EVONIK INDUSTRIES

Product Overview

tego

Evonik. Power to create.


tego
tego
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20A

Content

About us

TEGO – one of the successful brands from Evonik Industries.

As a leading supplier of specialty chemicals worldwide, Evonik offers its customers in the coatings industry a unique range of products under the TEGO brand name. Our portfolio is the result of experience gained over 30 years, during which we have researched optimal solutions for our customers. With more than 200 products, the range currently includes wetting and dispersing additives; defoamers and deaerators; flow and leveling additives; hydrophobing agents; radiation-curing additives; and even co-binders, specialty resins, and nanoresins. We remove air from paint, make surfaces glossy, and ensure lacquers are scratch resistant. Environmental concerns are of key importance when developing new products.

Along with our extensive expertise in providing customized solutions, we have numerous contacts in more than 40 countries. This emphasizes our philosophy of developing intelligent products for new applications, not only for, but in conjunction with our customers. We look forward to your challenges, and we are confident that we can find solutions for you.

TEGO – Adding Advantages.


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Basic functions and functionalities: TEGO – Adding Advantages

TEGO additives and specialty resins for functional coatings

Numerous TEGO additives and specialty resins are available to tailor the functionalities of coatings to suit a broad range of applications. Thus, our customers can differentiate themselves from their competitors by offering innovative coatings.

For example, floor coatings can be made electrically conductive using anti-static additives. Silica nanocomposites are particularly effective in making high-gloss coatings for wood and plastics resistant to scratch and abrasion. At the same time, such products improve barrier effects against water vapor, gases, and solvents.

Surface properties may be manipulated for "easy-to-clean" characteristics. Architectural paints may be formulated with water repellency properties that increase the longevity of buildings. Release properties lead to blocking resistance, which ensures that two coated surfaces (such as window frames) do not stick together.

Reactive resin modifiers enable silicone-elastomer particles to be bound into the

Basic functions

Anti-settling
TEGO® Dispers
TEGO® VariPlus

Anti-cratering
TEGO® Wet
TEGO® Twin
TEGO® Glide

Drying speed
TEGO® VariPlus

Flexibility
ALBIFLEX®
SILIKOPUR®
SILIKOTOP®

Deaeration
TEGO® Airex

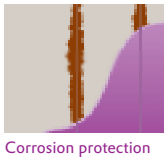
Defoaming
TEGO® Foamex
TEGO® Airex

Flow characteristics
TEGO® Dispers
TEGO® VariPlus

Gloss
TEGO® Dispers
TEGO® VariPlus

Hardness
TEGO® VariPlus

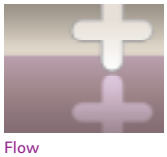
Adhesion
TEGO® AddBond
ADDID®



Corrosion protection
SILIKOPON®
TEGO® AddBond
SILIKOTOP®

Pigment wetting
TEGO® Dispers
TEGO® VariPlus

Substrate wetting
TEGO® Wet
TEGO® Twin
TEGO® Glide
TEGO® Rad



Flow
TEGO® Flow
TEGO® Glide
TEGO® Rad

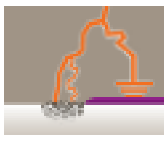
resin matrix of coatings, resulting in significantly increased impact strength (as required, for example, for wind turbine rotor blades). Even coatings with good long-term high and low temperature resistance can be formulated with the help of TEGO specialty resins.

Surface haptics may also be precisely adjusted with TEGO products. Touch modifiers ensure that leather and plastic surfaces have a pleasant feel while maintaining their high-quality appearance.

The TEGO range of products is founded on 30 years of experience in the research, development, and marketing of additives and specialty resins. In the future, we will continue to offer innovative technologies for optimizing coatings.

Functionalities

Anti-graffiti
TEGO® Protect
TEGO® Glide
TEGO® Rad
SILIKOPON®



Anti-static
ADDID®

Easy to clean
TEGO® Protect
SILIKOPON®

Touch
TEGO® Glide
SILIKOPUR®

Heat resistance
SILIKOPHEN®
SILIKOFTAL®
SILIKOPON®

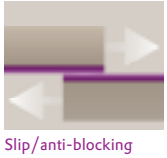
Hydrophobing
TEGO® Phobe
TEGOMER®

Scratch resistance
NANOCRYL®
NANOPOX®
NANOPOL®

Impact strength
ALBIDUR®

Appearance
NANOCRYL®
NANOPOX®
SILIKOFTAL®
SILIKOPON®
SILIKOTOP®
TEGO® AddBond
TEGO® Dispers
TEGO® Flow
TEGO® Glide
TEGO® Rad
TEGO® Twin
TEGO® VariPlus
TEGO® Wet

Weather resistance
SILIKOFTAL®
SILIKOPHEN®
SILIKOPON®
SILIKOTOP®
TEGO® AddBond
TEGO® Phobe
TEGO® Protect



Slip/anti-blocking
TEGO® Glide
TEGO® Rad

Release properties
TEGO® Glide
TEGO® Rad

TEGO Additives

Additives are added to coatings and printing inks in small quantities, and they exert a powerful impact. Depending on the type of additive, it is possible to optimize the production process of a coating, adjust application properties, or systematically control the properties of the cured coating film. Wetting and dispersing additives affect pigment wetting and development of tinting strength. Defoamers and deaerators ensure a foam-free and defect-free coating film. Surface additives – such as our glide, flow, and substrate wetting additives – produce uniform flow behavior and promote ideal surface smoothness.

