Pulp & Paper

pcc Exol

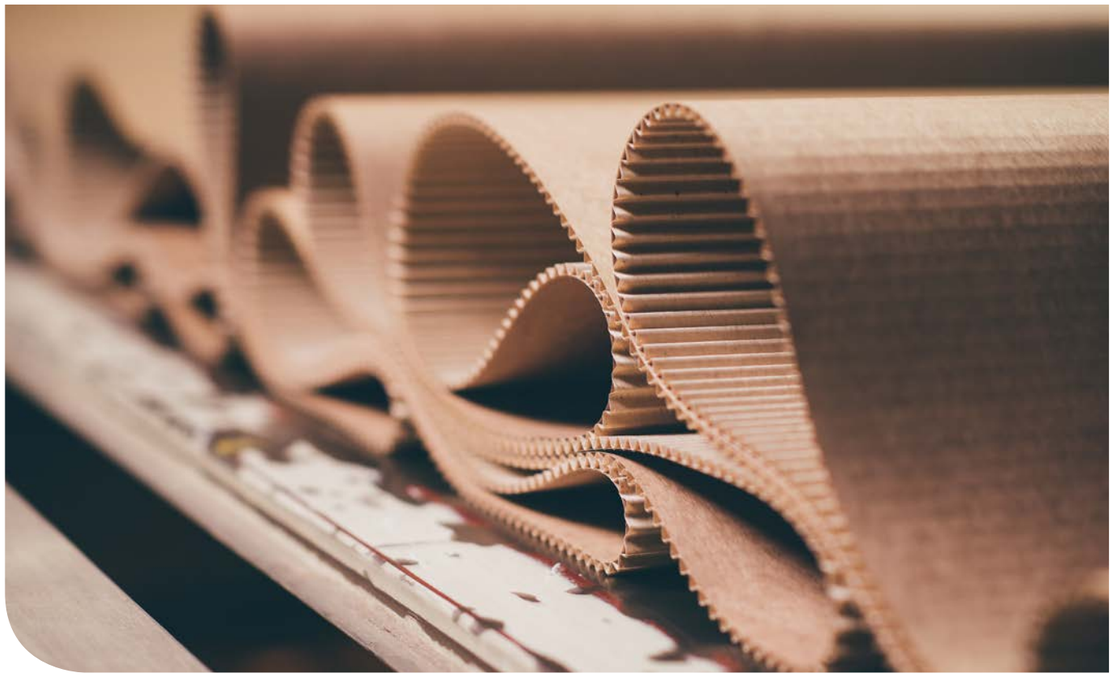
Introduction

The paper production process consists of several stages. In the first stage the fragmentation and purification of the pulp take place, which may be of primary origin (wood) or secondary (waste paper). The main source of cellulose fibres is wood obtained from sawmills in several forms, e.g., as logs, wood chip or sawdust.

Groundwood pulp is obtained during the process of abrading wood on stone at an atmospheric pressure. The wood (from which the bark has been previously removed) is pulped using stone and then washed with water. The prepared mass is dried in hydrocyclones and then transported to the compactor. At the next stage, the dense mass of wood is transported to the vat and the circulating water (filtrate) is recycled back to the pulp mill. During the production of pulp from processed wood, resinous substances are released, which easily agglomerate and create sediment on the grinder or internal walls of the pipelines. They often cause fouling of the stone's surface, which deteriorates its abrasive properties. Various chemical agents are used in order to eliminate these "resin problems". The most commonly used agent for this purpose are dispersants, which are designed to disperse deposits which are formed, facilitating their subsequent removal.

The use of defoamers at every stage of paper production is also crucial. Defoaming substances are used in the manufacturing process of all types of paper products. Foam is created by the mixing of gases with cellulose pulp, which is retained due to the presence of surfactants.

PCC EXOL SA offers various chemicals which are used during the processing of pulp, especially for the elimination of foam produced at all stages of paper production, enabling an improvement in the efficiency of subsequent technological steps. This catalogue presents all of our products by their function, complete with a short description of the chemicals and processes employed.



