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MPP-V37A
OO Scale Gel

MPP-V37A is one of our polyurethane gel formulations specifically designed for padding and cushioning application that requires Shore Durometer OO scale hardness.

The material does not contain any plasticizers, which are known to leach and have adverse effect to the plastic film encapsulation materials used in conjunction with gel materials. The shrinkage rate is negligible when cured at room temperature, which makes MPP-V37A idea material for cushioning parts made inside film encapsulation.

The applications for this material include cushioning and padding parts for shoe inserts, semi-medical or athletic cushioning applications, vibration-dampening for sensitive equipment, novelty products, and many more.

This polyurethane gel material is formulated in such a way that the user can control the hardness/deflection properties of the product. Following is reference for the hardness to the corresponding mixing ratio.

Hardness vs. Mixing Ratio Correlation

Part-A: Part-B	Expected Hardness Range
100: 220 -----	Shore OO 35 – 40 Durometer
100: 280 -----	Shore OO 5 – 10 Durometer

Note: The ratios are by weight.

The user can choose the mixing ratio between the above ratios to yield desired hardness for the product. The materials cured to lower Durometer hardness with slow rebounding property. If faster rebound property at softer range is more desired, choose our MPP-W43D as an alternative.

The product hardness is dictated by the stoichiometry ratios between the mole numbers of NCO and OH functional terminals. The component materials come in with some lot-to-lot variation, and for some applications, ratio adjustment may be required to keep the tight tolerance in softness. Please contact Northstar Polymers for more precise method of hardness control. The above is the result of our lab test, and it is reference only.

The hardness data are typical values. Harder products have faster rebound time after compression force is released. The data is guidance only. The user must test the mixing ratio and yielding hardness for each application.

Cold Temperature Flexibility Change Data:

	Hardness at 70 °F	Hardness at 30 °F	Hardness at -10 °F	Hardness at -60 °F
100:220 Ratio	OO 40	OO 48	A 5	A 15
100:280 Ratio	OO 5	OO 10	ND	A 10

*The hardness data is in the Shore Durometer OO and A scales.

Processing Conditions

Components:
Part-A: MPA-135
Part-B: PNA-157

Processing Temperature:

Part-A: Room Temperature
Part-B: Room Temperature
Mold: Room Temperature

Curing Pattern

Pot life: 10 - 15 minutes at ambient temperature
Demolding: 3 – 5 hours at ambient temperature
Complete Cure: 4 - 7 days at ambient temperature

Note: This curing data is the processing parameters of 100:220 mixing ratio at room temperature. The curing rate may vary depending on the mixing ratio, product design, and size chosen for the process. The curing pattern can be modified by addition of a catalyst. Please consult Northstar Polymers for the modification.

The material is solid within 5 to 6 hours at room temperature. However, the hardness will develop farther over 5 to 7 days at room temperature. The evaluation of the cured material needs to be done at least 5 days after the pour-date.

Recommendations

Mixing ratio setting for your dispensing equipment is critical to the hardness determination. We recommend the mixing ratio is calibrated by actual weight ratio of the material dispensed from the machine. For tighter control of the product hardness, recalculation of the volume ratio based on the actual values of the Certificates of Analysis may be required for each lot of material. Please consult Northstar Polymers for the detailed information on recalculation and calibration.

Part-A material is highly viscous at a room temperature. If casting machine is used for high volume production, part-A can be heated up to 160 °F to lower the viscosity; this helps mixing the components well. Higher processing temperature will increase the cure rate. Also, catalyst can be used to increase the production rate. However, with heat and higher catalyst level, it may start showing shrinkage.

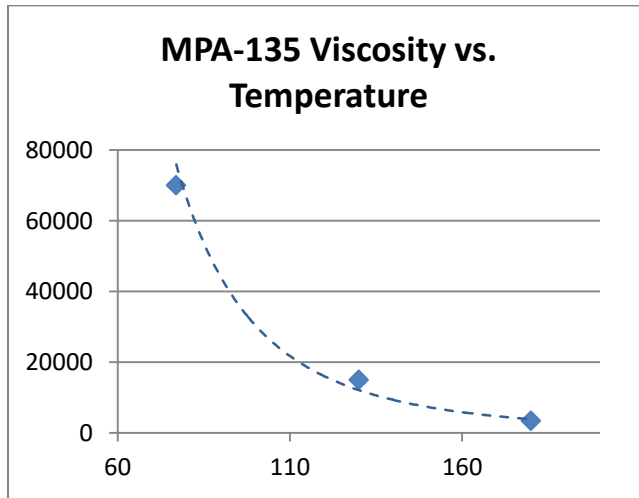
This material is often encapsulated with coated cloth material, polyurethane film, or other resilient materials. The surface of gel product is very sticky, and the gel can be cut or torn easily in certain applications. The encapsulation is essential for protection of the gel in some applications. For temporary handling, you may use talc powder to prevent it from sticking to the handlers or equipment.