The TEGO® Phobe product line imparts water repellency. The TEGO® Protect product line provides coatings with an anti-graffiti effect and with an easy-to-clean property.

Evonik's comprehensive chemical and technological competence forms the basis for a varied range of additives. We make the most of Evonik's expertise in organically modified polysiloxanes and silicone resins, its surfactant know-how, its sophisticated emulsification technology for the production of easy-to-incorporate defoamer emulsions, as well as its know-how in the targeted synthesis of specialty polymers and their functionalization.

TEGO – Adding Advantages.

- **Deaerators**
- **Defoamers**
- **Wetting and Dispersing Additives**
  - **for Pigment Concentrates**
  - **for Direct Grind**
- **Surface Control Additives**
- **Radiation-Curing Multifunctional Additives**
- **Substrate Wetting and Anti-Cratering Additives**
- **Hydrophobing Agents**
- **Anti-Graffiti Additives**
- **Others**

Deaeration Defoaming

Deaerators

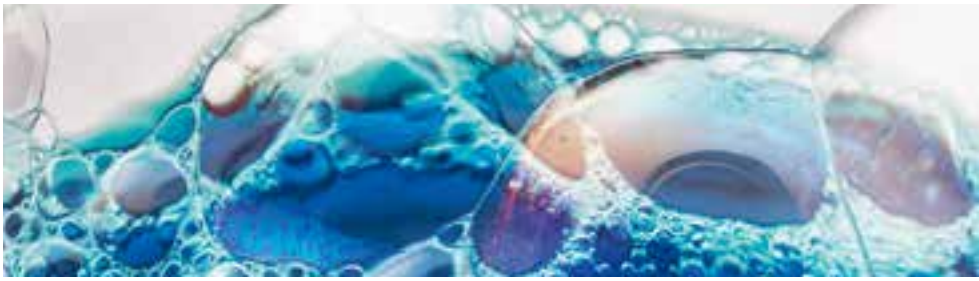
TEGO® Airex deaerators prevent the formation of air inclusions and pinholes in waterborne, solventborne, and radiation-curing coatings. This is particularly important in high viscosity or high solids formulations, and this is essential for airless/ air mix application in high film thickness. With our modern product portfolio of solvent-free deaerators for solventborne high solids and emission-free formulations, we continue to further reduce the VOC content.

Furthermore, preventing foam formation during production and application is particularly important in the case of waterborne formulations. TEGO® Foamex defoamers have proven their worth in this situation (see page 11).

Deaerators

Product	Waterborne	UV	UV PU/waterborne	Solventborne	2-pack solvent-free	High solids	Pigmented	Unpigmented	2-pack epoxy	2-pack PU	Acrylate	Alkyd	Alkyd/melamine	NC	Polyester/melamine	PU/acrylic	Acid-curing	Styrene acrylic	UPE	UV acrylate
TEGO® Airex 900		•		•	•	•	•		•											•
TEGO® Airex 901 W	•						•	•			•					•		•		
TEGO® Airex 902 W	•		•					•		•	•	•	•		•	•		•		
TEGO® Airex 904 W	•		•				•	•			•	•				•	•			
TEGO® Airex 910[1]		•		•	•			•	•										•	•
TEGO® Airex 920[1]		•					•	•												•
TEGO® Airex 921[1]		•					•	•												•
TEGO® Airex 922[1]				•	•	•	•	•	•	•										
TEGO® Airex 931				•		•	•	•	•	•	•	•	•	•	•		•			
TEGO® Airex 940				•	•		•	•	•	•		•							•	
TEGO® Airex 944				•	•	•	•		•	•		•							•	
TEGO® Airex 950				•		•		•					•		•					•
TEGO® Airex 962				•		•		•		•	•		•		•				•	•
TEGO® Airex 990		•		•	•	•		•	•	•	•		•		•				•	•
TEGO® Airex 991				•	•	•	•		•	•	•									
TEGO® Foamex N		•		•	•		•		•											•

[1] silicone-free



Defoamers

TEGO® Foamex defoamers prevent foam formation during production and application of waterborne coatings and printing inks. Pre-existing foam is destroyed and air inclusions are prevented.

TEGO® Foamex defoamers are available as emulsions, solutions, or concentrates. Because of their optimized particle size, emulsions have the greatest possible effectiveness and compatibility, especially when added to the let-down and in clear coats. The highly effective defoamer concentrates provide quick processing during the dispersion of the mill base.

TEGO® Airex deaerators (see page 10) also accelerate the escape of air from liquid paint film and inhibit formation of air inclusions and pinholes. TEGO® Airex deaerators are available for waterborne, solventborne, solvent-free, and radiation-curing coatings.