PRODUCT NAME	DEFOAMERS / ADDITIVES FOR DEFOAMERS	PULPING / DIGESTER AID	REWETTING AGENTS	DEINKING ADDITIVES / WASH DEINKING	FELT AND WIRE CLEANERS	DEPOSIT CONTROL ADDITIVES	TISSUE ADDITIVES	SIZING AGENT ADDITIVES
Rokamer 2000	•							
Rokamer 2330	•							
Rokamer 2600	•							
Rokamer 3100	•							
Rokamer 1000	•							
Rokamer PP 2000	•							
Polikol 300	•							
Polikol 400	•						•	
Polikol 600	•						•	
Rokanol® LP3135	•			•	•			
Rokanol® LP200	•			•	•			
Rokanol® LP2023	•							
Rokanol® LP2126	•							
Rokanol® LP3943	•							
Rokanol® IT6		•						
Rokanol® IT8		•	•					
Rokanol® IT9		•						
Rokanol® L2						•		
Rokanol® L4			•		•			
Rokanol® L5A						•		
Rokanol® L7			•			•		
Rokanol® L10					•			
Rokanol® L10/80						•		
Rokanol® L12				•	•	•		

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Rokanol® RZ4P11	•							
Rokafenol N4		•	•		•	•		
Rokafenol N6		•			•	•		
Rokafenol N9		•			•	•		
Rokafenol N10		•			•	•		
Rokafenol N12		•			•	•		
Rokafenol N14		•			•	•		
Rokacet R11				•				
Rokacet R40			•					
Rokacet O7							•	•
Rokanol® NL8P4				•				
EXOdis L								•

Defoamers / Additives for defoamers

Defoamers are used in pulp mills and paper mills to reduce foam associated problems. They tackle both problems with surface foam and entrained or entrapped air. Defoamers also hinder the formation of foam and improve drainage in the paper mill. They reduce paper breakage, thus improving the paper machine's runnability and increasing the paper mill's production. Defoamers (antifoaming agents) also lessen the steam consumption of the dryers, resulting in energy saving operation which consequently saves on costs. Holes are also prevented from appearing in the formation of paper by removing fine bubbles in the fibres.

PRODUCT NAME	DESCRIPTION	CAS	APPEARANCE	HLB	ACTIVE CONTENT %	USES
Rokamer 2000	PEG/PPG Copolymer Molecular weight, g/mol approx. 1800	9003-11-6	Liquid	2.4	min. 99.0	For defoamer formulations
Rokamer 2330	PEG/PPG Copolymer Molecular weight, g/mol approx. 2200	9003-11-6	Liquid	4.9	min. 99.0	For defoamer formulations
Rokamer 2600	PEG/PPG Copolymer Molecular weight, g/mol approx. 2600	9003-11-7	Liquid	5.6	min. 99.0	For defoamer formulations
Rokamer 3100	PEG/PPG Copolymer Molecular weight, g/mol approx. 3000	9003-11-8	Liquid	8.0	min. 99.0	For defoamer formulations
Rokamer 1010	PEG/PPG Copolymer Molecular weight approx. 8800	9003-11-9	Wax	16.6	min. 99.0	For defoamer formulations
Polikol 300	Polyoxyethylene glycol	25322-68-3	Liquid	-	min. 99.5	Intermediate for production of PEG esters
Polikol 400	Polyoxyethylene glycol	25322-68-4	Liquid	-	min. 99.5	Intermediate for production of PEG esters
Polikol 600	Polyoxyethylene glycol	25322-68-5	Liquid	-	min. 99.5	Intermediate for production of PEG esters
Rokanol® LP2023	Polyoxyalkylene glycol fatty alcohol ether	68002-96-0	Liquid	3.0	min. 99.5	Defoaming agent
Rokanol® LP2126	Polyoxyalkylene glycol fatty alcohol ether	68002-96-0	Liquid	1.3	min. 99.5	Defoaming agent
Rokanol® LP3943	Polyoxyalkylene glycol fatty alcohol ether	68551-13-3	Liquid	3.0	min. 99.5	Defoaming agent
Rokanol® RZ4P11	Alcohols, C16-18 + EO/PO	68002-96-0	Liquid	12.5	min. 99.0	Defoaming agent

Pulping / Digester aid

The digester is a special piece of machinery used in the process of papermaking. Without the digester, or the chemicals used within it, paper would not be able to be produced as quickly or as efficiently. Its purpose is to cook small wood chips for several hours in order to soften them. Surfactant based digester additives improve the efficiency at which the cooking liquor penetrates the wood. This is accomplished by reducing the surface tension between the wood and the liquor, which helps the chips become more thoroughly wetted by the chemicals.

