Stain removers for household use

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.

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PCC PCG
OXYALKYLATES
IRPC

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- 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

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

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SYNTEZA

Alkylphenols

- Nonylphenol
- Dodecylphenol
- Tristyrylphenol

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- Portfolio Management
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Stain removers for household use

Stain removers are substances designed to remove tough stains from various surfaces, including clothes, carpets, upholstery. Stain removers available on the market can be divided into stain removers designed for colored fabrics, black fabrics, white fabrics.

The most common methods of applying the product are as a laundry additive to enhance the action of the laundry detergent or directly on the stain, in the case of difficult, single stains.

The developed formulation is shown below:

- Liquid Stain Remover, LSR
- Pre-Treat Gel Stain Remover
- Concentrated Gel Stain Remover, CGSR

Detergency

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 on fabric soiled with standard, different dirt: 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. Beta-carotene on cotton, circular stain, 13. Dirty Motor Oil (DMO), 14. Butterfat with colourant, 15. Beef fat, coloured with Sudan Red.

Tested dirt divided into three categories:

Enzymatic
- Blood, aged
- Chocolate ice cream, aged

Bleachable
- Curry
- Wine, aged
- Grass/mud, with thickening agent
- Highly discriminative tea
- Grass, pure
- Standard clay
- Beta-carotene on cotton, circular stain
- Baby food carrot/potato

Greasy
- Fluid make-up
- Spaghetti sauce with beef
- Butter with colorant
- Beef fat, colored with Sudan Red
- Dirty Motor Oil (DMO)

Test conditions:

- automatic washing machine
- 40°C
- water hardness (13°dH)
- cotton program
- load – 2.5 kg of dry, white towels
- LSR – 40 mL/kg clothes + washing capsule
- CGSR – 40 mL/kg clothes + washing capsule
- pre-treat gel stain remover – applied before washing (squeeze on stains, rub in circles and leave for 5 minutes) + washing capsule
- fabric soiled with standard dirt

After the washing process was performed, the standardly soild fabrics were dried and then the degree of washing was assessed by measuring parameter dE* from the CIELab scale, as the difference between the initially stain and the degree of its washing.

