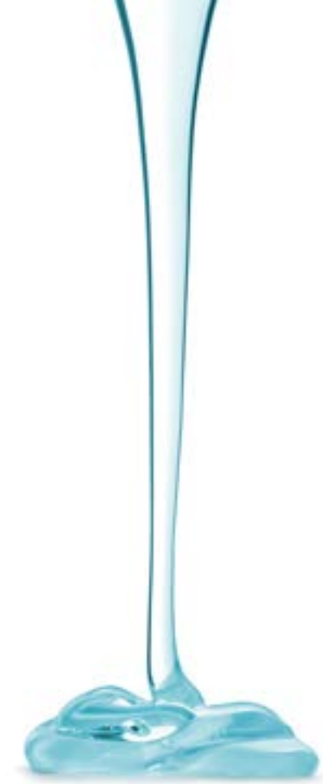
Polyurethane adhesives

Sustainable Technologies

pcc

More than Chemistry



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PCC Group
We build value through sustainable innovation

Each project or venture with a long-term success story shares one common thing – it's 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 dynamic and sustainable world-wide development of the PCC Group.

The companies, operating as a part of the PCC Group, act with responsibility and care. 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 through 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 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 3000 people. We operate in 17 countries, in 39 different locations around the world. Our portfolio includes eight basic segments. Individual operational responsibility is assigned to seven of them - Polyols, Surfactants, Chlorine, Specialty 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

Divisions	Segments	Business units
Chemicals	Polyols	• Polyols • Polyurethane Systems
	Surfactants	• Anionic Surfactants • Non-ionic Surfactants • Amphoteric Surfactants (Betaines)
	Chlorine	• Chlorine • MCAA • Other Chlorine Downstream Products
	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 • Rail Transport
Holding	Holding	• Portfolio Management • Projects • Services

*Consolidated sales

PCC PRODEX Sp. z o. o.
Innovations for the future

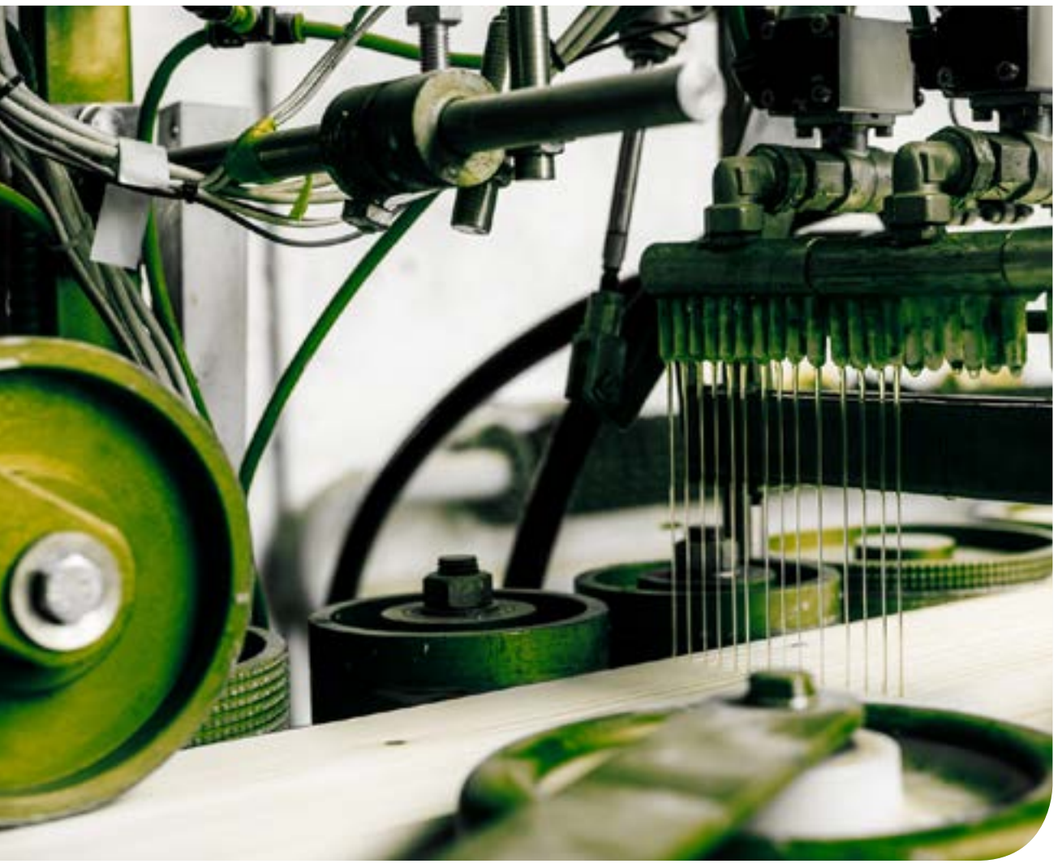
Did you know that...