PRODUCT NAME	DESCRIPTION	CAS	APPEARANCE	HLB	ACTIVE CONTENT %	USES
Rokanol® IT6	Alcohols, C13-Iso + 6 EO	69011-36-5	Liquid	11.4	min. 99.5	Wetting agent
Rokanol® IT8	Alcohols, C13-Iso + 8 EO	69011-36-5	Liquid/Paste	12.8	min. 99.5	Wetting agent
Rokanol® IT9	Alcohols, C13-Iso + 9 EO	69011-36-5	Oily liquid/Paste	13.2	min. 99.0	Wetting agent
Rokafenol N4	Nonylphenol + 4 EO	127087-87-0	Oily liquid	8.8	min. 99.0	Wetting agent
Rokafenol N6	Nonylphenol + 6 EO	127087-87-1	Oily liquid	11.0	min. 99.0	Wetting agent
Rokafenol N9	Nonylphenol + 9 EO	127087-87-2	Oily liquid	13.1	min. 99.0	Wetting agent
Rokafenol N10	Nonylphenol + 10 EO	127087-87-3	Oily liquid	13.3	min. 99.0	Wetting agent
Rokafenol N12	Nonylphenol + 12 EO	127087-87-4	Oily liquid	14.0	min. 99.0	Wetting agent
Rokafenol N14	Nonylphenol + 14 EO	127087-87-5	Oily liquid	15.0	min. 99.0	Wetting agent

Rewetting Agents

Rewetting is water transference from the felt to the sheet at the exiting side of the nip. It is caused by expansion of both the felt and sheet, capillary action, and water film splitting. Certain kinds of paper, such as tissue and liner board, are required to retain their strength after complete rewetting. Surfactants significantly reduce the water absorbency time of paper products which is caused by an increase in both the average pore size and an increase in the hydrophilicity of fibres treated by the surfactants.

PRODUCT NAME	DESCRIPTION	CAS	APPEARANCE	HLB	ACTIVE CONTENT %	USES
Rokanol® L4	Alcohols, C12-14 + 4 EO	68439-50-9	Liquid	10.0	min. 99.5	Wetting agent
Rokanol® L7	Alcohols, C12-14 + 7 EO	68439-50-9	Liquid	12.9	min. 99.0	Wetting agent
Rokafenol N4	Nonylphenol + 4 EO	127087-87-0	Oily liquid	8.8	min. 99.0	Wetting agent
Rokacet R40	Castor oil + 40 EO	61791-12-6	Paste	13.0	min. 99.0	Wetting agent
Rokanol® IT8	Alcohols, C13-Iso + 8 EO	69011-36-5	Liquid/Paste	12.8	min. 99.5	Wetting agent

Deinking additives

Deinking is the process of removing printing ink from the fibres of recycled paper in order to make deinked pulp. The key to the deinking process is the ability to detach ink from the fibres. This is achieved by a combination of mechanical action and addition of chemicals. The addition of surfactant in the pulper is related to the separation of the ink particles from the fibres. For wash deinking, the ink particles need to be detached from the fibres and very small ink particles must be created. The surfactant used in wash deinking must therefore have a high dispersing capacity.

