



Northstar Polymers (Div. of Tandem Products, Inc.)
 3444 Dight Avenue South, Minneapolis, MN 55406 USA
 Tel: (612)721-2911, Email: info@northstarpolymers.com

MGB-D53E

Room-Temp Mixable High Rebound, Hydrophobic Formula

Prepolymer (Part-A): MGE-031 Curative (Part-B): BAN-005POR33

MGB-D53E is a room-temperature-pourable, semi-high-performance polyether polyurethane system. The material is specifically designed so that the user can manually mix the component during the relatively long pot-life. The cured elastomer products exhibit high rebound, good cut/tear resistance, and good stability in outdoor environments. This combination of features makes MGB-D53E a good raw material candidate to make **custom skateboard wheels, scooter wheels, liners/bumpers used outdoors and in wet conditions** as well as many other specialty products. This formulation is designed to be used in smaller operations without dispensing equipment making smaller quantities of products. For a larger production rate, please consider using MGP-D50A for a faster mold cycle and more enhanced physical properties.

Mechanical Properties	Typical Value
Durometer Hardness	50 – 55 D
Tensile Strength	1500 psi
Ultimate Elongation	40 %
Tear Resistance: Die C	384 pli
Bashore Rebound	43 %

Mixing Ratio

	Prepolymer (A)	Curative (B)
Product Code	MGE-031	BAN-005POR33
Weight Ratio	1.000	0.151
Volume Ratio	1.000	0.160
Gear Ratio	100	16
NCO Index	1.015	NA

Processing Temperatures

Prepolymer Temperature	Ambient (72 °F)
Curative Temperature	Ambient (72 °F)
Mold Temperature	72 - 110 °F*
Post Cure Temperature	180 - 200 °F

Note: Plastic molds can be at room temperature.*

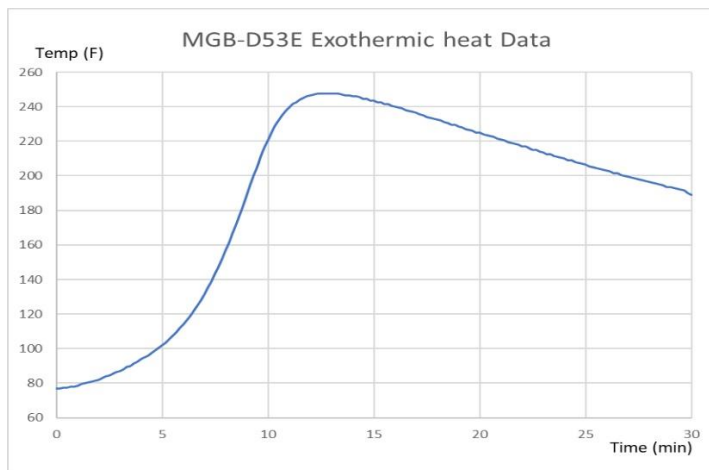




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Cure Pattern

Pot-Life	5 - 6 minutes
De-molding Time	1 – 2 hours
Post Cure @180 °F	4 – 20 hours



Component Properties

Prepolymer	MGE-031
Specific Gravity	1.091
Viscosity at 72 °F	1720 cps
% NCO	13.7
Equivalent Weight	307
Appearance at 72 °F	Pale Yellow Viscous Liquid
Storage Temperature	77 °F – 86 °F

Curative	BAN-005POR33
Specific Gravity	1.031
Viscosity at 77 °F	70 - 100cps
Equivalent Weight	47
Appearance at 72 °F	Dark green or amber color liquid
Storage Temperature	77 °F – 86 °F

NOTE* The part-A component, MGE-031, freezes just below the room temperature range. If it is suspected to be exposed to cold temperatures, please thaw the material to about 140 °F and store it at room temperature in its liquid state. Storing MGE-031 in its frozen state causes the material to deteriorate much faster. Be sure to always purge the headspace in the container with dry nitrogen or argon gas to prevent moisture contamination. Moisture contamination on MGE-031 is not reversible.

The constituents of the part-B component, BAN-005POR33, can separate into layers during storage. Please stir the content before dispensing. The part-B component may freeze just below the room temperature range. If it is frozen, the material needs to be heated to about 77 – 110 °F to thaw. If you see flakes or crystals in the liquid, the material needs to be kept at a temperature between 77 and 110 °F for longer until all solid is dissolved into the liquid. Stir the material before use to ensure the homogeneous blend of the constituents. Be sure to always purge the headspace in the container with dry nitrogen or argon gas to prevent moisture contamination.

Standard Packages:

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



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Other Molding Process Information

The material creates high exothermic heat. The processor may need to address some issues related to the heat during the molding process.

If the mold is made of resin or plastic, the mold does not have a good heat conductivity. With the high exothermic heat, the resin/plastic mold can expand, and the expansion can be different in various regions of the mold. This can cause some issues. If silicone or epoxy products are used to make the mold, the mold-making resin product needs to be filled with heat-conductive material(s) to dissipate the heat effectively.

Expansion of the resin/plastic molds can cause gaps between the curing polyurethane and the mold wall. This can cause voids on the molded part. The mold may need to be put in a pressure pot to address this issue. Aluminum molds have less concern in terms of mold expansion.

The polyurethane material also shrinks when it is cooled, and it can also affect the dimensional tolerance. If the part's dimensional tolerance needs to be very tight, you may need to consider machining the molded part to keep the tight dimensional tolerance.

When the part is just demolded, this material is solid, but not very strong. A proper mold release agent needs to be used on the mold surface for good surface quality and to prevent damage to the molded part.

If the part is left in the mold until it is cooled, the part shrinks inside the mold. The part may recede from the mold surface while the material is not very strong. This can cause damage to the surface of the molded part. Use of a more effective mold release agent can alleviate this issue. The demolding time should be tested for the optimum demolding time for your application.

This material is designed to be processed manually. However, an inline-mixing metering dispensing machine can be used to mix and dispense. The viscosity values of the component materials are widely different. A dynamic mixing head system is expected to work better than static mixing head system.



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Storage:

Part-A Component

Part-A component (MGE-031) contains isocyanate material(s), which are very much 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 a can and dispensing the content, nitrogen gas or negative-40-degree-due-point dry air needs to be injected to the can to blanket the material. Store it in an air-tight container such as steel drums, sealed pails, or totes. Silica gel or calcium chloride desiccant filter should be installed to 55 gallon drum-vent for your drum feeding system.

The storage temperature should be at a room temperature between 72 °F and 86 °F. Do not store in heated storage above 104 °F (40 °C) as it induces adverse reaction within the material, which could degrade the material.

Note:

This isocyanate prepolymer (MGE-031) 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

The constituents of the part-B component, BAN-005POR33, can separate into layers during storage. Please agitate the content before dispensing. 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 of excessive bubbles in the product after mixed with part-A. Avoid exposure of the material to moisture in air.





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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.

If this material is stored for a long time, the material may absorb air or gas inside the container, which may cause excess bubbles after while it is cast and/or molded. The material may need to be heated to 180 - 200 F range and degassed for 30 to 60 minutes above 29" Hg vacuum to eliminate infused air/gas from long term storage.

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 Northstar Polymers.

Tel: 612-721-2911.
Fax: 612-721-1009
Web Site: <http://www.northstarpolymers.com>
E-Mail: info@northstarpolymers.com

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