- Polyurethane was first known in 1937, when two German scientists published and patented a method of preparing it.
- At present, polyurethane (PU) is one of the most popular and most widely used polymers in the world.
- Today it is often said that polyurethane, as a material, has almost unlimited possibilities of use and is also one of the most important contemporary plastic.

Since 1979, PCC PRODEX Sp. z o. o. (formerly PRO-DEX-SYSTEM Sp. z o. o.) has been involved in the continual production of one and two-component polyurethane systems. The polyurethane solutions delivered by PCC PRODEX find their application in the production of adhesives, sealants, semi-rigid and rigid insulating materials as well as components made from integral and elastic foams. Thanks to our highly qualified staff with their experience and excellent understanding of polyurethane processing, the company offers a wide range of polyurethane systems (over 150) intended for application in construction, cooling and heating sectors, the automotive industry as well as in mining and sport & recreation. Owing to our in-house research and development facilities located in Brzeg Dolny and Żółwin (near Warsaw), the company can quickly adapt its offer to the specific customers' needs and also changes appearing on the market. The company places emphasis on the continuous improvement of the production process and product quality, making sure the offer meets the highest world standards. In 2010, PCC PRODEX company merged into the international company, PCC SE, that operates on the world's markets of chemical raw materials, transportation, energy, coal, coke, fuels, plastics and metallurgy. In October 2012, PCC Rokita SA concluded a contract with the PCC SE company located in Duisburg for the purchase of PCC Prodex Limited (Sp. z o. o.) company. As a result, PCC Rokita SA acquired 100% of the company shares. The polyurethane systems in the PCC PRODEX offer were granted a series of certificates and approvals of research institutes and certifying centres such as ITB, IMBiGS, GIG, OBAC, DNV, BV and PZH .

Polyurethane adhesives

Polyurethane adhesives demonstrate excellent adherence to practically any surface, no matter of what material or structure (i.e. smooth or rough). Polyurethane-based adhesives are ideal for gluing sandwich panels, wooden surfaces, styrofoam, mineral wool, polyurethane blocks, bituminous roofing paper, cardboard, paper, and typical construction materials such as concrete and metal sheets. When it comes to gluing, the durability of the joint is what matters most. In the case of joining surfaces with a polyurethane adhesive, the joint is able to endure varying weather conditions as well as large and frequent temperature fluctuations. An additional distinctive feature of polyurethane adhesives is their low viscosity, which enables gluing moist materials. There are no volatile organic components in polyurethane adhesives (no VOC), which enables joining materials not resistant to different chemicals, such as styrofoam.



One-component adhesives

Diisocyanate-based pre-polymer adhesives (MDI), which demonstrate strictly selected content of NCO groups and reactivity depending on their purpose. Both parameters affect the joint binding time. Such adhesives bond using moisture contained in the air. This process may be accelerated by spraying water on the layer of adhesive.

Two-component adhesives

Polyurethane adhesives operating on the principle of reaction of polyol part (component A) with isocyanate part (component B) with precisely selected proportions. These adhesives do not contain any organic solvents, and therefore do not pose any threat to the environment. Their primary applications include: gluing sandwich panels, construction components and joining wood or wood-like materials with steel, aluminium or concrete.

