

1. Product and Company Identification

1.1 Product Identifier

INEOS Styrolution Product Name: Lustran® 308 NR
INEOS Styrolution Material Number: 50020898
INEOS ABS Product Name
 (Formerly known as): GUARDIAN ABS 308 000000
INEOS ABS Material Number: 99600321
SDS Date of Preparation/Revision: 18 January 2016

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Product Use: Industrial Applications
Uses Advised Against: None known

1.3 Details of the Supplier of the Substance or Mixture

Manufacturer: INEOS Styrolution America LLC
 4245 Meridian Parkway, Suite 151
 Aurora IL 60504
 USA
www.ineos-styrolution.com
 E-mail: infopoint.americas@styrolution.com

1.4 Emergency Telephone Number

TRANSPORTATION CHEMTREC
 Telephone: 1 - 800 - 424 - 9300 (24 h)
 (collect calls accepted)
 Information Phone: +1 866 - 890 - 6353

2. Hazards Identification

2.1 Classification of the Substance or Mixture

EU Classification CLP (1272/2008): Not classified as hazardous

2.2 Label Elements : No EU Labeling Required

2.3 Other Hazards: WARNING! May form combustible dust concentrations in air during processing. Melted product is flammable and produces intense heat and dense smoke during burning. Irritating gases and fumes may be given off during burning or thermal decomposition. May cause mechanical irritation (abrasion). Causes slipping hazard if spilled. Contact with hot material will cause thermal burns.

3. Composition/Information on Ingredients

Chemical Name	CAS Number / EINECS Number / REACH Reg. Number	% (w/w)	CLP/GHS Classification (1272/2008)
Modified Acrylonitrile/ Butadiene/Styrene Polymer	Trade Secret	>=1	Not classified as hazardous
White Mineral Oil, Petroleum	8042-47-5	1-3	Not classified as hazardous
Styrene	100-42-5 / 202-851-5	<=0.25%	Flammable Liquid 3 (H226) Acute Toxicity 4 (H332)

			Eye Irritant 2 (H319) Skin Irritant 2 (H315) Reproductive Toxicity 2 (H361d) STOT RE 1 (H372)
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See Section 16 for further information on EU and GHS Classification.

4. First Aid Measures

4.1 Description of First Aid Measures

Eye Contact: In case of eye contact, flush eyes with plenty of lukewarm water.

Skin Contact: In case of contact with skin, wash affected areas with soap and water. In case of thermal burns, immediately immerse affected area in cold water. Do not attempt to remove material adhering to the skin. Get medical attention for burns.

Inhalation: If exposed to gases or fumes from thermal processing, move to fresh air. Get medical attention, if irritation or other symptoms develop and persist.

Ingestion: Not a likely route of exposure. If swallowed, get medical attention.

4.2 Most Important symptoms and effects, both acute and delayed: No adverse effects from handling solid material at ambient temperatures. Inhalation of decomposition products may irritate the eyes, skin or respiratory tract and cause nausea, drowsiness and headache. Hot material will cause thermal burns.

4.3 Indication of any immediate medical attention and special treatment needed: Immediate treatment of burns is required.

5. Fire-Fighting Measures

5.1 Extinguishing Media: Water, foam, dry chemical, carbon dioxide (CO₂).

5.2 Special Hazards Arising from the Substance or Mixture

Unusual Fire/Explosion Hazards: Toxic and irritating gases and fumes may be given off during burning or thermal decomposition. Avoid generating dust. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products: Carbon dioxide, carbon monoxide, styrene, acrylonitrile, hydrogen cyanide, hydrocarbons.

5.3 Advice for Fire-Fighter: Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.

6. Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures: Wear suitable protective equipment.

6.2 Environmental Precautions: Avoid release to the environment.

6.3 Methods and Material for Containment and Cleaning Up: If molten, allow material to cool and place into an appropriate marked container for disposal. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (i.e., removing dust from surfaces with compressed air). Non-sparking tools should be used.

6.4 Reference to Other Sections: Refer to Section 8 for personal protective equipment, Section 13 for disposal information, and Section 15 for Release Reporting information, if applicable.

7. Handling and Storage

7.1 Precautions for Safe Handling: Handle in accordance with good industrial hygiene and safety practices. Wash thoroughly after handling. Avoid breathing dust.

Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.

Pellets and pellet dust can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

Protect equipment (e.g. storage bins, conveyors, dust collectors) with explosion vents.

7.2 Conditions for Safe Storage, Including any Incompatibilities:

Storage Temperature: 82°C (179.6°F) maximum

Storage Period: Not established

7.3 Specific end use(s): Not applicable

8. Exposure Controls / Personal Protection

8.1 Control Parameters:

Although no exposure limit has been established for this product, national exposure limits for Particulates not Otherwise Regulated (PNOR) should be observed.

