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# Spotlights on high-performance adhesive applications

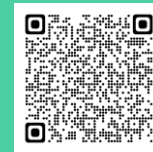


# Spotlights on high-performance adhesive applications





# Alternative raw materials

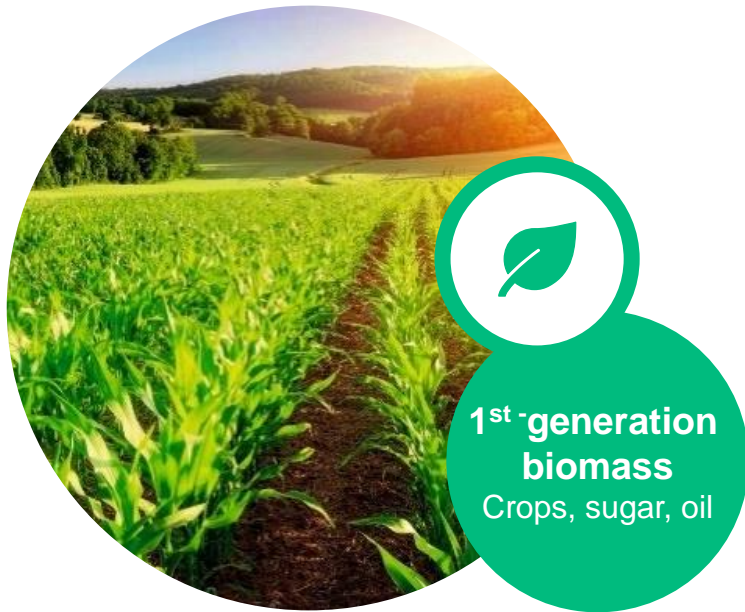


Circular solutions  
for our customers

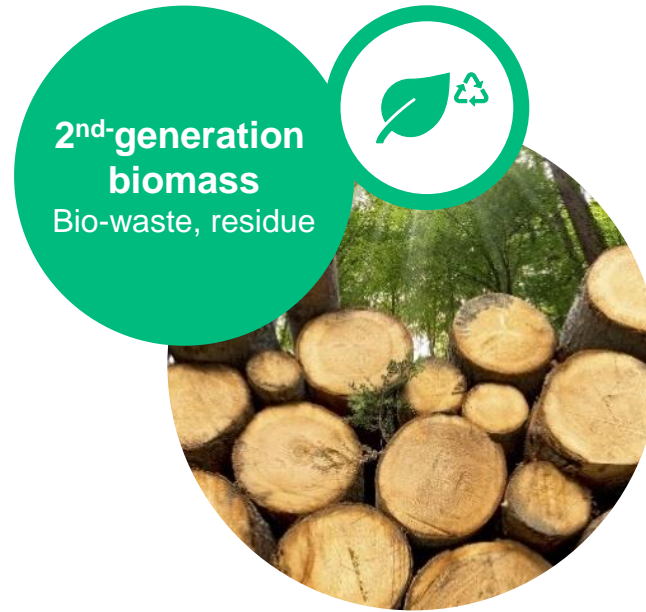
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# Alternative raw materials for a circular economy

Lowering the ecological footprint by using biomass or waste streams



Available in larger volumes



Limited availability, but growing further



Relevant feedstocks and routes in early developed phase



# High standards for introducing alternative raw materials

## Growing availability of alternative feedstocks for utilization in polymers

Covestro is transforming its activities toward a circular economy, responding to global sustainability challenges. One important pillar is the utilization of alternative feedstocks, which reduce the dependency on fossil resources and incorporate a lower carbon footprint.

According to our customer’s needs, we offer alternative raw materials with distinctive performance profiles, based on bio-derived molecules or ISCC<sup>1</sup> PLUS certified drop-in solutions. This way, we promote the use of alternative feedstocks while maintaining the highest attribution standards.



