

## MGP-V20A

### Soft Range Polyurethane Gel with Low-Tack Surface

MGP-V20A is formulated to yield a very soft (Shore OO 20 Durometer Hardness) elastomeric gel material using the low viscosity liquid components at room temperature. The consistency of cured/molded material resembles to soft TPE of the similar hardness range.

Unlike TPE, MGP-V20A is a thermosetting material that can be processed at room temperature with ambient pressure. Inexpensive soft molds or plastic/resin molds can be used to mold parts of this material. For small production quantities, it can be processed manually without a specific processing/dispensing machine. These easier processing parameters make MGP-V20A an easier and low-cost alternative to TPE.

Possible applications for MGP-V20A include cushioning and padding parts, body part models for medical training products, specialty gaskets for cable installation application, prototyping of various soft elastomeric parts, and many other custom applications.

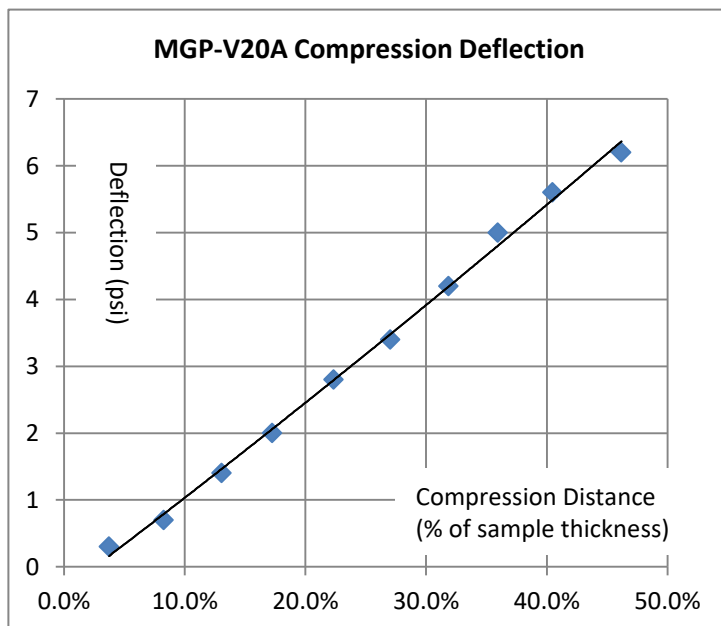


Unlike some of the polyurethane gel class materials, the tack level of completely cured surface is low, so the molded parts may be used without protective covering for some applications. When it is cut, the cut

surface also has low tack. Dies or sheets of MGP-V20A can be easily fabricated without getting very much residue sticking to the blades.

The cured material elongates over 500% (tested with an in-house method). Although it does not have as strong tensile strength or cut/tear resistance as TPE does, it part stretches far to resist tearing in many cushioning applications.

MGP-V20A is made of mostly hydrophobic constituents and the molded parts are expected to withstand well in wet conditions. The natural color of cured piece is clear with amber color.





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### **Designations:**

System Code:	MGP-V20A
Part-A:	MPC-078
Part-B:	GNB-254

### **Processing Temperature:**

Part-A/Part-B Components:	Ambient (72 °F – 86 °F)
Mold:	Ambient (72 °F – 86 °F)*

Note\*: For better surface finish and faster demolding time, we recommend the mold to be heated to 140 °F – 180 °F range. If a metal mold or a substrate that absorbs heat is used, the mold may need to be heated to ensure proper cure.

### **Curing Pattern:**

Pot-Life:	10 minutes
Demolding Time:	3 hours at room temperature (30 minutes at 180 °F mold temperature)
Complete Cycle:	3 days at room temperature**

Note\*\*: A molded part can be handled as a solid piece at and after the demolding time. However, the molded part continues change gradually/slowly for about 3 days at room temperature to reach the equilibrium state. The hardness and surface tack become stable in about 3 days at room temperature after the molding process.

### **Mixing Ratio:**

100: 322 by Weight  
100: 400 by Volume (25: 100 Gear Ratio for Gear Type Metering Pumps)

### **Other Information on Processing**

The curing patterns can be modified by addition of catalysts and/or use of heat.

