ROKAnol® MT7 and MT7E versus ROKAnol® L7

Local. Global. Integrated.


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

About Us

PCC Exol SA is a major player in the European surfactants market. In the eastern and central-eastern part of the continent, it is the undisputed leader in its industry. Most of the production facilities and the company's headquarters are located in Brzeg Dolny, Poland. Here we develop, test and manufacture a wide range of anionic, non-ionic and amphoteric surfactants and speciality industrial formulations.

New products are continuously added to the portfolio in response to market trends and individual customer requirements. The surfactants produced at the plants have a very wide range of industrial applications. They are used as wetting agents, emulsifiers, auxiliaries in paper, metallurgy and many other industries, as well as in household chemicals, personal care products and textiles.

PCC EXOL pays special attention to the issue of sustainable development, which is one of the key elements of the company's strategy. In order to strengthen its competitive position in the surfactants market, the company is committed to promoting responsible production and consumption throughout the value chain. The concept of sustainable development is therefore a key aspect of all the company's management and operational processes.

PCC ROKITA SA
PCC PCG
OXYALKYLATES
IRPC

Polyols

- Polyether polyols
- Polyester polyols
- Prepolymers
- Polyurethane Systems

PCC
ROKITA SA

Chlorine

- Chlorine
- MCAA
- Other Chlorine Downstream Product

PCC
ROKITA SA

Phosphorus

- Phosphorus derivatives
- Naphthalene derivatives
- Polycarboxyethers (PCE)

PCC EXOL SA
PCC CHEMAX INC
PCC PCG OXYALKYLATES

Surfactants

- Anionic surfactants
- Cationic surfactants
- Nonionic surfactants
- Amphoteric surfactants (betaines)
- Chemical formulation

PCC
SYNTEZA

Alkylphenols

- Nonylphenol
- Dodecylphenol
- Tristyrylphenol

PCC CONSUMER PRODUCTS SA

Consumer Products

- Household & industrial Cleaners, Detergents and Personal Care Products

PCC
ROKITA SA

Energy

- Renewable Energy
- Conventional Energy

PCC
INTERMODAL SA

Logistics

- Intermodal transport
- Road Haulage
- Rail Transport

PCC
BAKKISILICON HF.

