ROKAnol LP Series

pcc Exol

ROKAnol LP Series

Chemical description

ROKAnols with low foaming properties are non-ionic surfactants. They are ethylene and propylene oxides adducts to various types of alcohols and can be represented by follow structure

$$RO(CH_2CH_2O)_x[CH(CH_3)CH_2O]_yH$$

where: R = fatty alcohol radical
x = average number of ethylene oxide units
y = average number of propylene oxide units

Applications

ROKAnols with low foaming properties are multipurpose products which are used in variety of applications, where antifoaming, dispersing, wetting properties and detergency plays important role, i.e. in detergents, or I&I applications. Low foaming surfactants are very useful for low-foam and no-foam applications. They are especially suitable for:

- Automatic dishwashing detergents
- Laundry detergents
- Textile industry
- Agriculture
- Paints and coatings
- Rinse aids
- Hard surface cleaners
- Pulp and paper

Basic physical and chemical properties

ROKAnol	L4P5	L5P5	LP2024W/95	NL8P4	B2	RZ4P11
Appearance at 20-25 °C	Clear or slightly turbid liquid	Clear or slightly turbid liquid	Clear liquid	Clear or slightly turbid liquid	Turbid liquid	Clear or turbid liquid
Concentration [%]	apprx. 100	approx. 100	approx. 95	approx. 100	approx. 100	approx. 100
Hazen colour at 40°C	usually <100	max. 100	max. 100	max. 200	usually <100	–
Cloud point [°C]						
Method A 1% in water solution	approx. 25	27-31	approx. 23	38-48	30-39	insoluble
Method B 1% solution in 5% NaCl solution	approx 16	20,3	approx. 16	approx. 36	approx. 26	insoluble
Method C 1% solution in 10% NaCl solution	< 10	13	<10	approx. 28	approx. 18	insoluble
Method D 10% solution in 25% BDG solution	approx. 46	approx. 48	approx. 49	approx. 60	approx. 47	approx. 30
Method E 16.7% solution in 25% BDG solution	approx. 42	approx. 42	approx. 42	approx. 55	approx. 43	23-27
Average molar mass [g/mol]	650	730	500	740	1000	1080
Water content [%, by weight]	max. 0.5	max. 0.5	max. 5.0	max. 1.0	max. 0.5	max. 1.0
Approx. Solidification point [°C]	approx. -12	approx. -9	approx. -15	approx. -6	approx. 0	approx. -15
pH in deionized water, at 20°C	5.5-8.5 1% solution	5.0-7.0 1% solution	5.0-7.0 1% solution	5.0-7.0 1% solution	5.5-8.5 1% solution	5.5-8.5 1% solution
Density at 25°C [g/cm^3]	approx. 0.97	approx. 0.97	approx. 0.98	approx. 1.00	approx. 0.98	approx. 0.96
Viscosity at 25°C [cP]	approx. 60	approx. 70	approx. 50	approx. 80	approx. 130	approx. 110

Basic physical and chemical properties

ROKAnol	LP100	LP180	LP200	LP220	LP400	LP700	LP911	LP3034
Appearance at 20-25 °C	Liquid	Colorless to yellowish liquid	Clear or turbid liquid	Liquid	Clear or cloudy liquid	Liquid	Liquid	Clear liquid
Concentration [%]	approx. 95	approx. 100	approx. 100	approx. 97	approx. 100	approx. 100	approx. 100	approx. 100
Hazen colour at 40°C	max. 100 (20-25 °C)	approx. 150	max. 100	max.50	max. 100 (20-25°C)	max. 100 (50°C)	max. 100	max. 100
Cloud point [°C]								
Method A 1% in water solution	72-76	approx. 17	< 10	36-40	39-42	20-24	9-11	18.5
Method B 1% solution in 5% NaCl solution	approx. 57	insoluble	insoluble	approx. 27	approx. 30	approx. 13	insoluble	<10
Method C 1% solution in 10% NaCl solution	approx. 47	insoluble	insoluble	approx. 19	approx. 21	< 10	insoluble	<10
Method D 10% solution in 25% BDG solution	approx. 71	approx. 38	approx. 43	approx. 54	approx. 53	approx. 56	approx. 33	36.8
Method E 16.7% solution in 25% BDG solution	approx. 69	32-35	37-41	approx. 49	39-42	20-24	approx. 28	30-34
Average molar mass [g/mol]	1100	1870	680	790	640	540	920	740
Water content [%, by weight]	max. 5	max. 0.5	max. 0.5	max. 3.0	max. 0.5	max. 0.5	max. 0.5	max. 1.0
Approx. Solidification point [°C]	approx. 10	< -20	< -15	approx. -12	< -5	< -10	< -20	< -20
pH in deionized water, at 20°C	5-7 1% solution	5-8 5% solution	5-7 1% solution	5-8 5% solution	5-7 1% solution	5-7 1% solution	5-7 5% solution	5-7 1% solution
Density at 25°C [g/cm^3]	approx. 1.04	approx. 1.01	approx. 0.99	approx. 1.01	approx. 1.00	approx. 0.98	approx. 0.99	approx. 0.97
Viscosity at 25°C [cP]	approx. 245	approx. 240	approx. 100	max.200	approx. 90	approx. 70	approx. 100	approx.100

