



Material Safety Data Sheet

Trade Name: **NCS Ultrabond Blue 52 PAS**

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Printed 22-Sep-13
Date of issue: 29-Jul-08

MSDS Ref: 088/500

Compiled 2011-10-29

1. PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME	NCS Ultrabond Blue 52 PAS
PRODUCT	Unsaturated polyester resin in styrene monomer
RECOMMENDED USE	Manufacture of reinforced and/or filled plastic composites eg fiberglass products. Product may be repacked for sale to the public. All components are listed or meet requirements of NICNAS.
MANUFACTURER/SUPPLIER	NCS Resins (Pty) Ltd
	Street address: 9 Pineside Road New Germany 3600 Kwa Zulu Natal Republic of South Africa
	Telephone: +27 31 7130600 Facsimile: +27 31 7058430
24 hour EMERGENCY TELEPHONE No.:	0414 398 368 or 000 +27 31 7130600

2. HAZARD IDENTIFICATION

Health Hazard Classification:

This material is classified as hazardous according to the health criteria of NOHSC Australia

Hazard category

Xn Xi Harmful, Irritant

Risk phrases(s)

R10 Flammable
R20 Harmful by inhalation
R36/38 Irritating to eyes and skin

Safety phrase(s)

S9 Keep container in a well ventilated place
S16 Keep away from sources of ignition – NO Smoking
S23 Do not breathe vapour or spray
S36/37 Wear suitable protective clothing and gloves
S29 Do not empty into drains
S33 Take precautionary measures against static discharge

Health hazard classification and labeling according to the criteria of NOHSC

Hazard categories: Xn (Harmful), Xi (Irritant)



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New Zealand

Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001

HSNO Classification Categories:

3.1C, 6.1C, 6.3B, 6.4A, 6.6B, 6.8B, 6.9B, 9.1D

Dangerous Goods Classification:

Classified as Dangerous Goods by the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)

Class 3 Flammable liquid

Poison Schedule (Aust): 5

3. COMPOSITION & INFORMATION ON INGREDIENTS

Chemical Name	Unsaturated Polyester Resin
Chemical Family	Synthetic Resin
Chemical Abstracts Registry No. (CAS No.)	Mixture

Ingredients contributing to hazard.

Styrene	25 - 55%	Xn, R10-20-36/38	CAS 100-42-5
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4. FIRST AID MEASURES

Swallowed:

If swallowed, give a glass of water. Do not induce vomiting. Lean victim forward to reduce the risk of aspiration. Never give drink to an unconscious person. Transport to a doctor or hospital quickly. For further advice call Poisons Information Center (Australia 13 1126: New Zealand 03 4747000).

Eye:

Immediately flush with plenty of water for at least 15 minutes, with eyelids held open. Seek immediate medical advice.

Skin:

Immediately remove contaminated clothing. Wipe resin off skin. Wash skin thoroughly with soap and water. Wash clothing before reuse.

Inhaled:

Remove to fresh air. Seek medical assistance. If not breathing give artificial respiration. If breathing difficult give oxygen.

First Aid Facilities:

Provide eye baths and safety showers close to areas where splashing may occur.



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Medical Attention and Special Treatment:

Treat symptomatically. Effects may be delayed and include pulmonary oedema. Aspiration of this product during induce emesis may result in sever lung injury. If evacuation of stomach is necessary use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation.

5. FIRE FIGHTING MEASURES

Flammable liquid Polymerisable if exposed to heat.

Suitable Extinguishing Media:

Foam, dry chemical and carbon dioxide extinguishers may be used. Use water spray to cool exposed closed containers.

Hazards from Combustion Products:

Thermal decomposition products include carbon monoxide and carbon dioxide styrene and acrid smoke.

Precautions for Fire Fighters and Special Protective Equipment:

Fire fighters and others exposed to the products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

Vapours are heavier than air and can accumulate in low areas; they may travel a considerable distance to a source of ignition and flash back. The liquid normally contains an inhibitor to prevent polymerisation.

