H-8142 Castor Oil-Based Monofunctional Polyol

1. Product Description

SIOResin® H-8142 is a **castor oil-based monofunctional polyol** derived from refined and transesterified castor oil. It is designed as a reactive modifier for polyurethane systems and provides an effective means of adjusting formulation viscosity, hardness and flexibility.

With its very low viscosity and single hydroxyl functionality, H-8142 can function as a **reactive diluent and chain-terminating modifier** in polyurethane formulations. When incorporated with multifunctional polyols, it can reduce the crosslink density of the resulting polyurethane, providing lower hardness and improved flexibility.

H-8142 is particularly suitable for modifying polyurethane coatings, cast elastomers and other PU systems where low viscosity and controlled hardness are required.

2. Key Features & Benefits

- Based on refined natural castor oil
- Monofunctional polyol
- Very low viscosity
- Excellent reactive diluent for polyurethane systems
- Helps reduce formulation viscosity
- Helps reduce polyurethane hardness
- Can improve flexibility and processability
- Acts as a reactive chain-terminating modifier
- Good compatibility with multifunctional castor oil polyols
- Good thermal stability
- Good hydrolysis and acid resistance
- Good solvent resistance
- Good electrical insulation characteristics
- Suitable for polyurethane coatings and elastomers

3. Typical Applications

H-8142 is primarily used as a **reactive modifier** rather than as a stand-alone structural polyol.

Typical applications include:

- Polyurethane coatings
- Cast polyurethane elastomers
- 2K polyurethane systems
- Reactive diluent for PU formulations

- Viscosity adjustment
- Hardness modification
- Flexibility modification
- Low-hardness polyurethane materials

H-8142 can be blended with multifunctional polyols, such as castor oil-based polyols, to adjust the final crosslink density, hardness, flexibility and processing viscosity.

It is particularly useful in formulations requiring lower hardness or improved flexibility without introducing a conventional non-reactive plasticizer.

4. Typical Properties

Property	Typical Value	Unit
Chemical Nature	Castor Oil-Based Monofunctional Polyol	—
Appearance	Pale yellow, very low-viscosity liquid	—
Hydroxyl Value	157–170	mg KOH/g
Acid Value	≤ 3.0	mg KOH/g
Moisture	≤ 0.03	%
Functionality, Average	1.0	—
Hydroxyl Equivalent Weight	Approx. 362	g/eq
Viscosity, Dynamic (25°C)	≤ 40	mPa·s
Typical Viscosity (25°C)	Approx. 30	mPa·s
Specific Gravity (25°C)	Approx. 0.92	g/cm³
Gardner Color	≤ 1	—

Note: The above values are typical values and are not intended to be used as product specifications.

5. Application & Formulation

Due to its monofunctional structure, H-8142 is primarily recommended for use **in combination with multifunctional polyols** rather than as a stand-alone polyol for structural polyurethane materials.

When reacted with isocyanates, its single hydroxyl group can participate in the polyurethane reaction while limiting the development of crosslink density. This makes H-8142 useful for controlling the final hardness and flexibility of polyurethane systems.

H-8142 can be used with:

- Polymeric MDI
- Carbodiimide-modified MDI

- Aliphatic HDI-based polyisocyanates

For best results, H-8142 should generally be blended with multifunctional polyols such as castor oil-based polyols. The dosage should be optimized according to the desired viscosity, hardness, flexibility and mechanical properties.

As a formulation starting point, a **small addition level, typically around 0.5–4.0 wt.% of the total polyurethane formulation**, may be evaluated for viscosity and hardness modification.

6. Functional Role in Polyurethane Systems

H-8142 provides several formulation effects:

Reactive Dilution
Its very low viscosity can help reduce the overall viscosity of polyurethane polyol blends, improving mixing and processing.

Hardness Reduction
Because H-8142 has an average functionality of approximately 1.0, increasing its proportion relative to multifunctional polyols can reduce the effective crosslink density and lower the hardness of the cured polyurethane.

Flexibility Adjustment
H-8142 can be used to modify the balance between hardness and flexibility, particularly in cast elastomer and coating formulations.

Chain-Terminating Effect
The monofunctional structure limits its ability to form a three-dimensional crosslinked network. Therefore, H-8142 is generally used as a formulation modifier rather than as the primary structural polyol.

7. Compatibility

H-8142 can be used in combination with various multifunctional polyols and isocyanates.

Recommended combinations include:

Component	Application Role
Multifunctional Castor Oil Polyols	Hardness / flexibility adjustment
H-8141	Low-viscosity and flexible PU systems
H-8031	Polycarbonate-based PU systems
Polymeric MDI	Structural PU / elastomer systems
Carbodiimide-Modified MDI	High-performance PU systems
HDI-Based Polyisocyanates	UV-stable / weather-resistant systems

Note: The actual compatibility and optimum dosage should be confirmed through formulation testing.

8. Storage

Store in the original, tightly sealed container under **dry, normal-temperature conditions**. Protect from excessive moisture, heat and direct sunlight. If viscosity increases at low temperature, gradual warming to room temperature can restore the original fluidity.

9. Packaging

Standard packaging:

- **16 kg/can**
- **180 kg/drum**

Other packaging options are available upon request.

10. Shelf Life

Recommended shelf life is **24 months** when stored in the original sealed container under recommended storage conditions.

Disclaimer

The information provided in this TDS is based on our current technical knowledge and is intended for general guidance only. Actual performance depends on formulation and processing conditions. Users should conduct appropriate testing to confirm suitability for their specific application.