



Tandem Products, Inc., DBA Northstar Polymers  
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## NTG-9

### Polyurethane Gel Elastomer with Less Tacky Surface

NTG-9 is one of our polyurethane gel formulations designed to service applications requiring a soft elastomeric material with good cushioning effect, better strength, and less tacky surface than commonly available polyurethane gel formulations.

Whereas typical polyurethane gel formulations are used with another film or fabric materials covering the product surface, NTG-9 may not require such a surface-covering structure. This allows a user to make stand-alone polyurethane gel parts in mold without prefabrication of flexible film/laminate material. The low viscosity values of the component materials allow easy handling and replication of mold surface at a high resolution.

Same as other polyurethane gel materials, NTG-9 does not bottom-out as easily as flexible foams. NTG-9 can be used in cushioning/padding products supplementing foam cushion for pressure-point supporting part together with foams.

NTG-9 can be used in similar applications to where TPE (thermoplastic elastomer) class polymers have been used for. Whereas TPE polymers require high heat and high pressure injection molding process, NTG-9 can be processed at room temperature\* in ambient pressure molds.

(Note\*: Although it can cure at room temperature, mold temperature of 120 – 140 °F is recommended for less tacky surface.)

### Physical Properties

<u>Physical Properties</u>	<u>Typical Values</u>
Hardness:	Shore OO 50 - 60 Durometer*
Elongation	839%
Tensile Strength	62 psi
Die-C Tear Resistance	25 pli
Split Tear Resistance	11 pli
Bashore Rebound:	20%
Natural Color:	Translucent with some haze and yellow tint

(Hardness between open top and bottom surface vary widely if processed with an open top mold. Unlike other gel formulas, this material does not allow ration adjustment to change the product consistency to be yielded. You may use various plasticizer products to soften the material.)





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### Designations

System Code: NTG-9  
Part-A (Isocyanate) Component: MPB-028  
Part-B (Curative) Component: PNB-131

### Processing Temperature

Part-A Component: Ambient  
Part-B Component: Ambient

Mold Temperature: 120 – 140 °F

### Ratio Information

Mixing Ratio: 100: 480= Part-A: Part-B by Volume (100: 443 by weight)  
NCO Index: 1.018

### Curing Pattern

Pot-Life: 9 to 10 minutes  
Demolding Time: 1 to 2 hours  
Complete Cure: 3 to 5 days at room temperature

### Component Materials (Typical Properties)

#### **Part-A: MPB-028 (Isocyanate)**

General Description: Isocyanate Terminated Prepolymer based on MDI and polyether polyol

NCO: 14.5%

Equivalent Weight: 290

Specific Gravity (Theoretical at 77 °F): 1.108 grams/cm<sup>3</sup>

Viscosity at 77 °F: 450 – 550 cps

Storage/Handling: Store indoor at room temperature between 72 °F and 90 °F. The container head space must be purged to blanket the material with dry nitrogen gas or argon gas.





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### **Part-B: PNB-131 (Curative)**

General Description: Curing Agent (Curative) based on a blend polyether polyol, additives, and catalyst

Equivalent Weight: 1306

Specific Gravity (Theoretical at 77 °F): 1.0215 grams/cm<sup>3</sup>

Viscosity: 620 cps at 77 °F

Storage/Handling: Store indoor at room temperature between 72 and 90 °F. Avoid moisture entering the product.

### **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 head 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 77 and 90 °F. Avoid direct sunlight, high humidity, and high temperature.

Note:

The prepolymer used for this formulation contains different isocyanate isomers with different freezing points. When the product is shipped in cold season, the isocyanate isomers and extended prepolymer may separate into layers in the container. During the cold season, the container must be heated to about 120 °F and agitated to ensure homogeneous blend before use. The material should stay as liquid at room temperature. To avoid separation during the storage, store it in between 72 °F and 90 °F storage temperature range.

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





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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, and/or causes the parts to cure improperly 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 and duration of the exposure.)

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 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 may be required for the system. Separation can be seen in a higher degree when the material is stored in cold temperature for a long time. 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 Safety Data Sheet (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 isocyanate content level in the workplace 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.





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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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