Defoaming

Defoamers

Product	Grinding stage	Let-down stage	Pigmented	Unpigmented	2-pack epoxy	2-pack PU	Acrylate	Alkyd	Polyester	PU	PU/acrylic	Styrene acrylic	Vinyl acetate	Others
TEGO® Foamex 1488	•	•	•	•	•		•					•	•	
TEGO® Foamex 3062	•		•									•	•	
TEGO® Foamex 7447		•	•	•			•					•		
TEGO® Foamex 800		•	•	•		•	•				•			
TEGO® Foamex 8030		•	•		•		•					•	•	
TEGO® Foamex 805 N		•		•		•	•		•	•		•		
TEGO® Foamex 8050	•		•				•					•		
TEGO® Foamex 810	•		•	•			•	•			•	•		
TEGO® Foamex 815 N		•	•		•		•	•				•		
TEGO® Foamex 822		•	•	•		•	•	•		•	•	•		•
TEGO® Foamex 823		•	•	•		•	•	•		•	•	•	•	
TEGO® Foamex 825		•	•	•		•	•				•	•		
TEGO® Foamex 830[1]	•	•	•	•		•	•		•	•				
TEGO® Foamex 831[1]	•	•	•	•			•	•	•		•	•	•	•
TEGO® Foamex 832[1]	•	•												
TEGO® Foamex 833[1]	•	•	•	•			•		•		•	•		•
TEGO® Foamex 835	•	•	•									•		
TEGO® Foamex 840	•	•	•	•	•		•	•		•		•		
TEGO® Foamex 842	•	•	•	•			•					•		
TEGO® Foamex 843		•	•				•			•		•		•
TEGO® Foamex 845		•	•	•			•		•			•		
TEGO® Foamex 855	•	•	•				•					•	•	
TEGO® Foamex 883	•		•				•					•	•	
TEGO® Foamex 885	•		•	•			•				•	•	•	
TEGO® Twin 4000		•	•	•			•	•			•	•		•

[1] silicone-free

Wetting and Dispersing Additives

TEGO® Dispers wetting and dispersing additives promote pigment wetting and stabilization. They prevent floating, flooding, and settling of pigments so that color coverage and intensity remain consistent during storage. They ensure maximum color yield for the pigment, while also minimizing the number of milling steps. Because these additives lower viscosity, coatings and pigment concentrates can be produced cost-effectively because pigment concentration can be maximized during dispersion.

For manufacturing waterborne pigment concentrates, we recommend TEGO® Dispers 757 W, which is the preferred product for corrosion-resistant waterborne coatings. Much like TEGO® Dispers 750 W and TEGO® Dispers 755 W, TEGO® Dispers 757 W satisfies high demands in regards to optical properties.

The TEGO® Dispers 65x series' technology is currently the market standard for alkylphenolethoxylate-free universal pastes for waterborne and solventborne formulations. Modern solventborne formulations may be developed particularly well with TEGO® Dispers 656, 670, and 685. For UV systems, we recommend TEGO® Dispers 685 for all pigment types and TEGO® Dispers 688 for matting agents. All TEGO® Dispers products are alkylphenolethoxylate-free.


Anti-settling


Flow characteristics


Gloss


Pigment wetting


Appearance

Wetting and Dispersing Additives for Pigment Concentrates

Product	Waterborne	Polar solvents	Non-polar solvents	2-pack solvent-free	Universal pigment concentrates	Binder-containing	Binder-free	Carbon blacks	Organic pigments	Inorganic pigments	Fillers
TEGO® Dispers 650	•	•	•	•	•	•	•	•	•		
TEGO® Dispers 652		•		•	•	•	•			•	•
TEGO® Dispers 653	•				•	•	•	•	•	•	•
TEGO® Dispers 656	•	•	•	•	•	•	•		•	•	•
TEGO® Dispers 660 C	•				•		•			•	•
TEGO® Dispers 670		•				•	•	•	•	•	•
TEGO® Dispers 671		•	•			•		•	•	•	
TEGO® Dispers 672		•				•		•	•	•	
TEGO® Dispers 685		•		•		•		•	•	•	
TEGO® Dispers 688		•				•	•		•	•	•
TEGO® Dispers 710		•				•		•	•	•	
TEGO® Dispers 735 W	•					•	•			•	•
TEGO® Dispers 740 W	•						•		•		
TEGO® Dispers 745 W	•					•	•	•	•	•	•
TEGO® Dispers 750 W	•					•	•	•	•	•	•
TEGO® Dispers 752 W	•						•			•	•
TEGO® Dispers 755 W	•					•	•	•	•	•	•
TEGO® Dispers 757 W	•					•	•	•	•	•	•
TEGO® Dispers 760 W	•					•		•	•		
TEGO® Dispers 761 W	•					•		•	•		

