

POLYURETHANE ADDITIVES FOR FLEXIBLE POLYETHER FOAM

SILICONE SURFACTANTS

CATALYSTS

PERFORMANCE ADDITIVES

GCR



EVONIK –

Enhancing comfort in polyurethane foams

To meet specific customer demands and increasingly stringent market requirements, you need a reliable partner that provides you with customized solutions.

Over the decades, we've provided additives that deliver maximum efficiency and outstanding workability in formulations, but also solutions that answer the most specific needs.



OUR POLYURETHANE ADDITIVES SUPPORT YOU IN:

 **Stabilizing foam structure**

 **Boosting foam yield**

 **Improving foam recovery after compression**

 **Reducing VOC emissions in foam**

OUR EXTENSIVE RANGE OF ADDITIVES ARE COVERED BY 4 BRANDS:

TEGOSTAB®
Foam stabilizers/surfactants

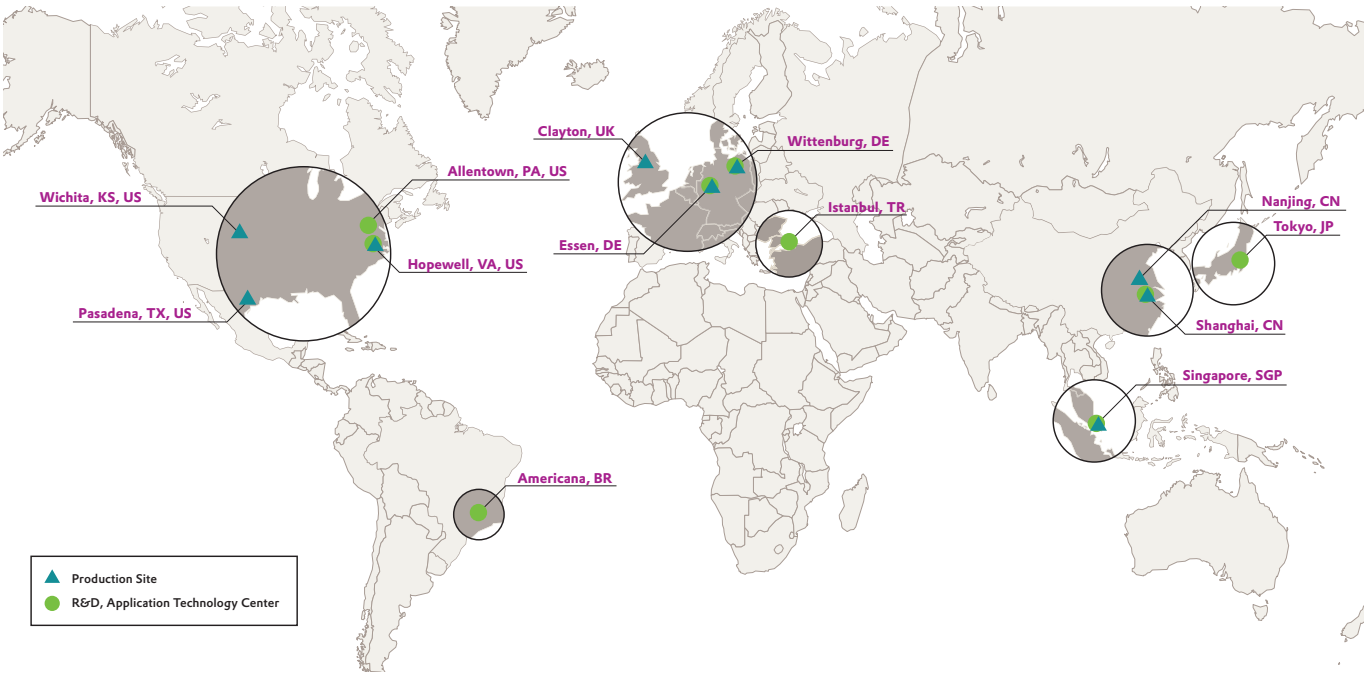
KOSMOS®
Metal catalysts

DABCO®
Amine catalysts and performance additives

ORTEGOL®
Special additives like crosslinkers, softeners, compression set enhancers, etc

FAST ONLINE SERVICES TO SUPPORT YOU WHEN YOU NEED IT MOST

EXPLORE PU takes our online service offering to the next level; a more personalized experience, with fast access to support from our polyurethane experts, wherever you are in the world.



