MATERIAL SAFETY DATA SHEET

LANXESS Corporation
Product Safety & Regulatory Affairs
111 RIDC Park West Drive
Pittsburgh, PA  15275-1112
USA

1. Product and Company Identification

Product Name:       LUSTRAN SAN 31       UNL  000000
Material Number:    3588649
Chemical Family:    Thermoplastic Polymer
Chemical Name:      Styrene/Acrylonitrile Copolymer
Synonyms:           SAN
Formula:            Not applicable--polymeric material

2. Hazards Identification

Emergency Overview

CAUTION!  Color: Natural  Form: solid  Pellets  Odor: Slight.  
Melted product is flammable and produces intense heat and dense smoke during burning.  
Irritating gases/fumes may be given off during burning or thermal decomposition.  May 
cause mechanical irritation (abrasion).  Causes a slipping hazard if spilled.  Contact with 
hot material will cause thermal burns.

Potential Health Effects

Primary Routes of Entry:  Inhalation, Skin Contact, Eye Contact
Medical Conditions Aggravated by Exposure:  Respiratory disorders, Eye disorders, Skin disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation
For Component: Styrene
May be harmful by inhalation. May cause nervous system effects which can include symptoms of
dizziness, incoordination, headache, numbness, and/or confusion. Causes respiratory tract irritation with
symptoms of coughing, sore throat and runny nose.
Skin  
Acute Skin  
For Product: LUSTRAN SAN 31  UNL  000000  
Contact with heated material can cause thermal burns.

For Component: Styrene  
Essentially non-toxic by skin absorption. Causes irritation with symptoms of reddening, itching, and swelling.

Chronic Skin  
For Component: Styrene  
May cause defatting of the skin with symptoms of dryness and cracking.

Eye  
Acute Eye  
For Product: LUSTRAN SAN 31  UNL  000000  
May cause mechanical irritation.

For Component: Styrene  
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause corneal injury.

Ingestion  
Acute Ingestion  
For Component: Styrene  
May be harmful if swallowed. Acute overexposure to this product may cause headache, dizziness, flushing, hypotension, and tachycardia. Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea. Ingestion and/or vomiting may cause aspiration into the lungs resulting in chemical pneumonitis (inflammation of the lungs).

Chronic Ingestion  
For Component: Styrene  
May cause brain damage. May cause kidney damage. May cause liver damage. May cause lung damage.

General Effects of Exposure  
Acute Effects of Exposure  
For Product: LUSTRAN SAN 31  UNL  000000  
Gases and fumes evolved during the thermal processing or decomposition of this material may irritate the eyes, skin or respiratory tract.

Chronic Effects of Exposure  
For Product: LUSTRAN SAN 31  UNL  000000  
Not expected to cause any adverse chronic health effects.

Carcinogenicity:  
Styrene  
IARC - Overall evaluation: 2B Possible carcinogen.

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>Weight %</th>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=0.25%</td>
<td>Styrene</td>
<td>100-42-5</td>
<td></td>
</tr>
</tbody>
</table>
4. First Aid Measures

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

Skin Contact
In case of skin contact, wash affected areas with soap and water. Get medical attention if thermal burn occurs.

Inhalation
If inhaled, remove to fresh air.

Ingestion
Get medical attention.

5. Fire-Fighting Measures

Suitable Extinguishing Media: water, foam, dry chemical, carbon dioxide (CO2)

Special Fire Fighting Procedures
Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.

Unusual Fire/Explosion Hazards
Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Dust may form explosive mixtures with air.

6. Accidental release measures

Spill and Leak Procedures
If molten, allow material to cool and place into an appropriate marked container for disposal.

7. Handling and Storage

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

Storage Period
Not Established

Handling/Storage Precautions
Handle in accordance with good industrial hygiene and safety practices. Wash thoroughly after handling. Avoid breathing dust.