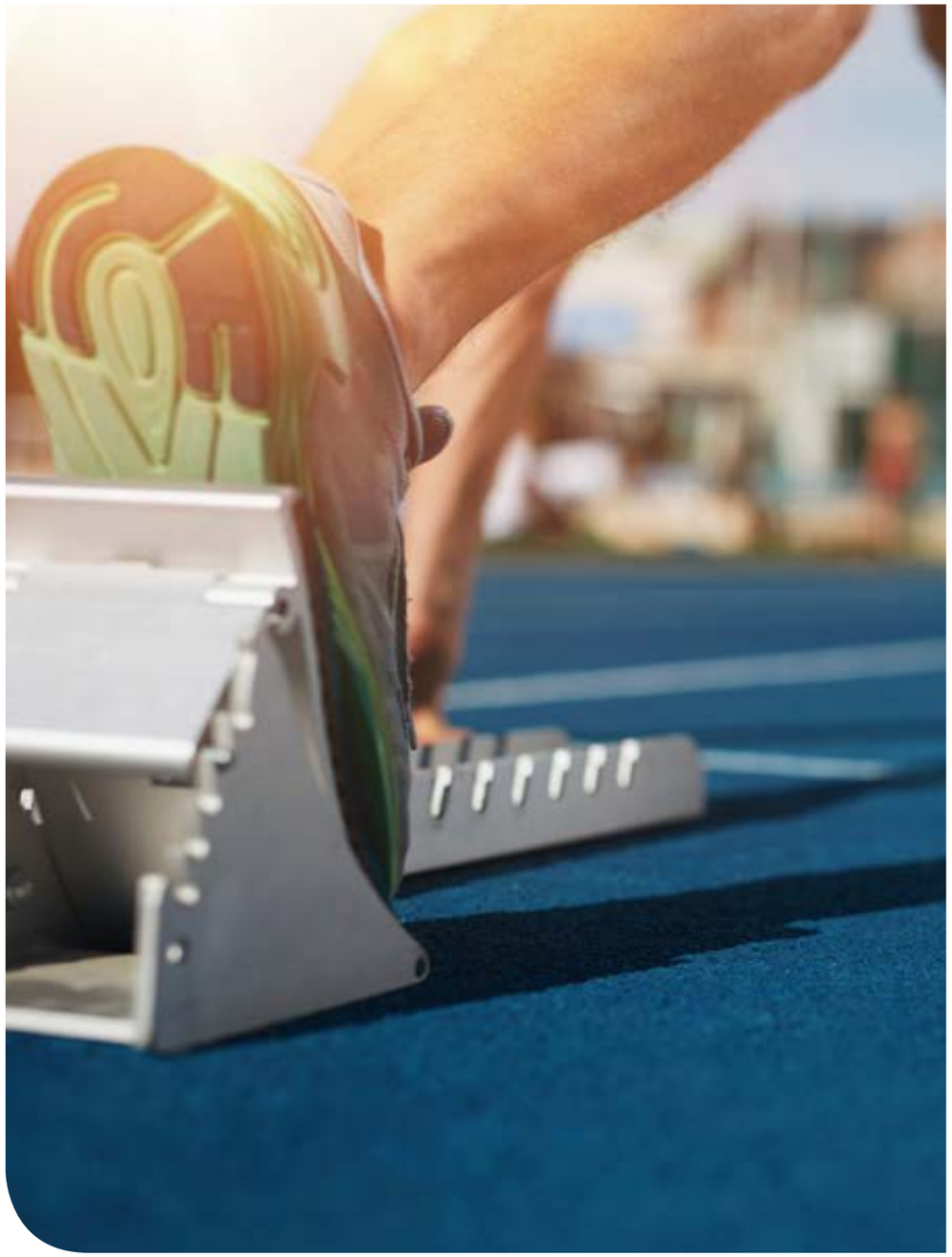
The product group also includes two-component polyurethane mining adhesives used for filling cracks in rock mass in order to bind dry, wet and very loose rocks and coal beds.

Fast-binding and slow-binding anchor loads adhesive for the mining industry

Polyurethane anchor loads adhesive used for reinforcement and filling mine working. It may be used in non-methane and methane mines, in workplaces with explosion risk at levels 'a', 'b' or 'c' such as coal and copper mines.

Adhesives for sports and leisure surfaces

One and two-component polyurethane adhesives with water-repellent or water-permeating properties. Using top quality polyurethane components with SBR/EPDM granulate, a uniform surface is achieved, demonstrating a high level of resilience and flexibility. It effectively absorbs impact energy, and therefore protects against any injuries caused by a fall which enhances user safety. Such surfaces are used for, among other things, multi-functional sports grounds and playgrounds.