1	Mass determination	Free attribution approach	Free attribution to one or several outputs
2	Energetic determination		
3	Trace-the-atom	Molecular attribution approach	Determination of sustainable share based on chemical reaction
4	<sup>12</sup> C/ <sup>14</sup> C analysis	Measurement	Measurement of biogenic carbon

Covestro follows the trace-the-atom option for all products utilizing the mass balance approach

Covestro provides <sup>12</sup>C/ <sup>14</sup>C results for partly bio-based products in segregated production streams

<sup>1</sup>ISCC = International Sustainability and Carbon Certification, internationally recognized system for sustainability certification of biomass and bioenergy



# Product offering promoting alternative feedstock utilization

## Circular Intelligence with our CQ line

### Supporting Customers



CQ-labeled materials cover at least 25 % alternative feedstock use



Reduced carbon footprint compared to fossil-based products confirmed via LCA<sup>1</sup>



Chain-of-custody models can be segregated or mass-balanced



Product portfolio already comprises up to climate neutral<sup>2</sup> CQ products



<sup>1</sup>LCA = Life Cycle Assessment

<sup>2</sup>Climate neutrality in terms of product carbon footprint (cradle-to-Covestro gate consideration) incl. biogenic uptake



# Reducing dependency on fossil resources

## Promoting alternative feedstock utilization for adhesive applications

### Feedstock origin



Crops, sugar, oil



Bio-waste, residue



Recycled materials

### Utilized chain-of-custody<sup>1</sup>



#### Segregation



Breakthrough in partially bio-based resins for label adhesives

#### Mass balance



Raw materials with ISSC<sup>2</sup> PLUS certified alternative feedstock attribution

<sup>1</sup>verifies the path from the input material to the final product  
<sup>2</sup>ISSC = International Sustainability and Carbon Certification

### Alternative raw material offering

#### Specialties with distinct performance



- Molecules with individual characteristics
- Sustainable share by means of biogenic carbon count measurable via <sup>12</sup>C/ <sup>14</sup>C analysis

#### Same performance, lower product carbon footprint



- Wide portfolio coverage possible
- Utilization of existing large-scale assets possible
- Sustainable share attributed via mass balance approach



# Changing value chains require strong partnerships

We engage in joint solutions for a momentous circular transformation



Combining ultra-light construction with high performance, 2K PU-based adhesives from Sika are made with Covestro raw materials



Covestro enables H.B. Fuller to offer adhesives for the woodworking, composites, automotive, and textile sectors that reduce fossil resource use of their products



Engineered wood adhesives from Henkel, made with alternative raw materials from Covestro, are used in building and construction applications





# Food-contact compliance



Full-spectrum PU solutions  
for flexible packaging

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# Raw materials for food-contact applications

Polyurethane (PU) adhesive polymers can be produced from a wide range of raw materials. The great adaptability of PU polymers allows adhesive manufacturers to provide tailor-made adhesive polymers for flexible packaging applications.

Our raw materials are manufactured in compliance with manufacturing best practices and fulfill the requirements of Regulation (EC) 1935/2004. Relevant compliance statements for suitable products can be requested for specific regions (e.g. Regulation (EU) No. 10/2011, FDA regulations in 21 CFR 175.105 (adhesives), Chinese hygienic standard GB 9685-2008).



