



# System Solutions for Bus Manufacturing



High Performance  
Adhesives and  
Sealants for  
Comfort and Safety

# BENEFITS OF ADHESIVE TECHNOLOGIES IN MODERN VEHICLE CONSTRUCTION

## BUSES & COACHES

Energy-efficient vehicles need to meet stringent requirements. To enable their fulfilment, we rely on technically sophisticated customer-specific solutions. The result are innovative products that already make welding, bolting and riveting unnecessary in many cases today. On the one hand, our products help to improve the noise dampening in buses and coaches, leading to greater comfort. And on the other they also ensure a weight reduction that is immediately reflected in lower fuel consumption – and thus in the preservation of natural resources. Designed for more efficient transport, our products hence ultimately also benefit nature.

## BENEFITS

Cost Savings	Added Value	Design
<ul style="list-style-type: none"> <li>+ Lower fuel costs through weight reduction</li> <li>+ Lower manufacturing costs by reducing the number of process steps</li> <li>+ Lower repair costs, fewer down-times thanks to reduced corrosion, etc.</li> <li>+ Lower long-term investment costs thanks to greater longevity</li> </ul>	<ul style="list-style-type: none"> <li>+ Enhanced functionality</li> <li>+ Greater comfort</li> <li>+ Moisture-proof</li> <li>+ Noise dampening inside and outside</li> <li>+ Safety</li> <li>+ Reduction of emissions</li> <li>+ Lightweight</li> <li>+ Energy savings</li> </ul>	<ul style="list-style-type: none"> <li>+ Improved look</li> <li>+ Greater freedom in the design</li> <li>+ Multi material mix</li> </ul>