Basic physical and chemical properties

ROKAnol	LP3135	LP3943	LP60	LP64	LP66	LP550	LP1319	LP2023
Appearance at 20-25 °C	Turbid liquid	Clear liquid	Clear liquid	Liquid	Liquid	Clear liquid	Clear liquid	Clear liquid
Concentration [%]	approx. 95	approx. 100	approx. 100	approx. 100	approx. 97	approx. 100	approx. 100	approx. 100
Hazen colour at 40°C	max. 100	–	max. 200 (20-25 °C)	max. 70	max. 70	max. 50 (20-25°C)	max.150 (20-25°C)	max. 100 (20-25°C)
Cloud point [°C]								
Method A 1% in water solution	31-35	< 10	insoluble	<10	approx. 15	<10	< 10	insoluble
Method B 1% solution in 5% NaCl solution	approx. 24	< 10	insoluble	<10	<10	<10	< 10	insoluble
Method C 1% solution in 10% NaCl solution	approx. 18	insoluble	insoluble	<10	<10	<10	< 10	insoluble
Method D 10% solution in 25% BDG solution	approx. 51	approx. 50	14-18	60-62	approx. 69	26-30	approx. 20	approx. 26
Method E 16.7% solution in 25% BDG solution	approx. 45	39-43	< 10	approx. 55	64-68	23-25	13-19	20-23
Average molar mass [g/mol]	620	550	770	770	1000	1550	1530	1060
Water content [%, by weight]	max. 6	max. 0.5	max. 1.0	max. 0.5	max. 3.0	max. 0.3	max. 0.5	max. 0.5
Approx. Solidification point [°C]	< -6	< -20	< -20	approx. 2	approx. 4	approx. -14	< -20	approx. -10
pH in deionized water, at 20°C	5-7 1% solution	5-7 2.5% solution	6-8 1% solution	5-7 1% solution	5-7 1% solution	5-7 1% solution	4-7 1% solution	5-7 1% solution
Density at 25°C [g/cm^3]	approx. 1.00	approx. 0.95	approx. 0.96	approx. 0.96	approx. 0.98	approx. 1.00	approx. 0.98	approx. 0.97
Viscosity at 25°C [cP]	approx. 100	approx. 55	approx. 100	approx. 115	approx. 160	max.300	approx.200	approx. 140

Basic physical and chemical properties

ROKAnol	LP2227	LP2500	LP2855
Appearance at 20-25 °C	Clear liquid	Clear liquid	Clear / slightly turbid liquid
Concentration [%]	approx. 100	approx. 100	approx. 100
Hazen colour at 40°C	max.100	max. 40	max. 100
Cloud point [°C]			
Method A 1% in water solution	22-27	31-35	27-31
Method B 1% solution in 5% NaCl solution	approx. 15	approx. 24	approx. 30
Method C 1% solution in 10% NaCl solution	approx. 12	approx. 15	12-14
Method D 10% solution in 25% BDG solution	approx. 48	approx. 48	approx. 49
Method E 16.7% solution in 25% BDG solution	approx. 43	approx. 45	42-44
Average molar mass [g/mol]	approx. 490	approx. 670	approx. 630
Water content [%, by weight]	max. 0.5	max. 0.5	max. 0.5
Approx. Solidification point [°C]	approx. -3	approx. -1	< -10
pH in deionized water, at 20°C	5-7 1% solution	6-8 5% solution	5-7 1% solution
Density at 25°C [g/cm^3]	approx. 1.00	approx. 0.98	approx. 0.97
Viscosity at 25°C [cP]	approx. 300	approx. 80	approx. 50

Basic physical and chemical properties

ROKAnol	LP3841	LP600	LP1300	LP2424	LP1012	LP160	LP42	LP610	LP27	LP3
Appearance at 20-25 °C	Clear or slightly Turbid liquid	Liquid	Turbid strawy liquid	Light yellow clear liquid	Liquid	Clear liquid	Clear liquid	Yellow clear liquid	Clear or slightly Turbid liquid	Clear liquid
Concentration [%]	approx. 100	approx. 100	approx. 100	approx. 100	approx. 100	approx. 100	approx. 100	approx. 99	approx. 100	approx. 100
Hazen colour at 40°C	max. 100	max. 40	max. 100 (20-25°C)	approx. 28 (25°C)	max. 100	max. 100 (50°C)	max. 70 (20-25°C)	approx. 240	max. 100	max. 100 (25°)
Cloud point [°C]										
Method A 1% in water solution	38-48	31-35	insoluble	insoluble	10-12	approx. 59	insoluble	approx. 73	27-31	insoluble
Method B 1% solution in 5% NaCl solution	approx. 37	approx. 24	insoluble	insoluble	35-40	approx. 44	insoluble	approx. 30	approx. 20	insoluble
Method C 1% solution in 10% NaCl solution	approx. 29	approx. 15	insoluble	insoluble	insoluble	approx. 32	insoluble	20-22	approx. 13	insoluble
Method D 10% solution in 25% BDG solution	approx. 60	approx. 48	approx. 28	29.1	approx. 36	74-76	50-54	57-62	48-50	22-24
Method E 16.7% solution in 25% BDG solution	approx. 56	approx. 45	20-23	28.6	27-29	approx. 76	42-46	approx. 54	approx. 43	< 10
Average molar mass [g/mol]	approx. 740	approx. 6760	approx. 1060	approx. 490	approx. 800	approx. 1600	approx. 670	approx. 650	approx. 730	approx. 374
Water content [%, by weight]	max. 1	max. 0.5	max. 05	max. 0.5	max. 0.5	max. 1	max. 1	max. 1.5	max. 0.5	max. 0.5
Approx. Solidification point [°C]	approx. -5	approx. -9	approx. -10	< -20	< -20	approx. 18	approx. 6	approx. -3	approx. -10	< -20
pH in deionized water, at 20°C	5 -7 5% solution	6-8 1% solution	5-7 1% solution	5-7 1% solution	6 -7.5 1% solution	5-8 10% solution	5-7 1% solution	4 -6 1% solution	5-7 1% solution	5-7 5% solution
Density at 25°C [g/cm^3]	approx. 1.00	approx. 0.98	approx. 0.97	0.93 - 0.97	approx. 0.96	approx. 1.0 (50°C)	approx. 0.94	approx. 1.01	approx 0.97	approx. 0.9
Viscosity at 25°C [cP]	approx. 100	approx. 80	approx. 150	< 100	approx. 40	approx. 100	approx. 100	approx.100	approx. 100	approx.100

Additional information

Solubility

Solubility in water and other solvents has been shown in the table below.

