# LOW FOAMING SURFACTANT

Alcohols alkoxylated Non-ionic surfactant series





# LOW FOAMING Surfactant

## Chemical description

Rokanols with low foaming properties are non-ionic surfactant. They are ethylene and propylene oxide adducts to various types of alcohols and can be represented by the following structures:

## $\mathsf{RO}(\mathsf{CH}_{2}\mathsf{CH}_{2}\mathsf{O})_{\mathsf{X}}[\mathsf{CH}(\mathsf{CH}_{3})\mathsf{CH}_{2}\mathsf{O}]_{\mathsf{Y}}\mathsf{H} \text{ or } \mathsf{RO}[\mathsf{CH}(\mathsf{CH}_{3})\mathsf{CH}_{2}\mathsf{O}]_{\mathsf{Y}}(\mathsf{CH}_{2}\mathsf{CH}_{2}\mathsf{O})_{\mathsf{X}}\mathsf{H}$

- where: R fatty alcohol chain
  - X average number of ethylene oxide units
  - Y average number of propylene oxide units

## Application

Low foaming surfactant are very useful for low- foam and no-foam applications. They are especially suitable for:

PAINTS AND COATINGS

• TEXTILE INDUSTRY

• METAL CLEANING

• PULP AND PAPER

- AUTOMATIC DISHWASHING
- DETERGENTS AND RINSE AIDS
- LAUNDRY DETERGENTS
- HARD SURFACE CLEANERS
- AGRICULTURE



## Basic physical and chemical properties

ROKAnol	L4P5	L5P5	L80/50W	NL8P4	В2	RZ4P11	LP2023	LP2024
Appearance at 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	Clear liquid	Clear liquid
Concentration, [%]	approx. 100	approx. 100	approx. 50	approx. 100	approx. 100	approx. 100	approx. 100	approx. 100
Hazen colour at 40°C	usually <100	max. 100	usually <100	max. 200	usually <100	-	max. 100	max. 100
Cloud point, [°C]								
Method A 1% in water solution	approx. 25	27-31	>100	38-48	30-39	-	-	20-24
Method B 1% solution in 5% NaCl solution	-	-	approx. 85	approx. 35	approx. 26	-	-	-
Method C 1% solution in 10% NaCl solution	-	-	approx. 70	approx. 26	-	-	-	-
Method D 10% solution in 25% BDG solution	approx. 48	approx. 45	approx. 89	approx. 55	approx. 46	-	approx. 27	approx. 45
Method E 16.7% solution in 25% BDG solution	approx. 42	approx. 41	approx. 88	approx. 51	approx. 43	23-27	20-23	approx. 40
Water content [%, by weight]	max. 0.5	max. 0.5	49-53	max. 1	max. 0.5	max. 1	max. 0.5	max. 0.5
Solidification point [°C]	approx12	approx9	approx1	approx10	approx. 0	approx10	approx10	approx15
pH in deionized water, at 20°C	5.5-8.5 1% solution	5-7 1% solution	5.5-8.5 10% solution	5-7 1% solution	5.5-8.5 1% solution	5.5-8.5 1% solution	5-7 1% solution	5-7 1% solution
Density at 25°C [g/cm <sup>3</sup> ]	approx. 0.97	approx. 0.97	approx. 1.05 at 50°C	approx. 1.00	approx. 0.98	approx. 0.96	approx. 0.97	approx. 0.97
Viscosity at 20°C [cP]	approx. 60	approx. 70	230-320 at 50°C	approx. 80	approx. 130	approx. 130	approx. 140	approx. 60
Surface tension of 0.1% solution at 25°C [mN/m]	30	32	45	31	33	33	33	31



## Basic physical and chemical properties

ROKAnol	LP2126	LP2529	LP3135	LP3943	LP100	LP200	LP400	LP700
Appearance at 25°C	Clear or turbid liquid	Clear liquid	Turbid liquid	Clear liquid	Liquid	Clear or turbid liquid	Clear or cloudy liquid	Liquid
Concentration, [%]	approx. 100	approx. 100	approx. 95	approx. 100	approx. 95	approx. 100	approx. 100	approx. 100
Hazen colour at 40°C	max. 100	max. 100	max. 100	-	max. 100	max. 100	max. 100	max. 100
Cloud point, [°C]								
Method A 1% in water solution	-	-	31-35	-	72-76	approx. 21	39-42	20-24
Method B 1% solution in 5% NaCl solution	-	-	approx. 24	-	approx. 57	approx. 14	approx. 30	approx. 13
Method C 1% solution in 10% NaCl solution	-	-	approx. 15	-	approx. 47	-	approx. 21	-
Method D 10% solution in 25% BDG solution	21-26	approx. 35	approx. 48	approx. 50	approx. 71	approx. 43	approx. 53	approx. 56
Method E 16.7% solution in 25% BDG solution	approx.20	25-29	approx. 44	39-43	approx. 69	37-41	approx. 50	approx. 53
Water content [%, by weight]	max. 0.5	max. 0.5	4-6	max. 0.5	max. 5	max. 0.5	max. 0.5	max. 0.5
Solidification point [°C]	below -20	approx18	below -20	below -20	approx. 10	below -15	below -5	below -5
pH in deionized water, at 20℃	4-6 1% solution (in solution EtOH: water)	5-7 1% solution	5-7 1% solution	5-7 2.5% solution	5-7 1% solution	5-7 1% solution	5-7 1% solution	5-7 1% solution
Density at 25°C [g/cm <sup>3</sup> ]	approx. 0.98	approx. 0.95	approx. 1.00	approx. 0.95	approx. 1.04	approx. 0.99	approx. 1.00	approx. 0.98
Viscosity at 20°C [cP]	approx. 250	approx. 60	approx. 100	approx. 55	approx. 245	approx. 80	approx. 90	approx. 70
Surface tension of 0.1% solution at 25°C [mN/m]	-	31	30	30	34	30	29	30

# Additional information

## Solubility

Solubility of Rokanols with low foaming properties depends on cloud point value. Product with higher cloud points exhibits better solubility in water. Solubility of these products can be increased by addition of other surfactants, hydrotropes or lower alcohols. Solubility in water and other solvents has been shown in table below.

