



Agrochemicals

Additives for crop protection products and fertilizers

Operating in 17 countries, in 39 different locations, PCC SE currently employs over 3 300 people.



About us

The PCC Group is an international capital structure made up of dozens of companies operating in three major sectors of the economy: Chemicals, Energy and Logistics. The organizations within the PCC Group are both business units engaged in production activities and service companies operating simultaneously for the external market.

The PCC Group is centrally managed by the German company PCC SE and comprises more than 74 companies at 39 locations in 17 countries around the world. One of the key elements of PCC SE's strategy is the dynamic development of the chemicals business by exploiting

the potential of new market segments and diversifying the portfolio of raw materials and chemical formulations in line with current trends in various industries. Every day, our specialists work on the stable growth and development of their organizations, making the PCC Group stronger and building a solid business platform for all contractors interested in reliable and long-term cooperation.

PCC ROKITA SA PCC PCG OXYALKYLATES IRPC	PCC ROKITA SA	PCC ROKITA SA	PCC EXOL SA PCC CHEMAX INC PCC PCG OXYALKYLATES	PCC SYNTEZA
Polyols 	Chlorine 	Phosphorus 	Surfactants 	Alkylphenols 
• Polyether polyols • Polyester polyols • Prepolymers • Polyurethane Systems	• Chlorine • MCAA • Other Chlorine Downstream Product	• Phosphorus derivatives • Naphthalene derivatives • Polycarboxyethers (PCE)	• Anionic surfactants • Cationic surfactants • Nonionic surfactants • Amphoteric surfactants (betaines) • Chemical formulation	• Nonylphenol • Dodecylphenol • Tristyrylphenol

PCC CONSUMER PRODUCTS SA	PCC ROKITA SA	PCC INTERMODAL SA	PCC BAKKISILICON HF.	PCC SE
Consumer Products 	Energy 	Logistics 	Silicon 	Holding & Projects 
• Household & industrial Cleaners, Detergents and Personal Care Products	• Renewable Energy • Conventional Energy	• Intermodal transport • Road Haulage • Rail Transport	• Microsilica • Silicon Metal	• Portfolio Management • Project Development



About PCC Exol

PCC Exol your sustainable partner with crop protection formulations.

PCC Exol is the unquestionable leader in its industry in Central and Eastern Europe. Most of the production facilities and the company's headquarters are located in Brzeg Dolny, near Wrocław in Poland. This is where we design, test, and manufacture a wide range of anionic, nonionic, amphoteric surfactants as well as specialized industrial formulations.

Anionic, Nonionic, Cationic, Amphoteric Surfactants

- over 700 products and formulations
- 7 manufacturing plants
- 144,000 tons of production capacity



Natural fatty Alcohols & Natural Oils

Oleochemicals



Polymers & Synthetic fatty Alcohols

Petrochemicals





Table of contents

Applications of Surfactants in Agrochemicals	8
EXOemul Series – effective emulsifiers for EC and EW formulations	20
EXOWet Series – tank mix adjuvants	22
EXOcal 60 & EXOcal 60B & EXOcal 60EH – Basic electrosteric emulsifiers for EC, EW and SE formulations	24
ROKAmer 6500 & ROKAmer 6500W – Basic co-dispersants and wetting agents for SC, FS and SE formulations and potential emulsifier in EW	26
ROKAnol TSP16 and related products – EXOfos series: PT-E, PT-A & PT-A75, PT-K60 & K25 as good dispersing agents for hydrophobic substances and good emulsifying agents	27

Applications of Surfactants in Agrochemicals

The agrochemical industry focuses its efforts on developing active ingredients specifically designed to help farmers fight weeds, fungi, pests and other, destroying their crops. Such active co-formulants are not suitable for use in their raw state. Instead, they must be formulated with specialist additives, co-formulant and adjuvants which improve active delivery and performance.

PCC Exol products have many uses and applications across the broad spectrum of crop protection formulations and adjuvants. Our focus is the development of additives, which enhance the performance of customers formulations. The following table shows different product groups and their main applications by formulation type.

Product group	EC	SC	EW	ME	OD	SL	WG	SG	WP	SP
Alkyl Sulfates		•			•	•	•	•	•	•
Alkylbenzene Sulfonates	•	•	•	•	•	•				
Alkyl Ether Sulfates		•	•	•		•				
Sulfosuccinates		•	•	•		•				
Betaines		•				•				
Fatty Amine Ethoxylates	•	•	•	•	•	•	•	•		
Alkylphenol Ethoxylates	•	•	•	•	•	•				
Alcohol Alkoxylates	•	•	•	•	•	•				
Sorbitan Esters	•		•	•	•					
Sorbitan Esters Ethoxylates	•		•	•	•	•				
Oils Ethoxylates	•		•	•	•					
Fatty Acid Alkoxylates	•		•	•	•		•	•		
EO/PO Block Copolymers	•	•	•	•		•				
Phosphate Esters	•	•			•					

Formulation codes:

EC – Emulsifiable Concentrate
 SC – Suspension Concentrate
 EW – Emulsion in Water
 ME – Microemulsion
 OD – Oil Dispersion

SL – Soluble Concentrate
 WG – Water Dispersible Granules
 SG – Water Soluble Granules
 WP – Water Dispersible Powders
 SP – Water Soluble Powders

Surfactants

are used primarily as wetting agents, emulsifiers and dispersing agents but also have uses as low foaming agents and anti-caking agents. They play a very important role as adjuvants and additives in crop-protection formulations.

Adjuvants

are used to aid or modify the action of agrochemical or their physical characteristics. Adjuvants must be adjusted to the pesticides, the crop species, the weed species and the prevailing environment for maximum effectiveness. Adjuvants are already included in the formulations of some pesticides available for sale or they may be purchased separately and added into a tank mix prior to use. In this way, adding an appropriate adjuvant can decrease the amount of pesticide applied and lower the total costs of weed control.

Wetting agents

are substances that decrease the surface tension which permits spreading drops onto a surface increasing the spreading abilities of a liquid. The molecules of these compounds are composed of a hydrocarbon chain with low affinity to water and a hydrophilic head. They form micelles, thanks to which they allow for easy distribution of liquids and perfect moisturizing of the surface. They also have the ability to remove air from solids.

Emulsifiers

are substances that enable the formation of emulsions and prevent the reaggregation of molecules. Emulsifiers are chemical compounds of amphiphilic structure, which means that hydrophilic polar groups (called 'head') and hydrophobic non-polar groups (called 'tail') are present in their structure. The emulsifier molecules adsorb at the phase boundary, reducing the interfacial tension. After reducing the tension, a spontaneous emulsification process takes place under the influence of the movement of particles. The resulting stable system is called an emulsion.

Dispersing agents

are substances that break down larger particles and prevent their further reaggregation. The dispersion system consists of two immiscible phases – one of which is a continuous phase and the other is a dispersed phase. Additional mechanical energy is required to disperse the substance, which will cause the dispersant to mix with the phases that make up the system. Dispersants adsorb on the surface of the particles of the phase to be dispersed. Surfactant molecules surrounding the droplets protect them from reaggregation due to electrostatic repulsion.