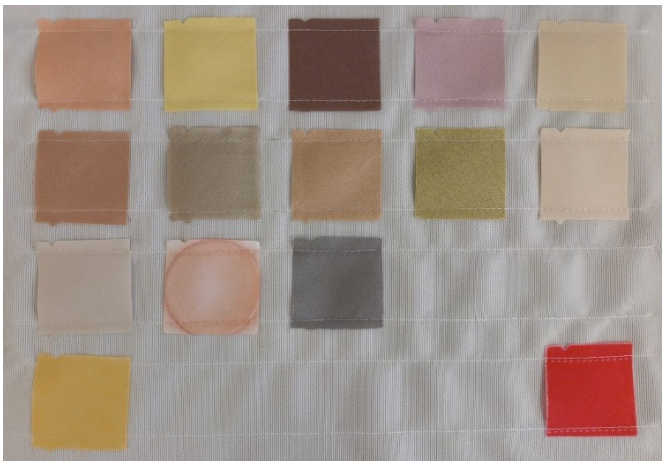


Figure 1. Soiled fabric before washing

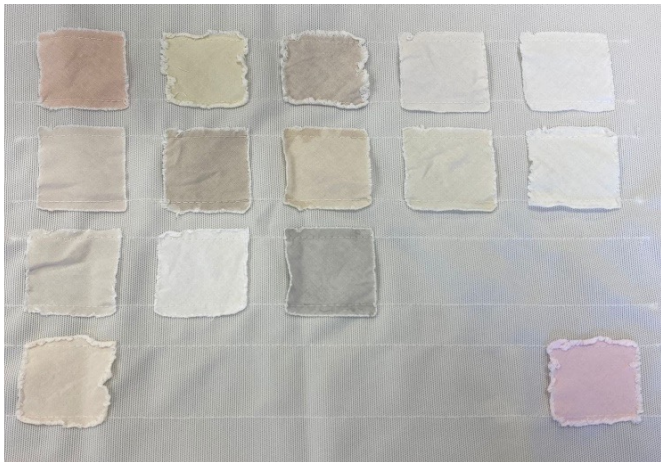


Figure 2. Fabric after washing

Liquid stain remover, LSR/1

Compound	Brand name	Concentration [%]	Function
PEG-6 Glyceryl Cocoate/ Laureth-7/ PEG 11-Rapeseedamide	**ROKAcet KO400G/ ROKAnol L7/ ROKAmid MRZ11**	**11.0**	**Breaks down stains**
Sodium Dodecylbenzenesulfonate	**ABSNa 50**	**7.7**	**Removes stains/ foaming agent**
Hydrogen Peroxide	–	30.0	Bleaching agent
Etidronic Acid	–	4.0	Stabiliser
Sodium Hydroxide	–	for pH ~ 4.5	pH regulator
Aqua	–	up to 100.0	Solvent

Appearance	visual method	clear liquid
pH		4
Viscosity [cP]	Brookfield LV, T: 20°C	100-150
Stability	1 month in 5°C, 20°C, 40°C	confirmed

Procedure:

1. Mix ABSNa 50 with water.
2. Add ROKAcet KO400G/ ROKAnol L7/ ROKAmid MRZ11 and mix until a homogeneous solution is obtained.
3. Then add Editronic Acid and mix.
4. Add Sodium Hydroxide to obtained pH around 4.5.
5. Then add Hydrogen Peroxide and until a clear liquid is obtained.

It is possible to make the same formulation witch pH around 6. For this purpose, add appropriate amount of Sodium Hydroxide.

Liquid stain remover, LSR/2

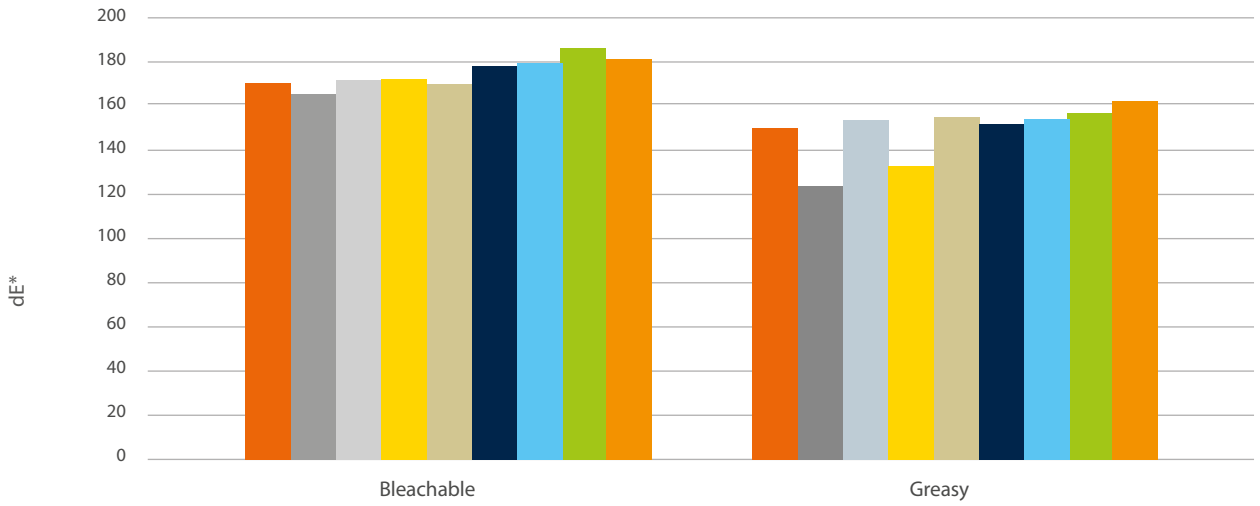
Compound	Brand name	Concentration [%]	Function
C12-16 Laureth-7/ PEG 11-Rapeseedamide	ROKAnol L7A/ ROKAmid MRZ11	9.0	Breaks down stains
Sodium Dodecylbenzenesulfonate	ABSNa 50	8.0	Removes stains/ foaming agent
Sodium Polyacrylate	EXOlat ZA	5.0	Sequestrant
C12-15 Pareth-3	ROKAnol DB3	1.0	Removes stains/rheology modifier
Hydrogen Peroxide	–	30.0	Bleaching agent
Aqua	–	up to 100.0	Solvent