PRODUCT NAME	DESCRIPTION	CAS	APPEARANCE	HLB	ACTIVE CONTENT %	USES
Rokanol® L12	Alcohols, C12-14 + 12 EO	68439-50-9	Wax	14.7	min. 99.5	Ink dispersant and anti-redeposition agent
Rokacet R11	Castor oil + 11 EO	61791-12-6	Liquid	10.6	min. 99.0	Defoamer for wash deinkers
Rokanol® NL8P4	Alcohols, C9-11-Iso, C10-rich + EO/PO	154518-36-2	Liquid	9.5	min. 99.0	Wetting agent

Felt and wire cleaners / Deposit control additives

The increased use of waste paper leads to problems due to the introduction of contaminants into the papermaking cycle. Felt and wire cleaners are needed for removing deposits and impurities, and to ensure that wire and felt are always operating at their maximum efficiency. The presented products in this group are efficient cleaners suitable for felt and wire.

Packaging and tissue machines lose the equivalent of 4% of their output per day due to machine contamination and sheet breaks caused by deposits. These deposits, pitch and stickies all have a negative influence on paper quality and papermaking productivity. Pitch is made from natural resins and occurs in virgin pulp. Stickies are found in recycled paper fibres. Deposits contribute to specks, holes in the sheet and printability issues, in addition to causing machine downtime and loss of productivity due to cleaning. Our products neutralise the tacky nature of the contaminants, eliminating felt and wire blocking problems, and deposits on pressing and drying cylinders. The runnability of the paper machine and the quality of the final paper product are improved significantly.