The surface tack on an open-top surface will be higher than the mold-contact surfaces. Applying a small amount of silicone fluid can further reduce the surface tack of molded products.





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Be sure to evaluate the tack, hardness, and other properties of molded product after it reaches to the equilibrium state at least 3 days after the part is molded. The material properties of molded parts change over about 3 days after it is molded.

Increasing the part-B mixing ratio will make softer parts, however, the surface tack will increase, and the hydrophobic property will be hindered. Off-ratio processing is not recommended with this formula.

The material consists of mostly non-polar raw materials. If coloring is needed, we recommend using pigment dispersion type colorant carried in polyether polyol with low OH content or non-polar plasticizer such as ESO, TXIB, and DINP. The color of material is expected to darken from oxidation and exposure to UV light (and other radiations). UV Stabilizer additives can be used to stabilize the color for a longer time.

**Typical Property Values of the Component Materials:**

Typical Properties of **Part-A** Component

Product Code:	MPC-078
Description:	Isocyanate terminated prepolymer with modifier
%NCO:	5.4% (+/- 0.5%)
Amine Equivalent	778
Specific Gravity:	1.185
Appearance at 25 °C ( 77 °F):	Clear amber colored liquid
Viscosity at 25 °C (77 °F):	10 – 150 cps
Agitation:	The material within container must be agitated before dispensing each time to ensure the homogeneous blend of constituents.
Storage:	Store in airtight containers with the head spaces purged with dry nitrogen or argon gas. Store the containers on a skid or another method to elevate from the floor in a dry indoor storage room within the temperature range between 72 °F and 86 °F. The material is highly sensitive to moisture. The head space must be purged with dry nitrogen gas or argon gas each time the container is opened.

Typical Properties of **Part-B** Component

Product Code:	GNB-254
Description:	Curing agent based on a blend of polyol, modifier, and additives
Equivalent Weight:	2544
Specific Gravity:	0.955
Physical State at 25 °C ( 77 °F):	Clear with some haze; Liquid





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Viscosity at 77 °F:	10 – 120 cps
Agitation:	The material within container must be agitated before dispensing each time to ensure the homogeneous blend of constituents.
Storage:	Store in a dry indoor storage at room temperature in an airtight container. The material is hygroscopic. Before storing, purge the container headspace with dry nitrogen gas or argon gas.

Note\*\*\*: In cold seasons, the component materials may be affected by exposure to cold temperature during shipping. These materials contain chemicals with different freezing points, and some constituents may freeze-out to separate from the blend. If freezing is suspected, the material must be inspected immediately after receiving. If you see partially gelled or solid material within or segments of different consistencies, the material needs to be heated to 130 °F to 140 °F to thaw. The material in the container must be agitated to ensure the homogeneous blend each time before dispensing.

Note\*\*\*: MGP-V20A contains a large loading ratio of plasticizers (inert liquid chemicals). All plasticizers are known to leach out slowly in time. Leaching plasticizer may affect surrounding plastic materials. The molded products may become harder and may shrink as plasticizer leaches out. Although the plasticizers contained in this formulation are used in cosmetics and/or food contact products and they are not known as hazardous, the end-products' safety must be confirmed for each specific application. MGP-V20A does not contain phthalate based plasticizer. Please see the Safety Data Sheet for each component for more detailed safety information about the constituents.

**Standard Packaging Sizes:**

- 5-gallon plastic pails (40 pounds net each)
- 55-gallon steel drums (450 pounds net each)

**Other Handling Information**

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 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.

The material has been tested for the stability at 32 °F for a few days. However, when the outdoor temperature is below 32 °F during transportation, there is a chance of freezing. The frozen material must be immediately thawed to avoid permanent damage



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from freezing. 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.

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-dew-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.

#### 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 Sheets (SDS) for detail information on safety and handling of the materials. 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





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isocyanate content level in the work place atmosphere may become above the threshold regulated by OSHA or by other applicable 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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