

Application Leaflet

Unlocking Efficient Rheology at Low Temperature

THIXATROL® AS 8053

Highly effective organic thixotrope for adhesives and sealants, engineered for superior efficiency and performance



Key Benefits

- **Low activation temperature** (45–70 °C) reduces energy use, no external heating and cooling necessary, enabling shorter production cycles.
- **Up to 20% higher efficiency** compared to benchmarks amine-based rheological additives.
- **Strong shear-thinning performance** enables easy and fast extrusion or sprayability, as well as excellent anti-runoff behavior.
- **High thixotropy enabling rapid structural recovery**, resulting in excellent sag resistance even at low loadings of just 1.6%–3%, ensuring proper application without generating waste.
- **Improved storage stability of final formulation**, guaranteeing proper application behavior during the whole shelf life.
- **Strong sustainable profile** with no labelling and 78% renewable carbon-based product.

Chemical & Physical Properties	
Composition	proprietary organic
Appearance	Fine, off-white powder
Non-volatile content / Active content	100%
Density	1.02 g/cm ³
Bulk density	0.25 g/cm ³
Melting point	120-130 °C
Mean particle size	max. 5 µm

Introduction

Increasing production efficiency while reducing energy consumption has become a key challenge for formulators across solvent free and solvent borne systems. Traditional thixotropes often require high activation temperatures, leading to longer production cycles, higher energy demand, and increased CO₂ emissions. As productivity requirements rise and sustainability targets become more stringent, the need for rheological additives that deliver reliable thixotropy at low activation temperatures has never been greater.

THIXATROL® AS 8053 is a highly efficient, 100% active, amide-based powder rheological additive specifically designed to meet this challenge. Its unique low-temperature activation delivers excellent thixotropy while enabling shorter processing cycles, improved throughput, and significant energy savings. Suitable for a wide range of solvent free and solvent borne formulations, THIXATROL® AS 8053 combines processing efficiency with sustainability. With more than 70% renewable carbon content, it supports modern formulation strategies aimed at reducing overall energy consumption and environmental impact—making it a practical solution for faster, more efficient, and more sustainable production.

Features

- Imparting thixotropy/pseudoplastic flow characteristics in A&S formulations, resulting in excellent slump and sag resistance while maintaining ease of application
- Designed for low temperature activation and a wider activation window, enabling a more robust production process for A&S systems
- Highly efficient and more effective compared to amine-based market references
- Improved elasticity and storage stability of final formulation.
- Labeling free and 78% renewable carbon*

Target Applications

- Compatible with solvent-free, high solid or solvent-borne systems; Hybrid (SMP), Epoxy, Polyurethane, Acrylic.
- Suitable for spray application and extrusion process for adhesives and sealants formulations.
- Main application in Automotive, Construction, and Industrial.

* % Renewable carbon calculates percentage of renewable carbon to total organic carbon, as per ASTM D6866

Optimised Process
No temperature control
No cool down phases
Less complex process
Energy Savings
Capacity Enlargement

Incorporation & Recommended Use Levels

THIXATROL® AS 8053 can be used in many different solvent free and solvent borne A&S formulations. The 100% active rheological additive can be used as supplied. The activation temperature, which is crucial for performance, is typically generated during the production process; no external heating or intermediate process step is necessary—making adhesives and sealants' production less complex.

Preferably, THIXATROL® AS 8053 is added directly into the polymer (polymer/solvent blend) at the beginning of the production. The addition of fillers and pigments or other formulation ingredients and the corresponding mixing process will generate friction resulting in the activation temperature - without need of external heating or long dispersing/ mixing times. See **FIGURE 1**.

Typical loading levels of THIXATROL® AS 8053 for effective rheology control range from 0.5% to 3.5% based on total formulation weight.