Use of elevated temperature may cause shrinkage of this material. Shrinkage will be a critical issue if you are pouring this material directly on a flexible film. Shrinkage could cause significant wrinkling of the film. If excessive wrinkle occurs, the processing rate may need to be slowed down.

Component Data:

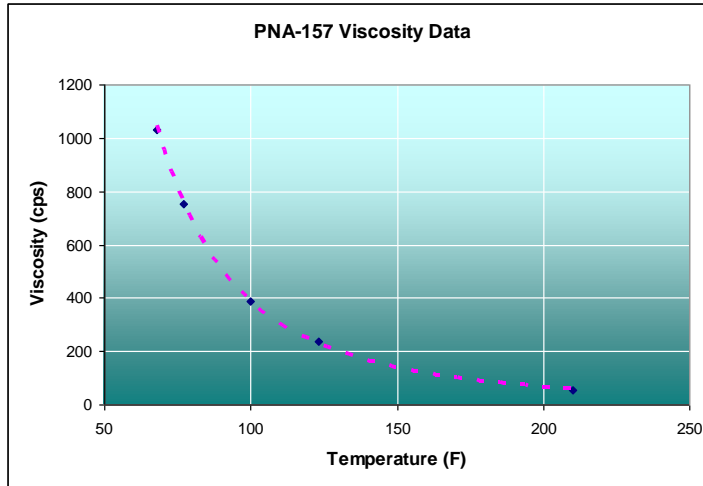
Part-A

Product Code:	MPA-135
Description:	Isocyanate terminated prepolymer extended with polyether polyol
%NCO:	3.11 % +, - 0.5%
Equivalent Weight	1351
Specific Gravity:	1.056
Physical State at 25 °C (77 °F):	Liquid (viscous translucent with haze and slight yellow tint)
Viscosity	70,000 – 130,00 cps (72 °F)
Storage:	Store in a dry indoor storage at room temperature. The material is highly sensitive to moisture. After using the content, immediately inject dry nitrogen gas or -40° dew-point dry air into the container to blanket the material then store. Heat will accelerate the subsequent reaction within the material and shorten the shelf life of the material. Do not store at an elevated temperature.



Part-B

Product Code:	PNA-157
Description:	Curing agent based on a blend of polyether polyols and additives
Equivalent Weight:	1566
Specific Gravity:	1.024
Physical State at 25 °C (77 °F):	Liquid (clear with some off-white haze)
Viscosity at 25 °C (77 °F)	600 – 1000 cps
Storage:	Store in a dry indoor storage at room temperature. The material is hygroscopic. For long term storage, inject dry nitrogen gas or -40° dew-point dry air into the container to blanket the material.



Handling Information:

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 handles these materials needs 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 you are conducting a test, or producing your parts using this material, please 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, we recommend, in addition to the above, installation of a proper dynamic ventilation system and/or using a half-face respirator 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. Please refer to the Material Safety Data Sheet for each component for the detailed health information.

Storage:

Part-A component (prepolymer) contains isocyanate component, which is very much sensitive to moisture. If it is left in air, part-A component 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-dew-point dry air needs to be injected to the container to blanket the material. Silica gel or calcium chloride desiccant filter should be installed to 55 gallon drum-vent for your drum dispensing system. The storage temperature should be at a room temperature between 65 and 90 °F.

Part-B component may be hygroscopic. If the material is exposed to ambient air, it may absorb moisture. Moisture contaminated part-B material may become source of degradation or excessive bubbles in the product. The moisture contamination of part-B material is reversible. Heating material to 160 - 180 °F and vacuuming it at about 29" Hg negative pressure for several hours will reduce the moisture level. Avoid exposure of the material to air. Purging the empty

space in the container with nitrogen gas or negative-40-degree-dew-point dry air is also recommended to prevent moisture contamination of part-B. The storage temperature should be at a room temperature between 65 and 90 °F. Store the containers in a dry indoor space.

For any questions, please contact Northstar Polymers.

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