SILICONE SURFACTANTS

Our TEGOSTAB® range offers VOC-optimized surfactants that have a cyclic siloxane (D4, D5 and D6) content of <0.1% weight in total.

Certain product grades are further improved to minimize cyclic siloxane level down to <0.03% weight, supporting formulators to meet stringent IKEA IOS Mat 0010 V15 emission targets, whilst still producing high quality foam.

CONVENTIONAL SILICONE SURFACTANTS

Conventional silicone surfactants are suitable for a broad range of different polyether foam grades. They are not recommended for FR foam grades because they require higher dosage of flame retardants, or the foam might not even pass FR test.

TEGOSTAB®	KEY FEATURES	STABILIZER POTENCY	DENSITY RANGE	NUCLEATION EFFICIENCY	PROCESSING LATITUDE	LOW VOC
B 2470	Broad processing with fine cell structure	...	L – M	...	...	✓
B 4900	For broad density range with open cell structure/ high filler foam	..	M – H	...		✓
B 8002	Extremely broad processing latitude for high density and TDI VE/shoe sole	.	H	..		✓
B 8123	Highest potency for lowest density		EL – M	...	..	✓
B 8195	Broad processing latitude for middle density foams	..	L – M	...	...	✓
B 8281	High potency with broad processing latitude for middle density foams	...	L – M	...	...	✓
BF 2370	Outstanding processing latitude, very open foam with fine cell structure and excellent hand-feeling	..	M – H			✓

- EL = Extremely Low
L = Low
M = Medium
H = High
- . = Low performance or narrow processing latitude
.. = Medium performance or medium processing latitude
... = High performance or wide processing latitude
.... = Very high performance or very wide processing latitude

UNIVERSAL SILICONE SURFACTANTS

Universal silicone surfactants combine balanced activity and medium FR properties. Generally foam manufacturers also use these silicone surfactants for their conventional foam grades.

TEGOSTAB®	KEY FEATURES	STABILIZER POTENCY	DENSITY RANGE	NUCLEATION EFFICIENCY	PROCESSING LATITUDE	Low VOC	ULTRA-LOW CYCLICS
B 2375 	Broad processing latitude for finer cell structure	..	M – H	...	...	✓	✓
B 4907 	Broad processing latitude with open cell structure, also suitable for filler foam	..	M – H	...	...	✓	✓
B 8005 	Extremely broad processing latitude for TDI VE/Shoe sole	..	M – H	...	...	✓	✓
B 8110	High potency with fine cell structure	...	EL – M		...	✓	✓
B 8158	Broad processing latitude especially for more hydrophobic polyols including NOP	...	L – M	...	...	✓	✓
B 8164	For quality demanding foam with fine cell structure	..	M – H	...	...	✓	✓
B 8228	High potency for middle density foams	...	L – M	..	..	✓	✓
B 8244	For quality demanding foam including automotive with finer cell structure	...	M – H		...	✓	✓
B 8277	To be used in combination with ORTEGOL® HPH 2 for water absorbing foams	...	M – H		...	✓	✓

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FLAME RETARDANT SILICONE SURFACTANTS

Flame retardant silicone surfactants are particularly well-suited for the production of flame retardant foam grades since they enhance the efficiency of the flame retardants by their minimized contribution to the flammability of the foam. TEGOSTAB® B 8258 and B 8239 F are essential for Crib 5 formulations.

TEGOSTAB®	KEY FEATURES	STABILIZER POTENCY	DENSITY RANGE	NUCLEATION EFFICIENCY	PROCESSING LATITUDE	LOW VOC	ULTRA-LOW CYCLICS	FLAME RETARDANT PERFORMANCE
B 8258	For FR applications (Crib V) with broad processing	..	L – H	...	...	✓	✓	...
B 8239 F	Best for FR applications (Crib V)	...	L – M	..	..	✓	✓	

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HIGH RESILIENCE SLABSTOCK FOAM SILICONE SURFACTANTS

All products listed below are phthalate free and mostly low fogging type (“LF2”). Especially low values can be obtained with TEGOSTAB® B 8707 LF2 in chamber tests conducted at room temperature.

