Product overview

Additives for Adhesives

EVONIK
Leading Beyond Chemistry

DEFOAMER

Our TEGO® Antifoam products are used in the production of polymer dispersions as well as in adhesive formulations. Many aqueous adhesives tend to foam due to their chemical composition.

To differentiate between the creation of macrofoam and microfoam, the experts use products from the TEGO® Antifoam range.

The foaming behavior can be critical either during the adhesive formulation step or during adhesive application, such as coating or lamination. In fast application adhesives, like for gravure rolls, the occurrence of foam can lead to problems that directly influence the productivity. Moreover, a strong foaming adhesive will most likely not meet the required product specifications (adhesion forces, transparency of the adhesive films or a defect free coating). Defoamers are used either to suppress the formation of foam or to effectively destroy foam bubbles once they are formed. A very small amount of TEGO® Antifoam can increase the speed of production, help to avoid defects and scrap, and reduce production costs.

The foaming tendency of the various base resins, and especially the surfactants used in these systems require different defoamers to provide an optimum level of efficiency and compatibility. None of the TEGO® Antifoams listed below contain silicone oil or APEO.

DEFOAMER FOR WATER-BASED ADHESIVES

Product name	Chemical base	Delivered as	Appearance	pH value (100g/l in water, 25 °C)	Viscosity at 25 °C [mPas]
TEGO® Antifoam 1488	Polyether siloxane	20% active emulsion	white liquid	7–9	50–250
TEGO® Antifoam 2-57	Polyether siloxane	20% active emulsion	white liquid	7–9	100–250
TEGO® Antifoam 2-80	Polyether siloxane	20% active emulsion	white liquid	7–9	90–200
TEGO® Antifoam 2-89	Polyether siloxane	20% active emulsion	white liquid	6–9	220 – 620
TEGO® Antifoam 204	Polyether siloxane	20% active emulsion	white liquid	7–9	50–250
TEGO® Antifoam 4-88	Polyether siloxane	40% active emulsion	white liquid	7	200–400
TEGO® Antifoam 4-94	Polyether siloxane	40% active emulsion	white liquid	6–9	200–500
TEGO® Antifoam 2280	Polyether + siloxane	50% active emulsion	white liquid	6–8	1000–3000
TEGO® Antifoam KE 600 EC	Polyether + siloxane	60% active emulsion	white liquid	7–9	80–400
TEGO® Antifoam 2290	Paraffinic oil	100% active self-emulsifiable concentrate	yellowish liquid	5–8	50–200
TEGO® Antifoam 2291	Paraffinic oil	100% active self-emulsifiable concentrate	yellowish, cloudy liquid	5–8	100–500
TEGO® Antifoam 2450	Vegetable oil	100% active self-emulsifiable concentrate	yellowish liquid	5–8	100–600
TEGO® Antifoam 2460	Mineral oil	100% active self-emulsifiable concentrate	yellowish, cloudy liquid	5–8	50–120
TEGO® Antifoam 3045	Vegetable oil	100% active self-emulsifiable concentrate	hazy, white to pale yellow liquid	5–7	approx. 350
TEGO® Antifoam KS 53	Vegetable oil	100% active self-emulsifiable concentrate	light yellow, cloudy liquid	6–7	130–210
TEGO® Antifoam D 2315	Polyether siloxane	100% active concentrate	slightly yellowish liquid	6–8	approx. 1000
TEGO® Antifoam D 3020	Gemini surfactant, acetylenic	100% active concentrate	yellow liquid	7	approx. 210