Solubility – at 25°C, 10% SOLUTIONS

○ macroscopic phase separation ● clear, homogeneous solution ● homogeneous, opalescent solution

ROKAnol SERIES	DEMINERALIZED WATER	METHANOL	ETHYL ETHER	ACETONE
L4P5	●	●	○	●
L5P5	●	●	○	●
LP2024W/95	●	●	○	●
NL8P4	●	●	○	○
B2	●	●	○	○
RZ4P11	●	●	○	○
LP100	●	●	○	●
LP180	●	●	○	●
LP200	○	●	○	●
LP220	●	●	○	●
LP400	●	●	●	●
LP700	○	●	○	●
LP911	○	●	●	●
LP3034	○	●	●	●
LP3135	●	●	○	●
LP3943	○	●	●	●
LP60	●	●	○	○
LP64	○	●	○	●
LP66	○	●	○	○
LP550	○	●	●	●
LP1319	○	●	●	●
LP2023	○	●	●	●
LP2227	●	●	○	●
LP2500	●	●	○	●
LP2855	●	●	○	●
LP3841	●	●	○	○
LP600	●	●	○	○
LP1300	○	●	●	●
LP2424	●	●	●	●
LP1012	○	●	●	●
LP160	●	●	○	●
LP42	●	●	●	●
LP610	●	●	●	●
LP27	●	●	○	●
LP3	●	●	●	●

Foaming capability – modified Ross-Miles

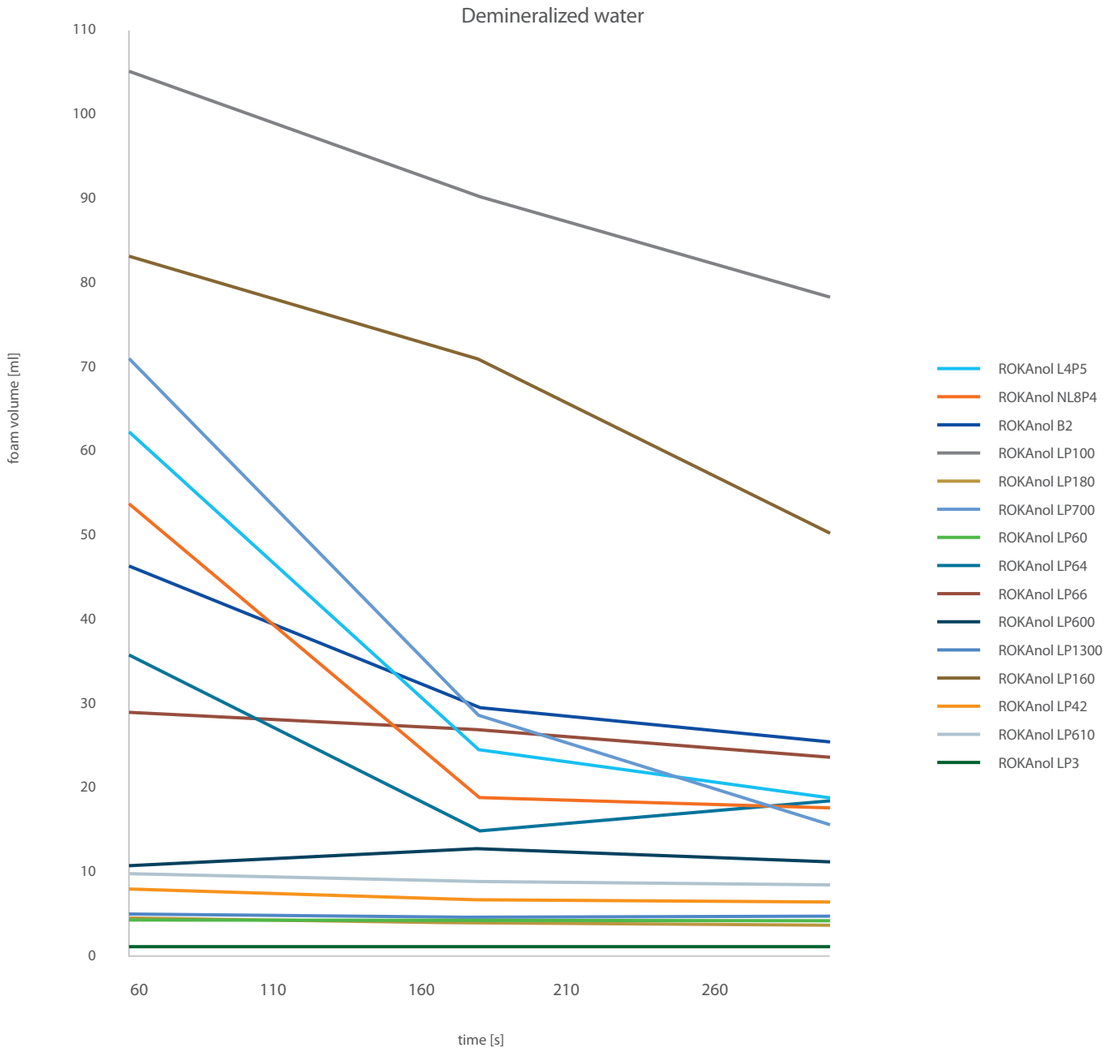
ROKAnols from low foaming range exhibit desired properties like good detergency, efficient wettability, degreasing abilities. Difference between low foaming ROKAnols and standard non-ionic surfactants is in their low foaming capability. Due to that, these products can be used in many application where foam is problematic. Determination of the foaming capability was preformed according to PN-ISO 696:1994 (the modified Ross-Miles method) for solution with a concentration of 1.0 g/l in deionised and hard water at a temperature of 25°C.

