3444 Cheatham Avenue, Minneapolis, MN 55406 Tel: 612-721-2911 Fax 612-721-1009

Technical Data Sheet

MPC-D83D

Polyurethane Casting System

Long Pot-Life for Easy Processing

MPC-D83D is a two-part, rigid polyurethane casting resin system developed by **Northstar Polymers**. It is engineered for applications that require high load-bearing strength, structural rigidity, and impact resistance. This formulation is well-suited for manufacturing durable polyurethane parts that must withstand mechanical stress and repeated use.

The system is optimized for ease of processing and user-friendly handling. It features a long pot life, low-viscosity components, and a simple 2:1 mix ratio by volume, allowing for efficient mixing and casting. These characteristics make MPC-D83D particularly effective for use in environments with limited processing equipment, as well as for prototyping, small-batch production, and in-house fabrication.

The extended working time enables the casting of larger or more complex parts with reduced risk of premature setting. Once cured, the material achieves hardness comparable to polypropylene and nylon, providing a balance of stiffness, toughness, and impact durability.

Typical applications include:

- Artificial rock climbing holds
- Foundry patterns and tooling boards
- Protective housings and impact-resistant casings
- Rigid rollers and wheels
- Bushings and bearings
- Wear strips and sliding surfaces
- Custom cast polyurethane parts and industrial components

Designations

System Code:	MPC-D83D
Part-A:	MPE-023
Part-B:	CPB-010

Mixing Ratio: **100: 50 by Volume** (100: 43 by Weight)

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Physical Properties

Hardness:	83 D Durometer*
Tensile Strength:	5,074 psi
Ultimate Elongation:	17 %
Die-C Tear Strength:	1,142 pli
Bashore Rebound:	56%

The above data is based on our lab test and reference only.

Processing Temperature

MPE-023 (Part-A):	Ambient
PCA-010 (Part-B):	Ambient
Mold:	Ambient**

Curing Pattern

Pot-life:	18 - 20 minutes
Demolding Time:	25 minutes (at ½" thick sample)
Complete Cure Cycle:	7 Days at room temperature

Note*: The material does not reach its final hardness at the time of demolding. At demold, the part has sufficient strength to be removed from the mold; however, it will still be hot and relatively soft. The part should be placed on a flat, stable surface during cooling to prevent deformation. The material gradually increases in hardness over 6 to 7 days at room temperature. For accurate evaluation of physical properties, testing should be conducted no sooner than 7 days after molding.

Note**: When using a soft mold (resin or plastic mold), the heat generated during curing may cause the mold to expand while the material is still in the liquid phase. This expansion can create a suction effect between the curing material and the mold, potentially resulting in void formation. If voids are observed, preheating the mold to approximately 180°F may help reduce this issue.

This material generates heat due to an exothermic chemical reaction during curing. The following chart illustrates the temperature rise shortly after mixing. Wear thick gloves and appropriate protective clothing to avoid direct contact with the material while it is hot.

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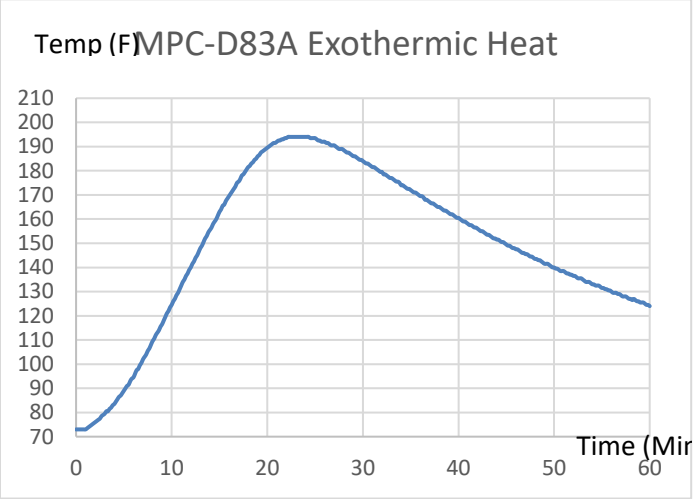

Component Materials

Part-A Component

Product Code: MPE-023
General Name: Prepolymer
NCO%: 18.5
Equivalent Weight: 227
Specific Gravity: 1.150
Viscosity: 600 cps at 72°F

Part-B Component

Product Code: CPB-010
General Name: Curative
Equivalent Weight: 100
Specific Gravity: 0.999
Viscosity: 900 cps at 72°F

Available Package Size: 5-gallon pails as well as 55-gallon drums

Storage/Handling Information for Polyurethane Component Materials

Our polyurethane component products are industrial-grade chemicals. For worker safety and optimal performance, proper handling and storage procedures must be followed. The following guidelines provide general storage and handling recommendations for Part-A (isocyanate prepolymer) and Part-B (curative) components. Supervisors and operators must be familiar with these practices to ensure safety and product quality.