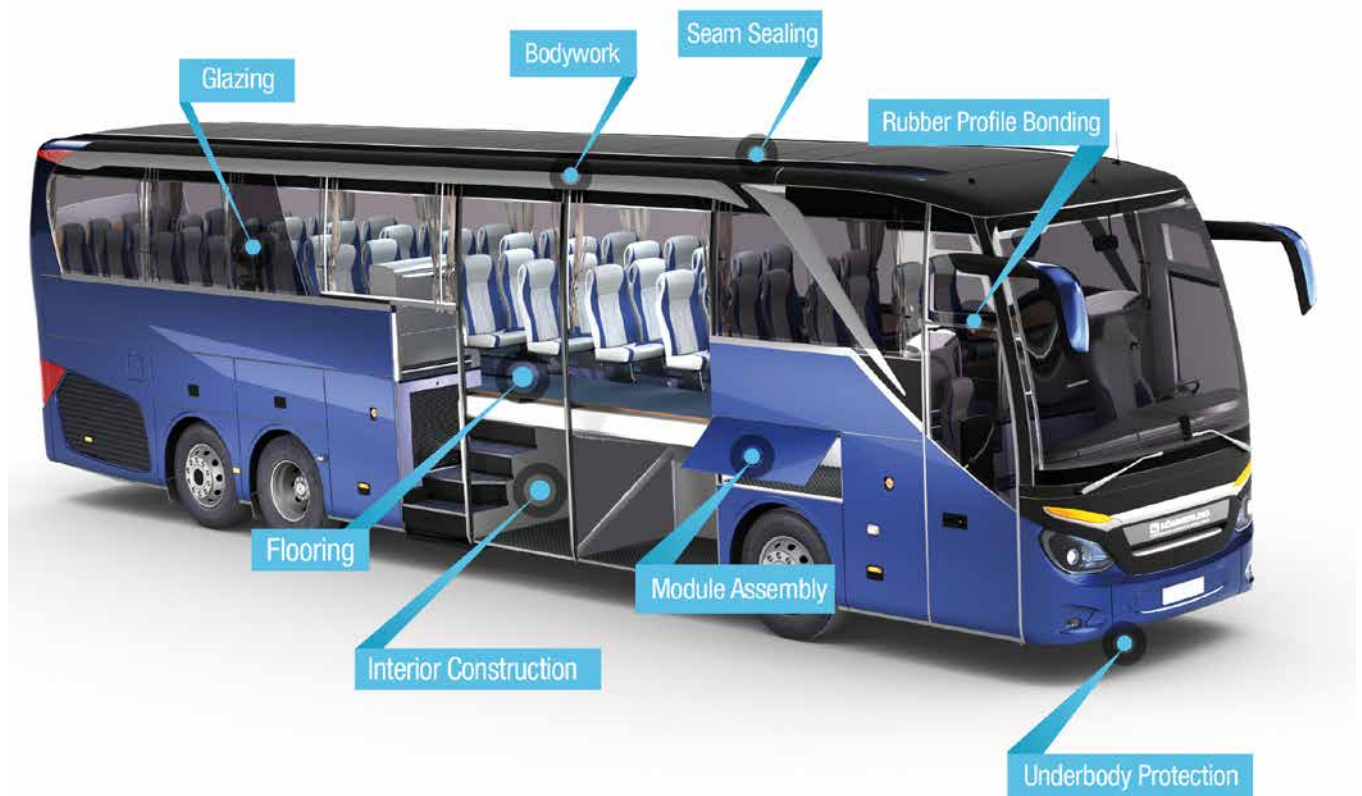
# TECHNOLOGY IN BUS CONSTRUCTION

Buses and coaches of today need to meet the highest requirements in their design, comfort and safety, coupled with maximum individualization. Buses are exposed to high mechanical stress throughout their lifetime. These include the weight of the passengers and luggage as well as the vibrations continuously attending their driving operation. To save fuel, the bus itself should weigh as little as possible, without compromising its stability. Adhesives and sealants from H.B. Fuller and its affiliates KÖMMERLING and Cyberbond greatly contribute to achieving these objectives. At the same time they help to achieve greater travel comfort while boosting passenger safety.

Adhesive applications in modern coach or service buses are multi-layered and also highly customized in many cases. With the right adhesive consultant by your side, your optimal solution will be found for all relevant tasks.

Our philosophy in this respect is to cater to the specific wishes and possibilities of the bus manufacturer and come up with adhesives that are tailored to the respective bonding process. Ever since our establishment more than 130 years ago we have continually set milestones in modern bonding and sealing by the development of new technologies, making us one of Europe's leading adhesive suppliers for commercial vehicles.

## APPLICATIONS



# RECOMMENDED TECHNOLOGIES

## 2-K Polyurethane Reaction Adhesives | Körapur

Solvent-free, 2-K polyurethane-based reaction adhesives that will harden at room temperature for bonding a great variety of surfaces such as wood-based materials, GFRP, untreated, primed and painted steel and aluminium sheets, many plastics and foams cores based on PUR, PS or PVC.

Körapur 2-K products consist of a resin and a hardening component that are mixed at a fixed ratio, whereupon they will harden into structural or semi-structural adhesives, irrespective of the humidity, that are also particularly suitable for applications involving large surfaces.

## 1-K Polyurethane Reaction Adhesives | Körapur

Polyurethane-based 1-K reaction adhesives that will harden at room temperature for bonding and sealing a great variety of materials such as wood-based materials, GFRP, untreated, primed and painted or anodized metals, as well as many plastics.

Körapur 1-K products react with moisture to form elastic adhesives and sealants that are in particular applied where different thermal length expansions require permanent compensation.

## 1-K Silane-Terminated (Polymer) Reaction Adhesives | Körapop

Solvent-free 1-K reaction adhesives that are based on silane-terminated polymers and will harden at room temperature for bonding and sealing a great variety of components such as wood-based materials, GFRP, untreated, primed and painted or anodized metals, as well as many plastics.

Körapop 1-K products react with moisture to form elastic adhesives and sealants that are in particular applied where different thermal length expansions require permanent compensation.

## Solvent Based Adhesives | Körapren, Köraplast, Swift®col

Solvent-containing, polychloroprene- or polyurethane-based adhesives that cure at room temperature for gluing a wide range of different materials such as wooden composites, steel, aluminium, textiles, plastics like PVC, leather or foams.

Solvent-based adhesives offer good wetting properties and can be easily applied with many different methods. The evaporation of the solvents helps to achieve fast initial strengths.

