

English

Sustainable Glazing

Trosifol® R3

Clear. Strong. Sustainable.

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kuraray

Trosifol®

The most recognized interlayer brand is now the most sustainable interlayer solution

WHETHER YOU'RE IN THE ARCHITECTURAL OR AUTOMOTIVE INDUSTRY, the pressure to decarbonize is affecting everyone. Manufacturers across the globe are being asked, or even required, to reduce operational emissions without reducing quality. But the real challenge is: how do you know which solutions provider you can trust?

For glazing interlayers, you're in safe and sustainable hands with Kuraray. You can now source laminated safety glass with a premium PVB interlayer that is purpose-built and proven to help reduce your carbon footprint.

Kuraray Advanced Interlayer Solutions (AIS) Division has launched Trosifol® R3, a new line of sustainable interlayer products that forms part of a wider and sustainable up- and downstream value chain, which includes products made from recycled materials, clean-energy fabrication practices, more efficient fabrication processes and in-life service and longevity.

Every Trosifol® R3 interlayer is or will be ISO-certified, which includes detailed environmental product declarations*. Best of all, you get the mechanical properties that have made Trosifol® the most trusted name in PVB interlayers for over 60 years.

Welcome to the future of interlayer technology. Welcome to sustainable, durable, and customizable glass lamination from Trosifol® R3.

* Certification in process



HIGHLIGHTS

- Trosifol® R3 offers up to a 90 % carbon emissions reduction**.
- The performance and quality you expect, minus the emissions.
- Built on a foundation of Kuraray's global commitment to sustainability.

** Compared to a standard PVB





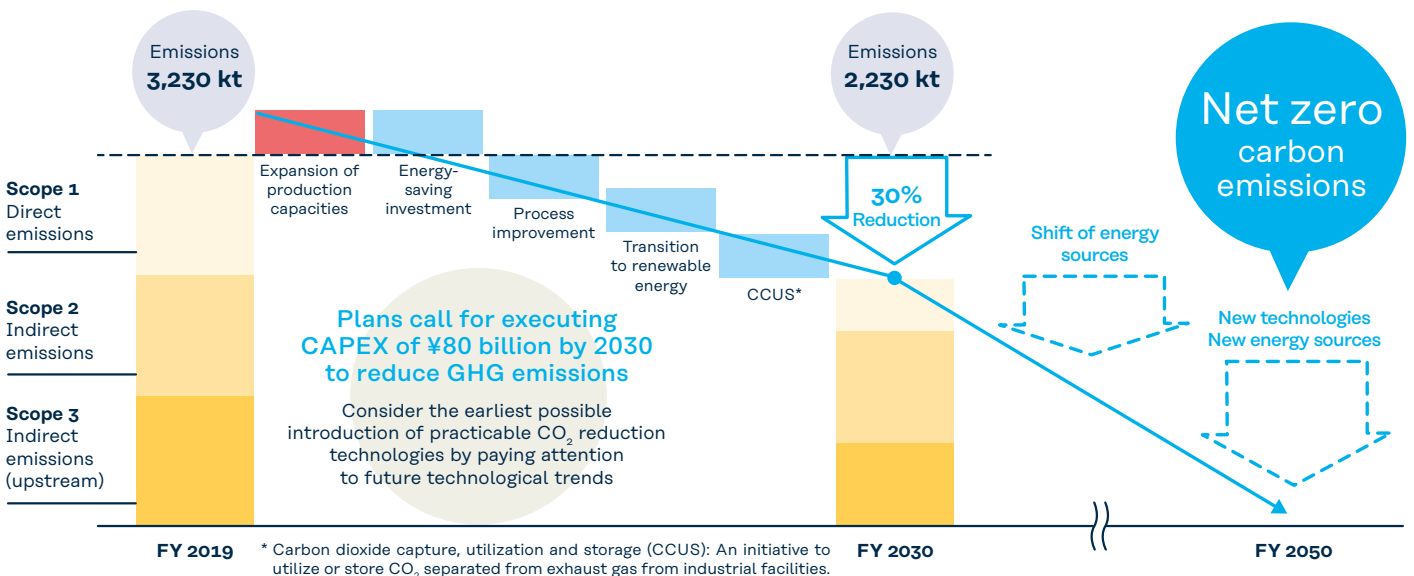
Our commitment to a sustainable future

WE ARE CONSCIOUS THAT A CERTAIN AMOUNT OF GREENHOUSE GASES RESULTS FROM THE INDUSTRY WE WORK IN. We as a corporation accept responsibility for this and work to increase our productivity across the board.