Further Info on Storage Conditions
Protect equipment (e.g. storage bins, conveyors, dust collectors) with explosion vents.
8. Exposure Controls / Personal Protection

Styrene (100-42-5)

US. ACGIH Threshold Limit Values
- Time Weighted Average (TWA): 20 ppm
- Short Term Exposure Limit (STEL): 40 ppm

US. OSHA Table Z-2 (29 CFR 1910.1000)
- Time Weighted Average (TWA): 100 ppm
- Ceiling Limit Value: 200 ppm
- Maximum concentration: 600 ppm (5 minutes in any 3 hours)

US. ACGIH Threshold Limit Values
- Hazard Designation: Group A4 Not classifiable as a human carcinogen.

Industrial Hygiene/Ventilation Measures
General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate airborne concentration standards/guidelines.

Respiratory Protection
Although no exposure limit has been established for this product, the OSHA PEL for Particulates Not Otherwise Regulated (PNOR) of 15 mg/m³ - total dust, 5 mg/m³ - respirable fraction is recommended. In addition, the ACGIH recommends 3 mg/m³ - respirable particles and 10 mg/m³ - inhalable particles for Particles (insoluble or poorly soluble) Not Otherwise Specified (PNOS).

Hand Protection
Wear heat resistant gloves when handling molten material.

Eye Protection
Safety glasses with side-shields.

Skin and body protection
No special skin protection requirements during normal handling and use.

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. Fumes or vapors emitted from the hot melted plastic during converting operations may condense on cool overhead metalsurfaces 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.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Pellets</td>
</tr>
<tr>
<td>Color</td>
<td>Natural</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight</td>
</tr>
<tr>
<td>pH</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Flash Point</td>
<td>380 °C (716 °F)</td>
</tr>
<tr>
<td>Lower Explosion Limit</td>
<td>Not Established</td>
</tr>
<tr>
<td>Upper Explosion Limit</td>
<td>Not Established</td>
</tr>
</tbody>
</table>
Vapor Pressure: Not Applicable
Density: not applicable
Specific Gravity: Approximately 1.06
Solubility in Water: Insoluble
Autoignition Temperature: 450 °C (842 °F)
Decomposition Temperature: 260 °C (500 °F)
Softening Point: 93 °C (199.4 °F)
Bulk Density: 650 - 750 kg/m³

10. Stability and Reactivity

Hazardous Reactions
Hazardous polymerization does not occur.

Stability
Stable

Materials to avoid
None known.

Conditions to avoid
None known.

Hazardous decomposition products
By Fire and Thermal Decomposition: Carbon Dioxide; Water; Styrene; Acrylonitrile; hydrogen cyanide; Carbon monoxide, hydrocarbons

11. Toxicological Information

Toxicity Data for Styrene/Acrylonitrile Copolymer (SAN)
Acute Oral Toxicity
LD50: 1,800 mg/kg (Rat)
LD50: 1,000 mg/kg (mouse)

Acute dermal toxicity
LD50: > 2,000 mg/kg (rabbit)
Estimated Value

Skin Irritation
rabbit, Draize, No skin irritation

Eye Irritation
rabbit, No eye irritation

Sensitization
dermal: non-sensitizer (guinea pig, Maximisation Test (GPMT))
dermal: non-sensitizer (Human)

Toxicity Data for Styrene
Acute Oral Toxicity
LD50: 1,000 mg/kg (Rat)

Acute Inhalation Toxicity
LC50: 11.8 mg/l, 4 hrs (Rat)
Acute dermal toxicity
LD50: > 20,000 mg/kg (rabbit)

Skin Irritation
rabbit, Draize Test, Moderately irritating

Eye Irritation
rabbit, Draize, Severely irritating

Sensitization
dermal: non-sensitizer (guinea pig, Maximisation 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/without)
Sister Chromatid Exchange: positive (human lymphocytes, Metabolic Activation: with/without)
Genetic Toxicity in Vivo:
Cytogenetic 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 tumour incidence in rats.
Styrene was tested for carcinogenicity in mice in one inhalation study and four oral gavage studies. In the
inhalation study, there was an increase in the incidence of pulmonary adenomas and only an increase in that
of carcinomas in the high-dose group. Two of the gavage studies were negative and the other two were
considered inadequate for an evaluation of the carcinogenicity of styrene. A screening study by
intraperitoneal administration also did not find an increase in tumour incidence or multiplicity in mice.
The increased risks for lymphatic and haematopoietic neoplasms observed in some 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, gestation, NOAEL (teratogenicity): > 600 ppm, NOAEL (maternal): > 600 ppm
Fetotoxicity seen only with maternal toxicity.

