

SAFETY DATA SHEET

HCT Safety Data Sheet according to Globally Harmonized System of Classification and Labeling of Chemicals (GHS), fifth revised edition of the GHS, published in 2013.

Date/Revised: 06. 10. 2015

Version: 2.1

Products: Soluryl 20

| 1. Chemical Product and Company Identification | |
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| Product Name | Soluryl 20 |
| Product Family | Styrene-Acrylic acid Copolymer |
| Recommended Use | Pigment grinding vehicle for water base ink |
| Supplier | Hanwha chemical Thailand Co., Ltd 377 Moo 17 Bangna-Trad Rd., Bangsaotong, Bangsaotong, Samutprakarn, 10540, TEL 66-2-315-3204~7 Seock Yong Shin, shin@hanwhath.com |
| Emergency Information | Joon Woo Ahn ahnjoonwoo@hanwhath.com , TEL 66-2-705-9681~4 (EXT. 103) |

| 2. Hazards Identification |
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Hazard Classification : No need for classification in accordance with GHS

The products does not require a hazard warning label in accordance with GHS

| 3. Composition, Information on Ingredients | | |
|---|------------|-------|
| Component | CAS # | wt% |
| Styrene-a-methyl styrene-Acrylic acid copolymer | 52831-04-6 | >98.0 |

| 4. First Aid Measures | |
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| Eye | Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists. |

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| Skin | Immediately wash skin with plenty of soap and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash contaminated clothing and shoes before reuse. |
| Ingestion | Give 1~2 glasses of water to drink and get medical attention. |
| Inhalation | Remove to fresh air. Get medical attention If a cough or other respiratory irritation develop or persists. |
| Notes to Physician | Not necessary |

5. Fire Fighting Measures

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| Extinguishing Media | Dry powder, Carbon dioxide, Water spray |
| Unsuitable Extinguishing Media | High pressure water jet |
| Decomposition Hazardous Gases | Could be formed corrosive and irritant gases |
| Fire Fighting Instruction | Respirator, Wear self-contained breathing apparatus |

6. Accidental Release Measures

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| Personal Precautions | Wear eye, skin and respiratory protection during cleaning |
| Environmental Precautions | Not necessary |
| Methods for Clearing | Vacuum into a closed container or Sweep up mechanically |

7. Handling and Storage

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| Handling | Handling may result in dust or powder from this product. When mixed with air in critical proportions and in the presence of an ignition source, the dust presents an explosion hazard. Use in a well ventilated area and handling methods that minimize dust production. Avoid contact with eyes, skin and cloth |
| Storage | Keep containers closed and upright to prevent leakage. Store in a cool, well ventilated area away from heat, sources of ignition, direct sunlight. Keep from Children |

8. Exposure Controls & Personal Protection

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| Exposure Limit | Polymer/Solid, Not applicable |
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| Engineering Controls | Provide general clean air dilution or local exhaust ventilation in volume and pattern to prevent air contaminant concentration build-up |
| Protection | Eye: Wear safety glasses Skin: Wear appropriate protective gloves Respiratory: Avoid breathing dust. If exposed to dust, wear an appropriate, properly fitted respirator |

9. Physical & Chemical Properties

| | |
|------------------------|--|
| Physical state | Solid Bead |
| Color | Transparent, Clear |
| Odor | Faint |
| pH | Not applicable |
| Melting Point(°C) | Not applicable |
| Boiling Point(°C) | Not applicable |
| Flash Point(°C) | Not applicable |
| Evaporation Rate | Not applicable |
| Flammability | Not applicable |
| Explosive Limit | Not applicable |
| Vapor Pressure | Not applicable |
| Vapor Density | Not applicable |
| Relative Density(g/cc) | 1.10 ~ 1.13 |
| Bulk Density(g/cc) | 0.6 ~ 0.7 |
| Solubility | Alkaline water soluble, Alcohol soluble, THF soluble |
| Partition Coefficient | Not applicable |
| Auto-ignition temp(°C) | Not applicable |
| Decomposition Temp(°C) | Not applicable |
| Viscosity(cps) | Not applicable |
| Molecular weight | 1,800 ~ 2,200 |

10. Stability & Reactivity

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| Chemical Stability | Stable |
| Possibility of Hazardous Reaction | None under normal conditions |
| Conditions to avoid | Elevated temperature |

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| Materials to avoid | Strong oxidizing materials |
| Hazardous decomposition products | Carbon dioxides, Incomplete combustion can produce carbon monoxide. |

11. Toxicological Information

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| Information on the likely routes of exposure | No data available |
| Symptoms related to the physical, chemical and toxicological characteristics | No data available |
| Delayed and immediate effects and also chronic effects from short- and long-term exposure | No data available |
| Numerical measures of toxicity | No data available |

12. Ecological Information

| | |
|--|-------------------|
| Ecotoxicity (aquatic and terrestrial, where available) | No data available |
| Persistence and degradability | No data available |
| Bioaccumulative potential | No data available |
| Mobility in soil | No data available |
| Other adverse effects | No data available |

13. Disposal Information

Dispose of in accordance with local, state or national regulations.
 Do not incinerate closed containers.
 Incinerate in approved facility.

14. Transport Information

| | |
|------------------------------|------------------------------------|
| UN number | Not Classified |
| UN Proper shipping name | Not applicable |
| Transport Hazard class | Not Classified as a dangerous good |
| Packing group, if applicable | Not applicable |
| Marine pollutant | Not Classified as a dangerous good |

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| Special precautions which a user needs to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises | Not applicable |
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15. Regulatory Information

Country and Inventory Status:

- TCSA Listed of USA:** Yes
- EINECS Listed of Europe:** Yes
- AICS Listed of Australia:** Yes
- ENCS Listed of Japan:** Yes
- IECSE Listed of China:** Yes
- DSL Listed of Canada:** Yes
- NZIoC Listed of New Zealand:** Yes
- PICCS Listed of Philippines:** Yes
- EHS Listed of Malaysia:** Yes

16. Other Reference

Date issued: 03.06.2015

Date revised: 06.10.2015

Revision No: 1

- This SDS has been issued by Hanwha Chemical Thailand Co., Ltd. complied with Globally Harmonized System of Classification and Labeling of Chemicals (GHS), fifth revised edition of the GHS, published in 2013.
- This SDS has been issued only to help the purchasers, agencies or the third parties who's needed to handle the material with safety, therefore, there should be no legal and technical responsibility if it applies to the special purpose and using with the other materials, commercial application or expression.
- The purchasers and agencies must have the responsibilities for the observance and compliance of the relevant regulations of each government because the specifications of this SDS cannot be available in accordance with the provisions of each nation or area.