Low foaming agents

are additives whose main role is to prevent the formation of abundant foam. Low-foaming preparations are used wherever the effect of rapid growth and stabilization of the foam is undesirable. Not only do they reduce foaming, but they also act as surfactants, and because of that they are also characterized by wetting and emulsifying properties. These products are required to be active in a wide temperature range and to be compatible with other ingredients in the preparations.

Anti-caking agents

are additives used in the most type of powder and granulated products or materials. They are used so that the powdered or granulated content doesn't form lumps in moist conditions and can be packed easily. The most common anti-caking agents for fertilizers contain oils and fats to avoid the interaction of fertilizer particles with that of the atmosphere. Anti-caking agents operate by increasing the separation of the single particles, reducing the absorption of moisture and regulating the growth of crystals.



Product portfolio – Anionic Surfactants

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
Alkylbenzene Sulfonates											
ABS Acid	Dodecylbenzene Sulfonic Acid	85536-14-7	liquid	–	34	min. 96.0	•	•		•	
ABSNa 30	Sodium Dodecylbenzenesulfonate	68411-30-3	liquid	–	–	28-32	•	•		•	
ABSNa 50	Sodium Dodecylbenzenesulfonate	68411-30-3	paste/liquid	–	37	48-52	•	•		•	
ABSNa 60	Sodium Dodecylbenzenesulfonate	68411-30-3	paste	–	–	59-62	•	•		•	
EXOcal 60	Calcium Dodecylbenzenesulfonate in n-butanol	–	liquid	–	–	60	•				
EXOcal 60B	Calcium Dodecylbenzenesulfonate in isobutanol	–	liquid	–	–	60	•				
EXOcal 60EH	Calcium Dodecylbenzenesulfonate in 2-ethylhexanol	–	liquid	–	–	60	•				
Alkyl Sulfates											
ROSULfan C/PH MB	Sodium Coco Sulfate	68955-19-1	liquid	–	36	29-33	•	•			
ROSULfan D	Sodium Decyl Sulfate	142-87-0	liquid	–	46	35-37	•	•			
ROSULfan L	Sodium Lauryl Sulfate	85586-07-8	liquid	–	31	27.5-30	•	•			
Alkyl Ether Sulfates											
SULFOROKAnol L225/1	Sodium Laureth Sulfate	68891-38-3	liquid	–	30	25-27	•	•			
SULFOROKAnol L227/1	Sodium Laureth Sulfate	68891-38-3	liquid	–	38	26-28	•	•			
SULFOROKAnol L270/1	Sodium Laureth Sulfate	68891-38-3	liquid paste	–	36	68-72	•	•			
SULFOROKAnol L270/1A	Sodium Laureth Sulfate	68891-38-3	liquid paste	–	34	68-76	•				
SULFOROKAnol L327	Sodium Pareth Sulfate	125301-92-0	liquid	–	37	26-28	•				
SULFOROKAnol L327/1K	Sodium Laureth Sulfate	68891-38-3	liquid	–	–	25-27	•				
SULFOROKAnol L370	Sodium Pareth Sulfate	125301-92-0	liquid paste	–	37	68-72	•				
SULFOROKAnol L370/1	Sodium Laureth Sulfate	68891-38-3	liquid paste	–	38	68-72	•				
Sulfosuccinates											
Sulfosuccinate DOSS	Diethylhexyl Sodium Sulfosuccinate	577-11-7	liquid	–	–	min. 60.0	•	•		•	
Sulfosuccinate DOSS70E	Diethylhexyl Sodium Sulfosuccinate in Ethanol	577-11-7	liquid	–	25	68-72	•	•		•	
Sulfosuccinate DOSS70GP	Diethylhexyl Sodium Sulfosuccinate in propylene glycol	577-11-7	liquid	–	–	min. 70.0	•	•		•	
Sulfosuccinate L3/40	Disodium Laureth Sulfosuccinate	39354-45-5	liquid	–	–	min. 38	•	•		•	

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent

Phosphate Esters

EXOfos PB-136	Tridecyl Ether Phosphate, ethoxylated	9046-01-9	liquid	–	28	min. 98.0	•	•			
EXOfos PB-139	Tridecyl Ether Phosphate, ethoxylated	9046-01-9	liquid	–	34	min. 98.0	•	•			
EXOfos PB-184	Oleyl Ether Phosphate, ethoxylated	39464-69-2	liquid	–	35	min. 97.0	•				
EXOfos PB-264	Lauryl Ether Phosphate, ethoxylated	68511-37-5	viscous liquid	–	32	min. 96.0	•				
EXOfos PT-E	Tristyrylphenol Ether Phosphate, ethoxylated	90093-37-1	viscous liquid	–	44	min. 98.0	•	•		•	
EXOfos PT-A	Tristyrylphenol Ether Phosphate, ethoxylated, triethanolamine salt	105362-40-1	viscous liquid	–	–	min. 97	•	•		•	
EXOfos PT-A75	Tristyrylphenol Ether Phosphate, ethoxylated, triethanolamine salt	–	viscous liquid	–	–	74-77		•		•	
EXOfos PT-K60	Tristyrylphenol Ether Phosphate, ethoxylated, potassium salt	–	viscous liquid	–	–	58-61		•		•	
EXOfos PT-K25	Tristyrylphenol Ether Phosphate, ethoxylated, potassium salt	–	liquid	–	–	24-26		•		•	

Product portfolio – Nonionic Surfactants

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent

Alcohol Alkoxyates

ROKAnol DB3	Alcohols, C12-15, ethoxylated	68131-39-5	liquid/paste	7.8	27	min. 99.7	•				
ROKAnol DB5	Alcohols, C12-15, ethoxylated	68131-39-5	liquid	10.5	28	min. 99.5	•				
ROKAnol DB7	Alcohols, C12-15, ethoxylated	68131-39-5	liquid/paste	12.0	29	min. 99.5	•	•			
ROKAnol DB7R	Alcohols, C12-15, ethoxylated	68131-39-5	liquid	12.0	28	min. 99.5	•	•			
ROKAnol DB7W	Alcohols, C12-15, ethoxylated	68131-39-5	oily liquid	12.0	29	91-93	•	•			
ROKAnol DB9	Alcohols, C12-15, ethoxylated	68131-39-5	paste	13.2	30	min. 99.5	•	•			
ROKAnol DB9W	Alcohols, C12-15, ethoxylated	68131-39-5	liquid	13.2	29	89-91	•	•			
ROKAnol DB11	Alcohols, C12-15, ethoxylated	68131-39-5	paste	13.6	33	min. 99.0	•	•			
ROKAnol DB11W	Alcohols, C12-15, ethoxylated	68131-39-5	oily liquid/paste	13.6	34	88-92	•	•			
ROKAnol GA3	Alcohols, C10, ethoxylated	160875-66-1	liquid with tendency to separation	9.0	28	min. 99.5	•				

