Tanning industry

Chemical products and raw materials

PCC Exol

Raw hides

Sorting and trimming
Salting and storage

Soaking, washing, degreasing of hides and skins	ROKsol A87, EXOletan DG, EXOletan SF
Aluminium tanning	ROTANINA ALFc, ALDEHYD AG ROTANINA M70, ROTANINA W
Tightening of hides and skins	ROKpen SU25, ROKryl SU25
Filling	ROKryl GA14, ROKryl GA15 ROKryl GA16, ROZIN 2M, Rozin MC
Dyeing	Dyspergator NNOC E
Lubrication/fatliquoring	ROKsol ST4A, ROKsol ST3K ROKsol STE, ROKsol STR ROKsol STB, ROKsol ST6

01 / SKIN SOAKING, WASHING, DEGREASING

SKIN SOAKING, WASHING, DEGREASING

ROKsol A87

Composition:

ROKsol A87 is a mixture of oxyalkylated alcohols for soaking and degreasing of leather at any stage of the leather tanning process.

Physico-chemical properties

Appearance:	a colourless to pale yellow liquid
Odour:	characteristic
pH of a 1% aqueous solution at 20°C	4.6–7.4
Solubility in water:	in any ratio
Other solvents:	alcohols, acetone
Solidification point, °C:	approx. -5
Flash point, °C:	approx. 118
Boiling point, °C:	approx. 100

Performance properties:

- it has excellent wetting properties, facilitates and accelerates the soaking of the skin and other bathing processes during leather tanning
- it allows to achieve a low-fat content (in the vet-blue phase) in highly greasy skins (pig, sheep and fur skins)
- it is biodegradable
- it does not have a significant effect on the hydrophobisation of hides

Applications:

- for the bathing processes of the wet tanning and re-tanning at every stage of the processing of calf, bovine, pig, sheep, goat, horse, ostrich and fur skins

EXOletan DG

Composition:

EXOletan DG s a polyoxyalkylenated fatty alcohol.
An ecological, non-ionic surfactant with degreasing properties, for universal use.
Compatible with other non-ionic, as well as anionic and cationic surfactants.

Properties:

Colour on the Hazen scale at 20–25°C:	max. 100
pH of a 1% (m/m) solution:	5.0–7.0
Solubility in water (20°C):	forms cloudy solutions
Solidification point, °C:	approx. 20
Viscosity at 25°C, cP:	approx. 100

Performance properties:

- it works well in the degreasing and tanning of hides; the product has a strong degreasing effect
- promotes the soaking effect and facilitates the penetration of other chemicals into the skin's surface. This product improves the uniformity of dyeing, intensifies the re-tanning process and increases the softness of the skin.
- it shows a cleaning effect
- it is easily biodegradable
- recommended range of use up to 0.5%

Applications:

- EXOletan DG is stable in electrolyte solutions and in chrome tanning
- unstable in vegetable tanning baths
- it can be used in the environment of oxidising and reducing agents as well as in the presence of hard water
- it is active in cold water, and in acidic, neutral and neutral-alkaline baths

EXOletan SF

Composition:

Stabiliser for lubricants/oiling agents with a softening effect.

An anionic product from the group of alkyl ether sulfates. The product is colourless to light yellow, with a pH close to neutral and low viscosity at room temperature.

Properties:

Solubility in water:	unlimited
Other solvents:	low aliphatic alcohols
Density at 20°C, g/mL:	approx. 1.04
Odour:	odourless
Light and heat resistance:	very good
Stability in mineral tanning:	excellent

Performance properties:

- EXOletan SF is used alone or with lubricants during the mineral tanning or pickling process

Applications:

- facilitates the spreading of the lubricant and has a softening effect. In addition, better penetration of the lubricant/oiling agent improves the functional properties of the product
- recommended range of use 0.5 to 1%

02 ALUMINIUM TANNING

ALUMINIUM TANNING

ROTANINA ALFc

Cationic aluminium salt complex for white skins and fur skins.

Composition:

Rotanina ALFc s a tannin based on organic aluminium salt complexes with alkalinity of approx. 20%. Rotanina ALFc has a tanning and antiseptic effect.

Physico-chemical properties

Appearance:	a colourless to straw-coloured liquid
Odour:	characteristic
Charge:	cationic
pH of a 10% solution:	ca 4.2
Miscibility:	miscible with water in all proportions

Performance properties:

- it is a tannin with a cationic charge, hence its affinity for syntans with anionic groups, especially carboxylic groups, with which it forms permanent bonds
- it creates aluminium soaps with hydrophobic fatty acids
- aluminium hydroxide is useless in tanning processes, while its release in sewage settling tanks may intensify the sedimentation of organic and inorganic suspensions in tanning wastewater, which is a desirable phenomenon
- the antiseptic properties of Rotanina ALFc can advantageously delay the putrefaction process of tanning waste

Applications:

- Rotanina ALFc is used in the tanning and re-tanning of white and fur skins
- for fixing colouration, lubricants, vegetable and polymer tannins in skins and hides
- when fixing the colours, it is applied after formic acid in the amount of 2–3% of the commercial product

TANNING AND ALDEHYDE RE-TANNING

ALDEHYD AG

It is an aldehyde tanning agent for the re-tannage of mainly chromium-tanned leather, also designed for individual and combined re-tanning (aluminium-aldehyde or chrome-aldehyde) of fur leather. Aldehyd AG is a polymerisation product of formaldehyde.

Physico-chemical properties:

Appearance:	a colourless to yellow liquid
Odour:	sharp, irritating
Charge:	non-ionic
Aldehydes on the basis of formaldehyde, % (m/m)	10–16
pH of the commercial product:	6–7
Solubility in water:	very good
Other solvents:	organic solvents (methanol, ethanol, acetone); with the release of some components
Electrolyte resistance:	acids, salts and alkalis used in leather tanning
Boiling point, °C:	approx. 102
Flash point, °C:	78
Solidification point, °C:	below -12
Miscibility:	with chrome, aluminium and aldehyde tannins, dispersing and filling agents, as well as anionic lubricating agents

Performance properties:

- it is capable of self-tanning
- the thermal resistance of leathers tanned with Aldehyd AG is similar to the thermal resistance of leathers tanned with formaldehyde or glutaraldehyde
- compared to formaldehyde, Aldehyd AG tanned leathers are distinguished by slightly higher fullness and plumpness
- compared to glutaraldehyde – there is a more advantageous, white colour of tanned hides
- Aldehyd AG tanned leathers show the typical advantages of aldehyde tanning, such as good resistance to: sweat, alkalis and washing

- an important functional property in the case of chrome-tanned leathers is the filling, softening and improving the grip of the tanned leathers
- chrome leathers re-tanned with Aldehyd AG also show favourable dyeing properties
- with a low equalising effect, the product does not cause excessive brightening of leather dyed with anionic dyes
- the affinity of Aldehyd AG for pelts and chrome tanning leather increases with increasing pH, as does the affinity of chrome tannins
- a preferred re-tanning combination for chrome leathers is the use of Aldehyd AG with aluminium salts. The filling effect is, in this case, associated with a marked effect of improving the tightness of the grain of the tanned hides

Applications:

- **Aldehyd AG** is mainly used for the re-tannage of chromium-tanned leather of all types. The tanning of chrome leathers with Aldehyd AG in conjunction with a mineral, chrome, aluminium or aluminium-chrome re-tanning gives particularly favourable results. The use of Aldehyd AG is simple and does not alter the conditions for mineral tanning. The most commonly used concentration is 4–6% of the product based on the weight of shaved hides.
- The re-tanning time is usually around 2 hours, and the temperature is 35–45 °C.
- It is advantageous to complete the re-tanning process at pH 4.2 for the best possible use of the product from the bath. The pH adjustment is most often carried out during the process with the use of NaHCO3.
- Aldehyd AG is added to the drum through the axis along with the chrome tanning agent or 15–30 minutes before adding the mineral tanning agent.
- Re-tanning with Aldehyd AG can be combined with mineral re-tanning and resin-syntan-vegetable filling in the so-called compact wet finishing of chrome leathers. In these methods, Aldehyd AG and the mineral tannin are always added first.
- Aldehyd AG can be used like other aldehyde tannins in the case of fur skins and in the treatment of vegetable type skins.
- The use of Aldehyd AG in combination with mineral tannins gives particularly favourable results in the treatment of fur.
- In the treatment of vegetable-type leathers, Aldehyd AG is used as a tanning agent prior to actual vegetable tanning and as a preparation for fixing an unbound tanning agent.
- In the treatment with Aldehyd AG, it preferably cooperates in particular with the condensation products of naphthalenesulfonic acids, e.g. Dyspergator NNOC E.

SYNTAN-VEGETABLE TANNING AND RE-TANNING, MASKING NEUTRALISATION, BLEACHING

ROTANINA M70

A synthetic substitute of tanning agents with bleaching properties used in the treatment of chrome and vegetable tanned leather.

Composition:

Rotanina M70 is an anionic product of formaldehyde-urea condensation of phenolsulfonic acids and phenol.

