

MATERIAL SAFETY DATA SHEET

Trade Name: **NCS MONOMER**

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

1. PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME

NCS MONOMER

MANUFACTURER

NCS Resins, Durban Head Office
9 Pineside Road, New Germany 3610
Kwa-Zulu Natal, South Africa

Tel: +27 031 713 0600 Fax: +27 031 705 9858

Emergency Telephone: +27 031 713 0600

SUPPLIER

Aurora Glass Fibre (NZ) Ltd
3/16 Zelanian Drive, East Tamaki,
Auckland 2013, New Zealand

Tel: +64 09 273-3540 Fax: +64 09 273-3565

Emergency Telephone No. +64 09 273-3540

Poisons Information Centre

0800 764 766 (from anywhere in New Zealand)

2. HAZARD IDENTIFICATION

Classified as Hazardous according to the New Zealand Hazardous Substances Regulations. Classified as Dangerous Goods for transport according to New Zealand Standard.

DG Classification: Class 3
UN Number: 1866, Resin Solution, Flammable
EPA New Zealand Approval Code: HSR001221



HSNO Classification:

- 3.1C Flammable Liquid
- 6.1E Acute Toxicity, Oral/Dermal
- 6.1D Acute Toxicity, Inhalation
- 6.3A Substance that is corrosive or irritating to the skin
- 6.4A Substance that is corrosive or irritating to the eye
- 6.6B Suspected human mutagen
- 6.7B Suspected human carcinogen
- 6.9B May cause damage to target organs through prolonged/repeated exposure
- 9.1C Aquatic ecotoxicity, Fish

Hazard Statements:

- 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.
- H341 Suspected of causing genetic defects.

MATERIAL SAFETY DATA SHEET

Trade Name: NCS MONOMER

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H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H370	Causes damage to organs (Central Nervous System).
H372	Causes damage to organs (Blood system, Liver, Nervous System, Respiratory Tract/Organ) through prolonged or repeated exposure.
H401	Toxic to aquatic life.

Precautionary Statements – Prevention

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/spark/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/fume/gas/mist/vapour/spray.
P264	Wash skin 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/face protection.

Precautionary Statements – Response

P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/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.
P308 + P311	IF exposed or concerned: Call a POISON CENTER or doctor/physician.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P321	Specific treatment (see supplemental first aid instructions on this label).
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Precautionary Statements – Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Precautionary Statements – Disposal

P501	Dispose of contents/container to an approved waste disposal plant.
P505	Dispose of in accordance with local bylaws and national waste regulations.

MATERIAL SAFETY DATA SHEET

Trade Name: NCS MONOMER

Revision Date: 2019-05-23

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3. COMPOSITION / INFORMATION ON INGREDIENTS

Synonyms: Inhibited Styrene
Phenylethylene
Benzene, Ethenyl
Styrol
Cinnamene
Vinylbenzene
Styrolene
Styrene Monomer

Molecular formula: C₈H₈

Component	CAS No	Weight %
Styrene	100-42-5	100

Chemical Name: Styrene
Chemical Family: Aromatic Hydrocarbon

4. FIRST AID MEASURES

Eyes

Immediately flood the eyes with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention urgently.

Skin

Wash skin thoroughly with soap and water. Obtain medical attention if blistering occurs or redness persists.

Ingestion

Wash mouth with water. Do not induce vomiting. If any material enters the lungs, for example during swallowing or vomiting, obtain medical attention urgently.

Inhalation

Remove from exposure. Keep warm and at rest. If there is difficulty in breathing, give oxygen. If breathing stops or gives signs of failing, give artificial respiration. If heart beat absent, give external cardiac compression (CPR). Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Irritating to eyes, respiratory system and skin. Harmful by inhalation, in contact with skin and if swallowed.

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically. Keep under medical surveillance for 48 hours if aspiration could have occurred.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

Carbon dioxide (CO₂), Foam, Dry Chemical, Water Spray.

MATERIAL SAFETY DATA SHEET

Trade Name: **NCS MONOMER**

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

Unsuitable Extinguishing Media

Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Hazardous combustion products

Combustion may produce carbon monoxide, carbon dioxide and irritating or toxic vapours and gases

Combustion/Explosion Hazards

Flammable. Vapours may form explosive mixture with air. Flash back possible over considerable distance. This material may polymerize (react) when its container is exposed to heat (as during a fire). This polymerization increases pressure inside a closed container and may result in the violent rupture of the container. Empty containers may retain product residue (liquid and/or vapor). Do not pressurize, cut, weld, braze, solder, drill, grind or expose these containers to heat, flame, sparks, static electricity, or other sources of ignition as the container may explode and may cause injury or death.

