Technical Data Sheet

MPP-A80H

Prepolymer (Part-A): MPA-053 Curative (Part-B): BPB-005

MPP-A80H has been specifically formulated to service applications where high elongation and good physical strength are required as well as where temperature during the process must be low for a very small shrinkage and a low processing temperature requirement.

The component materials are liquid at room temperature allowing a user to process without heating the components. The reactivity is controlled specifically to be very slow so that the exothermic heat does not exceed the specific temperature range. This attributes to a very small shrinkage rate. This formula may be suitable when the high temperature at curing is an issue.

The completely cured parts made of this material exhibit good tensile, elongation, abrasion resistance, and tear resistance properties. If the higher temperature for curing is not an issue, the higher catalyst level and elevated temperature will increase the curing rate to improve the turnaround rate.

Physical Property Data:

	Lab Test Results on Physical Properties
Tensile	1818 psi
Elongation	813%
Hardness	Durometer 75 – 80 A
Tear (Die-C)	427 pli
Split Tear	152 pli
Natural Color	Off-white opaque (can be pigmented)

*The above data is based on our lab tests on sample coupons that are stored for 3 weeks at room temperature.

Component Properties:

Prepolymer (Part-):	**MPA-053**
Specific Gravity	1.073
Viscosity at 77 ºF	7000 - 9000 cps
% NCO	8.0 %
Amine Equivalents	525
Appearance at 77 ºF	Viscous Clear Liquid

Curative (Part-B):	**BPB-005**
Specific Gravity	1.027
Viscosity at 77 ºF	50 – 200 cps
Equivalent Weight	50
Appearance at 77 ºF	Cloudy Color Liquid

Mixing Ratio:

	Part-A		Part-B
By Wight:	1.000	:	0.093
By Volume	1.000	:	0.097

Processing Parameters (Slow/Low Temperature Process):

The following processing parameters are for lower temperature process.

Part-A: Room Temperature (72 – 80 °F)
Part-B: Room Temperature (72 – 80 °F)
Mold Temperature: 120 °F

Curing Pattern

Pot Life: > 15 minutes (at 72 °F)
Demolding Time: 4 hours (mold temperature at 120 °F)
Post Cure: 2 to 3 weeks stored at room temperature to complete the cure cycle

Note: Post curing at an elevated temperature will shorten the complete cure cycle.

Processing Parameters (Elevated Temperature Process):

The curing pattern can be faster with a higher processing temperature and higher level of catalyst. The following data is for elevated temperature process at a higher catalyst level.

Part-A: 160 – 170 °F
Part-B: Room Temperature (72 – 80 °F)
Mold Temperature: 180 °F

Curing Pattern

Pot Life: 2- 3 minutes
Demolding Time: 35 to 40 minutes hours (mold temperature at 180 °F)
Post Cure: 8 - 16 hours at 180 °F

Standard Packaging Sizes:

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

Recommended Test Process (for Manual Low-Temperature Process):

When you use these component materials, please be sure to operate in a well-ventilated area, wear rubber gloves, long sleeves, and protective eyewear to avoid skin/eye contact of the materials. Please refer to the enclosed MSDS for the details on safety and handling.

The part-B material (BPB-005) consists of several chemical components that are not completely compatible, and it separates into layers as it is stored. The part-B material needs to be agitated inside the container before dispensed. Use a bung mixer to agitate it for 20 to 30 minutes for 55-gallon drum container. Use a stainless steel spatula or a hand-held powered paint mixer to stir it in smaller containers. Do not use wooden sticks. The part-B material (BPB-005) may also freeze just below the room temperature. Be sure to store at temperature above 72 °F. If you see it solidified (frozen), you need to be thawed by heating the material to about 90 to 100 °F. Do not over heat. Always agitate part-B component before dispensing it out of the container.

Put a mixing container on a scale, and pour the proper amount of part-A material first as you weigh it. Allow enough top-space for degassing later. Calculate the part-B amount according to the recommended mixing ratio and pour the correct amount of part-B on the top of part-A in the mixing container. Start a clock to measure time as you start agitating the part-A/B components. Use a stainless steel spatula or hand-held power mixer with paint-mixing fins to agitate. Scrape the side and bottom of the mixing container with a spatula as you agitate.

Put the container of the blended components into a vacuum chamber for degassing. The vacuum gage should be above 29" Hg for faster degassing or at least 28" Hg for degassing for an extended time. Again, you need to allow some top space in the container for bubbles to rise. Degas until all bubbles are popped from the surface. Degassing should be done within about 10 minutes after the beginning of the agitation, or before the material is too thick to degas.

Pour the blended material into the mold. The mold can be heated to 120 °F. However the heated mold may induce exothermic reaction and raise the material temperature much above 120 °F. If the material temperature is too high for your upper bound temperature requirement, keep the mold at room temperature until about 40 minutes point from the beginning of the agitation or when you confirm the temperature is tapering down, and then heat the mold to 120 °F to avoid inducing exothermic reaction too much.

The exothermic heat changes depending on the temperature and heat properties of the mold/substrate as well as the batch size. A lager batch gets hotter. Please check the temperature change and control the mold temperature accordingly to avoid the material getting too hot for your requirement. Typically, the exothermic heat peaks at about the 30 to 40 minute point after the beginning of mixing part-A/B components.

At the mold temperature 120 °F, the part should be strong enough to be demolded in about 4 hours. At this point, the material may not be very strong. So, handle carefully to avoid damaging the part. For a more complex mold design where you need to force the part to come out, you may need to leave the material in the mold for a longer time before demolding.

The material cures at room temperature slowly for 2 to 3 weeks to get to the final cure point. If you need to evaluate the material sooner, you can keep the demolded parts in an oven or heated room for extended time. The maximum temperature you can use to post cure this material is 180 °F. Lower oven temperature requires longer post-cure time to reach the final cure.

This curing pattern is intentionally given to allow this material to be processed at lower temperature range without the exothermic heat peaking much above the specified temperature. If the heat is not an issue, the material can be processed much faster by use of heat or catalyst modification. Please consult Northstar Polymers for any formula modification.

Other Handling Information

Storage/Handling Information for the Component Materials

Storage:

Part-A (Isocyanate Prepolymer) Component

Part-A component (MPA-053 / 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.

Store the containers a dry indoor storage within the temperature range between 72 and 86 °F. Avoid direct sunlight.

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, 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

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-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 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.

Part-B material contains chemical constituents that can separate during the storage. Agitation of the part-B content before dispensing is recommended if stored for a long time. Separation can be seen in a higher degree when the material is stored in cold temperature. You may need to heat to re-blend the separated material in some cases. Please consult Northstar Polymers when separation is suspected.

If the part-B component is exposed to a very cold temperature, some of the constituents may crystallize. This will be seen as a clear flakes floating in the material. This crystal can be thawed when the material temperature is at 77 °F or above. Please stir the material gently before dispensing part-B material to ensure the homogeneous blend of the constituents.

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 SDS for each component for the detailed health information.

For any questions, please contact Northstar Polymers.

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