DEFOAMER FOR WATER-BASED ADHESIVES

Name	Density at 20 °C [g/m³]	VOC via DIN ISO 11890/2 [%]	SVOC via DIN ISO 11890/2 [%]	For application in water-based adhesive formulations based on				
				Acrlyates	PVAc/VAE/PVOH	SBR/NBRLatex	PU	PF/MF/MUFresins
TEGO® Antifoam 1488	approx. 1.0	approx. 0.2	approx. 0.7	●	●	○		
TEGO® Antifoam 2-57	approx. 1.0	nd *	nd *	○	○	○	○	
TEGO® Antifoam 2-80	approx. 1.0	approx. 0.1	approx. 0.5	○			●	●
TEGO® Antifoam 2-89	approx. 1.0	approx. 0.2	approx. 0.5	●	●	○		
TEGO® Antifoam 204	approx. 1.0	approx. 0.9	approx. 0.6	●	○	●		
TEGO® Antifoam 4-88	approx. 1.0	nd *	nd *	●	○	○		
TEGO® Antifoam 4-94	approx. 1.0	approx. 0.5	approx. 0.1	●	○			
TEGO® Antifoam 2280	approx. 1.0	nd *	nd *		○			
TEGO® Antifoam KE 600 EC	approx. 1.0	approx. 0.7	approx. 0.1	●	○			
TEGO® Antifoam 2290	approx. 0.9	< 0.02	approx. 26.5	○	●	●	○	○
TEGO® Antifoam 2291	approx. 0.9	approx. 0.03	approx. 0.1	○	●	●		○
TEGO® Antifoam 2450	approx. 1.0	nd *	nd *					●
TEGO® Antifoam 2460	approx. 0.9	nd *	nd *					●
TEGO® Antifoam 3045	approx. 1.0	nd *	nd *		●			●
TEGO® Antifoam KS 53	approx. 1.0	approx. 0.2	< 0.05	○	○		○	
TEGO® Antifoam D 2315	approx. 1.0	approx. 1.3	approx. 0.3	●		●		
TEGO® Antifoam D 3020	approx. 1.0	approx. 0.7	approx. 3.7	○	●	○	●	

*not detected ● recommended ○ suitable

DEFOAMER & DEAERATOR FOR REACTIVE & SOLVENT-BASED ADHESIVES

Name	Chemical base	Delivered as	Appearance	Flash point [°C]	Viscosity at 25 °C [mPas]
SURFYNOL® DF 178	Polysiloxane + acetylenic gemini	100% active	clear to slighty hazy, yellow liquid	135	2000–3400
TEGOPREN® 5863	Polyether siloxane	100% active	yellowish, dull liquid	> 110	approx. 3000
TEGO® Antifoam D 3944	Polymeric mixture, with a tip of silicone	100% active	turbid, yellowish liquid	144	approx. 3000
TEGO® Antifoam D 2340	Polymer solution in mineral oil, with a tip of silicone	15% active in solvent mixture	colourless to brown liquid	46	approx. 1000
TEGO® Antifoam D 2315	Polyether siloxane	100% active	slightly yellowish liquid	114	200–400

*not detected

Name	Density at 20 °C [g/m³]	VOC via DIN ISO 11890/2 [%]	SVOC via DIN ISO 11890/2 [%]	For systems based on
SURFYNOL® DF 178	approx. 1.0	nd *	nd *	Silane-modified polymers (SMP)
TEGOPREN® 5863	approx. 1.0	nd *	nd *	Silane-modified polymers (SMP)
TEGO® Antifoam D 3944	approx. 0.9	approx. 3.0	approx. 0.7	Silane-modified polymers (SMP), PUR, Epoxide
TEGO® Antifoam D 2340	approx. 0.9	nd *	nd *	PUR, Epoxide, Acrylate
TEGO® Antifoam D 2315	approx. 1.0	approx. 1.3	approx. 0.3	PUR, Epoxide, Acrylate