TEGOSTAB®	STABILIZER POTENCY	PROCESSING LATITUDE	MDI FORMULATION	TDI FORMULATION	LOW VOC
B 8681	•	...	..	...	
B 8716 LF2	•	...	..	...	✓
B 8707 LF2	..	..	...	...	✓

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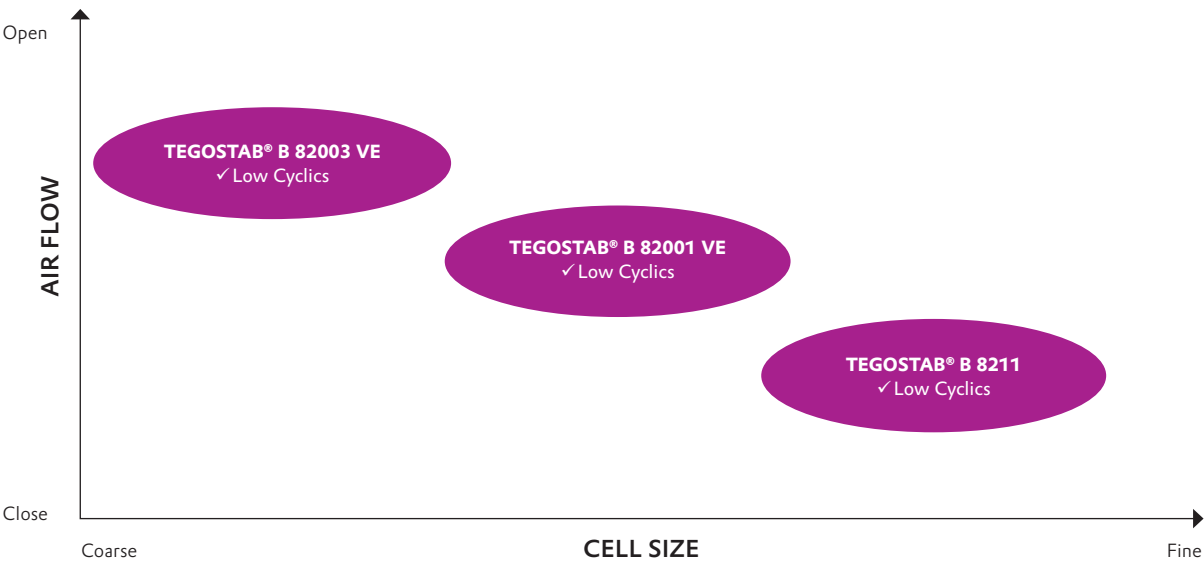
INTRODUCING
TEGOSTAB® B 82001 VE

- TEGOSTAB® B 82001 VE is a surfactant designed to produce fine, pneumatic cell foams.
- Fine and tight cell structure without shrinkage
 - VOC-optimized with cyclic siloxane (D4, D5 and D6) content <0.1% weight in total (ideal for meeting IKEA IOS Mat 0010 V 15 specifications)
 - Suitable for combustion modified viscoelastic flexible foams
 - Non-hydrolysable

MDI-VE APPLICATION

TEGOSTAB®		FEATURE
B 8211	NEW	Low VOC, low cyclics, combination of strong pneumatic effect and finer cell structure
B 82001 VE	NEW	Low VOC, low cyclics, balanced pneumatic effect and open cell
B 82003 VE	NEW	Low VOC, ow cyclics, provide open cell structure with broad processing latitude

OVERVIEW OF MDI/TDI VISCOELASTIC SURFACTANTS



TRADITIONAL CATALYSTS

Evonik has been the global leader in polyurethane additives for several decades, offering the broadest range of catalysts to the flexible foam industry.