Appearance	visual method	clear liquid
pH		6
Viscosity [cP]	Brookfield LV, T: 20°C	200-400

Procedure:

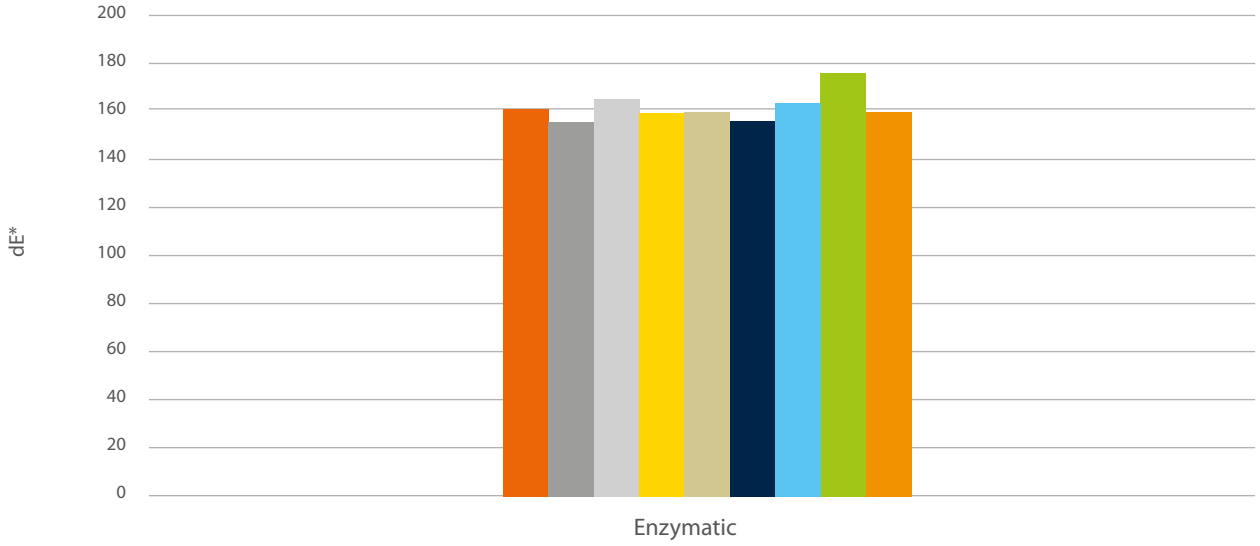
1. Mix ABSNa 50 with water.
2. Add ROKAnol L7A/ ROKAmid MRZ11 and mix until a homogeneous solution is obtained.
3. Then add EXOlat ZA and mix.
4. Add ROKAnol DB3 and mix.
5. Then add Hydrogen Peroxide and mix.

Liquid stain removers for bleachable and greasy stains (40 mL/kg clothes + washing capsule)



Market product pH 4.5
LSR/1 with ROKAcet KO400G pH 4
LSR/1 with ROKAcet KO400G pH 6
LSR/1 with ROKAnol L7 pH 4
LSR/1 with ROKAnol L7 pH 6
LSR/1 with ROKAmid MRZ11 pH 4
LSR/1 with ROKAmid MRZ11 pH 6
LSR/2 with ROKAnol L7A pH 6
LSR/2 with ROKAmid MRZ11 pH 6

Liquid stain removers for enzymatic stains (40 mL/kg clothes + washing capsule)



Market product pH 4.5
LSR/1 with ROKAcet KO400G pH 4
LSR/1 with ROKAcet KO400G pH 6
LSR/1 with ROKAnol L7 pH 4
LSR/1 with ROKAnol L7 pH 6
LSR/1 with ROKAmid MRZ11 pH 4
LSR/1 with ROKAmid MRZ11 pH 6
LSR/2 with ROKAnol L7A pH 6
LSR/2 with ROKAmid MRZ11 pH 6

Parameter dE* is the difference between the initial stain and the degree of its washing, higher dE*, better detergency.