**Food-contact statements for suitable adhesive raw materials are available upon request**

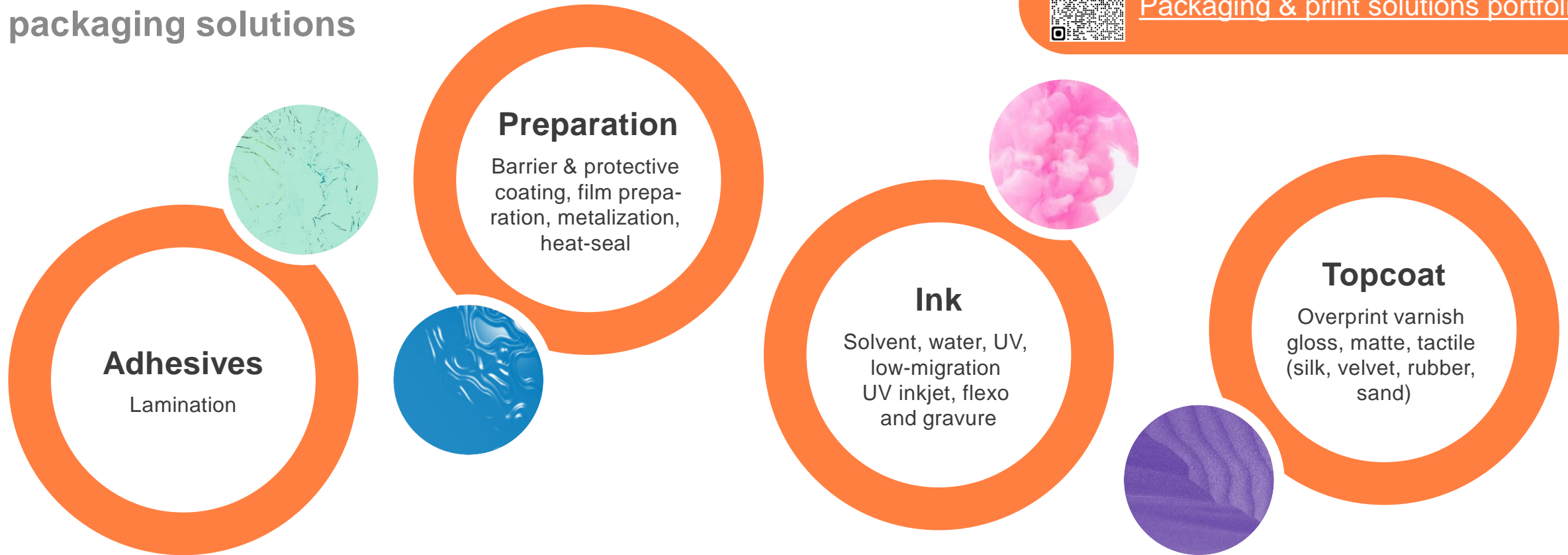


# Covestro's main technologies for packaging applications

Enabling efficient packaging solutions



[Packaging & print solutions portfolio](#)





# Productivity

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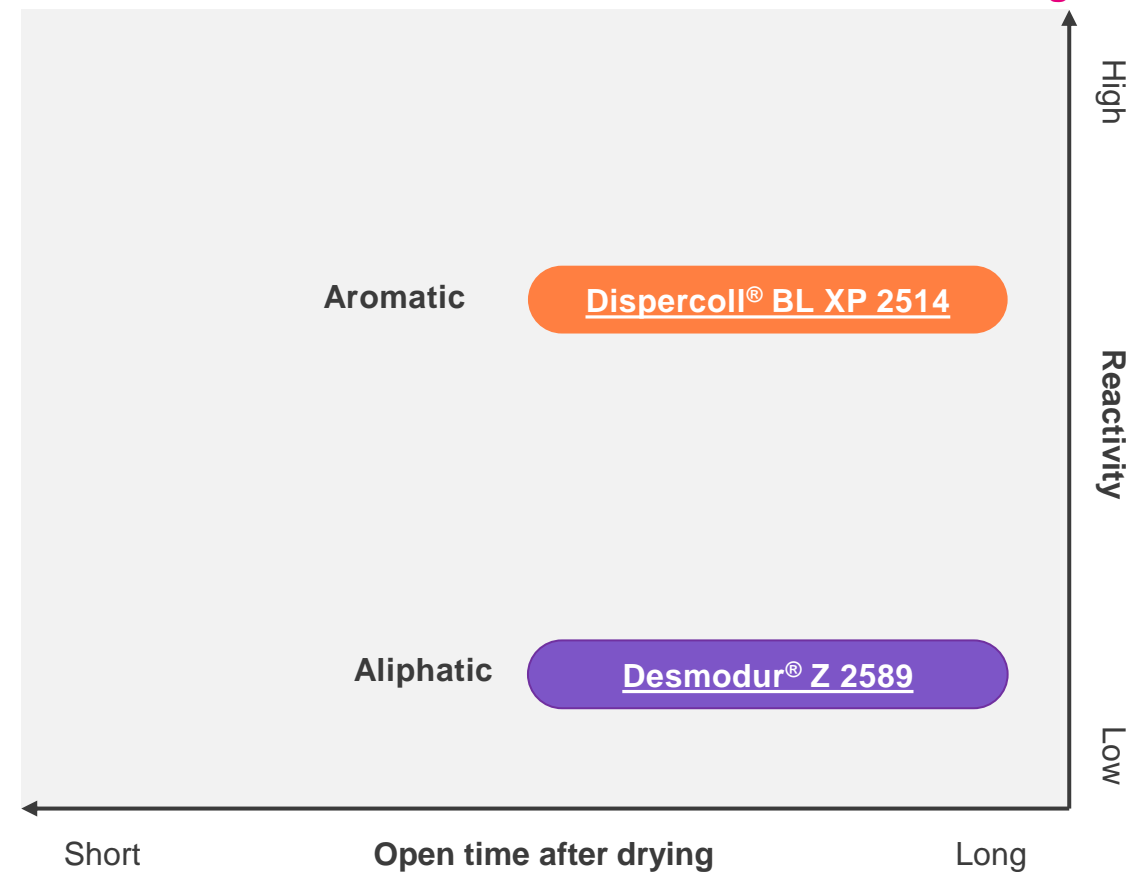
# Improving productivity for downstream users

