

***kuraray***

High performance materials that shape the world we live in

**DISCOVER THE WORLD  
OF KURARAY**





# Pioneering chemical progress for a safer and more

## Who we are

### An international leader in high performance materials

Kuraray is a **global speciality chemicals group** based in Tokyo, Japan. It is one of the largest suppliers of polymers and synthetic microfibres and an international leader in the development and use of **innovative high performance materials**. Its subsidiary Kuraray Europe GmbH is

Europe's leading producer of polyvinyl alcohol (KURARAY POVAL™/EXCEVAL™) and polyvinyl butyral (Mowital®). Our Trosifol® PVB and SentryGlas® ionoplast interlayers are used for laminated safety glass applications in the architectural, automotive and photovoltaic industries.

Kuraray Europe's product portfolio also includes chemical specialities, EVAL™ EVOH, activated carbon filters, thermoplastic elastomers, man-made fibres, man-made leather and dental products. **You can find Kuraray literally everywhere in everyday life.**

### Kuraray at a glance

- **High performance materials**
- More than **10.000** employees worldwide
- About **1.000** employees in Europe
- **1926** founded in Japan
- **4** Billion EUR sales globally,  
**525** Million EUR sales in Europe\*
- **4 %** of sales invested in R&D
- **22** sites globally

\*Kuraray Europe GmbH



# pleasant world



## Our mission

**To achieve what no one else can**

Kuraray has got unique experience in developing high performance materials, fusing future-oriented technologies and expanding sustainable businesses. This proficient expertise is essential for finding new solutions that meet the growing requirements of today's world.

*"We are committed to developing new fields of business using pioneering technology that improves the environment and enhances the quality of life throughout the world. For people and the planet – to achieve what no one else can."*

Kuraray's mission is challenging. So are our tasks. With our products and technologies, **we strive to help finding answers on the major challenges** of a world in transition such as global warming, finite natural resources, shortages of food and water, and environmental pollution. **And we do find answers:** With more than 50 different product ranges, Kuraray provides perfectly adapted products for a large variety of applications – in automotive, healthcare, industry and many other segments.



# Providing innovative products face the challenges

## Our roots

### Actively creating the future for more than 90 years

Kuraray was established in Japan in 1926 with the aim to commercialize and manufacture artificial silk known as rayon. The name **Kuraray is derived from Kurashiki**, the Japanese town where Kuraray was founded, **and rayon fibre**, which was the first product the company produced. In the beginning, the company's business

essentially developed around fibers and textiles.

In 1950 the company achieved a corporate milestone as the first in the world to bring polyvinyl alcohol synthetic fiber to the market. In subsequent years we used our proprietary technology in the areas of polymer

and synthetic chemistry to engineer a number of high-performance resins such as EVAL™ EVOH and KURARAY POVAL™. This helped us gain an internationally competitive edge based on which we expanded our operations in the field of chemicals.

## Pioneering spirit

### Enabling innovations that matter

As specialist for high performance materials with operations around the world, we are committed to provide unique, innovative products that help find solutions to global challenges and improve the quality of life.

Kuraray was the first company in the world to develop a technology for the mass production of polyvinyl alcohol (KURARAY POVAL™). From a base of polymer and synthetic chemistry, the Kuraray Group has built a unique and advanced system of technologies by fusing related technologies and expertise.

