

SAFETY DATA SHEET

Product: STYRENE MONOMER

Version: 07

Date: 09/03/2021

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SECTION 1: IDENTIFICATION

Identification of the product	STYRENE MONOMER.
Recommended use of the chemical and restrictions on use	Industrial use.
Company	COMPANHIA BRASILEIRA DE ESTIRENO.
Address	Rua Hidrogênio, 1879 - Polo Petroquímico – Camaçari – BA - CEP: 42810-140, Brazil.
Phone number(s)	55 (71) 3415-6990.
Company	COMPANHIA BRASILEIRA DE ESTIRENO.
Address	Av. Nove de Abril, 1296 – Vila Elisabeth - Cubatão – SP, CEP: 11510-001, Brazil.
Phone number(s)	55 (13) 3023-5890 / 55 (13) 3023-5891.
Emergency phone number	0800 110 8270 Pró-Química.

SECTION 2: HAZARD IDENTIFICATION

Classification of the substance or mixture	Flammable liquids – Category 3. Acute toxicity – Inhalation – Category 4. Skin corrosion/irritation – Category 2. Eye damage/irritation – Category 2A. Carcinogenicity – Category 2. Reproductive toxicity – Category 2. Specific target organ toxicity – single exposure – Category 3. Specific target organ toxicity – repeated exposure – Category 1. Aspiration hazard – Category 1. Hazardous to the aquatic environment – Acute – Category 2.
Classification system adopted	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), United Nations, 2019.

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Other hazards which do not result in classification

The product does not have other hazards.

Adequate labeling elements

Pictograms



Signal word

DANGER

Hazard statement(s):

H226 Flammable liquid and vapour.
 H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H332 Harmful if inhaled.
 H335 May cause respiratory irritation.
 H351 Suspected of causing cancer.
 H361 Suspected of damaging fertility or the unborn child.
 H372 Causes damage to hearing organs through prolonged or repeated exposure.
 H401 Toxic to aquatic life.

Precautionary statement(s):

PREVENTION:
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P233 Keep container tightly closed.
 P240 Ground and bond container and receiving equipment.
 P241 Use explosion-proof electrical, ventilating and lighting equipment.
 P242 Use non-sparking tools.

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P243 Take action to prevent static discharges.

P260 Do not breathe mist and vapours.

P261 Avoid breathing mist and vapours.

P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection and face protection.

RESPONSE:

P302 + P352 IF ON SKIN: Wash with plenty of water.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P331 Do NOT induce vomiting.

P332 + P317 If skin irritation occurs: Get medical help.

P337 + P317 If eye irritation persists: Get medical help.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P370 + P378 In case of fire: Use foam, water mist, chemical powder and carbon dioxide (CO₂) to extinguish.

STORAGE:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

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P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

DISPOSAL:

P501 Dispose of contents and container in accordance with local regulations.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

SUBSTANCE

Common chemical name Styrene monomer.

Common name(s), synonym(s) of the substance Phenylethene; Vinylbenzene.

CAS number 100-42-5.

Ingredients or impurities The product does not have impurities which contribute to contributing to the hazard hazards.

SECTION 4: FIRST-AID MEASURES**Routes of exposure**

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 on the left side (upward if possible) to keep the airway open and avoid aspiration. Keep the patient silent and maintain normal body temperature. Consult a TOXICOLOGY CENTER or a doctor. Take this SDS.

Skin Wash exposed skin with sufficient amount of water to remove

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	the material. Take off and isolate contaminated clothing and shoes. In case of skin irritation: contact a doctor. Bring this SDS.
Eye	Wash carefully with water for several minutes. In case of use of contact lenses, remove them, if possible. Keep washing. If eyes irritation continues: Contact a doctor. Bring this SDS.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the victim feels unwell, contact a TOXICOLOGICAL INFORMATION CENTER or a doctor. Bring this SDS.
Most important symptoms/effects, acute and delayed	Harmful if inhaled. Causes irritation to the skin with redness and dryness, and to the eyes with tearing and redness. May cause respiratory irritation with coughing and sneezing. Repeated exposure may cause damage to hearing organs and ototoxicity. May be fatal if swallowed and enters the respiratory tract.
Indication of immediate medical attention and special treatment needed, if necessary	Avoid contact with the product when helping the victim. Treatment of exposure should be directed towards the control of the patient's symptoms and clinical condition. In case of contact with the skin, do not rub the affected area.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable extinguishing media	Suitable: Compatible with foam, water mist, chemical powder and carbon dioxide (CO ₂). Not recommended: Water jets directly.
Specific hazards arising from the chemical	Extremely dangerous when exposed to excessive heat or other sources of ignition such as sparks, open flames or flames of matches and cigarettes, welding operations, pilot lights and electric motors. Can accumulate static charge by flow or