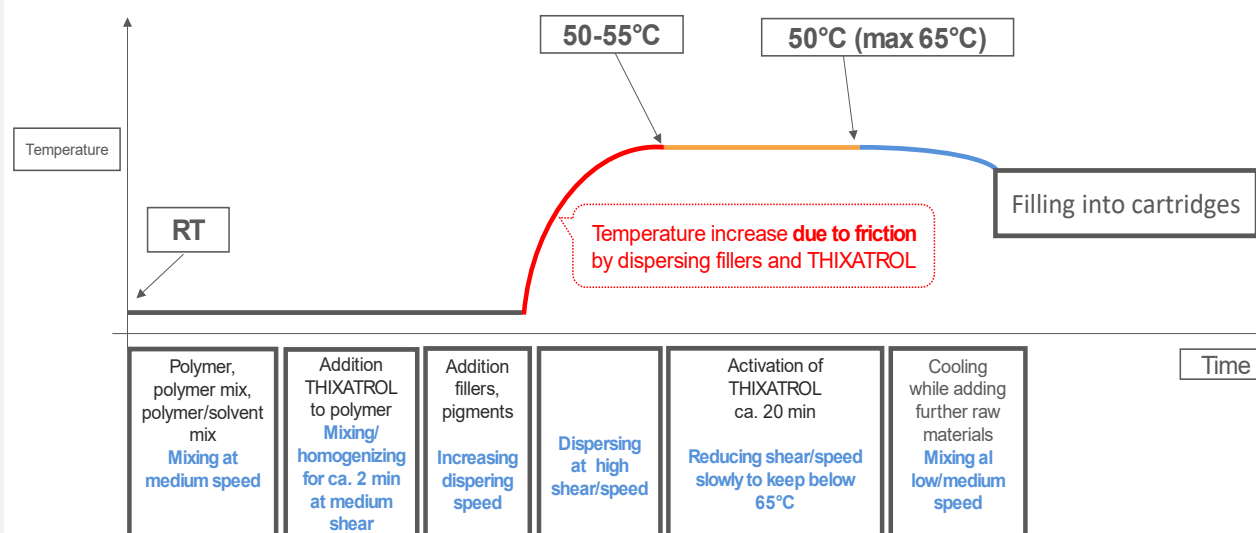
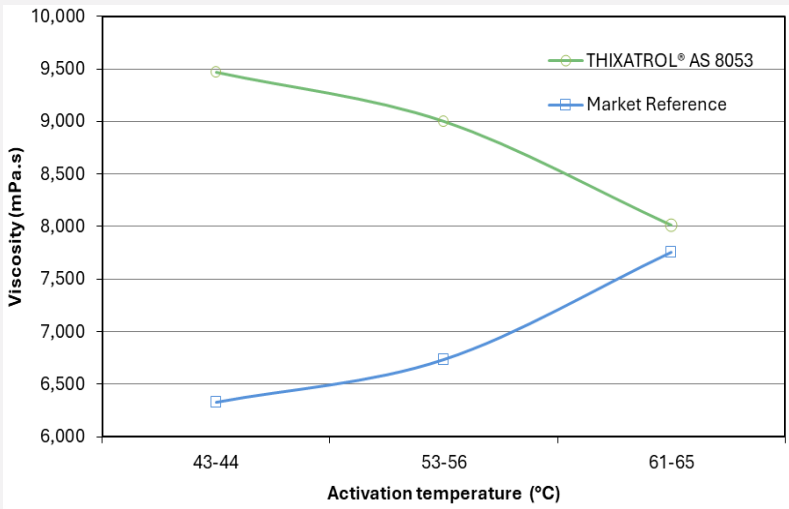


FIGURE 1: Schematic representation of an industrial production process of sealants using THIXATROL® AS 8053 – NO EXTERNAL HEATING REQUIRED

TABLE 1: SMP sealant formulation

Ingredients		Concentration (%)
1	Binder	15.00
2	Extender	50.00
3	Pigment	3.00
4	Rheological additive	3.50/1.60
5	Binder	10.00
6	Plasticizer	16.50
Adding after cooling down, Temperature depends on the activation temperature		
7	Water scavenger	0.70
Adding after cooling down, Temperature depends on the activation temperature		
8	Adhesion promoter	0.50
9	Catalyst	0.30

FIGURE 2: Viscosity at 0.1 s⁻¹ measured at different temperatures (loading level 3%)



Performance Data & Comparative

An intensive study was carried out comparing THIXATROL® AS 8053 against market references.

The project evaluated activation behavior, efficiency, sag resistance, and storage stability at a 3.0% loading level and at a low loading level of 1.6%.

All these studies have been performed in a hybrid (SMP) sealant formulation (see **TABLE 1**), varying process temperature, additive levels, and storage conditions. This chemistry has been chosen because hybrid polymer-based sealants represent the most demanding and least forgiving system from a rheological standpoint, making it an excellent screening and comparison system. The results allow the establishment of rheological trends and comparative rankings indicative of expected behavior in other chemistries, although specific formulation adjustments may be required.

