

# VORASURF™ Additives

## for TDI viscoelastic and mechanical froth foam applications

The requirements for a surfactant in viscoelastic foams (slow recovery foams) created using toluene diisocyanate (TDI) as well as mechanical froth foams are different from that of conventional surfactants. Special (AB)<sub>n</sub> type silicone – polyether copolymer – surfactants produce the best results in terms of polyurethane foam cell stabilization as well as cell opening characteristics. The (AB)<sub>n</sub> type surfactants are chemically distinct from typical polyurethane foam surfactants and demonstrate a relatively lower level of surface activity. However, (AB)<sub>n</sub> type surfactants are crucial for cell nucleation and cell opening in these applications.

TDI viscoelastic foams are commonly used in bedding, pillows and other applications, while mechanical froth foams are commonly used in electronics, carpet underlay and other applications. VORASURF™ (AB)<sub>n</sub> type surfactants are non-hydrolyzable and have been consistently manufactured for over 30 years to ensure consistent foam quality in these critical and demanding applications.



**Table 1:** Formulations tested in internal lab trials and plant trials

		TDI viscoelastic foam		Mechanical froth foam
		55 kg/m <sup>3</sup>	31 kg/m <sup>3</sup>	400 kg/m <sup>3</sup> with filler
Additive	VORASURF™ SZ 1952 Additive	✓	✓	✓
	VORASURF™ SZ 1959 Additive	✓	✓	✓
Formulation (pph)	VORALUX™ HT 762 Polyol	90	–	–
	VORANOL™ 8150 Polyol	–	95	–
	VORANOL™ CP 1421 Polyol	10	–	–
	VORANOL™ 4053 Polyol	–	5	–
	VORANOL™ PR9002	–	–	100
	Additive	1.0	1.0	1.0
	Calcium carbonate filler	–	–	> 100
	Water	1.5	2.7	0.16
	Amine catalyst	0.5	0.3	–
	Tin catalyst	0.05	0.05	0.16
	MDI	–	–	47.6
TDI	37.05	43.21	–	

**Table 2:** TDI Viscoelastic foam performance

Surfactant	Fine cell structure	Cell opening	VOC	Non-hydrolyzable
VORASURF™ SZ 1952 Additive	**	**	***	✓
VORASURF™ SZ 1959 Additive	***	**	**	✓
Competitor 1	**	***	**	–

These are typical properties, not to be construed as specifications

**Table 3:** Mechanical froth foam performance

Surfactant	Frothing efficiency	Physical properties	VOC	Non-hydrolyzable
VORASURF™ SZ 1952 Additive	**	***	***	✓
VORASURF™ SZ 1959 Additive	***	***	**	✓
Competitor 2	**	***	**	–

\* = Low performance \*\* = Moderate performance \*\*\* = High performance  
 ✓ = Attribute present in product – = Attribute absent in product

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