	The product is not expected to cause reproductive toxicity.

STOT - Single exposure:	In polymer form, inhalation of the product may cause respiratory irritation with coughing and sneezing, due to mechanical action. In the case of polymer melting, vapors are released, which causes respiratory and mucous membrane irritation.
STOT - Repeated exposure:	The product is not expected to cause specific target organ toxicity through repeated exposure.
Aspiration hazard:	The product is not expected to present an aspiration hazard.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity:	The product is not expected to be harmful to aquatic organisms. Crystal polystyrene: LC_{50} (*Oryzias latipes*, 48h): > 500 mg/L.
Persistence and degradability:	The product is expected to be persistent and not rapidly degraded. Crystal polystyrene: Biodegradability: 1 – 3% in 28 days.
Bioaccumulative potential:	The product is expected to have low bioaccumulative potential in aquatic organisms. Crystal polystyrene: BCF: 58 – 144.
Mobility in soil:	Low soil mobility is expected.
Other adverse effects:	No other effects of the product are known.

SECTION 13: DISPOSAL CONSIDERATIONS

Elimination methods	
Product:	Treatment and disposal should be evaluated specifically for each product. Keep the remaining product in its original, tightly closed container. Disposal should be carried out as directed for the product.
Product remains:	Keep the remaining product in its original packaging and tightly closed. Dispose of according to the product's guidelines.
Packaging used:	Do not reuse empty packaging. These may contain product residue and should be kept sealed and sent for proper disposal as specified for the product.

SECTION 14: TRANSPORT INFORMATION

Road:	UN - "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations
UN Number:	Not classified as hazardous for land transport.
Rail:	Convention concerning International Carriage by Rail (COTIF) Appendix C - Regulations concerning the International Carriage of Dangerous Goods by Rail - RID
UN Number:	Not classified as hazardous for land transport.
Sea:	*IMO – International Maritime Organization* *International Maritime Dangerous Goods Code (IMDG Code)*
UN Number:	Not classified as hazardous for waterways.
Air:	*IATA - International Air Transport Association* *Dangerous Goods Regulation (DGR)*
UN Number:	Not classified as hazardous for air transport.
Special precautions for user:	There is no need of special precautions.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006. - International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

SECTION 15: REGULATORY INFORMATION

Chemical regulations	Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990. SGA. Globally Harmonized System of Classification and Labeling of Chemical Products. 10. Ed. New York: United Nations, 2023.

SECTION 16: OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS prepared in May 2025.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
BCF – Bioconcentration Factor
BEI – Biological Exposure Index
CAS – Chemical Abstracts Service
C – Ceiling
EC_{50} – Efective Concentration 50%
LC_{50} – Lethal Concentration 50%
LD_{50} – Lethal Dose 50%
ERPG - Emergency Response Planning Guidelines
LEL – Lower Explosive Limit
UEL – Upper Explosive Limit
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short Term Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average

Bibliographic references:

ACGIH. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs®

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ECHA – EUROPEAN CHEMICAL AGENCY. Available at: <http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances>. Access: May 2025.

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NIOSH – NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available at: <http://www.cdc.gov/niosh/>. Access: May 2025.

NJ. STATE OF NEW JERSEY - Department of Health. Available at: <http:/nj.gov/health/eoh/rtkweb/odispubr.shtml>. Access: May 2025.

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