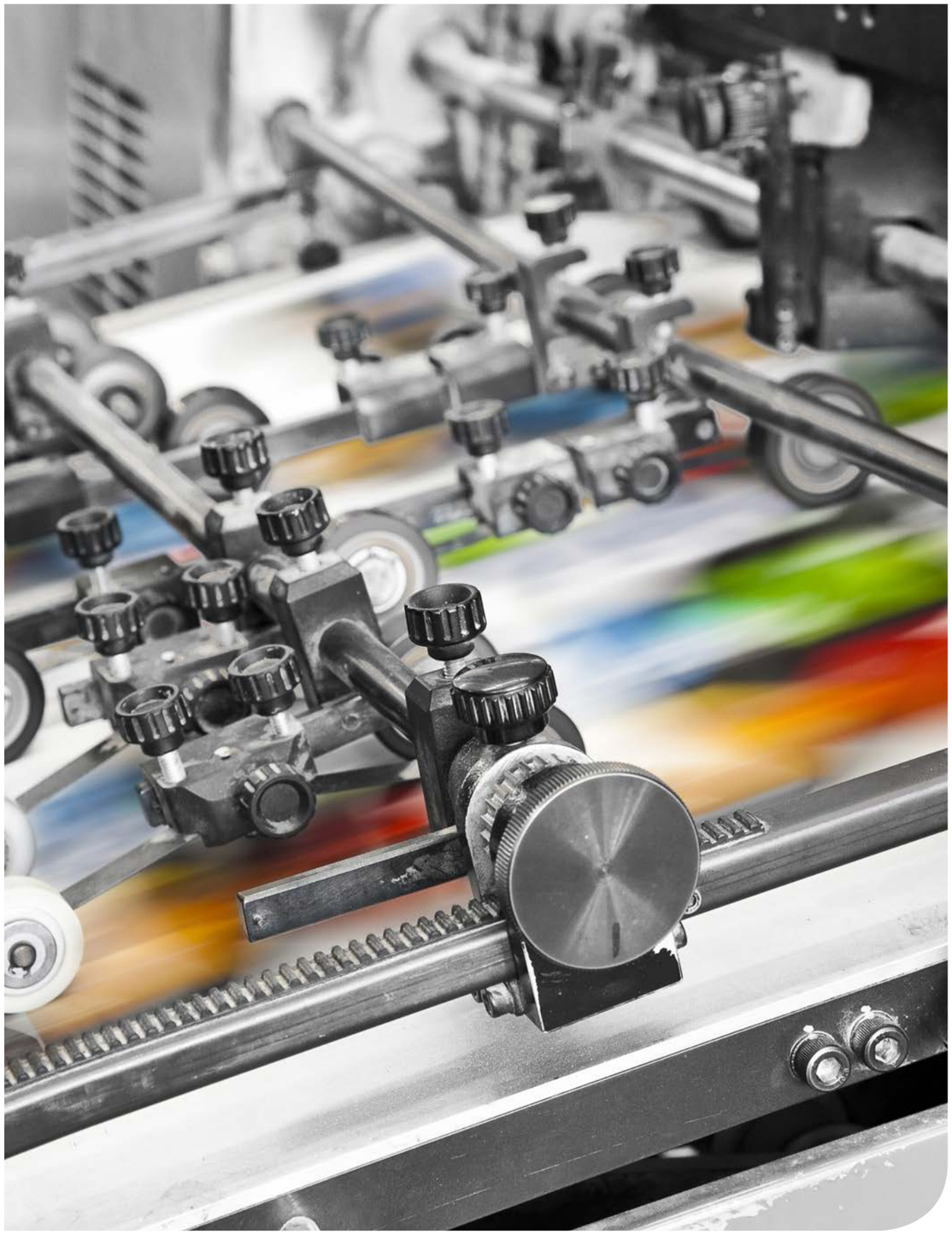
PRODUCT NAME	DESCRIPTION	CAS	APPEARANCE	HLB	ACTIVE CONTENT %	USES
Rokanol® L2	Alcohols, C12-14 + 2 EO	68439-50-9	Liquid	6.2	100	Cleaners and wetting agents
Rokanol® L4	Alcohols, C12-14 + 4 EO	68439-50-9	Liquid	10.0	min. 99.5	Cleaners and wetting agents
Rokanol L5A	Alcohols, C12-16 + 5 EO	68551-12-2	Liquid	10.5	min. 99.0	Cleaners and wetting agents
Rokanol® L7	Alcohols, C12-14 + 7 EO	68439-50-9	Liquid	12.9	min. 99.0	Cleaners and wetting agents
Rokanol® L10	Alcohols, C12-14 + 10 EO	68439-50-9	Paste	13.8	min. 99.5	Cleaners and wetting agents
Rokanol® L10/80	Alcohols, C12-14 + 10 EO	68439-50-9	Viscous liquid	13.8	77-81	Cleaners and wetting agents
Rokanol® L12	Alcohols, C12-14 + 12 EO	68439-50-9	Wax	14.7	min. 99.5	Cleaners and wetting agents
Rokafenol N4	Nonylphenol + 4 EO	127087-87-0	Oily liquid	8.8	min. 99.0	Cleaners and wetting agents
Rokafenol N6	Nonylphenol + 6 EO	127087-87-1	Oily liquid	11.0	min. 99.0	Cleaners and wetting agents
Rokafenol N9	Nonylphenol + 9 EO	127087-87-2	Oily liquid	13.1	min. 99.0	Cleaners and wetting agents
Rokafenol N10	Nonylphenol + 10 EO	127087-87-3	Oily liquid	13.3	min. 99.0	Cleaners and wetting agents
Rokafenol N12	Nonylphenol + 12 EO	127087-87-4	Oily liquid	14.0	min. 99.0	Cleaners and wetting agents
Rokafenol N14	Nonylphenol + 14 EO	127087-87-5	Oily liquid	15.0	min. 99.0	Cleaners and wetting agents
Rokanol® LP3135	Polyoxyalkylene glycol fatty alcohol ether	154518-36-2	Liquid	3.0	94-96	Cleaners and wetting agents
Rokanol® LP200	Polyoxyalkylene glycol fatty alcohol ether	68439-30-5	Liquid	7.3	min. 99.5	Cleaners and wetting agents

Tissue additives / Sizing agent additives

Tissue additives are used to make the operation of the tissue machine simpler and to improve certain tissue paper properties such as wet strength, softness and water absorbency.
Sizing agents are applied to the paper to introduce certain desirable qualities. The main function of the sizing agent is to increase the resistance to the penetration of water or other liquids on the paper so that the paper is suitable for printing, writing and other purposes.