Storage of Part-A Component (Isocyanate Prepolymer)

Part-A (prepolymer) contains isocyanate, which is highly sensitive to moisture. Exposure to ambient air will cause an irreversible reaction with atmospheric moisture, rendering the material unusable.

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After opening, immediately blanket the material with dry nitrogen or argon gas. Inject gas for 15–20 seconds for 5-gallon pails and 60–120 seconds for 55-gallon drums, depending on empty headspace.

For gravity-fed dispensing from a 55-gallon drum, install a silica gel, zeolite, or calcium chloride desiccant filter on the vent hole, or use a nitrogen gas shut-off valve.

Store in a dry indoor area at **72–86°F all the time**, avoiding direct sunlight.

Safety Notes:

If a large volume of water mixes with isocyanate, an exothermic reaction can generate extreme heat, potentially causing fire. Keep storage areas dry. High-temperature decomposition or fire can produce toxic gases. Refer to the SDS for details.

Handling Frozen Material:

Many isocyanate prepolymers may freeze during cold-weather shipping, appearing opaque or creamy and taking on a solid, gel, or highly viscous form.

If freezing is suspected, thaw in an industrial oven at 160–180°F for plastic pails or use a drum heater at 160–200°F for steel drums.

Do not heat the material temperature to exceed 180°F, as excessive heat can degrade the material. Avoid prolonged heating after thawing, as it may promote the formation of crosslink, which increases viscosity and alter performance.

Plastic pails are rated for a maximum of 190°F. Keep away from the heat source when using an oven.

Store thawed material at a temperature **72–86°F all the time**

If you agitate content of a drum, maintain a small nitrogen gas flow into the drum to blanket the material surface with nitrogen gas.

Shelf Life: 6 months in unopened original containers under proper storage conditions.

Storage of Part-B Component (Curative/Polyol Blend)

Part-B components consist of polyol blends and additives. They are hygroscopic, meaning they rapidly absorb moisture from the air, which can introduce bubbles into cured products.

Prevent exposure to ambient air to avoid moisture contamination.
Purge headspace with nitrogen gas or -40° dew point dry air, especially when humidity exceeds **60% Relative Humidity** at room temperature range. Store in a dry indoor area at **72–86°F**, avoiding direct sunlight.

Agitation Requirements:

The constituents of some Part-B formulations may separate into layers in the container over time. (The rate of separation varies between different formulas and may increase at lower storage temperatures.) Agitate the content for the following durations before dispensing:

55-gallon drums: Use a drum mixer for **30 minutes.**
5-gallon pails: Use a handheld power mixer for **1-2 minutes.**

Minimize air entrapment during agitation. In high-humidity environments, maintain a slow nitrogen gas flow while agitating to prevent moisture contamination.

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Shelf Life: 6 months in unopened original containers under proper storage conditions.

Handling Guidelines

Keep all materials in a secure area, restricting access to unauthorized individuals. The personnel who handles these materials must review the SDS for detailed safety and handling instructions. Operate in a well-ventilated area or a wide-open workspace with good air movement.

Wear rubber gloves, long sleeves, and protective eyewear to avoid skin/eye contact of the materials. For heated or sprayed applications, use dynamic ventilation and/or appropriate respirators to prevent inhalation exposure.

Hygiene practices: Avoid direct skin/eye contact or ingestion. No eating or smoking in work areas. Wash hands thoroughly after handling materials.

Humidity Considerations: If excessive bubbles appear in cured urethane parts, moisture contamination may be the cause. Maintain workspace humidity **below 60% relative humidity** at room temperature range using a dehumidifier if necessary. Prevent condensation on materials, molds, and tools by keeping them at ambient workspace temperature.

Warranty and Disclaimer

Northstar Polymers warrants that its products meet specified chemical quality standards and are free from manufacturing defects. However, we do not guarantee fitness for specific end-use applications. Users are responsible for testing materials for suitability in their specific processes and ensuring compliance with health, environmental, and regulatory requirements.

For any questions, please contact Northstar Polymers.

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