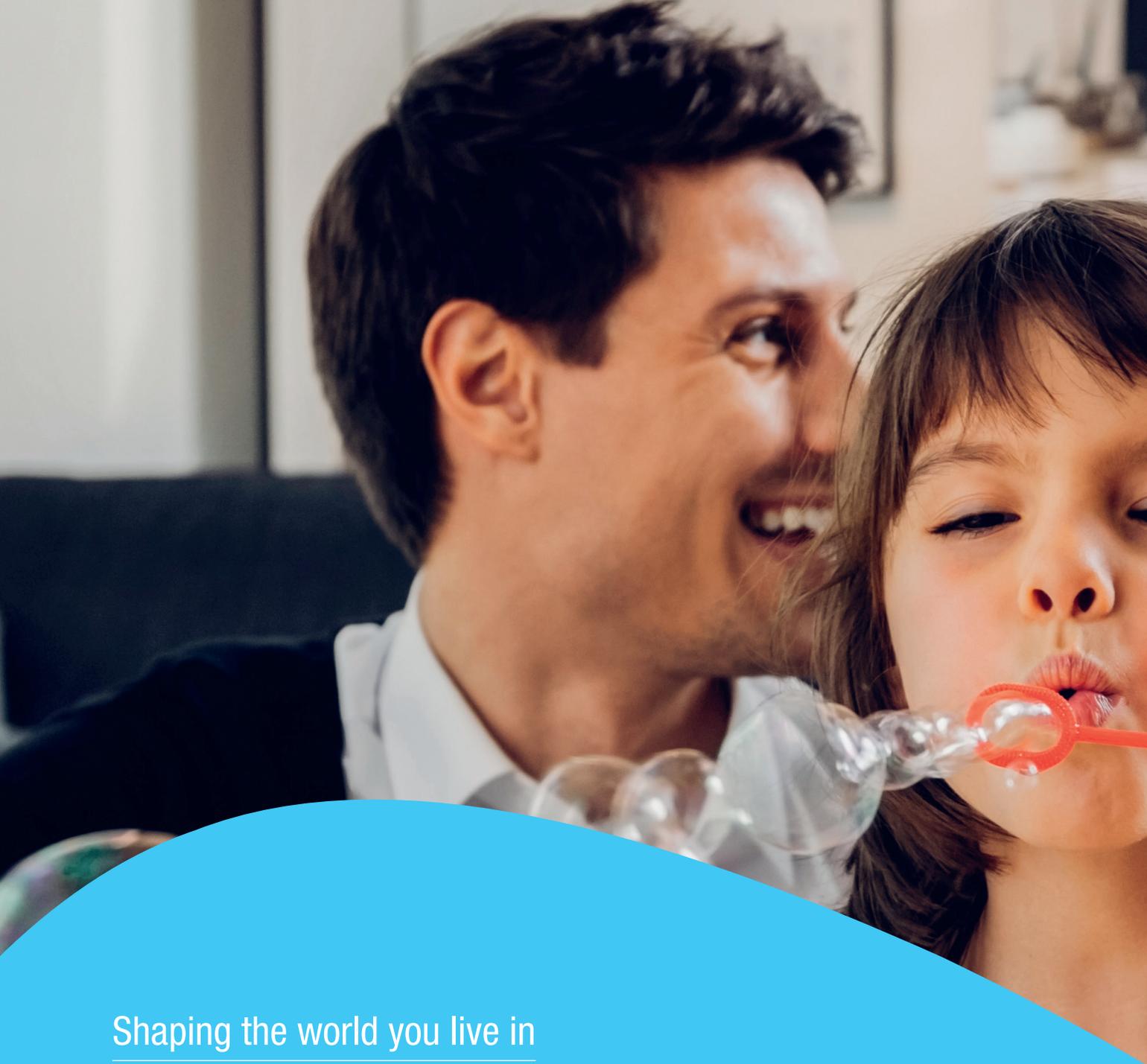


# and solutions that of a world in transition



## **Kuraray has been present in Europe since 1965:**

Initially through a sales office in Hamburg and later through its subsidiary Kuraray Europe GmbH, which was based in Düsseldorf. In 1999 Europe's first and largest EVAL™ EVOH plant began production near Antwerp. Kuraray Europe took over Clariant's PVA/PVB operations in Frankfurt in 2001 and HT Troplast's Trosifol™ film business in 2004. In 2007 it acquired the man-made leather business of amaretta in Aßlar, followed in 2008 by the PVB activities of Wacker, Munich. Since April 2012 Kuraray Europe GmbH has been based in Hattersheim, near Frankfurt, from where it runs its European business.



Shaping the world you live in

## Discover Kuraray everywhere in everyday life

Kuraray's solutions play an important role in **enabling our customers to produce better products with excellent properties** that are perfectly adapted to their specific requirements.