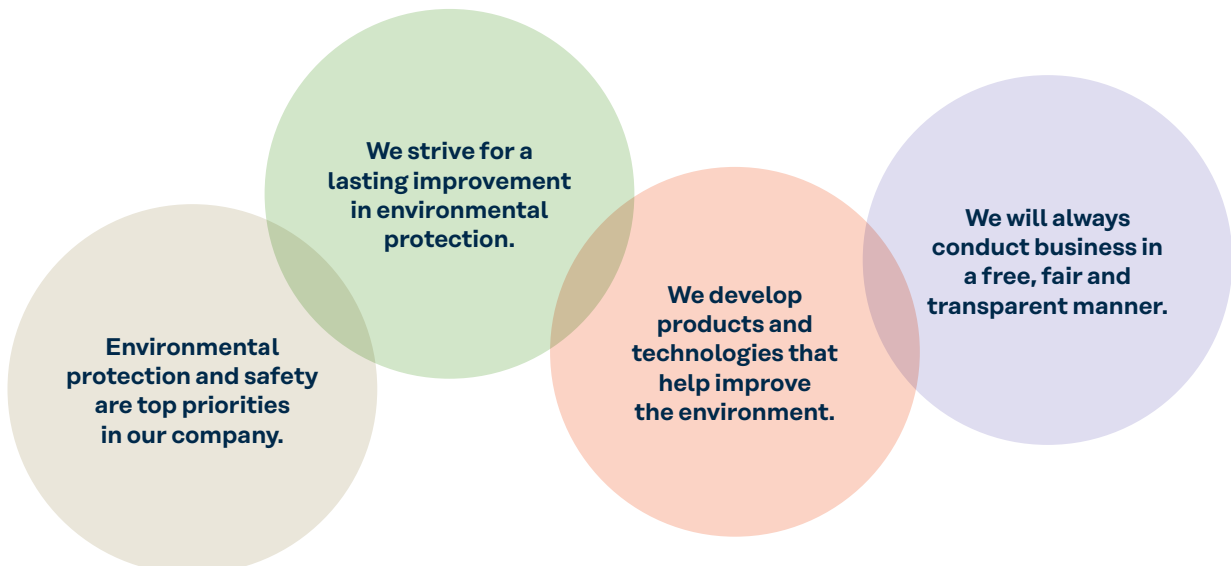
Growth and responsibility towards people and the environment are fundamental principles of all Kuraray employees' actions worldwide.

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.

Kuraray net zero commitment



GRAPH 1 •





For more information about our extensive sustainability activities and our corporate commitment for wider and further improvement, please follow this link: www.kuraray.com/csr