Wetting and Dispersing Additives for Direct Grind

Product	Waterborne	Solventborne	2-pack solvent-free	High solids	UV	2K EP	2K PU	PES	Acrylate	Alkyd	PU	Styrene acrylic	Vinyl acetate copolymer	Organic pigments/ Carbon black	Inorganic pigments/ Fillers	Mixed pigmentation (inorg./org.)	Remark
TEGO® Dispers 630		•				•		•	•	•		•			•		very good anti-sagging properties
TEGO® Dispers 650	•	•	•	•		•	•	•		•				•			
TEGO® Dispers 652	•	•	•	•	•	•				•		•		•	•	•	good anti-sagging properties
TEGO® Dispers 653	•						•			•				•	•	•	
TEGO® Dispers 656	•	•			•										•		
TEGO® Dispers 670		•		•	•	•	•	•	•		•			•	•		universal use
TEGO® Dispers 671		•				•	•		•	•		•		•	•	•	
TEGO® Dispers 672		•				•	•		•					•	•	•	excellent storage stability in epoxy systems
TEGO® Dispers 685		•	•	•	•		•	•	•					•	•	•	
TEGO® Dispers 688		•			•		•		•					•	•	•	excellent in stabilization of matting agents
TEGO® Dispers 700		•							•						•		best for bentonite pastes
TEGO® Dispers 710		•			•		•		•	•				•	•	•	
TEGO® Dispers 740 W	•											•	•		•		
TEGO® Dispers 745 W	•						•		•		•			•	•	•	
TEGO® Dispers 750 W	•					•	•		•	•	•	•		•	•	•	
TEGO® Dispers 752 W	•								•		•	•	•		•		highly suitable for transparent iron oxides
TEGO® Dispers 755 W	•					•	•	•	•	•	•	•	•	•	•	•	
TEGO® Dispers 757 W	•						•	•	•	•	•	•	•	•	•	•	excellent salt spray resistance
TEGO® Dispers 760 W	•						•	•	•			•		•			
TEGO® Dispers 761 W	•						•	•	•			•		•			

Surface Control Additives

Our multi-purpose surface control additives, **TEGO® Glide and TEGO® Flow,** improve the flow/leveling and reduce cratering. They prevent pigment flooding and flotation. Slip and anti-blocking of a coating can be adjusted.


Anti-graffiti


Anti-cratering


Touch


Slip/anti-blocking


Substrate wetting


Release properties


Flow


Appearance

Surface Control Additives

Product	Waterborne	UV	Solventborne	Slip	Leveling	Low foaming	Compatible	Recoatable	Anti-blocking/scratch resistance	Remark
TEGO® Flow 300 [1]			•		•		•	•		
TEGO® Flow 370 [1]		•	•		•	•	•	•		
TEGO® Flow 425	•	•	•		•		•	•		
TEGO® Flow ATF 2			•	•					•	anti-crater effect
TEGO® Flow ZFS 460 [1]		•	•		•	•		•		
TEGO® Glide 100	•	•	•	•	•		•	•		flow/leveling
TEGO® Glide 110	•	•	•	•	•		•			anti-crater effect
TEGO® Glide 130	•	•	•	•	•		•			
TEGO® Glide 403	•		•	•	•				•	
TEGO® Glide 406	•		•	•	•		•	•		flow/leveling
TEGO® Glide 410	•		•	•	•		•		•	
TEGO® Glide 432		•		•	•	•				
TEGO® Glide 435		•		•	•					
TEGO® Glide 440	•	•	•	•	•		•			
TEGO® Glide 450	•	•	•	•	•		•	•		
TEGO® Glide 482	•			•		•			•	anti-blocking
TEGO® Glide A 115			•	•	•				•	
TEGO® Glide B 1484			•		•	•		•		
TEGO® Glide ZG 400		•	•	•	•		•			

[1] silicone-free

Radiation-Curing Multifunctional Additives

Product	Waterborne UV	UV	Slip/anti-blocking	Wetting	Flow	Low foaming	Compatible	Recoatable	Release
TEGO® Rad 2100		•		•	•		•	•	
TEGO® Rad 2200 N	•	•	•	•	•		•		
TEGO® Rad 2250	•	•	•	•	•		•		
TEGO® Rad 2300		•	•	•	•	•	•		
TEGO® Rad 2500		•	•			•			•
TEGO® Rad 2650		•	•			•			•
TEGO® Rad 2700		•	•			•			•

Radiation-Curing Multifunctional Additives

The **TEGO® Rad** range comprises cross-linkable, acrylate additives for radiation-curing formulations. These multifunctional products improve slip; substrate wetting and anti-cratering; scratch resistance; and leveling. In addition, some of the additives have release and defoaming properties.


Anti-graffiti


Slip/anti-blocking


Release properties


Substrate wetting


Flow


Appearance

Substrate Wetting and Anti-Cratering Additives

TEGO® Wet and **TEGO® Twin** substrate wetting and anti-cratering additives enable uniform wetting for coatings and printing inks, even on very low energy or contaminated surfaces. Good wetting is a fundamental prerequisite for optimum adhesion. Defects in the coating surface – such as cratering and poor leveling – are minimized or improved.