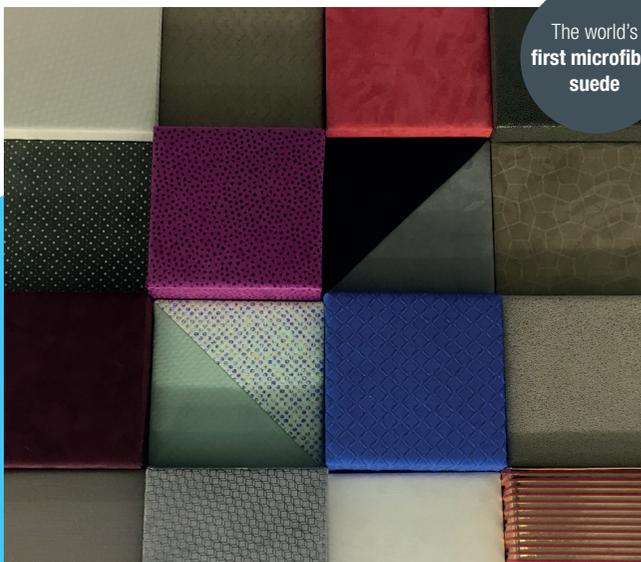
With our **global research network** and extensive technical and chemical expertise, we produce high-performance fibres and materials that allow all kinds of forms and functionalities. Many of the innovations that we have pioneered in recent years are now global market leaders and **shape the world** as you know it. Fascinating, isn't it?



# Driving innovation with high-performance

Kuraray supplies a wide range of high-performance materials for many areas of daily life. We have used our unique technical strengths to create products that the world had never seen before.

We were the first company in the world to commercialize KURALON™, the first synthetic fiber produced using »Made-in-Japan« technology. And this is just one example in a **great variety of outstanding highlight-products** that help improve life and protect the environment.



The world's first microfiber suede

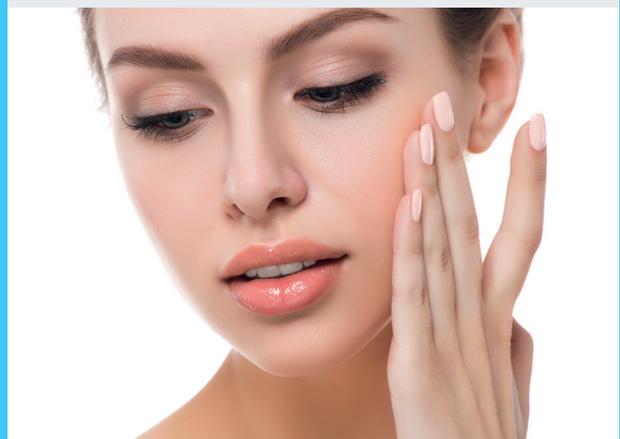
## **Clarino™** (man-made leather)

A first in the world product industrialized by Kuraray.

**Clarino™** is Kuraray's fine leather-look fabric made of polyamide or polyester microfibers with a strong focus on animal protection and on sustainable manufacturing. For both fashion and technical applications Clarino™ is the inspiring and efficient alternative to genuine leather that delivers highest quality and variety. The diverse possibilities of dyeing, finishing and surface treatment, such as stamping, perforating, embossing, printing and laminating make Clarino™ suitable for numerous applications. Accessories, garments, sporting goods, consumer electronics, decoration and furniture cover only a part of the various use cases.

## **Isopentyldiol**

Kuraray offers a wide range of unique isoprene derivatives. One of them is Isopentyldiol (3-methyl-1.3-butanediol), a colourless and odourless liquid, which is completely miscible with water. From skin-care to fragrances, Isopentyldiol helps in the processing of a variety of cosmetic formulations. Safe and highly compatible, this multifunctional ingredient is for example able to reduce the alcohol part in fragrances or to create an immediate moisturizing effect of O/W emulsions.



# materials



## DENTAL MATERIALS

Kuraray Noritake Dental Inc. applies polymer-chemistry-based technology and ceramic technology to develop a variety of dental materials that make it possible to restore teeth to a near-natural state. Kuraray Noritake stands for high quality products such as PANAVIA™, CLERAFIL™ and KATANA™ which have a very good reputation not only in Japan, but throughout the world.

## KURARAY POVAL™

**KURARAY POVAL™** is the brand name of Kuraray's globally produced polyvinyl alcohol (PVOH). KURARAY POVAL™ features an extremely wide-ranging field of applications. The main uses are in the paper, adhesive, textile and construction industries, as well as in ceramics, packaging and electronics. The physical and chemical properties make PVOH very versatile. It features water-solubility, excellent film forming characteristics, high tensile strength and elasticity, as well as resistance against organic solvents and dispersing power.



## EVAL™ (EVOH resin)

A first in the world product industrialized by Kuraray.