Physico-chemical properties

Appearance:	a homogeneous light brown liquid with the consistency of a syrup
Odour:	sharp, close to acetic acid
Charge:	anionic
Tannins, % (m/m):	42 ± 1
Ingredients other than tannins, % (m/m):	max. 14
pH of the commercial product:	3.4–3.9
Solubility in water:	unlimited
Density, g/mL:	approx. 1.225
Volatile substances, %:	max. 58
Miscibility:	Rotanina M70 solutions are miscible in all proportions with solutions of vegetable tannins and anionic syntans

Performance properties:

- when used for tanning, it gives a fairly stiff leather with a light, almost white colour
- a characteristic feature of syntan is the ability to bleach chrome leathers, while the bleached leathers retain high smoothness and tightness of the grain

Rotanina M70 used in vegetable tanning processes:

- has a whitening effect and helps to obtain a bright and even colour of the skins
- acidifies and helps to maintain the proper acidity of the tan liquor
- prevents the development of mould in the tan liquor

Rotanina M70 used in the processes of the treatment of chrome leather:

- has a whitening effect and makes it possible to obtain leathers of a white colour, while bleached leathers are characterised by a smooth and tight grain
- shows a good equalising effect and facilitates obtaining even, pure colouration
- for velour and nubuck leather, it helps to obtain fine leather texture

Applications:

- **Rotanina M70** is a syntan mainly used for bleaching chrome leather. In vegetable tanning, Rotanina M70 is used for fancy leather goods, and blank and underside leathers as a component of a set of tannins that brighten the colour.
- Re-tanning of fancy and vegetable-tanned pigskins with a Rotanina M70 solution lightens the colour of the skins and increases their resistance to light. A similar effect is demonstrated by Rotanina M70 used in the process of preserving unbound tannin (the so-called impregnation process) and in vegetable tanning leathers. In chrome tanning, Rotanina M70 is used for all white leathers for footwear uppers, leathers for protective gloves, white ball leathers and lining leathers.
- Rotanina M70 is used in addition to the usual deacidification agents for the so-called masking neutralisation of chrome-tanned leather. Neutralisation with 3–5% of commercial Rotanina M70, based on the weight of shaved leathers, increases the softness of the leather while maintaining good smoothness and tightness of the grain. Rotanina M70 is also used as an equaliser when dyeing chrome leathers with anionic dyes to light, pastel colours.

ROTANINA W

Composition:

Rotanina W is an auxiliary agent used in the tanning industry. It is a substitute synthetic tannin used mainly in tanning of vegetable tanned leather to increase its softness and elasticity. The product is a sulphonated phenolic resin of anionic character. It is in the form of a homogeneous, viscous brown liquid with a cherry red shade.

Physico-chemical properties

Appearance:	a homogeneous, viscous brown liquid with a cherry red shade
Odour:	sharp, close to acetic acid
Density at 20°C, g/cm3:	1.195–1.215
Tannins, %, (m/m):	44 ± 1
Ingredients other than tannins, % (m/m):	max.11
Insoluble matter, %:	max. 0.60
Purity:	min. 79
Volatile substances, %:	max. 49
pH difference figure:	max. 0.7
Ash, %:	max. 0.3
Iron, based on Fe2O3, %:	max. 0.03
Ammonium salts on the basis of (NH4)2SO4, %:	max. 13
pH of the commercial product:	3.5–3.9
Solubility in water:	good
Miscibility:	miscible with solutions of vegetable and synthetic tannins in any ratio.

Performance properties:

- Rotanina W is a substitute synthetic tannin of anionic character
- when used as a standalone product, it leaves the skin soft and full, with a light pink colour
- Rotanina W is characterised by fast penetration and high tannin binding capacity to the skin, similar to the values found in vegetable tannins

Advantages of the product:

- it is used in dressing of vegetable tanned leather to increase its softness and elasticity
- it provides leathers with a flexible, full and pleasant to the touch grain
- has the ability to dissolve in water and mix with vegetable and synthetic tanning solutions at any ratio
- it significantly accelerates and facilitates the leather re-tanning process
- it has a positive effect on the re-tanning of chrome-tanned sole leathers
- in the presence of insoluble vegetable tannin, it shows dispersing properties
- it has a positive effect on plant tanning liquor

Applications:

- Rotanina W is a typical syntan used for tanning light and medium vegetable-tanned skins, in particular for fancy goods leather, lining leather, vegetable-tanned topskins, light and heavy blank leathers and for large surface cowhide sole leathers. Beneficial effects are also obtained when using Rotanina W along with syntans having stiffening properties for the tanning of heavy type sole leathers. Rotanina W is also used for re-tanning of chrome sole leathers for light filling, better absorption and a bright, even colour.

Examples:

Fancy leathers

The use of Rotanina W in fast (drum) tanning of fancy leathers gives particularly favourable effects. In this case, its advantages, such as rapid penetration and fast bonding to the skin, are fully exploited.

Rotanina W, used in combination with vegetable tannins, provides the leather with softness, fullness and a bright pink colour. The skins can be easily and intensively dyed with acid dyes, and their further finishing is easy.

The proportion of Rotanina W in the mix of tannins can be significant, and in the case of pigskins, practically 30–60% of the total amount of tannins is used. Tanning pigskins with Rotanina W is quick and easy, and tanned skins are characterised by a particularly nice grain texture. When tanning leather: fancy goods, lining goat and sheep skins as well as reptile and amphibian skins, the proportion of Rotanina W in the tanning mix can be up to 60%.

Vegetable, blank and sole leather uppers

Rotanina W is mainly used in the bottom-drum method for tanning of vegetable topskins, blank leather and sole leather. It is most advantageous to use it in the initial stages of tanning.
In the initial stages of tanning in the dyeing pits, the addition of Rotanina W ensures gentle tanning of the skins and a smooth, clean grain tightly bound to the proper tissue. The presence of Rotanina W also helps to maintain the proper acidity of the tan liquor, which contributes to the correct swelling of the pelt. Rotanina W can be added even to the first dyeing pit, as it is insensitive to calcium salts and does not precipitate with them.

In the middle phases – tanning in lay-away pits – the addition of Rotanina W counteracts the development of mould and clarifies and prevents the formation of sediments in the tan liquor. When vegetable tanning topskins, 20–50% of vegetable tannins can be replaced with good effect by Rotanina W. Practice has shown that the beneficial effect of Rotanina W on the condition of the tan liquor and the penetration of the tannin into the skin is already noticeable when using it in an amount of about 20%. The increase in the amount of Rotanina W in the tannin mix shifts the properties of the leather towards increased softness and fullness.

The proportion of Rotanina W in vegetable-syntan tanning of blank skins can be up to 40%.
For the tanning of waste leathers, Rotanina W is used in combination with other synthetic tannins, and for repair type leathers 20–25%.

Large surface cowhide leathers tanned with Rotanina W are characterised by a tight and flexible grain. These features are especially desirable for waste leathers used in the production of women's footwear.
The percentages given in the brochure refer to the mix of tannins and Rotanina converted to tannin percentage.

03 TIGHTENING OF SKINS AND HIDES

TIGHTENING OF SKINS AND HIDES

ROKpen SU25

ROKpen SU25 is a speciality additive used in the tanning industry. It acts as a regulator of the penetration of anionic acrylic water dispersion (Rokryl SU25) into the surface layer of the leather. The product is an aqueous dispersion of a non-ionic surfactant and an organic solvent. It has the form of a clear liquid with a colour ranging from colourless to pale yellow. The product is non-flammable.

Composition:

An aqueous solution of a non-ionic surfactant and diacetone alcohol.

Physico-chemical properties:

Appearance:	a clear liquid, colourless to light yellow
Odour:	characteristic
Charge:	non-ionic
Solid substance, % (m/m):	10–12
Density at 20°C:	1.01–1.02
Surface tension / mhi / m:	48-52
pH of the commercial product:	7-9
Solubility in water:	good, in all proportions
Other solvents:	ethanol
Miscibility:	max. 2.5
Solidification point, °C:	-10
Boiling point, °C:	approx. 100 for a commercial product

Performance properties:

- the product is characterised by good water solubility in all proportions.
- it also dissolves in ethanol. ROKpen SU25 is resistant to electrolyte solutions, i.e. ammonia water, formic acid and sodium chloride.
- it is able to mix with auxiliary agents used in the preparation of skin tightening blends, in the process of bath-free tightening of hides, as well as with all auxiliary agents used in the coating finishing processes. ROKpen SU25 has a solidification point of -10 °C. Below this temperature it freezes, but after thawing and mixing, it is able to return to its original state without losing its functional properties.
- the product works by reducing the surface tension and quickly wetting the skin surface, which facilitates the penetration of the aqueous tightening dispersion. The solvent contained in ROKpen SU25 may partially degrease the skin surface. In some cases, especially in tight leathers requiring the use of large amounts of ROKpen SU25, it may cause a rough touch. The addition of Roksol STE effectively counteracts this. A tightening blend based on Rokryl SU25 and ROKpen SU25 provides a grain strengthening primer, which, however, does not harden the skin and does not reduce the adhesion of the next covering layer.