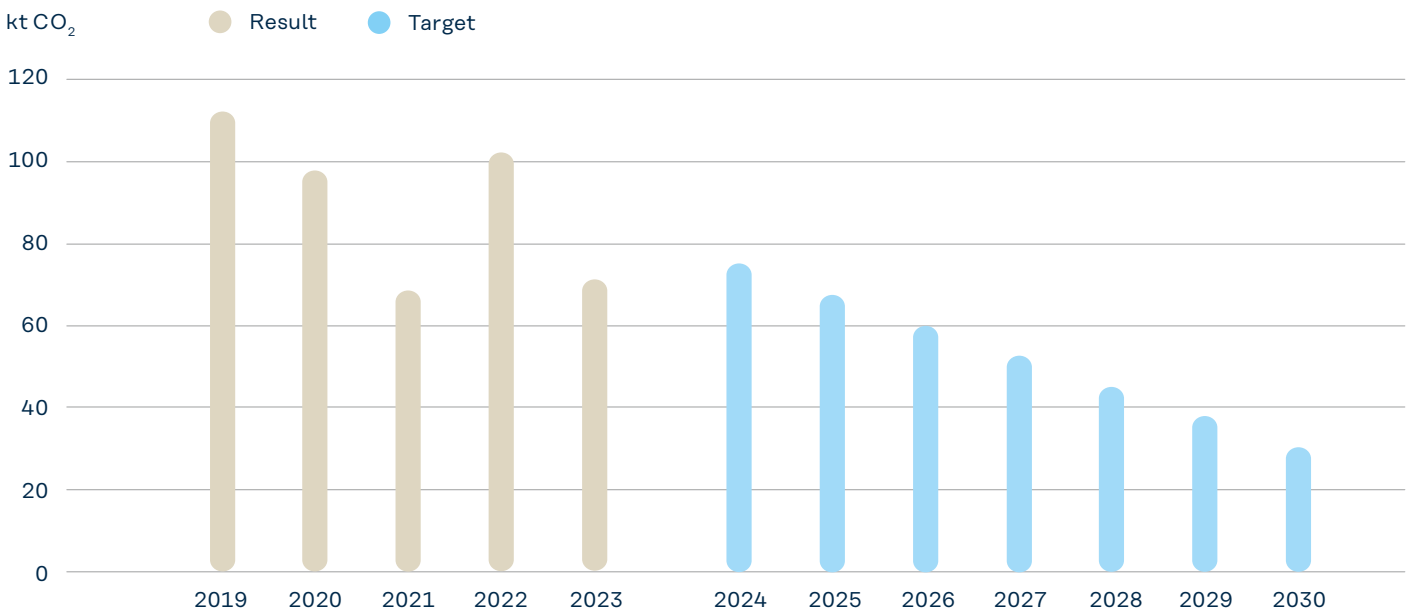
Photo: © HappyBall369 - stock.adobe.com

We are actively promoting the growth and marketing of low carbon footprint (CFP) PVB interlayers to help reduce carbon dioxide emissions (scope 3), which is a significant driver of climate change.

Our long-term vision for our Advanced Interlayer Solutions Division includes a commitment to sustainability that extends far beyond just responsible production practices.

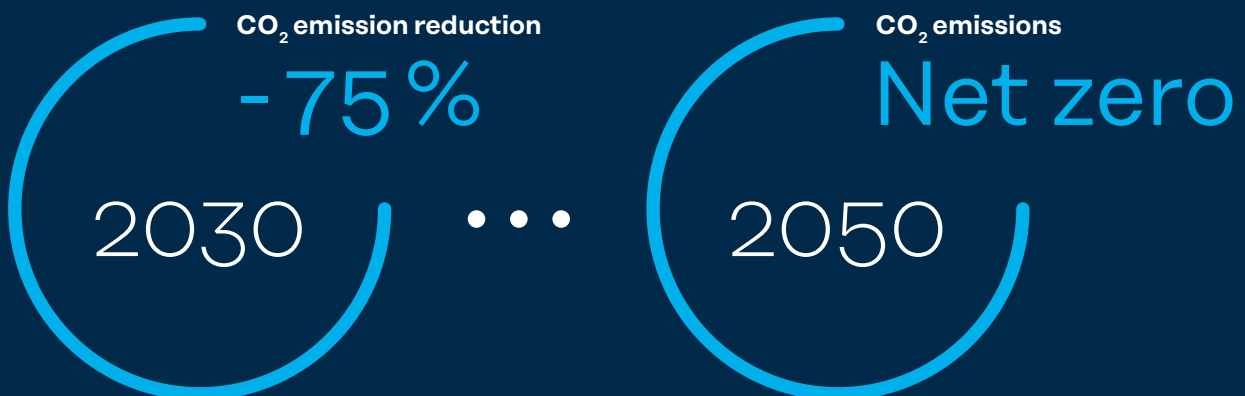
AIS scope 1 & 2 Green House Gas (GHG) emissions

By optimizing our production processes and minimizing our scope 1 (direct) emissions, coupled to more rigorous energy management and control of our scope 2 (indirect) emissions, we are already well established on our sustainability journey.



GRAPH 2

Advanced Interlayer Solutions net zero commitment



We can't create the future alone.



CRADLE TO GATE

Since our PVBs are used in numerous applications, a cradle-to-gate (raw material extraction to the factory gate) analysis was performed. This includes all production steps, from the production of raw materials and chemical precursors to energy production and consumption, transport and processing.

IMPACT INDICATOR

Global Warming Potential (GWP) measures the total greenhouse gas emissions associated with the production processes, expressed in CO₂ equivalents, and represents the product's contribution to climate change during its life-cycle up to the factory gate.

LCA – LIFE CYCLE ASSESSMENT

A life cycle assessment is a method of quantifying a product's environmental impact based on an array of materials, products, processes or activities – from raw-material extraction to the product's final disposal.