PRODUCT NAME	DESCRIPTION	CAS	APPEARANCE	HLB	ACTIVE CONTENT %	USES
Polikol 400	Polyoxyethylene glycol	25322-68-4	Liquid	-	min. 99.5	Softener and humectant for various paper grades
Polikol 600	Polyoxyethylene glycol	25322-68-5	Liquid	-	min. 99.5	Softener and humectant for various paper grades
Rokacet O7	Oleate + 7 EO	9004-96-0	Liquid	-	min. 99.0	Sizing agent
EXOdis L	Sodium Polynaphthalenesulfonate	9084-06-4	Oily liquid	-	39-41*	Sizing agent

* Dry substance,% (m/m)



PCC EXOL SA
Sustainable technologies for new generations

PCC Exol SA combines the latest technologies with experience in production and distribution of surfactants.

PCC Exol SA combines the latest technologies with experience in production and distribution of surfactants. The company has its headquarters in Brzeg Dolny, Poland, where the manufacturing units of anionic, nonionic and amphoteric surfactants are located. Flexibility of production enables us to offer a wide range of surfactants adjusted to our customers' needs. As one of the leading chemical product manufacturers, we continue to undertake investment activities based on sustainable development.

Our products have numerous industrial applications. Our surfactants are used as raw materials for various markets including household chemicals, textile, agrochemicals, metalworking, oilfield industries, construction, paints and coatings, pulp and paper, and many others. Over the years, PCC Exol SA has developed core expertise in manufacturing specialty surfactants. We meet our customers' needs with a unique and versatile product portfolio, broad expertise in surfactants chemistry and a high degree of flexibility.

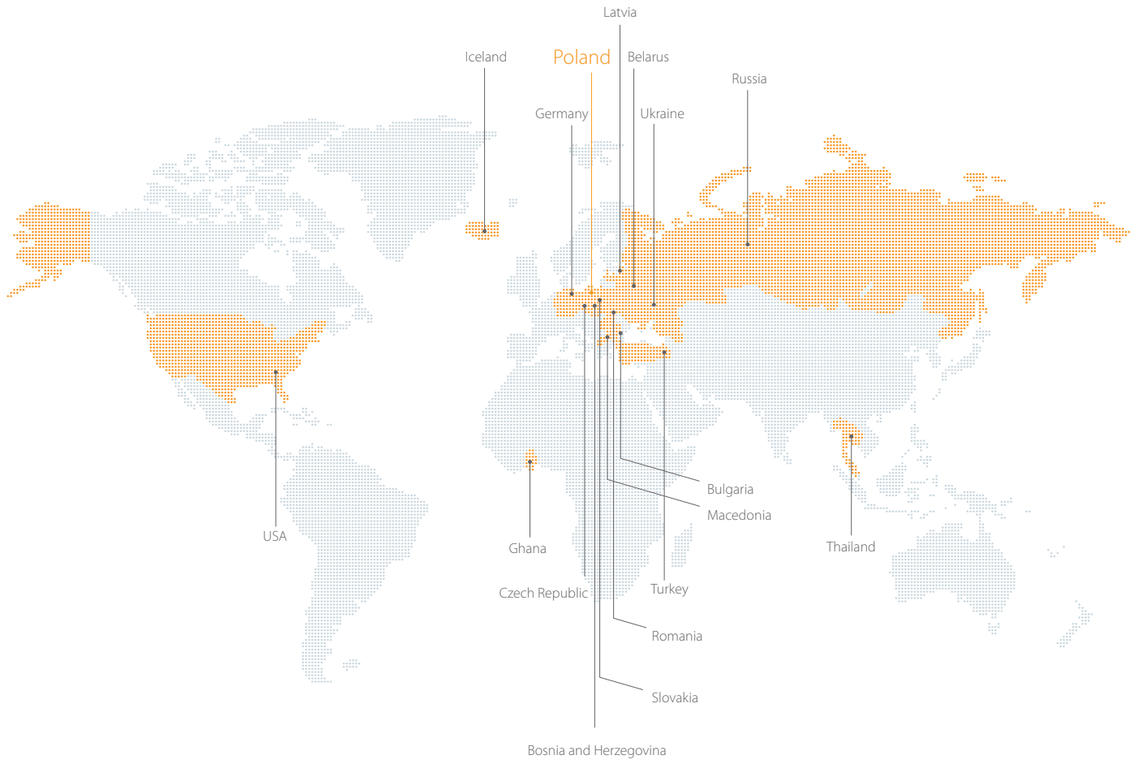
Through close customer relationships and by maximising the synergy of customers' application experience combined with our knowledge of chemistry, we continuously strive to offer tailor-made products and system solutions that contribute to your success.