Leather impregnated with this unique set of products has the following features:

- a smooth, homogeneous, non-sticky surface, it is easy to grind and iron
- a soft grip
- a high tensile strength

Applications:

- **ROKpen SU25** it is used in the processes of tightening leather, mainly leather with corrected grain, as a regulator of the depth of penetration of the anionic, aqueous acrylic dispersion, called Rokryl SU25, into the leather. To facilitate the correct selection of individual impregnating sets, we provide a general recipe for the tightening blend:

Rokryl SU25	100	parts	by weight
ROKpen SU25	50-80	parts	by weight
Water or a 2% dye solution	150-200	parts	by weight
Roksol STE	10-20	parts	by weight

- The amount of ROKpen SU25 used in the tightening blend should be selected each time, depending on the degree of looseness and absorbency of the skin. When changing the amount of the penetrator, the amount of water in the recipe used should not be changed. In the case of chrome leather, re-tanned with syntans, tight and hard, and on the verge of grain cracking, the amount of ROKpen SU25 can be increased to 100 parts by weight. The amount of added fat depends on the initial level of skin lubrication and requires individual refinement.

EXAMPLE: Cowhides with an improved grain
Tightening blend:

Rokryl SU25	100	parts	by weight
ROKpen SU25	50	parts	by weight
Water	100	parts	by weight
Roksol STE	10	parts	by weight

Pouring, 25 g of set per 1 m^2 of skin.

ROKryl SU25

ROKryl SU25 is an acrylic copolymer, obtained by emulsion polymerisation with the use of an anionic-non-ionic dispersing system.

Physico-chemical properties

Appearance:	a milky dispersion
Odour:	characteristic
Charge:	anionic
Dry matter content, % (m / m)	23-27
pH of the commercial product:	9.5-10.5
Density at 20°C:	1.02–1.03
Viscosity at 20°C, mPa*s:	10–15
Solubility in water:	dilutable
Other solvents:	acetic acid, organic solvents, e.g. acetone, methyl ethyl ketone, acetonitrile
Electrolyte resistance: - ammonium hydroxide solution 2 mol/L, mL: - 2 mol L formic acid solution, mL:	 min. 60 min. 60
Miscibility:	it is miscible with the auxiliary agents used in the preparation of skin tightening blends, in the process of bath-free tightening of the hides, as well as with all auxiliary agents used in the coating finishing processes.
Solidification point, °C:	approx. -2.5
Boiling point, °C:	above 40 the product coagulates

Advantages of the product:

- impregnating properties
- designed to tighten the grain of the skins
- dissolves in water
- miscible with auxiliary agents

Performance properties:

- it is an impregnating, soft backing resin
- it provides a foundation that strengthens the grain, which, however, does not harden the skin and does not reduce the adhesion of the next covering layer
- it is excellent for tightening the grain of the skin, because it is a polymer that is soft enough and has a particle size that allows the polymer to settle in the grain layer of the skin
- ROKpen SU25 is usually used as a regulator of the depth of penetration of ROKryl SU25 into the skin (penetrator), while ROKsol STE is used as an agent preventing degreasing of the skin surface
- ROKryl SU25 is highly concentrated when it comes into contact with the skin due to the removal of water through the hide, therefore it should be used in large dilutions
- solids content in tightening blends should not exceed 10%

Leather impregnated with Rokryl SU25 has the following features:

- a smooth, homogeneous, non-sticky surface, it is easy to buff and plate
- a soft grip
- shows high tensile strength
- the addition of ROKryl SU25 to the covering blend improves its flow, increases the elasticity of the coating and its adhesion to the leather

Applications:

- **ROKryl SU25** is an anionic aqueous acrylic dispersion used as a binding agent in leather coating processes in the tanning industry. The product is an acrylic copolymer obtained by emulsion polymerization with the use of an anionic-ionic dispersion system. It is an opalescent liquid of white colour. It dissolves well in water and is miscible with the auxiliary agents used in the preparation of tightening blends in non-bathing processes. It is also miscible with all auxiliary agents used in the finishing processes of coating.
- ROKryl SU25 does not show any tendency to delaminate or increase viscosity during storage. It is, however, sensitive to low temperatures. Below 0°C, it freezes, and after thawing it coalesces (increasing the size of latex particles), which reduces the ability of the polymer to penetrate into the surface of the tightened leather and is associated with the loss of functional properties. Repeated freezing and thawing leads to irreversible coagulation.
- ROKryl SU25 is an impregnating, soft backing resin. Using it strengthens the grain without hardening the skin and reducing the adhesion of the next covering layer. It is excellent for tightening the grain, because it is a polymer of appropriate softness and the right size of particles that allow the polymer to settle in the grain layer of the leather.
- ROKryl SU25 is usually used in combination with ROKpen SU25 as a regulator of its penetration depth into the skin (penetrator), while ROKsol STE is used as an anti-degreasing agent.

General recipe of the tightening blend: Full-grain cowhide with improved grain

Tightening blend:

Rokryl SU25	400	parts by weight
ROKpen SU25	200	parts by weight
Water	360	parts by weight
Roksol STE	40	parts by weight

Pouring, 300–350 g of the blend per 1 m^2 of the skin.

04 FILLING

FILLING

ROKryl GA14

Composition:

A sodium salt of an acrylic copolymer containing iron complexing agents.

Physico-chemical properties

Appearance:	a clear liquid, colourless to light yellow
Odour:	characteristic
Charge:	anionic
Solid substance, % (m/m)	38–42
Density at 20°C:	1.15–1.18
Viscosity at 20°C, mPa*s:	max. 6500
pH of a 10% solution:	4.5-5.4
Solubility in water:	good in cold and warm water
Biodegradability, %:	ca 86.3
Electrolyte resistance:	it shows moderate resistance to acids and good resistance to mineral tannins and iron salts.
Miscibility:	the product mixes very well with synthetic and vegetable tannins.

Performance properties:

- an auxiliary agent in the processes of re-tanning and filling chrome leather
- it facilitates the penetration of synthetic, resin and vegetable tannins into the skin tissue
- resistance to iron salts
- soluble in cold and warm water
- it creates mixtures with synthetic and vegetable tannins
- it affects the filling and tightening of the grain
- it gives the skins elasticity and full structure, and moderately brightens colours
- it exhibits resistance to sunlight
- the filling potential of hides is twice as high as that of vegetable tannins
- it reduces the tendency to form iron stains

Applications:

- ROKryl GA14 is used instead of vegetable tannins for re-tanning and filling chrome and vegetable tanned leather in the amount of 1.5–3.0% based on the weight of shaved skins
- for filling white hides, it is used along with bleaching syntans in the amount of 2–3% based on the weight of shaved skins
- in the case of chrome tanned leather, it can also be used in the dyeing and lubricating bath, in the amount of 1–2% based on the weight of shaved skins
- before adding it to the bath, it is recommended to dilute the product in a ratio of 1:4 with water

ROKryl GA15

Composition:

Sodium ammonium salts of an acrylic and maleic acid copolymer.

Physico-chemical properties

Appearance:	a colourless liquid
Odour:	characteristic
Charge:	anionic
Solid substance, % (m/m):	39–41
pH of a 10% solution:	6.8-7.5
Density at 20°C, g/mL:	1.2–1.3
Dynamic viscosity at 20°C, mPa*s:	approx. 1400
Solubility in water:	total
Miscibility:	the product mixes very well with synthetic and vegetable tannins
Solidification point, °C:	approx. 0

Performance properties:

- it shows high reactivity with mineral tannins, e.g.: $Al.^{+3}$ and Cr^{+3}
- even in small amounts in chrome tanning, it significantly improves the skin's filling
- in the re-tanning process, ROKryl GA15 fills loose parts of the skin well
- in combination with chrome re-tanning, it significantly improves the tightening of the grain
- it improves the depletion of chromium compounds from the tanning bath in chrome tanning and re-tanning processes
- the product can be used in combination with polymer and vegetable tannins to obtain finished skins with the desired properties
- it increases leather's resistance to sunlight and has an equalising effect on colours
- in the re-tanning of fur skins with an aluminium tannin, it increases tear resistance

Applications:

- it is an auxiliary agent used in tanning, re-tanning and filling of chrome-tanned leather
- it increases the leather's resistance to sunlight and has an equalising effect on colours
- it reacts with mineral tannins
- unlimited water solubility
- easy to mix with synthetic and vegetable tannins

ROKryl GA16

An anionic agent used in the processes of re-tanning and filling of chrome-tanned leather.
ROKryl GA16 is an aqueous solution of acrylic syntan.

Physico-chemical properties

Appearance:	a viscous, clear liquid, light yellow to light brown in colour
Odour:	characteristic
Charge:	anionic
Solid substance, % (m/m):	38–42
pH:	6.0 - 7.5
Solubility in water:	unlimited
Density at 20°C, g/cm³:	1.13–1.16
Viscosity at 20°C, mPa*s:	max. 3500
Electrolyte resistance:	it exhibits limited resistance to acids, and at pH <4, precipitate forms from the bath (which redissolves when the pH of the bath is raised above 4).
Resistance to chromium and aluminium salts:	resistant to salts, weak alkalis and three valent chromium salts in anionic form
Hard Water resistance:	very good
Miscibility:	the product mixes well with all synthetic tannins, auxiliary agents and vegetable tannins.