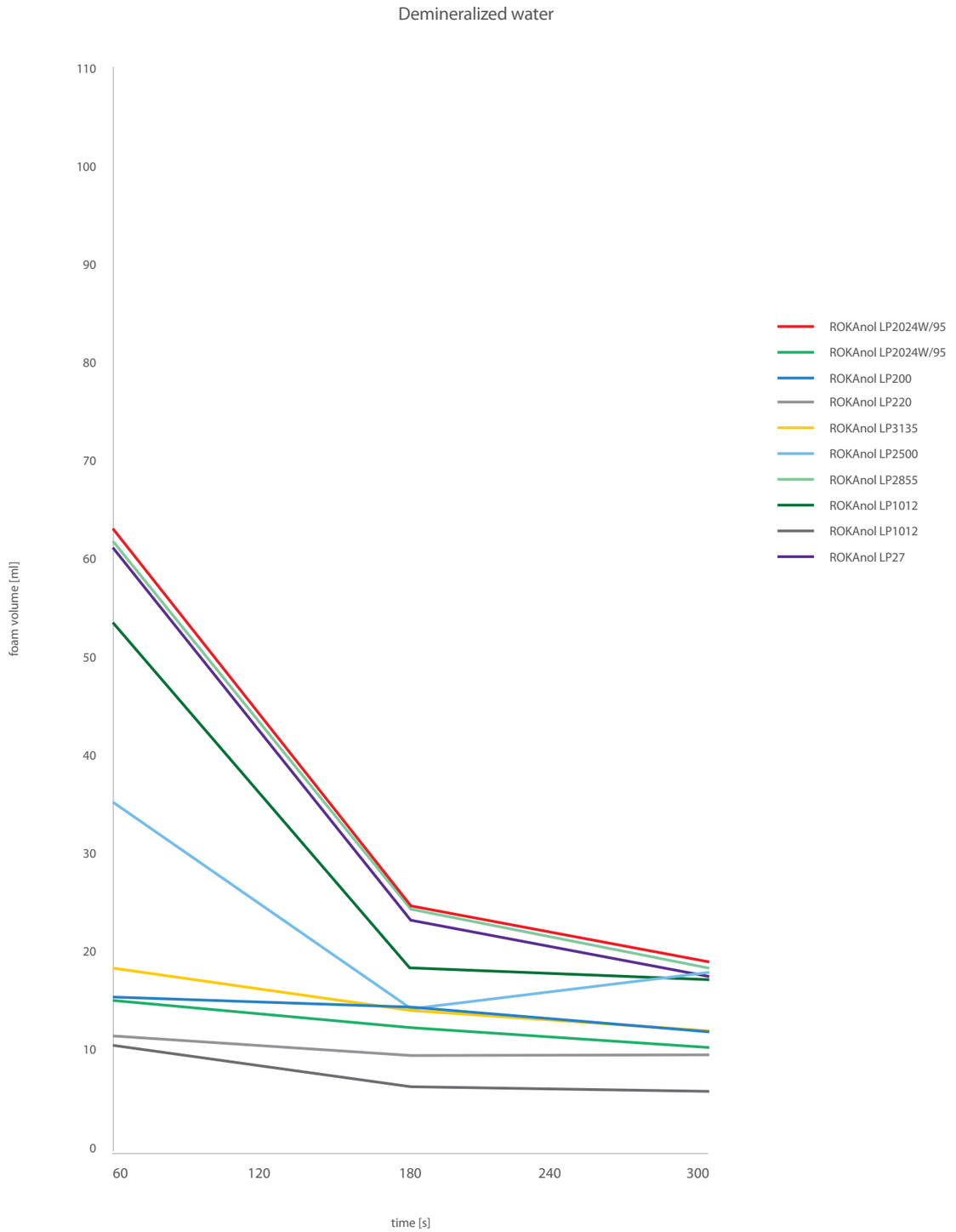
ROKAnol SERIES	DEMINERALIZED WATER	HARD WATER
L4P5	low	poor
L5P5	poor	poor
LP2024W/95	poor	poor
NL8P4	poor	non
B2	moderate	low
RZ4P11	non	non
LP100	moderate	moderate
LP180	non	non
LP200	non	non
LP220	non	non
LP400	poor	poor
LP700	moderate	moderate
LP911	non	non
LP3034	non	non
LP3135	non	non
LP3943	non	non
LP60	non	non
LP64	non	non
LP66	poor	poor
LP550	non	non
LP1319	non	non
LP2023	non	non
LP2227	non	non
LP2500	poor	poor
LP2855	poor	poor
LP3841	poor	non
LP600	poor	poor
LP1300	non	non
LP2424	non	non
LP1012	non	non
LP160	poor	poor
LP42	non	non
LP610	non	non
LP27	poor	poor
LP3	non	non