PRODUCT	DESCRIPTION
KOSMOS® T 9	Stannous octoate
KOSMOS® 54	Co-catalyst for cold flow prevention in HR and visco foams
KOSMOS® T 900 NEW	2-ethyl-hexanoic acid free tin catalyst alternative to stannous octoate
DABCO® 33 LV	Standard gel catalyst based on Triethylenediamine in DPG
DABCO® 33 LE	Standard gel catalyst based on Triethylenediamine
DABCO® 33 LSI	Low odor Gel catalyst based on Triethylenediamine
DABCO® 8154	Delayed action gel catalyst that helps improve foam curing
DABCO® BL 11	Strong urea reaction blow catalyst
DABCO® CS 90	Balanced amine catalyst with cell opening properties, recommended for high density conventional foam, HR and VE foams
TEGOAMIN® SMP	Tertiary amine with outstanding catalytic properties, recommended for low density foams

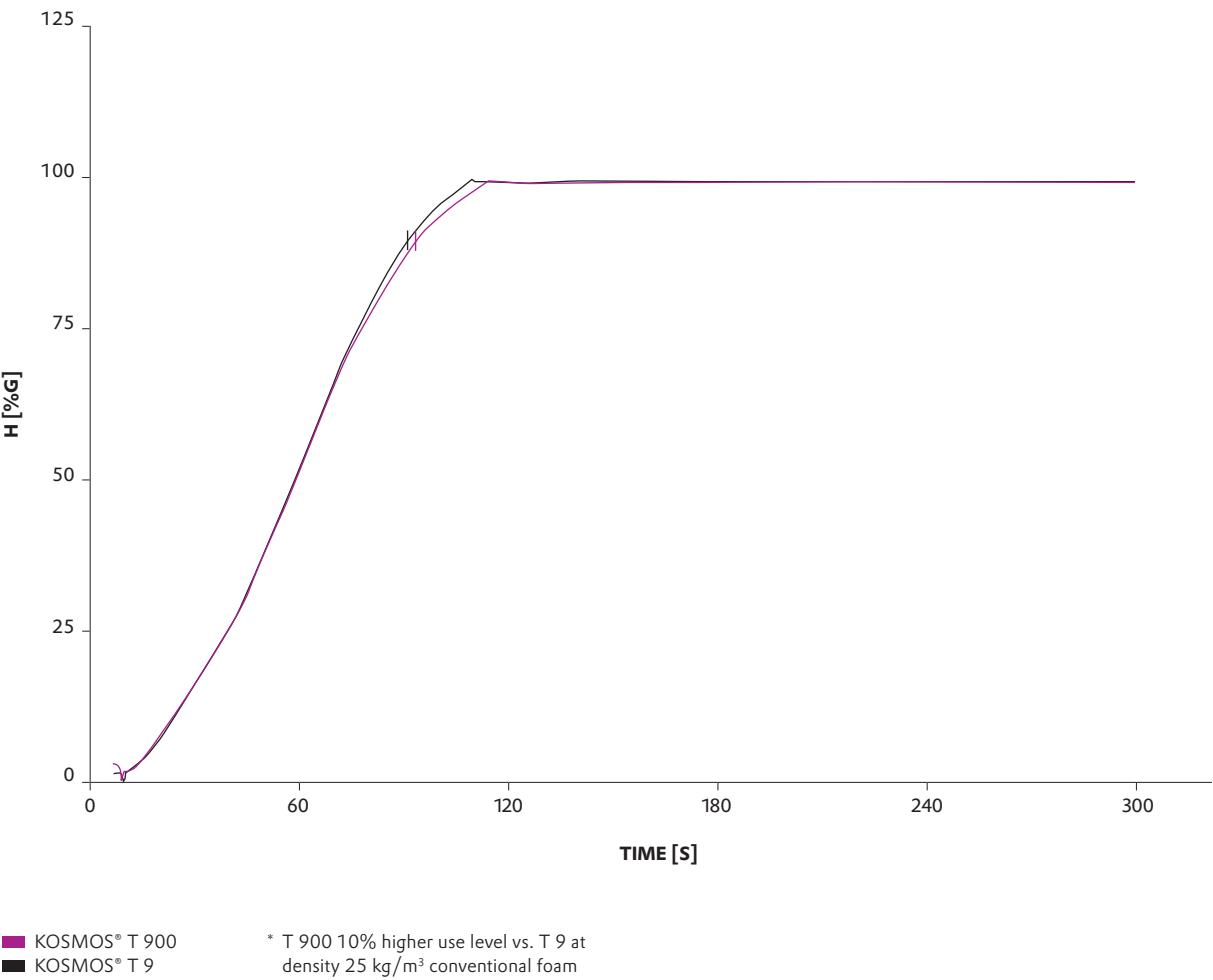


INTRODUCING KOSMOS® T 900

KOSMOS® T 900 is a 2-ethylhexanoic acid free tin catalyst for the manufacturing of all types of polyurethane foam formulations.