Anti-cratering


Substrate wetting


Appearance

Substrate Wetting and Anti-Cratering Additives

Product	Waterborne	UV	Solventborne	Static	Dynamic	Anti-crater	Low foaming
TEGO® Twin 4000	•		•	•			•
TEGO® Twin 4100	•	•	•	•		•	•
TEGO® Twin 4200	•	•	•	•	•	•	•
TEGO® Wet 240	•			•		•	
TEGO® Wet 251	•			•		•	
TEGO® Wet 260	•			•		•	
TEGO® Wet 265	•			•		•	•
TEGO® Wet 270	•	•	•	•		•	
TEGO® Wet 280	•		•	•		•	
TEGO® Wet 500[1]	•	•			•		•
TEGO® Wet 505[1]	•				•		•
TEGO® Wet 510[1]	•				•		•
TEGO® Wet KL 245	•		•	•		•	

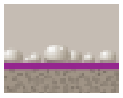
[1] silicone-free

Hydrophobing Agents

Product	Waterborne	Solventborne	Hydrophobing	Water-beading effect	Impregnation	Primer	Silicone resin paints and plasters	Silicate emulsion paints and plasters	Printing inks	Remark
TEGO® Phobe 1000	•		•				•			
TEGO® Phobe 1401	•		•	•			•	•	•	
TEGO® Phobe 1500 N	•	•	•	•			•	•	•	
TEGO® Phobe 1650	•		•				•	•	•	strong early water resistance

Hydrophobing Agents

TEGO® Phobe products are used to make waterborne exterior paints hydrophobic. Used in silicone resin paints in small amounts, TEGO® Phobe 1650 is characterized by low water absorption. For additional water-beading effect, TEGO® Phobe 1401 is recommended.



Hydrophobing

Weather resistance

Anti-Graffiti Additives

TEGO® Protect provides polyurethane coatings with anti-graffiti and easy-to-clean characteristics. This range of products can be used in solvent or waterborne coatings.


Anti-graffiti


Easy to clean


Weather resistance

Anti-Graffiti Additives

Product	Dosage	Applications/effect
TEGO® Protect 5000 N	1–3 %	for matte, unpigmented and/or pigmented formulations, especially good release properties
TEGO® Protect 5001	2–5 %	for clear coats, marked water-beading effect, high solvent resistance
TEGO® Protect 5100 N	2–8 %	for waterborne 2-pack PU anti-graffiti coatings

Other Additives

Product	Waterborne	UV	Solventborne	Solvent-free	Adhesion promoter	Hammer finish	Reduced drying-up	Anti-static
ADDID® 240	•		•	•				•
ADDID® 900[1]	•	•	•		•			
TEGO® Hammer 300000			•			•		
TEGO® Hammer 501[1]	•		•			•		
TEGO® Humectant 7000	•						•	

[1] containing silicone

Anti-static

Adhesion

TEGO Co-Binders

Co-binders are added to the formulation to give the coating or printing ink specific properties. In contrast to additives, the concentrations used with these products range between 5.0–20.0 % relative to the main binder. The incorporation can take place in addition to or as a partial exchange of the main binder.

The two groups of TEGO co-binders are based on different technologies. They offer customized solutions for diverse tasks.

TEGO® VariPlus products are co-binders based on modified ketone-aldehyde resins. Their hard-resin character provides the formulator with a simple means of increasing the hardness, gloss, anti-blocking properties, and drying speed of printing inks and coatings. Their hyper-branched polymeric structures yield low solution viscosities so VOC levels may be reduced.

Ketone-aldehyde resins improve the adhesion properties on many substrates and complement the TEGO® AddBond product group in some applications. Selected products are suitable specifically for pigment grinds with high color strength.

TEGO® AddBond products are acid polyesters which, because of their special polymer structure and type of functional groups, improve the bonding of coatings on plastics and metals, thus increasing corrosion resistance.

This expertise, combined with a sound knowledge of interfacial chemistry, makes Evonik a strong partner for meeting the challenges of coating formulation.

TEGO – Adding Advantages.

- **TEGO® VariPlus**
- **TEGO® AddBond**

TEGO® VariPlus

TEGO® VariPlus products are widely compatible hard resins used as co-binders in paints, lacquers, printing inks, and other inks. They not only increase the solids content and accelerate drying speed, but they also improve numerous properties: hardness, gloss, and film build. Adhesion on various substrates is increased, which – combined with its resistance to hydrolysis – enhances corrosion protection.

Several TEGO® VariPlus products can be used as pigment concentrate resins for the most diverse pigments. This enables excellent gloss to be obtained even at high pigment loading.

Resins such as TEGO® VariPlus SK and TEGO® VariPlus CA which contain hydroxyl groups are also used for modification of (for example PUR) binders.

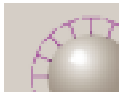

Anti-settling


Drying speed


Flow characteristics


Gloss


Hardness


Pigment wetting


Appearance

TEGO® VariPlus

Product	Waterborne	UV	Solventborne	Adhesion to metal	Adhesion to plastic	Hardness	Gloss	Viscosity reduction / increased solids content	Drying time	Pigment wetting and stabilization	Remark
TEGO® VariPlus AP		•	•	•			•	•			formaldehyde-free, solid
TEGO® VariPlus SK		•	•	•	•	•	•	•	•		formaldehyde-free, solid
TEGO® VariPlus 1201 TF			•		•	•	•		•	•	formaldehyde-free, free of tin-organic components
TEGO® VariPlus CA			•	•			•	•	•		solid
TEGO® VariPlus TC			•	•			•	•		•	solid, very wide compatibility and solubility
TEGO® VariPlus UC	•		•				•	•		•	100 % liquid, very wide compatibility and solubility
TEGO® VariPlus UC W 40	•						•			•	non-ionic solution, free of organic solvents, for formulating universal pigment concentrates
TEGO® VariPlus DS 50	•				•	•	•	•	•	•	formaldehyde-free, aqueous emulsion, free of organic solvents
TEGO® VariPlus 3350 UV		•		•	•		•				in tripropylene glycol diacrylate

TEGO® AddBond

The **TEGO® AddBond** range of products comprises special, widely compatible polyester resins which improve the adhesion of the most diverse coating and printing ink formulations.