FOAM VALUE[ml]	DESCRIPTION
100-200	moderate
70-100	low
20-70	poor
0-20	non

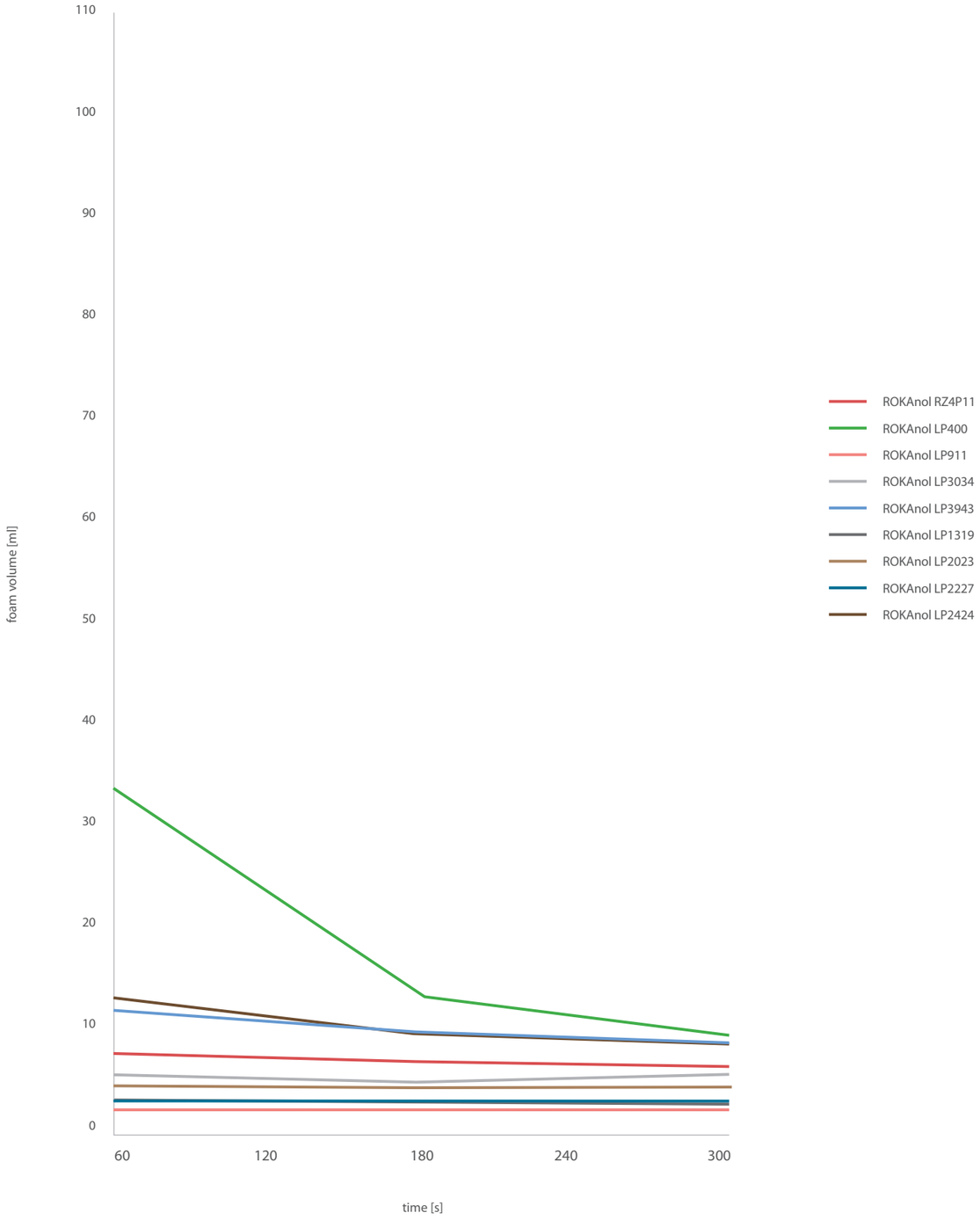
Foaming capability – modified Ross-Miles

The other method of determination of foamability I conducted according to ASTM D1173 (Ross-Milles method), for solutions of 1g/l concentration in demineralized and hard water. At a temperature of 25ºC. The measures of foam volume are taken in 60 s, 180 s and 300 s.

