

# Myrinol™ HP 56: High Performance Liquid Polyol

*For cast elastomers, TPUs, coatings, polyesters, and other chemistries*

**Myrinol™ HP 56** is made from Myriant's renewable **bio-succinic acid** and is a cost effective linear polyol designed specifically for use in thermoplastic urethane and polyurethane dispersion applications. Utility in other urethane applications can be found as well. TPUs produced with Myrinol™ HP 56 offers physical properties that surpass TPUs formulated with alternate polyols, with **superior tensile strength at increased temperatures, hardness, linear tear strength, and solvent resistance.**

## Applications

### Thermoplastic Urethanes

TPUs synthesized from Myrinol™ HP 56 reveal some of the toughest, most resilient properties available that rival those of polycarbonate-based materials.

### Polyurethane Dispersions

Thermoplastic or self-crosslinking polyurethane dispersions made from Myrinol™ HP 56 reveal a tough, abrasion resistant coating without loss of adhesion.

### Moisture Cure Urethane

A urethane formulator can synthesize outstanding prepolymers using Myrinol™ HP 56 for adhesive or similar uses.

### 2K Urethane

Myrinol™ HP 56 can also be formulated into solvent or waterborne coatings for property enhancement.

Typical Properties	
Color	< 2 Gardner
Hydroxyl Number	52-58 mg KOH/g
Acid Number	2.0 mg KOH/g, max
Viscosity	10,750 cPs (80°C)
Specific Gravity	1.1
Water Content	500 ppm, max

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## Myrinol™ HP 56: Thermoplastic Urethane (TPU) Application

Data contained herein illustrate the utility of Myrinol™ HP 56 in TPU systems.

### Formulation

Table 1. Thermoplastic urethane preparation.

Myrinol™ HP 56	39.61g
1,4 butanediol (chain extender)	3.27 g
Monomeric MDI (isocyanate)	17.12 g
Benzoyl Chloride	800 ppm
Polyol Temperature	100°C
Chain Extender Temperature	100°C
Isocyanate Temperature	70°C
Press Temperature	120°C
Mix Time	40 seconds
Gel Time	86 seconds
Cure at 120°C	2 hours
Cure at 100°C	20 hours
Cure at Room Temperature	7 days

### Mechanical Properties

The following data represents the TPU described herein compared against published literature for competitive TPUs. The competitive formulations were prepared in an identical fashion to the Myrinol™ HP 56 version with alternate polyols; testing was provided by a third party research facility for comparison. TPUs formulated with Myrinol™ HP 56 show **outstanding hardness and linear tear strength**.

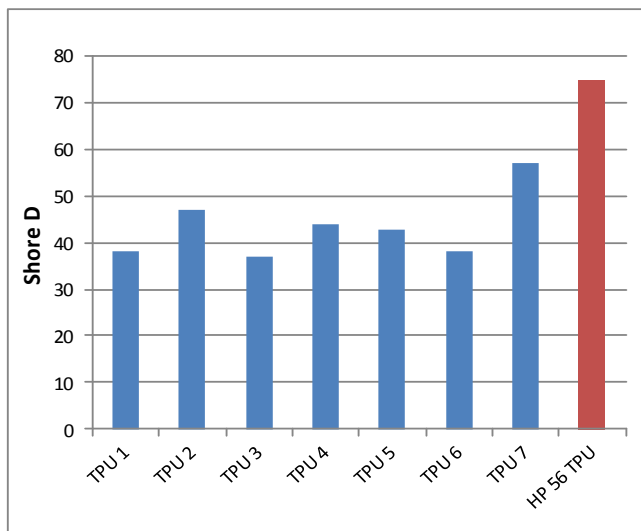


Figure 1. Hardness

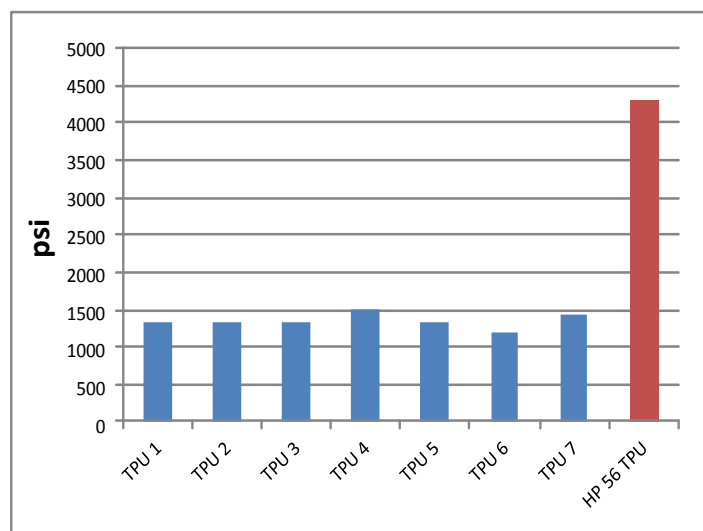


Figure 2. Linear Tear Strength

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## Myrinol™ HP 56: Thermoplastic Urethane (TPU) Application Continued