<u>Country</u>	<u>Chemical</u>	<u>Exposure Limits</u>
Austria	Oil mist, mineral	5 mg/m ³ TWA inhalable aerosol
Belgium	Oil mist, mineral	5 mg/m ³ TWA
Denmark	Oil mist, mineral	1 mg/m ³ TWA 2 mg/m ³ STEL
Spain	Oil mist, mineral	5 mg/m ³ TWA 10 mg/m ³ STEL
Sweden	Oil mist, mineral	1 mg/m ³ TWA 3 mg/m ³ STEL
United Kingdom	Oil mist, mineral	5 mg/m ³ TWA 10 mg/m ³ STEL

This product contains <=0.25% residual styrene. The national occupational exposure limits for styrene should also be observed.

<u>Country</u>	<u>Chemical</u>	<u>Exposure Limits</u>
Australia	Styrene	20 ppm TWA 80 ppm STEL
Austria	Styrene	20 ppm TWA 80 ppm STEL
Belgium	Styrene	50 ppm TWA 100 ppm STEL
Denmark	Styrene	25 ppm TWA 25 ppm STEL
France	Styrene	50 ppm TWA
Germany, Spain, Switzerland	Styrene	20 ppm TWA 40 ppm STEL
Sweden	Styrene	20 ppm TWA 50 ppm STEL
United Kingdom	Styrene	100 ppm TWA

250 ppm STEL

8.2 Exposure Controls:

Industrial Hygiene/Ventilation Measures: General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate occupational exposure limits. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling 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).

Respiratory Protection: If the recommended exposure limits are exceeded a NIOSH approved particulate/organic vapor respirator appropriate for the form and concentration of the contaminants should be used. Selection and use of respiratory equipment must be in accordance with OSHA 1910.134 or other applicable regulations and good industrial hygiene practice.

Hand Protection: Wear heat resistant gloves when handling molten material.

Eye Protection: Safety glasses with side shields.

Skin and Body Protection: No special protection required for normal handling and use. For operations where heated polymer is handled, thermally protective gloves and clothing should be worn along with appropriate eye protection.

Additional Protective Measures: Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Purgings should be collected as small flat, thin shapes or thin strands to allow for rapid cooling. Precautions should be taken against autoignition of hot, thick masses of the plastic. Quench with water. Fumes or vapors emitted from the hot melted plastic during converting operations may condense on cool overhead metal surfaces or exhaust ducts. The condensate, usually in the form of a soft, grease-like semi-solid may contain substances which can be irritating or toxic. Wear rubber gloves when cleaning contaminated surfaces.

Use only appropriately classified electrical equipment and powered industrial trucks where dust from product is present.

8.2.3 Environmental Exposure Controls: Follow all national regulations regarding emissions from manufacturing operations.

9 Physical and Chemical Properties

Form:	Solid	Appearance:	Pellets
Color:	Natural	Odor:	Slight, sweet, aromatic
pH:	Not applicable	Boiling Point/Range:	Not applicable
Flash Point:	388-400°C (730-752°F)	Vapor Pressure:	Not applicable
Evaporation Rate:	Not applicable	Partition coefficient: n-octanol/water	Not determined
Lower Explosion Limit:	Not established	Bulk Density:	600-700 kg/m ³
Upper Explosion Limit:	Not established	Specific Gravity:	Approx. 1.05
Autoignition Temperature:	495-510°C (923-950°F)	Solubility in Water:	Insoluble
Decomposition Temperature:	Approx. 260°C (500°F)	Softening Point:	82-107°C (179-224°F)
Flammability (solid):	Fine dust generated from processing may burn at elevated temperatures	Viscosity:	Not applicable
Explosive Properties:	Fine dust generated from processing may be explosive	Oxidizing Properties:	None

10. Stability and Reactivity

10.1 Reactivity: Not reactive under normal handling and storage.

10.2 Chemical Stability: Stable

10.3 Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4 Conditions to Avoid: None known

10.5 Incompatible Materials: None known

10.6 Hazardous Decomposition Products: Thermal decomposition will generate carbon dioxide, carbon monoxide, styrene, acrylonitrile, hydrogen cyanide, hydrocarbons.

11. Toxicological Information

11.1 Information on Toxicological Effects:

Product Toxicity Data

Toxicity Note: Toxicity data is based on similar ABS resins.

Skin Irritation: rabbit – non-irritating.

Eye Irritation: rabbit – Draize – slightly irritating.