We are continuously expanding our product range with new surfactants, focusing on safe chemistry and being friendly to people and environment. We operate in full compliance with legal and other requirements, including environmental requirements. The design, production and sale of large volumes of specialist, often unique, chemical products for further processing requires the coordinated cooperation of many services at the Company's disposal.

A certified quality management system and environmental management system has proven to be very useful. Those two integrated systems help our employees to be aware of their roles in reaching quality and environmental goals.

Our specialists know that in the end, by carrying out their tasks in accordance with procedures applicable to their positions and other internal regulations, we provide our clients with exactly what they expect from us, acting in a reasonable manner and in compliance with legal requirements relating to the environment. Our strategic investor is the German company PCC SE, which operates internationally as three divisions: Chemical, Energy and Logistics.

PCC Group in the world



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TEXT PAGES	
Brand	Cocoon Silk
Grammage	150
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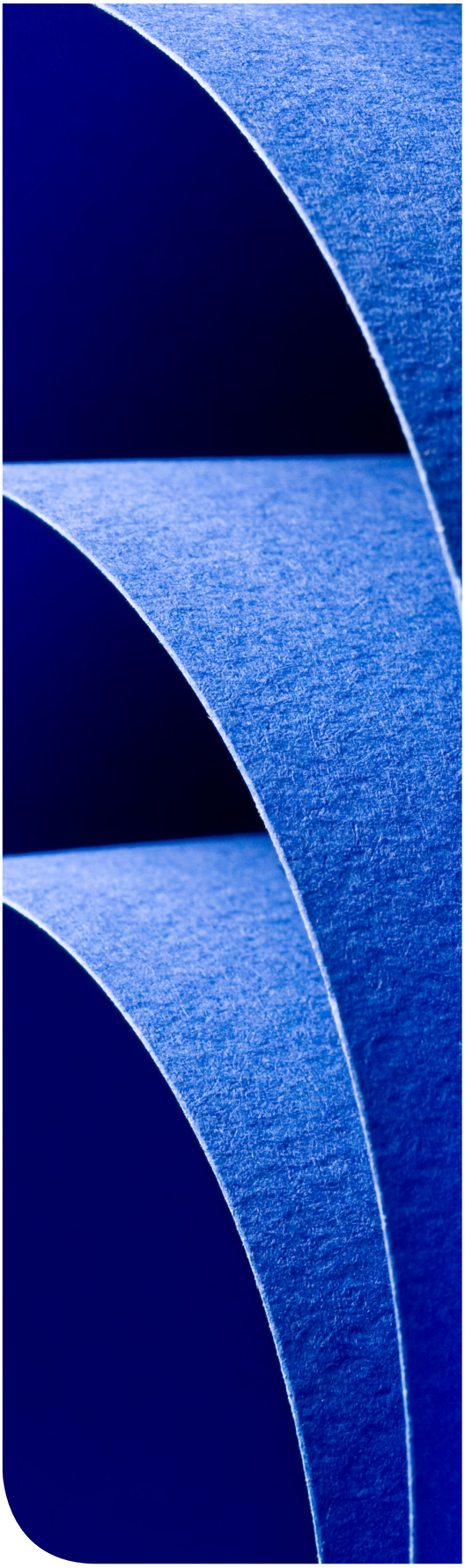
Grammage	250
Number of pages	4
PUBLICATION	
Size (cm)	21 x 29.7
Quantity	100

By using Cocoon Silk rather than non-recycled paper, the environmental impact was reduced by:

11	kg of landfill
1	kg CO_2 and greenhouse gases
15	km travel in the average European car
447	litres of water
24	kWh of energy
18	kg of wood

Carbon footprint data evaluated by Labelia Conseil in accordance with the Bilan Carbone® methodology. Calculations are based on a comparison between recycled paper used versus a virgin fibre paper - according to the latest European BREF data (virgin fibre paper) available.



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