- Strong gel catalyst
- 2-ethylhexanoic acid emission-free
- No solvent emission
- Alternative to industry standard catalysts such as KOSMOS® T 9

T 900 VS. T 9 FOAMING RISE PROFILE COMPARISON



EMISSION-OPTIMIZED CATALYSTS

Our latest ‘Negligible-Emissive’ (NE) grades offer reduced emissions compared to traditional amines, resulting in lower exposure to VOC's for both worker and consumers.

PRODUCT	DESCRIPTION
KOSMOS® EF	Emission optimized stannous catalyst
DABCO® NE 300	Low odor and negligible emissive reactive blowing catalyst
DABCO® NE 750 NEW	Negligible emissive reactive gelling catalyst for production of foam with challenging curing, recommended for visco and hyper soft foams
DABCO® NE 1082	Negligible-emissive reactive gelling catalyst
DABCO® RE 533 NEW	Low emission gel catalyst
DABCO® RP 204	Low emission balanced catalyst
DABCO® RP 208	Negligible-emissive and low odor balanced catalyst

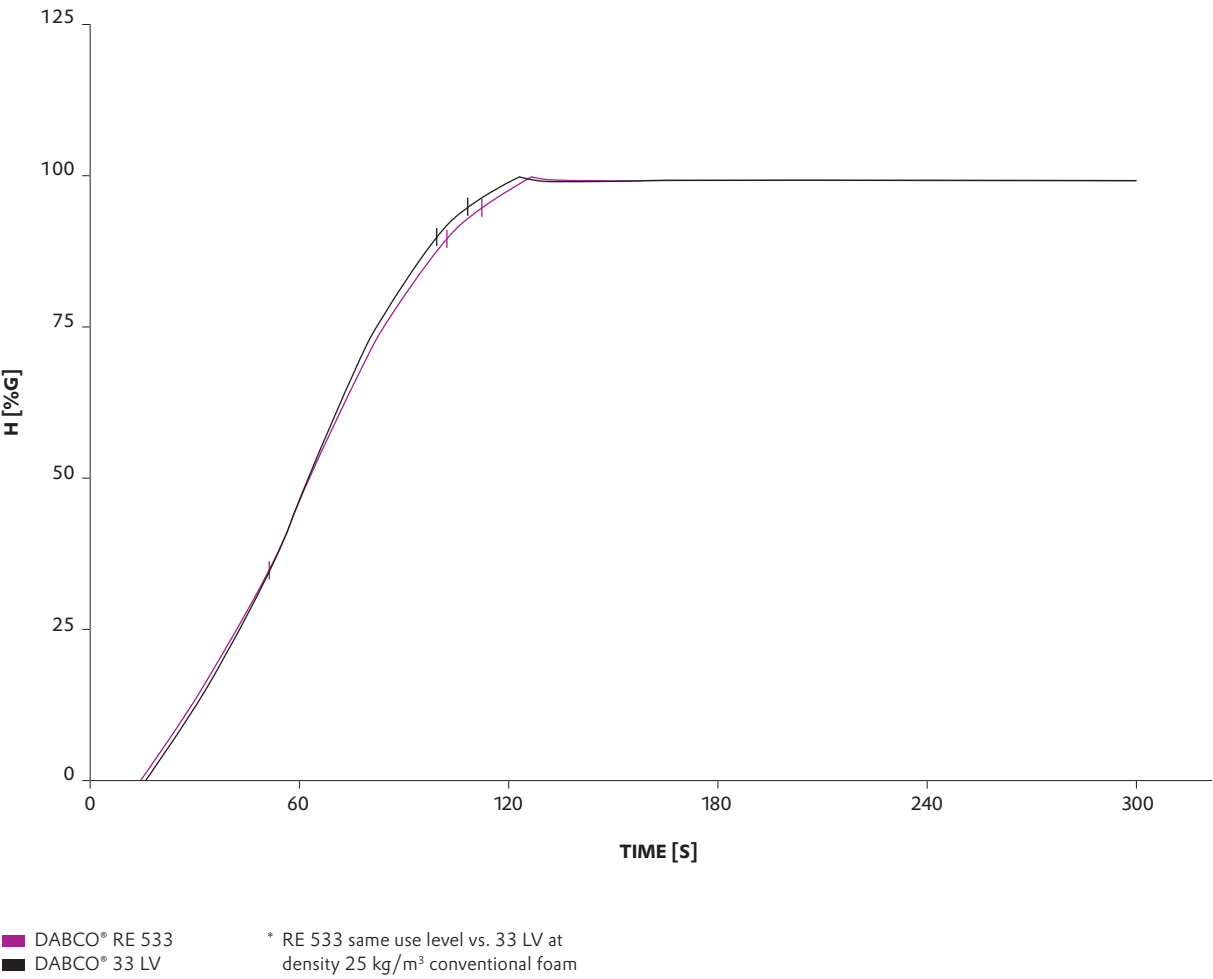
INTRODUCING DABCO® NE 750

- DABCO® NE 750 is an extra low-emission amine catalyst with outstanding gel selectivity
- Extremely high similarity of rise profile to DABCO® 33 LV
 - Odor-optimized
 - Lower tack-free time
 - Ideal for fulfilling comfort industry labels like LGA, OEKOTEX, and automotive OEM specifications, including VDA 278
 - Helps to pass PVC staining tests
 - Recommended for viscoelastic, low index and soft foams

INTRODUCING DABCO® RE 533

- DABCO® RE 533 gelling catalyst is one in a series of reduced emission catalysts for manufacturing of all types of polyurethane foam formulations.
- Reduced foam odor in final foam article
 - Reduced vinyl staining
 - Reduced catalyst VOC and FOG for emission-sensitive applications
 - Reduced amine emissions in the foam manufacturing/production environment
 - Maintains foam physical properties and processing versus industry standards such as DABCO® 33-LV catalyst
 - Produces fine, regular-celled foam
 - Viscosity similar to DABCO® 33-LV catalyst providing pump throughput stability without additional blending steps

