

ROKAnol DB SERIES

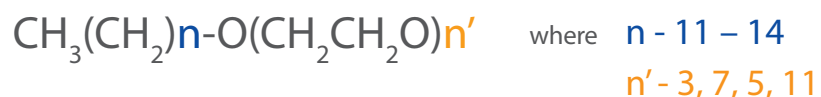
Ethoxylated C12-C15 alcohols
Nonionic surfactant series



ROKAnol DB SERIES

Chemical description

ROKAnol DB series are nonionic surfactants of the ethoxylated fatty alcohols type. The product belongs to the ROKAnol DB series, based on C12-C15 fatty alcohol. Its high surface activity allows it to be used as an excellent detergent and a cleaning agent, and opens up the possibility of using it in other branches of industry.



Application

ROKAnol DB series are especially effective in the cleaning process can successfully become ingredients of household and professional cleaning agents, detergents as well as an emulsifier in industrial application.



Industrial and institutional cleaning



Agrochemicals



Metal working



Hard surface cleaners



Household detergent



Others



Laundry detergents



Basic physical and chemical properties

Basic information concerning their physical and chemical properties is summarised in a Table 1.

General characteristic

Product name	ROKAnol DB3	ROKAnol DB5	ROKAnol DB6	ROKAnol DB7	ROKAnol DB7W	ROKAnol DB7R	ROKAnol DB9	ROKAnol DB11W
Appearance ¹⁾	Liquid or paste ^a	Clear or slightly turbid liquid ^a	Liquid ^c	Slightly turbid liquid or paste ^b	Oily liquid ^a	Liquid ^a	Paste ^a	Oily liquid or paste ^a
Average molecular weight [g/mol]	approx. 330	approx. 415	approx. 464	approx. 530	approx. 530	–	approx. 600	approx. 680
Color ²⁾	max. 70 ^b	max. 50 ^b	max. 60 ^c	max. 70 ^b	max. 70 ^b	max. 70 ^b	max. 100 ^b	max. 50 ^c
Solution pH ³⁾	4.6 ÷ 7.4 ^a	4.6 ÷ 7.4 ^a	5 ÷ 7 ^b	4.6 ÷ 7.4 ^a	4.6 ÷ 7.4 ^a	5.0 ÷ 7.0 ^a	5.0 ÷ 7.0 ^a	5.0 ÷ 7.0
Cloud point [°C] ⁴⁾	–	65 ÷ 72 ^c	76 ÷ 82 ^d	–	48 ÷ 52 ^a	48 ÷ 52 ^a	61 ÷ 69 ^a	60 ÷ 64 ^b
Water content [%] ⁵⁾	max. 0.3	max. 0.5	max. 0.5	max. 0.5	7 ÷ 10	max. 0.5	max. 0.5	8 ÷ 12
Solidification point [°C]	approx. 10	approx. 10	approx. 15	approx. 20	approx. 5	approx. 5	approx. 26	approx. 16
Density [g/mL] ⁶⁾	approx. 0.93 ^a	approx. 0.957 ^a	approx. 0.96 ^b	approx. 0.97 ^a	approx. 0.995 ^b	approx. 0.97 ^c	approx. 0.98 ^d	approx. 1.02 ^b
Viscosity at 25°C [cP]	–	–	approx. 45	–	–	–	–	–
Hydroxyl number [mg KOH/g]	164 ÷ 172	130 ÷ 140	–	100 ÷ 114	–	–	–	–
HLB ⁷⁾	7.8	10.5	11.4	12	12	12	13.2	13.6

1) Appearance:

a - at 20±25°C
b - at 25±30°C
c - at 50°C

2) Color:

a - Hazen units at 30°C
b - Hazen units at 40°C
c - Hazen units at 50°C

3) pH according to PN-EN 1262:2004 solution B at 20°C where:

a - pH of a 1% solution
b - pH of a 10% solution

4) Cloud point according to PN-EN 1890:2000:

a - aqueous solution
b - 100 g/l NaCl solution
c - 45 g butyldiglycol/water solution
d - 25 g butyldiglycol/water solution