To give users of our products an easy-to-understand point of reference, we have created a set of carbon footprint classification system that allows them to compare the relative global warming potential (GWP) of our materials.



Our EPDs:
www.trosifol.com/about-us/sustainability

Interlayer CO₂ classification

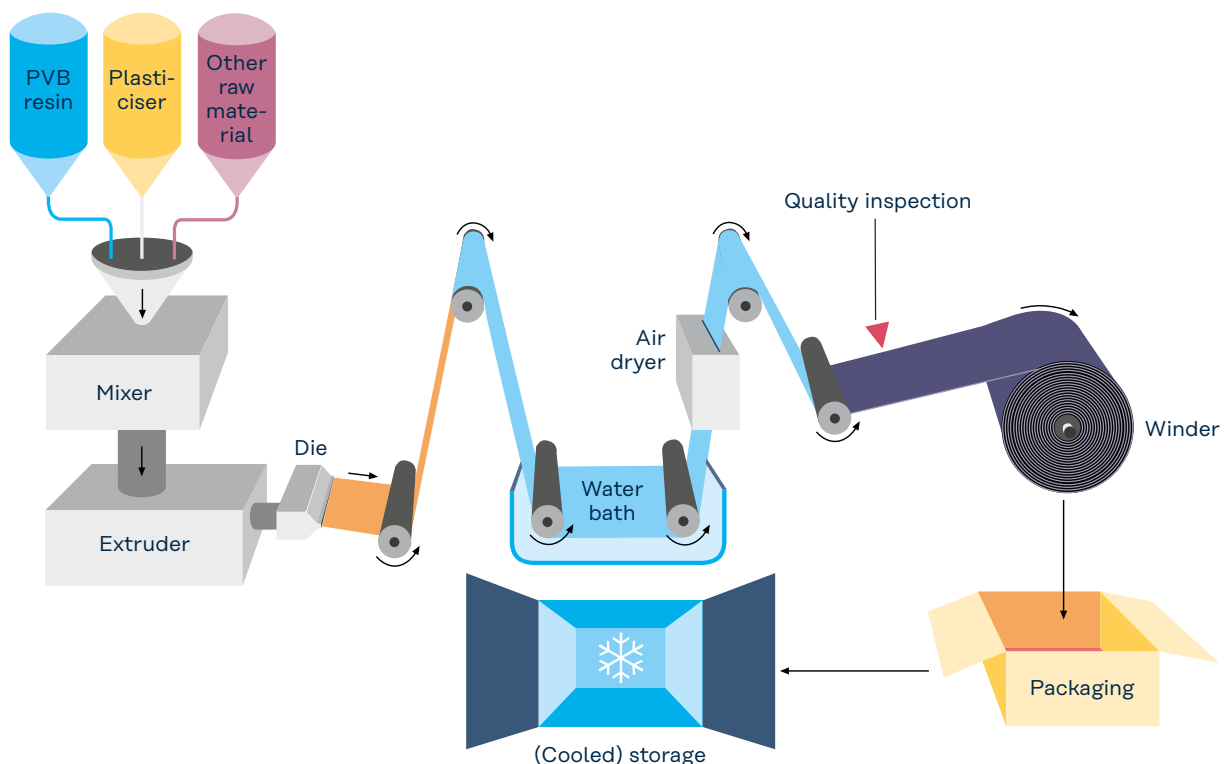
Class	kg CO ₂ / kg film
A	< 2.0
B	< 3.0
C	< 4.0
D	< 5.0
E	< 6.0
F	> 6.0

EPD – ENVIRONMENTAL PRODUCT DECLARATION

In order to evaluate the overall sustainability rating of a solution, structure or product that comprises multiple material inputs, many material suppliers are creating environmental product declaration (EPD) which quantifies all the relevant environmental information about the life cycle of a product.





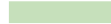
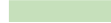













By adhering to a common or transferable format, individual EPD documents – combined with EPDs from other material inputs – deliver the facts and figures necessary to assess, measure and formalize the overall sustainability of the finished product.

