Northstar Polymers (Div. of Tandem Products, Inc.)
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MSS-A50E

Oil Resistant Polyurethane Casting Resin System

Technical Data Sheet

MSS-A50E is a room-temperature curable, polyester-based polyurethane casting resin specifically designed for manufacturing oil-resistant components, such as gaskets used in small engine air filters. This formulation is ideal for applications where traditional polyether-based systems are unsuitable due to their tendency to absorb oily substances. MSS-A50E incorporates polar raw materials, providing exceptional resistance to oil absorption.

Unlike many polyester-polyol-based materials that are solid at room temperature, both components of MSS-A50E remain liquid at room temperature, making the system easy to handle. Its pot life is long enough to enable the production of small to medium-sized molded parts using manual hand-mixing processes. Yet it provides a reasonable demolding time for a good production cycle rate.

MSS-A50E offers a soft yet flexible consistency, along with excellent tensile strength, elongation, and tear resistance. These properties make it an excellent choice for producing oil-resistant gaskets, seals, and other flexible parts.

However, the formulation is susceptible to hydrolysis upon prolonged water exposure, leading to material degradation. Therefore, MSS-A50E is not recommended for applications involving frequent or significant contact with water. For such applications, non-polar, polyether-based formulations would be more suitable.

Designations

System Name:	MSS-A50E
Part-A Component:	MSE-021 (Prepolymer)
Part-B Component:	SNE-025 (Curative)

Mixing Ratio

76: 100 = Part-A: Part-B by Volume
(100: 120 by weight)

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Processing Temperature

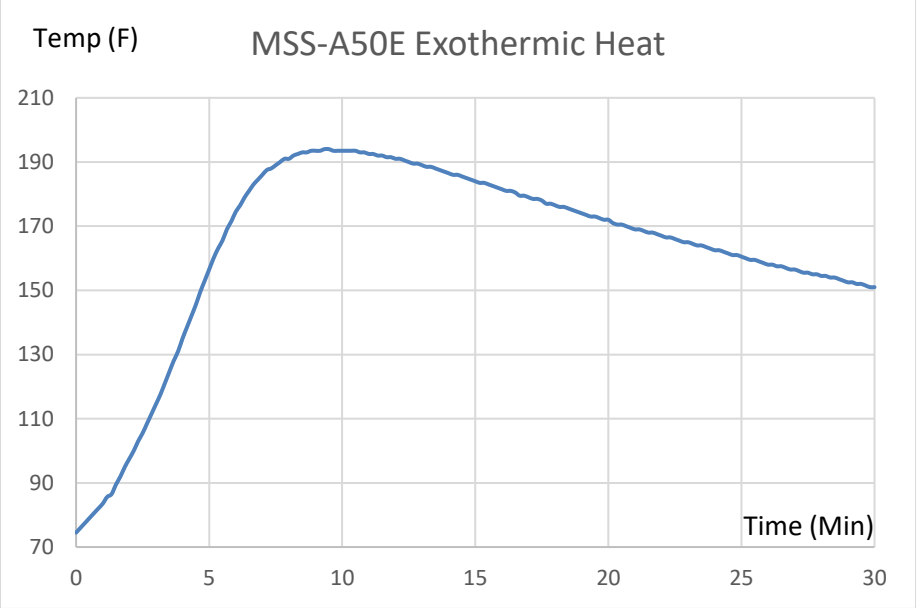
Part-A:	72 – 86 ˚F
Part-B:	Ambient (72 – 82 ˚F)
Mold:	Ambient (72 – 82 ˚F)*

Note*: The mold can be heated to the range of 125 ˚F and 180 ˚F for faster demolding time.

Curing Pattern:

Pot-Life:	5-1/2 minutes at room temperature
Demolding Time:	40 minutes (with mold temperature 72 – 82 ˚F) (Tested with 200 grams batch at ½" thickness.)

Note: The material continues to cure at room temperature for the next 3 to 5 days to reach the final physical properties.



The component materials are moisture sensitive. The headspace in the containers must be purged with dry nitrogen gas (or argon gas) and stored in an air tight container to store. The component materials should be stored in the temperature range 72 – 86 ˚F all time. The shelf life of these component materials are 6 months under the good storage conditions.

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Physical Properties (Typical Values)

Hardness (Shore A Durometer)	A 50 (+,-5)
Tensile Strength	628 psi
Elongation	413 %
Die-C Tear Strength	129 pli
Split Tear Strength	32 pli

Component Properties (Typical Values)

	Prepolymer (Part-A)	Curing Agent (Part-B)
Code Number:	MSE-021	SNE-025
Specific Gravity:	1.204	1.100
Equivalent Weight:	205	250
%NCO	20.5 %	n/a
Viscosity (@77F)	2400 cps	500 cps

When you are handling these component materials, please operate in a wide area with good air circulation or well-ventilated area. Please wear rubber gloves, long sleeves, and protective eyewear (paint goggle etc.) to avoid skin/eye contact of the materials. Please read the enclosed documents for the details on safety, handling, storage, and processing information.

The material temperature increases as the mixed component cures in the mold. At a certain point, the curing material will become too hot to touch with a bear hand. Please use a thick glove to prevent accidental skin burn with a hot material. Please see the above temperature curve chart for the temperature increase pattern. A larger batch size increases the heat. A higher heat also causes the cured resin to shrink with a larger shrinkage rate.

Packaging Sizes:

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

Other Handling Information

Storage/Handling Information for the Component Materials

Storage:

Part-A (Isocyanate Prepolymer) Component

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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.

When the outdoor temperature is below 32 °F during transportation, there is a chance of freezing. The frozen material must be immediately thawed to avoid permanent damage from freezing. Use a pail heater, drum heater, or industrial oven to elevate the material temperature to 140 °F degrees or until the material is smooth liquid with clear with amber color tint.

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

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/amine) 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 materials 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 the highest 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, 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 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-due-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.

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Part-B material contains chemical constituents that can separate during the storage for a long period of time. Agitation of the part-B content before dispensing may be required if stored for a long time. Separation can be seen in a higher degree when the material is stored in cold temperature.

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 Safety Data Sheet (SDS) for detail information on safety and handling of the material. The SDS for each component is sent with the shipment of the material.

When using the component materials, 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.

For any questions, please contact Northstar Polymers.

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