H-8871Castor Oil-Based Branched Polyether/Polyester Polyol

1. Product Description

SIOResin® H-8871 is a **castor oil-based branched polyether/polyester polyol** designed for the production of high-performance polyurethane materials with **extremely high glass transition temperature (Tg), high hardness and excellent durability**.

H-8871 combines a high renewable raw material content with excellent hydrolysis and saponification stability, strong hydrophobicity and chemical resistance. Polyurethane systems based on H-8871 can achieve **very high Shore D hardness, high dimensional stability and excellent mechanical strength**, making it particularly suitable for demanding protective coating and casting applications.

In combination with aliphatic HDI-based polyisocyanates, H-8871 can also be used to develop **UV-stable and weather-resistant polyurethane coatings**.

2. Key Features & Benefits

- **Castor oil-based** and derived from renewable resources
- High renewable raw material content
- Branched **polyether/polyester polyol**
- **Extremely high Tg**
- **Ultra-high Shore D hardness**, typically around D 90
- Excellent **hydrolysis stability**
- Excellent **saponification stability**
- Strong **hydrophobicity / water repellency**
- Excellent **chemical resistance**
- High mechanical strength
- Good dimensional stability
- Suitable for **UV-stable polyurethane systems**
- Suitable for **weather-resistant coatings**
- Reduced moisture sensitivity during curing

3. Typical Applications

H-8871 is designed for high-performance polyurethane systems where very high hardness, thermal stability and chemical resistance are required.

Typical applications include:

- **2K polyurethane coatings**
- **High-hardness protective coatings**

- **Polyurethane casting materials**
- **Industrial coatings**
- **Flooring systems**
- **Chemical-resistant coatings**
- **UV-stable coatings**
- **Weather-resistant polyurethane coatings**
- **High-Tg polyurethane materials**

H-8871 can be used with polymeric MDI, carbodiimide-modified MDI and aliphatic HDI-based polyisocyanates to achieve different combinations of hardness, flexibility and weathering resistance.

4. Typical Properties

Property	Typical Value	Test Method
Chemical Nature	Branched Polyether/Polyester Polyol	—
Appearance	Yellow, medium-viscosity liquid	—
Water Content	< 0.20%	DGF C-III 13 A
Acid Number	< 2.0 mg KOH/g	DGF C-V 2
Hydroxyl Value	390–400 mg KOH/g	DIN 53240-98
Viscosity, Dynamic (25°C)	2000–2500 mPa·s	DIN 53015
Density (20°C)	1.00–1.04 g/cm³	DGF C-IV 2B (52)

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

5. Application & Formulation

H-8871 reacts with suitable polyisocyanates to produce high-hardness polyurethane coatings, casting materials and other polyurethane systems.

The isocyanate level should be calculated based on the hydroxyl value of H-8871 and adjusted according to the desired NCO/OH ratio, hardness, curing rate and mechanical properties.

As a general reference, a formulation containing **100 parts H-8871 and approximately 94 parts Polymeric MDI**, together with a suitable moisture scavenger, can produce a highly crosslinked polyurethane material with very high hardness.

For UV-stable and weather-resistant coatings, **HDI-based aliphatic polyisocyanates** are recommended.

6. Typical Performance with Polymeric MDI

Representative performance data obtained using H-8871 with Polymeric MDI are shown below.

Property	Typical Value	Test Method
Mixing Ratio	100 : 94	—
Gel Time at 23°C	Approx. 19 min	Coesfeld
Shore A, after 1 day	100	ISO 868
Shore D, after 1 day	86	ISO 868
Shore D, after 2 days	88	ISO 868
Shore D, after 14 days	90	ISO 868
Shore D, after 28 days	90	ISO 868
Tensile Strength	42 MPa	ISO 527-3
Elongation at Break	1%	ISO 527-3
Tear Resistance	6 N/mm	ISO 34-1
Bending Strength	57 MPa	DIN EN ISO 178
Impact Resistance	4 mJ/mm²	DIN 53453
Glass Transition Temperature (Tg)	136°C	DMA

7. Performance with Different Polyisocyanates

H-8871 can be combined with different isocyanate types to tailor the final polyurethane properties.

Property	Polymeric MDI	Carbodiimide-Modified MDI	HDI-Based Aliphatic Polyisocyanate
Mixing Ratio	100 : 94	100 : 108	100 : 127
Gel Time	19 min	17 min	92 min*
Shore D, after 1 day	86	86	37
Shore D, after 2 days	88	87	—
Shore D, after 14 days	90	90	—
Shore D, after 28 days	90	90	82
Tensile Strength	42 MPa	30 MPa	26 MPa
Elongation at Break	1%	2%	39%
Tear Resistance	6 N/mm	14 N/mm	20 N/mm
Bending Strength	57 MPa	29 MPa	22 MPa
Impact Resistance	4 mJ/mm²	7 mJ/mm²	—
Glass Transition Temperature (Tg)	136°C	119°C	—

*Reference formulation includes an appropriate catalyst.

The use of HDI-based aliphatic polyisocyanates provides a more flexible polyurethane system while maintaining good hardness and enabling applications requiring **UV stability and outdoor weathering resistance**.

8. Storage

Store in the original, tightly sealed container in a **cool, dry and well-ventilated area**. Protect from moisture, direct sunlight and excessive heat. Avoid storage below **15°C**, as partial crystallization may occur. If crystallization occurs, gradually warm the product to approximately **50°C** before use.

9. Packaging

Standard packaging:

- **25 kg/drum**
- **200 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.