



"Environmentally Responsible Resin Systems"

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

MATERIAL IDENTITY:

NOVOC 4020, Vinyl Ester Resin

INFORMATION TELEPHONE:

920-803-1700

COMPANY:

NOVOC Performance Resins, LLC
3687 Enterprise Drive
Sheboygan, WI 53083

EMERGENCY TELEPHONE:

CHEMTREC: 800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient(s) | CAS Number | % (by weight) |
|-------------------|------------|---------------|
| Vinyl Ester Resin | See Index | AP 25-85 |
| Monomer(s) | See Index | AP 15-75 |
| Photoinitiator | 7473-98-5 | AP 1-35 |
| Limestone | 1317-65-3 | AP 1-70 |
| Blue Pigment | 147-14-8 | AP 1-10 |
| Titanium Dioxide | 13463-67-7 | AP 1-10 |
| Carbon Black | 1333-86-4 | AP 1-10 |

3. HAZARDS IDENTIFICATION

EYE -- PRIMARY ROUTE

Although no appropriate human or animal health effects data are known to exist, this material is expected to cause eye irritation. Symptoms may include pain or burning sensation, redness, swelling, tearing/discharge or blurred vision.

SKIN ABSORPTION -- PRIMARY ROUTE

Although no appropriate human or animal health effects data are known to exist, this material is expected to be a health hazard by skin absorption. Repeated/prolonged skin contact with this material may result in absorption through the skin causing redness, burning, drying, cracking of the skin, and skin burns.

SKIN IRRITATION -- PRIMARY ROUTE

Although no appropriate human or animal health effects data are known to exist, this material is expected to be a skin irritant. May cause delayed skin irritation and blistering. Symptoms may include localized redness or rash, swelling, blistering and flaking of the skin. Prolonged or repeated exposure may cause a more severe skin response. This material may cause an allergic skin reaction (sensitization) in susceptible individuals upon repeated exposure.

INGESTION

Although no appropriate human or animal health effects data are known to exist, this material is expected to be a slight ingestion hazard. Lethargy and ataxia may result. Irritation or corrosive effects on the stomach may also occur.

INHALATION -- PRIMARY ROUTE

Wear appropriate respiration equipment if vapor or mist is expected. Over exposure may cause irritation to the respiratory tract and to other mucous membranes. Symptoms of irritation may include coughing, mucous production and shortness of breath.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

This material or its emissions may induce an allergic or sensitization reaction and thereby aggravate systemic disease.

4. FIRST AID MEASURES

EYES

Immediately flush eyes gently with large amounts of water for at least 20-30 minutes. Retract eyelids often. Get prompt medical attention.

SKIN

Remove contaminated clothing. Wash the exposed area with mild soap and water. Flush w/lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.

INGESTION

If large quantity is swallowed, give lukewarm water (pint) if victim is completely conscious/alert. Do not induce vomiting as risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

INHALATION

If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.

ADVISE TO PHYSICIANS

If exposed, treat skin and eye burns or irritation conventionally after decontamination.

5. FIRE FIGHTING MEASURES

FLASH POINT METHOD= (Estimated)

GT 102C/216F

FLAMMABLE LIMITS (% VOLUME IN AIR) AUTOIGNITION TEMP. METHOD=N/AP

LOWER: N/AP UPPER: N/AP

FIRE AND EXPLOSIVE HAZARDS

High temperatures, inhibitor depletion, accidental impurities, or exposure to radiation or oxidizers may cause spontaneous polymerizing reaction generating heat/pressure. Closed containers may rupture or explode during runaway polymerization

EXTINGUISHING MEDIA

Dry Chemical, CO2, Foam, Water spray/water fog for cooling.

FIRE FIGHTING INSTRUCTIONS

Do not enter fire area without proper protection. Wear self contained breathing apparatus (pressure-demand MSHA/NIOSH) approved or equivalent. See Section 10 – decomposition products possible. Fight fire from safe distance/protected location. Heat/impurities may increase temperature/build pressure/rupture closed containers, spreading fire, increasing risk of burns/injuries. Water may be ineffective in firefighting due to low solubility. Use water spray/fog for cooling. Pressure relief system may plug with solids, increasing risk of overpressure. Notify authorities if liquid enters sewer/public waters.

6. ACCIDENTAL RELEASE MEASURES

Spilled or released material may polymerize and release heat/gases. Extinguish all ignition sources and ventilate area. Wear protective equipment during clean up. Dike and recover large spill. Soak up small spill with inert solids (such as vermiculite, clay) and sweep/shovel into vented disposal container. Wash spill area with a strong detergent and water solution; rinse with water but minimize water use during clean up. For spills on water, contain, minimize dispersion and collect. Dispose/report per regulatory requirements.

7. HANDLING AND STORAGE

Unless inhibited, product can polymerize, raising temperature and pressure, possibly rupturing container. Check inhibitor content often, adding to bulk liquid if needed. Do not blanket or mix with oxygen-free gas as it renders inhibitor ineffective. Do not store at below 32F – inhibitor can separate as a solid. If frozen, warm and remix material gently (<90F). Prevent moisture contact. Store in tightly closed, properly vented containers away from: heat, sparks, open flame, strong oxidizers, radiation and other initiators. Prevent contamination by foreign materials. Use only non-sparking tools and limit storage time.