Performance properties:

- it gives the leather softness, elasticity and a full, pleasant grip
- improvement of the elasticity and tightness of the leather grain
- it increases the penetration of synthetic, resin and plant tannins into the skin tissue in the re-tanning process
- ROKryl GA16 facilitates the grinding of finished products
- it lightens the colours
- with the addition of bleaching syntans, it creates white leather with high resistance to sunlight

Applications:

- ROKryl GA16 is used in re-tanning and filling processes for chrome tanned leather in the amount of 1.5–3.0% based on the weight of shaved skins.

ROZIN 2M

A resin filling agent, mainly for chrome tanned leather.

Composition:

Rozin 2M is an aqueous solution of methylenesulfone oligomers of amino resins.

Physico-chemical properties

Appearance:	a liquid with a syrup-like consistency
Odour:	characteristic
Charge:	anionic
Active substance, % (m / m):	48–52
pH of the commercial product:	7.5-9.0
Solubility in water:	unlimited
Free formaldehyde, %:	max. 0.5
Density at 20°C, g/cm^3:	1.250–1.268
Resistance to chromium and aluminium salts:	resistant to three valent chromium salts in anionic form
Miscibility:	Rozin 2M solutions can be mixed in a bath with most of the additives used in wet finishing processes, i.e. synthetic tanning agents, resins and fillers, and anionic fats.

Performance properties:

- it gives a smooth and tight grain
- it fills the side parts of leather
- it makes it easier to obtain a good finish effect
- a weak equalising effect allows for obtaining full-bodied colours
- it does not increase the stiffness of the leather

Applications:

- Rozin 2M is used for filling all types of chrome-tanned leather, especially leather for footwear tops, finished with preserving the natural grain layer.
- The product is used during re-tanning and anionic filling of skins in the amount of 4–12%, depending on the type of skins and the required degree of filling. In special cases, when very intense dyeing of chrome leathers is required, Rozin 2M can be used for filling only at the stage of fatliquoring.

ROZIN MC

A resin filling agent, mainly for chrome tanned leather

Composition:

Rozin MC is a mixture of condensation products of amine resins with polyhydroxy alcohols.

Physico-chemical properties

Appearance:	a homogeneous, brown-coloured liquid
Odour:	characteristic
Charge:	anionic
Active substance, % (m / m):	min. 45%
pH of a 20% solution:	6.0-9.0
Water solubility at 25–29°C, % (m/m):	min. 98
Acid-precipitated parts, %:	min. 16
Electrolyte resistance:	very good
Hard Water Resistance:	very good
Solidification point, °C:	approx. -27

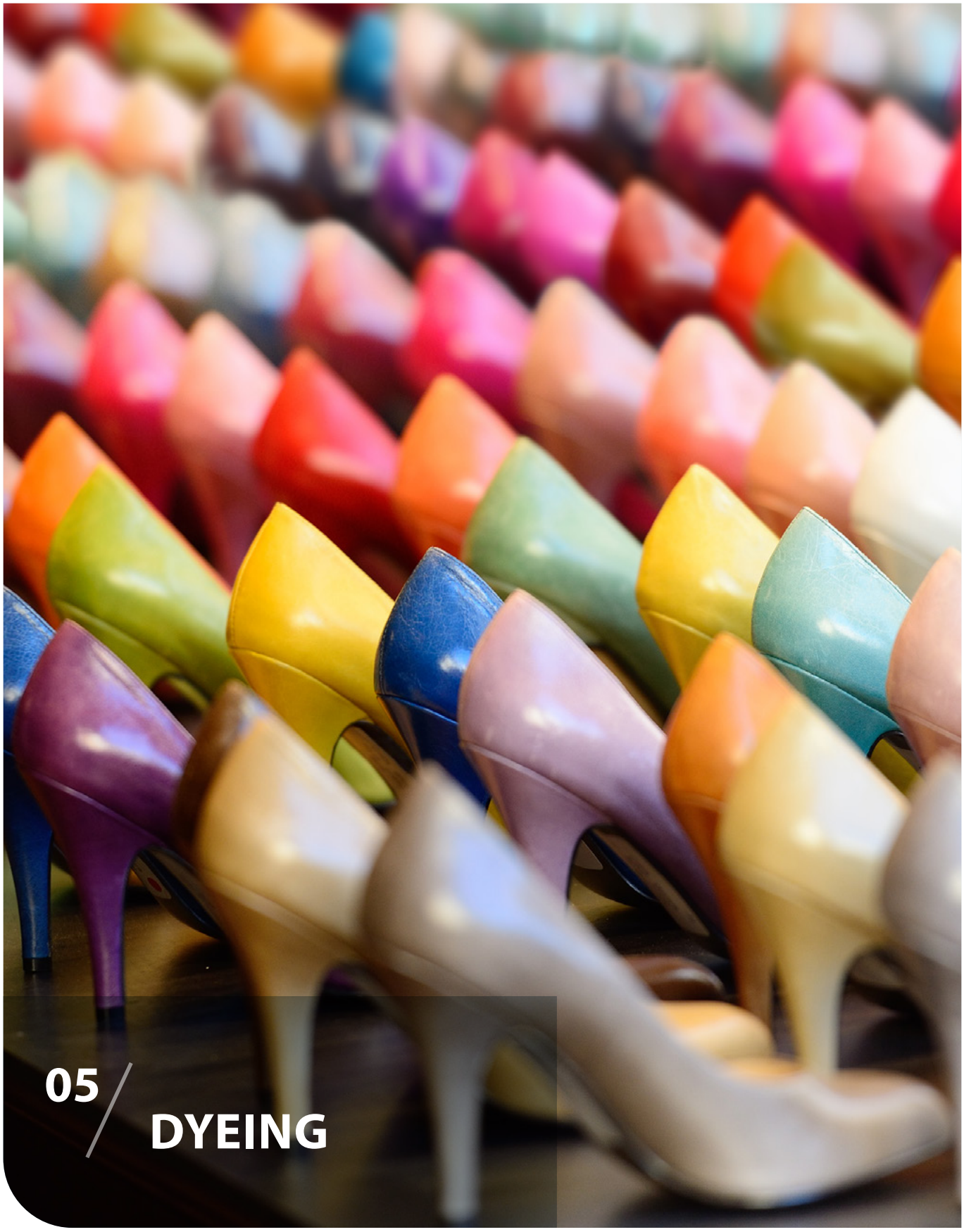
Performance properties:

The characteristic properties of Rozin MC include:

- the ability to give a smooth and tight grain to filled leather. It should be emphasised that this feature occurs not only for moderate temperatures of filling baths: in the range of 40–45°C, but also for high temperatures: in the range of 55–60°C. This allows the product to be used in all compact filling methods of chrome tanned leather
- it fills the side parts of leather
- it makes it easier to obtain a good finish of both the flesh and grain layer
- a moderate bleaching effect allowing the use of products apart from whitening syntans, such as Rotanina M70 for filling white leathers
- compatible with traditional re-tanning agents, such as vegetable, synthetic and chrome tannins

Applications:

- **Rozin MC** is used for all types of chrome leather, especially leather for footwear finished with the natural grain layer.
- The product can be used in all phases of bath finishing of chrome leather, namely:
  - during mineral re-tanning together with chrome or aluminium tannin, in the amount of 4–8% of the commercial product based on the weight of shaved skins
  - in the process of neutralising chrome tanned leather, next to the usual deacidification agents, in the amount of 3–5%
  - during re-tanning and anionic filling of chrome leathers along with other filling agents in the amount of 7–14%, depending on the type of leather and the required degree of filling
- In special cases, when very intense dyeing of chrome leathers is required, Rozin MC can be used for filling only at the stage of fatliquoring.
- Rozin MC solutions can be mixed with solutions of most auxiliary agents used in wet finishing processes, i.e. synthetic tanning agents, dispersants, resins and fillers, and anionic fats.
- Blending with cationic fatliquors requires testing, however, it is possible with Roksol ST3K.
- Mixtures of Rozin MC with tanning chromium salts are durable enough for the product to be used in chrome tanning or re-tanning processes. Keeping the Rozin MC solution with tanning chromium salts for more than 10 hours causes the appearance of iridescence and then the abundant, spongy sediment to precipitate.
- Mixing the solution of Rozin MC with the solution of a mimosa extract causes the appearance of a very fine sediment, suspended quite persistently in the entire volume of the mixture. This property does not limit the use of Rozin MC in a mixture with mimosa in the processes of filling chrome tanned leather. The acidification of Rozin MC solutions leads to the precipitation of resin, the amount of precipitate formed depending on the type and amount of acid added.



05 DYEING

DYEING

Dyspergator NNOC E (Dispersant)

An auxiliary agent in the processes of leather tanning.
The dyspergator NNOC E is a mixture of sodium salts of formaldehyde polycondensates of naphthalenesufonic acids.