Other Relevant Toxicity Information: Styrene is slightly toxic to practically non-toxic in oral feeding studies (rats) and skin application studies (rabbits). Repeated inhalation studies in rats for 3 weeks reported effects suggestive of a hearing impairment. Repeated inhalation exposures produced lung irritation in guinea pigs and organ weight changes in rats. An oral study in mice reported slight increases in lung tumors and lymphomas, but the National Cancer Institute reported no convincing evidence for carcinogenicity in repeated oral studies with rats and mice. In standard mutagenicity tests, both positive and negative results were reported. No birth defects occurred in rats given styrene orally. Some toxic effects on the fetus were noted in a limited inhalation study using repeated high doses.

Toxicity Data for White Mineral Oil, Petroleum

Acute Oral Toxicity: LD50 >5000 mg/kg (rat)

Acute Dermal Toxicity: LD50 >2,000 mg/kg (rabbit)

Skin Irritation: rabbit – Draize – 24 hour occlusive – non-irritating

Eye Irritation: rabbit – Slightly irritating

Sensitization: Dermal – non-sensitizer (guinea pig maximization test)

Repeated Dose Toxicity: 90 days oral rat, NOAEL 1800 mg/kg/day

Mutagenicity:

Genetic Toxicity in Vitro: Ames test salmonella typhimurium negative (with and without activation); Mouse lymphoma assay negative (with and without activation)

Carcinogenicity

Mouse, dermal, 18-24 months – did not show carcinogenic effects

Dog, inhalation, 12-26 months - did not show carcinogenic effects

Toxicity to Reproduction/Fertility

One generation study, oral, rat, NOAEL parental >4350 mg/kg; NOAEL F1 offspring >4350 mg/kg – No effects on reproductive parameters observed at doses tested.

Developmental Toxicity/Teratogenicity

Rat, gestation days 6-19, NOAEL maternal toxicity and teratogenicity >4350 mg/kg – No teratogenic or fetotoxic effects observed at doses tested.

Toxicity Data for Styrene

Acute Oral Toxicity: LD50 1000 mg/kg (rat)

Acute Inhalation Toxicity: LC50 11.8 mg/L/4 hr (rat)

Acute Dermal Toxicity: LD50 >20,000 mg/kg (rabbit)

Skin Irritation: rabbit – Draize – moderately irritating

Eye Irritation: rabbit – Draize – severely irritating

Sensitization: Dermal – non-sensitizer (guinea pig maximization test (GPMT))

Repeated Dose Toxicity

6 months, inhalation NOAEL 6.3 mg/kg (monkey, male/female, daily)

28 Days, dermal NOAEL <500 mg/kg (rat, male daily)

13 weeks, inhalation NOAEL 0.565 mg/L (rat, male/female, daily)

Mutagenicity

Genetic Toxicity in Vitro:

Ames: negative (Salmonella typhimurium, metabolic activation with and without)

Sister Chromatid Exchange: positive (human lymphocytes, metabolic activation with and without)

Genetic Toxicity in Vivo:

Cytogenic assay positive (rat)

Drosophila SLRL test: positive (Drosophila melanogaster)

Carcinogenicity

Styrene was tested for carcinogenicity in rats in four gavage studies, one drinking water study and two inhalation studies. Overall, there was no reliable evidence for an increase in tumor incidence in rats in any of these studies. Inhalation exposure caused benign lung tumors (alveolar/bronchiolar adenoma) and increased the combined incidence of benign and malignant lung tumors (alveolar/bronchiolar adenoma and carcinoma) in CD-1 mice of both sexes; in females, it also increased the separate incidence of malignant lung tumors. In male B6C3F1 mice, oral exposure to styrene increased the combined incidence of benign and malignant lung tumors (alveolar/bronchiolar adenoma and carcinoma), and a positive dose-response trend was observed (NCI 1979). These findings are supported by findings of lung tumors in both sexes of O20 mice exposed to styrene (Ponomarev and Tomatis 1978). In O20 mice, a single dose of styrene was administered to pregnant dams on gestational day 17, and pups were exposed orally once a week for 16 weeks after weaning. A significantly increased incidence and earlier onset of benign and malignant lung tumors combined (adenoma and carcinoma) occurred in mice of both sexes as early as 16 weeks after weaning. In a similar study with C57Bl mice administered a much lower dose of styrene, lung-tumor incidence was not significantly increased. A screening study by intraperitoneal administration did not find an increase in tumor incidence or multiplicity in mice. The increased risks for lymphatic and hematopoietic neoplasms observed in some human epidemiological studies are generally small, statistically unstable and are not very robust.

Toxicity to Reproduction/Fertility

Three generation study, oral, daily (rat, male/female) NOAEL (parental): 250 ppm, NOAEL (F1): 125 ppm, NOAEL (F2): 125 ppm

No effects on reproductive parameters observed at doses tested.

Other method, inhalation, daily, (rabbit female) NOAEL parental 2.6 mg/L, NOAEL (F1) 2.6 mg/L

Developmental Toxicity/Teratogenicity

Rat, female inhalation, gestation NOAEL (teratogenicity): >600 ppm, NOAEL (maternal) : <300 ppm. No teratogenic effects observed at doses tested.