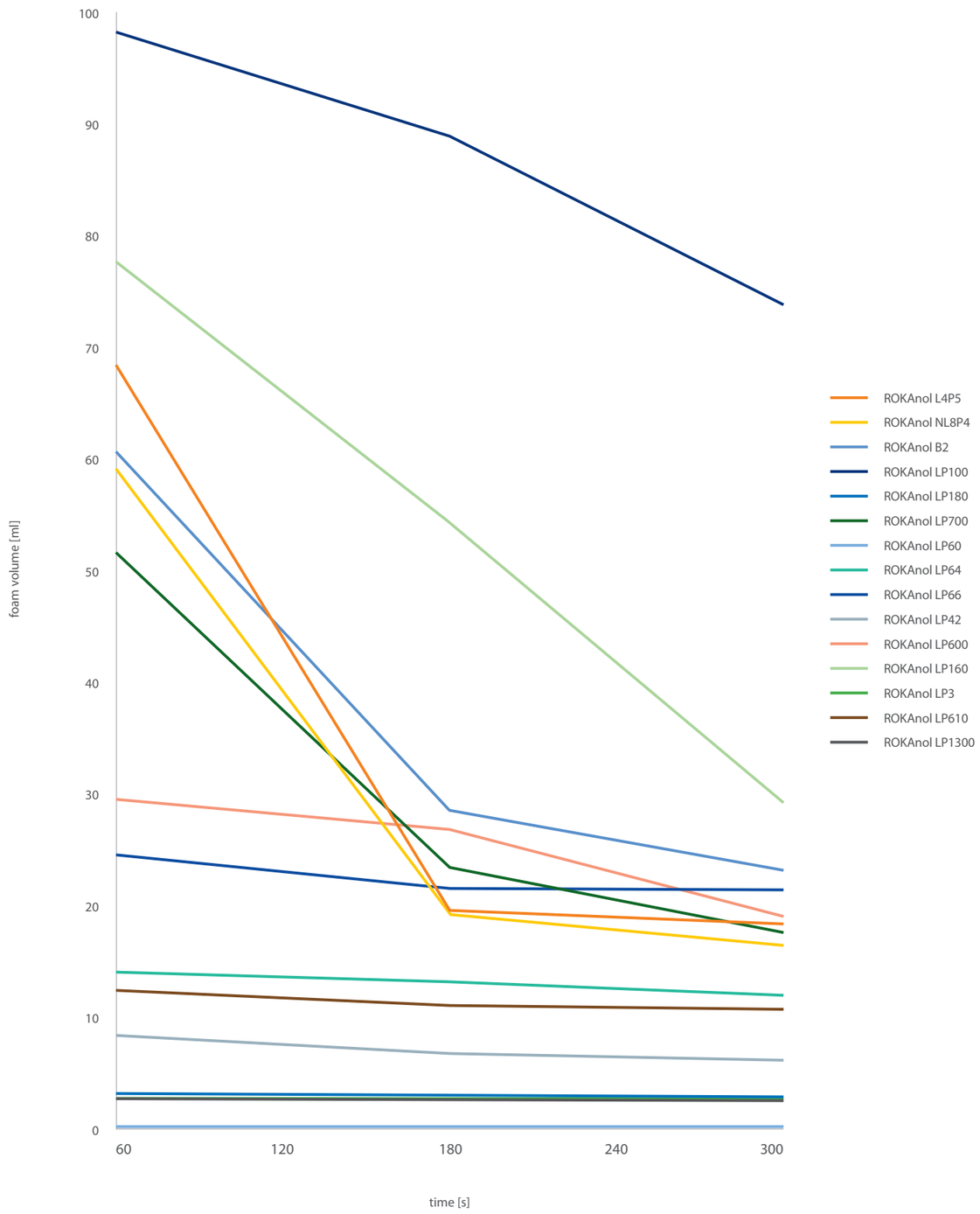




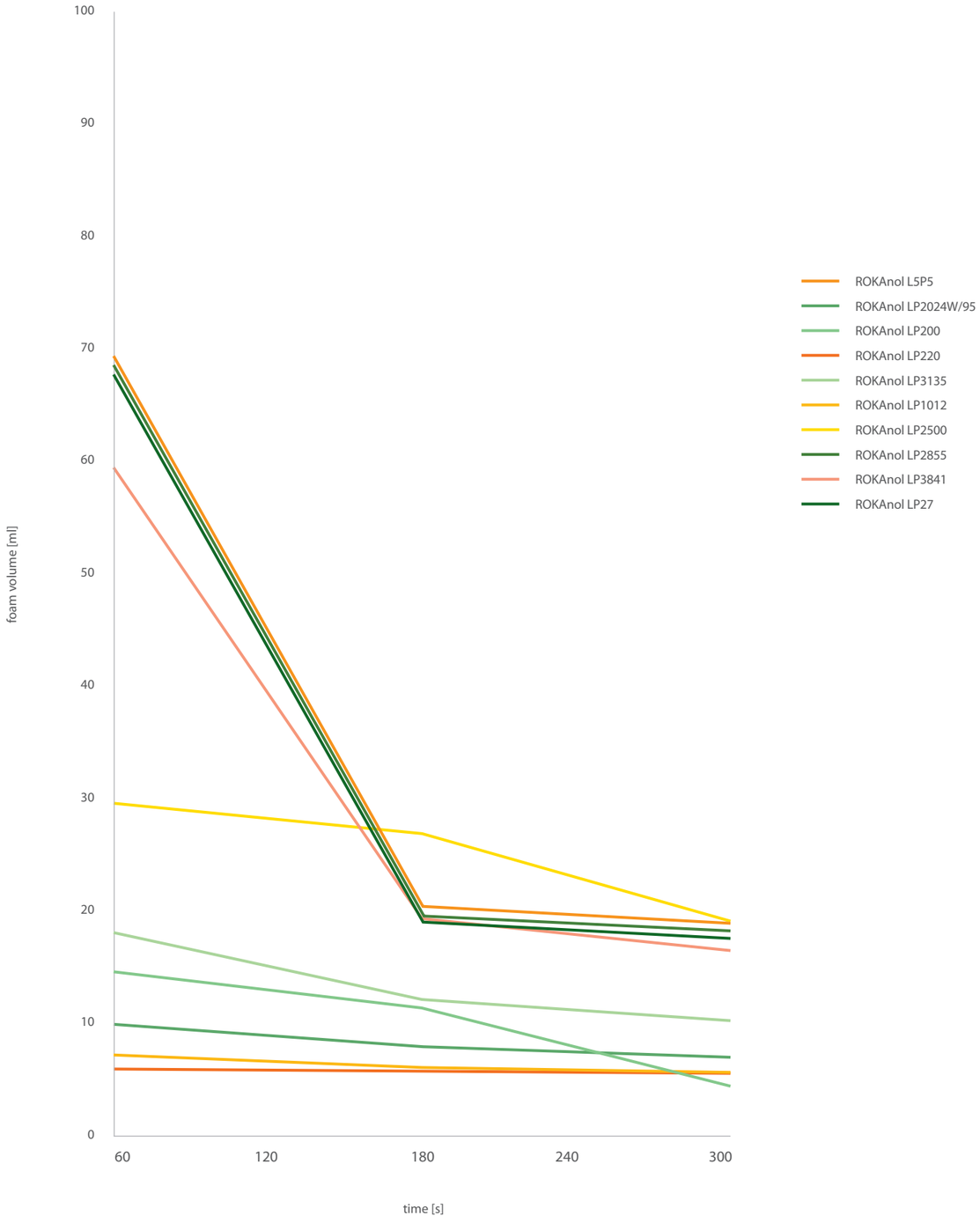
Demineralized water



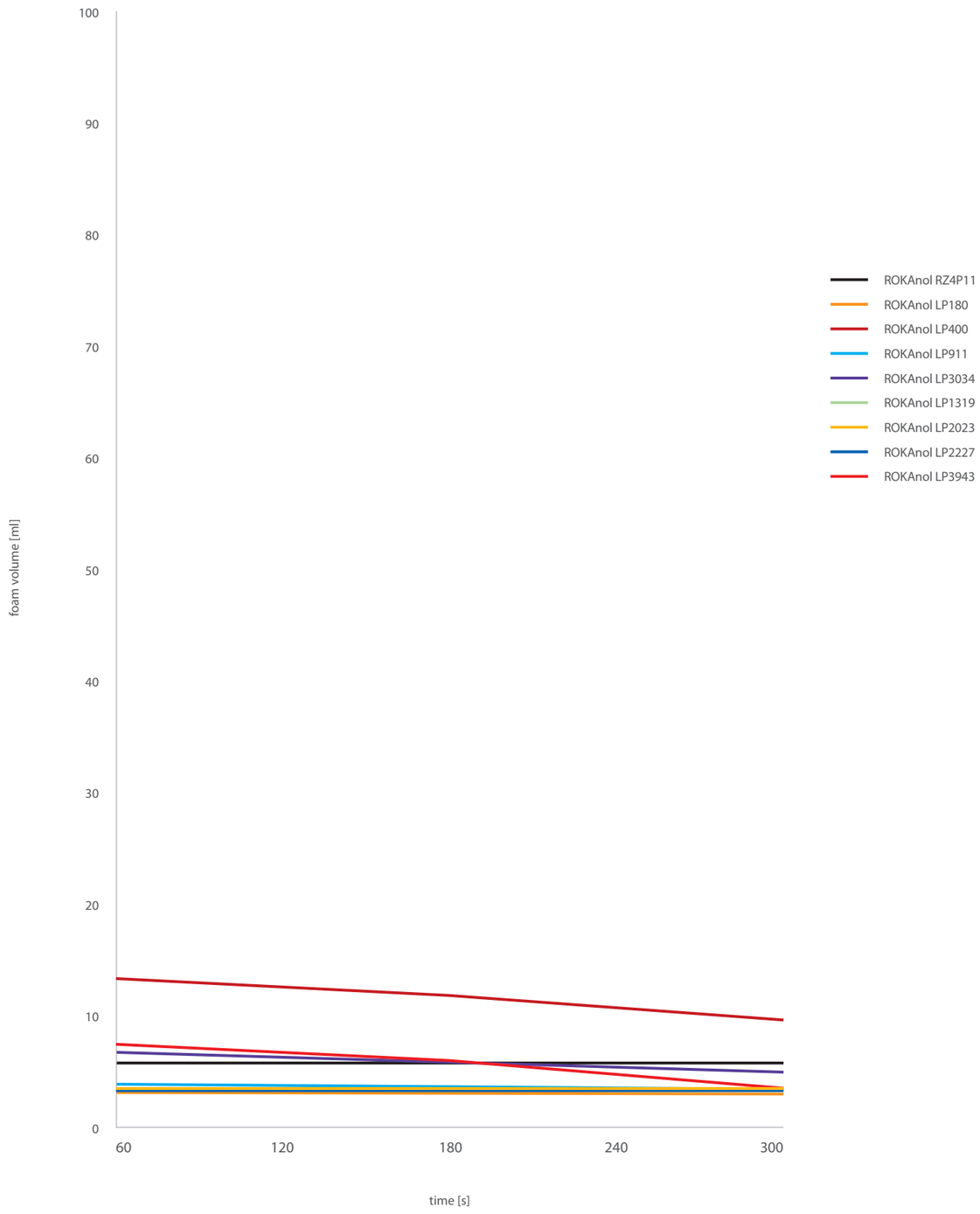
Hard water



Hard water



Hard water



Wetting capability

The capability of effective wetting is a necessary and required property of surfactants in a large number of applications. Some of ROKAnols with low foaming properties are effective wetting agents. Other products with antifoaming profile exhibit poor wetting properties. The capability of wetting cotton fabric was determined according to EN 1772:2001.Wetting time (time in seconds necessary for wetting the textile material) was measured at ROKAnols solution with a concentration of 1.0 g/l in deionized water at a temperature of 25°C.

ROKAnol SERIES	DEMINERALIZED WATER
L4P5	excellent
L5P5	good
LP2024W/95	excellent
NL8P4	good
B2	low
RZ4P11	low
LP100	low
LP180	poor
LP200	good
LP220	good
LP400	excellent
LP700	excellent
LP911	good
LP3034	excellent
LP3135	good
P3943	low
LP60	low
LP64	low
LP66	low
LP2500	good
LP1319	poor
LP2023	low
LP2227	good
LP2500	excellent
LP2855	excellent
LP3841	good
LP600	excellent
LP1300	poor
LP2424	low
LP1012	moderate
LP160	poor