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
ROKAnol GA4	Alcohols, C10, ethoxylated	160875-66-1	liquid with tendency to separation	10.5	27	min. 99.5	•				
ROKAnol GA4LA	Alcohols, C10, alkoxyated	166736-08-9	liquid with tendency to separation	–	28	min. 99.5	•				
ROKAnol GA5	Alcohols, C10, ethoxylated	160875-66-1	liquid with tendency to separation	11.5	27	min. 99.5	•				
ROKAnol GA7	Alcohols, C10, ethoxylated	160875-66-1	liquid with tendency to separation	13.0	27	min. 99.5	•	•	•		
ROKAnol GA7W	Alcohols, C10, ethoxylated	160875-66-1	liquid	13.0	27	84-86	•	•	•		
ROKAnol GA7LA	Alcohols, C10, alkoxyated	166736-08-9	liquid with tendency to separation	–	28	min. 99.5	•	•	•		
ROKAnol GA7LAW	Alcohols, C10, alkoxyated	166736-08-9	liquid	–	28	84-86	•	•	•		
ROKAnol GA8	Alcohols, C10, ethoxylated	160875-66-1	liquid with tendency to separation/paste	14.0	28	min. 99.5	•	•	•		
ROKAnol GA8W	Alcohols, C10, ethoxylated	160875-66-1	liquid	14.0	28	84-86	•	•	•		
ROKAnol GA9	Alcohols, C10, ethoxylated	160875-66-1	paste/liquid with tendency to separation	14.5	28	min. 99.5	•	•	•		
ROKAnol GA9W	Alcohols, C10, ethoxylated	160875-66-1	liquid	14.5	28	84-85	•	•	•		
ROKAnol GA9LA	Alcohols, C10, alkoxyated	166736-08-9	liquid with tendency to separation	–	30	min. 99.5	•	•	•		
ROKAnol ID3	Alcohols, C10, branched, ethoxylated	78330-20-8	liquid with tendency to separation in time	–	26	min. 99.5	•	•			
ROKAnol ID5	Alcohols, C10, branched, ethoxylated	78330-20-8	liquid	11.7	27	min. 99.5	•	•			
ROKAnol ID6	Alcohols, C10, branched, ethoxylated	78330-20-8	liquid	12.4	27	min. 99.5	•	•			
ROKAnol ID7	Alcohols, C10, branched, ethoxylated	78330-20-8	liquid	13.2	27	min. 99.5	•	•			
ROKAnol ID8	Alcohols, C10, branched, ethoxylated	78330-20-8	liquid	13.8	28	min. 99.5	•	•			
ROKAnol ID11	Alcohols, C10, branched, ethoxylated	78330-20-8	paste	15.0	33	min. 99.5	•	•			
ROKAnol IT3	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid with tendency to separation	8.0	28	min. 99.0	•				
ROKAnol IT5	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid with tendency to separation	10.5	29	min. 99.5	•				
ROKAnol IT6	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	11.4	28	min. 99.5	•				
ROKAnol IT6R	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	11.5	27	min. 99.5	•	•			
ROKAnol IT7	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	12.1	29	min. 99.0	•	•			
ROKAnol IT7P	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	12.1	–	min. 99.0	•	•			
ROKAnol IT7W	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	12.1	29	89-91	•	•			
ROKAnol IT8	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid/paste	12.8	27	min. 99.5	•	•			
ROKAnol IT8W	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	12.8	27	89-91	•	•			
ROKAnol IT9	Alcohols, C13, branched, ethoxylated	69011-36-5	oily liquid/paste	13.3	28	min. 99.0	•	•			

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
ROKAnol IT9R	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	13.4	28	min. 99.0	•	•			
ROKAnol IT9S	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	–	–	min. 99.5	•	•			
ROKAnol IT9W	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	13.3	28	89-91	•	•			
ROKAnol IT10	Alcohols, C13, branched, ethoxylated	69011-36-5	turbid liquid/paste	13.8	29	min. 99.5	•	•			
ROKAnol IT10W	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	13.8	29	84-86	•	•			
ROKAnol IT12	Alcohols, C13, branched, ethoxylated	69011-36-5	turbid liquid/paste	14.5	29	min. 99.5	•	•			
ROKAnol IT12W	Alcohols, C13, branched, ethoxylated	69011-36-5	liquid	14.5	29	89-91	•	•			
ROKAnol K3	Alcohols, C16-18 and C18-unsatd., ethoxylated	68920-66-1	semi-liquid paste	7.0	–	min. 99.0	•				
ROKAnol K5	Alcohols, C16-18 and C18-unsatd., ethoxylated	68920-66-1	liquid/paste	9.2	–	min. 99.0	•				
ROKAnol K7	Alcohols, C16-18 and C18-unsatd., ethoxylated	68920-66-1	liquid/semi-liquid paste	10.8	31	min. 99.0	•				
ROKAnol K14	Alcohols, C16-18 and C18-unsatd., ethoxylated	68920-66-1	paste/wax	14.0	–	min. 99.0	•				
ROKAnol K18	Alcohols, C16-18 and C18-unsatd., ethoxylated	68920-66-1	paste/wax	16.3	41	min. 99.0	•				
ROKAnol K21	Alcohols, C16-18 and C18-unsatd., ethoxylated	68920-66-1	paste/wax	16.5	–	min. 99.0	•				
ROKAnol LK1	Alcohols, C12-14, ethoxylated	68439-50-9	liquid	–	24	min. 99.8	•				
ROKAnol LK2	Alcohols, C12-14, ethoxylated	68439-50-9	liquid	6.2	23	min. 99.8	•				
ROKAnol LK3	Alcohols, C12-14, ethoxylated	68439-50-9	liquid	7.8	26	min. 99.0	•				
ROKAnol L3A	Alcohols, C12-16, ethoxylated	68551-12-2	liquid	7.8	26	min. 99.0	•				
ROKAnol L4	Alcohols, C12-14, ethoxylated	68439-50-9	liquid	10.0	27	min. 99.5	•				
ROKAnol L4P5	Alcohols, C12-14, alkoxyated	68439-51-0	liquid	–	30	min. 99.5		•	•		
ROKAnol L5A	Alcohols, C12-16, ethoxylated	68551-12-2	liquid	10.5	27	min. 99.5	•				
ROKAnol L5P5	Alcohols, C12-14, alkoxyated	68439-51-0	liquid	–	31	min. 99.5		•	•		
ROKAnol L7	Alcohols, C12-14, ethoxylated	68439-50-9	liquid	12.9	29	min. 99.0	•	•			
ROKAnol L7A	Alcohols, C12-16, ethoxylated	68551-12-2	liquid	12.9	29	min. 99.0	•	•			
ROKAnol L7W	Alcohols, C12-14, ethoxylated	68439-50-9	liquid	12.9	29	89-91	•	•			
ROKAnol L10	Alcohols, C12-14, ethoxylated	68439-50-9	paste	14.1	–	min. 99.5	•	•			
ROKAnol L10A	Alcohols, C12-16, ethoxylated	68551-12-2	paste	14.1	33	min. 99.5	•	•			
ROKAnol LP2023	Alkoxyated fatty alcohol	68002-96-0	liquid	–	33	min. 99.5		•	•		
ROKAnol LP2024W/95	Alkoxyated fatty alcohol	37251-67-5	liquid	6.3	29	min. 95.0		•	•		