Purpose

- door panels providing thermal insulation
- panels with a core made of styrofoam, mineral wool, and polyurethane
- wooden structures such as spiral staircase
- mining industry
- outdoor and indoor sport and leisure surfaces

SYSTEM	TYPE	PURPOSE
MULTIFUNCTIONAL ADHESIVES		
EKOPRODUR RB2	One-component polyurethane adhesive	For gluing different materials such as wood, metal sheet, roofing paper etc.
EKOPRO MER G12		Used in the wood industry, rubber industry and construction industry for gluing fibre board, styrofoam board, polyurethane board and mineral wool boards with sheet metal, wood, plasterboard and roofing paper; maintains mechanical properties within the temperature range –40°C to 80°C.
EKOPRO MER G15/0		Used in the wood industry, rubber industry and construction industry for gluing fibre board, styrofoam board, polyurethane board and mineral wool board with metal sheet, wood, plasterboard.
CONSTRUCTION ADHESIVES		
EKOPRO MER G15	One-component polyurethane adhesive	Used in the construction industry, for gluing fibreboard, styrofoam board, polyurethane board and mineral wool board with metal sheet, wood, plasterboard and roofing paper.
ADHESIVES FOR REGENERATED FOAM BLOCKS		
EKOPRO MER G18	One-component polyurethane adhesive	For gluing polyurethane foam and manufacturing blocks of regenerated foam
EKOPRO MER G21		For gluing polyurethane foam and manufacturing blocks of regenerated foam
ADHESIVES FOR PANELS WITH A CORE MADE OF STYROFOAM, MINERAL WOOL AND POLYURETHANE		
EKOPRODUR KW1	Two-component polyurethane adhesive	For gluing painted metal sheet with panels with a core made from polyurethane, styrofoam, and mineral wool, using a continuous line
EKOPRODUR KW3		For gluing painted metal sheet with panels with a core made from polyurethane, styrofoam and mineral wool, using a continuous line
EKOPRODUR KW-A2		For gluing painted sheet metal with panels with a core made from polyurethane, styrofoam, and mineral wool, using a continuous line; flammability class A2
EKOPRODUR 1331B2		For gluing painted sheet metal with panels with a core made from polyurethane, styrofoam and mineral wool, using a continuous line

SYSTEM	TYPE	PURPOSE
ADHESIVES FOR SPORT AND LEISURE SURFACES		
TENSILPUR ET	One-component polyurethane adhesive	For gluing SBR granulate, and additionally used as a binder for the development of layers comprising mineral aggregate and SBR granulate
TENSILPUR S		For gluing rubber granulates; also used for the professional manufacturing of use-surface for a number of sport & leisure surfaces
ACTIVE PLAY AS H		For gluing rubber granulates, for manufacturing moulded rubber components such as rubber boards, fitness mats, vibration isolator pads, for manufacturing special curbs, end stops, traffic lane separators etc.
STONEPUR		For gluing gravel and stones, for the manufacturing of floors and pavements, for driving surfaces such as access roads or car parks.
MINING ADHESIVES		
PROMOPUR (strong)	Two-component polyurethane adhesive	For filling and reinforcing cracked rock mass in the presence of dry/wet loose rocks and coal beds
PROMOPUR Un		Un Universal range of mining applications
PROMOPUR W		Adhesive with a short reaction time, for rocks containing water
PROMOPUR L		Adhesive with long reaction time, for deep penetration
SIL-PUR 80		Mineral and organic adhesive for mines with many rocks containing water
Anchor loads adhesive Type LK; LK-B		Used for dry, moist, and beds containing water, for gluing steel anchors, rope anchors and string anchors in order to attach them to coal beds, non-ferrous metal beds and other rocks
Anchor loads adhesive Type LK-Cu; LK-Cu-B		Fast-/slow-binding adhesive for gluing steel anchors, rope anchors and string anchors (rock bolts) in order to attach them to coal beds, non-ferrous metal beds and other rocks
Anchor loads adhesive Type LP; LP-B		Used for dry, moist and beds containing water, for gluing steel anchors, rope anchors and string anchors (rock bolts) in order to attach them to coal beds, non-ferrous metal beds and other rocks

PCC Group - Industrial Park in Brzeg Dolny, Poland

PCC Rokita SA

PCC Rokita Capital Group, 22 companies, including:
PCC Rokita SA
PCC Prodex Sp. z o.o.
PCC Prodex GmbH (Germany)
PCC PU Sp. z o.o.
IRPC PCC Co. Ltd. (Thailand)
PCC Therm Sp. z o.o.

PCC EXOL SA

PCC EXOL Capital Group, 5 companies, including:
PCC EXOL SA
PCC Chemax Inc. (the USA)
PCC EXOL Kýmya Sanayý Ve Týcaret Lýmýted Ţýrketý (Turkey)

PCC CP Kosmet Sp. z o.o.

Capital Group PCC CP Kosmet, 3 companies, including:
PCC CP Kosmet Sp. z o.o.
OOO PCC Consumer Products Navigator (Belarus)
OOO PCC Consumer Products (Russia)

PCC MCAA SE

PCC MCAA Sp. z o.o.