Silicon

- Microsillica
- Silicon Metal

PCC
SE

Holding & Projects

- Portfolio Management
- Project Development

ROKAnol MT7 and MT7E versus ROKAnol L7

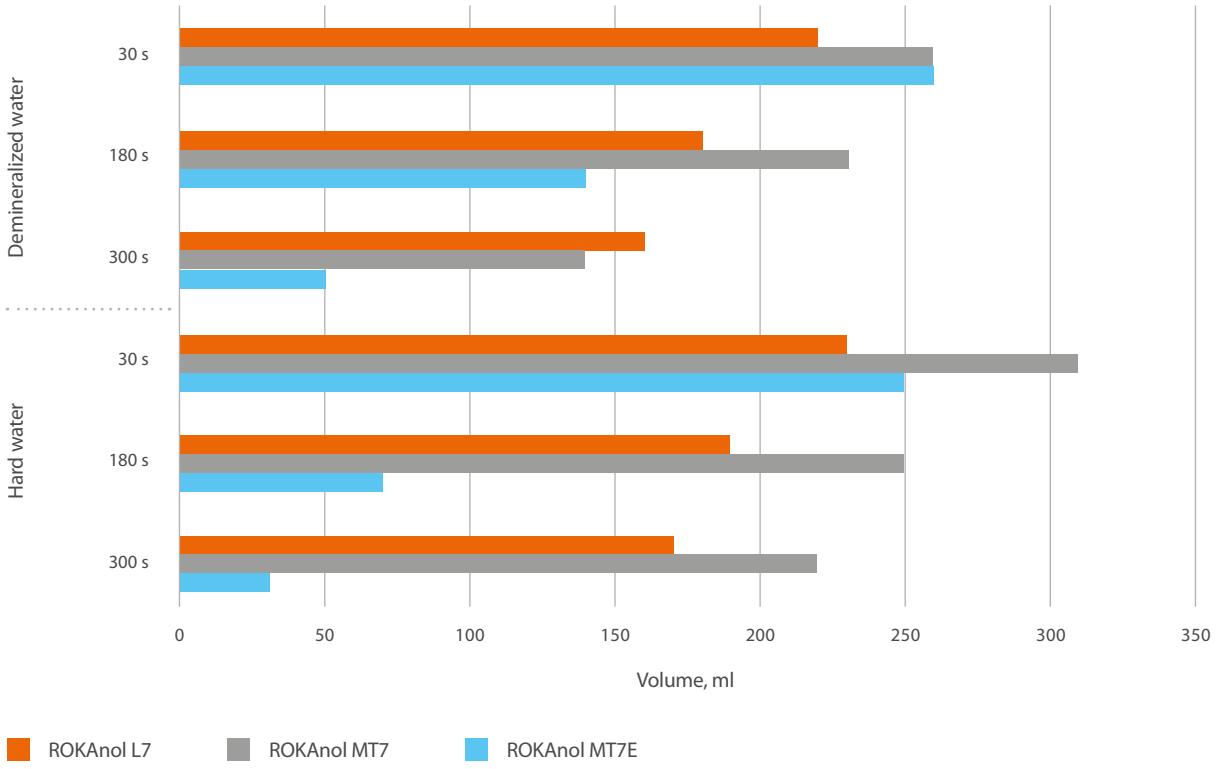
General characteristic

Basic information concerning the physical and chemical properties is summarised in a table below.

	ROKAnol L7	ROKAnol MT7	ROKAnol MT7E
Chemical Name	Alcohols, C12-14, ethoxylated	Alcohols, C8-18, ethoxylated	Alcohols, C8-18, ethoxylated
CAS Number	68439-50-9	157707-43-2	157707-43-2
Appearance	clear or slightly turbid liquid	liquid	clear or slightly turbid liquid
Colour in Hazen scale	max. 70	max. 150	max. 150
pH of 5% solution	4.6 ÷ 7.4	5 ÷ 8	5 ÷ 8
Cloud point (aqueous solution), method A °C	57 ÷ 63	56 ÷ 62	56 ÷ 62
Cloud point (aqueous solution), method B °C	41 ÷ 48	41 ÷ 47	39 ÷ 45
Cloud point (aqueous solution), method C °C	30 ÷ 40	30 ÷ 37	29 ÷ 35
Cloud point (aqueous solution), method D °C	78 ÷ 84	74 ÷ 80	71 ÷ 78
Cloud point (aqueous solution), method E °C	76 ÷ 83	73 ÷ 79	71 ÷ 77
Water, % (m/m)	max. 1	max. 0.5	max. 1.0
Density at 25°C, g/mL	approx. 0.99	approx. 0.99	approx. 1.00
Viscosity at 25°C, cP	approx. 200	approx. 200	approx. 200
Freezing point, °C	approx. 12	approx. 15	approx. 12