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agitation. Vapors from heated liquid can be ignited by static discharge. Vapors are heavier than air and tend to accumulate in low or confined areas, such as sewers and basements. Can travel great distances causing retrogression of the flame or new fires both in open environments in as confined ones. Containers may explode if heated. The combustion of the chemical products or containers may form toxic and irritant gases such as carbon monoxide and carbon dioxide.

Special protective actions for fire-fighters

Self-contained breathing apparatus (SCBA) with positive pressure and full protective clothing. Containers and tanks involved in the fire can be cooled by water fog.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel

Isolate spills from ignition sources. Evacuate the area within a radius of at least 50 meters. Keep unauthorized persons away from the area. Stop the leak if it can be done without risk. Prevent sparks or flames. Do not smoke. Do not touch damaged containers or spilled material without wearing suitable clothing. Avoid exposure to the product. Stay away from low areas, with the wind behind you. Use personal protective equipment as described in section 8.

For emergency responders

Wear PPE complete with safety glasses, PVC or latex safety gloves, suitable protective clothing and closed shoes. The material used must be waterproof. In case of leakage, where exposure is high, it is recommended to use respiratory protection equipment against organic vapors, at high exposure,

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	<p>the use of autonomous type equipment (SCBA) with positive pressure is recommended. Isolate spills from ignition sources. Evacuate the area within a radius of at least 100 meters. Keep unauthorized persons away from the area. Stop the leak if it can be done without risk.</p>
Environmental precautions	<p>Avoid that the spilled material reaches waterways or sewage system.</p>
Methods and materials for containment and cleaning up	<p>Use water mist or vapor suppressing foam to reduce dispersion of vapors. Use natural or spill containment barriers. Collect the spilled product and place in proper 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. Use non-sparking tools to collect the absorbed material. For final destination, proceed according to Section 13 of this SDS.</p>
Differences in the action of large and small leaks	<p>For large spills, the liquid should be confined to a dike away from the spill for further appropriate disposal. Water fog can be used to reduce vapors.</p>

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Safe handling of the substance or mixture	<p>Schedule a first aid action before starting the activity with the product. The use of the product is restricted to professionals. Caution - Avoid exposure - obtain special instructions before use. Handle in a ventilated area or with a general local ventilation / exhaust system. Avoid formation of vapors or mists. Avoid exposure to the product. Avoid contact with incompatible</p>
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	materials. Use personal protective equipment as described in section 8.
Condições de higiene no local de trabalho	Wash your hands and face thoroughly after handling and before eating, drinking, smoking or using the bathroom. Contaminated clothing must be changed and washed before reuse. 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 heat, sparks, open flames and hot surfaces. - Do not smoke. Keep the container tightly closed. Ground the container and the product receiver during transfers. Use only non-sparking tools. Avoid the accumulation of electrostatic charges. Use explosion-proof electrical, ventilation and lighting equipment.
Adequate conditions	Store in a well-ventilated place away from sunlight. Keep container closed. Keep a temperature controller in the storage location that can guarantee the following conditions: - Temperature below 29°C. For stabilization of the product, the addition of polymerization inhibitors, such as tert-butylcatechol, is required. Maintain the inhibitor level and dissolved oxygen. The recommended oxygen level is 10 to 15 ppm. The recommended inhibitor level is 10 to 15 ppm. This product may react dangerously with some incompatible materials as outlined in Section 10. Keep away from incompatible materials.
Packaging compatibilities	Similar to the original packaging.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

	Common chemical name or technical name	TWA-TLV (ACGIH, 2020)	TLV – STEL (ACGIH, 2020)
Occupational exposure limit	Styrene, monomer*	10 ppm	20 ppm

*A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans (ACGIH).