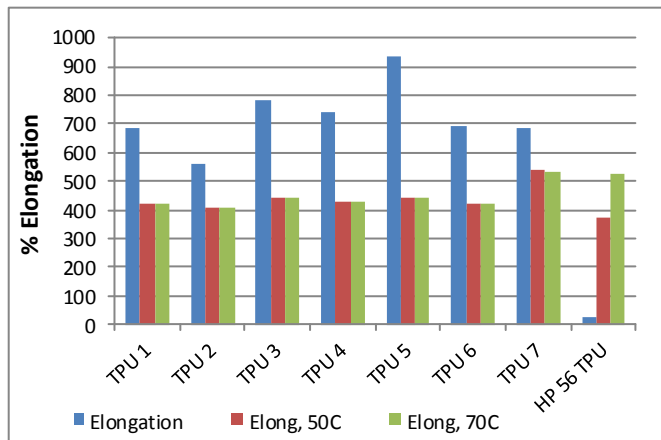


Figure 3. Elongation at Various Temperatures

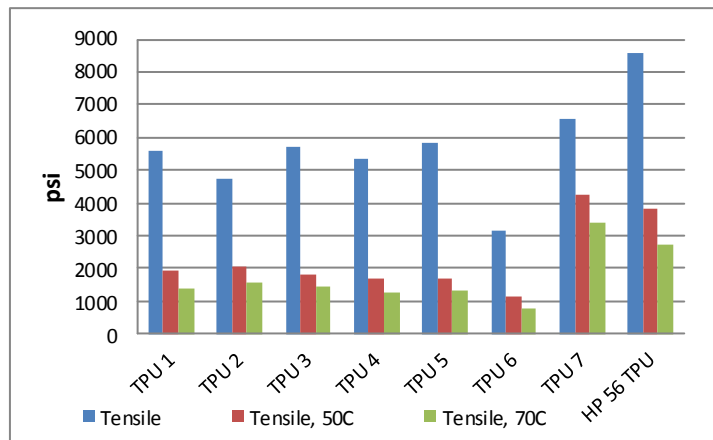


Figure 4. Tensile Strength at Various Temperatures

\*Note: Elongation at room temperature is tested below the Tg of the Myrinol™ HP 56 TPU (Tg = 31°C)

TPUs formulated with Myrinol™ HP 56 show **excellent retention of elongation at** increased temperatures as well as **superior tensile strength** over a wide range of temperatures as compared with published data on similar TPUs formulated with alternate polyols.

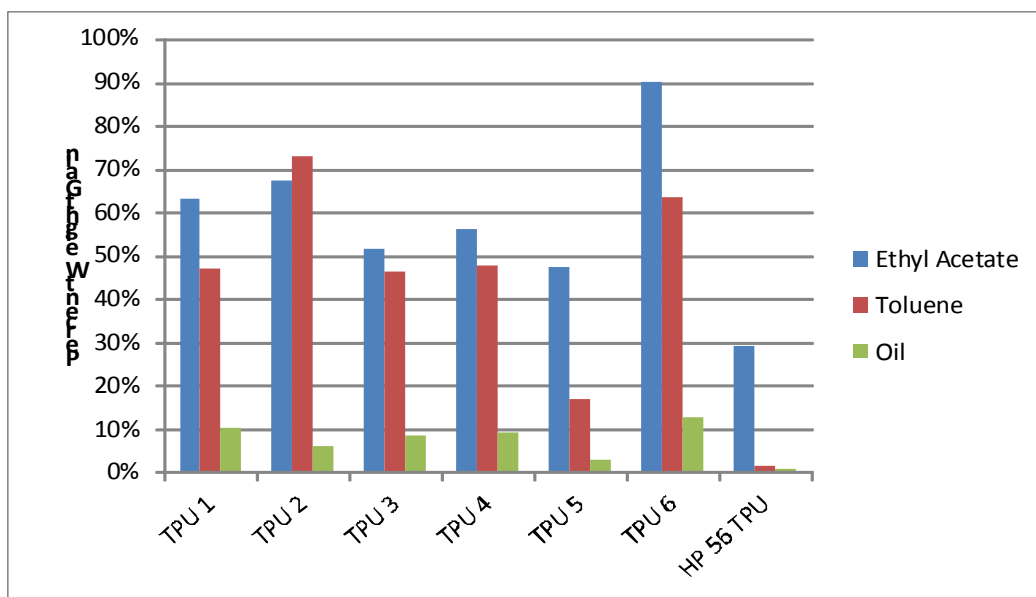


Figure 5. Solvent Resistance Measured as Percent Weight Gain

\*Note: A lower number is desirable as it shows the TPU's chemical resistance: a low percent weight gain means little solvent is penetrating the coating

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## Summary

Myrinol™ HP 56 has been specially designed for use in thermoplastic urethanes and polyurethane dispersions but finds utility in many other urethane applications. The resulting TPUs show superior tensile, elongation, solvent resistance, linear tear strength, and hardness as compared with published data for TPUs formulated with other polyols.

### Myrinol™ HP 56

- ◇ Contributes to tough thermoplastic urethanes with outstanding performance at increased temperatures
- ◇ Contributes to increased solvent resistance to a variety of solvents
- ◇ 100% bio-renewable content with no price premium

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