H-8861Castor Oil-Based Branched Polyether/Polyester Polyol

1. Product Description

SIOResin® H-8861 is a **castor oil-based branched polyether/polyester polyol** designed for the production of high-performance, UV-stable and weather-resistant polyurethane materials.

H-8861 combines a **high renewable raw material content** with low viscosity, high hydroxyl functionality and excellent resistance to hydrolysis, saponification and chemicals. Polyurethane systems based on H-8861 can develop **high Shore D hardness and high glass transition temperature (Tg)** while maintaining good durability and weathering resistance.

Its strong hydrophobicity also reduces sensitivity to moisture during curing, making H-8861 particularly suitable for protective coatings and outdoor polyurethane applications.

2. Key Features & Benefits

- Castor oil-based and derived from renewable resources
- High renewable raw material content
- Branched polyether/polyester polyol
- Low viscosity for easy processing
- High hydroxyl value and high reactivity
- Excellent hydrolysis stability
- Excellent saponification stability
- Strong hydrophobicity / water repellency
- High Shore D hardness, typically around D 80
- High Tg for enhanced hardness and dimensional stability
- Excellent chemical resistance
- Suitable for UV-stable and weather-resistant polyurethane coatings
- Reduced moisture sensitivity during curing

3. Typical Applications

H-8861 is particularly suitable for high-performance polyurethane systems requiring high hardness, weathering resistance and chemical durability.

Typical applications include:

- **UV-stable polyurethane coatings**
- **Weather-resistant coatings**
- **Outdoor protective coatings**
- **High-hardness 2K polyurethane coatings**
- **Industrial protective coatings**

- **Floor coatings**
- **Chemical-resistant coatings**
- **Water-resistant polyurethane materials**
- **High-Tg polyurethane systems**

H-8861 can be used with aromatic or aliphatic polyisocyanates depending on the required balance of hardness, weathering resistance, flexibility and appearance retention.

4. Typical Properties

Property	Typical Value	Test Method
Chemical Nature	Branched Polyether/Polyester Polyol	—
Appearance	Clear, yellow, low-viscosity liquid	—
Water Content	< 0.10%	ISO 4317
Acid Number	< 2.0 mg KOH/g	ISO 660
Hydroxyl Value	315–320 mg KOH/g	DIN 53240-98
Viscosity, Dynamic (20°C)	750–1,200 mPa·s	DIN 53015
Density (20°C)	0.97–1.02 g/cm³	DGF C-IV 2B (52)
Color Number	0–3	DIN ISO 4630

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

5. Application & Formulation

H-8861 reacts with suitable polyisocyanates to produce high-performance polyurethane coatings, elastomers and other polyurethane materials.

The required isocyanate amount should be calculated based on the hydroxyl value of H-8861 and adjusted according to the desired NCO/OH ratio, hardness, curing speed and final mechanical properties.

As a general reference, a formulation containing **100 parts H-8861 and approximately 76 parts Polymeric MDI**, together with a suitable moisture scavenger, can be used to produce high-hardness polyurethane materials.

H-8861 can also be formulated with **carbodiimide-modified MDI or HDI-based aliphatic polyisocyanates** where different combinations of hardness, flexibility and weathering resistance are required.

6. Typical Performance with Polymeric MDI

Representative performance data obtained from a polyurethane formulation based on H-8861 and Polymeric MDI are shown below.

Property	Typical Value	Test Method
Mixing Ratio	100 : 76	—
Gel Time at 23°C	Approx. 38 min	Coesfeld
Shore A, after 1 day	100	ISO 868
Shore D, after 1 day	74	ISO 868
Shore D, after 2 days	80	ISO 868
Shore D, after 14 days	86	ISO 868
Shore D, after 28 days	87	ISO 868
Tensile Strength	45 MPa	ISO 527-3
Elongation at Break	3%	ISO 527-3
Tear Resistance	9 N/mm	ISO 34-1
Bending Strength	53 MPa	DIN EN ISO 178
Impact Resistance	6 mJ/mm²	DIN 53453

7. Performance with Different Polyisocyanates

H-8861 can be combined with different types of polyisocyanates to tailor the final polyurethane performance.

Property	Polymeric MDI	Carbodiimide-Modified MDI	HDI-Based Aliphatic Polyisocyanate
Mixing Ratio	100 : 76	100 : 88	100 : 103
Gel Time	38 min	54 min	14 min*
Shore D, after 1 day	74	75	—
Shore D, after 2 days	80	83	—
Shore D, after 14 days	86	86	—
Shore D, after 28 days	87	86	—
Tensile Strength	45 MPa	40 MPa	5 MPa
Elongation at Break	3%	6%	52%
Tear Resistance	9 N/mm	15 N/mm	13 N/mm
Bending Strength	53 MPa	—	—
Impact Resistance	6 mJ/mm²	—	—

*The HDI-based formulation uses a suitable catalyst according to the reference formulation.

The choice of isocyanate allows H-8861 to cover a broad performance range, from **high-hardness industrial polyurethane systems** to more flexible **aliphatic weather-resistant coatings**.

8. Storage

Store in the original, tightly sealed container in a **cool, dry and well-ventilated area**. Protect from moisture and direct sunlight. Avoid storage below **15°C**, as partial crystallization may occur. If crystallization occurs, the product can be restored by gradual warming to approximately **50°C**.

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.