All rheological measurements were performed using an Anton Paar MCR 301 with PP 25 serrated plate geometry at a gap of 1 mm and 23°C.

Flow curves were determined over a shear rate range from 0.1 s⁻¹ to 100 s⁻¹, and the shear stress at 100 s⁻¹ was extracted from the curves.

To evaluate sag control, an aluminum U profile (20 × 20 mm; 25 cm long) was used. A polyethylene tape was placed on the back side of the inside profile; this tape can slide. By using this tape, the sealant's adhesion area to aluminum is reduced, making the test more severe. Then, 12 cm of the profile (in horizontal position) were filled with the sealant, and the U profile was positioned vertically.

This study evaluated organic thixotrope based sealants at activation temperatures of 45°C, 55°C and 65°C. **FIGURE 2** shows the differences in activation between THIXATROL® AS 8053 and the main market reference.

THIXATROL® AS 8053 provides a higher viscosity profile at activation temperatures of 40–43°C, 53–56°C and 61–65°C compared with the market reference. This enables production at lower temperatures and across a wider activation window, resulting in a simpler and more robust process with reduced energy consumption and processing time (heating and cooling steps).

FIGURE 3: Flow curves (loading level 3%, activation at 50°C)

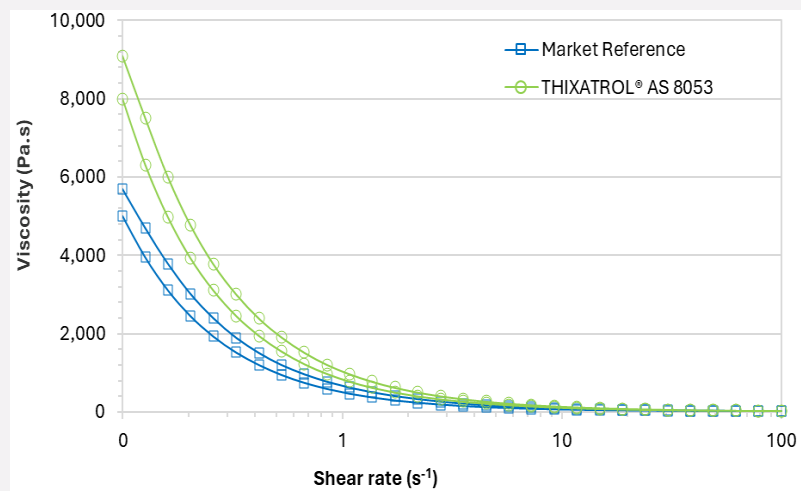
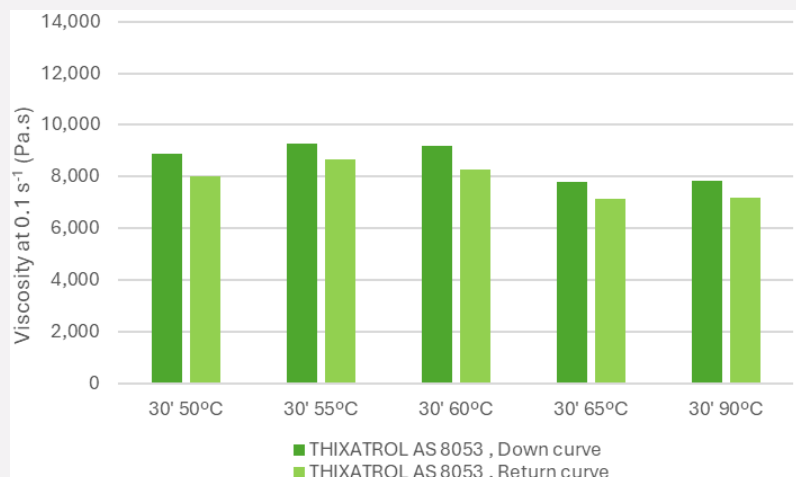


FIGURE 4: Sealant viscosity measurement. (Loading level 3% THIXATROL® AS 8053)