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
ROKAnol LP2126	Alkoxylated fatty alcohol	68002-96-0	liquid	–	33	min. 99.5	•	•			
ROKAnol LP2529	Alkoxylated fatty alcohol	68551-13-3	liquid	–	31	min. 99.5	•	•			
ROKAnol LP100	Alkoxylated fatty alcohol	120313-48-6	liquid	–	36	min. 95.0	•	•			
ROKAnol LP200	Alkoxylated fatty alcohol	68439-30-5	liquid	–	31	min. 99.5	•	•			
ROKAnol LP400	Alkoxylated fatty alcohol	103818-93-5	liquid	–	29	min. 99.5	•	•			
ROKAnol LP700	Alkoxylated fatty alcohol	196823-11-7	liquid	–	28	min. 99.5	•	•			
ROKAnol LP3034	Alkoxylated fatty alcohol	120313-48-6	liquid	–	31	min. 99.0	•	•			
ROKAnol LP3135	Alkoxylated fatty alcohol	154518-36-2	liquid	–	30	94-96	•	•			
ROKAnol LP3943	Alkoxylated fatty alcohol	120313-48-6	liquid	–	30	min. 99.0	•	•			
ROKAnol NL3	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	8.5	26	min. 99.8	•				
ROKAnol NL4	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	10.6	27	min. 99.5	•				
ROKAnol NL5	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	11.6	27	min. 99.5	•	•			
ROKAnol NL6	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	12.5	27	min. 99.5	•	•			
ROKAnol NL6W	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	12.5	–	min. 90.0	•	•			
ROKAnol NL8	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	13.8	29	min. 99.5	•	•			
ROKAnol NL8P4	Alcohols, C9-11, alkoxyated	103818-93-5	liquid	–	31	min. 99.0	•	•			
ROKAnol NL9	Alcohols, C9-11, ethoxylated	68439-46-3	liquid	–	30	min. 99.5	•	•			
ROKAnol O3	Alcohols, C16-18 unsaturated, ethoxylated	9004-98-2	liquid	7.1	–	min. 99.0	•				
ROKAnol O5	Alcohols, C16-18 unsaturated, ethoxylated	9004-98-2	liquid	9.1	32	min. 99.0	•				
ROKAnol O10	Alcohols, C16-18 unsaturated, ethoxylated	9004-98-2	paste/semi-solid	12.2	–	min. 99.0	•				
ROKAnol O18	Alcohols, C16-18 unsaturated, ethoxylated	9004-98-2	paste	16.3	–	min. 99.5	•				
ROKAnol O20	Alcohols, C16-18 unsaturated, ethoxylated	9004-98-2	paste	15.3	–	min. 99.5	•				
ROKAnol O100	Alcohols, C16-18 unsaturated, ethoxylated	9004-98-2	wax	18.9	–	min. 99.0	•				
ROKAnol RZ4P11	Alcohols, C16-18, alkoxyated	68002-96-0	liquid	12.5	33	min. 99.0	•	•			
ROKAnol T6	Alcohols, C16-18, ethoxylated	68439-49-6	wax	10.0	–	min. 99.5	•				
ROKAnol T10	Alcohols, C16-18, ethoxylated	68439-49-6	wax	13.0	–	min. 99.5	•				
ROKAnol T12	Alcohols, C16-18, ethoxylated	68439-49-6	wax	13.5	–	min. 99.5	•				
ROKAnol T18	Alcohols, C16-18, ethoxylated	68439-49-6	wax	16.3	42	min. 99.0	•				

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
ROKAnol T20	Alcohols, C16-18, ethoxylated	68439-49-6	wax	15.3	–	min. 99.0	•				
ROKAnol T20 FLAKES	Alcohols, C16-18, ethoxylated	68439-49-6	flakes	15.3	–	min. 99.0	•				
ROKAnol T25	Alcohols, C16-18, ethoxylated	68439-49-6	wax	16.0	–	min. 99.0	•				
ROKAnol T25 FLAKES	Alcohols, C16-18, ethoxylated	68439-49-6	flakes	16.0	–	min. 99.0	•				

Alkylphenol Ethoxylates

ROKAnol TSP16	Tristyrylphenol, ethoxylated	99734-09-5	viscous liquid	13.5	–	min. 99.5	•	•		•	
ROKAnol TSP20	Tristyrylphenol, ethoxylated	99734-09-5	liquid/paste	14.0	–	min. 99.5	•	•		•	
ROKAnol TSP40	Tristyrylphenol, ethoxylated	99734-09-5	wax	16.0	–	min. 99.0	•	•		•	
ROKAnol TSP40/20	Tristyrylphenol, ethoxylated	99734-09-5	liquid	16.0	47	19-21				•	
EXOdiss AG-137	Tristyrylphenol, alkoxyated	70880-56-7	liquid/paste	12.0	39	min. 99.5	•	•		•	
ROKAfenol N3	Nonylphenol, ethoxylated	127087-87-0	oily liquid	8.0	–	min. 99.0	•			•	
ROKAfenol N4	Nonylphenol, ethoxylated	127087-87-0	oily liquid	8.8	–	min. 99.0	•			•	
ROKAfenol N5	Nonylphenol, ethoxylated	127087-87-0	oily liquid	10.0	–	min. 99.0	•			•	
ROKAfenol N6	Nonylphenol, ethoxylated	127087-87-0	oily liquid	11.0	–	min. 99.0	•			•	
ROKAfenol N7	Nonylphenol, ethoxylated	127087-87-0	oily liquid	11.6	–	min. 99.0	•			•	
ROKAfenol N8	Nonylphenol, ethoxylated	127087-87-0	oily liquid	12.5	–	min. 99.0	•			•	
ROKAfenol N9	Nonylphenol, ethoxylated	127087-87-0	oily liquid	12.8	–	min. 99.0	•			•	
ROKAfenol N10	Nonylphenol, ethoxylated	127087-87-0	oily liquid	13.3	–	min. 99.0	•			•	
ROKAfenol N12	Nonylphenol, ethoxylated	127087-87-0	liquid/paste	14.0	–	min. 99.0	•			•	
ROKAfenol N14	Nonylphenol, ethoxylated	127087-87-0	semi-liquid paste	14.5	–	min. 99.0	•			•	
ROKAfenol N22	Nonylphenol, ethoxylated	127087-87-0	paste/wax	16.2	–	min. 99.0	•			•	
ROKAfenol N22/30	Nonylphenol, ethoxylated	127087-87-0	liquid	16.2	–	25-30	•			•	