Biological limit:

BEI (ACGIH, 2020):
 Mandelic + phenylglyoxylic acids in the urine (end of the day): 400 mg/g creatinine Ne.
 Styrene in the urine (end of the day): 40 µg/L.
 Ne: The determinant is not specific and is also observed after exposure to other chemicals.

Other limits and values

Styrene: IDLH: 700 ppm (NIOSH, 2010).

Appropriate engineering controls

Promote direct mechanical ventilation and exhaust system to the outside environment. These measures help reduce exposure to product. Maintain the atmospheric concentrations of the constituents of the product below the indicated occupational exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses wide vision and face field.

Skin protection

Wear PVC chemical resistant gloves, suitable protective clothing and closed shoes.

Respiratory protection

It is recommended to use respiratory protective equipment with respirator for organic vapors. Based on the inhalation hazard of

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	the product, a risk assessment must be carried out to adequately define respiratory protection in view of the conditions of use of the product.
Thermal hazards	It is not necessary to use specific EPIs, since the product does not present thermal hazards.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid.
Colour	Not available.
Odour	Not available.
Melting point/freezing point	- 30,6°C.
Boiling point or initial boiling point and boiling range	145°C.
Flammability	Not available.
Lower and upper explosion limit /flammability limit	Upper: 6.8%. Lower: 0.9%.
Flash point	31°C.
Auto-ignition temperature	490°C.
Decomposition temperature	Not available.
pH	Not available.
Kinematic viscosity	0,7 mm ² /s.
Solubility	Imiscible in water. (310 mg/L at 25°C).
Partition coefficient n-octanol/water (log value)	log kow: 2.95.

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Vapour pressure	6.62 hPa at 20°C.
Density and/or relative density	0.906 at 20°C.
Relative vapour density	3.6 (Air = 1).
Particle characteristics	Not available.
Other information	Not applicable.

SECTION 10: STABILITY AND REACTIVITY

Reactivity and chemical stability	Product has no reactivity. Unstable product under normal conditions of temperature and pressure. Used as stabilizer: Polymerization inhibitors such as tert-butylcatechol.
Possibility of hazardous reactions	Reacts violently with strong acids and strong oxidizing agents, with risk of fire and explosion. Vapors may form explosive mixtures in contact with air. The product may polymerize violently in contact with metallic salts, peroxides, rust or the absence of air.
Conditions to avoid	High temperatures, ignition source, luminosity and contact with incompatible materials.
Incompatible material	Acids, oxidizing agents, metal salts, rust, potassium hydroxide, metal halides, cellulose, clay based absorbents, sawdust, copper alloys and peroxides.
Hazardous decomposition products	Decomposition of the product can release toxic gases such as carbon monoxide and carbon dioxide.

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SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity	<p>Harmful if inhaled. Not classified as toxic by dermal or oral route.</p> <p>LD₅₀ (oral, rats): > 5,000 mg / kg.</p> <p>LD₅₀ (dermal, rabbits): > 2000 mg / kg.</p> <p>LC₅₀ (inhalation, rats, 4h): 11.8 mg / L.</p>
Skin corrosion/irritation	Causes irritation to the skin with redness and dryness.
Serious eye damage/irritation	Causes serious eye irritation with tearing and redness.
Respiratory or skin sensitization	<p>The product is not expected to cause respiratory or skin sensitization.</p> <p>Due to widespread exposure to styrene in industries, data in humans regarding the sensitizing potential of styrene are not reported. Thus, extensive human experience indicates that styrene is not a skin sensitizer.</p>
Germ cell mutagenicity	<p>The product is not expected to cause germ cell mutagenicity.</p> <p>There is no convincing evidence that styrene has shown mutagenic activity in humans.</p> <p>The data available in vivo in experimental animals suggests that styrene is weakly positive in indicator tests that detect SCEs, breaks in DNA support and DNA adducts. In contrast, an in vivo UDS test carried out according to international guidelines did not reveal a genotoxic effect of styrene on the liver of mice.</p>
Carcinogenicity	<p>Suspected of causing cancer.</p> <p>ACGIH - Classifies styrene as group A3 - confirmed animal carcinogen with unknown relevance to humans.</p> <p>IARC - Classifies styrene as group 2A - Probably carcinogenic to humans.</p>