Adhesion is improved on numerous critical substrates. The range of products is also effective on metals, minerals, and various plastics. Therefore, TEGO® AddBond products are frequently used in primers (to increase, for example, corrosion protection).

They also improve inter-coat adhesion in multi-coat finishes. In effect finishes, they increase cohesion within the film.

TEGO® AddBond products help to enhance gloss, hardness, and flexibility.


Adhesion


Corrosion protection


Appearance


Weather resistance

TEGO® AddBond

Product	Waterborne	UV	Solventborne	Adhesion on metal	Adhesion on plastic	Hardness	Flexibility	Fixation of aluminum pigments	Remark
TEGO® AddBond LTH		•	•	•		•		•	solid
TEGO® AddBond LTW			•	•	•		•	•	
TEGO® AddBond LTW-B			•	•	•		•	•	
TEGO® AddBond 2220 ND			•	•	•		•	•	especially suitable for alkyd systems
TEGO® AddBond HS			•	•	•		•		especially suitable for high solids coatings
TEGO® AddBond 1270	•		•	•	•		•		after neutralization suitable for waterborne formulations, good acrylate compatibility
TEGO® AddBond 2325			•	•	•		•		especially suitable for thermoplastic acrylic enamels
TEGO® AddBond DS 1300	•			•	•		•	•	aqueous emulsion, free of organic solvents

TEGO Specialty Binders

TEGO specialty binders' unique properties – such as weathering stability and high resistance to heat and cold – originate from a combination of organic chemistry and inorganic silicone chemistry. This distinguishes them from purely organic binders.

Targeted variation of the organic groups on the siloxane backbone results in compounds which, thanks to their broad property spectrum, can be used in many diverse areas of application. Their exceptional properties include excellent chemical resistance, good elasticity, excellent release characteristics, and an especially high level of eco-compatibility.

Because of their highly crosslinked basic structure, TEGO silicone hybrid systems, silicone resins, and silicone resin emulsions have proven particularly valuable as binders wherever especially high demands are required of the coating.

For example, they are particularly suitable for high-temperature resistant, weatherproof, or easy-to-clean pigmented coatings.

TEGO specialty binders enable formulation of air-drying coating systems, as well as the stoving enamels used on ovens, cookware, and exhaust systems.

In new product development, Evonik focuses heavily on eco-friendly products that also comply with the new requirements of the VOC directive. Thanks to our strong concentration on future coating technologies, we are already able to offer aqueous silicone resins for heat-resistant corrosion protection.

TEGO – Adding Advantages.

- **Silicone-Epoxy Resins**
- **Silicone Resins**
- **Silicone-Polyester Resins**
- **High Solids Silicone Hybrid Resins**
- **Silicone-Modified Polyurethane Emulsion**
- **Reactive Silicone-Based Resin Components**

Silicone-Epoxy Resins

The product group **SILIKOPON®** and the product SILIKOFTAL® ED are silicone-epoxy hybrid systems which combine the advantages of both technologies.

SILIKOPON® EF and SILIKOFTAL® ED are ultra-high solids products with very low VOC content. They are the basis for isocyanate-free, air-drying, 2-pack anti-corrosion top coats. The coatings are highly resistant to chemicals and exhibit high color fastness as well as excellent gloss retention during outdoor use.

SILIKOPON® EW is a medium solid silicone-epoxy hybrid resin for high-temperature resistant corrosion protection coatings. It is a stoving resin, and it is distinguished by good adhesion and resistance to solvents.


Anti-graffiti


Easy to clean


Heat resistance


Corrosion protection


Appearance


Weather resistance

Silicone-Epoxy Resins

Product	Non-volatile content	Remark
SILIKOPON® EF	98 %	for 2-pack isocyanate-free curable high solids top coats with a low VOC content (100-250 g/l), with good corrosion, excellent gloss, weathering resistance, and anti-graffiti effect
SILIKOFTAL® ED	100 %	for 2-pack isocyanate-free curable high solids top coats with a low VOC content (100-250 g/l), with good corrosion, weathering resistance, and anti-graffiti effect
SILIKOPON® EW	53 %	stoving system, solventborne, for stoving enamels (heat resistant up to 650 °C, depending on formulation), excellent adhesion, and resistance to solvents

Silicone Resins

Heat resistance up to 650 °C
(formulation dependent)

SILIKOPHEN® products consist of methyl and phenyl-methyl silicone resins which, depending on the formulation, provide corrosion protection up to 650°C. Applications include exhaust systems and combustion chambers.

SILIKOPHEN® P resins are stoving resins and can be cold-blended with organic binders (alkyds or acrylics). They are suitable for manufacturing coatings with numerous properties.

SILIKOPHEN® AC resins are high solids products which cure in the presence of a catalyst at room temperature. These products are ideal for the coating of big objects in high-temperature applications and provide good flexibility during the heating and the cooling process, as well as an early resistance to solvents after application.