LP42	poor
LP610	moderate
LP27	good
LP3	poor

TIME (S)	DESCRIPTION
<20	excellent
20-50	good
50-100	moderate
100-300	low
>300	poor

Acid resistance (Sulphuric Acid); concentration of 1%; temperature 20°C

o macroscopic phase separation
• homogeneous, cloudy solution
• clear, homogeneous solution
• homogeneous, opalescent solution

ROKAnol \H_2SO_4 conc. [g/l]	1	10	20	60	120	225
L4P5	•	•	•	•	•	•
L5P5	•	•	•	•	•	•
LP2024W/95	•	•	o	o	o	•
NL8P4	•	•	•	•	•	•
B2	•	•	•	•	•	•
RZ4P11	o	o	o	o	o	o
LP100	•	•	•	•	•	•
LP180	o	o	o	o	o	o
LP200	o	o	o	o	o	o
LP220	•	•	•	•	•	•
LP400	•	•	•	•	•	•
LP700	o	o	o	o	o	o
LP911	o	o	o	o	o	o
LP3034	o	o	o	o	o	o
LP3135	•	•	•	•	•	•
LP3943	o	o	o	o	o	o
LP60	o	o	o	o	o	o
LP64	o	o	o	o	o	o
LP66	o	o	o	o	o	•
LP550	o	o	o	o	o	o
LP1319	o	o	o	o	o	o
LP2023	o	o	o	o	o	o
LP2227	•	•	•	•	•	•
LP2500	•	•	•	•	•	•
LP2855	•	•	•	•	•	•
LP3841	•	•	•	•	•	•
LP600	•	•	•	•	•	•
LP1300	•	•	•	•	•	•
LP2424	o	o	o	o	o	o
LP1012	o	o	o	o	o	o
LP160	•	•	•	•	•	•
LP42	o	o	o	o	o	o
LP610	•	•	•	•	•	•
LP27	•	•	•	•	•	•
LP3	o	o	o	o	o	o

Alkali resistance

The analysis of this stability for low foaming surfactants has been performed in accordance with the PN-EN 14712:2005 Standard.