Protective Equipment and Precautions for Fire-Fighters

Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing. Thoroughly decontaminate all protective equipment after use. Evacuate all person from the fire area to a safe location. Move non-burning material, as feasible, to a safe location as soon as possible. Fire fighters should be protected from potential explosion hazard while extinguishing the blaze. DO NOT extinguish a fire resulting from the flow of this flammable liquid until the flow of liquid is effectively shut off. This precaution will help prevent the accumulation of an explosive vapor-air mixture after the initial fire is extinguished. Use water spray to cool fire-exposed containers.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Remove all sources of ignition. Evacuate personnel to safe areas. Avoid contact with skin and eyes. Use personal protective equipment as required. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Other Information

All equipment used when handling the product must be grounded.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Prevent product from entering drains. Soak up with inert absorbent material and dispose of as hazardous waste. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Take precautionary measures against static discharges.

Methods for Containment

Prevent spilled material from contaminating soil, entering sanitary sewers, storm sewers, and drainage systems and entering bodies of water or ditches that lead to waterways. Prevent spreading over a wide area (e.g. by containment or oil barriers).

Methods for Clean-Up

Soak up with inert absorbent material. Remove from surface water (e.g. by skimming or siphoning). Dispose of contaminated material as waste according to item 13.

MATERIAL SAFETY DATA SHEET

Trade Name: NCS MONOMER

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

7. HANDLING AND STORAGE

Handling

Do not breathe vapour or mist. Avoid contact with eyes, skin and clothing. Take off contaminated clothing and wash before reuse. Ensure adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion-proof equipment. Consult your supplier of promoters and catalysts for additional instructions on proper mixing and usage. Empty containers may retain product residue (liquid and/or vapour). Do not pressurize, cut, weld, braze, solder, drill, grind, or expose these containers to heat, flame, sparks, static electricity, or other sources of ignition as the container may explode and may cause injury or death. Empty drums should be completely drained and properly bunged. Empty drums should be promptly returned to a drum reconditioner or properly disposed. Do not use compressed air for filling, discharging or handling. Wash hands before breaks and immediately after handling product.

Storage

Keep away from heat and sources of ignition. No smoking. Keep away from direct sunlight. Keep containers tightly closed in a cool, well-ventilated place. To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 77°F (25°C).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Guidelines:

Components with workplace control parameters

Styrene (CAS #: 100-42-5)

Occupational Health and Safety Act, 1993

Regulations for Hazardous Chemical Substances, 1995 Table 1&2

TWA OEL CL-RL	100ppm (styrene)
STEL OEL CL-RL	250ppm

Legend

TWA – Time-Weighted Average

STEL – Short Term Exposure Limit

OEL – Occupational Exposure Limit

CL – Control limit for Hazardous Chemical Substances

RL – Recommended limit for Hazardous Chemical Substances

Biological exposure index (BEI) for STYRENE

Chemical Determinant	Sampling Time	BEI	Notation
Mandelic acid in urine	End of shift	800mg/g creatinine	Determinant is non-specific
Mandelic acid in urine	Prior to next shift	300mg/g creatinine	Determinant is non-specific
Phenylglyoxylic acid in urine	End of shift	240mg/g creatinine	Determinant is non-specific; determinant is usually present in a significant amount in biological specimens
Phenylglyoxylic acid in urine	Prior to next shift	100mg/g creatinine	Determinant is non-specific; determinant is usually present in a significant amount in biological specimens

MATERIAL SAFETY DATA SHEET

Trade Name: **NCS MONOMER**

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

Styrene in venous blood	End of shift	0.55mg/l	Determinant is an indicator of exposure to the chemical but semi-quantitative (ambiguous interpretation)
Styrene in venous blood	Prior to next shift	0.02mg/l	Determinant is an indicator of exposure to the chemical but semi-quantitative (ambiguous interpretation)

Appropriate engineering controls

Engineering Controls

Use general ventilation to maintain airborne concentrations to levels that are below regulatory and recommended occupational exposure limits. Local ventilation may be required during certain operations. Use explosion-proof equipment.