RE 533 VS. 33 LV FOAMING RISE PROFILE COMPARISON



PERFORMANCE ADDITIVES

Evonik’s range of Performance Additives can help formulators to delay reactions, modify physical properties or reduce scorching of flexible foams.

ORTEGOL® CROSSLINKERS AND CHAIN EXTENDERS		PURPOSE
ORTEGOL® 204		Additive for cold flow prevention in HR and visco foams
ORTEGOL® CXT		Stabilizing foam and preventing splits. Recommended for low index and filler containing foams
ORTEGOL® G		Highly efficient crosslinker for low index and filler containing foams
ORTEGOL® HARDNERS		
ORTEGOL® HA 1		Hardening additive for flexible foam formulations
ORTEGOL® SOFTENERS		
ORTEGOL® 310		Softening agent. No need to adjust TDI index, and disturbs formation of hard segments
ORTEGOL® FS 2		Foam softening additive, low odor and prevent splits in low Index formulation
ORTEGOL® EMULSIFIERS		
ORTEGOL® NOP	NEW	Emulsifier for blends of natural oil-based polyols and standard polyols
ORTEGOL® TO IMPROVE COMPRESSION SET		
ORTEGOL® 700		Improving foam recovery after compression
ORTEGOL® 702		Improving foam recovery after compression, and provide excellent recovery in demanding application
ORTEGOL® FOR ANTI-SCORCHING		
ORTEGOL® AO 1		Scorch prevention, for polyether foam
ORTEGOL® AO 2		Scorch prevention, for polyester foam
OTHER PROCESSING ADDITIVES		
ORTEGOL® AST 2		Antistatic additive with reduced tendency for scorch
ORTEGOL® BS 1		Wetting agent for rebonded foam production to reduce binder level
DABCO® BA 150		Emission optimized blocking agent for delaying cream time to reduce or eliminate pinholes in foams
ORTEGOL® HPH 2		Additive to enhance the wetting of foam by liquids, especially water Should be used in combination with TEGOSTAB® B 8277
DABCO® PE 40		Additive to stabilize dispersions of solid powder particles in polyol and emulsifier for incompatible polyol blends

ORTEGOL® NOP is an additive for the manufacturing of polyurethane foam where natural oil-based polyols are in use.