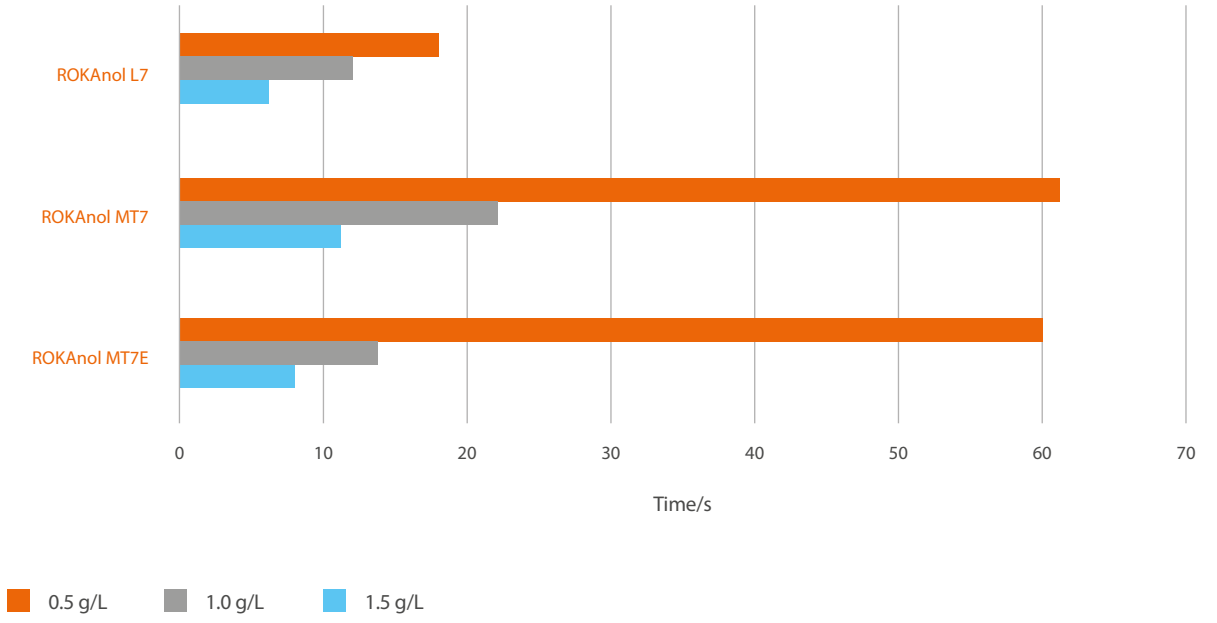
Foaming capability

Foaming capability was measured according to modified Ross-Miles' method (PN-ISO 696:1994). The foam value was measured after 30, 180 and 300 seconds. The results were presented on graphs.



Wetting capability

Wetting capability was measured at 20°C for three concentrations. The results were presented on graph.



Alkali and acid resistance

Alkali resistance

Product name	NaOH con., g/L						
	30	40	50	60	70	80	90
ROKAnol L7	●	●	●	●	●	●	○
ROKAnol MT7	●	●	●	○	○	○	○
ROKAnol MT7E	●	●	●	○	○	○	○

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

Acid resistance

Product name	H_2SO_4 conc. mL/L						
	1	10	40	60	100	140	225
ROKAnol L7	●	●	●	●	●	●	○
ROKAnol MT7	●	●	●	○	○	○	○
ROKAnol MT7E	●	●	●	○	○	○	○