Fatty Amine Ethoxylates

ROKAmin K5	Cocamine, ethoxylated	61791-14-8	liquid	–	31	min. 99.0	•	•			•
ROKAmin K15	Cocamine, ethoxylated	61791-14-8	liquid	–	40	min. 99.0	•	•			•
ROKAmin SR5	Tallow amine, ethoxylated	61791-26-2	liquid/semi-liquid paste	–	32	min. 99.0	•				•
ROKAmin SR8	Tallow amine, ethoxylated	61791-26-2	liquid/paste	–	–	72-77	•				•
ROKAmin SR8P4	Tallow amine, alkoxyated	68213-26-3	liquid	8.8	–	–	•				•

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
ROKAmin SR11	Tallow amine, ethoxylated	61791-26-2	liquid/semi-liquid paste	–	–	min. 99.0	•				•
ROKAmin SR15	Tallow amine, ethoxylated	61791-26-2	liquid/semi-liquid paste	14.1	41	min. 99.5	•				•
ROKAmin SR22	Tallow amine, ethoxylated	61791-26-2	paste	–	44	min. 99.0	•				

Fatty Acid/Oils Alkoxyates

ROKAcet K7	Cocotate, ethoxylated	61791-29-5	liquid	–	–	min. 99.0	•				•
ROKAcet O7	Oleate, ethoxylated	9004-96-0	liquid	–	33	min. 99.0	•				•
ROKAcet R11	Castor oil, ethoxylated	61791-12-6	liquid	–	35	min. 99.5	•			•	
ROKAcet R26	Castor oil, ethoxylated	61791-12-6	liquid	–	41	min. 99.5	•			•	
ROKAcet R36	Castor oil, ethoxylated	61791-12-6	liquid/semi-liquid paste	13.0	41	min. 99.0	•			•	
ROKAcet R40	Castor oil, ethoxylated	61791-12-6	paste	–	41	min. 99.0	•			•	
ROKAcet R40W	Castor oil, ethoxylated	61791-12-6	liquid	–	41	89-91	•			•	
ROKAcet R70	Castor oil, ethoxylated	61791-12-6	paste	–	42	min. 99.0	•			•	
ROKAcet R250	Castor oil, ethoxylated	61791-12-6	solid	18.5	–	min. 99.0	•			•	
ROKAcet RZ17	Rapeseed oil, ethoxylated	70914-02-2	oily liquid	–	32	min. 99.0	•				
ROKAcet S24	Stearate, ethoxylated	9004-99-3	wax	–	–	min. 99.0	•			•	•
ROKAcet S7	Stearate, ethoxylated	9004-99-3	paste/wax	–	32	min. 99.0	•	•		•	•

Fatty Acid Amide Ethoxylates

ROKAamid MRZ4	Amides, Rape Oil, ethoxylated	85536-23-8	liquid	–	33	–	•				
ROKAamid MRZ17	Amides, Rape Oil, ethoxylated	221045-17-6	liquid/paste	–	–	–	•				

EO/PO Block Copolymers

ROKAmer 1000	PPG/PEG Copolymer	9003-11-6	liquid	–	44	min. 99.0	•		•		
ROKAmer 1010	PPG/PEG Copolymer	9003-11-6	wax	–	40	min. 99.0	•		•	•	
ROKAmer 1010/50	PPG/PEG Copolymer	9003-11-6	liquid	–	36	49-51			•	•	
ROKAmer 2000	PPG/PEG Copolymer	9003-11-6	liquid	–	39	min. 99.0	•	•	•	•	
ROKAmer 2100	PPG/PEG Copolymer	9003-11-6	liquid	–	41	min. 99.0	•		•	•	
ROKAmer 2330	PPG/PEG Copolymer	9003-11-6	liquid	–	37	min. 99.0	•		•	•	
ROKAmer 2400	PPG/PEG Copolymer	9003-11-6	liquid	–	42	min. 99.5	•		•	•	
ROKAmer 2600	PPG/PEG Copolymer	9003-11-6	liquid	–	37	min. 99.0	•	•	•	•	

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
ROKAmer 2950	PPG/PEG Copolymer	9003-11-6	liquid/semi liquid paste	–	42	min. 99.0	•		•	•	
ROKAmer 6500	PPG/PEG Copolymer	9003-11-6	wax	–	35	min. 99.5	•	•		•	
ROKAmer 6500W	PPG/PEG Copolymer	9003-11-6	liquid	–	36	17–19		•		•	
ROKAmer R2800	PEG/PPG Copolymer	9003-11-6	liquid	–	40	min. 99.5	•	•	•	•	
ROKAmer PP450	Polyoxypropylene Glycol	25322-69-4	liquid	–	50	min. 99.8	•		•		
ROKAmer G1000	Glycerine, alkoxylated	9082-00-2	liquid	–	47	min. 99.5			•	•	
ROKAmer G3400	Glycerine, alkoxylated	9082-00-2	liquid	–	–	min. 99.8			•	•	
ROKAmer G3500	Glycerine, alkoxylated	9082-00-2	liquid	–	42	min. 99.5			•	•	
ROKAmer G3800	Glycerine, alkoxylated	9082-00-2	liquid	–	37	min. 99.5			•	•	
ROKAmer G4300	Glycerine, alkoxylated	9082-00-2	liquid	–	36	min. 99.7			•	•	

Polyethylene Glycols

POLIKol 200	Polyoxyethylene glycol	25322-68-3	liquid	–	–	min. 99.5			•		
POLIKol 300	Polyoxyethylene glycol	25322-68-3	liquid	–	–	min. 99.5			•		
POLIKol 400	Polyoxyethylene glycol	25322-68-3	liquid	–	58	min. 99.5			•		
POLIKol 600	Polyoxyethylene glycol	25322-68-3	liquid/paste	–	50	min. 99.5			•		
POLIKol 800	Polyoxyethylene glycol	25322-68-3	paste/solid	–	–	min. 99.5			•		
POLIKol 1000	Polyoxyethylene glycol	25322-68-3	wax	–	41	min. 99.0			•		
POLIKol 1500	Polyoxyethylene glycol	25322-68-3	wax	–	–	min. 99.0			•	•	
POLIKol 1500 FLAKES	Polyoxyethylene glycol	25322-68-3	flakes	–	–	min. 99.0			•	•	
POLIKol 2000	Polyoxyethylene glycol	25322-68-3	wax	–	–	min. 99.5			•	•	
POLIKol 2000 FLAKES	Polyoxyethylene glycol	25322-68-3	flakes	–	–	min. 99.5			•	•	

Sorbitan Esters

ROKwin 80	Sorbitan monooleate	1338-43-8	liquid	4.3	25	min. 98.5	•			•	
-----------	---------------------	-----------	--------	-----	----	-----------	---	--	--	---	--

