



Northstar Polymers (Div. of Tandem Products, Inc.)
 3444 Dight Avenue South, Minneapolis, MN 55406 USA
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MSS-A90A

MSS-A90A is high-performance polyester polyurethane casting resin system. Urethane elastomers molded with this system exhibit high tear strength, high tensile strength, high tensile elongation, excellent oil resistance, and excellent abrasion resistance. This combination of features makes elastomers molded from MSS-A90A perfect for many applications including bulk-handling parts for grain, sand, gravel, and other commodities, as well as many other custom applications.

| Physical/Mechanical Properties | ASTM# | Typical Value |
|---------------------------------------|--------------|----------------------|
| Durometer Hardness | D 2240 | A 90 |
| Tensile Strength | D 412 | 4200 psi |
| Ultimate Elongation | D 412 | 650% |
| Tear Resistance: Die C | D 624 | 600 pli |
| Tear Resistance: Split | D 624 | 300 pli |
| Taber Abrasion | D 4060 | 28 mg loss |

| Prepolymer | MSS-052 |
|---------------------|------------------------|
| Specific Gravity | 1.188 |
| Viscosity at 180 °F | 1500 cps |
| % NCO | 8.14 |
| Amine Equivalents | 516 |
| Appearance at 77 °F | Yellow to Amber Liquid |

| Curative | BNA-005 |
|---------------------|------------------|
| Specific Gravity | 1.017 |
| Viscosity at 77 °F | < 150 cps |
| Equivalent Weight | 45 |
| OH Value | 1247 |
| Appearance at 77 °F | White waxy solid |

| Processing Conditions | |
|------------------------------|--------------|
| Prepolymer Temperature | 180 – 190 °F |
| Curative Temperature | Ambient |
| Mold Temperature | 180 - 200 °F |
| Post Cure Temperature | 180 – 200 °F |

Recommended Release Agent
 100% solid silicone mold release

| Cure Pattern at the Above Conditions | |
|---|--------------------|
| Pot-Life | 2-1/2 to 3 minutes |
| Gel Time | 4 - 9 minutes |
| De-molding Time | 30 - 45 minutes |
| Post Cure | 16 – 20 hours |

| Ratio Calculation | | |
|--------------------------|----------------|--------------|
| | Prepolymer (A) | Curative (B) |
| Product Code | MSS-052 | BNA-005 |
| Stoichiometry | NCO=100 | OH=95 |
| Weight Ratio | 1.000 | 0.083 |
| Weight Ratio | 1.000 | 0.097 |
| Gear Ratio | 100 | 10 |

- This material is not suitable for long-term use in constant aqueous environment. Consider a system from our polyether product families for such applications.



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Standard Packaging Sizes:

5-gallon pail (40 LBS per pail)
55-gallon drums (450 LBS per drum)

Storage/Handling Information for the Component Materials

Storage:

Part-A (Isocyanate Prepolymer) Component

Part-A component (prepolymer) contains isocyanate component, which is highly sensitive to moisture. If it is left in air, part-A will react with atmospheric moisture and will be ruined. This reaction is non-reversible. Soon after opening the container to dispense the content, dry nitrogen gas or argon gas needs to be injected to the container to purge and blanket the top space. Please consult Northstar Polymers for nitrogen gas set-up information.

For gravity feeding system from a 55-gallon, silica gel or calcium chloride desiccant filter(s) should be installed to the vent-hole of the drum. A valve to inject dry nitrogen gas can be installed instead.

Store the containers a dry indoor storage within the temperature range between 72 and 86 °F. Avoid direct sunlight.

Note:

This isocyanate prepolymer (MSS-052) may freeze during the transportation and storage in the cold seasons. Frozen state of isocyanate prepolymer can be indicated by solid, gel, or high viscosity liquid state and cloudy color. This material may freeze just below room temperature. This product makes unwanted byproducts if it is kept frozen. It may ruin the material if it is store frozen for a long time. The frozen material must be thawed immediately. Please consult Northstar Polymers if isocyanate prepolymer is suspected to be frozen. Northstar Polymers will not refund or replace the material damaged from cold temperature and mishandling.

If a large amount of water mixes with a large amount of isocyanate base materials, the chemical reaction may produce a large amount of CO₂ gas and heat to create a hazardous condition. Keep the storage area free of water.

Under a certain combination of heat, catalyst (basic chemicals), amounts of reactive materials, and some other favorable conditions for the reaction, the water (or alcohol/glycol) to isocyanate reaction can reach a dangerous state of accelerated reaction. The accelerated reaction may create a very high temperature condition. The thermal decomposition of isocyanate based material by extremely high temperature or fire can produce toxic gasses and smokes. Please be sure that the containers are stored in dry indoor storage, away from source of large amount of water.

If a leak is found in a drum, please place the drum in such a position that the leaking part is at a higher part of drum so that the content no longer leaks out. Cover the leaking area with dry towel to prevent air from entering. If possible,





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transfer the material into new container(s) with nitrogen purge. If moisture enters into an isocyanate container from a small leakage, CO₂ gas may be produced to gradually pressurize the container. If pressure built up is suspected, open the bung (or cap) very slowly to release the pressure before you change the drum position.

Part-B (Curative) Component

Part-B component (BNA-005) is hygroscopic. If the material is exposed to ambient air, it absorbs moisture. Part-B component contaminated by moisture can become a source excessive bubbles in the product after mixed with part-A. Avoid exposure of the material to moisture in air.

Purging the empty space in the container with dry nitrogen gas, argon gas, or negative-40-degree-dew-point dry air is also recommended to prevent moisture contamination of part-B as well. (However, simply keeping the material in an airtight container may also be sufficient depending on the moisture level of the work place.)

Store it in a dry indoor storage at a room temperature between 65 and 90 °F. Avoid direct sunlight.

Note: Moisture contamination of part-B material can be reversed by heating material to 160 - 180 °F and vacuuming it at about 29" Hg negative pressure for several hours.

If this material is stored for a long time, the material may absorb air or gas inside the container, which may cause excess bubbles after while it is cast and/or molded. The material may need to be heated to 180 - 200 F range and degassed for 30 to 60 minutes above 29" Hg vacuum to eliminate infused air/gas from long term storage.

Safety:

The component materials are industrial-grade chemicals. Please keep them in a secure place and prevent access from any unauthorized individual. The personnel who handle these materials need to read the Material Safety Data Sheet (MSDS) for detail information on safety and handling of the material. The MSDS for each component is sent with the shipment of the material.

When using this material, be sure to operate in a wide-open area with good air movement, or in a well-ventilated area. Wear rubber gloves, long sleeves, and protective eyeglasses to prevent skin/eye contact of the material. When your operation involves heating or spraying of the material, and if you expect the isocyanate content level in the work place atmosphere may become above the threshold regulated by OSHA or by other appropriate working place safety standard, we recommend, in addition to the above, installation of a proper hooded dynamic ventilation system and/or using an appropriate type of respirator (such as a full-face respirator equipped with OSHA approved HEPA filters for particulate and organic vapor) to prevent inhalation of the fume.

Direct contact of polyurethane raw materials to skin/eye, as well as ingestion may lead to health problems. No eating or smoking should be permitted at the working area. The operator should wash hands well with soap and water after handling the materials and follow the other procedures of the Standard Industrial Hygiene Practices. Please refer to the MSDS for each component for the detailed health information.





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