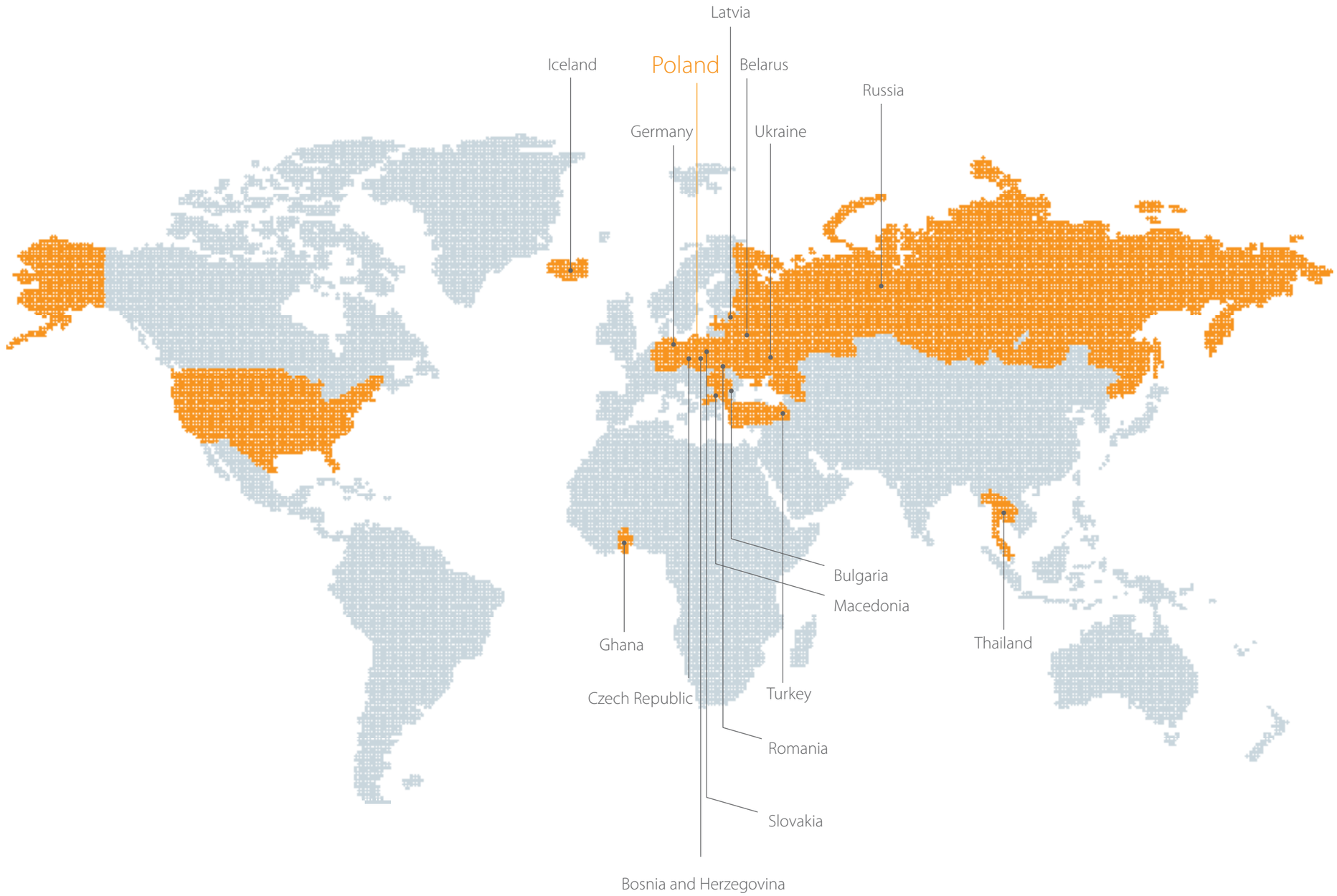
PCC Autochem Sp. z o.o.

PCC Autochem Sp. z o.o.

PCC Intermodal SA

PCC Intermodal SA

PCC Group in the world



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Brand	Cocoon Silk
Grammage	250
Number of pages	4
PUBLICATION	
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Quantity	100

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1 kg CO_2 and greenhouse gases

12 km travel in the average European car

343 litres of water

19 kWh of energy

14 kg of wood

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

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More than Chemistry