Physico-chemical properties

Appearance:	a brown/brownish oily liquid
Odour:	characteristic of formaldehyde polycondensates
Charge:	anionic
Density at 20°C:	1.150-1.170
Water, % (m/m):	max. 68
Ash, on a dry weight basis, %:	max. 34
pH of 2.5% aqueous solution, on a dry weight basis, %:	7.0-8.0
Dispersibility, on a dry weight basis, %:	7
Active substance, on a dry weight basis, %:	min. 65
Na_2SO_4, on a dry weight basis, %:	max. 2.5
Solubility in water:	good

Performance properties:

- it is an anionic auxiliary agent used in the processes of: neutralisation, dyeing and bleaching of leather
- when used in chrome or combined tanning processes, it allows to reduce the affinity of anionic dyes, vegetable and synthetic tannins for collagen. This property affects the maintenance of the natural structure of the grain
- it brightens the colouration with anionic dyes, moderately fills loose parts of the skin without changing its character, and facilitates the absorption and proper distribution of fat in the skin
- it can be mixed in any ratio with vegetable and synthetic tannins, acid and direct dyes and anionic greasing preparations
- it reduces the excessive affinity of plant extracts to the skin tissue and protects it against removing the grain layer
- in combination with vegetable tannins, it shows very good dispersing properties
- it clarifies the plant tanning liquor and reduces the amount of the precipitate
- when dyeing vegetable-tanned hides with alkaline dyes, it facilitates obtaining even, pure colours and prevents browning of the colouration

Applications:

- The dyspergator NNOC E is used in the processes of tanning leather with vegetable and synthetic tannins, for neutralising, filling and dyeing chrome tanned leather.
- after introducing it into solutions of sparingly soluble plant extracts, e.g. oak, chestnut, quebracho, it accelerates their dissolution and influences the clarification of tan liquor.
- at the same time, it significantly reduces the amount of the precipitate of the cooled tan liquor of vegetable tannins, thus contributing to their better utilisation and preventing tannin losses. In the processes of dyeing vegetable skins with acid or basic dyes, NNOC E is used as an equalising and lightening agent.

Examples:

- for dyeing of chrome leathers: top leather, garment leather and gloving leather to light colours, 0.6–1.5% of the NNOC E dyspergator is used, based on the weight of shaved skins
- for dyeing in pastel colours, 2–5% of the Dyspergator NNOC E is used, based on the weight of shaved skins
- the dyspergator NNOC E should be added prior to introducing the dye into the bath
- clarification and dispersion of plant extracts is carried out by adding 10–30% Dyspergator NNOC E to hot, concentrated solutions, depending on the composition of the extracts, then the solutions are mixed, and then the tan liquor is prepared at the concentration required by the technology
- when brush dyeing leather with acid dyes to light colours, add 3–6 g of Dyspergator NNOC E per litre of the solution
- when dyeing in a drum, 1–2.5% of Dyspergator NNOC E is used, based on the weight of shaved skins
- vegetable hides dyed with alkaline dyes should be brushed with a solution of 12–15 g of Dyspergator NNOC E per litre of water before dyeing
- in drum dyeing of hides, 0.8–1.5% Dyspergator NNOC E is treated, based on the weight of shaved skins, and then dyed according to the applicable rules

06 LUBRICATION/FATLIQUORING

LUBRICATION/FATLIQUORING

ROKsol ST4A

ROKsol ST4A is an anionic auxiliary agent used in tanning. It is used to lubricate leather, mainly in chrome tanning.
The product is a mixture of anionic emulsifiers and aliphatic compounds containing carboxyl groups. Its commercial form is an O/W type emulsion (oil in water), beige to brown in colour, with a tendency to delaminate. Due to the solidification point - below -5 °C, the product does not require special storage and transport conditions.

Physico-chemical properties

Appearance:	a homogeneous liquid, white to brown in colour
Odour:	characteristic
Charge:	anionic
Water, (%) (m/m)	max. 20
pH of a 10% emulsion	7.0-8.0
Density at 20°C, g/cm^3:	1.000–1.005
Solubility in water:	forms milky oil-in-water emulsions
Electrolyte resistance:	limited resistance: acids, bases and electrolytes
Resistance to both chromium and aluminium salts:	it has limited miscibility with the tanning salts of chromium and aluminium
The content of emulsified components on a dry weight basis, % (m/m):	min. 65
Anionic active substance content on the basis of -SO_3Na in dry matter, % (m/m):	0.17-1.0
Solidification point, °C:	2
Flash point, °C:	above 100
Emulsibility, in degrees of scale:	2
Emulsion stability after 2 hours, in degrees of scale:	min. 1

Performance properties:

- the product emulsifies natural and mineral crude fats.
- ROKsol ST4A can be mixed with all anionic and non-ionic lubricants. It is also possible to prepare so-called multi-stage compositions made of Roksol ST4A and cationic fats, e.g. ROKsol ST3A
- mixing ROKsol ST4A with compounds of a clearly cationic or anionic (syntans, vegetable tannins) nature depends on the conditions and requires checking in any case. It does not oxidise and it is resistant to sunlight
- an excellent softener for chrome tanned leather and has a moderate equalising and hydrophobic effect
- its moderate equalising effect favours obtaining clean and vivid colours when dyeing leather with anionic dyes

Applications:

- Roksol ST4A is used for the basic lubrication of all types of chrome and combination leather, especially garment leather, gloving leather and footwear tops. It can be used as a standalone product – that is, for basic greasing with the exclusive use of ROKsol ST4A or in combination with other greasing preparations – anionic varnishes and crude natural and synthetic oils. The presence of ROKsol ST4A in the fatliquoring blend helps to increase the durability of the emulsion (an increase in the degree of dispersion) and facilitates the penetration deep into the skin tissue. Chrome leathers greased with ROKsol ST4A are characterised by high softness, smoothness and tightness of the grain as well as good dyeing properties. ROKsol ST4A can be used without any restrictions in the conditions of emulsion oiling typical for chrome dressing – 100–200% bath, 50–60°C and in the processes of the so-called low-temperature greasing (25–40°C) at low bathing factors (20–40% of water).

ROKsol ST3K

A cationic greasing preparation used for leather, mainly for chrome tanning.

Composition:

ROKsol ST3K is a complex mixture of cationic surfactants with hydrophobic substances of fatty origin. The commercial product is an oil-in-water emulsion.

Physico-chemical properties

Appearance:	a homogeneous, viscous liquid or paste with a yellow to light brown colour
Odour:	characteristic
Charge:	cationic
Water content, % (m/m):	38–42
Solubility in water:	forms milky oil-in-water emulsions
Other solvents:	ethanol
Density at 30°C, g/cm^3:	approx. 0.96
Electrolyte resistance:	shows high resistance to salts and acids
Resistance to chromium and aluminium salts:	shows high resistance to three valent chromium compounds
Hard Water Resistance:	shows high resistance to hard water
Emulsion stability after 2 hours, in degrees of scale:	min. 1
Miscibility:	miscible with all cationic and non-ionic lubricants
Solidification point, °C:	below 0
Boiling point, °C:	approx. 100
Flash point, °C:	above 150
Fatty acids on the basis of oleic acid in dry matter, %:	min. 12.5
The content of emulsified components on a dry weight basis, % (m/m):	min. 60
The content of cationic compounds on the basis of -NH_2, in dry matter:	0.1-0.4

Performance properties:

- the product can be mixed with all cationic and non-ionic lubricants. In most cases, it is also possible, after prior checking, to mix ROKsol ST3K with anionic greasing preparations when preparing so-called multi-load compositions
- a mixture of ROKsol ST3K with compounds of a clearly anionic nature (synthetic and vegetable tannins, anionic dyes and dispersants, etc.), especially in an acidic environment, causes the emulsion to break down and the sediment to precipitate out
- ROKsol ST3K is able to emulsify crude fats, such as whale oil, bone oil or machine oil
- the durability of emulsions with crude fats depends on the ratio of the components and the method of preparation. Technically useful emulsions are obtained for bone and spindle oil with a weight ratio of 1 part oil to 2 parts. ROKsol ST3K. For technical whale oil, the ratio is 1 part whale oil to 3 parts. ROKsol ST3K
- when used alone for greasing chrome tanned leather, it gives a product of good softness, plumpness and malleability, as well as a smooth and tight grain
- it moderately whitens the natural colour of chrome leather, and the resulting colour is completely resistant to sunlight. The product is therefore included in the group of fats resistant to fading under the influence of light
- as a cationic agent, ROKsol ST3K does not exhibit an equalising effect in relation to anionic dyes and allows obtaining vivid and deep shades of dyed leather. The effect on leather treated with ROKsol ST3K depends on the type of tanning and the surface charge of the leather
- with chrome-only tanned leather, ROKsol ST3K penetrates quickly and easily into the skin tissue, giving the effect of uniform lubrication of the entire skin section, which ensures good softness and fullness of the finished product
- on anionic treated leather (vegetable, syntan tanning, etc.) and on chrome treated leather, then treated with anionic agents (vegetable and synthetic tannins, direct acid dyes, sulphated and sulphonated fats, etc.), ROKsol ST3K is deposited on the surface, giving the effect of strong lubrication of the external layers

Applications:

- **ROKsol ST3K can be used in the treatment of all types of chrome tanned leather.**

Particularly favourable results are obtained when using the product during the basic chrome tanning, during the cationic pre-lubrication of soft grain leathers (e.g. napa, softy leather, garment leather, gloving leather, etc.) and velour or nubuck leather, and during the final cationic degreasing of box leather with improved (corrected) grain, dried on glass plates.

