1. Identification of the substance/preparation and of the company/undertaking

The following SDS applies to products described by combinations of the following trade name, product grade and color code listed below.

Trade Name

Vectra®

Product Grade(s):
A430, A430FDA, V200P

Color Code:
See Section 16 for list of Color Codes

Manufacturer, importer, supplier
Ticona Polymer, Inc.
A business of Celanese
8040 Dixie Hwy.
Florence, KY 41042
United States
www.celanese.com

Transportation emergency phone numbers:
In USA, call 800 424 9300
Outside USA, call 703 527 3887, collect calls accepted.

Product Information
info-engineeredmaterials-am@celanese.com

Synonyms:
Liquid crystal polymer / LCP

Identified uses
Plastic processing industry.

2. Hazards identification

Emergency Overview

This product is considered non-hazardous under the OSHA Hazard Communication Standard (29CFR1910.1200)

Potential health effects

Immediate effects

Skin

Polymer particles may cause mechanical irritation. The molten product can cause serious burns.
Eyes
Resin particles, like other inert materials, are mechanically irritating to eyes.

Inhalation
Dust irritating to respiratory tract. Overheating in processing may generate hazardous, irritating vapours. Thermal decomposition may evolve hazardous fumes which can cause “polymer fume fever”, which has flu-like symptoms.

Ingestion
Low toxicity by this route is expected based on the biological activity of high molecular weight polymers.

Medical conditions which may be aggravated by exposure:
No specific information available on the product. Off-gases, which may be released if overheated, may affect those with chronic diseases of the respiratory system.

3. Composition/information on ingredients

Chemical characterization
Liquid crystal polymer / LCP, unreinforced

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>109-99-9</td>
<td>0.5</td>
</tr>
</tbody>
</table>

This product may contain proprietary ingredients. This is a polymeric material. Any hazardous constituents are wetted by the polymer system, and therefore are unlikely to present exposure under normal conditions of processing and handling.

4. First aid measures

Skin
Cool skin rapidly with cold water after contact with molten polymer. Immediate medical attention is required. Do not peel solidified product off the skin.

Eyes
Immediately flush eye(s) with plenty of water. Call a physician if irritation persists.

Inhalation
Move to fresh air in case of accidental inhalation of vapors. Get medical attention immediately if symptoms occur.

Ingestion
If swallowed, do not induce vomiting - seek medical advice.

Notes to physician
This product is essentially inert and nontoxic. However, if it is overheated so that excessive off-gassing occurs, a condition called polymer fume fever may be seen in individuals exposed to the gases. Polymer fume fever is a flu-like syndrome (aches, chest pain, cough and fever) that clears within one to two days. Patients who have been exposed to off-gases may need to have their arterial blood gases and carboxyhemoglobin levels checked. If the carboxyhemoglobin levels are normal and the exposure occurred in an enclosed space, asphyxia (carbon dioxide replacing oxygen) is a possibility. Fluorinated hydrocarbons and hydrogen fluoride are respiratory irritants. If patients may have inhaled high concentrations of irritating fumes, they should be monitored for delayed onset pulmonary edema. The greatest hazard is from respiratory tract irritation; specific antidotes for hydrogen fluoride (HF) are not recommended because HF is not likely to be present in high enough concentration for an antidote to be of use.
5. Fire-fighting measures

Suitable extinguishing media
Water, Foam, Dry powder

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases
Under conditions giving incomplete combustion, hazardous gases produced may consist of
Carbon monoxide
Carbon dioxide (CO2)
Nitrogen oxides (NOx)
Hydrogen fluoride (HF)

Special protective equipment for fire-fighters
Wear self-contained breathing apparatus and protective suit.

Environmental precautions
Dike and collect water used to fight fire.

Other Information
Potential dust explosion hazard.

6. Accidental release measures

Personal precautions
Do not breathe dust. Avoid dust formation.

Environmental precautions
No special environmental precautions required.

Methods for cleaning up
Use mechanical handling equipment.

7. Handling and storage

Advice on safe handling
Do not handle hot or molten material without appropriate protective equipment. Maintain good housekeeping in work areas. Do not exceed recommended process temperatures to minimize release of decomposition products.

Protection - fire and explosion
Do not smoke in areas where polymer dust is present. Appropriate measures should be taken to control the generation and accumulation of dust during conveying and processing operations.

Material storage
Store in a cool dry place. Maintain dryness of resin.
8. Exposure controls/personal protection

OSHA Exposure Limits
No exposure limits established.

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>200 PPM</td>
</tr>
</tbody>
</table>

ACGIH Exposure Limits
No exposure limits established.