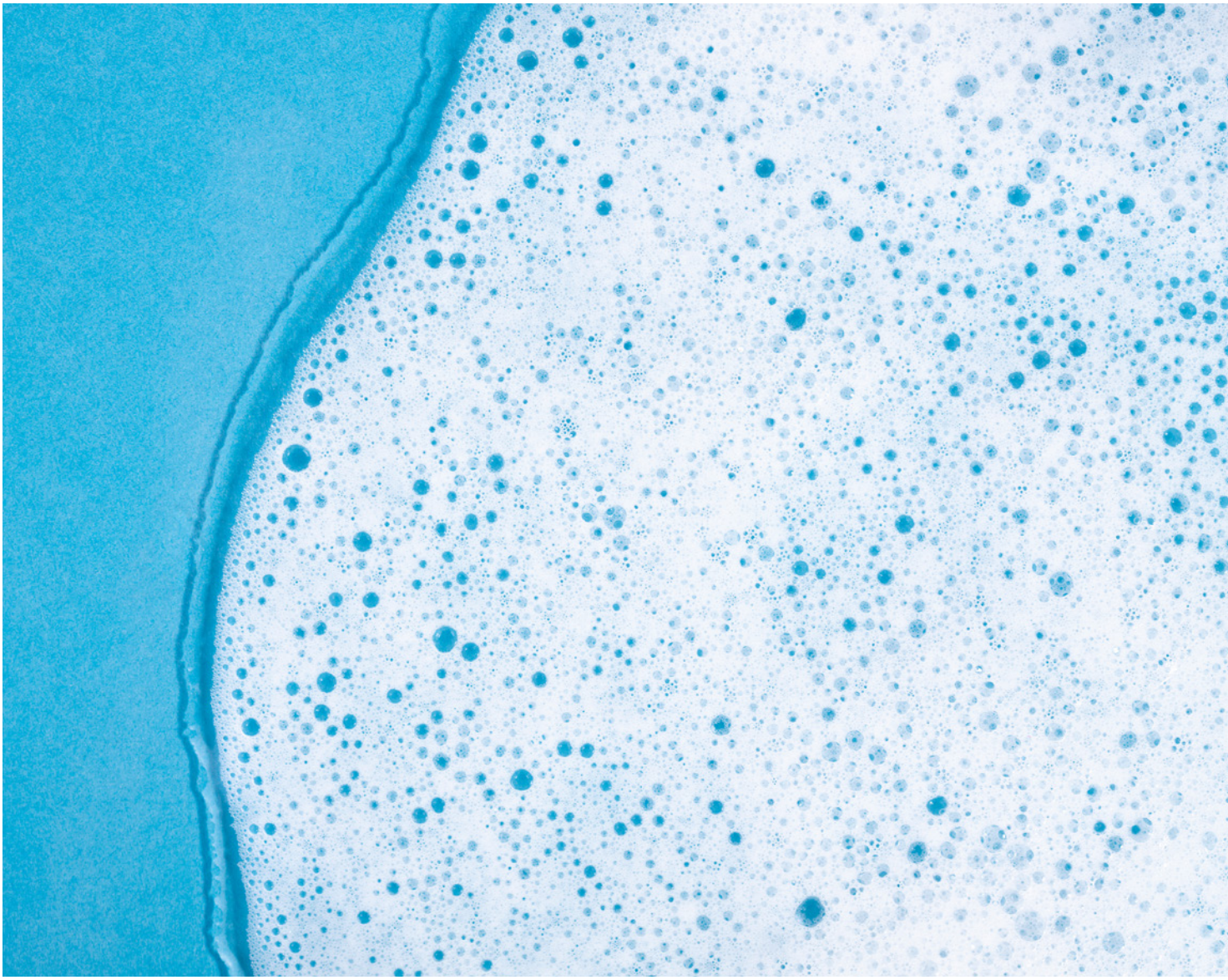
● clear, homogeneous solution ● homogeneous, cloudy solution ● homogeneous, opalescent solution ○ macroscopic phase separation

Solubility

Product name	Demineralized water	Methanol	Acetone	Ethyl ether
ROKAnol L7	●	●	●	●
ROKAnol MT7	●	●	●	●
ROKAnol MT7E	●	●	●	●

● soluble ● insoluble ● partially soluble

Both products showed similar solubility in the tested solvents.