Sorbitan Esters Ethoxylates

ROKwinol 20	Sorbitan monolaureate, ethoxylated	9005-64-5	liquid	–	36	min. 97.0	•			•	
ROKwinol 60	Sorbitan monostearate, ethoxylated	9005-67-8	liquid/paste	–	37	min. 99.0			•	•	
ROKwinol 80	Sorbitan monooleate, ethoxylated	9005-65-6	liquid/semi-liquid paste	–	–	min. 97.0	•			•	

Product portfolio – Amphoteric Surfactants

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
Betaines											
ROKAmina K30	Cocamidopropyl Betaine	97862-59-4	liquid	–	29	29-32		•			
ROKAmina K30B	Coco Betaine	66455-29-6	liquid	–	–	29-32		•			
ROKAmina K30K	Cocamidopropyl Betaine	97862-59-4	liquid	–	–	29-32		•			
ROKAmina K40	Cocamidopropyl Betaine	97862-59-4	liquid	–	–	37-42		•			
ROKAmina K40HC	Cocamidopropyl Betaine	97862-59-4	liquid	–	–	37-42		•			
ROKAmina L30B	Lauryl Betaine	66455-29-6	liquid	–	–	29-31		•			

Product portfolio – Surfactant Blends

Product name	Description	CAS	Appearance	HLB	Surface tension at 25°C [mN/m]	Active content [%]	Function				
							Emulsifier	Wetting agent	Low-foaming agent	Dispersing agent	Anti-caking agent
EXOantifoam S100	Mixture	–	liquid	–	–	–			•		
EXOdis AG-94	Mixture	–	paste/gel	–	37	–	•	•		•	
EXOdis PC40	Sodium Salt of Polyacrylic Acid	9003-04-7	liquid	–	–	min. 40				•	
EXOdis PC40A	Ammonium Salt of Polyacrylic Acid	9003-04-6	liquid	–	–	min. 40				•	



EXOemul Series – effective emulsifiers for EC and EW formulations

Emulsifiers – agents that promote the formation of an emulsion. An emulsifier contains water soluble hydrophilic parts and oil-soluble lipophilic parts. Adding an emulsifier to a mixture of water and oil, the emulsifier is arranged on the interface, anchoring its hydrophilic part into water and its lipophilic part into oil.

On the interface of water, the hydrophilic part and the lipophilic part are adsorbed and arranged around the interface. It reduces interfacial tension. The result is that oil and water is easily mixed.

The hydrophilicity and lipophilicity are different among emulsifiers, and the balance between the two is called HLB value (ranges from 0 to 20). An emulsifier with higher lipophilicity shows a lower HLB whereas higher hydrophilicity has high HLB.

The EXOemul series is a group of emulsifier blends dedicated to the formulation of EC and EW plant protection products as well as to the preparation of adjuvants (tank mixes) based on mineral oils, vegetable oils and their derivatives. EXOemul series shows high emulsifying efficiency and ensures the stability of emulsions.

Action of EXOemul:

- enable emulsification of the oil phase into aqueous phase by decreasing interfacial tension,
- they ensure spontaneous emulsification and the formation of milky emulsions when the formulation is added to water,
- introduce electrostatic and steric stabilization to the fine droplets; preventing coalescence or flocculation,
- improve compatibility with other components in the aqueous phase.

Advantages

- excellent emulsifying and stabilizing properties,
- excellent solubility in vegetable and mineral oils,
- good solubility in organic solvents.

Benefits

- nonylphenol free,
- ensures emulsion stability over time.



Physical and chemical properties of our emulsifiers

EXOemul	OM2	OM3 LSP	EM260	A3	AG-4	AG-6
Appearance at (20-25)°C	yellow liquid	yellow to dark yellow liquid	light brown liquid	viscous yellow liquid	liquid	liquid
pH	5.0-7.0 (1% solution B)	7.0-9.5 (1% solution B)	6.0-8.0 (1% solution C)	5.0-8.0 (2% solution B)	5.0 – 8.0 (5% solution C)	5.0 – 8.0 (5% solution C)
Color	max. 6 (Gardner at 20-25°C)	max. 250 (Hazen at 20-25°C)	max. 10 (Gardner at 20-25°C)	max. 500 (Hazen at 40°C)	–	–
Solubility in water	insoluble	insoluble	weak	very good	insoluble	soluble
Other solvents	octanol, acetone, ethyl ether, methanol	methanol, ethyl ether	octanol, ethyl ether, methanol, acetone	methanol, ethyl ether, acetone, xylene	methanol, ethyl ether, acetone	methanol, benzene, xylene
Flash point [°C]	>120	approx. 110	approx. 120	approx. 53	28	128
Density at 20°C [g/cm³]	0.90-1.00	0.95-1.05	0.95-1.10	1.05-1.07	approx. 0.99	approx. 1.09
Melting point/ freezing point [°C]	approx. 1	approx. -12	approx. -15	approx. 8	< -20	approx. 7
Viscosity at 20°C [mPa·s]	approx. 50	approx. 60	approx. 2300	approx. 3000	approx. 630	approx. 1700
HLB	9.2	–	–	10.5	9.6	12.6

Example of formulations:

EXOemul OM2 15 – 25%
Paraffin oil 75 – 85%

EXOemul OM3 LSP 15 – 25%
Paraffin oil 75 – 85%

EXOemul EM260 15 – 25%
Tebuconazole 24 – 26%
Rapeseed oil methyl esters 15 – 25%
N,N-dimethylformamide 10 – 20%
Other additives 0.5 – 2%
Water up to 100%

EXOemul A3 10 – 20%
Alpha cypermethrin 10 – 11%
Solvent naphtas (e.g. Solvesso 100) up to 100%

EXOemul AG-4, EXOemul AG-6 10 – 13%
Alpha cypermethrin 10 – 11%
Solvent naphtas (e.g. Solvesso 100) up to 100%



EXOWet Series – tank mix adjuvants

Wetting agents play a crucial role in crop spraying. Thanks to their amphiphilic structure and small, mobile molecules, they migrate efficiently to liquid–solid and liquid–gas interfaces, where they lower surface tension in aqueous solutions.

This function is particularly important during the milling of suspension formulations (SC and FS): wetting agents reduce suspension viscosity, enhance grinding efficiency and prevent premature wear of the bead mill.

The EXOWet product series can also be used as standalone tank adjuvants; their addition improves spray formation, retention and leaf coverage. Enhancing these spray properties translates into more effective treatments or the same efficacy at lower doses of plant protection products.

Action of EXOWet:

- decreases a surface tension of a working fluid,
- causes spreading of a liquid drop contributing to perfect wetting of a leaf surface,
- improves coverage of a leaf surface by sprayed agrochemicals,
- causes retention of liquid droplets on plants,
- facilitates substances penetration into a plant,
- prevents washing of agrochemicals by rain and dew.

Advantages

- excellent wetting properties,
- reduces the surface tension of the spray liquid, allowing it to spread,
- increases spraying efficiency,
- faster absorption of substances by penetrating the cuticular wax.

Benefits

- lower pesticide doses, which:
 - contribute to cost reduction of crop protection,
 - reduce a negative impact on the environment.