Alkali resistance (Sodium Hyroxide); concentration of 1%; temperature 20°C

o macroscopic phase separation • homogeneous, cloudy solution • clear, homogeneous solution • homogeneous, opalescent solution

ROKAnol \NaOH conc. [g/l]	10	20	30	40	60	70	300	360
L4P5	o	o	o	o	o	o	o	o
L5P5	o	o	o	o	o	o	o	o
LP2024W/95	o	o	o	o	o	o	o	o
NL8P4	•	•	•	o	o	o	o	o
B2	•	•	o	o	o	o	o	o
RZ4P11	o	o	o	o	o	o	o	o
LP100	•	•	•	•	o	o	o	o
LP180	o	o	o	o	o	o	o	o
LP200	o	o	o	o	o	o	o	o
LP220	•	•	•	o	o	o	o	o
LP400	o	o	o	o	o	o	o	o
LP700	o	o	o	o	o	o	o	o
LP911	o	o	o	o	o	o	o	o
LP3034	o	o	o	o	o	o	o	o
LP3135	•	•	o	o	o	o	o	o
LP3943	o	o	o	o	o	o	o	o
LP60	o	o	o	o	o	o	o	o
LP64	o	o	o	o	o	o	o	o
LP66	o	o	o	o	o	o	o	o
LP550	o	o	o	o	o	o	o	o
LP1319	o	o	o	o	o	o	o	o
LP2023	o	o	o	o	o	o	o	o
LP2227	•	o	o	o	o	o	o	o
LP2500	•	•	o	o	o	o	o	o
LP2855	•	o	o	o	o	o	o	o
LP3841	•	•	•	o	o	o	o	o
LP600	o	o	o	o	o	o	o	o
LP1300	•	•	•	•	•	•	•	•
LP2424	o	o	o	o	o	o	o	o
LP1012	•	o	o	o	o	o	o	o
LP160	•	•	•	•	•	o	o	o
LP42	o	o	o	o	o	o	o	o
LP610	•	•	•	•	o	o	o	o
LP27	o	o	o	o	o	o	o	o
LP3	o	o	o	o	o	o	o	o

PCC EXOL SA
Sustainable technologies for new generations

PCC EXOL SA combines innovative technologies with experience in designing, producing and selling surfactants and chemical formulations

PCC EXOL SA is a company that combines cutting-edge technologies with rich experience in production of surfactants (surface active agents). The company is located in Brzeg Dolny (Poland), where anionic, nonionic and amphoteric surfactant production plants have been launched. Due to the flexible production processes, the company offers a wide spectrum of surfactants and industrial formulations, which are often suited for the individual customers operating in plenty of various industry sectors. As one of the leading surfactant manufacturers, PCC EXOL SA carries out new investment projects and implements innovative technologies based on the global sustainability trends.

PCC EXOL SA portfolio includes surfactants with a broad range of applications. Besides of the mass production for personal care and detregents industry, the substances produced by PCC EXOL SA also include specialized products used in various branches, such as textile, agrochemical, metal cleaning, oil drilling, building & construction, paints & coatings, paper industry, extraction & drilling, and many others.
The company comprehensive portfolio is continuously enriched with new innovative products, which meet even the strictest market requirements and adapt to the individual needs of customers. This is possible due to the dynamic development of the research facilities, flexible production, knowledge as well as experienced personnel.

PCC EXOL SA has the key competence necessary for a worldwide production of surfactants. The ongoing projects will soon bring the new opportunities for the company's further development and expansion into new markets. The company offers not only a wide portfolio and professional servicing but most of all flexible production and comprehensive system solutions that meet individual customer demands. The strategic PCC EXOL SA investor is PCC SE, operating on international markets of the chemical raw materials, transport, energy, coal, coke, petrol, plastics and metallurgy. PCC SE includes 80 companies operating in 39 different locations in 17 countries.

In accordance with our environmental concerns, this publication from the PCC Group was printed on Cocoon Silk - an ecological double-sided-coated matt paper. This paper is made of 100% waste paper using environmentally friendly technology. The FSC® Certificate confirms that the raw materials used during the paper production process come from well-managed forests, or other certified and controlled sources.

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Grammage	135
Number of pages	20
COVER PAGES	
Brand	Cocoon Silk
Grammage	250
Number of pages	4
PUBLICATION	
Size (cm)	21 x 29.7
Quantity	400

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73 kg of landfill

9 kg CO_2 and greenhouse gases

98 km travel in the average European car

2 874 liters of water

168 kWh of energy

119 kg of wood

Carbon footprint data evaluated by Labelia Conseil in accordance with the Bilan Carbone® methodology. The calculations are based on a comparison between recycled paper used versus virgin fiber paper, according to the latest European BREF data (virgin fiber paper) available.

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Please visit our capital group business platform:
www.products.pcc.eu

The information in the catalogue is believed to be accurate and to the best of our knowledge, but should be considered as introductory only. Detailed information about our products is available in TDS and MSDS.
Suggestions for product applications are based on the best of our knowledge.

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

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