## Dispersion Adhesives | Tec™, Rakol, Swift®tak, Thermonex

Water-based adhesives based on various polymer systems such as polyurethane or acrylate for gluing a wide range of different materials such as wooden composites, steel, aluminium, textiles, plastics like PVC, leather or foams.

In comparison to solvent-based adhesives, dispersion adhesives are distinguished by a longer wet life. An aspect that is highly advantageous for gluing large areas.

## Butyl Sealants | Ködiplast, EternaBond®

Solvent-containing, butyl rubber-based sealants for sealing joints, cracks and transitions in wood, metal, glass, many thermosetting plastics and other materials.

Butyl sealants show their ultimate properties immediately upon application. They are distinguished by a broad adhesion spectrum and their excellent imperviousness to water vapour. Their high weathering stability also lends them a very good anti-corrosive effect on metals.

## Silicone Adhesives and Sealants | Ködisil, Ködiglaze

Silicone-based sealants and adhesives for sealing, filling and grouting joints, cracks and transitions in ceramics, glass, steel, aluminium, wood, thermosetting and many thermoplastic materials. In comparison to polyurethane adhesives silicone glazing products show a better climate and UV-resistancy.

# RECOMMENDED TECHNOLOGIES

## Cyanoacrylates | CB

Solvent-free 1-K reaction adhesives, based on cyanoacrylate esters. They react with air humidity and cure by polymerization within seconds at room temperature. To reach optimal results it is important to work with thin adhesive layers and to keep the mating parts as small as possible as the adhesives reacts very quickly.

Cyanoacrylates are used to bond metals, plastics, wood and elastomers.

## Anaerobics | T, S, R

Solvent-free 1-K reaction adhesives curing in absence of oxygen on metal contact. Therefore anaerobics are only suitable for bonding and sealing metals.

Typical application fields are locking of threads, retaining of threads, shafts, hubs and bearings and sealing of threads.

## Methylmethacrylate Adhesives (MMA) | WeldMount AT

Acrylic non-sag adhesives which hold the parts in place on a vertical or overhead surface providing permanent high strength bonds. Our adhesives create structural bonds which provide excellent tensile strength in 20 to 30 minutes.

MMA are ideal for production applications.

Besides the acrylic adhesives our WeldMount System also includes fasteners like wire tie mounts, hose and cable clamps, studs, standoffs, floating nut plates and other mounting solutions which are mounted with our AT adhesives. Our system can be easily installed without extensive training, eliminating the high costs associated with welding or drilling and tapping. For more information please check out our progressive web app!



Just scan the QR code with your mobile device or enter the following link in your browser:  
<https://eguide.to/weldmount-eu/>





# APPLICATIONS

## BODYWORK

Higher flexibility, longer durability, vibration and noise damping are only some of the advantages that the gluing technology can bring to body construction. Gluing the side panels to the body structure prevents the thermal stress attending traditional welding processes, while the adhesive doubles up as an active anti-corrosive.

### Körapur range

1-K polyurethane adhesives

- + Permanently elastic, vibration-damping
- + Can be overpainted after hardening
- + Non-sagging to self-levelling formulations
- + Also applicable as 2-K products with accelerator paste

### Körapur range

2-K polyurethane adhesives

- + Hard-tough to impact-resistant types with high damping across a broad temperature range
- + Reaction speed individually adjustable within a broad pot life range
- + High stability

### Körapop range

1-K silane-terminated polymers

- + Permanently elastic, vibration-damping
- + Good ageing-, UV- and weather resistance
- + Can be overpainted wet-in-wet
- + Non-sagging to self-levelling formulations
- + Hardens with little to no shrinkage in volume
- + Also applicable as 2-K products with accelerator paste

## SEAM SEALING

Welded seams are sealed with elastic polyurethanes, silane-terminated polymers or butyls that offer protection against moisture, dirt and exhaust, noise reduction, corrosion prevention, improved aesthetics and greater freedom in design.