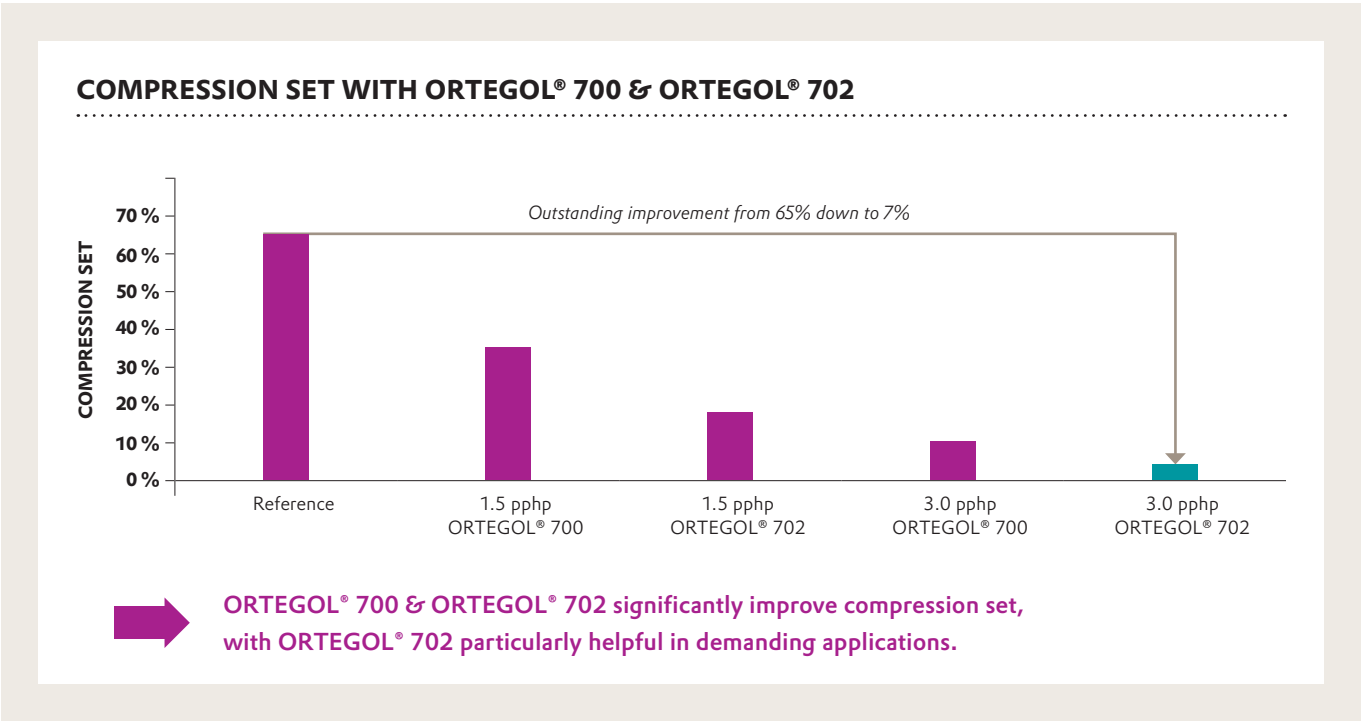
- Designed for flexible polyether polyurethane foam formulations with natural oil-based polyols (NOPs).
- Improves processing with NOPs.
- Improves foam properties and property distribution when NOPs are used

ORTEGOL® CXT s a difunctional reactive additive for improved processing latitude of sensitive formulations.

- Reduces splits in low index and filler formulations
- Supports the production of soft flexible slabstock by lowering the index
- Compatible with high levels of fillers or NOPs
- Partially substitutes for DEOA in HR foams
- Maintains consistent processing and improves quality in VE foams

INTRODUCING
ORTEGOL® 700 &
ORTEGOL® 702

- Superior foam recovery after prolonged compression
- Reduced curing time before compression
- Improved wet compression set
- Odor-optimized
- Emission-optimized; suitable for room temperature chamber tests



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To discuss your requirements for polyurethane additives for the comfort foam industry further, or to learn more about regional product availability.

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