



# MPP-A90A

Prepolymer (Part-A): MPN-023

Curative (Part-B): PPA-019

MPP-A90A is one of our room-temperature-cure liquid castable polyurethane systems. This ether-base polyurethane system is used in applications such as mold-making, prototyping, cast custom parts, potting, tool-making, and many other applications. MPP-A90A is designed for an easy operation for industrial applications without special casting or heating equipment. The mixing ratio between part-A (MPN-023) and part-B (PPA-019) is 1:1 by volume. Its low viscosity also makes it easy to achieve replicating the details of the mold/original with a fine resolution. Urethane elastomer parts made of this system exhibit:

- Fine resolution of mold details
- Good cut/tear resistance for its class
- Good performance in wet environments
- Easy-to-use room-temperature-curable

The suitable applications of MPP-A90A include patterns and molds designed to transfer a decorative image to wet surfaces. It is also suitable for many other custom applications where some flexibility and strength of the parts are required.

### Physical/Mechanical Properties

Durometer Hardness  
Tensile Strength  
Ultimate Elongation  
Tear Resistance: Die C  
Tear Resistance: Split  
Natural Color of Solid

### Typical Value

A 90  
1800 psi  
300 %  
250 pli  
90 pli  
Opaque, Off white with yellow tint

Prepolymer	MPN-023
Specific Gravity	1.1731
Viscosity at 77 °F	700 - 1200 cps
% NCO	18.6
Amine Equivalents	226
Appearance at 77 °F	Yellow Liquid

Curative	PPA-019
Specific Gravity	1.030
Viscosity at 77 °F	500 – 1000 cps
Equivalent Weight	194
Appearance at 77 °F	Clear Pale Yellow Liquid

### Processing Conditions

Prepolymer Temperature	77 °F
Curative Temperature	77 °F
Mold Temperature	77 °F

### Recommended Release Agent

Pure silicone mold release (no water base)

### Ratio Calculation

	Prepolymer (A)	Curative (B)
Product Code	MPN-023	PPA-019
Stoichiometry	1.000	1.02
NCO/OH Index	0.977	1.00
<b>Volume Ratio</b>	<b>1.000</b>	<b>1.000</b>
Weight Ratio	1.000	0.878

### Standard Cure Pattern at 77 °F

(Curing pattern can be changed)\*

Pot-Life	10 minutes
Gel Time	10 – 25 minutes
De-molding Time	6 hours
Complete Cure	2 - 3 days

\* The cure pattern can be controlled by catalyst level. Please consult Northstar Polymers for change of curing pattern. The system cures at room temperature. However, higher processing temperature (up to 180 °F) will result a faster cure pattern.

Part-A component (MPN-023) is cold-temperature sensitive. If it is kept in a cold place for a long time, crystal is formed and depletes the functional chemical within part-A. Especially, if the material is frozen, the crystal formation rate is very fast. In the coldest part of winter, it may freeze during the



transportation. If it is frozen, it must be thawed quickly by heating the material to 140 °F. MPN-023 should be stored in a warm place in the temperature range 72 – 86 °F.

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

Part-A component (MPN-023 / 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.

During the cold seasons there is a chance of freezing during the transportation. The frozen material must be immediately thawed to avoid permanent damage from freezing. If the material color is opaque with the consistency of thick liquid, gel, waxy, or solid, the material requires immediate thawing. The container should be put into an industrial oven at 180 °F until the material temperature is 140 °F or the color of the material is clear with smooth liquid consistency. Storing frozen material more than a few days will cause a permanent damage to the material, and it will not be returnable or refundable.

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 CO<sub>2</sub> 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 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 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, CO<sub>2</sub> 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 72 and 86 °F. Avoid direct sunlight.

Note: Moisture contamination of part-B material can be reversed by heating material to 180 °F and vacuuming it at about 29" Hg or above negative pressure for 20 to 40 minutes.

Part-B material contains chemical constituents that can separate during the storage. Agitation of the part-B content before dispensing is recommended if stored for a long time. Separation can be seen in a higher degree when the material is stored in cold temperature. You may need to heat to re-blend the separated material in some cases. Please consult Northstar Polymers when separation is suspected.

If the part-B component is exposed to a very cold temperature, some of the constituents may crystallize. This will be seen as a clear flakes floating in the material. This crystal can be thawed when the material temperature is at 77 °F or above. Please stir the material gently before dispensing part-B material to ensure the homogeneous blend of the constituents.

#### 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 SDS for each component for the detailed health information.

For any questions, please contact Northstar Polymers.



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