Spray coverage test performed using a spray chamber on water-sensitive paper.

with wetting agent



without wetting agent



Physical and chemical properties of wetting agents

EXOwet	D15	L5	T7	A7W	N5	R3823	R3831
Appearance at (20-25)°C	colorless liquid	clear or slightly turbid liquid	clear or slightly turbid liquid	clear or cloudy liquid	clear or slightly turbid liquid	liquid	liquid
pH	4.5 – 7.5 (1% solution B)	4.6 – 7.4 (1% solution B)	5.0 – 7.0 (1% solution B)	5.0 – 7.0 (1% solution B)	5.0 – 7.0 (1% solution B)	4.0 – 7.0 (5% solution C)	4.0 – 7.0 (5% solution C)
Solubility in water	very good	very good	limited, creates turbid solutions	good	good	good in cold water	good in cold water
Other solvents	methanol, acetone, methyl ester	acetone, ethyl ether	acetone	low aliphatic alcohols, acetone, ethyl ether	methanol, acetone	methanol, acetone	methanol, acetone
Flash point [°C]	>200	>120	>200	>170	>200	>200	>200
Density [g/cm ³]	approx. 0.99 (at 25°C)	approx. 0.97 (at 25°C)	approx. 0.97 (at 30°C)	approx. 0.95 – 1.00 (at 30°C)	approx. 0.98 (at 25°C)	approx. 1.02 (at 25°C)	–
Melting point/ freezing point [°C]	approx. -20	approx. 0	approx. 2	–	approx. 3	< -20	approx. -20
Viscosity [mPa·s]	approx. 65 (at 20°C)	approx. 40 (at 20°C)	approx. 130 (at 20°C)	approx. 120 (at 20°C)	approx. 40 (at 25°C)	–	–
Application range	50 ml/100 l of working fluid	0.05 – 0.5%	0.05 – 0.5%	0.05 – 0.5%	0.05 – 0.5%	0.5 – 1.0%	0.5 – 1.0%

Application:

EXOwet series can be used with crop protection products for which it is recommended to use wetting agents. EXOwet L5 and T7 are specially recommended to use with foliar fertilizers.



EXOcal 60 & EXOcal 60B & EXOcal 60EH – Basic electrosteric emulsifiers for EC, EW and SE formulations

The products are calcium dodecylbenzenesulfonate CaDDBS salts in three different variants in: n-butanol, isobutanol and 2-ethylhexanol. Due to its structure, the substance is characterized by a low HLB of

about 8.6 and an electrosteric mechanism of action, which ensures spontaneous emulsification and emulsion stability over time.

Advantages

- excellent emulsifying and stabilizing properties,
- ideal for use with pesticides,
- product soluble in most organic solvents.

Benefits

- ensures uniform distribution of active ingredients during application,
- nonylphenol free,
- ensures emulsion stability over time.



Physicochemical properties of EXOcal: 60, 60B and 60EH

Physical and chemical properties	EXOcal 60	EXOcal 60B	EXOcal 60EH
Appearance at (20-25)°C	liquid	liquid	liquid
Water [% m/m]	max. 1.0	max. 1.0	max. 0.5
pH of 5% solution i sopropanol: water 1:1, at 20°C	5.0 – 7.5	4.6 – 7.4	5.0 – 7.5
Content active substance [% m/m]	approx. 60	approx. 60	approx. 60
Water solubility	insoluble	insoluble	insoluble
Other solvents	alcohols, xylene, ketones, aromatic hydrocarbons	xylene, kerosene	xylene, kerosene
Density at 25 °C [g/cm ³]	approx. 0.97	approx. 0.98	approx. 1.00
Flash point [°C]	approx. 39	approx. 30	approx. 65
Odor	characteristic	characteristic	characteristic



ROKAmer 6500 & ROKAmer 6500W – Basic co-dispersants and wetting agents for SC, FS and SE formulations and potential emulsifier in EW

The products are EO/PO block copolymers. Due to their large molecule of 6.5 KDa and the presence of both hydrophilic and lipophilic groups, they have both dispersing and wetting properties. They work perfectly with ionic dispersants, stabilize suspensions and reduce viscosity during wet grinding. They are also hygroscopic,

which limits too rapid evaporation of the spray from the plants after treatment and ensures better access to water by the seeds after sowing in the case of seed treatments-this has a positive effect on their germination and growth.

Advantages

- dispersing properties,
- wetting properties,
- hygroscopicity,
- solubility in water,
- product not classified as a hazardous substance,
- product approved for contact with food,
- product reactivity – possibility of modification with other substances.

Benefits

- chemical stability,
- compatibility with other surfactants,
- versatility.

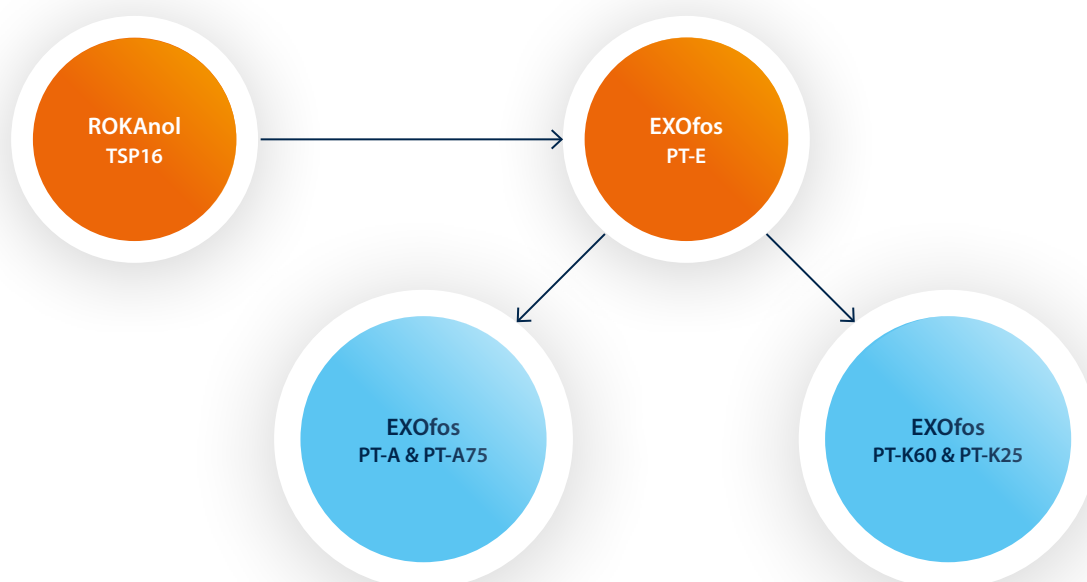
Physicochemical properties of ROKAmers: 6500 and 6500W