Respiratory Protection

If TWA OEL CL level above is exceeded, then suitable respiratory protection must be worn. Up to 500 ppm a chemical cartridge respirator with organic vapour cartridge(s). Above 500 ppm them full face supplied air respirator, or self-contained breathing apparatus should be used. Note that the IDL (immediately dangerous to life or health) concentration of styrene is 700 ppm.

Hand Protection

Impervious gloves. Evaluate the resistance of the product under conditions of use.

Eye Protection

Wear approved safety glasses or chemical goggles or a face shield. Have an emergency eyewash station readily available in the working area.

Skin and Body Protection

Impervious gloves, coveralls, boots, and/or other resistant protective clothing. Have a safety shower/eye wash fountain readily available in the immediate work area.

Personal Protection Comments

Dust generated by grinding or polishing finished products is regarded as hazardous and precautions should be taken to ensure dust concentrations to be maintained below a TWA OEL value of 10mg/m³. Where dust concentrations exceed these values, appropriate dust masks should be worn.

Other Protective Measures

Remove contaminated clothing immediately. Keep contaminated clothing in closed containers. Discard or launder before re-wearing. Inform laundry personnel of contaminated hazards.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Colour	Clear colourless
Odour	Pungent
pH	Not applicable
Boiling Point/Range	145°C – 148°C
Freezing Point	-30.6°C
Flash Point	31°C (closed cup)

MATERIAL SAFETY DATA SHEET

Trade Name: NCS MONOMER

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

Flammability	1.1 – 6.1 % v/v
Auto Ignition Temperature	490°C
Explosive Properties	LEL 1.1% UEL 6.1%
Oxidising Properties	None
Vapour Pressure	0.60 kPa at 20°C 0.81 kPa at 25°C
Density	0.9 g cm ⁻³
Solubility	Practically insoluble 0.03%
Vapour Density (Air=1)	4.33

10. STABILITY AND REACTIVITY

Stability

Stable under normal storage conditions, below 25°C.

Conditions to Avoid

Heat, sparks, open flames, ignition sources.

Materials to Avoid

Oxidising agents. Mineral Acids. Alkalis. Phosphorous pentoxide. Peroxides. Ferrous chloride and other metal halides.

Hazardous Decomposition Products

Heating to decomposition may cause the emission of thick irritating and acrid fumes, resulting in zero visibility. Styrene may form styrene oxide as decomposition product.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Primary Routes of Entry Eye contact, Ingestion, Inhalation, Skin Contact, Skin absorption

Acute Toxicity

Styrene

Oral LD50	= 5000 mg/kg (Rat)
Dermal LD50	> 2000 mg/kg (Rat)
Inhalation LC50	= 11.8 mg/l (4 H) (Rat)

Information on toxicological effects

Symptoms Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Eyes Irritating to eyes.

Skin Harmful by skin absorption. Contact causes skin irritation. Prolonged skin contact may defat the skin and produce dermatitis.

MATERIAL SAFETY DATA SHEET

Trade Name: NCS MONOMER

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

Inhalation Harmful by inhalation. May cause irritation of respiratory tract. Inhalation of high vapour concentrations can cause CNS-depression and narcosis.

Ingestion Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Aspiration hazard if swallowed – can enter lungs and cause damage. Ingestion is not an anticipated route of exposure for this material in industrial use.

Sensitization Not sensitizing.

Repeated dose toxicity In humans, styrene may cause a transient decrease in colour discrimination and effects on hearing. Repeated or prolonged exposure may cause skin irritation and dermatitis, due to defatting properties of the product. May cause damage to the liver, eyes, brain, respiratory system, central nervous system through prolonged or repeated exposure if inhaled. May cause damage to the kidneys, liver, eyes, brain, respiratory system, central nervous system through prolonged or repeated exposure if inhaled.

Mutagenic effects Styrene has given mixed positive and negative results in a number of mutagenicity tests. Styrene was not mutagenic without metabolic activation but gave negative and positive mutagenic results with metabolic activation.

Carcinogenicity

Styrene

- ACGIH** Group A4 – Not classified as human carcinogen.
IARC Group 2B – Possibly carcinogenic to humans.
NTP Reasonably anticipated to be human carcinogen.

Legend *IARC – International Agency for Research on Cancer*
NTP – National Toxicology Program

Reproductive Toxicity No information available.

Neurological Effects No information available.

STOT – single exposure No information available.

STOT – repeated exposure No information available.