### SOLUBILITY - at 25°C, 10% SOLUTIONS

PRODUCT NAME	DEMINERALIZED WATER	METHANOL	ETHYL ETHER	N-OCTANOL	ACETONE
ROKAnol L4P5	٠	٠	0	•	٠
ROKAnol L5P5	٠	٠	0	•	٠
ROKAnol L80/50W	٠	٠	0	٠	٠
ROKAnol NL8P4	٠	٠	0	•	0
ROKAnol B2	٠	٠	0	٠	0
ROKAnol RZ4P11	0	٠	0	•	0
ROKAnol LP2023	0	٠	٠	٠	٠
ROKAnol LP2024	٠	٠	0	٠	0
ROKAnol LP2126	0	٠	•	•	٠
ROKAnol LP2529	0	٠	0	•	٠
ROKAnol LP3135	٠	٠	•	•	٠
ROKAnol LP3943	0	٠	0	•	٠
ROKAnol LP100	٠	٠	•	•	٠
ROKAnol LP200	٠	٠	0	•	٠
ROKAnol LP400	٠	•	•	•	٠
ROKAnol LP700	٠	٠	0	•	٠

• Soluble • Insoluble





## 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.

PRODUCT NAME	DEMINERALIZED WATER
ROKAnol L4P5	Excellent
ROKAnol L5P5	Good
ROKAnol L80/50W	Poor
ROKAnol NL8P4	Good
ROKAnol B2	Low
ROKAnol RZ4P11	Low
ROKAnol LP2023	Low
ROKAnol LP2024	Excellent
ROKAnol LP2529	Low
ROKAnol LP3135	Good
ROKAnol LP3943	Low
ROKAnol LP100	Low
ROKAnol LP200	Good
ROKAnol LP400	Excellent
ROKAnol LP700	Excellent

### WETTING CAPABILITY

concentration of 1.0 g/l commercial products; demineralised water, temperature 25°C





TIME (s)	DESCRIPTION
<20	Excellent
20-50	Good
50-100	Moderate
100-300	Low
>300	Poor



Wetting time [s]

## Foaming capability

Rokanols from low foaming range exhibit desired properties like good detergency, efficient wettability, degreasing abilities. Difference between Rokanols and standard non-ionic surfactants lies 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.

PRODUCT NAME	DEMINERALIZED WATER	HARD WATER
ROKAnol L4P5	Low	Poor
ROKAnol L5P5	Poor	Poor
ROKAnol L80/50W	Low	Poor
ROKAnol NL8P4	Poor	Non
ROKAnol B2	Moderate	Low
ROKAnol RZ4P11	Non	Non
ROKAnol LP2023	Non	Non
ROKAnol LP2024	Poor	Poor
ROKAnol LP2529	Poor	Non
ROKAnol LP3135	Non	Non
ROKAnol LP3943	Non	Non
ROKAnol LP100	Moderate	Moderate
ROKAnol LP200	Non	Non
ROKAnol LP400	Poor	Poor
ROKAnol LP700	Moderate	Moderate

FOAM VALUE (ml)	DESCRIPTION
100-200	Moderate
100-70	Low
20-70	Poor
0-20	Non

#### FOAMING CAPABILITY

concentration of 1.0 g/l commercial products; demineralized water; temperature 25°C



Foam volume [ml]

### FOAMING CAPABILITY

concentration of 1.0 g/l commercial products; hard water; temperature 25°C





Foam volume [ml]



## Antifoaming capability

Antifoam capability - the ability of the surfactant to extinguish the foam produced by the standard solution. It is defined by the volume of extinguished foam (%) measured after a certain period of time.

#### demineralized water, after 4 minutes



Antifoaming capability

#### hard water, after 4 minutes







Extinguished foam [%]

## Alkali resistance

Alkali resistance - the maximum concentration of NaOH (purity of at least 98%) g/l in the solution of which the surfactant forms a stable solution at a concentration of 1%.

REODUCT NAME			NaOH CON	CENTRATION		
PRODUCT NAME	10 g/l	20 g/l	30 g/l	40 g/l	60 g/l	70 g/l
ROKAnol L4P5	0					
ROKAnol L5P5	0					
ROKAnol L80/50W					٠	0
ROKAnol NL8P4			٠	0		
ROKAnol B2		•	0			
ROKAnol RZ4P11	0					
ROKAnol LP2023	0					
ROKAnol LP2024	0					
ROKAnol LP2126	0					
ROKAnol LP2529	0					
ROKAnol LP3135		٠	0			
ROKAnol LP3943	0					
ROKAnol LP100				٠	0	
ROKAnol LP200	0					
ROKAnol LP400		٠	0			
ROKAnol LP700	0					
ROKAnol LP200 ROKAnol LP400 ROKAnol LP700	0	•	0			

• clear homogenous solution

• macroscopic phase separation





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A certified quality management system and environmental management system has proven to be very useful. Those two integrated systems help our employees to be



PCC Exol SA is a combination of the latest technology with experience in production and distribution of surfactants.

> aware of their roles in reaching quality and environmental goals.

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