Physical and chemical properties	ROKAmer 6500	ROKAmer 6500W
Appearance at 20-25°C	wax	clear liquid
Iodine color scale at 40°C	–	max. 2
Iodine color scale at 70°C	max. 3	–
pH of 5% water solution at 20°C	5.0 – 8.0	5.5 – 8.5
Water [% m/m]	max. 0.5	82
Hydroxyl value [mg KOH/g]	17	17
Molecular weight [g/mol]	6500	6500
Water solubility	good	very good
Density at 25°C [g/cm ³]	1.04	1.02
Viscosity at 25°C [mPa·s]	–	approx. 10
Viscosity at 60°C [mPa·s]	approx. 600	–
Freezing point [°C]	48	-4
Preservative	–	MIT max. 100 ppm

ROKAnol TSP16 and related products – EXOfos series: PT-E, PT-A & PT-A75, PT-K60 & K25 as good dispersing agents for hydrophobic substances and good emulsifying agents

The series of products based on tristyrilphenol is distinguished by its versatility. As can be seen in the attached diagram, the basis of all products is ROKAnol TSP16, which is an amphiphilic non-ionic surfactant with a branched hydrophobic part and a linear hydrophilic part. Its modification is EXOfos PT-E, where a negatively charged phosphate group is additionally attached to the hydrophilic part. EXOfos PT-E is an excellent base for creating various salts and two groups of them, i.e. EXOfos PT-A and PT-K are the last elements of the puzzle. The products work great as dispersants in

SC and FS formulations, especially for hydrophobic substances, they also show some wetting properties. For EC and EW formulations, ROKAnol TSP16, EXOfos PT-E and EXOfos PT-A are recommended, where they are distinguished by good emulsifying properties as high HLB emulsifiers and, in the case of phosphates, additionally electrosteric emulsifiers. In SE formulations, all of the above products can act in a triple way: as dispersants, emulsifiers and wetting agents, which makes them very good co-formulants in this type of formulation.



Physicochemical properties of ROKAnol TSP16 and EXOfos PT-E

Physical and chemical properties	ROKAnol TSP16	EXOfos PT-E
Appearance at 20-25°C	viscous liquid	viscous liquid
Hazen color at 50°C	max. 200	–
pH of 5% water solution at 20°C	5.0 – 8.0	1.0 – 3.0
Acid number (to second inflection point) [mg KOH/g]	–	50 – 70
Cloud point (aqueous solution) [°C]	58 – 62	–
Water [% m/m]	max. 1	max. 1
Molecular weight [g/mol]	approx. 1060	–
Water solubility	good	very good
Other solvents	aliphatic alcohols	–
Density at 20°C [g/cm³]	1.12	1.14
Viscosity at 20°C [mPa·s]	approx. 1500	approx. 4500
Freezing point [°C]	approx. 11	approx. -1

Physicochemical properties of EXOfos series: PT-A and PT-A75

Physical and chemical properties	EXOfos PT-A	EXOfos PT-A75
Appearance at 20-25°C	viscous liquid	viscous liquid
pH of 5% water solution at 20°C	7.0 – 8.0	7.0 – 8.0
Water [% m/m]	max. 2.5	approx. 25
Water solubility	very good	very good
Density at 20°C [g/cm³]	1.15	1.09
Viscosity at 20°C [mPa·s]	approx. 3000	approx. 1600
Freezing point [°C]	below -20	approx. -11

Physicochemical properties of EXOfos series: PT-K60 and PT-K25

Physical and chemical properties	EXOfos PT-K60	EXOfos PT-K25
Appearance at 20-25°C	viscous liquid	clear liquid
pH of 5% water solution at 20°C	7.0 – 8.0	–
pH of 10% water solution at 20°C	–	7.0 – 8.0
Acid number [mg KOH/g]	1 – 3	–
Water [% m/m]	approx. 35	approx. 70
Water solubility	very good	very good
Density at 20°C [g/cm ³]	0.97	1.05
Viscosity at 20°C [mPa·s]	approx. 3000	approx. 1600
Freezing point [°C]	-19	-5



Notes for guidance concerning the functional parameters and notation used in the catalogue

HLB (Hydrophilic-Lipophilic Balance)

The hydrophilic-hydrophobic balance is a parameter that determines the ratio of the content of the hydrophilic group and that of the hydrophobic group in a particle. The validity scope of the HLB number for non-ionic surface-active compounds is included within the range of 0 to 20 and is the measure of the share of the hydrophilic group in the particle

$$\text{HLB} = 20 \cdot \frac{\text{molecular mass of hydrophilic part}}{\text{molecular mass of compound}}$$

On the other hand, for aqueous solution of ionic surface active agents, they acquire additional transformations increasing their degree of hydrophilicity, the value of the HLB number goes up to 40.

HLB for ester type compounds (ethoxylated fatty acids):

$$\text{HLB} = 20 \cdot \left(1 - \frac{\text{LZ}}{\text{LK}}\right)$$

LZ – saponification number of ethoxylated product, mg KOH/g

LK – acid number of acids subjected to ethoxylated product, mg KOH/g

On the basis of the HLB scale, the range of the utility fitness of surface-active agents can be determined.

Cloud point

Cloud point is an indicator determining the behavior of water or other organic solutions of non-ionic surfactants. Solutions of surfactants become cloudy during heating and revert to a clear solution at a certain temperature when cooled – this temperature is defined as 'cloud point'.

Depending on the temperature range at which the solution becomes cloudy, five determination methods are distinguished:

Method A – aqueous solution (10 – 90°C)

Method B – solution of NaCl 50 g/l (>90°C)

Method C – solution of NaCl 100 g/l (>90°C)

Method D – solution 45 g of butyl diglycol/water (<10°C)

Method E – solution 25 g of butyl diglycol/water (<10°C)

HLB number	EO content in product [%]	Product application
1-3	5-15	Anti-foaming agent
4-6	20-30	W/O emulsifier
7-11	35-55	Wetting agent
8-18	40-90	O/W emulsifier
10-15	50-75	Detergent
10-18	50-90	Solubilizer





PCC Group

Sienkiewicza 4

56-120 Brzeg Dolny, Poland

products@pcc.eu

Please visit our capital group business platform:

[**www.products.pcc.eu**](http://www.products.pcc.eu)



July 2026

The information in the catalogue is believed to be accurate and compiled to the best of our knowledge; however, it should be considered as introductory only. Detailed information about our products is available in TDS and MSDS.

The suggestions for product applications are based on our best knowledge.

The responsibility for the use of products in conformity or otherwise with the suggested application, and for determining product suitability for the user's own purposes rests with the user.

All copyright and trademark rights, as well as other intellectual and industrial property rights and the resulting rights to use this publication and its contents have been transferred to PCC Rokita SA or PCC EXOL SA or its licensors. All rights reserved.

Users/readers are not entitled to reproduce this publication in whole or in part, nor are they entitled to reproduce it (excluding reproduction for personal use) or to transfer it to third parties.

Permission to reproduce it for personal use does not apply to data used in other publications, electronic information systems, or other media publications. PCC Rokita SA and PCC EXOL SA shall not be responsible for data published by users.