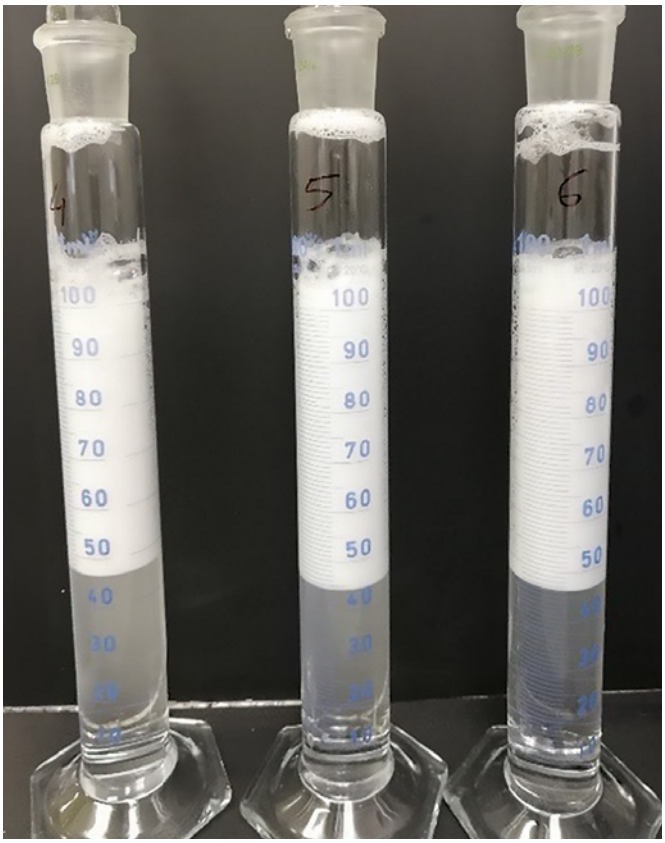
Formulations – performance tests

1. The basic formulations for three tested surfactants are shown in a table below.

Brand name	ROKAnol L7	ROKAnol MT7	ROKAnol MT7E
	Concentration [%]		
Aqua	81.5		
SULFOROKAnol L270/1	8.0		
ROKAmina K30	5.0		
ROKAmid KAD	1.0		
ROKAnol L7	2.0	-	-
ROKAnol MT7	-	2.0	-
ROKAnol MT7E	-	-	2.0
Sodium Chloride	2.5		
	Physical and chemical properties		
Appearance	clear, transparent homogenous liquid		
Viscosity [cP]	1000-1500	200-400	20-100
pH	6-7	6-7	6-7

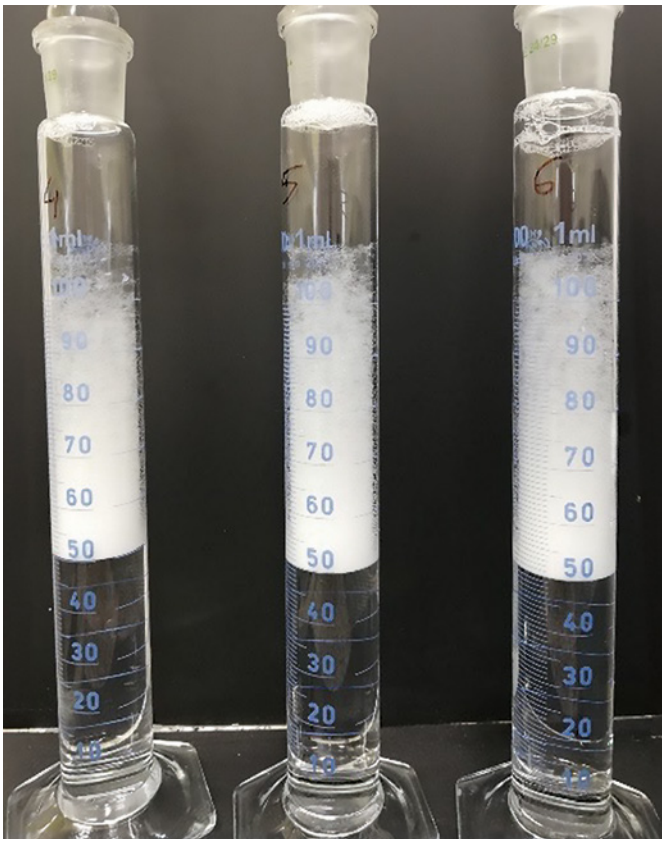
The foaming properties were measured for samples: ROKAnol L7, ROKAnol MT7, ROKAnol MT7E. The results are presented on the photos.