5) Water content was measured according to PN-ISO 760:2001, direct method, solvent – methanol

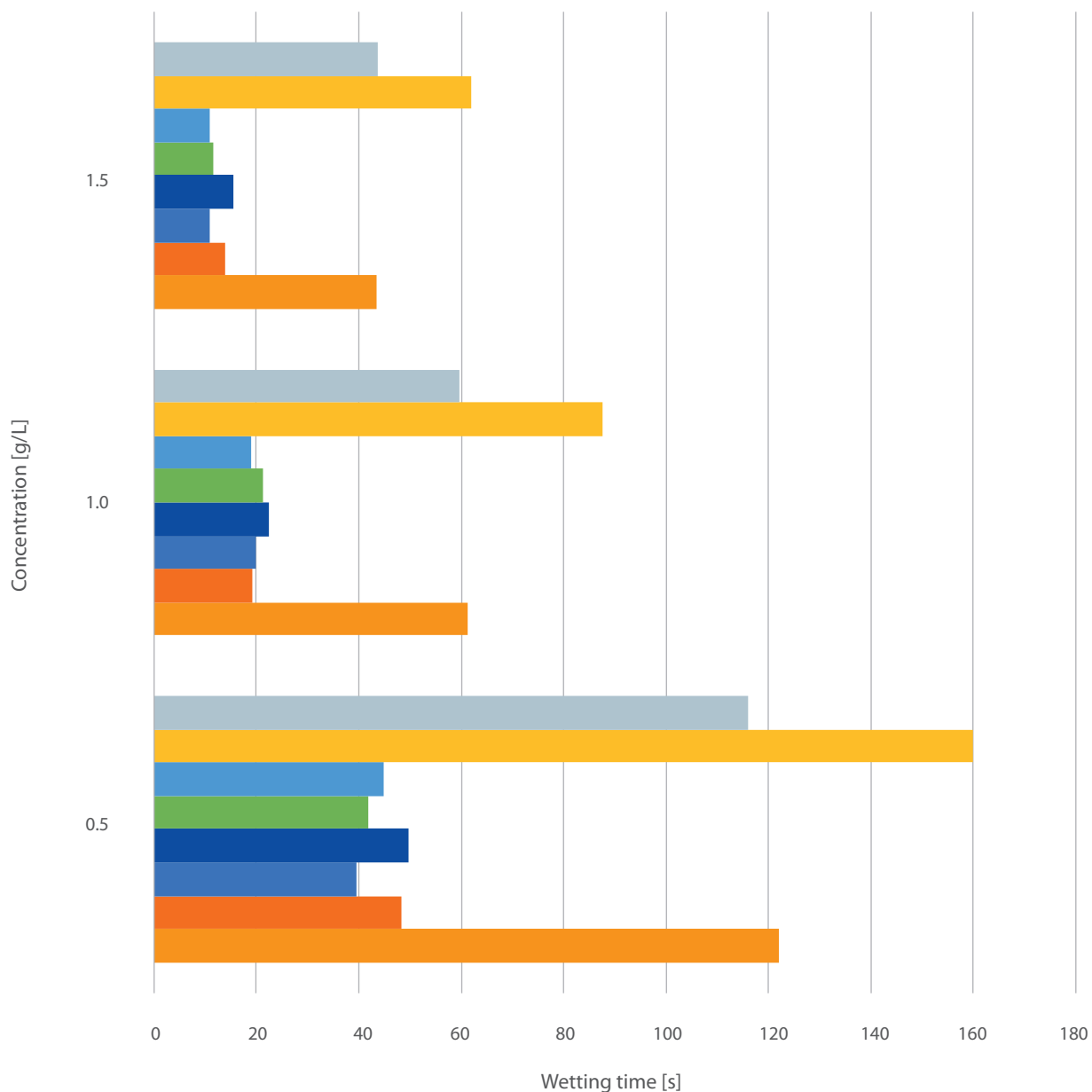
6) Density measurements:

a - at 20°C
b - at 25°C
c - at 40°C
d - at 50°C

7) HLB was determined using calculation method

Wetting capability

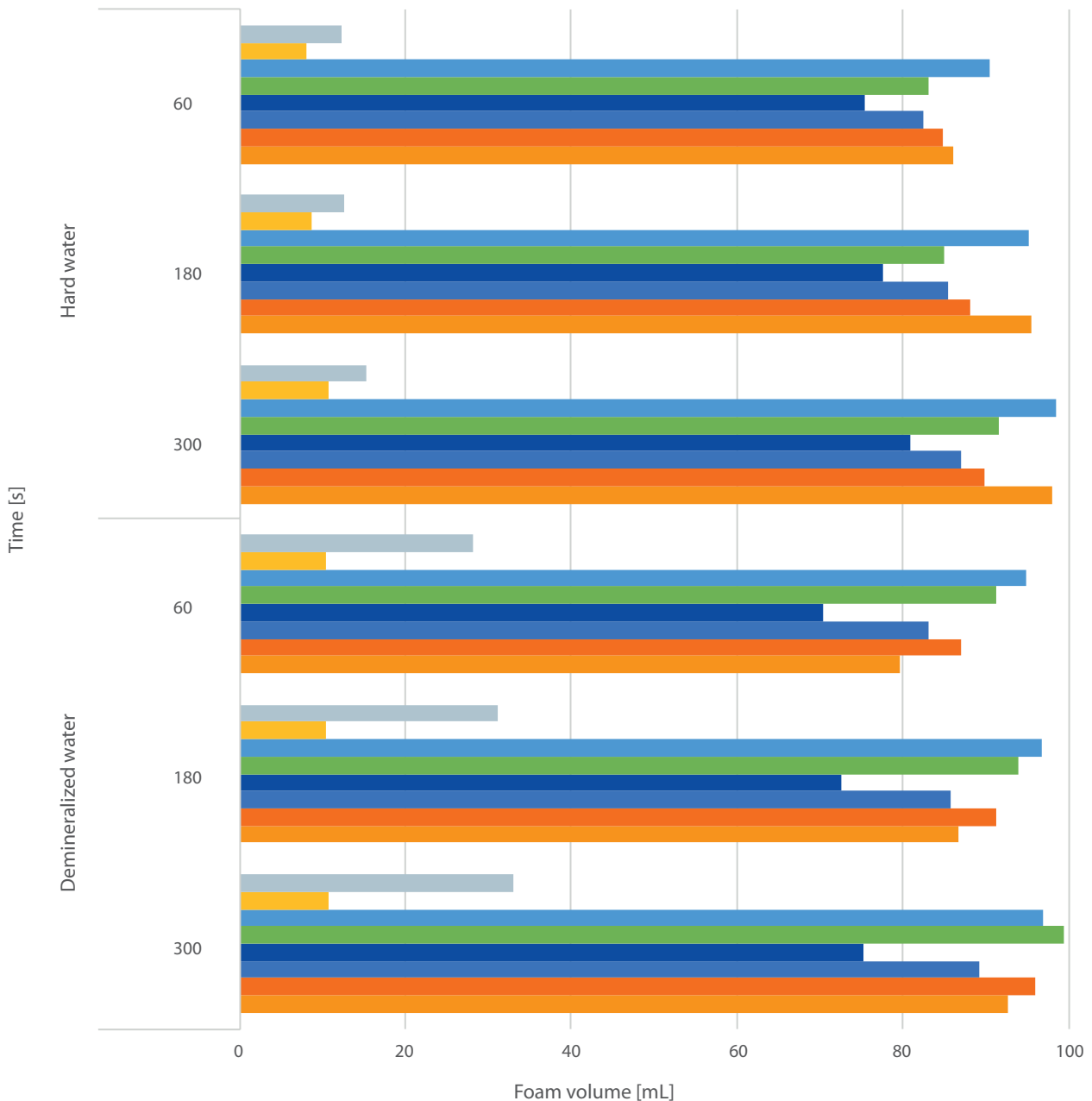
In a large number of applications the capability of effective wetting is desired property of surfactants. The wetting capability of cotton fabric was determined according to EN 1772:2001 method. Wetting time (time in seconds necessary for wetting the textile material) was measured in ROKAnols solutions with a concentration of 1.0 g/L in distilled water at a temperature of 20°C.