Pre-treat gel stain remover

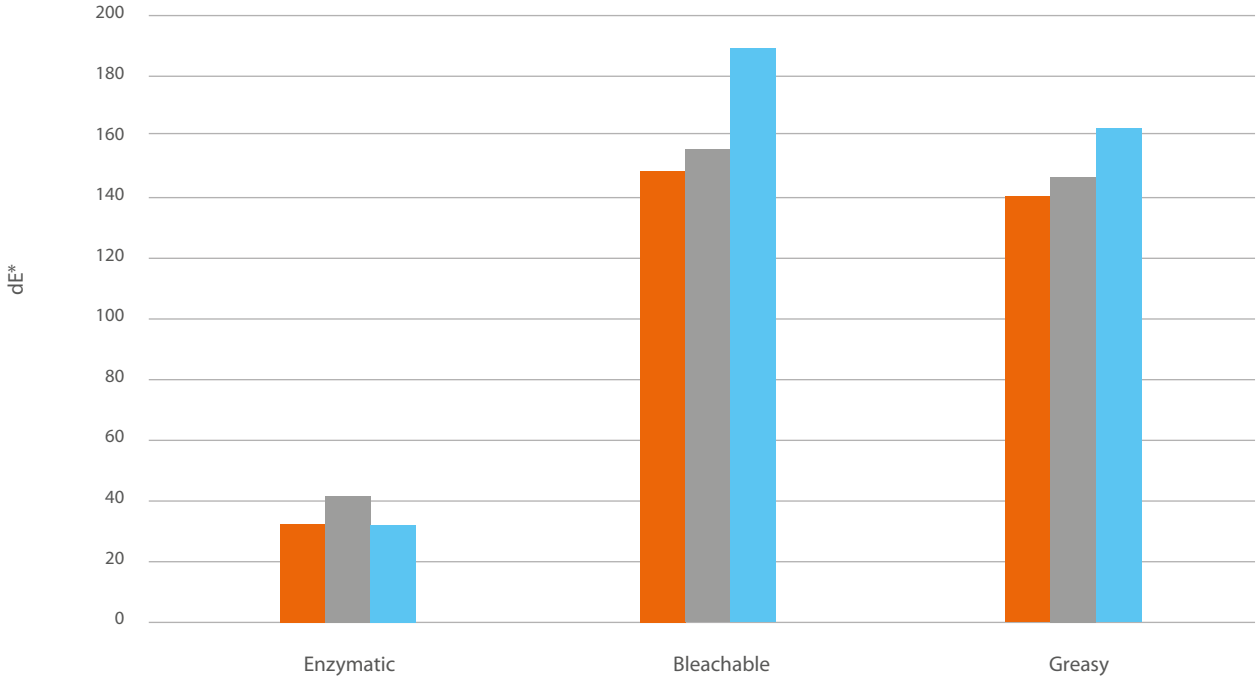
Compound	Brand name	Concentration [%]	Function
Sodium Dodecylbenzenesulfonate	**ABSNa 50**	**7.7**	**Removes stains/ foaming agent**
Laureth-3	**ROKAnol LK3**	**6.0**	**Removes stains/ rheology modifier**
Laureth-7/ PEG 11-Rapeseedamide	**ROKAnol L7/ ROKAmid MRZ11**	**4.0**	**Breaks down stains**
Hydrogen Peroxide	–	13.0	Bleaching agent
Sodium Hydroxide	–	for pH 6	pH regulator
Aqua	–	up to 100.0	Solvent

Appearance	visual method	liquid paste
pH		6
Viscosity [cP]	Brookfield LV, T: 20°C	1000-1400

Procedure:

1. Mix ABSNa 50 with water.
2. Add ROKAnol LK3 and mix.
3. Then ROKAnol L7/ROKAmid MRZ11 and mix.
4. Then add Hydrogen Peroxide and mix until homogeneous liquid paste id obtained.
5. Check the pH, add Sodium Hydroxide to obtained approximately 6.

Pre-treat gel stain removers



Parameter dE* is the difference between the initial stain and the degree of its washing, higher dE*, better detergency.