ROKAnol L7	ROKAnol MT7	ROKAnol MT7E



After 30 seconds

ROKAnol L7	ROKAnol MT7	ROKAnol MT7E



5 minutes

ROKAnol L7	ROKAnol MT7	ROKAnol MT7E

2. In the next step new formulations with higher organic matter were prepared. The formulations are shown in a table below.

Brand name	ROKAnol L7	ROKAnol MT7	ROKAnol MT7E
	Concentration [%]		
Aqua	78.9		
SULFOROKAnol L270/1	10.0		
ROKAmina K30	7.0		
ROKAmid KAD	0.7		
ROKAnol L7	1.4	-	-
ROKAnol MT7	-	1.4	-
ROKAnol MT7E	-	-	1.4
Sodium Chloride	2.6		
	Physical and chemical properties		
Appearance	clear, transparent homogeneous liquid		
Viscosity [cP]	4000-5500	1500-3000	1500-2500
pH	6-7	6-7	6-7

3. The formulations for baby laundry detergent and stain remover are presented below.

Baby laundry detergent

Brand name	ROKAnol L7	ROKAnol MT7	ROKAnol MT7E
	Concentration [%]		
Aqua	43.0		
SULFOROKAnol L227/1	35.0		
EXOsoft MG	5.0		
EXOsoft PO30	5.0		
ROKAnol L7	3.0	-	-
ROKAnol MT7	-	3.0	-
ROKAnol MT7E	-	-	3.0
GLDA	2.5		
Euperlan HCA	0.5		
Glycerin	6.0		
	Physical and chemical properties		
Appearance	clear, transparent homogenous liquid		
Viscosity [cP]	700-900	100-200	<100
pH	7-9	7-9	7-9

Stain remover

Brand name	ROKAnol L7	ROKAnol MT7	ROKAnol MT7E
	Concentration [%]		
Aqua	51.3		
ABSNa 50%	7.7		
ROKAnol L7	11.0	-	-
ROKAnol MT7	-	11.0	-
ROKAnol MT7E	-	-	11.0
Perhydrol, 35%	-	30	-
Citric Acid			
	Physical and chemical properties		
Appearance	clear, transparent homogenous liquid		
Viscosity [cP]	<200	<200	<200
pH	4-6	4-6	4-6