### Körapur range

1-K polyurethane adhesives

- + Permanently elastic, vibration-damping
- + Can be overpainted after hardening
- + Non-sagging to self-levelling formulations
- + Also applicable as 2-K products with accelerator paste

### EternaBond® range

Foam gasket tapes

- + PVC foam core with high tack butyl adhesive/sealant
- + Flexible
- + Easy to apply by roll
- + Eliminates moisture ingress
- + No cold or hot flow

### Körapop range

1-K silane-terminated polymers

- + Permanently elastic, vibration-damping
- + Good ageing-, UV- and weather resistance
- + Can be overpainted wet-in-wet
- + Non-sagging to self-levelling formulations
- + Hardens with little to no shrinkage in volume
- + Also applicable as 2-K products with accelerator paste

### Ködiplast range

1-K Butyl sealants

- + Can be dapped
- + Excellent weather resistance
- + Water vapour tight

## MODULE ASSEMBLY

After the sandwich production the side panels, flaps, doors and roof, back and front mask are assembled. These modules are made from various materials that our adhesives and sealants are able to safely bond. They are temperature resistant and weatherproof, compensate different linear expansions, and will keep moisture out for good. Their broad pot life range meanwhile qualifies them for manual as well as automated application. They allow a fast production process and contribute to energy savings due to improved aerodynamics.

### Körapur range

1-K PUR adhesive

- + Permanently elastic, vibration-damping
- + Can be overpainted after hardening
- + Non-sagging to self-levelling formulations
- + Also applicable as 2-K products with accelerator paste

### Körapur range

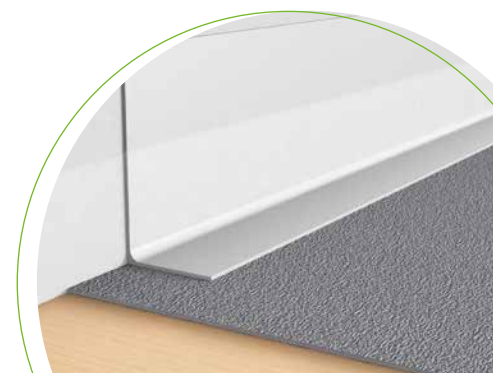
2-K PUR adhesives

- + Hard-tough to impact-resistant types with high damping across a broad temperature range
- + Reaction speed individually adjustable within a broad pot life range
- + High stability

### Körapop range

1-K silane-terminated polymers

- + Permanently elastic, vibration-damping
- + Good ageing-, UV- and weather resistance
- + Can be overpainted wet-in-wet
- + Non-sagging to self-levelling formulations
- + Hardens with little to no shrinkage in volume
- + Also applicable as 2-K products with accelerator paste



# INTERIOR CONSTRUCTION

The requirements for the design and comfort inside the bus are constantly increasing, but also for the functionality and safety. The number of plastic, wooden and textile composites is growing in parallel. Our high-performance adhesives will safely bond the materials without mechanical fixation and lead to noise and vibration damping.

## Thermonex® range

PUR dispersion adhesive

- + High heat and humidity resistance
- + High initial bond strength
- + Emission free in accordance to clean air regulations

## Körapren range

Solvent-based polychloroprene adhesives

- + Toluene free
- + High temperature resistance
- + High contact bonding
- + Good adhesion on many substrates