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- ROKAnol DB6
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- ROKAnol DB9
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- ROKAnol DB7
- ROKAnol DB7R
- ROKAnol DB11W

Foaming capability

Determination of the foaming capability was performed on Ross Miles Foam Analyzer according to ASTM D1173 for the ROKAnol DB series solutions with a concentration of 1.0 g/L in both hard (17°dH - calcium hardness of 3 Ca²⁺ mmol/L) and demineralized water at a temperature of 25°C.



Stability

Determination of capability to form stable solutions in the acid and alkaline environment was performed according to PN-EN 14712:2005 at a temperature of 20°C. Stability in the alkaline environment is defined as the maximum concentration of sodium hydroxide (with minimum purity of 98%) in g/L in a stable surfactant solution with a concentration of 1% (as active substance). Stability in the acid environment is defined as the maximum concentration of sulphuric acid (with purity in the range between 95 and 98%) and hydrogen chloride (with purity in the range between 35 and 38%) in ml/L in a stable surfactant solution with a concentration of 1% (as active substance).

Stability in the peroxides environment was measured using hydrogen peroxide at a concentration of 30% in ml/L in a stable surfactant solution with a concentration of 1% (as active substance).

Alkali resistance (SODIUM HYDROXIDE); concentration of 1%; temperature 20°C

Product	NaOH conc. [g/L]											
	10	20	30	40	50	60	70	80	110	120	180	225
ROKAnol DB3	○	○	○	○	○	○	○	○	○	○	○	○
ROKAnol DB5	○	○	○	○	○	○	○	○	○	○	○	○
ROKAnol DB6	●	●	●	●	○	○	○	○	○	○	○	○
ROKAnol DB7	●	●	●	●	●	○	○	○	○	○	○	○
ROKAnol DB7W	●	●	●	●	●	○	○	○	○	○	○	○
ROKAnol DB7R	●	●	●	○	○	○	○	○	○	○	○	○
ROKAnol DB9	●	●	●	●	●	●	○	○	○	○	○	○
ROKAnol DB11W	●	●	●	●	●	●	●	○	○	○	○	○

- homogenous, clear solution
- homogenous, opalescent solution
- homogeneous, cloudy solution
- macroscopic phase separation

Acid resistance (SULPHURIC ACID, HYDROGEN CHLORIDE); concentration of 1%; temperature 20°C

Product	H ₂ SO ₄ conc. [g/L]											
	10	20	30	40	50	60	70	80	110	120	180	225
ROKAnol DB3	○	○	○	○	○	○	○	○	○	○	○	○
ROKAnol DB5	○	○	○	○	○	○	○	○	○	○	○	○
ROKAnol DB6	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB7	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB7W	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB7R	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB9	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB11W	●	●	●	●	●	●	●	●	●	●	●	●

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- homogenous, cloudy solution
- macroscopic phase separation