4. The detergency test for final product.

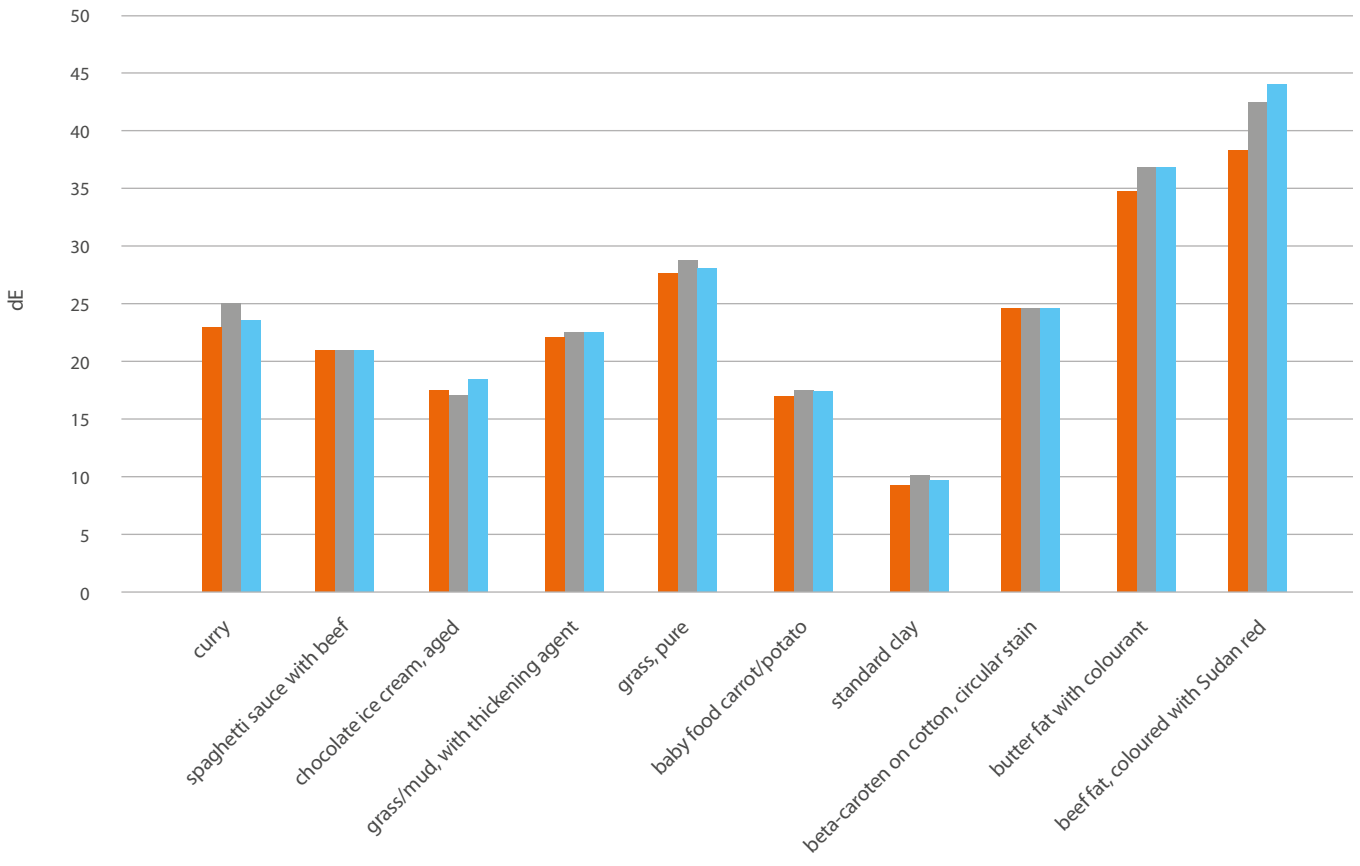
Detergency – the ability of the detergent to remove soils from the fabric surface during the laundering process. Detergency tests were performed using to own method, with a different solids: 1. Fluid make-up, 2. Curry, 3. Blood, aged, 4. Wine, aged, 5. Spaghetti sauce with beef, 6. Chocolate ice cream, aged, 7. Grass/ mud, with thickening agent, 8. Highly discriminative tea, 9. Grass, pure, 10. Baby food carrot/potato, 11. Standard clay, 12. Betacarotene on cotton, circular stain, 13. Dirty Motor Oil (DMO), 14. Butterfat with colourant, 15. Beef fat, coloured with Sudan red.

Test conditions for baby laundry detergents:

- automatic washmachine
- 40°C (with one of the formulations)
- cotton program
- load – calculated for 2 kg of dry, white towels
- fabric soiled with standard dirt

After the washing process was performed, the standardly disturbed fabrics were dried and ironed, and then the degree of washing was assessed by measuring parameter dE from the CIE LAB scale, as the difference between the initially disturbed stain and the degree of its washing. The greater dE value, the better the washing outcome.