Rabbit, female, inhalation, daily, gestation, NOAEL (teratogenicity): >600 ppm, NOAEL (maternal) : >600 ppm. Fetotoxicity seen only with maternal toxicity.

11.1.7 Routes of Exposure: Dermal, eye, inhalation

Potential Health Effects:

Skin (Acute): Contact with heated material can cause thermal burns.

Eye (Acute): May cause mechanical irritation.

Acute Effects of Exposure: Gases and fumes evolved during thermal processing or decomposition of this material may irritate the eyes, skin or respiratory tract and cause nausea, drowsiness and headache.

Chronic Effects of Exposure: Not expected to cause any adverse chronic health effects.

11.1.8 Symptoms related to the physical, chemical and toxicological characteristics: No adverse effects from handling solid material at ambient temperatures. Inhalation of decomposition products may irritate the eyes, skin or respiratory tract and cause nausea, drowsiness and headache. Hot material will cause thermal burns.

11.1.9 Delayed and immediate effects as well as chronic effects from short and long-term exposure: Gases and fumes evolved during thermal processing or decomposition of this material may irritate the eyes, skin or respiratory tract and cause nausea, drowsiness and headache. Contact with hot product will cause thermal burns.

11.1.10 Interactive effects: No applicable data is available on interactive effects.

12. Ecological Information

12.1 Toxicity:

White Mineral Oil:

Acute and Chronic Toxicity to Fish

LC50: >10,000 mg/L/96 hr bluegill (*lepomis macrochirus*)

LC50: 10-100 mg/L/96 hr zebra fish (*brachydanio rerio*)

Styrene:

Acute and Chronic Toxicity to Fish

LC50 9 mg/L/96 hr sheepshead minnow (*cyprinodon variegatus*)

LC50 29 – 59.3 mg/L/96 hr fathead minnow (*pimephales promelas*)

LC50 25 mg/L/96 hr bluegill (*lepomis macrochirus*)

LC50 2.4 – 4.1 mg/L/96 hr rainbow trout (*salmo gairdneri*)

Acute Toxicity to Aquatic Invertebrates

EC50 4.7 – 23 mg/L/48 hr water flea (*daphnia magna*)

Toxicity to Aquatic Plants

EC50 1.4 mg/L/72 hr green algae (*selenastrum capricornutum*)

Toxicity to Microorganisms

EC50 approx. 500 mg/L/30 min activated sludge microorganisms

EC50 5.5 mg/L/5 min photobacterium phosphoreum

EC50 72 mg/L/16 hr pseudomonas putida

12.2 Persistence and degradability:

White Mineral Oil:

Biodegradation: Aerobic, 0-24% after 28days, Not readily biodegradable

Biological Oxygen Demand (BOD): 344 mg/g

Chemical Oxygen Demand: 3130 mg/g

Styrene: Biodegradation: aerobic 71% 28 d

Biological Oxygen Demand (BOD): 5 days, 2.46 mg/L

Chemical Oxygen Demand: 2800-2880 mg/g

Theoretical Biological Oxygen Demand (ThBOD): 3.07 mg/L

12.3 Bioaccumulative Potential:

Styrene : Carp 13.5 BCF

12.4 Mobility in Soil: No data available

12.5 Results of PVT and vPvB assessment: Not required

12.6 Other Adverse Effects: Not applicable

13 Disposal Considerations

13.1 Waste Treatment Methods:

Waste disposal should be in accordance with existing national and/or local environmental control laws. **Consult your local or regional authorities.**

14. Transportation Information

Land Transport (DOT): Not Regulated

Land Transport (TDG): Not Regulated

Sea Transport (IMDG): Not Regulated

Air Transport (ICAO/IATA): Not Regulated

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

International Inventories

AUSTRALIAN INVENTORY (AICS): Not Listed.

CANADA INVENTORY (DSL): Listed

CHINA INVENTORY (IECS): Listed

EU INVENTORY (EINECS/ELINCS): Listed

JAPAN INVENTORY (ENCS): Not Listed

KOREA INVENTORY (ECL): Listed.

PHILIPPINE INVENTORY (PICCS): Not Listed

UNITED STATES (TSCA): Listed.

Classification of Substances Hazardous to Water (WGK): 2

16. Other Information

GHS Classes and Hazard Phrases for Reference (See Section 3):

STOT RE Specific Target Organ Toxicity Category 1

H226 Flammable liquid and vapour.

H332 Harmful if inhaled.

H319 Causes serious eye irritation.

H315 Causes skin irritation.

H361d Suspected of damaging the unborn child.
H372 Causes damage to organ through prolonged or repeated exposure.

Contact Person: Product Safety Department
Telephone: +1 866 - 890 - 6353
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