Heat resistance


Weather resistance

Silicone Resins

Product	Non-volatile content	Active content	Remark
Curing systems			
SILIKOPHEN® P 40/W	50 %		water reducible, good compatibility with organic resins
SILIKOPHEN® P 50/X	50 %		solventborne, good air drying
SILIKOPHEN® P 80/X	80 %		solventborne, good air drying, for low VOC formulations
Ambient curing systems			
SILIKOPHEN® AC 900		90 %	high solids, solventborne, ambient curing, good flexibility during the heating and the cooling process
SILIKOPHEN® AC 1000		100 %	solvent-free, ambient curing, good flexibility during the heating and the cooling process

Silicone-Polyester Resins

Heat resistance up to 250 °C
(formulation dependent)

With products of the **SILIKOFTAL®** brand, Evonik offers a wide range of aromatic silicone-polyester resins tailored to meet specific customer requirements. The building blocks of the SILIKOFTAL® product range are chemically linked.

This brand combines the properties of silicones (such as heat resistance, weathering resistance, and low surface tension) with those of polyesters (such as low thermoplasticity, high flexibility, and good pigmentability).

The SILIKOFTAL® products comply with FDA/BfR* regulations, making them particularly suitable for inner / outer coatings for cooking utensils and bakeware.


Heat resistance


Appearance

Silicone-Polyester Resins

Product	Silicone content	Properties
SILIKOFTAL® HTT	80 %	retains hardness from room temperature to 150 °C; long-term heat resistance to 250 °C; good detergent resistance. (FDA/BfR)*
SILIKOFTAL® HTS/MPA	70 %	very good resistance to yellowing up to 220 °C. (FDA/BfR)*
SILIKOFTAL® HTL 2	50 %	high gloss, low thermoplasticity, good detergent resistance. (FDA/BfR)*
SILIKOFTAL® HTL 3	30 %	very good yellowing resistance up to 200 °C, very good boiling water resistance. (FDA/BfR)*
SILIKOFTAL non-stick 60	80 %	for release coatings, particularly good demolding of sugar-containing bakery products. (FDA/BfR)*

* U.S. Food and Drug Administration/German Federal Institute for Risk Assessment

High Solids Silicone Hybrid Resins

SILIKOTOP® resins are aliphatic silicone hybrid resins with high solids content. These resins provide excellent properties for the formulation of coatings with low VOC content in general industrial applications.

SILIKOTOP® E 900 and SILIKTOP® E 901 are low viscosity, isocyanate-crosslinking silicone polyester resins used for corrosion protection in top coat applications. Both products provide chemical and weather resistance. They are characterized by their flexibility and mechanical stability. In addition, both products offer excellent processability and good appearance.


Flexibility


Corrosion protection


Appearance


Weather resistance

High Solids Silicone Hybrid Resins

Product	Non-volatile content	Remark
SILIKOTOP® E 900[1]	90 %	corrosion protection, tough elasticity, also for primers and sandable fillers applications
SILIKOTOP® E 901[1]	90 %	corrosion protection, excellent weather resistance, also for direct-to-metal applications

[1] new

Silicone-Modified Polyurethane Emulsion

Non-heat resistant

SILIKOPUR® is a waterborne, silicone-modified 1-pack polyurethane emulsion.

With SILIKOPUR®, very flexible coating systems for a wide range of substrates – such as leather, wood, plastic, rubber, and metal – can be formulated.

Silicone-Modified Polyurethane Emulsion

Product	Non-volatile content	Remark
SILIKOPUR® 8081	33 %	waterborne silicone modified polyurethane emulsion, high flexibility

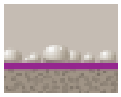
Touch

Flexibility

Reactive Silicone-Based Resin Components

The **TEGOMER®** range of products consists of linear, reactive polydimethylsiloxanes with various terminal functional groups. These are specially developed for modifying binders such as polyurethanes, acrylic resins, polyesters, and epoxides.

The use of TEGOMER® products as reactive co-binders or coatings additives enables unique siloxane properties – flexibility, water repellency, dirt repellency, weather resistance, and slip – to be incorporated into the profile of the organic binder. With the addition of the TEGOMER® products, the properties of the coating can be further optimized.



Hydrophobing

Reactive Silicone-Based Resin Components

Product	Non-volatile content	Remark
TEGOMER® E-Si 2330	100 %	diepoxyalkylpolydimethylsiloxane
TEGOMER® H-Si 2315	100 %	dihydroxypolydimethylsiloxane
TEGOMER® V-Si 2250	100 %	diacryloxypolydimethylsiloxane

TEGO Nanoresins

The nanoresins portfolio offers various products for targeted modification and customization of coatings systems to suit individual applications.

The liquid silica nanocomposites – NANOCRYL®, NANOPOX®, and NANOPOL® – are colloidal dispersions of up to 50% w/w amorphous silica in unsaturated (meth-) acrylates, epoxy resins, or solvents. The spherical SiO_2 particles are monodisperse with a very narrow particle size distribution. The resulting silica nanocomposites are particularly easy to process because of their low viscosity. The effect is a previously unobtainable, targeted improvement in mechanical properties. The surface hardness and scratch/abrasion resistance of coatings can thus be significantly increased without impairing transparency or gloss.