Baby laundry detergents – typical stain for children

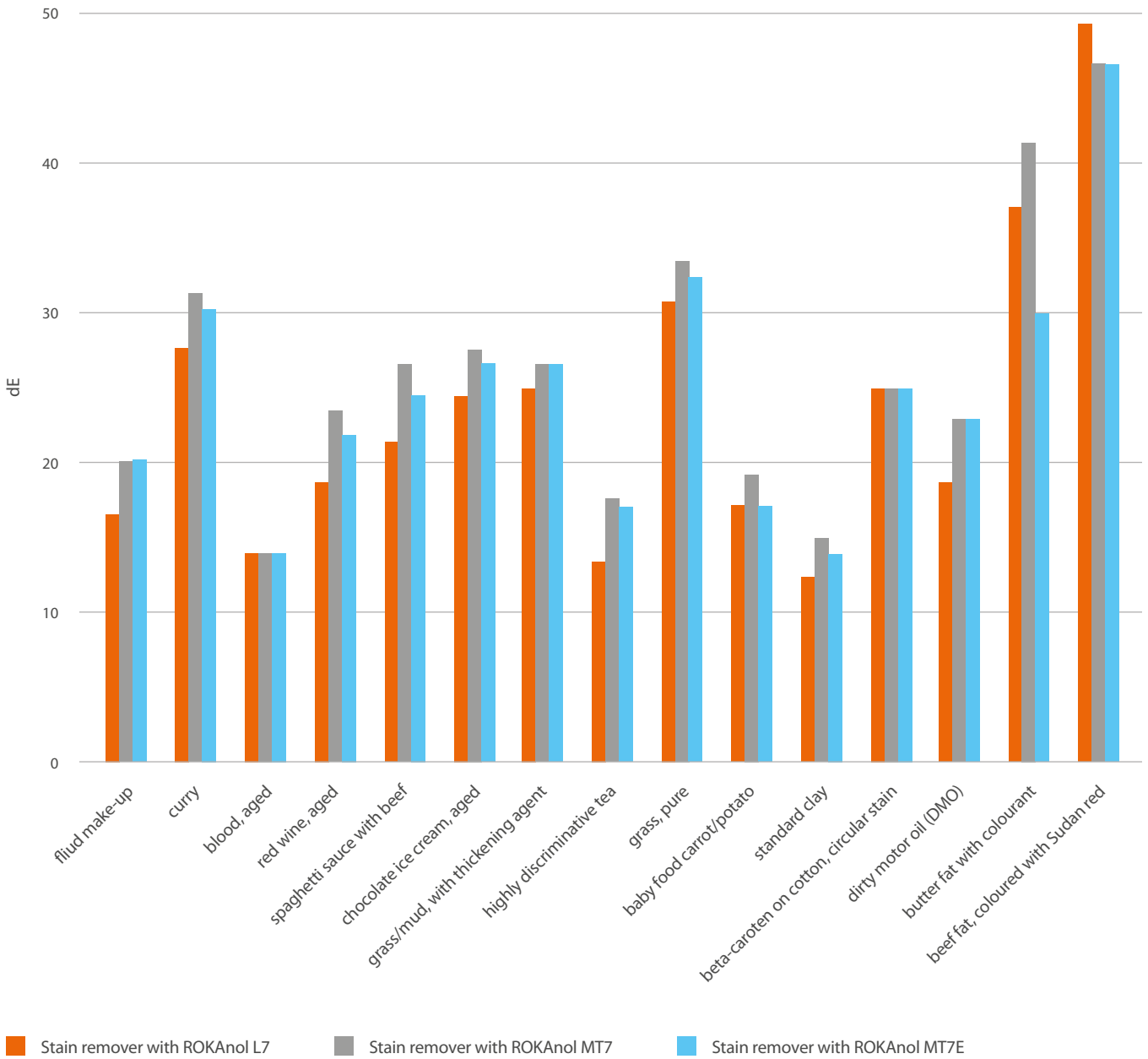


Test conditions for stain remover:

- automatic washmachine
- 40°C (with one of the formulations)
- cotton program
- load – calculated for 2.5 kg of dry, white towels
- the dosing of the stain remove: 100 ml with market capsule
- fabric soiled with standard dirt

After the washing process was performed, the standardly disturbed fabrics were dried and ironed, and then the degree of washing was assessed by measuring parameter dE from the CIE LAB scale, as the difference between the initially disturbed stain and the degree of its washing. The greater dE value, the better the washing outcome.

Stain remover



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