Concentrated gel stain remover, CGSR/1

Compound	Brand name	Concentration [%]	Function
Sodium Laureth Sulfate	**SULFOROKAnol L170/1**	**6.0**	**Removes stains/ foaming agent**
C12-16 Laureth-7/ PEG 11-Rapeseedamide	**ROKAnol L7A/ ROKAmid MRZ11**	**7.0**	**Breaks down stains**
C12-15 Pareth-3	**ROKAnol DB3**	**3.0**	**Breaks down stains/ rheology modifier**
Hydrogen Peroxide	–	30.0	Bleaching agent
Disodium Edetate	–	5.0	Chelator and stabiliser
Citric Acid	–	for pH 6	pH regulator
Aqua	–	up to 100.0	Solvent

Appearance	visual method	liquid paste
pH		6
Viscosity [cP]	Brookfield LV, T: 20°C	1200-1400

Procedure:

1. Mix SULFOROKAnol L170/1 with water until dissolved.
2. Add ROKAnol L7A/ROKAmid MRZ11 and mix.
3. Then add ROKAnol DB3 and mix.
4. Add Disodium Edetate and mix.
5. Then add Hydrogen Peroxide and mix.
6. Check the pH in the mass, add citric acid to obtained approximately 6.

Concentrated gel stain remover, CGSR/2

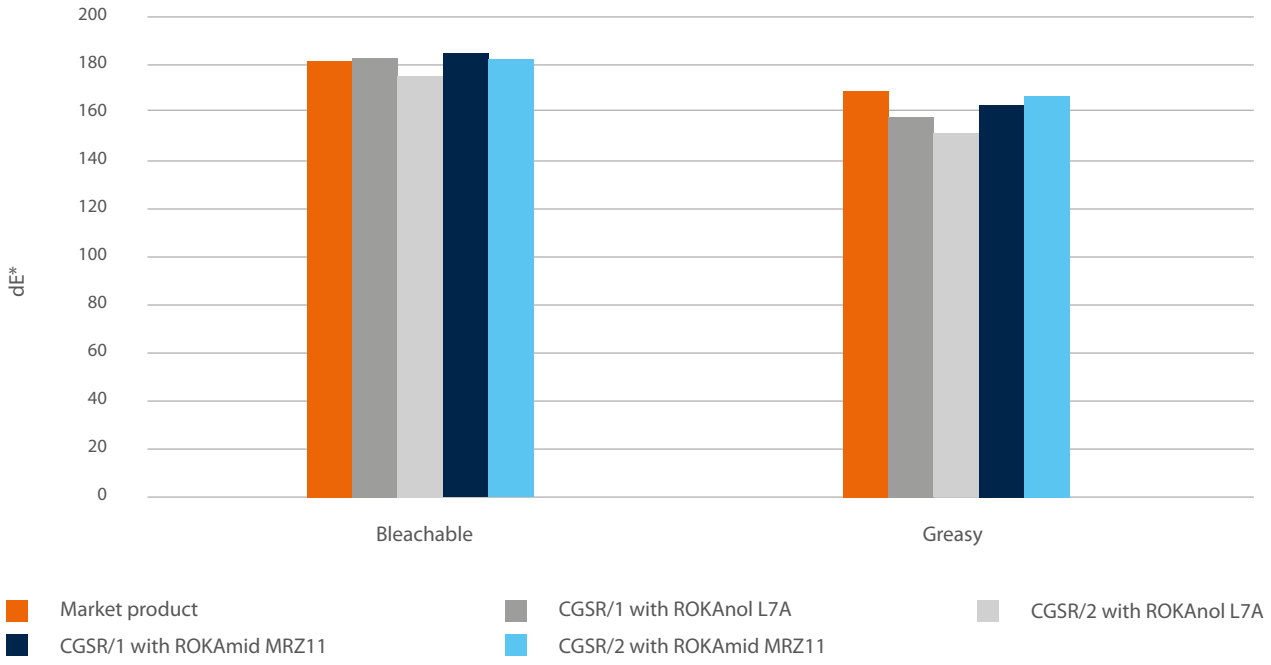
Compound	Brand name	Concentration [%]	Function
C12-16 Laureth-7/ PEG 11-Rapeseedamide	ROKAnol L7A/ ROKAmid MRZ11	7.0	Breaks down stains
Sodium Laureth Sulfate	SULFOROKAnol L270/1	6.0	Removes stains/ foaming agent
Sodium Polyacrylate	EXOlat ZA	5.0	Sequestrant
C12-15 Pareth-3	ROKAnol DB3	3.0	Breaks down stains/ heology modifier
Hydrogen Peroxide	–	30.0	Bleaching agent
Disodium Edetate	–	5.0	Chelator and stabiliser
Aqua	–	up to 100.0	Solvent

