SIOResin® H-8173 Castor Oil-Based Diol Polyol

1. Product Description

SIOResin® H-8173 is a **castor oil-based modified diol** with an average functionality of approximately 2.0. It is designed for the manufacture of polyurethane elastomers, coatings, adhesives and sealants requiring a good balance of hardness, flexibility and mechanical performance.

H-8173 combines a relatively high hydroxyl value with **low viscosity**, providing an efficient way to increase polyurethane hardness and mechanical strength while maintaining good processability.

As a castor oil-based polyol, H-8173 provides the inherent advantages of renewable castor oil chemistry, including good **hydrolysis resistance, water resistance, acid resistance, solvent resistance and electrical insulation properties**.

2. Key Features & Benefits

- Based on natural castor oil
- Castor oil-modified diol
- Average functionality of approximately 2.0
- Relatively high hydroxyl value
- Low viscosity for a mid-to-high OH polyol
- Good hardness development
- Good balance of hardness and flexibility
- Good hydrolysis resistance
- Good water resistance
- Good acid resistance
- Good solvent resistance
- Good electrical insulation
- Good abrasion and impact resistance
- Suitable for high-hardness polyurethane elastomers
- Suitable for solvent-free polyurethane systems

3. Typical Applications

H-8173 is suitable for polyurethane systems where increased hardness and mechanical strength are required without significantly increasing formulation viscosity.

Typical applications include:

- Cast polyurethane elastomers
- High-hardness polyurethane coatings

- Solvent-free PU coatings
- 2K polyurethane coatings
- Floor coatings
- Protective coatings
- Polyurethane adhesives
- Sealants
- Hardness modifier for PU systems
- Viscosity modifier for higher-hydroxyl polyols

H-8173 can be used alone or in combination with other polyols to balance hardness, flexibility, elongation and processing viscosity.

4. Typical Properties

Property	Typical Value	Unit
Chemical Nature	Castor Oil-Based Modified Diol	—
Appearance	Pale yellow, low to medium-viscosity liquid	—
Hydroxyl Value	245–275	mg KOH/g
Acid Value	≤ 4.0	mg KOH/g
Moisture	≤ 0.03	%
Functionality, Average	2.0	—
Viscosity, Dynamic (25°C)	240–290	mPa·s

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

5. Application & Formulation

H-8173 reacts with suitable polyisocyanates to produce polyurethane elastomers, coatings, adhesives and sealants.

Due to its difunctional structure, H-8173 can participate in the formation of polyurethane networks while providing relatively low processing viscosity. The NCO/OH ratio should be adjusted according to the desired hardness, flexibility, curing speed and mechanical properties.

H-8173 can be used with **polymeric MDI, modified MDI and other suitable isocyanates**. It may also be blended with other castor oil-based polyols or conventional polyols to achieve the desired hardness and elasticity.

6. Typical Performance with Crude MDI

As a reference, when cured with crude MDI at an **NCO index of 1.05**, H-8173 produces a relatively hard polyurethane material.

Property	Typical Value
Isocyanate	Crude MDI
NCO Index	1.05
Shore A Hardness	92
Shore D Hardness	55

The cured material demonstrates a useful balance between hardness and elasticity, making H-8173 suitable for polyurethane elastomer and coating applications requiring **medium-high hardness**.

Note: The above hardness data are reference values obtained under specific formulation and curing conditions.

7. Performance Characteristics

H-8173 provides an effective balance between **hydroxyl functionality, viscosity and hardness development**.

Its relatively high hydroxyl value allows it to contribute to higher crosslink density and hardness compared with lower-OH castor oil polyols, while its low viscosity helps maintain good processing characteristics.

H-8173 can therefore be used as:

- A primary diol for polyurethane elastomers
- A hardness builder in PU formulations
- A low-viscosity polyol for higher-OH systems
- A hardness modifier when blended with softer polyols
- A reactive component for solvent-free PU systems

8. Storage

Store in the original, tightly sealed container under **dry, normal-temperature conditions**. Protect from excessive moisture and heat. Partial thickening may occur at low temperatures and can be reversed by gradual warming before use.

9. Packaging

Standard packaging: 16 kg/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.