**EVAL™** provides excellent barrier properties against the permeation of gas, odours and solvents. It is used widely in food packaging materials to block out oxygen and preserve the flavour and quality of food, avoiding food waste. It is also used in automotive plastic fuel systems, providing an effective barrier against fuel vapour permeation. New developments focus on improving energy efficiency, prolonging the service life of vacuum insulation panels and insulated heating/cooling systems.



### Carbon materials

Kuraray is Japan's leading supplier of activated carbon and one of the world's most successful manufacturers of this product. Air and water purification as well as energy storage are the key areas of use. Activated carbon is extracted from coconut shells or hard coal by pyrolysis in a multi-step process. Activated carbon produced by Kuraray meets extremely high quality standards and is tailored specifically to customers' individual needs. Main applications are: Domestic water and air filters, wastewater treatment facilities, emission control canisters for cars, capacitors.

### Trosifol® (PVB and ionoplast interlayers)

**Trosifol™** offers the world's broadest portfolio of innovative glass-laminating solutions, including structural and functional interlayers for safety and security applications, sound insulation and UV protection. For decorative applications, Trosifol™ offers colored interlayers, digitally printable films and other innovative products for interior design projects. Trosifol® UltraClear films exhibit the lowest Yellowness Index (YI) in the industry.



### VECTRAN™ (industry fiber)

**VECTRAN™** is Kuraray's high-performance multifilament yarn spun from liquid crystal polymer. The fibre is five times stronger than steel and offers a unique combination of outstanding properties. It is the fibre of choice where others fail to meet performance requirements. Vectran™ is used in a wide range of applications, even in the aerospace industry.





**Mowital® (polyvinyl butyral resin)**

**Mowital®** is the trademark for a wide range of different polyvinyl butyrals (PVB) marketed by Kuraray. It has excellent adhesion and film-forming properties, high binding power and outstanding optical transparency. It is soluble in many organic solvents and can be combined with a wide range of reaction partners. Mowital® is mainly used as a binder in printing inks, coatings and corrosion-protection primers.

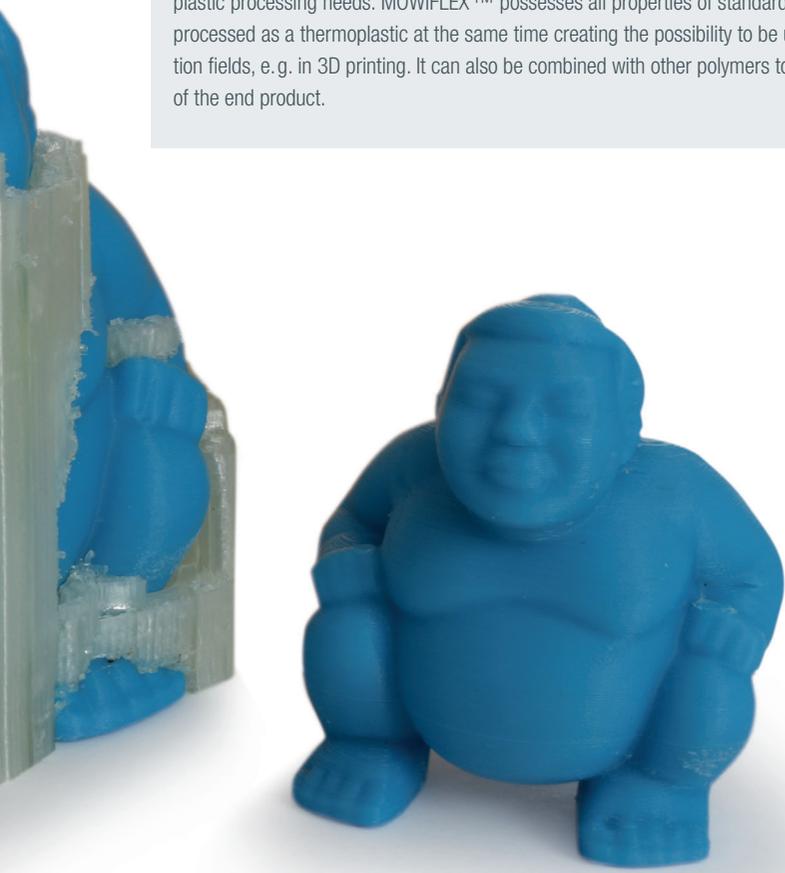
**ELASTOMERE**

Kuraray's thermoplastic elastomers (TPE) are environment-sound, free of PVC and do not need additional plasticisers. They are used for an extremely wide range of applications, including many plastic compounds for everyday products, such as toys, toothbrushes, medical tubes, sports equipment and sealants. In addition Kuraray Liquid Rubber is used in the production of high performance tires.