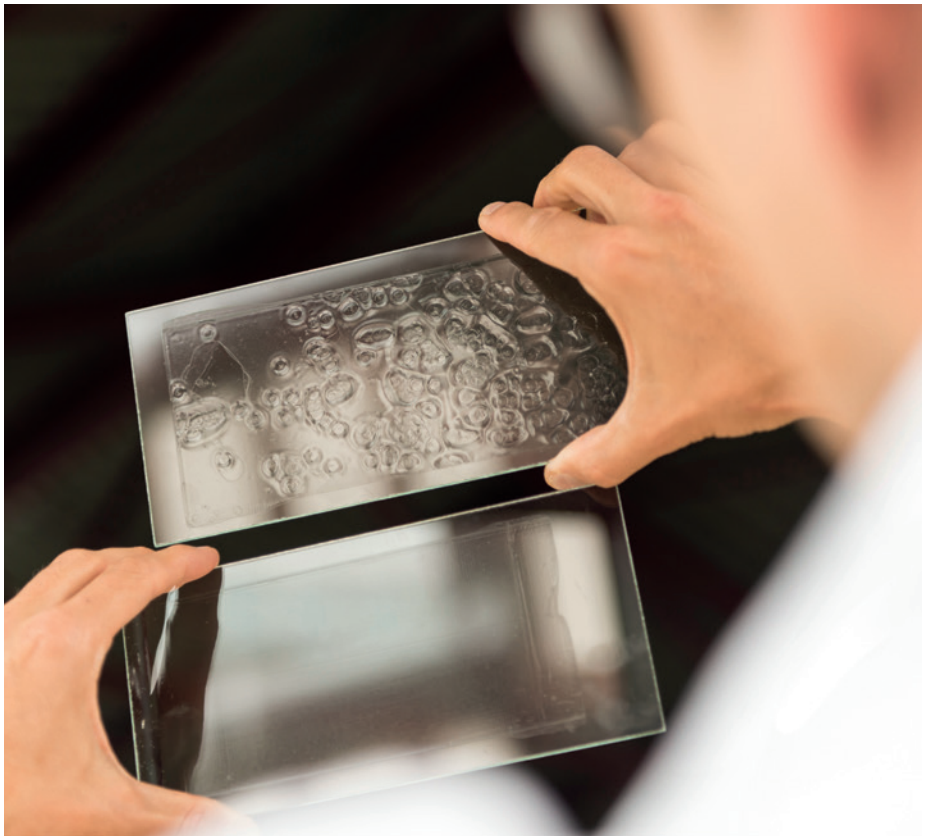
*not detected

WETTING AGENTS

In order to spread the adhesive across the surface, wetting agents play an important part of an adhesive formulation.

We offer different kinds of products based on our versatile technologies of organomodified siloxanes, organic chemistry and acetylenic technology.

We can create the property profile you need to best suit your application. Whether it is extremely good wetting, low dynamic surface tension for curtain coating or a standard sulfosuccinate, we have what you need. We also provide special wetting agents with low foaming tendencies.



WETTING AGENTS FOR WATER-BASED ADHESIVES

Product name	Chemical base	Delivered as	Appearance	Flash point [°C]	Viscosity at 25 °C [mPas]
SURFYNOL® AS 5000	Gemini surfactant, acetylenic	50 % active solution	pale, yellow liquid	111	approx. 100
SURFYNOL® AS 5020	Ethoxylated gemini surfactant, acetylenic	100% active concentrate	clear, yellow liquid	> 108	approx. 212
SURFYNOL® AS 5040	Ethoxylated gemini surfactant, acetylenic	100% active concentrate	amber liquid	> 110	approx. 81 (35 °C)
SURFYNOL® AS 5060	Alkoxylated gemini surfactant, acetylenic	100% active concentrate	clear, pale yellow liquid	174	approx. 110
SURFYNOL® AS 5080	Blend of gemini surfactants, acetylenic	100% active concentrate	clear, yellow liquid	188	approx. 230
SURFYNOL® AS 5100	Blend of acetylenic gemini and anionic surfactants	81% active concentrate	clear to hazy, yellow liquid	> 230	approx. 190
SURFYNOL® AS 5120	Anionic surfactant blend	75% active concentrate	clear hazy, colorless to pale yellow liquid	> 100	approx. 2500
SURFYNOL® AS 5140	Anionic surfactant blend	85% active concentrate	clear colorless to pale yellow liquid	> 184	approx. 890
SURFYNOL® AS 5160	Anionic surfactant	75% active concentrate	nearly colorless, clear liquid	25	approx. 100
SURFYNOL® AS 5180	Alcohol alcoxylate	100% active concentrate	colorless, clear liquid	157	20–32
TEGOPREN® 5840	Organomodified Siloxane	100% active concentrate	colorless to light yellow liquid	< 140	40–90
TEGOPREN® 5860	Organomodified Siloxane + acetylenic gemini	100% active concentrate	clear, light yellow liquid	157	approx. 66
TEGOPREN® 5885	Siloxane based gemini surfactant	100% active concentrate	clear to slightly turbid, yellowish to brownish liquid	> 100	70–250
TEGOPREN® 5890	Organomodified Siloxane	100% active concentrate	clear, yellowish liquid	100	160–230