Appearance	visual method	liquid paste
pH		6
Viscosity [cP]	Brookfield LV, T: 20°C	900-1200

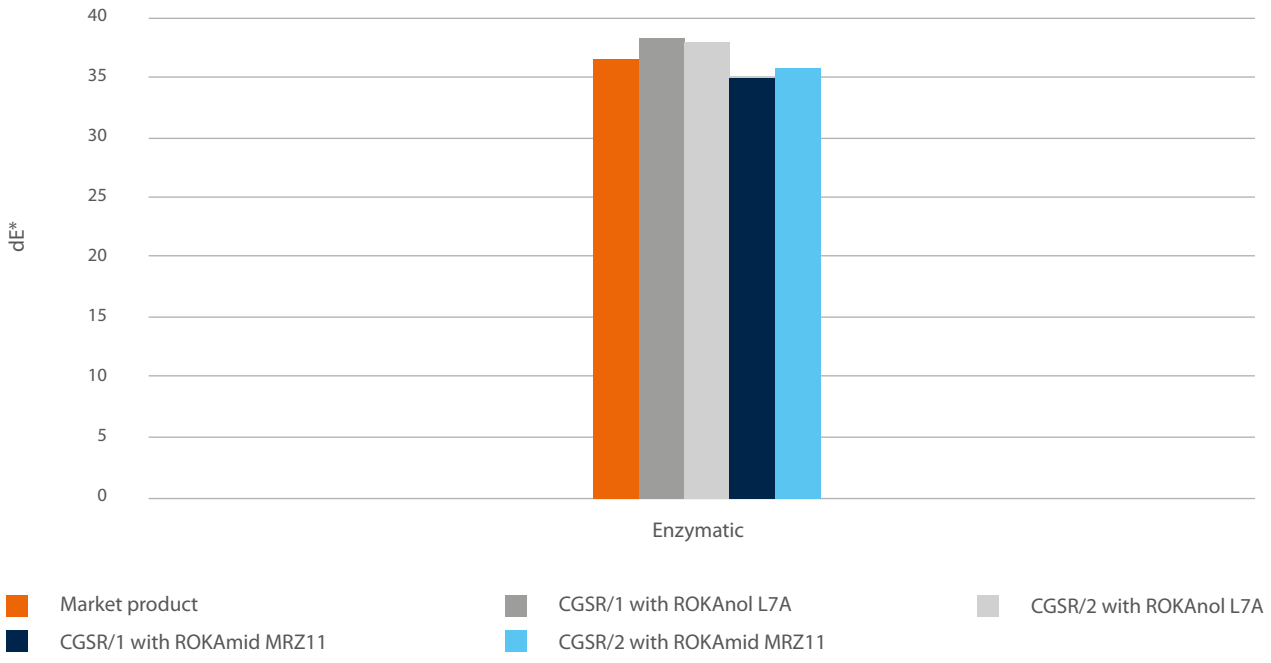
Procedure:

1. Mix SULFOROKAnol L270/1 with water until dissolved.
2. Add ROKAnol L7A/ROKAmid MRZ11 and mix.
3. Then add ROKAnol DB3 and mix.
4. Add EXOlat ZA and mix.
5. Add Disodium Edetate and mix.
6. Then add Hydrogen Peroxide and mix.

Concentrated gel stain removers, 40 mL/kg clothes + washing capsule



Concentrated gel stain removers, 40 mL/kg clothes + washing capsule



Parameter dE* is the difference between the initial stain and the degree of its washing, higher dE*, better detergency.

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