DECONTAMINATION PROCEDURES

Follow standard plant procedures or supervisor's instructions for decontamination operations.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION

Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles or vapor. Contact lenses should not be worn.

SKIN PROTECTION

When skin contact is possible, protective clothing including gloves, apron, sleeves, boots head and face protection should be worn. This equipment must be cleaned thoroughly after each use.

RESPIRATORY PROTECTIONS

No occupational exposure standards have been developed for this material. Where exposure through inhalation may occur from use, NIOSH/MSHA approved respiratory protection equipment is recommended.

ENGINEERING CONTROLS

Local exhaust ventilation may be required in addition to general room ventilation.

OTHER HYGIENIC PRACTICES

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

OTHER WORK PRACTICES

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Promptly remove soiled clothing and wash thoroughly before reuse. Shower after work using plenty of soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-------------------------------------|----------------------------|
| Boiling Point | N/DA |
| Vapor Pressure | N/DA |
| Vapor Density (air=1) | N/DA |
| Specific Gravity (water=1 @39.2F) | AP 1.20 @ 25C/77F |
| Percent Volatiles | Negligible |
| Evaporation Rate (Bac=1) | N/DA |
| Viscosity Units, Temp. (Brookfield) | AP 650 cps @ 25C/77F |
| Odor | Mild to sweet acrylic odor |
| pH | N/DA |
| Color | Straw to light yellow |
| State | viscous liquid |

10. STABILITY AND REACTIVITY

CONDITIONS AND MATERIALS TO AVOID

High temperatures, localized heat sources (i.e., drum or band heaters), oxidizing conditions, freezing conditions, direct sunlight, ultraviolet radiation, inert gas blanketing; strong oxidizers, strong reducers, free radical initiators, inert gases, oxygen scavengers.

HAZARDOUS DECOMPOSITION PRODUCTS

Acrid smoke-fumes, carbon monoxide, carbon dioxide and perhaps other toxic vapors may be released during a fire involving this product.

11. SUPPLEMENT

NPCA HMIS RATING

| | |
|-----------------------|---|
| Health | 2 |
| Flammability | 1 |
| Reactivity | 2 |
| Personal Protection** | D |

**Respiratory protection may be necessary depending on conditions of use.

12. CHRONIC HEALTH EFFECTS INFORMATION

SARA TITLE 3: SECTION 311/312 HAZARD CLASS (40CFR370)

This product does not contain a chemical which is listed in Section 313 at or above the de minimus concentrations.

CERCLA INFORMATION (40CFR302.4)

This material contains no hazardous or extremely hazardous substances as defined by CERCLA or SARA Title III, and release is therefore not reportable.

13. REGULATORY INFORMATION

TSCA status: All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

California Proposition 65 Information: This product contains, or may contain, trace quantities of a substance(s) known to the state of California to cause cancer and/or reproductive toxicity.

This material contains an inhibitor (HQ, MEHQ, etc.). The type and amount meet product specifications. Contact a company representative for exact concentrations and details on inhibitor level maintenance.

*Note – qualifiers and codes used in this MSDS

EQ=Equal; AP= Approximately; LT= Less Than; GT = Greater Than; TR =Trace; UK = Unknown; N/AP = Not Applicable; N/P = No Applicable Information Found; N/DA = No Data Available.

TRANSPORTATION INFORMATION

US DOT Hazard Class

Non-Regulated

WORKPLACE CLASSIFICATION

This product is not considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200)

WASTE CLASSIFICATION

When a decision is made to discard this material as supplied, it does not meet RCRA's characteristics definition of ignitability, corrosiveness, or reactivity and is not listed in 40CFR261.33. The toxicity characteristic (TC), has not been evaluated by the Toxicity Characteristic Leaching Procedure (RCLP).

14. OTHER INFORMATION

Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. The information in this MSDS was obtained from sources, which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable. This MSDS has been prepared in accordance with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

15. RESIN & MONOMER CAS INDEX

The resins and monomers listed under Section 2 are identified by one or more of the following CAS numbers:

| | | |
|-------------|------------|-------------|
| 26098-37-3 | 37347-86-7 | 135108-89-3 |
| 113060-15-4 | 37999-57-8 | 112945-52-5 |
| 149717-53-3 | 52453-94-8 | 155122-62-6 |
| 29350-58-1 | 56083-99-9 | 25101-03-5 |
| 28516-30-5 | 57863-48-6 | 26588-55-6 |
| 31472-46-5 | 61224-63-3 | 28516-30-5 |
| 25215-73-9 | 13048-33-4 | 29350-58-1 |
| 27342-37-6 | 1746-23-2 | 31472-46-5 |
| 28572-30-7 | 58182-50-6 | 54228-09-0 |
| 29403-69-8 | 68585-94-4 | 67380-21-6 |
| 37339-47-2 | 25749-46-6 | 67939-40-6 |
| 56083-98-8 | 27837-75-8 | 68647-07-4 |
| 67712-08-7 | 28679-80-3 | 68492-68-2 |
| 68299-40-1 | 30110-00-0 | 68140-84-1 |
| 62569-28-2 | 42133-45-9 | 68140-88-5 |
| 32677-47-7 | 58182-50-6 | 68171-28-8 |

25987-82-0

67845-68-5
68585-94-4

64386-66-9