NORTHSTAR POLYMERS
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Technical Data Sheet

MPP-A85C

Prepolymer (Part-A): MPB-028 Curative (Part-B): PPB-012

MPP-A85C is one of the MDI/polyether based polyurethane formulations supplied by Northstar Polymers for general molding purposes.

The component materials are low viscosity liquid at room temperature allowing to process without heating the component materials. The low viscosity of components helps easy mixing and pouring.

The completely cured parts made of this material exhibit good tensile, elongation, and tear resistance properties and comparing to other commonly available MDI/polyether room-temperature-cure urethane systems.

Typical Physical Property:

Lab Test Data

Hardness	Durometer 85 A
Tensile	2,020 Psi
Elongation	320 %
Tear (Die-C)	600 pli
Split Tear	200 pli
Bashore Rebound	26%
Natural Color	Off-white opaque to semi-translucent

Component Properties:

Prepolymer (Part-A):	**MPB-028**
Specific Gravity	1.108
Viscosity at 77 ºF	350 -850 cps
% NCO	14.5%
Equivalent Weight	290
Appearance at 77 ºF	Viscous Clear Yellow Liquid

Curative (Part-B):	**PPB-012**
Specific Gravity	1.036
Viscosity at 77 ºF	400 – 900 cps
Equivalent Weight	118
Appearance at 77 ºF	Liquid, clear with some haze

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Mixing Ratio:

	Part-A		Part-B
By Wight:	100	:	40
By Volume	100	:	43

Component Temperature:

Part-A: Room Temperature (72 – 80 °F)
Part-B: Room Temperature (72 – 80 °F)

Curing Pattern

Pot-Life:	8 -11 minutes (at 72 °F tested with 100 gram batch)
Demolding Time:	2 - 4 hours (part thickness ½", mold temperature 72 °F)
Post Cure:	3 to 6 days stored at room temperature

(Post curing at an elevated temperature 150 ˚F – 180 ˚F will shorten the complete cure cycle. For thinner parts, post cure may be necessary to complete the curing cycle.)

Standard Packages:

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

Recommended Test Process:

When you use these raw component chemical materials, please be sure to operate in a well-ventilated area, wear rubber gloves, long sleeves, and protective eyewear to avoid skin/eye contact of the materials. Please refer to the Safety Data Sheet (SDS) for the details on safety and handling.

Put a mixing container on a scale. Using a digital scale with tare function is recommended. The mixing container should be a clean/dry disposable round container with a smooth flat bottom. Plastic pails, tin paint cans, and plastic cups are some of the recommended containers.

Digital Scale with Tare Function

Pour the proper amount of part-A component material first as you weigh it. Allow enough head space if you are degassing in a vacuum chamber.

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Calculate the part-B amount according to the recommended mixing ratio and pour the correct amount of part-B on the top of part-A in the mixing container.


Jiffy mixers

Start a clock to measure time as you start agitating the part-A/B components. The time marks for curing pattern data herein are based on this clock starting at the beginning of agitation of part-A/B blend.

Use a stainless steel spatula or hand-held power mixer to agitate. A paint mixer blade or mortar mixer blade (such as Jiffy Mixers) attached to a power drill is recommended for the mixing a larger amount. Scrape the side and bottom of the mixing container with a spatula as you agitate with a power mixer to ensure homogeneous mix.

Put the container of the blended components into a vacuum chamber for degassing if needed. The vacuum gage should be about 29" Hg or above to degas quickly. Degas until all bubbles are popped from the surface. Degassing should be done within about 4 minutes after the beginning of the agitation, or before the material is too thick to degas. Degassing is optional. Without degassing, your part will have some bubbles.


Stainless Steel Spatula

Apply mold release agent on the mold surface.

Pour the blended material into the mold. Use only gravity to pour; do not scrape the side and bottom of container to get the last drops of the material. The material on side and bottom of container is often not mixed well, and it may make sticky wet spots on surface if it enters the mold.

The pot life of this material is over 10 minutes. However, the material viscosity increases gradually. Try to pour early while the material viscosity is still low to avoid air-traps, bubbles, and to get a better resolution from the mold surface.

If the mold is made of resins, plastics, or other non-heat-absorbing materials, the mold can be used at room temperature. If the mold is metal or other heat-absorbing materials, you may need to heat the mold to ensure curing.

The material creates heat while curing. This heat energy is required for the chemical reaction to cure properly. If the mold is made of a heat-absorbing material, a cold mold absorbs the heat energy

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necessary for curing. The material, especially at thin parts, may not cure properly. In such a case, pre-heat the mold to 110 ˚F – 180 ˚F. The heat from chemical reaction varies depending on the temperature conditions and heat properties of the mold/substrate as well as the batch size. Test with various mold temperatures to find the optimum for your molding operation.

The material will have some shrinkage. The shrinkage is caused by the heat during the cure expands the material while it is turning solid. As the cured cools down, the material shrinks. Higher the curing temperature larger the shrinkage will be. The linear shrinkage may be as large as 4% and it varies depending on the part size, shape, and the processing conditions. Please check the shrinkage and adjust your mold as needed.

The material cures to solid at room temperature in hours. Check the strength of the material before demolding to avoid damaging your parts. Heat will accelerate the curing rate. If you pour in a mold heated to 150 ˚F to 180 ˚F, you should be able to demold the part within 1 to 2 hours.

The molded part will take another 3 to 5 days at room temperature to reach the final hardness. Post curing the demolded part will speed up to complete cure. After parts are demolded, you can store it in an oven at 150 ˚F – 180 ˚F to post cure for faster completion of cure. Again, thinner parts may require post cure to complete the curing cycle.

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 head 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 65 and 90 °F. Avoid direct sunlight.

Note: If large amount of water mixes with a large amount of any isocyanate base materials, the exothermic heat can raise the temperature so high that it can start a fire. Keep the storage area free of water. The decomposition of isocyanate based material by extremely high temperature or fire can produce toxic gasses and smokes. Please read the Safety Data Sheet (SDS) for the detailed information.

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This isocyanate prepolymer may freeze during the transportation and storage particularly in the cold seasons. Frozen state of isocyanate prepolymer can be indicated by solid, gel, or high viscosity liquid state and cloudy color. Each material has different freezing temperature, and some freezes more readily than the others. Please consult Northstar Polymers for handling frozen isocyanate prepolymer materials.

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.

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.

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 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 your supplier or Northstar Polymers at the following.

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 Revision Date: 5/16/2016