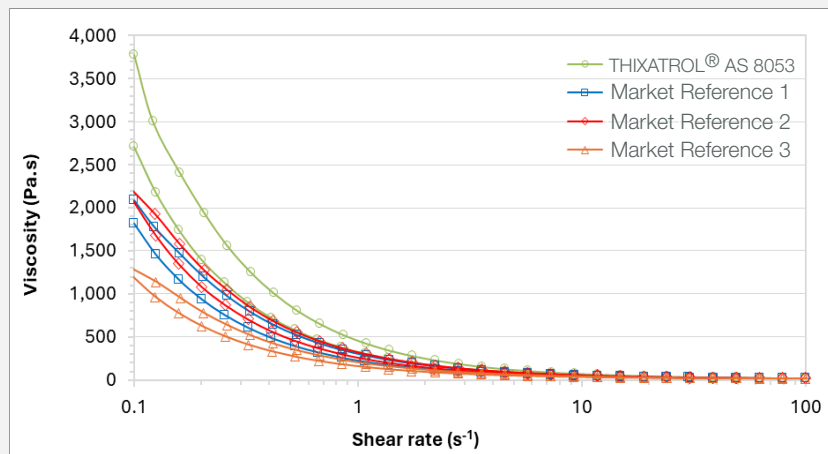
Higher efficiency vs competitors

Compared to benchmark amide-based, the superior efficiency of THIXATROL® AS 8053 regarding viscosity build, was proven by tests performed under identical conditions (3% loading Level; activation temperature 50°C). The results are shown in **FIGURE 3**.

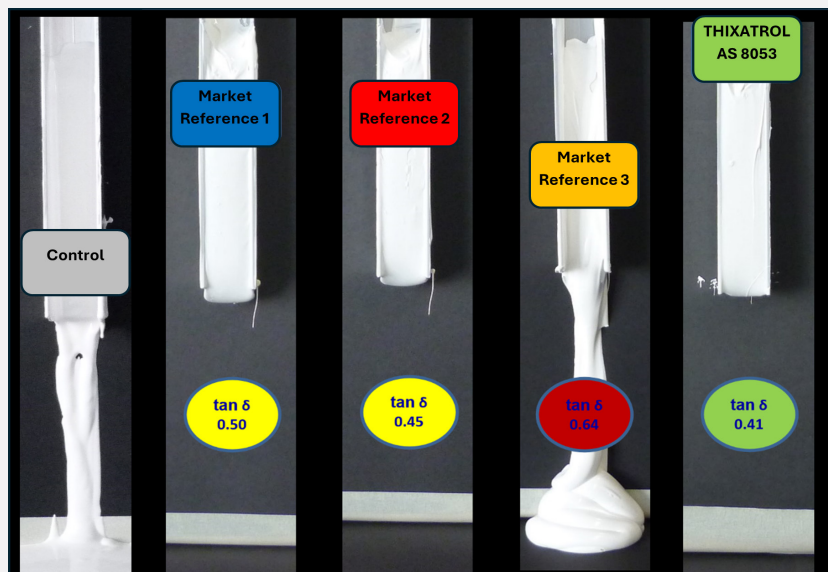
To assess how the final sealant's rheological behavior depends on activation temperature, same SMP-based sealant was processed during same time, using same equipment and using 3% loading level of Thixatrol® AS 8053, with only the activation temperature varying (at 50°C, at 55°C, at 60°C, at 65°C and at 90°C.)

The **FIGURE 4** shows the viscosity values of the final sealant immediately after production (dark green bars) and the viscosity recovery after application (light green bars), It demonstrates the high reliability and consistent rheological performance delivered by THIXATROL® AS 8053, enabling a stable process even at 90°C. Our THIXATROL® AS 8053 facilitates a less complex and more robust production process.

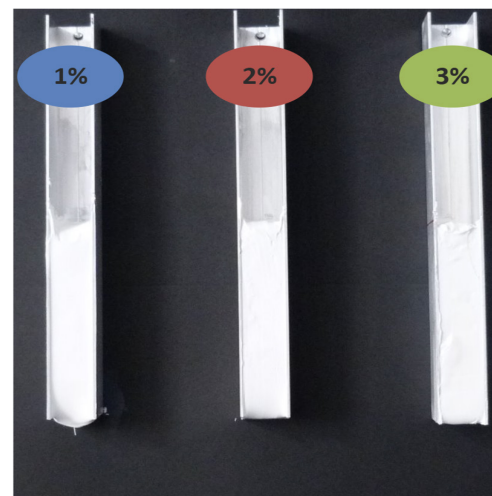
FIGURE 5: Flow curves (loading level 1.6% , activation at 50°C)



PICTURE 2: Sag control test at 1.6% loading level.



In another study, the minimum loading level of THIXATROL® AS 8053 required to achieve the target sag performance was determined. For this purpose sagging test at **PICTURE 1** was done with different loading levels: 1%, 2% and 3%.