- **The use of ROKsol ST3K in the chrome tanning process.**

The use of 0.5–1.0% ROKsol ST3K in relation to the weight of a pelt facilitates the proper distribution of chrome tannin on the cross-section of the skins and improves the softness and bulk of the finished product. In cases where the chrome tanning process is carried out with low bath ratios or with a non-bathing system, the use of ROKsol ST3K prevents damage to the grain (abrasions) caused by excessive mechanical work of the skins in the drum. ROKsol ST3K emulsions are added to the skins together with the chrome liquor or about 15 minutes after the introduction of the usual amount of chromium extract. The use of the product does not alter the parameters normally used in the chrome tanning process.

- **Use of ROKsol ST3K in the final cationic lubrication.**

To increase the fullness, softness and plumpness of all types of chrome leathers tanned with a natural grain, such as napa leather, softy leather, aniline leather, garment leather, gloving leather etc., as well as velour and nubuck leather, re-tanning with cationic chrome tanning liquor is often used. The re-tanning effect can be significantly increased by the use of ROKsol ST3K in the process.

The effect of the preparation makes it possible to obtain full and soft leather with a good surface performance and good dyeing properties (vivid and even colouration). The use of ROKsol ST3K in the re-tanning of leather with cationic chrome liquor does not require any changes or modifications to the practically applied re-tanning methods. The product emulsions are added to the skins together with the chrome liquor. The amounts used for grain leathers are generally 2–4%, for velour and nubuck leathers 3–5% of ROKsol ST3K based on the weight of shaved skins. Cationic greasing with ROKsol ST3K can be carried out both after initial deacidification (neutralisation) of the hides and in the case of non-neutralised hides.
With strong pre-neutralisation, especially with substances having a masking effect, the penetration of cationic fats into the interior of the chrome tanned skin may be difficult. These reservations do not apply to the most commonly used pre-neutralisation with NaHCO3. In individual cases, cationic pre-greasing with ROKsol ST3K, used in the re-tanning process, allows for a significant reduction in the amount of anionic fats used in the actual fatliquoring process.

- **Use of ROKsol ST3K in the final cationic lubrication.**

Some types of chrome leathers used on footwear tops, in particular, cowhide box leather with improved (corrected) grain, are dried on glass plates and require cationic greasing. The purpose of the process is to intensively lubricate the outer layers of the leather, facilitating the proper course of the drying process when glued onto the boards and regulating the absorbency of the leather in relation to the finishing solutions. These requirements are met by the use of ROKsol ST3K. Cationic lubrication with ROKsol ST3K is carried out in the exhausted or almost exhausted proper lubrication bath with anionic varnishes. In most cases, the use of ROKsol ST3K in the amount of 1%, based on the weight of shaved skins, gives a sufficient effect. The intensity of cationic lubrication can be increased by adding 4.0–10% of raw whale oil. The time of carrying out cationic lubrication at temperatures at which anionic lubrication is usually carried out (50–60 °C) is approx. 20 minutes.

ROKsol STE

Anionic lubricant for chromium tanned leather, vegetable tanned leather and fur leather.

Composition:

ROKsol STE is a mixture of anionic emulsifiers and carboxylated aliphatic compounds.

Physico-chemical properties

Appearance:	a homogeneous yellow to light brown liquid
Odour:	characteristic
Charge:	anionic
Water, (%) (m/m):	32–36
pH of a 10% of dry substance emulsion:	6.0–7.0
Solubility in water:	forms milky oil-in-water emulsions
Other solvents:	polar solvents
Electrolyte resistance:	high resistance to electrolytes: acids, salts
Resistance to chromium and aluminium salts:	high resistance to three valent chromium and aluminium salts
Hard Water Resistance:	resistant
Miscibility:	miscible with all anionic and non-ionic lubricants
Anionic active substance content, on the basis of -SO3Na in dry matter, % (m/m):	0.8–2.0
The content of emulsified components on a dry weight basis, % (m/m):	40–50
Boiling point, °C:	approx. 100 (water evaporates)
Flash point, °C:	above 405
Emulsibility, in degrees of scale:	2
Emulsion stability after 2 hours, in degrees of scale:	min. 1
Foaming capacity at room temperature:	
- after 30 s, $cm^{3:}$	max. 70
- after 3 min, cm^3	max. 45
- after 5 min, $cm^{3:}$	max. 35

Performance properties:

- It is also possible, by selecting the appropriate ratios, to mix ROKsol STE with cationic greasing agents when preparing the so-called multi-stage compositions.
- ROKsol STE has the ability to emulsify raw fats. The durability of emulsions with crude fats depends on the ratio of the components and the method of preparation. Technically useful emulsions (durability of a 10% emulsion over 2 hours) are obtained for machine oil, raw whale oil or pig oil, with a weight ratio of individual products to ROKsol STE of 1:1. Depending on the time and conditions of storage, a brown deposit of greasing preparation ingredients may occur in the product. The low viscosity of the commercial product, even at lower temperatures, facilitates the handling in industrial conditions.
- Water solutions are clear or opalescent. The stability of ROKsol STE aqueous solutions is practically unlimited.
- When preparing an ROKsol STE emulsion with other oiling agents (e.g. crude fats), it is advisable to mix the preparations in the form of commercial products and then dilute them with water.
- Used as a standalone product for lubrication of chrome-tanned leathers, it provides leathers with high softness and fullness as well as a smooth, tight and absorptive grain.
- It whitens the natural colour of chrome tanned leather and makes it resistant to sunlight.
- Against the background of the anionic varnishes used in chrome dressing, ROKsol STE is distinguished by the following functional features:
  - a stronger effect of softening the skin structure
  - a better whitening effect of the natural colour of the skin
  - a stronger equalising effect in relation to anionic dyes, while the lower intensity of dyeing is to some extent compensated by better evenness of the obtained colour and deeper penetration of the dye into the skin tissue
  - a faster and easier wettability of the leather surface; this feature is positively reflected in industrial practice, which makes it possible to obtain a better and more even colour of spray-dyed leather
  - a more pleasant, silky feel of greased skin
  - a characteristic functional feature of ROKsol STE when greasing vegetable-tanned skins is the ease of penetration of the product into the skin tissue and the softening effect associated with this property

Applications:

- ROKsol STE is used for greasing chrome- and vegetable-tanned leather. The properties of the product allow it to be used in the treatment of fur skins, both in bathing methods and in manual lubrication from the flesh side.
- **ROKsol STE in the dressing of chrome leather**

In the treatment of all types of chrome leather, Roksol STE is used as an ingredient in the basic greasing composition.

- In the case of cowhides for footwear tops, the amounts used are generally in the range of 1–3% of the product, based on the weight of the shaved skins. In the case of pigskins, the amounts are generally slightly higher: 2–5%. The addition of ROKsol STE to mixtures of commonly used tanning varnishes increases the degree of dispersion and durability of the obtained emulsion, which facilitates the proper distribution of fats in the cross-section of the skins, and improves their softness. The addition of the product also prevents excessive deposition of fats in the outer layers of the skin when using agents with low stability and resistance to electrolytes. The introduction of ROKsol STE to traditional blends used for basic lubrication can be made at the expense of scarce agents with increased emulsifying power (e.g. so-called "Turkey red oil", imported fats, etc.).

- Using ROKsol STE as a component of the blend for the basic lubrication of chrome leather does not exhaust the product's application possibilities. In special cases, such as: lining leathers (split leather and grain leather), leather for protective gloves, etc., it is possible to lubricate with the exclusive use of ROKsol STE. When lubricating independently or using significant amounts of ROKsol STE and strongly neutralising the skins, it is recommended to introduce 0.3–0.5% (based on the weight of the shaved skins) of formic acid about 20 minutes before the end of the greasing process to improve the degree of fat depletion from the bath. Modern technologies of leather tanning are recently promoting the pre-greasing of leathers already at the stage of the chrome tanning process. The purposefulness of such a procedure is justified mainly by:
    - the possibility of obtaining better softness and firmness of the skins
    - more permanent binding of fat in the skin tissue
    - an easier course of the tanning process and less susceptibility of the skins to damage and abrasions of the grain during its course, especially when using low bathing factors
    - an easier flow of mechanical operations after tanning (splitting, shaving) and wet finishing processes

The requirement for the possibility of using pre-lubricating during chrome tanning is the appropriate quality of the fat, especially its resistance to electrolytes and chrome tanning salts. This condition is met by Roksol STE both with regard to chromium and aluminium salts.