## Swift®col range

PUR solvent based adhesives

- + Excellent heat resistance

## Tec™ range

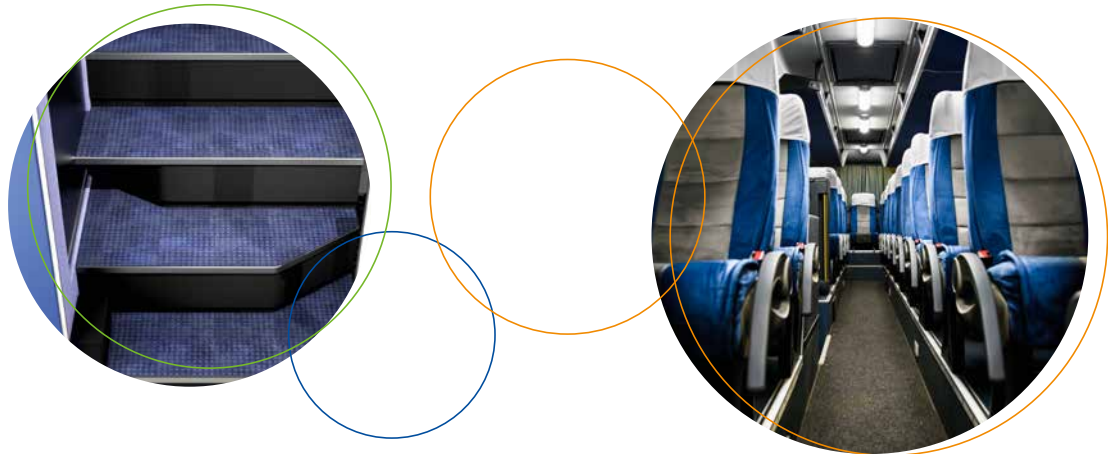
Waterborne dispersion

- + High solid content
- + Multi-purpose, easy to apply
- + Long work time
- + High initial adhesion strength and final bond strength
- + Very strong resistance to plasticizers

## Swift®lock range

Reactive hotmelt adhesives

- + Excellent adhesion to various substrates
- + High final bonding strength due to chemical curing reaction
- + Excellent temperature resistance



# GLAZING

Glued window panes improve the stability of the chassis and reduce its weight. They therefore help to lower the fuel consumption, and thus protect the environment and save costs. At the same time, our window adhesives will safely protect from corrosion while dampening noise and vibrations.

## Körapur range

1-K polyurethane adhesives

- + Permanently elastic, vibration-damping
- + Can be overpainted after hardening
- + Non-sagging to self-levelling formulations
- + Also applicable as 2-K products with accelerator paste

## Ködiglaze range

2-K structural glazing silicone

- + Fast curing
- + High UV stability

## Körapop range

1-K silane-terminated polymers

- + Permanently elastic, vibration-damping
- + Good ageing-, UV- and weather resistance
- + Can be overpainted wet-in-wet
- + Non-sagging to self-levelling formulations
- + Hardens with little to no shrinkage in volume
- + Also applicable as 2-K products with accelerator paste





## FLOOR CONSTRUCTION

Bonding the wooden floor instead of bolting leads to acoustic decoupling between the floor and chassis, thereby reducing noise in the vehicle interior and at the same time prevents corrosion damage. It additionally allows a fast production process.

### Körapur range

1-K PUR adhesive

- + Permanently elastic, vibration-damping
- + Can be overpainted after hardening
- + Non-sagging to self-levelling formulations
- + Also applicable as 2-K products with accelerator paste

### Körapop range

1-K silane-terminated polymers

- + Permanently elastic, vibration-damping
- + Good ageing-, UV- and weather resistance
- + Can be overpainted wet-in-wet
- + Non-sagging to self-levelling formulations
- + Hardens with little to no shrinkage in volume
- + Also applicable as 2-K products with accelerator paste

## FLOOR COVERING

Bonding the floor coverings reduces noise inside the vehicle and thus creates greater passenger comfort. A greater freedom in design and enhanced aesthetics are further benefits of the bonding technology.

### Körapren range

Solvent based adhesives

- + Cold contact adhesive
- + Good resistance to humidity
- + Toluene free

### Swift®tak range

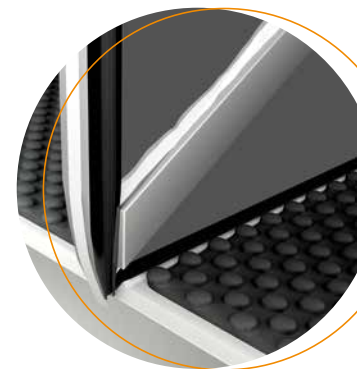
Acrylate dispersion adhesives

- + Heat sealable
- + High viscosity
- + Good adhesion on different substrates

### Tec™ range

Waterborne dispersion

- + High solid content
- + Multi-purpose, easy to apply
- + Long work time
- + High initial adhesion strength and final bond strength
- + Very strong resistance to plasticizers



## RUBBER PROFILE BONDING

Bonding rubber profiles such as corner or all-round door profiles with our Cyanoacrylates or 2-K silane terminated polymers allows to join dissimilar materials quickly without the need for mechanical fixing. It provides further benefits like vibration or interior and exterior noise damping, improved aerodynamic or efficient air-conditioning.