PVB interlayer production process and LCA scope


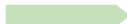











Carbon footprint classification

Products for Architectural Glazing

Product	Origin	CFP class [A-F]	CFP [kg CO ₂ /kg film]
Trosifol® R3 Clear	Germany CZ	B 	2.70
		A 	0.19
SentryGlas®	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
SentryGlas Xtra®	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
SentryGlas® Natural UV	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
SentryGlas® Translucent White	Rolls CZ	C 	3.92
	Rolls US	n.a.	-
	Sheets	n.a.	-
Trosifol® Extra Stiff		D 	4.45
Trosifol® Extra Stiff Pro		D 	4.45
Trosifol® HR		D 	4.45
Trosifol® Natural UV		D 	4.45
Trosifol® SC Monolayer		D 	4.45
Trosifol® SC Multilayer		D 	4.45
Trosifol® Spallshield® CPET		n.a.	-
Trosifol® UltraClear		D 	4.45
Trosifol® UV Extra Protect		D 	4.45
Trosifol® XT UltraClear		D 	4.45
BirdSecure® Pro		n.a.	-
Trosifol® Brilliant Black		n.a.	-
Trosifol® Diamond White		n.a.	-
Trosifol® Shining White		n.a.	-
Trosifol® Translucent White	Germany CZ	D 	4.45
		n.a.	n.a.
Tints		D 	4.45
Trosifol® Clear	Germany	D 	4.45
	Germany	E 	5.50
	US	n.a.	-

Products for Automotive Glazing

Product	Origin	CFP class [A-F]	CFP [kg CO ₂ /kg film]
SentryGlas®	Rolls CZ Rolls US Sheets	C  n.a. n.a.	3.92 - -
SentryGlas Xtra®	Rolls CZ Rolls US Sheets	C  n.a. n.a.	3.92 - -
Trosifol® Acoustic	Germany CZ	D  n.a.	4.45 -
Trosifol® Acoustic Shadeband	Germany South Korea	D  n.a.	4.45 -
Trosifol® Shadeband	Germany South Korea	D  n.a.	4.45 -
Trosifol® Spallshield CPET		n.a.	-
Trosifol® The Wedge Acoustic	Germany South Korea	D  n.a.	4.45 -
Trosifol® The Wedge Acoustic Shadeband	Germany South Korea	D  n.a.	4.45 -
Trosifol® The Wedge Monolayer	Germany South Korea	D  n.a.	4.45 -
Trosifol® The Wedge Shadeband	Germany South Korea	D  n.a.	4.45 -
Trosifol® Clear	Germany South Korea	D  n.a.	4.45 -
Trosifol® Color	Germany South Korea	D  n.a.	4.45 -

TAB 2 ●

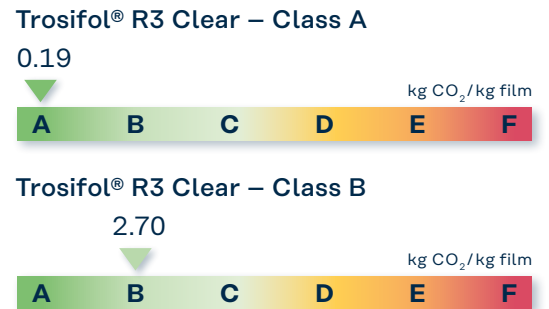


Technical data

Trosifol® R3 – Products available



Trosifol® R3 Clear classification



Trosifol® R3 – Physical properties

Type	Adhesion	Film thickness [mm] [mil]	Color	Light transmittance* [%]	UV transmittance* [%]	Solar absorption* [%]
Trosifol® R3 Class A	high	0.76 30	Clear	88	< 1	19
Trosifol® R3 Class A	high	1.52 60	Clear	88	< 0.5	21
Trosifol® R3 Class B	medium	0.38 15	Clear	88	< 2	18

TAB 3 • * LSG with 2 x 4 mm Floatglass according EN 410/ISO 9050

Trosifol® R3 – Dimensions

Product	Thickness		Roll widths		Roll lengths PE interleaved		Roll lengths refrigerated	
	[mm]	[mil]	[mm]	[in]	[m]	[ft]	[m]	[ft]
Trosifol® R3 Class A	0.76	30	< 2400	< 94	60 / 250	197 / 820	-	-
Trosifol® R3 Class A	1.52	60	< 2400	< 94	125 / 250	410 / 820	-	-
Trosifol® R3 Class B	0.38	15	< 3210	< 126	-	-	500	1640

TAB 4 •

Trosifol® R3 products available from Q1/2025.

Not all products are available in all regions.



R3 – it's all in the name

Reduce → Reuse → Recycle

CONSUMER PACKAGING IS UNDERGOING A PARADIGM SHIFT in terms of materials, volume and design, and much of industry needs to catch up.