At elevated temperatures, such as fire conditions, polymerisation may take place. If polymerisation takes place in a closed container, there is the possibility of a violent rupture of the container. Styrene vapours are unihibited and may form polymers in vents and flame arresters of storage tanks, resulting in vent blockages.

Hazchem Code: 3Y

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures:

Flammable liquid. Vapour may form explosive mixtures with air. Avoid all ignition sources. Keep unprotected people away. Wear appropriate protective equipment to prevent eye and skin contact and inhalation of vapours (See "Personal Protection" section). Increase ventilation. For large spills wear self contained breathing apparatus and full protective clothing.

Methods and Materials for Containment and Clean Up Procedures:

Contain spill and absorb with inert absorbent such as sand, earth or vermiculite and seal in properly labeled containers for disposal. Alternatively, pump to salvage truck. Keep out of sewer, stormwater drains and waterways.

Containers:

Emptied containers retain vapour and product residue and may therefore present explosive vapour and toxic material hazards. Observe all safeguards on label and in this MSDS until container is cleaned, reconditioned or destroyed. DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER. In all cases disposal should be in accordance with regulations.



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7. HANDLING AND STORAGE

Precautions for Safe Handling

Flammable liquid. Vapour may form explosive mixtures with air. Avoid all ignition sources. Use only in well ventilated areas. Keep container tightly closed. Flameproof equipment is necessary in area where product is being used. Earth (ground) and bond shipping container transfer line and receiving container. Consult AS1940 for further information on the storage and handling of flammable liquids. Handle in accordance with State or Territory regulations for flammable liquids.

Avoid contact with skin, eyes and clothing. Keep away from incompatible materials. Use only in well ventilated areas. Wash thoroughly after handling. When using product do not eat, smoke or drink.

A waterless hand cleanser followed by a mild soap and water wash is recommended for clean-up. The application of a barrier cream under suitable gloves and moisturizing cream after hand washing is also recommended. These practices can assist in the prevention of dermatitis.

Conditions for Safe Storage

The material is a Schedule 5 Poison and must be stored, maintained and used in accordance with relevant regulations.

Keep away from sources of ignition – No smoking. Keep container tightly closed. Store in the shade preferable below 30°C. Store in a well ventilated area. Keep away from incompatible materials. The product is stable under normal conditions of storage and transport. It has a limited storage life due to inhibitor depletion and should be used within six months of delivery. Rapid polymerization resulting in violent rupture of closed containers and possible fire from flammable vapours may be initiated by high temperatures or certain contaminants.

Contamination with alkalis reduces inhibitor concentration and increases the risk of spontaneous polymerization. Exposure to UV radiation (including from light fittings) can initiate slow polymerization that may continue in a sealed container. Oxidising agents (e.g. organic peroxides), strong acids (e.g. sulfuric acid), ferrous salts present in rust and some metal halides, can promote polymerization. Contamination of the product with these substances should therefore be absolutely avoided.

Styrene degrades most plastics and rubbers and corrodes copper and copper alloys. Avoid these materials for storage and handling of styrene based resin solutions.

Protect storage containers against physical damage. Outside storage or detached storage is preferred. Tanks should be above ground and banded to contain the entire contents. Styrene vapours are uninhibited and may polymerise in vents and flame arresters of storage tanks resulting in blockage of vents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE STANDARDS

	<u>NOHSC EXPOSURE STANDARDS</u>		
	<u>8 HR TWA</u>	<u>STEL (15 MIN'S)</u>	<u>PEAK LIMITATION</u>
Styrene	50ppm	100ppm	-



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Note the New Zealand OSH Service has published the following Workplace exposure Standards (WES)
Styrene (skin) 8-hour TWA 50ppm, STEL (15min's) 100ppm

Keep exposures as low as practicable below exposure standards

ENGINEERING CONTROL MEASURES

Provide good mechanical ventilation with a non sparking, grounded ventilation system exhausting directly to the outside, to control airborne levels below the OEL above, and separate from other exhaust ventilation systems. Care should be taken in controlling the emission of fumes into the environment, to meet the local regulations. Electric lighting and plugs to be explosion proof. Ensure that eyewash stations and safety showers are proximal to the workstation location.