12. Ecological Information

Ecological Data for Styrene
Biodegradation
aerobic, 71 %, Exposure time: 28 d

**Biological Oxygen Demand (BOD)**
5 Days, 2.46 mg/l

**Chemical Oxygen Demand (COD)**
2,800 - 2,880 mg/g

**Theoretical Biological Oxygen Demand (ThBOD)**
3.07 mg/l

**Bioaccumulation**
Carp, 13.5 BCF

**Acute and Prolonged Toxicity to Fish**
- LC50: 9 mg/l (Sheepshead minnow (Cyprinodon variegatus), 96 hrs)
- LC50: 29 - 59.3 mg/l (Fathead minnow (Pimephales promelas), 96 hrs)
- LC50: 25 mg/l (Bluegill (Lepomis macrochirus), 96 hrs)
- LC50: 2.4 - 4.1 mg/l (Rainbow trout (Salmo gairdneri), 96 hrs)

**Acute Toxicity to Aquatic Invertebrates**
- EC50: 4.7 - 23 mg/l (Water flea (Daphnia magna), 48 hrs)

**Toxicity to Aquatic Plants**
- EC50: 1.4 mg/l, (Green algae (Selenastrum capricornutum), 72 hrs)

**Toxicity to Microorganisms**
- EC50: approximately 500 mg/l, (Activated sludge microorganisms, 30 min)
- EC50: 5.5 mg/l, (Photobacterium phosphoreum, 5 min)
- EC50: 72 mg/l, (Pseudomonas putida, 16 hrs)

**13. Disposal considerations**

**Waste Disposal Method**
Waste disposal should be in accordance with existing federal, state and local environmental control laws.

**14. Transportation information**

**Land transport (DOT)**
Non-Regulated

**Sea transport (IMDG)**
Non-Regulated

**Air transport (ICAO/IATA)**
Non-Regulated

**15. Regulatory Information**
United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components
None

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components
Styrene

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

State Right-To-Know Information
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

The concentrations reported below in units of parts per million (ppm) or parts per billion (ppb) are maximum values.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

<table>
<thead>
<tr>
<th>Weight %</th>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=1%</td>
<td>Styrene/Acrylonitrile Copolymer (SAN)</td>
<td>9003-54-7</td>
</tr>
</tbody>
</table>

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

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<tr>
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<td>Styrene/Acrylonitrile Copolymer (SAN)</td>
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<td>&lt;=0.25%</td>
<td>Styrene</td>
<td>100-42-5</td>
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Pennsylvania Right to Know Special Hazard Substance List:

<table>
<thead>
<tr>
<th>Weight %</th>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=0.01%</td>
<td>Acrylonitrile</td>
<td>107-13-1</td>
</tr>
</tbody>
</table>

MA Right to Know Extraordinarily Hazardous Substance List:
California Prop. 65:
Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.

Weight %  | Components   | CAS-No.  
------------|--------------|--------
<=0.25%     | Styrene      | 100-42-5
<=0.01%     | Acrylonitrile| 107-13-1

16. Other Information

HMIS Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>1</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>0</td>
</tr>
</tbody>
</table>

0=Minimal  1=Slight  2=Moderate  3=Serious  4=Severe
* = Chronic Health Hazard

LANXESS Corporation's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by LANXESS Corporation as a customer service.

Contact Person: Product Safety Department
Telephone: (800) LANXESS
MSDS Number: R301250
Version Date: 04/01/2005
Report Version: 1.2

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