Peroxides resistance (HYDROGEN PEROXIDE); concentration of 1%; temperature 20°C

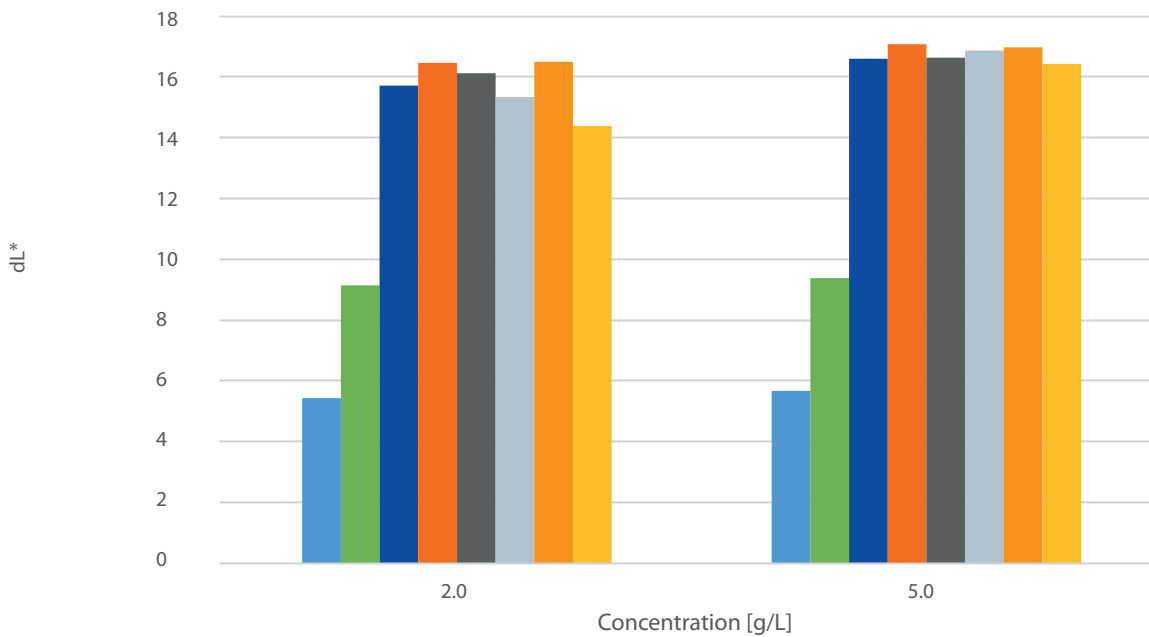
Product	H ₂ O ₂ conc. [g/L]											
	10	20	30	40	50	60	70	80	110	120	180	225
ROKAnol DB3	○	○	○	○	○	○	○	○	○	○	○	○
ROKAnol DB5	○	○	○	○	○	○	○	○	○	○	○	○
ROKAnol DB6	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB7	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB7W	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB7R	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB9	●	●	●	●	●	●	●	●	●	●	●	●
ROKAnol DB11W	●	●	●	●	●	●	●	●	●	●	●	●

- homogenous, clear solution
- homogenous, opalescent solution
- homogenous, cloudy solution
- macroscopic phase separation



Detergency

Detergency is the ability of the surfactant to remove soils from the fabric surface during the laundering process. Detergency tests were performed using to own method, with an EMPA 125 fabric: soiled with a mixture of oils and carbon black. Cotton was washed at a temperature 40°C in ROKAnol DB series solutions. After drying the fabrics and pressing them, the total color difference of the fabric before and after washing, was measured. The higher the difference is, the better detergency properties are for surfactant.



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Solubility

Determination of the solubility of products is carried out by visual evaluation of 1%, 10% and 50% solutions of a given product in a specified solvent, 24 hours after their preparation. Visually, the appearance of the sample is evaluated according to the following scale:

Result	1	2	3	4
Appearance of the test sample	Homogeneous clear	Homogeneous opalescent	Homogeneous cloudy	Macroscopic phase separation

The results of the samples (1%, 10% and 50%) are added up and on this basis the solubility of the product is determined. The following table gives the solubility scales according to the sum of the appearance scale results:

Sum	3-6	7-9	10-12
Solubility	Soluble	Partially soluble	Insoluble

Product name	Demineralized water	Methanol	Ethyl ether	Acetone
ROKAnol DB3	●	●	●	●
ROKAnol DB5	●	●	●	●
ROKAnol DB6	●	●	●	●
ROKAnol DB7	●	●	●	●
ROKAnol DB7W	●	●	●	●
ROKAnol DB7R	●	●	●	●
ROKAnol DB9	●	●	●	●
ROKAnol DB11W	●	●	●	●

- Soluble
- Partially soluble
- Insoluble

Viscosity of stain removal formulation

Test was conducted on the effect of changing the concentration of ROKAnol in the formulation on the viscosity of the final product. Viscosity was tested using an IKA ROTAVISC lo-vi Complete viscometer, spindle 6.7, temperature 20°C. The results are shown in the graph.