Target organ(s) Liver, Central Nervous System (CNS), Respiratory System, Kidney.

Aspiration Hazard No information available.

Numerical measures of toxicity – Product Information

The following values are calculated based on chapter 3.1 of the GHS document.

ATEmix (oral)	2923 mg/kg
ATEmix (dermal)	1967 mg/kg
ATEmix (inhalation-vapour)	11.4 mg/L

MATERIAL SAFETY DATA SHEET

Trade Name: NCS MONOMER

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

12. ECOLOGICAL INFORMATION

STYRENE:

Toxicity to fish

LC50: 4.02 mg/l

Exposure time: 96 h

Species: Pimephales promelas (fathead minnow)

Flow-through test

Test substance: Yes

Toxic to fish

Toxicity to daphnia and other aquatic invertebrates

EC50: 4.7mg/l

Exposure time: 48 h

Species: Daphnia magna (Water flea)

Flow-through test

Toxicity to Algae

EC50: 4.9 mg/l

Exposure time: 72 h

Species: Selenastrum capricornutum (algae)

Toxicity to bacteria

EC10: 0.28 mg/l

Exposure time: 96 h

Growth rate

Species: Skeletonema costatum (Marine algae)

Test substance: Yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

NOEC: 1.01 mg/l

Exposure time: 21 d

Species: Daphnia magna (Water flea)

Semi-static test

Test substance: Yes

Method: OECD Test Guideline 211

Elimination information (persistence and degradability)

Bioaccumulation Does not significantly accumulate in organisms.

Biodegradability According to the results of tests of biodegradability this product is considered as being readily biodegradable.

Ecotoxicology Assessment

Acute aquatic toxicity

Toxic to aquatic life.

Chronic aquatic toxicity

Harmful to aquatic life with long lasting effects.

Toxicity data on soil

No data available

MATERIAL SAFETY DATA SHEET

Trade Name: **NCS MONOMER**

Revision Date: 2019-05-23

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Other organisms relevant to the environment	No data available.
Impact of sewage treatment	No data available.
Results of PBT assessment	This substance is not considered to be very persistent nor very bioaccumulating (vPvB). This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
Additional ecological	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal Considerations

Hazardous waste. Can be incinerated, when in compliance with local regulations.

Contaminated Packaging

Empty containers should be taken for local recycling, recovery or waste disposal.

14. TRANSPORT INFORMATION

NOT TO BE SENT BY MAIL

TARIFF No.		2902.5
UN No.		2055
Substance Identity No. S.I.N.	SANS 10232-3	2055
Emergency Action Code EAC	SANS 10232-3	27
SANS 10228:2006	S.I.N.	2055
SANS 10228:2006	Technical Name	Styrene
SANS 10228:2006	Class	3
SANS 10228:2006	Danger Group	111
SANS 10228:2006	Subsidiary Risks	Nil
SANS 10228:2006	Packaging Methods SABS 0229	13.3
IMDG – Shipping Name		Styrene monomer, inhibited
IMDG – Code		Page 3381
IMDG – Class		Class 3.3
IMDG – Packaging Group		111
IMDG – Marine Pollutant		Yes
IMDG – EMS No.		<u>3-07</u>
IMDG – MFAG Table No.		310
IATA – Shipping Name		Styrene monomer, inhibited
IATA – Class		Class 3
IATA – Subsidiary Risk(s)		None
IATA – Packaging Group		111
IATA – Packaging Instruction – Passenger		309
IATA – Packaging Instruction – Cargo		310
Tremcard No. TEC(R)		101

MATERIAL SAFETY DATA SHEET

Trade Name: **NCS MONOMER**

Revision Date: 2019-05-23

Compilation Date: 2015-08-15

15. REGULATORY INFORMATION

ECC Hazard Classification	Flammable. Harmful. Irritant. [R10; Xn; Xi] (Styrene)
Risk Phrases	Flammable. Harmful by inhalation. Irritating to eyes and skin. [R: 10, 20, 36/38]
Safety Phrases	Do not breathe vapour. [S: 23]
National Legislation	South African Hazardous Substance Act 15 of 1973. South African Occupational Health & Safety Act (85 of 1993).

16. OTHER INFORMATION

Reference:	NCS Resins South Africa	MSDS on NCS MONOMER	15 August 2015
Compiled by:	Aurora Glass Fibre (NZ) Ltd		
Preparation Date:	23 May 2019		

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