Furthermore coatings can be modified with the reactive resin modifiers, ALBIDUR® and ALBIFLEX®.

ALBIDUR® products enable the unique properties of silicone elastomer particles to be introduced into a coatings system. Higher impact strength over a wide range of temperatures results in considerably improved low temperature performance, while the glass transition temperature and chemical resistance of the base resin are unaffected.

ALBIFLEX® products are flexible epoxy-silicone co-polymers which combine the advantageous properties of both epoxy resins and silicones. The high elasticity, even at very low temperatures, stems from the inherent properties of silicone. The epoxy resin contributes excellent adhesion to various substrates, high mechanical strength, and good chemical resistance.

TEGO – Adding Advantages.

- **NANOCRYL®, NANOPOX® and NANOPOL®**
- **ALBIDUR®**
- **ALBIFLEX®**

Silica Nanocomposites

Evonik's silica nanocomposites are colloidal silica sols in various binders and solvents. These are low viscosity products that are highly transparent and do not exhibit any sedimentation. This means that processability is largely unchanged compared to that of the base resin. The result is an almost perfect combination of the advantageous properties of organic and inorganic materials.

Silica nanocomposites are used wherever these improvements in properties are desirable or necessary without compromising processability. The fact that this can be achieved without impairing optical clarity makes silica nanocomposites particularly suitable for use in transparent formulations. Good examples include highly scratch-resistant, steel wool-resistant clear coats for plastics (e.g. PC, PMMA, and PET) and wood.

NANOCRYL® and NANOPOX® – Silica Nanocomposites for the Modification of Radiation-Curing Coatings

Technical Data

Product	Monomer	Characterization	SiO_2-content [w/w%]	Dynamic viscosity, 25 °C [mPa·s]
NANOCRYL® C 130	CTFA	trimethylol propane formal acrylate	50	275
NANOCRYL® C 140	HDDA	hexanediol diacrylate	50	175
NANOCRYL® C 150	TMPTA	trimethylol propane triacrylate	50	3,300
NANOCRYL® C 153	TMPEOTA	ethoxylated trimethylol propane triacrylate	50	1,000
NANOCRYL® C 155	GPTA	propoxylated glycerine triacrylate	50	1,750
NANOCRYL® C 165	PPTTA	alkoxylated pentaerythritol tetraacrylate	50	2,500
NANOPOX® C 620	EEC	cycloaliphatic epoxy resin for cationic curing	40	4,000
NANOPOX® C 680	TMPO	trimethyl propyl oxirane	50	200

Scratch resistance

Appearance

NANOPOX® – Silica Nanocomposites for the Modification of Heat-Cured Epoxy Resin Coatings

Technical Data

Product	SiO_2-content [w/w%]	Base resin	EEW [g/equiv.]	Dynamic viscosity, 25 °C [mPa·s]	Characterization
NANOPOX® C 620	40	EEC	220	4,000	cycloaliphatic epoxy resin
NANOPOX® C 680	50	TMPO	232	200	reactive diluent for cycloaliphatic systems

Scratch resistance

Appearance

NANOPOL® – Silica Nanocomposites for the Modification of 1- and 2-pack Coatings

Technical Data

Product	Characterization	SiO_2-content [w/w%]	Dynamic viscosity, 25 °C [mPa·s]
NANOPOL® C 764	methoxy propyl acetate	50	20
NANOPOL® C 784	n-butylacetate	50	20

Scratch resistance

ALBIDUR® – Silicone Elastomer Particles for the Modification of Coatings

ALBIDUR® products can be used to modify the fracture toughness of a formulation without affecting the modulus or glass transition temperature and without markedly increasing the viscosity of the mixture. Optimal performance is obtained with the addition of 8–10 % delivery form in the total formulation (without fillers). This leads to a noticeable improvement of the impact strength with scarcely any effect on the modulus.

Impact strength

Technical Data

Product	Silicone content [w/w%]	Base resin	Dynamic viscosity, 25 °C [mPa·s]	Comments
ALBIDUR® EP 2240 A	40	DGEBA	35,000	EEW: 300 g/equiv.
ALBIDUR® PU 5640	40	PPG-triol	2,500	hydroxyl value: 230

ALBIFLEX® – Epoxy-Silicone Copolymer for the Modification of Coatings

ALBIFLEX® combines normally incompatible epoxy-resin and silicone in one homogeneous copolymer which exhibits the benefits of both of its constituent polymers:

- the epoxy component provides excellent adhesion to numerous substrates, high mechanical strength, and good chemical resistance
- the silicone component provides high elasticity (even at very low temperatures), good thermal and aging resistance, and excellent dielectric properties

Flexibility

Technical Data

Product	Silicone content [w/w%]	Base resin	EEW [g/equiv.]	Dynamic viscosity, 25 °C [mPa·s]
ALBIFLEX® 348	60	DGEBA	1,150	30,000

Web Seminars – Learn more about the world of TEGO additives, co-binders, specialty resins, and nanoresins

This online initiative enables you to obtain important and useful information on our products and their dynamic functionalities. Participants can communicate directly with our experts via a chat function while keeping the user's identity hidden. The platform gives you and your team direct access to information and training from the location you deem most convenient. All you need is a PC and an Internet connection.

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Masthead

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