## Crosslinkers for water-borne 1K latent reactive adhesives

Polyurethane (PU) systems represent a benchmark in productivity and process efficiency in many industries. We strive to improve this efficiency even further by developing new, game-changing solutions. This is why we offer solutions that enable our value-chain partners to use materials more efficiently and reduce waste, such as raw materials for latent reactive systems.

- ✔ Significantly longer storage time of formulations (potlife) compared to 2K wb PU adhesives
- ✔ Dried films/pre-coatings of latent reactive adhesives can be stored for months (open time)
- ✔ No mixing of liquid adhesive by the user, resulting in clean, reliable, and efficient processes

### Latent reactive crosslinkers for thermoactivation bonding



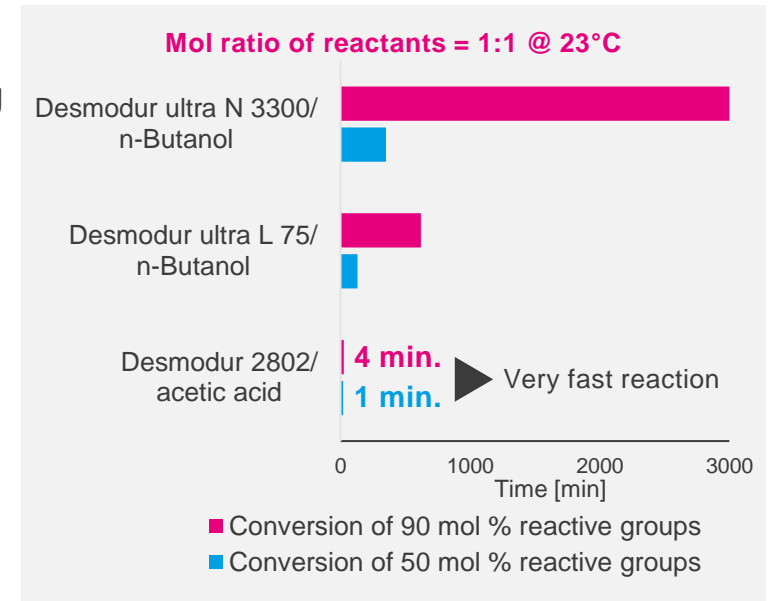


# Fast crosslinking for fast processing

## High-performance 1K water-borne adhesives

Desmodur® 2802 is a water-borne dispersion of a hydrophically-modified polyfunctional carbodiimide. It can be used as a crosslinker for water-borne adhesive formulations in roll-to-roll applications, with the following benefits:

- ✓ High initial bond strength at room temperature for rapid further processing
- ✓ One-component processing prevents mixing failures and adhesive waste
- ✓ Maintains brilliant finishes of adhesives that are applied on top of a print
- ✓ Improves chemical & thermal resistance of adhesive layer
- ✓ Potlife up to 6 months (pH 7-9)



# Easy processable powders

## For non-yellowing hotmelt and solvent adhesive applications

Desmomelt® U is a new class of non-yellowing polyurethane (PU) adhesive raw material. Supplied as a coarse powder or pellet, it provides the bonding characteristics of well-known and proven solvent- or water-based heat activation PU adhesives in a 100% solid form.

Desmomelt® U can be processed as a hotmelt in various application forms, as well as dissolved to yield a solvent-based adhesive formulation.