- ROKsol STE is used for pre-greasing in the chrome tanning phase in the amount of 1–2% based on the weight of the pelt. The product is added to the drum approximately 20 minutes after the start of tanning.
- In special cases, it is also possible to add the product together with the chromium liquor or even during the pickling process when the tanning process is carried out in the spent pickling bath.
- The use of ROKsol STE during chrome tanning is possible with all bathing factors used in practice.
- **ROKsol STE in the treatment of vegetable tanned or combined leather (chrome-vegetable, vegetable-syntan, etc.)**

In the case of vegetable tanned-type skins, such as blanks, Russian leather, etc., anionic lubricants are used in addition to raw fats (blubber, beef tallow, etc.) in greasing blends. Some types of vegetable leather, such as soles or insoles, are sometimes greased with the exclusive use of anionic varnishes.
The anionic character of the vegetable-tanned type skins and the fats used to facilitate their relatively good penetration into the skin tissue.

- A favourable additional factor in the case of ROKsol STE is its high resistance to electrolytes and acid environments.
- ROKsol STE can be used for greasing vegetable tanned leathers in the same way as traditionally used anionic varnishes based mainly on sulphated or sulphonated compounds. Below are examples of blends for no-bath greasing of vegetable type skins using ROKsol STE.

EXAMPLES:

The examples of "no float" fatliquoring, based on ROKsol STE are as follows:

1. Full backs and saddlery flanks veg. tanned

ROKsol STE	**%**	**3.0**
Tallow	%	2.0

2. Belting croupons veg. tanned

ROKsol STE	%	1.2÷1.5
Tallow	%	2.5

3. Harness and salddlery veg. tanned

ROKsol STE	%	2.0
Tallow	%	1.0

Packaging

Polyethylene containers with a capacity of: 60 and 120 dm^3.

Storage conditions

ROKsol STE does not require any special storage conditions. For longer storage, especially at lower temperatures, bring the product to a temperature of approx. 20°C and mix it before use. After mixing, the product retains its original functional properties.

Transport conditions

ROKsol STE does not require any special transport conditions.

Handling the product

In accordance with generally accepted principles of handling chemicals.

Guarantee period

The guaranteed shelf life is 12 months from the production date. After this period, it can be used after checking the compliance of the parameters with the technical requirements.

ROKsol STR

An anionic lubricant used primarily for glove and garment leather chrome tanning.

Composition:

ROKsol STR is a mixture of anionic emulsifiers and chlorinated organic compounds.

Physico-chemical properties

Appearance:	a brown liquid
Odour:	characteristic
Charge:	anionic
Water, % (m/m):	max. 22
Solubility in water:	forms milky oil-in-water emulsions
Electrolyte resistance:	shows good resistance to acids, bases and electrolytes
Fatty substance content in commercial product, % (m/m):	max 65
Emulsibility, in degrees of scale:	min. 1
Emulsion stability after 2 hours, in degrees of scale:	approx. 100 (water evaporates)
Resistance to electrolytes (chromium tannin solution at room temperature), in degrees of scale:	min. 4
Flash point, °C:	above 100

Advantages of the product:

- resistant to oxidation and sunlight
- the product's water emulsions are anionic
- the optimal degree of emulsion stability is obtained by using water at a temperature of 60–70°C

Performance properties:

- an excellent softener for chrome tanned leather and has a moderate equalising and hydrophobic effect
- a characteristic feature of leathers greased with ROKsol STR, also with significant product consumption, is that they do not develop oily spots and residues during storage, even with long-term storage

- chrome leathers greased with ROKsol STR are also characterised by high softness, fullness, smoothness, tightness of the grain and good dyeing properties
- miscible with all anionic and non-ionic lubricants. It is also possible to prepare so-called ROKsol STR multi-stage compositions with cationic fats, with an excess of both cationic and anionic agent
- it has the ability to emulsify crude, natural and mineral fats, which in some cases allows for increasing the efficiency of greasing.
- it shows limited miscibility with tanning salts of chromium and aluminium
- mixing ROKsol STR with compounds of a clearly cationic or anionic nature (syntans, vegetable tannins) depends on the conditions (pH, concentration, etc.) and requires checking in any case

Applications:

- ROKsol STR is used for the basic lubrication of chrome tanned and chrome-aluminium tanned leather intended mainly for gloves and garments
- it can be used as a standalone product – i.e. basic greasing with the exclusive use of ROKsol STR, or in combination with other lubricating agents, such as sulphated or sulphonated varnishes, crude natural and synthetic oils or cationic greasing preparations
- the amount of ROKsol STR in the greasing mixture should be at least 50% of the amount of fat used
- ROKsol STR can be used without any restrictions in the conditions of emulsion fatliquoring usual for chrome tanning of leather – 100–200% bath, 50–60°C and in the processes of the so-called low-temperature greasing at low bathing factors: 20–40% and temperature: 25–40°C

Storage conditions

ROKsol STR does not require any special storage conditions. Longer storage of ROKsol STR at elevated temperature (above 25°C) may lead to gradual delamination of the product. Mixing the product restores its original functional properties.

ROKsol STB

An anionic greasing preparation used for greasing leather, mainly in chrome tanning.

Composition:

ROKsol STB is a mixture of anionic emulsifiers and chlorinated organic compounds.

Physico-chemical properties

Appearance:	a brown viscous liquid
Odour:	characteristic
Charge:	anionic
Water content, % (m/m):	max. 22
Density at 20°C, g/cm^3:	0.98–1.00
Solubility in water:	forms milky oil-in-water emulsions
Fatty substance content in commercial product, % (m/m):	min. 70
Emulsibility, in degrees of scale:	2
Emulsion stability after 2 hours, in degrees of scale:	min. 1
Electrolyte resistance:	shows moderate resistance to acids, bases and electrolytes
Miscibility:	miscible with all anionic and non-ionic lubricants
Solidification point, °C:	below -15
Boiling point, °C:	approx. 98
Flash point, °C:	approx. 180 (after drying).

Performance properties:

- resistant to oxidation and sunlight
- it is also possible to mix ROKsol STB with cationic greasing agents when preparing so-called multi-stage compositions
- ROKsol STB has a low emulsifying capacity for crude fats, such as: whale fish oil, pig oil, machine oil, etc.
- the high content of emulsified ingredients does not require the use of raw fat additives in the preparation of fatliquoring mixtures. In special cases, the emulsifying ability of ROKsol STB allows for limited use of crude fat in the greasing mixture

- ROKsol STB as a commercial product shows a relatively low viscosity, which facilitates its handling in an industrial setting
- the product, however, has thixotropic properties and may be significantly "thickened" on prolonged standing. The mixing of the "thickened" product restores its original viscosity
- has a high softening capacity for chrome-tanned or chrome-combined leather
- other advantages include a good hydrophobising effect and a weak equalising effect
- thanks to the weak equalising effect, it is possible to obtain clean and vivid colours when dyeing leather with anionic dyes
- leather greased with ROKsol STB can be finished without any difficulties with water-based covering paints
- preparation of working emulsions is extremely simple, and in individual cases, it is possible to add ROKsol STB to greasing devices in the form of a commercial product
- good absorption rate by chrome skins or combined skins of greasing components of ROKsol STB, as a rule, does not require a change in physical parameters (temperature, time, bath ratio, etc.) of the greasing process used in industrial practice

Applications:

- ROKsol STB is used for the basic greasing of chrome-tanned and combination leather, and in particular for all types of leather for the footwear tops as well as for garments and gloves. The advantage of the product is that you can carry out the greasing process using only ROKsol STB. For cowhide leathers, usually, 8–9% of ROKsol STB is used for footwear tops, based on the weight of shaved skins. Leather greased exclusively with ROKsol STB is characterised by good softness, fullness, smoothness and firmness of the grain, moderate water absorption and good dyeing properties.
- ROKsol STB can also be used in any amounts in a mixture with other anionic greasing varnishes. The presence of the product in the set is conducive to better flammability properties and plumpness of the skins. The introduction of ROKsol STB to the greasing blend does not require any changes in the technology of the greasing method used. ROKsol STB can be used without any restrictions in the conditions of emulsion fatliquoring, typical for a chrome tanning or combined tanning of leathers: 100–200% bath, 50–60°C and in the processes of the so-called low-temperature greasing: 25–40°C with low bathing factors: 20–40% of water. The greasing time with ROKsol STB is usually 60–90 minutes.
- ROKsol STB can be used without any limitations in dyeing and greasing hides, carried out in a new bath, after neutralisation and filling processes, as well as in so-called compact methods, in which neutralisation, filling and re-tanning as well as dyeing and greasing are carried out in one bath. The scope of application of ROKsol STB is similar to that of ROKsol ST6 and STR.

Storage conditions

ROKsol STB does not require any special storage conditions.

Longer storage of ROKsol STB at elevated temperatures (above 25°C) may lead to gradual delamination of the product. Mixing the product restores its original functional properties.