PICTURE 1: Sag resistance at different loading levels of THIXATROL® AS 8053

Looking at **FIGURE 5**, it was determined that, at an equal loading level of 1.6%, THIXATROL® AS 8053 showed the highest viscosity impact compared to market references.

Overall, THIXATROL® AS 8053 delivers high performance even at low loadings, while enabling energy savings and shorter production times—supporting meaningful cost savings in A&S production.

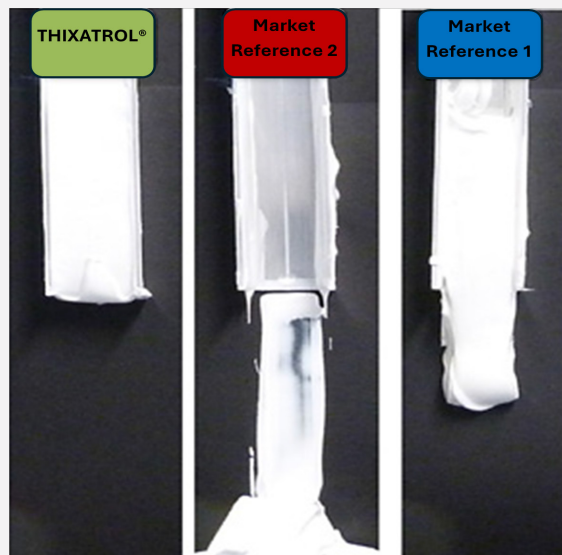
Superior sag & slump resistance

To evaluate sag control in sealant applications, an aluminum U profile (20 × 20 mm; 25 cm long) was used as described at the beginning of this document.

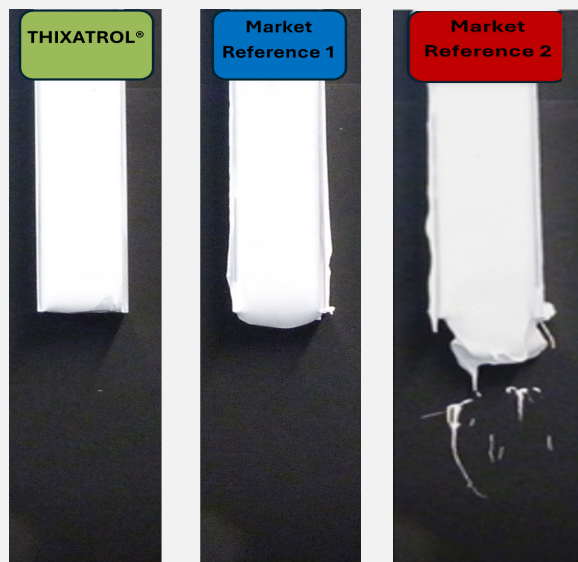
Sealant formulations were activated at 50°C with an organic thixotrope loading of 1.6%. As shown in **PICTURE 2**, THIXATROL® AS 8053 demonstrates strong sag resistance, while market references show clear signs of sagging due to poorer activation at 50°C and lower efficiency.

The “ $\tan \delta$ ” values indicate a stronger elastic behavior (lower values) for the sealant with THIXATROL® AS 8053. Tan delta values above 1 indicate a viscous behavior and therefore the sealant without rheological additive shows no sag performance at all.

PICTURE 3: Sag resistance after 3 months of storage at 30°C



PICTURE 4: Sag resistance after 2 months of storage at 50°C



Improved storage stability

The stability of sealants prepared under equal conditions (1.6% loading, activation at 50°C) was evaluated.

Samples containing THIXATROL® AS 8053 show excellent sag stability after storage at room temperature and elevated temperature. Sealants formulated with market reference rheology modifiers show a loss of sag resistance, especially after 3 months of storage at 30°C. See **PICTURE 3** and **PICTURE 4**.

Improved extrudability

Extrusion performance is important to ensure an easy and clean sealant application. Comparing the extrusion rate with rheological data in a sealant formulation containing 1.8% rheological additive, activated at 55°C. It was found that high shear stress is a better predictor of extrusion performance than the shear thinning index (viscosity@100s⁻¹/viscosity@ 0.1s⁻¹), which only reflects viscosity gradients.