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>50 PPM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>100 PPM</td>
</tr>
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</table>

Mexico National Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>LMPE - PPT</th>
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</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>590 mg/m³</td>
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</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>735 mg/m³</td>
</tr>
</tbody>
</table>

Exposure controls

Engineering measures
General: May not be adequate as the sole means to control employee exposure.
Local Exhaust: Recommended when appropriate to control employee exposure to dust or process vapors

General advice
Do not breathe dust. Do not handle hot or molten material without appropriate protective equipment.

Respiratory protection
In case of insufficient ventilation wear suitable respiratory equipment.
Skin protection:
When thermal or melt processing, wear long pants, long sleeves, well insulated gloves, and face shield when there is a chance of contact.

Eye/face protection:
Safety goggles. safety glasses with side-shields.

Comments:
Operations involving grinding and machining of parts should be reviewed to assure that particulate levels are kept below recommended standards

### 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>pellets</td>
</tr>
<tr>
<td>Odor</td>
<td>slight , specific .</td>
</tr>
<tr>
<td><strong>Molecular Weight</strong></td>
<td>&gt; 20,000 (base resin)</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>&gt; 93°C(200°F)</td>
</tr>
<tr>
<td><strong>Ignition temperature</strong></td>
<td>&gt; 540°C (1004°F)</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>ASTM D 1929</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>1.3 - 1.4 g/ml @ 20°C</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>approx 600-900 kg/m³ @ 20 °C</td>
</tr>
<tr>
<td><strong>Water solubility</strong></td>
<td>insoluble</td>
</tr>
</tbody>
</table>

### 10. Stability and reactivity

**Chemical stability**
Stable under normal conditions.

**Conditions to avoid**
Flame. Avoid prolonged heating at or above the recommended processing temperature.

**Incompatible Materials**
strong bases.

**Hazardous Combustion or Decomposition Products:**
Thermal decomposition products may include oxides of nitrogen and carbon., Hydrogen fluoride, Fluorinated hydrocarbons.

**Possibility of hazardous reactions**
No hazards to be especially mentioned.

### 11. Toxicological information

No data is available on the product itself
12. Ecological information

Ecotoxicity:
The effects of resin pellets on the wildlife that may ingest them is not well understood. In the case of seabirds, some marine biologists believe that the fowl may not be able to pass plastic pellets through their digestive tracts. Thus, large quantities of ingested pellets may cause intestinal blockage, false feelings of satiation or reduction in absorption of nutrients, causing malnutrition and starvation. The goal of SPI's Operation Clean Sweep is zero loss of pellets into the environment.

Environmental Fate/Information:
This material is considered to be non-biodegradable.

13. Disposal considerations

Disposal considerations
Recycling is encouraged. Dispose of spilled material in accordance with state and local regulations for waste that is non-hazardous by Federal definition. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.

This product as shipped is not a RCRA hazardous waste under present EPA regulations

14. Transport information

US Department of Transportation Not regulated
TDG Not regulated
Mexico Transport Information Not regulated
ICAO/IATA Not restricted
IMDG Not regulated

15. Regulatory information

U.S. FEDERAL REGULATIONS

TSCA Inventory
This product complies with the U.S. Toxic Substances Control Act (TSCA).

SARA 313 Chemicals
Contains no substances at or above the reporting threshold under Section 313.
CANADIAN REGULATIONS

WHMIS Classification:
Not a WHMIS controlled product.

WHMIS Ingredient Disclosure List IDL:
This product does not contain substances required to be disclosed according to the Canada WHMIS Ingredient Disclosure List.

16. Other information

<table>
<thead>
<tr>
<th>NFPA: Health</th>
<th>Flammability</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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

Color code(s)
VA3031, VF3001, VL3159, WT010

Prepared By
Product Stewardship Department
Celanese

Other Information:
Observe national and local legal requirements
Except as otherwise noted, all of the trademarks referenced herein are owned by Ticona or its affiliates.
Changes against the previous version are marked by ***
This product is not intended for use in medical or dental implants.

The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Celanese makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. User has sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.

Abbreviation and Acronym:
ADR = Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID = Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG = International Maritime Code for Dangerous Goods
IATA = International Air Transport Association
ICAO = International Civil Aviation Organization
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
EINECS = European Inventory of Existing Commercial Chemical Substances
CAS = Chemical Abstracts Service (division of the American Chemical Society)
CLP = Classification, Labelling and Packaging
DNEL = Derived No Effect Level
PNEC = Predicted No Effect Concentration