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Reproductive toxicity	<p>Suspected of damaging fertility or the unborn child.</p> <p>Animal studies have shown a decrease in the growth rate in puppies of the F2 generation, a decrease in the weight of the pituitary gland, among other effects.</p>
STOT - Single exposure	May cause respiratory irritation with coughing and sneezing
STOT - Repeated exposure	<p>Causes damage to hearing organs by repeated or prolonged exposure.</p> <p>There is evidence that maximum hearing loss is already achieved after a few weeks of exposure and that ototoxicity does not increase with prolongation of the exposure period.</p>
Aspiration hazard	May be fatal if swallowed and enters the respiratory tract.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	<p>Toxic to aquatic organisms.</p> <p>LC₅₀ (<i>Pimephales promelas</i>, 96h): 10 mg / L.</p> <p>LC₅₀ (<i>Pimephales promelas</i>, 96h): 4.02 mg / L.</p> <p>EC₅₀ (<i>Daphnia magna</i>, 48h): 4.7 mg / L.</p> <p>LC₅₀ (<i>Hyalella azteca</i>, 96h): 9.5 mg / L.</p> <p>CEr₅₀ (<i>Selenastrum capricornutum</i>, 72h): 4.9 mg / L.</p> <p>NOEC (<i>Daphnia magna</i>, 21 days): 1.01 mg / L.</p>
Persistence and degradability	<p>The product has no persistence and is considered rapidly degradable.</p> <p>Biodegradability rate: 100% after 28 days</p>
Bioaccumulative potential	<p>It has low bioaccumulative potential in aquatic organisms.</p> <p>Log kow: 2.95.</p>

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Mobility in soil	No data available.
Other adverse effects	There are not known adverse environmental effects of the product.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods

Product	It must be disposed of as hazardous waste according to local regulations. The treatment and disposal should be evaluated for each specific product. Keep the product remains in its original and properly closed. Disposal should be performed as established for the product. Do not reuse empty containers. These may contain product residues and should be kept closed and sent for proper disposal as established for the product.
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SECTION 14: Transport information

Road	UN - "United Nations". Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations.
UN Number	2055
UN Proper Shipping Name	STYRENE MONOMER, STABILIZED
Transport hazard class(es):	3
Packing group:	III
Rail	Convention concerning International Carriage by Rail (COTIF) Appendix C - Regulations concerning the International Carriage of Dangerous Goods by Rail - RID
UN Number	2055

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UN Proper Shipping Name	STYRENE MONOMER, STABILIZED
Transport hazard class(es)	3
Packing group	III
Sea:	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN Number	2055
UN Proper Shipping Name	STYRENE MONOMER, STABILIZED
Transport hazard class(es)	3
Packing group	III
EmS	F-E, S-D
Marine pollutant	The product is not considered a marine pollutant.
Air	IATA - International Air Transport Association Dangerous Goods Regulation (DGR)
UN Number	2055
UN Proper Shipping Name	STYRENE MONOMER, STABILIZED
Transport hazard class(es)	3
Packing group	III
Hazardous to the environment	The product is not considered environmentally hazardous
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: <ul style="list-style-type: none"> - 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

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dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

SECTION 15: REGULATORY INFORMATION

Regulations for chemical products Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990.

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 the 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.

Revised and adequate in march 2021.

Subtitles and abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

EC₅₀ – Effective concentration 50%

LC₅₀ – Lethal concentration 50%

LD₅₀ – Lethal dose 50%

IARC – International Agency for Research on Cancer

IDLH – Immediately Dangerous to Life or Health

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kow – Octanol/Water Partition Coefficient

NOEC – No Observed Effect Concentration

STEL – Short Term Exposure Limit

TLV – Threshold Limit Value

TWA – Time Weighted Average

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ECHA. EUROPEAN CHEMICAL AGENCY. Available in: <<https://echa.europa.eu/>>. Access in: dec. 2020.

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