WETTING AGENTS FOR WATER-BASED ADHESIVES

Name	Density at 20 °C [g/m³]	Cloud point, 0.1% in water [°C]	VOC via DIN ISO 11890/2 [%]	SVOC via DIN ISO 11890/2 [%]	Surface tension***		wetting of		
					Static (bubble life time 5000 ms)	Dynamic (bubble life time 30 ms)	Glass	PE/PE film	Siliconized paper
SURFYNOL® AS 5000	approx. 1.0	< RT	nd **	nd **	34	37	●	●	
SURFYNOL® AS 5020	approx. 1.0	< RT	nd **	nd **	33	38	○	○	●
SURFYNOL® AS 5040	approx. 1.0	58	nd **	nd **	35	40	●	●	●
SURFYNOL® AS 5060	approx. 1.0	46	0.8	12	35	42	●	●	●
SURFYNOL® AS 5080	approx. 1.0	< RT	nd **	nd **	27	39	●	●	●
SURFYNOL® AS 5100	approx. 1.1	> 100	nd **	nd **	27	39			●
SURFYNOL® AS 5120	approx. 1.0	28	nd **	nd **	29	42	●	●	●
SURFYNOL® AS 5140	approx. 1.1	30	nd **	nd **	36	49	○	○	○
SURFYNOL® AS 5160	approx. 1.1	> 100	nd **	nd **	33	45	○	○	●
SURFYNOL® AS 5180	approx. 1.0	44	1.5	23	31	40	●	●	●
TEGOPREN® 5840	approx. 1.0	< RT	nd **	nd **	23	55	●	●	●
TEGOPREN® 5860	approx. 1.0	25	nd **	nd **	29	50	●	●	
TEGOPREN® 5885	approx. 1.0	n.a. *	nd **	nd **	n.a. *	n.a. *	●	●	
TEGOPREN® 5890	approx. 1.0	< RT	nd **	nd **	48	61	●	●	

* product is not soluble in water
** not detected
*** 0.1% active in water; measurement took place at with BP100 from Krüss

● recommended ○ suitable

DISPERSING AGENTS

Dispersing agents are surface-active ingredients, which ease the incorporation of pigments and fillers into a liquid. Agglomerates are broken up by shearing so new surfaces are created. They are wetted by dispersing agents which stabilize the aggregates of pigments or fillers. Dispersing agents have an amphiphilic structure which combines to meet the following requirements:
Specific anchoring groups enable them to be strongly absorbed onto the particle surface. As a second requirement the molecule must contain polymeric chains that give steric stabilization in the required system.

Name	Chemical base	Delivered as	Ionogenity	Appearance	Viscosity at 25 °C [mPas]
TEGOMER® DA 626	Polymeric nature	≥ 98% active concentrate	Nonionic	yellow to brown liquid	50000–150000
TEGOMER® DA 640	Polyether phosphate	30% active solution	Anionic	yellow to brown liquid	100–500
TEGOMER® DA 646	Modified Polyether	100% active concentrate	Nonionic	yellowish, clear liquid	200–800
TEGOMER® DA 850	Polymeric nature	40% active solution	Nonionic	amber liquid	100–500
ZETASPERSE® 3100	Polymeric nature	40% active solution	Anionic	amber liquid	approx. 500
ZETASPERSE® 3600	Polymeric nature	52% active solution	Anionic	amber liquid	approx. 500
ZETASPERSE® 3800	Polymeric nature	40% active solution	Nonionic	amber liquid	approx. 500
CARBOWET® 103	Alcohol ethoxylate	100% active concentrate	Nonionic	cloudy liquid	35 (38 °C)
CARBOWET® 106	Alcohol ethoxylate	100% active concentrate	Nonionic	colorless liquid	20–50 (16 °C)
TEGOPREN® 6875	Alkyl modified siloxane	100% active concentrate	Nonionic	colorless liquid	200–500

Name	Density at 20 °C [g/m³]	Dispersing of					Application area
		Chalk	Talc	Glass or polymeric fiber	Micronized filler	Organic pigments	
TEGOMER® DA 626	approx. 1.1	●	●		●	●	PUR, Epoxy systems, VE & UP resins
TEGOMER® DA 640	approx. 1.1	●	●				Water-based systems
TEGOMER® DA 646	approx. 1.1			●	●		Water-based systems, Epoxy systems, PUR, SMP
TEGOMER® DA 850	approx. 1.1	●	●			●	Water-based systems
ZETASPERSE® 3100	approx. 1.1	●	●		●	●	Water-based systems
ZETASPERSE® 3600	approx. 1.0	●	●		●	●	Water-based systems
ZETASPERSE® 3800	approx. 1.1	●	●		●		Water-based systems
CARBOWET® 103	approx. 0.9	●	●		●		SMP
CARBOWET® 106	approx. 1.0	●	●		●		SMP
TEGOPREN® 6875	approx. 0.9	●	●		●	●	Epoxy systems, VE & UP resins

● recommended

RHEOLOGY MODIFIER

Thickeners are not only used to adjust the viscosity of an adhesive formulation, but also to influence the flow behavior of the adhesive which is important for the final application. For this purpose, we provide associative PUR thickeners, giving either Newtonian or pseudoplastic flow behavior.

