COLBOND

Environmental Care

makes a world of difference

Environmental culture and strategy

Colbond, headquartered in Arnhem (the Netherlands) is a globally active, leading producer of high-quality industrial nonwovens for Flooring, Automotive and Construction Applications, and of high-quality three-dimensional polymeric structures and composites for Civil Engineering, Building and Industrial Products. With a workforce of some 625 people, Colbond's production facilities are located in Emmen and Arnhem (the Netherlands), Obernburg (Germany) and Asheville (USA). Our sales offices are located throughout the world, including the Netherlands, the United States, Germany, France, and Singapore.

As a leading international supplier and partner to industry, Colbond is concerned about upholding the highest standards in the fields of health, safety and the environment and actively takes part in national and international efforts to maintain those standards.

Our efforts regarding the development of new products, continuous improvement of technologies and optimal commercial and technical service to our customers are also closely linked to the company's environmental culture and strategy. Actively exploring the options of increasing sustainable value is one of the key activities of our environmental policy.

We aim to be pro-active in environmental issues in all markets we serve. Through continuous review, Colbond strives for optimum processes and products with minimum environmental impact. Within this context, significant results can be achieved in energy and emission reduction, waste reduction, raw material reduction by the utilization of non-virgin material and the re-use of internal waste streams.

Alongside this, Colbond's R&D team has been instrumental in the pro-active introduction of a great many concrete and innovative environment-related measures in the fields of production, distribution and product stewardship. Furthermore Colbond's R&D team constantly investigates opportunities to exchange virgin raw materials for recycled ones. In doing so, Colbond lives up to its responsibility towards its employees, its customers, its stakeholders and society at large.

- Colbond adopts a proactive stance on environmental issues in all markets in which we are active: Flooring, Construction, Automotive, Civil Engineering, Building and Industrial Products.
- Colbond fully accepts the environmental covenants agreed to in Rio, Kyoto and The Hague, and will comply with the relevant targets for emission reductions.
- Colbond encourages its staff to maintain a positive attitude towards environmental improvements.
- Colbond strives, through continuous redesigning, for optimum processes and products with minimum environmental impact.
- Colbond continuously invests in HSE projects.

Continual improvement

From the product development and design stage, through to distribution and recycling, Colbond grants high priority to developing solutions that result in products which place less of a burden on the environment. At our production sites on both sides of the Atlantic, we invest significant time and effort to develop measures which (as you will see in this brochure) have contributed importantly to reducing raw materials use, emissions and waste on the part of Colbond, our customers and end-users.
And there where solutions are not yet fully available, Colbond sets for itself "stretch" environmental targets that keep us on our toes, striving for continual improvement in order to be the best partner for our customers.

Major technologies

Colbond's environmental achievements and targets apply to its major technologies: **Colback**® bi-component nonwovens and **Enkamat**® multidimensional mats, both manufactured from polyamide, polyester and polyolefins.

Colback is a unique, thermally bonded spunlaid nonwoven made from bi-component filaments with a polyester core and a polyamide (PA6) skin. Its advantages for the end-user are based on its uniform open structure, its high tensile strength and high tear resistance, as well as its stability, ease of impregnation, moldability and weldability. Colback uses no chemical binder. Variations on the Colback theme are Colback Pro (PET core and PP skin) and Colfors (other PET/PA6 version).

Enkamat's proven high performance and reliability includes a high resistance to weathering and UV radiation, chemical resistance, low flammability and low sensitivity to temperature fluctuations.

The following examples are merely a selection, chosen from an extensive range of measures taken or currently in progress.

Colback® bi-component technology

Energy / Emissions

In early 2004, Colbond began at Arnhem with the production of a new low-energy-consuming PET/PP nonwoven ("Colback Pro") for the automotive industry.

With the production of Colback Pro, we are able to achieve a reduction of some 25% annually in the consumption of natural gas during production. Colback Pro also has pronounced environmental benefits at the customers, where it allows energy reductions of about 20 % via lower molding temperature, as well as a 5% reduction in raw materials via pre-stretching before molding.

At Colbond's plant in Emmen (the Netherlands), we have succeeded in achieving a reduction of solvent emissions from spin finishes of 40% since 2003. At our U.S. plant in Asheville (NC), a 50 % reduction in such emissions has been seen since 1995. One of our spinning machines in the U.S. now works with a water based spin finish, thereby completely eliminating all emissions of the hydrocarbon exxsol.

In 2003, we introduced a new, biodegradable tuft-finish for our bi-component products.

Waste Reduction / Re-use

Since the very start of production of bi-component Colback in the late 1960s, Colbond bv has adopted a two-step manufacturing process, thereby allowing the nonwoven production of exactly the width needed by our customers. This eliminates waste (raw materials, energy and final product) both in the production of the nonwoven, and at our customers' manufacturing plants, thereby underscoring Colbond's commitment to tailor-made products with the lowest possible environmental impact.