Exposure to aerosols and mists when material is sprayed may present a greater risk of injury from component because higher concentrations are in the atmosphere than result from vapour alone. Provide adequate ventilation and if necessary respiratory protection.

PERSONAL PROTECTION EQUIPMENT

- RESPIRATORY PROTECTION.

Avoid breathing vapours and/or spray mist. If inhalation risk exists, wear air-purifying respirator fitted with organic vapour/particulate filters, self contained breathing apparatus or air-supplied respirator meeting AS/NZS1716 and selected and used in accordance with AS/NZS1715. Full face equipment is recommended and if used replaces the need for face shield and/or chemical splash goggles.

- HAND PROTECTION.

Wear impervious gloves, preferably with cotton inners to prevent skin contact. Supplier data indicates polyvinyl alcohol and Viton gloves are suitable for prolonged contact with styrene. Other glove types, such as nitrile rubber, may be suitable as disposable gloves for brief or intermittent contact only.

- EYE PROTECTION

Wear approved safety glasses or chemical goggles or a face shield. Do not wear contact lenses. Have an emergency eyewash station readily available in the working area.

- SKIN & BODY PROTECTION

Wear coveralls and safety boots where potential for skin contact is low. A disposable suit (e.g. Tyvek) and polyethylene boots and glove covers may be practical options during application of the resin. Wear impervious clothing such as PVC apron. PVC splash suit or Saranex disposable suit and PVC boots as appropriate for the operation where the potential for skin contact is high.

Other Personal Protection:

Protective clothing/equipment should meet and be selected and used in accordance with relevant Australian Standards. Consult protective equipment/clothing suppliers to determine appropriate type equipment/clothing for a given application. Avoid contact with eyes, skin and clothing. Use only in well ventilated areas. Wash thoroughly after handling. When using do not eat, smoke or drink. Protective equipment and clothing should be decontaminated before storage and/or use.

Solvents should not be used to remove resin from skin. A waterless hand cleanser is recommended for clean-up followed by a mild soap and water wash. The application of a barrier cream under suitable gloves and moisturizer cream after hand washing is also recommended. These practices can assist in the prevention of dermatitis.

FLAMMABILITY



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Flammability liquid vapour may form explosive mixtures with air. Avoid all ignition sources. Use only in well ventilated areas. Keep container tightly closed. Flameproof equipment is necessary in area where product is being used. Earth (ground) and bond shipping container transfer line and receiving container. Consult AS1940 for further information on the storage and handling of flammable liquids. Handle in accordance with State or Territory regulations for flammable liquids.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE

Form / colour / odour: Clear or cloudy, viscous liquid with a sweet or sharp aromatic odour.

pH	Not applicable	
BOILING POINT/RANGE	145°C at 760mm Hg	Styrene
FREEZING POINT	-30.6°C	Styrene
FLASH POINT	31 °	Styrene (closed cup)
FLAMMABILITY	1.1 - 6.1 % v/v	Styrene
AUTO IGNITION TEMPERATURE	490°C	Styrene
EXPLOSIVE PROPERTIES	LEL 1.1% UEL 6.1%	Styrene
OXIDISING PROPERTIES	None	
VAPOUR PRESSURE	0.60 kPa at 20°C 0.81 kPa at 25°C	Styrene Styrene
DENSITY at 25°C	1.09 – 1.11 g cm ⁻³	
ODOUR THRESHOLD	Approx 0.1ppm	Styrene
SOLUBILITY - WATER	Practically insoluble 0.03%	Styrene
RELATIVE VAPOUR DENSITY (Air=1)	3.6	Styrene

10. STABILITY AND REACTIVITY

Chemical stability:

The product is stable under the normal conditions of storage and transport.