When the shear stress is stopped the viscosity of the formulation containing the pseudoplastic thickener returns to the starting value quickly, whereas the formulation containing the thixotropic thickener needs some time to recover.

In contrast to standard thickeners, our thickeners also operate at low pH values (<3).

TEGO® Rheo 8600 is fully compliant with EU 10/2011 and can be applied on all kinds of acrylics and even for Vinyl-Acetate/Ethylene (VAE) Emulsions.

In acrylic dispersions TEGO® Rheo 8600 is

- 25–50% more efficient than other PUR thickeners
- it outperforms acrylic thickeners regarding electrolyte stability and water resistance.
- It shows efficient thickening even at low pH-values

Name	Chemical base	Delivered as	Flow behaviour	Appearance	Viscosity at 25 °C [mPas]
TEGO® Rheo 8600	Polyurethane	25% active solution	Newtonian	colorless to yellowish liquid	approx. 26000
TEGO® Rheo 8510	Polyurethane	60% active solution	Pseudoplastic	colorless to yellowish liquid	9000 – 14000

				For application in water-based adhesive formulations based on			Conditions of use		
Name	Density at 20 °C [g/m³]	VOC via DIN ISO 11890/2 [%]	SVOC via DIN ISO 11890/2 [%]	Acrylics	SBR/NBR-Latex	PVAc/VAE/PVOH	pH 3-10	high electrolyte content	shear stable formulations
TEGO® Rheo 8600	approx. 1.1	nd *	nd *	●	●	○	●	●	●
TEGO® Rheo 8510	approx. 1.1	nd *	nd *	●	●	○	●	●	●

*not detected ● recommended ○ suitable

FOOD CONTACT COMPLIANCE

Defoamer	EU Regulation 10/2011	BfR XIV	21 CFR FDA							
			FDA 175.105	FDA 175.125	FDA 175.300	FDA 176.170	FDA 176.180	FDA 176.210	FDA 177.1210	FDA 177.2600
TEGO® Antifoam 2–57		●	●					●		
TEGO® Antifoam 2–80		●	●					●		
TEGO® Antifoam 2–89		●	●					●		
TEGO® Antifoam 4–88	●	●	●	●	●	●	●	●	●	●
TEGO® Antifoam 4–94	●	●	●	●	●	●	●	●	●	●
TEGO® Antifoam 204	●	●								
TEGO® Antifoam 1488		●	●					●		
TEGO® Antifoam 2280	●	●	●					●		
TEGO® Antifoam 2290		●	●		●	●	●	●		●
TEGO® Antifoam 2291	●	●	●		●	●	●			●
TEGO® Antifoam 2450	●	●								●
TEGO® Antifoam 3045	●	●	●		●	●	●			
TEGO® Antifoam D 2315	●	●	●	●	●	●	●	●	●	●
TEGO® Antifoam KS 53	●	●	●	●	●	●	●	●	●	●
TEGO® Antifoam KE 600 EC	●	●	●	●	●	●	●	●	●	●

			21 CFR FDA								
Wetting Agents	**EU Regulation 10/2011**	**BfR XIV**	**FDA 175.105**	**FDA 175.125**	**FDA 175.300**	**FDA 176.170**	**FDA 176.180**	**FDA 176.210**	**FDA 177.1210**	**FDA 177.2600**
SURFYNOL® AS 5020			●		●	●	●			
SURFYNOL® AS 5040			●		●	●	●			
SURFYNOL® AS 5060			●				●			
SURFYNOL® AS 5100			●		●	●	●			
SURFYNOL® AS 5120	●	●	●			●	●			
SURFYNOL® AS 5140			●							
SURFYNOL® AS 5160	●	●	●	●	●	●	●			
TEGOPREN® 5840			●							
TEGOPREN® 5885			●							
TEGOPREN® 5890	●	●	●							
Rheology Modifier										
TEGO® RHEO 8600	●	●	●							

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