Liquid stain remover

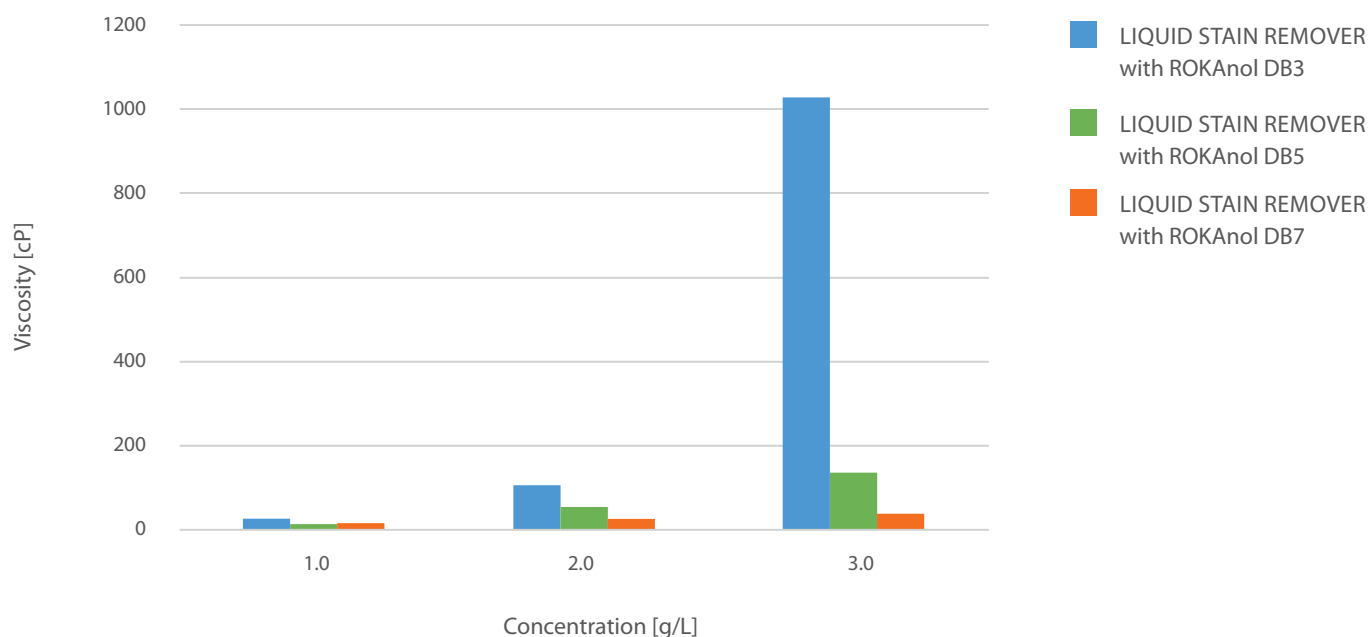
INCI name	Brand name	Concentration [%]	Function
C12-16 Laureth-7	ROKAnol L7A	9.0	Breaks down stains
Sodium Dodecylbenzenesulfonate	ABSNa 50	8.0	Removes stains/ foaming agent
C12-15 Pareth-3/ C12-15 Pareth-5/ C12-15 Pareth-7	ROKAnol DB3/ ROKAnol DB5/ ROKAnol DB7	1.0/ 2.0/ 3.0	Removes stains/rheology modifier
Hydrogen Peroxide	Hydrogen Peroxide, 35%	30.0	Bleaching agent
Aqua	Water	up to 100.0	Solvent

APPEARANCE visual method clear liquid
pH 6



PROCEDURE

1. Mix **ABSNa 50** with water.
2. Add **ROKAnol L7A** and mix until a homogeneous solution is obtained.
3. Add **ROKAnol DB3/ ROKAnol DB5/ ROKAnol DB7** and mix.
4. Then add Hydrogen Peroxide and mix.



PCC EXOL SA

Sustainable technologies for new generations



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 detergents 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 faci-

The background of the central section is a light blue gradient with a pattern of overlapping, semi-transparent hexagons. On the left side, there are faint, glowing molecular structures and network diagrams with nodes and connecting lines.

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

ties, 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.



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Please visit our Group's business
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September 2024

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