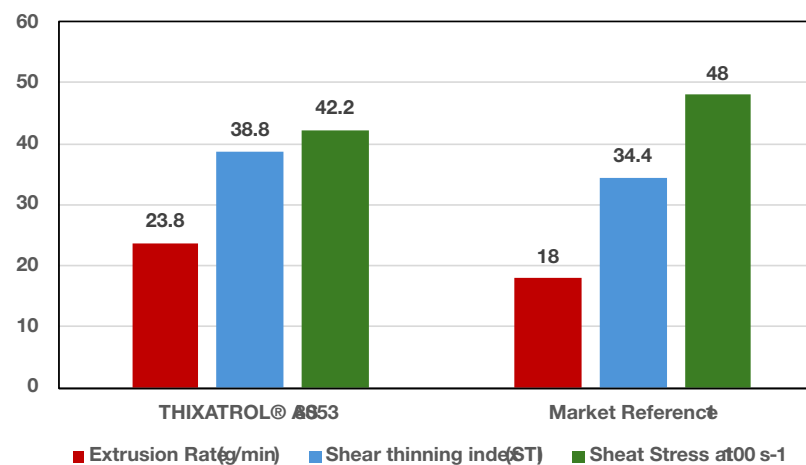


FIGURE 6: Extrusion rate performance test for a PU silane polymer based sealant (loading 1.8%, activated at 55°C)

Using a standard formulation based on a PU silane polymer and adding 1.8% w/w of rheological additives (AS 8053 vs market reference OT), it is evident that lower shear stress at high shear rates correlates with better extrudability.

In summary, THIXATROL® AS 8053 helps ensure easy and clean extrusion.

Why choose THIXATROL® AS 8053?

All rheology and performance tests show that THIXATROL® AS 8053 provides excellent rheological behavior and can be activated at low temperatures without external heating or long mixing times. This results in energy savings, a more robust process, and shorter production cycles—helping to increase production capacity.

Compared to market references, THIXATROL® AS 8053 provides significantly more efficient rheology control and stable sealant formulations—even during storage at elevated temperatures—resulting in excellent application properties, including the required sag resistance.

The radar chart (**FIGURE 7**) below provides a visual summary of the relative performance of the mentioned rheology modifiers in SMP-based sealants (the larger the value, the better the performance).

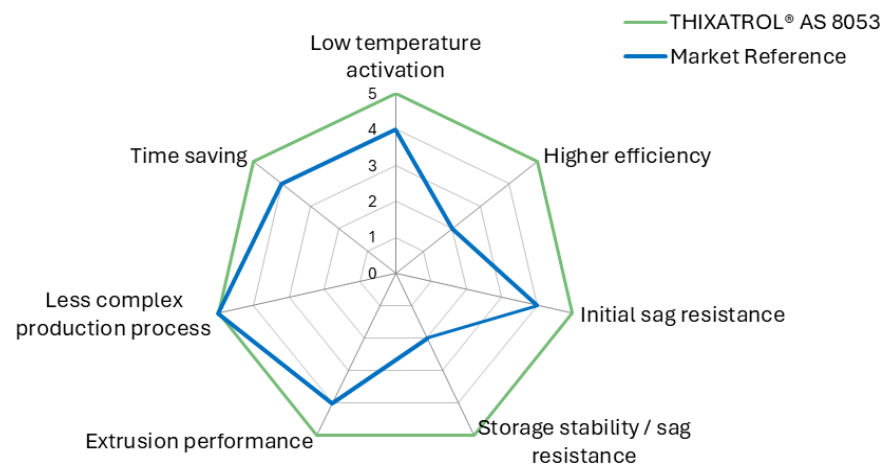


FIGURE 7: Radar chart with overall results



Conclusion

Based on extensive comparative testing, THIXATROL® AS 8053 confirms its value as a next generation rheological additive by combining performance, processing efficiency, and sustainability. Its low activation temperature (45–70 °C) eliminates the need for external heating and cooling, reducing energy consumption and enabling shorter, more efficient production cycles. Delivering up to 20% higher efficiency versus amine-based benchmarks, it provides strong shear-thinning for easy extrusion or sprayability, alongside excellent anti-runoff behavior.

High thixotropy ensures rapid structure recovery and outstanding sag resistance at low loadings of just 1.6% w/w, supporting precise application and minimizing waste. Improved storage stability guarantees consistent application performance throughout the full shelf life. With no labeling requirements and 78% renewable carbon content, THIXATROL® AS 8053 offers an innovative solution for manufacturers seeking faster processing, reliable application performance, and a reduced environmental footprint.

NOTE:

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