Starting in 1993, the installation of a monomer scrubber in our U.S. plan has enabled us to cut caprolactam emissions by 75%.

The use of an automatic fault-detection and correction system on one of our lines for Colback fleecing resulted in 2003 in a 25 % reduction in length waste. In coming years, all our lines worldwide will be equipped with similar systems and are expected to provide similar reductions.

Raw Material Reduction

Colbond has set for itself the target of continuously expanding the use of recycled polymer in the Colback production process.

Enkamat® technology

Energy / Emissions
The development and bringing on-stream of more efficient production units at our U.S. plant has resulted in a 40% reduction since 2003 in the energy units needed to chill coolant for Enkamat and Colback production.

Waste Reduction / Re-use
Since the early 1990s, all Enkamat waste produced during manufacturing for civil engineering purposes at our Asheville plant has been reintroduced back into the process.

In 2004, Colbond introduced a new family of innovative Enkadrain subsurface drainage composites (Enkadrain 3000R): the drain's polypropylene core is made from 99.5% recycled post-industrial waste.

Raw Material Reduction
A major thrust of Colbond's development strategy is to re-design processes to be less dependent on raw materials. This allows for greater flexibility and the use of non-virgin materials, to the great benefit of the environment. In this context, our civil engineering Enkamat applications in Asheville have been using 80% non-virgin PA6 since the late 1990s.

At Obernburg (Germany) our Enkamat civil engineering products are currently based on up to 90% post-industrial PET.

As the result of a project started in 2002, Colbond expects to soon introduce a commercial Colbonddrain product based in part on recycled PE bottle caps. These bottle caps are readily available from PET bottle-recycling plants in Holland, Germany and elsewhere. The new vertical drain is targeted for its European introduction in 2004.

COLBOND

products

sorted according to sector, applications/end-use

Flooring

Products : Colback®

End-uses: Primary backing for carpet tiles, entrance mats, high qualitybroadloom carpets, artificial turf, and bath mats. Wall paper. Flower wrapping. Clothing. Filtration. Screens.

Automotive

Products: Colback®

End-uses: Primary backing for molded car carpets and option mats. Trunk liners. Door panels. Package trays. Car seats.

Construction Industry

Products: Colback®, Colfors®

End-uses: Waterproof bitumen membranes, built-up roofing, cold applied roofing, vapor barriers, single ply, liquid roofing. Reinforced plastics. Coatings.

Civil Engineering

Products: Enkamat®, Enkadrain®, Armater®, Colbonddrain®, Enkagrid®

End-uses: Erosion prevention. Drainage. Soil reinforcement. Soil improvement. Waste containment.

Building & Industrial Products

Products: Enka®-Vent, Enkasonic®, Enka®-Break, Enka®-Spacer, EnkaFusion®, Enka®-Channel, Enka®-Ski, ExSpray®, Enkadrain®.

End-uses: Roof ventilation. Sound reduction. Mortar break. 3D structures. PUR molding. Resin infusion. Sound control. Spray absorption. Drainage. Radon Mitigation.

All the above products are nonwoven, or related technology, based on PET, PA, PP and HDPE polymers.

Safety & health

Structural health measures at our plants include the installation of improved air-suction units above the Colback spinning blocks, to draw off lactam vapor that would otherwise sublimate and settle as a fine dust.

Our HSE policy mission statement

Colbond considers Health, Safety and Environment (HSE) to be essential values; HSE is therefore integrated into all our operational activities as a key line-management function. We will conduct our activities in compliance with Health, Safety and Environmental legislation.

Colbond actively supports the principles of the Responsible Care® Program and is committed to the development of an environmentally sustainable business. We will seek continuous improvement in HSE performance by attention to the design of systems of work, processes and products.

To achieve this we will:

- aim to conduct our activities to protect the environment by preventing or reducing the environmental impact of our products and processes
- provide HSE training and education for our employees
- motivate and expect our employees to work in a manner which promotes high standards of HSE performance
- monitor HSE performance and report openly on progress
- We will ensure that our customers are informed of any HSE issues associated with the use and disposal of our products
- seek to conduct our activities so as to prevent harm to the health of our employees and others associated with our products and processes.
- work towards the prevention of all injuries associated with our activities and those of our contractors.

Colbond is a leading producer of high-quality synthetic nonwovens for flooring, automotive and construction applications, and three-dimensional polymeric mats and composites for civil engineering, building and industrial products. Colbond employs some 625 people worldwide and is headquartered in Arnhem – Netherlands, with production facilities in Emmen and Arnhem (NL), Obernburg (D) and Asheville, NC – USA. Regional sales offices are located all over the world.

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