



SMC-53A

Custom Polyurethane Microcellular Foam 50 -55 A Durometer Hardness

SMC-53A is polyester-MDI based flexible microcellular foam formulation. At 25 LBS/ft³ compressed density foam, the surface hardness is 53A Shore Durometer. The cell structure is closed-cell. SMC-53A is formulated with high-performance class raw materials, and the physical property and surface quality of molded foam are very strong for this hardness range foam. SMC-53A may be suitable for such applications that require good cushioning property together with durability of molded foam parts

Component Properties

	<u>Prepolymer (Part-A)</u>	<u>Curing Agent (Part-B)</u>
Code Number:	MSA-018	SBC-024*
Specific Gravity:	1.183	1.139
Equivalent Weight:	183	239
%NCO	23 %	n/a

Mixing Ratio

	(A)	(B)
Weight Ratio:	1.000	1.279
Volume Ratio:	1.000	1.352
Volumetric Gear Ratio	74	100
Stoichiometry:	1.000	0.980
NCO Index	1.021	1.000

Processing Temperature:

Part-A	Ambient
Part-B	125 – 135 °F
Mold/Substrate	140 - 150 °F

Cure Pattern:

Pot life (pour within)	60 - 90 seconds
Demolding time	40 - 50 minutes
Post Cure:	2 – 16 hours at 160 – 180 °F
Complete Cure Cycle:	3 – 5 days at room temperature

Compression Molding:

At the compression density 25 LBS per cubic foot, the surface hardness will be about 50 – 55 A Shore Durometer. It may be compressed for a higher density to yield harder/firmer consistency.

Other Processing information:

Due to the degradation concern of polyester polyol in the part-B component (SBC-024), water is not added to the part-B component. Water is needed for forming, and the processor must add distilled water into SBC-024 prior to foam batch. The concentration of water to be added is 0.2% of SBC-024. (This is equivalent to 2 grams of water in 998 grams of SBC-024.)

**Note: The above property data on SBC-024 is after the necessary amount of water is added.*

Polyester hydrolysis rate is expected to be fairly slow, and the adverse effect may not occur for a few days after the water is mixed in the part-B component. However, the stability of part-B after water is added must be tested to confirm. The most prevalent effect from the ester hydrolysis in this system will be slower curing and/or insufficient cure.

Typically, pigment, catalysts, and other additives should all be added to part-B component. Please contact Northstar Polymers for the compatibility of materials added to the formula.

The part-B component (SBC-024) contains some ingredients that can be separated into layers. Specially, when the material is cooling off and changes the state from liquid to solid, different constituents with different freezing point turns solid at different time, and this can cause the separation. When part-B components are thawed, the content must be agitated to ensure the homogeneous mix before dispensing any material out of the container.

This foam is not fire-retardant foam, and it is not recommended for applications, which require or should be using fire-retardant grade materials. The applications such as automotive interior, building material, and components for some electronic parts often require fire-retardant grade materials by regulations. It is the user's responsibility to confirm the compliance with the applicable regulations.

By adding fire retardant additives, this foam may be modified to fire-retardant grade foam. The user must test the foam modified with the fire retardant additives for the fire-retardant property and the conformance to the applicable regulations.

Note: The part-A component, MSA-018 is sensitive to low temperature. It can freeze just below the room temperature range, and keeping the material at the frozen state can permanently damage the material. During the cold seasons, the material may arrive frozen while in transit. The material must be inspected immediately after receiving, and if it has signs of freeze, it must be thawed immediately following our thawing instructions. After the material is thawed, it must be stored at a warm indoor storage with temperature range between 72 °F and 100 °F. The ideal storage temperature is 90 °F. Since we do not have any control over the environments during the shipping, we cannot guaranty the material to be arriving without being frozen. Northstar Polymers will not be replacing or refunding for the material damaged by the cold temperature or mishandling by the customer. This disclaimer must be accepted at the time of ordering the material.

Standard Packaging Sizes:

MSA-018: 500 LBS per 55-gallon drum or 40 LBS per 5-gallon pail
SBA-033-40: 500 LBS per 55-gallon drum or 40 LBS per 5-gallon pail

Storage:

Part-A (Isocyanate Prepolymer) Component

Part-A component (MSA-018) 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 (MSA-18) 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, 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-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.

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.

For any questions, please contact Northstar Polymers.

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