Conditions to Avoid:

Keep away from sunlight, heat and sources of ignition.

Incompatible Materials:

Avoid contamination with materials such as alkylation catalysts (sulphuric acid, phosphoric acid, boron trifluoride, aluminium trichloride), halogens and hydrogen halides, alkali metal-graphit compounds and butyl lithium and organic peroxides which catalyse rapid polymerization of styrene monomer.

Styrene degrades most plastics and corrodes copper and copper alloys.

Hazardous Decomposition Products:

Thermal decomposition products may include carbon monoxide and carbon dioxide, styrene and acrid smoke.

Hazardous Reactions:



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May undergo hazardous polymerization in closed containers at elevated temperatures and in the presence of initiating contaminants.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Materials Safety Data Sheet and the product label. Symptoms that may arise if the product is mishandled are;

Acute – Swallowed:

No data on the resin. Styrene may cause irritation to the mouth and throat and abdominal discomfort, nausea and vomiting.

Acute – Eye

May cause irritation, experienced as discomfort or pain and seen as excess redness and possible swelling of the eye and possible injury to the cornea.

Acute – Skin

May cause irritation and discomfort and seen as local redness and possible swelling. Prolonged contact as with clothing wetted with material, may cause severe irritation and discomfort. Scientific studies indicate that absorption of styrene from skin contact with liquid resin during normal use is unlikely to add significantly to exposure.

Acute – Inhaled

Inhalation of styrene may cause irritation to the upper respiratory tract and central nervous system effects (dizziness, drowsiness, euphoria, loss of co-ordination, headache, nausea and vomiting). In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Inhalation may result in the absorption of potentially harmful amounts of material.

Chronic:

Repeated skin contact may cause irritant contact dermatitis (itching, drying, redness). Repeated inhalation may cause lung damage. Prolonged and repeated overexposure may cause damage to the liver and kidney.

Other Health Effects Information:

STYRENE COMPONENT

Carcinogenicity (Capability to Cause Cancer)

Chronic (lifetime) inhalation studies on rats and mice exposed to styrene vapours showed evidence of lung tumours in mice but not in rats. Further research is in progress to determine the relevance of these mouse tumours to humans.

It should be noted, however, that several workplace exposure (epidemiological) studies investigating the incidence of cancer in a large number of workers employed in the styrene, polystyrene and reinforced plastics industries have shown no increased incidence of cancer risk due to workplace exposure to styrene.

The International Agency for Research on Cancer (IARC) has evaluated styrene and classified it as "Possibly Carcinogenic to Humans" under group 2B. The National Occupational Health and Safety Commission (NOHSC) has not classified styrene as a carcinogen under any category.



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Developmental and Reproductive Toxicity

Laboratory studies investigating human developmental and reproductive toxicity of styrene have indicated that styrene exposures either as vapour, oral or drinking water, do not result in any specific developmental or reproductive toxicity. Although some minor developmental effects were noted in some studies, these effects were either within the historical range for these effects or were secondary to maternal toxicity from exposure to relatively high levels of styrene.

Neurological (Nervous System) Effects

Some evidence of hearing loss was observed in rats repeatedly exposed to high concentrations of styrene vapour. Effects on human hearing are not expected from workplace exposures to styrene.

Slight effects on colour discrimination have been detected in workers exposed to styrene vapours. These subtle effects are unlikely to be noticed by those affected.

Other nervous system effects have been noted in humans exposed to styrene. However, these effects have not been consistently or reliably observed in animal studies.

Medical conditions generally aggravated by exposure

Because of styrene's defatting properties, prolonged and repeated skin contact may aggravate an existing dermatitis (skin condition). Repeated overexposure may aggravate or enhance existing nervous system dysfunction. Repeated overexposure may aggravate existing respiratory, liver or kidney disease.