ROKsol ST6

Composition:

ROKsol ST6 is an anionic agent used for greasing chrome-tanned leather in the tanning industry. It is a mixture of anionic emulsifiers and chlorinated organic compounds.

Physico-chemical properties

Appearance:	a brown viscous liquid
Odour:	weak, characteristic
Charge:	anionic
Water, %:	14–18
Density at 20°C, g/cm^3:	1.000–1.005
Solubility in water:	forms milky oil-in-water emulsions
Other solvents:	trichloroethylene, chloroform
Electrolyte resistance:	shows moderate resistance to acids, bases and electrolytes
Viscosity at 20 °C, mPa.s:	15000
Fatty acids content on the basis of oleic acid in dry matter, %:	12 - 16
Anionic active substance content, on the basis of -SO_3Na in dry matter, % (m/m):	0.5-1.2
Miscibility:	all anionic and non-ionic lubricants
Solidification point, °C:	below -5
Boiling point, °C:	at 100, the water is being evaporated
Emulsibility, in degrees of scale:	2
Emulsion stability after 2 hours, in degrees of scale:	min. 1

Performance properties:

- resistant to oxidation and sunlight
- ROKsol ST6 can be mixed with all anionic and non-ionic lubricants
- it is also possible, by selecting the appropriate ratios, to mix ROKsol ST6 with cationic greasing agents when preparing the so-called multi-stage compositions
- ROKsol ST6 has a low ability to emulsify raw fats
- however, the high content of emulsified components (about 80%, based on the product's dry weight) does not require the use of additional amounts of hydrophobic components, such as: whale fish oil, pig oil, machine oil, etc.
- it has a high softening capacity for chrome tanned leather, good hydrophobic effect, and moderate equalising effect
- thanks to the moderate equalising effect, it is possible to obtain clean and vivid colours when dyeing leather with anionic dyes
- due to the high softening capacity of chrome-tanned hides, it is not recommended to enhance this effect by adding raw fats when lubricating
- good absorption rate of ROKsol ST6 greasing ingredients by chrome skins, generally does not require changing the physical parameters of the fatliquoring process used

Applications:

• ROKsol ST6 is used for the basic greasing of chrome-tanned and combination tanned leather, and in particular for all types of leather for the footwear tops as well as for garments and gloves. The advantage of the product is that you can carry out the greasing process using only ROKsol ST6. Leather greased exclusively with ROKsol ST6 is characterised by good softness, fullness, smoothness and firmness of the grain, moderate water absorption and good dyeing properties. The properties of ROKsol ST6 also allow it to be used in a mixture with other anionic greasing varnishes. The presence of the product in the blend, thanks to the high efficiency of lubrication, favours better fullness and plumpness of the skins. Leather greased with ROKsol ST6 can be processed further without any difficulties with water-based covering paints.

• ROKsol ST6 can be used without any restrictions in chrome-tanned or combination-tanned coating in conditions of emulsion fatliquoring: 100–200% bath, 50–60°C and in the processes of the so-called low-temperature greasing (25–40°C) at low bathing factors (20–40% water).

EXAMPLE:

Bovine soft, full grain (2.0÷2.2 mm)

Wash:	250% 0.1%	**Water** **Formic acid**	40°C 10 min
Chrome-aldehyde retanning:	80% 4% 5% 0.8% 1.0%	**Water** **Aldehyd AG** **Chromal Sodium formate** **Bicarbonate**	40°C 20 min 30 min

Sodium formate and Chromal introduced directly
Bicarbonate, diluted 1:10, added through axle

Wash:	100% 300%	**Water** **Water**	65°C 20 min 40°C 10 min
Nautralization	150% 1.5% 1.5%	**Water** **Bicarbonate** **Sodium formate**	32°C 45÷60 min
Wash:	250%	**Water**	60°C 10 min
Dyeing and fatliquoring	200% 2% 1 ÷ 2 % 6 ÷ 8 % 0.5%	**Water** **Dyspergator NNOC** **Dye** **ROKsol ST6** **Formic acid**	50°C 30 min 30 min 45 min 15 min

It is not recommended to use Dyspergator NNOC for black dyeing

PCC Group

We build value through sustainable innovation

Each project or venture with a long-term success story shares one common thing – it is based on in-depth market research and on the knowledge acquired through years of experience. It is knowledge and experience that enables us to constantly aim higher and deliver greater value through the dynamic and sustainable world-wide development of the PCC Group. We only embark on new business challenges when we are certain that we have the skills and knowledge to achieve success. We operate in three major markets: chemicals, energy and logistics. Several dozen business units, managed by PCC SE, work in synergy to generate the greatest possible competitive advantage in both local and international markets. Each day nearly three thousand professionals contribute their energy, and effort, to secure the sustainable development of the PCC Group. The key element of our strategy is to ensure the development of each individual

business unit by taking advantage of innovative technology and new market applications. We achieve our goals in a sustainable and responsible way – we care about the environment and the society within which we operate.
We are always ready to reach our strategic goal. Efficient and dynamic management helps our employees to fully develop their potential and therefore enhances the overall PCC Group value. Joint enterprises and individual initiatives of our companies are the results of the entrepreneurship culture promoted within the PCC Group. Our philosophy is built on simple values – integrity, trust and reliability. We believe that following those principles is the only way to build a long-term competitive advantage. The PCC Group currently employs nearly 3200 people. We operate in 17 countries, in 39 locations around the world. Our portfolio includes eight basic segments. Individual operational responsibility is assigned to seven of them: Polyols, Surfactants, Chlorine, Speciality Chemicals, Consumer Products, Energy and Logistics. Each of these segments is supported by 19 business units, all under the management of the PCC Group

The divisions, segments and business units of the PCC Group

Division	Segment	Business units
Chemicals	Polyols	• Polyols • Polyurethane Systems
	Surfactants	• Anionic Surfactants • Non-ionic Surfactants • Amphoteric Surfactants (Betaines) • Cationic Surfactants • Chemicals
	Chlorine	• Chlorine • MCAA • Other chlorine derivatives
	Speciality chemicals	• Phosphorus and Naphthalene Derivatives • Alkylphenols • Chemicals and Commodities Trading • • Quartzite
	Consumer Products	• Household and Industrial Cleaners, Detergents and Personal Care Products • Matches and Firelighters
Energy	Energy	• Renewable Energies • Conventional Energies
Logistics	Logistics	• Intermodal Transport • Road Haulage • Railway Transport
Holding	Holding	• Managing the portfolio of companies • Projects • Services

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.

TEXT PAGES	
Brand	Cocoon Silk
Grammage	135
Number of pages	56
COVER PAGES	
Brand	Cocoon Silk
Grammage	250
Number of pages	4
PUBLICATION	
Size (cm)	21 x 29.7
Quantity	100

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52	kg of landfill
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85	kg of wood

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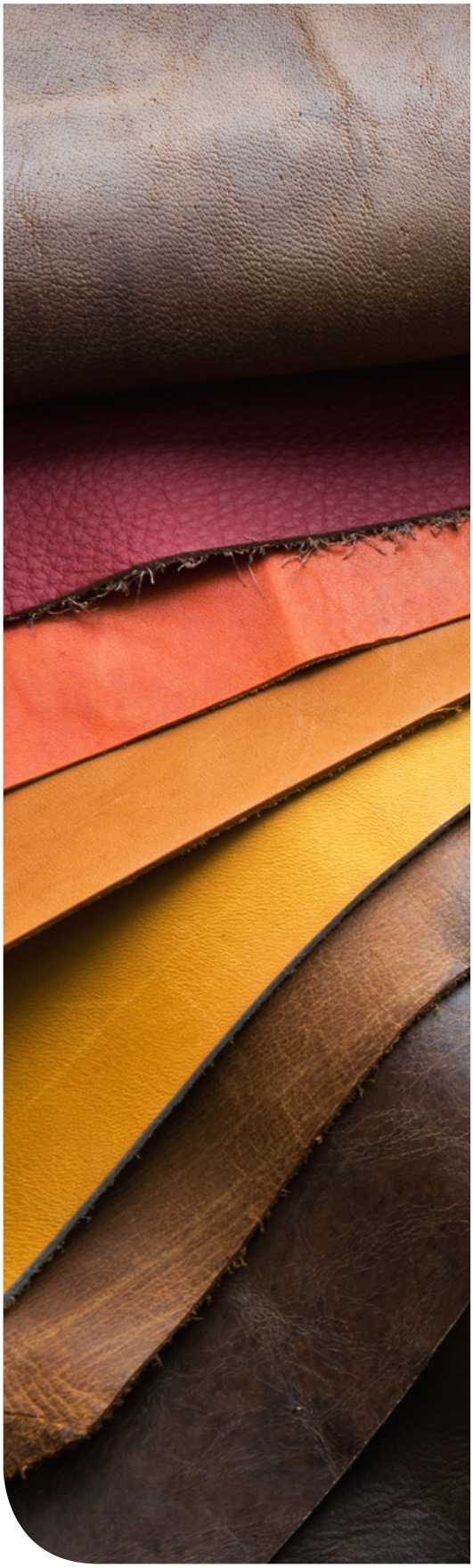

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