We are a leader in the field in this respect and have already made significant strides in our packaging practices by introducing several more-sustainable initiatives and solutions that are positively impacting the sustainability value chain.

REDUCE

For customers: In addition to the extensive tools available on our website, we have introduced our new free **Carbon Reduce AI** tool, which uses the power of artificial intelligence to help you determine the carbon footprint of glass structures such as laminated safety glass and insulating glass.

EPD documents relating to specific Kuraray interlayers are used to calculate the CO₂ footprint of the glass super-structures.

The values of the selected individual glass types and the energy consumption for the processing procedures at the glass processor are based on the average values of the glass industry determined by the Bundesverband Flachglas, in cooperation with IFT Rosenheim. However, the actual values of the respective base glass or glass processor can also be used.

The application is linked to the Strength Lab AI structural design software so that the structural properties can also be checked at the same time. An optimization function is then used to quickly and easily determine the best possible glass structure for the respective application.



IMPROVEMENTS ALREADY IMPLEMENTED

Emission reduction – 16.7% of CO₂-eq kg/kg-mile

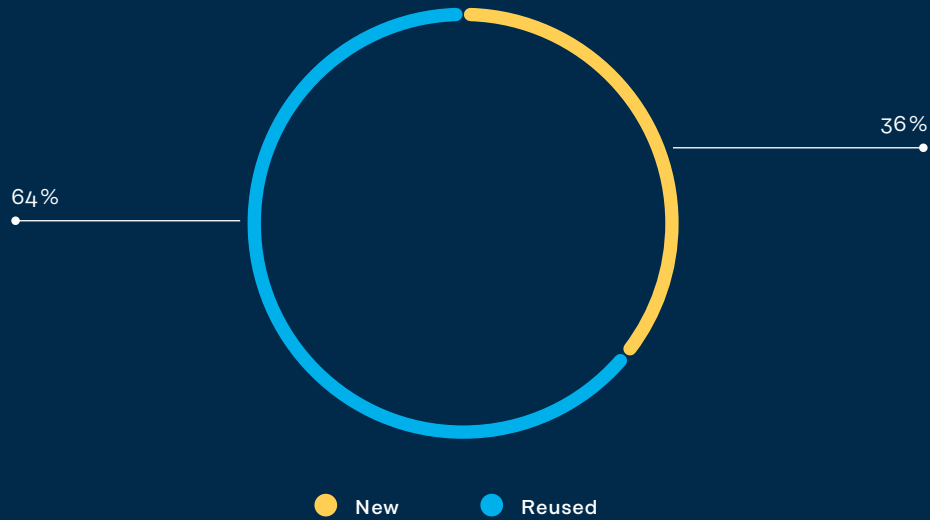
We are excited to share that, as part of our initiative to improve the sustainability of our internal transfers, we've achieved a 16.7% reduction in CO₂ emissions on one of our routes. This progress highlights our commitment to reducing our environmental footprint, with plans to extend these improvements across all internal logistics operations.

IMPROVEMENTS UNDER INVESTIGATION

Finished product – Internal transfer

As part of our ongoing efforts, we are actively investigating shifting more of our shipments from rail back to ocean transport. This transition leverages the lower emissions per ton-mile that ocean freight offers, helping us minimize our environmental impact while continuing to deliver high-quality products efficiently.

Plastic cores Q1 2024



REUSE

Returnable and reuseable assets will always be more sustainable, and many can be reused multiple times, boosting their sustainability credentials even more

- In 2024 our returnable packaging usage climbed to 35%, more than doubling the 2020 figure of 17%
- A solution to track returnable assets is in advanced development and is well on its way to full deployment
- Our North America division is working on and implementing several returnable-packaging projects and will look to grow their deployment throughout 2024.

RECYCLE

In line with reuseable packaging concepts, we are also investigating recyclable materials for use in components that cannot be easily redeployed, this includes wider usage of wood, cardboard, and paper and the adoption of more easily / widely recyclable plastics.





Contact



FOR FURTHER INFORMATION

on products from Kuraray, please visit www.kuraray.com.

You can find further information on our Trosifol® and SentryGlas® products at www.trosifol.com.

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WORLD OF INTERLAYERS

**The most recognized
interlayer brand is now
the most sustainable
interlayer solution.**

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