12. ECOLOGICAL INFORMATION

No data available on product.

Ecotoxicity

Styrene is moderately toxic to fish and daphnia and highly toxic to algae.

Aquatic Toxicity

LC50-96hr	10mg/litre (Fathead minnow) moderately toxic
EC50-48hr	4.7mg/litre (Daphnia magna) moderately toxic
EC50-96hr	0.72mg/litre (Green algae) highly toxic (algistatic)

Mobility:

Styrene is expected to bind to soils and sediments and have low mobility. The estimated organic carbon/water partition co-efficient ($\log K_{oc}$)^{=2.42 - 2.96}

Persistence / Degradability

Persistence and Biodegradability

Styrene has been shown to undergo slow but nearly complete biodegradation in laboratory studies. Styrene released to soil will have low mobility (see above) and will biodegrade. Styrene released to water will float and volatilize (Henry's Law constant = 0.00275 atm m³/mole at 25°C) and will biodegrade. Styrene vapour will degrade rapidly in the ambient atmosphere. Styrene is not expected to persist in the environment.

Potential to Bioaccumulate



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Although the octanol/water partition co-efficient (log Kow) for styrene has been determined to be 2.95, indicating a moderate potential to bioaccumulate, the bioconcentration factor (log BCF) in goldfish has been determined to be 0.83 to 1.13 indicating a reduced bioconcentration potential in aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Disposal methods:

The product is considered to be a hazardous waste because of its flammability and toxicity. If feasible, recycle. Liquid waste resin may be solidified by heating in an approved heating chamber. The properly cured solid may be disposed of in a chemical landfill. Otherwise, dispose of by burning in an approved incinerator. In all cases, disposal should be in accordance with regulations.

Special precautions for landfill or incineration:

Emptied containers retain vapour and product residue and many therefore present explosive vapour and health hazards. Observe all safeguards on label and in this MSDS until container is cleaned, reconditioned or destroyed. **DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.** In all cases disposal should be in accordance with regulations.

14. TRANSPORT INFORMATION

Road and Rail Transport (ADG Code)

UN Number	1866
Proper Shipping Name	RESIN SOLUTION
Dangerous Goods Class	3
Subsidiary Risk	None allocated
Packing Group	III
Hazchem Code	3[Y]
Emergency Information	IERG 14 (SAA/NZS HB:76) or EPG 3A1(AS2931)

Marine Transport (IMDG Code)

UN Number	1866
Proper Shipping Name	RESIN SOLUTION
Dangerous Goods Class	3
Subsidiary Risk	None allocated
Packing Group	III

Air Transport (IATA Regulations)

UN Number	1866
Proper Shipping Name	RESIN SOLUTION
Dangerous Good Class	3
Subsidiary Risk	None allocated
Packing Group	III

Dangerous Goods Segregation (ADG Code)

Do not load and pack with Class 1 (Explosives). Class 2.1 (Flammable Gases – where flammable liquids/gases are in bulk). Class 2.3 (Toxic Gases). Class 4.2 (Spontaneously Combustible Substances). Class 5.1 (Oxidising



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Agents). Class 5.2 (Organic Peroxides). Class 7 (Radioactive Substances). Transport in accordance with State and Territory regulations for Dangerous Goods.

15. REGULATORY INFORMATION

Country / Region	Inventory	Status
Australia	AICS	All components are listed

Poisons schedule (Aust): 5

16. OTHER INFORMATION

Abbreviations:

AICS	Australian Inventory of Chemical Substances
IARC	International Agency for Research on Cancer
IATA Regulations	International Air Transport Association Regulations
IERG	Initial Emergency Response Guide (SAA/NZS HB 76)
IMDG Code	International Maritime Dangerous Goods Code
NOHSC	National Occupational Health and Safety Commission Australia

EXCLUSION OF LIABILITY

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