



# MPP-A80E

Prepolymer (Part-A): MPN-023 Curative (Part-B): PBA-031

MPP-A80E is one of our general purpose room-temperature-cure liquid casting polyurethane systems. This ether-base polyurethane system is used in applications such as mold-making, prototyping, production of cast parts, potting, tool-making, and many other applications. MPP-A80E 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 (PBA-031) is 2: 3 (or 1.0: 1.5) 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
- Small shrinkage factor

The suitable applications of MPP-A80E include stamps/patterns and concrete molds designed to transfer a decorative image to wet surfaces. Its property of small shrinkage rate provides users with a tight dimensional stability when a replication is made. It is also suitable for many other custom applications where 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 80  
 1100 psi  
 180 %  
 140 pli  
 25 pli  
 Opaque, Off white with yellow tint

Prepolymer	MPN-023
Specific Gravity	1.173
Viscosity at 77 °F	900 - 1200 cps
% NCO	18.6
Amine Equivalents	226
Appearance at 77 °F	Pale Yellow Liquid

Curative	PBA-031
Specific Gravity	1.026
Viscosity at 77 °F	400 - 900 cps
Equivalent Weight	310
Appearance at 77 °F	Pale White Liquid

### Processing Conditions

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

### Recommended Release Agent

Pure silicone mold release (non water base)

### Standard Cure Pattern at 77 °F (Curing pattern can be changed)\*

Pot-Life	10 - 13 minutes
Gel Time	18 – 25 minutes
De-molding Time	5 - 6 hours
Complete Cure	2 - 3 days

### Mixing Ratio

	Prepolymer (A)	Curative (B)
Product Code	MPN-023	PBA-031
Stoichiometry	1.000	0.96
NCO Index	1.04	
Volume Ratio	1.0	1.5
Weight Ratio	1	1.312

\* **Note:** Part-B component PBA-031 has constituents that can separate during storage. The content of the drum/pail for PBA-031 need to be gently agitated before dispensing out. Please use dry/clean plastic or metal mixing tool. Do not use wooden tools.



## **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 90 °F. Avoid direct sunlight.

Note:

MPN-023 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. Generally, we recommend isocyanate components to be stored in their liquid state in room temperature range. This product makes unwanted byproducts if it is kept frozen. It may ruin the material if it is store frozen for a long time. Please consult Northstar Polymers if isocyanate prepolymer is suspected to be frozen.

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) 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, 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 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.

Some part-B materials contain chemical constituents that can separate during the storage. Agitation of the part-B content before dispensing may be required for the system. 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.

**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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