**MOWIFLEX™**

**MOWIFLEX™**, a compound of PVOH and plasticizer, has been designed in order to suit thermoplastic processing needs. MOWIFLEX™ possesses all properties of standard PVOH and can be processed as a thermoplastic at the same time creating the possibility to be used in various application fields, e.g. in 3D printing. It can also be combined with other polymers to modify the properties of the end product.



**PLANTIC™** (bio-based barrier packaging material)

**PLANTIC™** is used to provide food packaging with barrier properties, reducing environmental impact through versatile optimised structure design. PLANTIC™ is composed of up to 80% renewable material and used primarily for high barrier trays and skin packs. This ready-to-use structure offers a direct reduction in the food packaging material's environmental footprint. Yellowness Index (YID) in the industry.

# We offer a wide range of prod an attractive

Our success is not a matter of chance. Thanks to our skilled and experienced employees and uniquely wide range of products, Kuraray is a competent partner for many areas of technology.

## Architecture & Building



**We make the world a little quieter.**

- **Laminated safety glass** with Trosifol™
- **Material reinforcement** with KURALON™ / KURALON™-KII fibres
- **Mortar, plaster and tile adhesives** with KURARAY POVAL™
- **Cement and concrete** with Isoprenol additives
- **Sealing material** with SEPTON™
- **Under-floor heating pipe and barrier membranes** with EVAL™ EVOH
- **Damping materials** with HYBRAR™
- **Floor coverings** with HYBRAR™
- **Solvents** for air fresheners

## Automotive



**We make the world a little safer.**

- **Laminated safety glass** with Trosifol™
- **Instrument panels** with SEPTON™ and HYBRAR™
- **Protective finishes and coatings** with KURARAY POVAL™ and Mowital®
- **Air-conditioning systems** with activated carbon
- **Hoses and cables** with VECTRAN™, KURALON™ and SEPTON™
- **Multi-layer fuel systems** with EVAL™ EVOH
- **Tyres** with Kuraray Liquid Rubber
- **Batteries** with Mowital®

## Clothing



**We make the world a little more fashionable.**

- **Sizes** with KURARAY POVAL™
- **Textile coatings** with Kuraray Liquid Rubber
- **Sports and leisurewear** with Sophista™ fibres
- **Protective clothing** with VECTRAN™
- **Fibre blends** KURALON™-KII
- **Textiles and accessories** with Clarino™ leather-like fabrics

## Paintings & Coatings



**We make the world a little more creative.**

- **PVOH based binders:** KURARAY POVAL™
- **PVB-based binders:** Mowital® polyvinyl butyrals
- **Coatings and sealants:** Kuraray Liquid Rubber (K-LR)

## Paper



**We make the world a little more exciting.**

- **Paper finishing** with KURARAY POVAL™
- **Finishing of ink-jet paper** with KURARAY POVAL™ R polymers
- **Production of thermal paper** with KURARAY POVAL™ K/SD polymers

## Plastics



**We make the world a little lighter.**

- **Thermoplastic processing:** MOWIFLEX™
- **Emulsion polymerisation:** EXCEVAL™
- **PVC compounding:** KURARAY POVAL™ L and LM grades
- **Auxiliaries:** crosslinker: 1,7-octadiene; plasticiser: MPD (3-methyl 1,5-pentanediol); building block of polyacetal: Methylal

# ucts and are partner for many industries.

High-quality products, competent technical service and a focus on what our customers need are the core of all our business activities. Our close and trusting relationship with our customers results in exceptional products and individual applications that meet today's demanding standards.