Visit our [Solution Center to find out more](#)  
Desmomelt® U aliphatic polyurethane powders for adhesives



Product name	Molecular weight	Crystallization speed	Heat activation temperature [°C]	Viscosity [mPas*]
Desmomelt® U 410	Medium/low	++	50-60	20-50
Desmomelt® U 320	Medium	+	60-70	50-200
Desmomelt® U 230	High	o / +	70-80	200-600

\*15 w% in methylethylketone (MEK) / water (16:1), (23°C, #62, 30 rpm)





# Raw materials for high industrial hygiene standards



Ultra line – keeping the quality up and your business future-ready

**Focus  
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# Redefining industrial hygiene

## Raw materials for high industry standards

Covestro is committed to continually improving products and setting new standards, especially in the field of industrial hygiene. Our new ultra line allows for further improvements through a consistent reduction of the specified residual monomer content, (kept below 0.1 percent), and helps users comply with legal regulations without additional administrative efforts.

	Conventional 2K PU	Covestro's ultra line
High-performance isocyanate technology	✓	✓
Improved industrial hygiene standard	✓	✓ ✓
No additional efforts to comply with the proposed use restriction on diisocyanates*	✗	✓

\*On August 24, 2020, the REACH Committee decided on the final draft of new occupational safety standards on the use of diisocyanates. The Commission Regulation entered into force on August 24, 2023

# Water-borne industrial hygiene

## Low-monomer crosslinker solutions for water-borne adhesives

Formulations utilizing polyurethane dispersions are well recognized for their very low odor and very low volatile organic compound emission levels. With our ultra line, industrial hygiene is increased even further, for 2K formulations as well.



**Hydrophilized crosslinker with monomeric isocyanate content below 0.1%**

Type	Product
HDI	<a href="#"><u>Bayhydur® ultra 304</u></a>
HDI	<a href="#"><u>Bayhydur® ultra 3100</u></a>
IPDI	<a href="#"><u>Bayhydur® ultra 401-70 MPA</u></a>
IPDI	<a href="#"><u>Bayhydur® ultra 401-70 MPA/X</u></a>
HDI	<a href="#"><u>Desmodur® ultra DA-L</u></a>
HDI	<a href="#"><u>Desmodur® ultra DN</u></a>



# Low-monomer solutions

For solvent-borne & solvent-free\* adhesives

 **Crosslinker with monomeric isocyanate content below 0.1%**

Type	Product
HDI	<a href="#">Desmodur® ultra N 31100</a>
HDI	<a href="#">Desmodur® ultra N 3300</a>
HDI	<a href="#">Desmodur® ultra N 3500</a>
HDI	<a href="#">Desmodur® ultra N 3600</a>
HDI	<a href="#">Desmodur® ultra N 3700</a>
HDI	<a href="#">Desmodur® ultra N 3800</a>
HDI	<a href="#">Desmodur® ultra N 3900</a>
PDI	<a href="#">Desmodur® CQ ultra N 7300</a>

Type	Product
TDI	<a href="#">Desmodur® ultra L 75</a>
TDI/IPDI	<a href="#">Desmodur® ultra IL BA</a>
TDI/IPDI	<a href="#">Desmodur® ultra IL EA</a>
TDI/IPDI	<a href="#">Desmodur® ultra IL 1351 BA</a>
TDI/HDI	<a href="#">Desmodur® ultra RN</a>
IPDI	<a href="#">Desmodur® ultra Z 4470 BA</a>
IPDI	<a href="#">Desmodur® ultra Z 4470 MPA/X</a>
IPDI	<a href="#">Desmodur® ultra Z 4470 SN</a>

 **Prepolymers with monomeric isocyanate content below 0.1%**

Type	Product
TDI	<a href="#">Desmodur® ultra E 15</a>
HDI	<a href="#">Desmodur® ultra E 3370</a>

Type	Product
HDI	<a href="#">Desmodur® ultra E 30500</a>
HDI	<a href="#">Desmodur® ultra E 30600</a>

\*In accordance to DIN EN 923



# Innovative functionalities

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# Functionalities for next-generation vehicles



Translucent adhesives for new lighting designs



Electric vehicle components with safe, tough materials



# High-end requirements

Raw materials for  
challenging applications



**Dispercoll® U 66: High bond for  
challenging lamination applications**



**Baymedix® | Medical polyurethanes**





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## **Disclaimer**

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Our advice does not release you from the obligation to verify the information currently provided – especially that contained in our safety data and technical information sheets – and to test our products as to their suitability for the intended processes and uses.

The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility.

Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.