## Electronics



**We make the world a little smarter.**

- **Binders for technical ceramics:**  
Mowital® SB grades
- **PVOH film for LCD displays:**  
KURARAY POVAL™ film Electrical and electronic components Genestar™
- **Capacitors:** Kuraray Activated Carbon and PA9T polyamide fibre
- **Battery separators:** KURALON™

## Packaging



**We make the world a little more portable.**

- **Barrier coatings** with EXCEVAL™
- **Barrier packaging** with EVAL™ EVOH
- **Thermoplastic processed packaging** with MOWIFLEX™
- **Retort pouches** with KURARISTER™
- **PVC-free films for packaging** with HYBRAR™
- **Multi-layer packaging** with Mowital®
- **Renewable biopolymer barrier packaging** with PLANTIC™

## Healthcare & Pharma



**We make the world a little more healthy.**

- **Cements, adhesives, composites and ceramics** from Kuraray Noritake dental
- **Pharmaceuticals** based on Isoprene
- **Tablet coatings** with KURARAY POVAL™
- **X-ray films** with Mowital®
- **Pharmaceutical packaging** with EVAL™ EVOH
- **Medical nonwoven fabrics** with FELIBENDY™ and KURAFLEX™
- **Medical hoses, tubes, splints and prostheses** with Kuramiron, SEPTON™ and HYBRAR™
- **Patch Adhesives** with SEPTON™ und HYBRAR™
- **Intermediates** for API's/Excipients

## Printing



**We make the world a little more colourful.**

- **Flexo and special gravure inks, pigment preparations, inkjet inks and thermotransfer inks:** Mowital® polyvinyl butyrals
- **Binders for printing inks:** polyester polyols (P series)
- **Printing Plates:** Kuraray Liquid Rubber and HYBRAR™

## Environmental Protection



**We make the world a little more sustainable.**

- **Filters in commercial and public wastewater treatment facilities, water filters for private households and air filters, for example, in vehicles:** Activated carbon
- **TIF™ barrier fumigation films and geomembranes** with EVAL™ EVOH

## Sports & Toys



**We make the world a little more enjoyable.**

- **Sport shoes** with Clarino™ and SEPTON™
- **Shoe soles** with SEPTON™ and HYBRAR™
- **Sports equipment** with SEPTON™ and HYBRAR™
- **Toys** with SEPTON™

# Working together to make the world a

## Taking social responsibility

### Kuraray's engagement as corporate citizen

Taking social responsibility is part of our corporate DNA and consequently one of our deepest concerns at Kuraray. With organizations and enterprises such as the Ohara Research Institutes established by Kuraray's founder Magusaburo Ohara, Kuraray strives to tackle social problems. **Environmental safety** is another core focus of our

R&D, which is basically inscribed in all our development processes and an important driver for our businesses.

The second field of our social engagement is activities such as educational **"chemistry classes for boys and girls"**, the Kuraray workshop for people with mental disabilities and the

project **"Sending schoolbags across the sea"** on corporate level.

As Kuraray Europe also engages in many local CSR projects, we would like to introduce our activities for the **"Malteser Social Days"** and **"Christmas in a shoebox"** as prime examples of our corporate citizenship:



Foto: Maurice Ressel

### Malteser Social Days

Kuraray Europe is part and sponsor of the Malteser Social Day. For one day every year, employees leave their companies and engage in hundreds of projects in their neighbourhood: they work in kindergartens and retirements homes, support people with disabilities or diseases and engage in all areas of community work. Contributing with tangible actions to society bridges the gap between social and work-life.

### Christmas in a shoebox

Kuraray supports the project every year and provides its employees with own collection points for the gifts and takes over the costs for handling and transporting the packages with a donation. The initiative is a real success story: In 2016 the charity initiative collected around 11.5 millions shoebox gifts and sent them to children in need around the world.

To find out more about career opportunities at Kuraray and our corporate culture, please visit our Career World online: [www.kuraray.eu/en/career/career-world](http://www.kuraray.eu/en/career/career-world)

# little better

## A global success factor

### Our aspirational employees make Kuraray what it is

More than 10.000 employees are working at Kuraray worldwide, about 1.000 employees in Europe. Our employees make Kuraray what it is, so they are especially important to us. We are convinced that we can only move forward as a company if they are able to develop their potential.

We therefore foster the people who work for us personally and individually so their careers develop in line with their aspirations.

*"I enjoy my work. Partly because working in a highly complex plant like this means I face new challenges every day and partly, because I value the good working relationship with my colleagues. What's more, at Kuraray employees are people not just numbers. The company has a very strong sense of social responsibility and takes employees' needs into account."*

Stephanie W., Deputy shift leader



We give our employees **freedom to shape their work** and encourage them to question established solutions and **put their own ideas into practice**. Respect and cooperation are the key elements of our working relationships. Kuraray's long tradition of responsibility and social commitment is a firm element in our corporate culture.

# ***kuraray***

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