### CB range

Cyanoacrylate adhesives

- + Fast setting
- + Flexible adhesives available
- + Several viscosities
- + Easy to apply

### Körapop range

2-K silane-terminated polymers

- + Good weather and temperature resistance
- + Excellent moisture resistance

# THREADLOCKING, SEALING AND RETAINING

Vibration may cause the self-loosening of threads and consequently lead to liquid or gas leakages. This problem can be solved by applying the Cyberbond T, S or R series for threadlocking, sealing and retaining. The products can easily be applied and protect against rust and corrosion.

## T range

Anaerobic curing adhesives

- + Threads, nuts and bolts are secured in the strength classes low, medium and high
- + Different viscosities available

## S range

Anaerobic curing adhesives

- + For sealing of joints against various media
- + Prevention of loosening from shock and vibration
- + Protection against rust and corrosion
- + Easy application

## R range

Anaerobic curing adhesives

- + Retain cylindrical parts such as bearings, studs, bushes, shaft/collar connections etc.
- + Bridge small gaps
- + Avoid friction corrosion
- + Assembly of parts with different elongation is possible



# UNDERBODY PROTECTION

Our products for underbody protection are resistant to water, salt water, brake fluid and many other chemicals. They have excellent weather resistance and prevent corrosion.

## Körpop range

1-K silane-terminated polymers

- + Permanently elastic, vibration-damping
- + Good ageing-, UV- and weather resistance
- + Can be overpainted wet-in-wet
- + Non-sagging to self-levelling formulations
- + Hardens with little to no shrinkage in volume
- + Also applicable as 2-K products with accelerator paste

## HydroArmor® range

Dispersion coating

- + Spray application
- + Water, weather, and corrosion resistance
- + Highly flexible
- + Aesthetically pleasing appearance
- + Easy cleanup



## COMPLEMENTARY PRODUCTS

The reliable adhesion of the glue on the surface of the material is a decisive factor for successful execution. To ensure this, the surface needs to be thoroughly cleaned beforehand. Apart from that, the adhesion between substrate and glue can also be optimized by the application of a primer.

For the pre-treatment of metal and plastic surfaces, we have developed primers and cleaners that are individually tailored to the materials to be bonded, and to our adhesives. This ensures that the products reach their greatest possible effectiveness.

### Körabond HG 17

Black primer for adhesion promoter and UV protectron agent in glazing applications. Useful as a general purpose primer for glass, aluminium, stell and plastics.

### Körabond HG 79

Primer for pre-treating absorbent substrates such as wood or concrete, etc.

### Körabond HG 81 / Körabond HG 83

Bonding agent for pre-treating painted surfaces, metals or plastics.

### Körabond HG 92 / Körabond HG 93

Moisture-hardening primer for pre-treating stainless steel, aluminium, rigid PVC and GFRP, as well as absorbent substrates such as wood, etc.

### Körabond PR 262

Primer for pretreating TPE, PE, PP, EVA and EPDM as base for the subsequent bonding.

### Körasolv GL

Cleaner for cleaing and degreasing different plastic, metal and glass surfaces.

### Körasolv PU

Toluene-free cleaner for cleaning and degreasing different metal surfaces.

### Körasolv PR

Toluene-free deluting and cleaning agent and for pre-treatment of CC-metal sheets before application of Körapur adhesives.

### Körasolv EC

Cleaning agent to solve fresh adhesive residues, working tool and mixing heads of 2-K mixing and metering machines.

### Körasolv WL

Cleaner for cleaning greasy and waxen surfaces.

## WE ARE YOUR RELIABLE PARTNER

Our competent consultancy in all product selection, process and quality assurance issues is based on decades of experience gained in cooperation with the leading bus manufacturers, and offers a broad foundation for the safe use of the adhesive and sealant technology.

We consider ourselves as a system provider offering not only high-quality products, but also individual consultancy and support services which are tailored to our customers and their needs, from the project planning through to the final realization.

Our superior technologies set us apart. We specialize in the development of custom formulations to meet your specific needs. And as always, we're working to support emerging transportation industry trends with new technologies that enable us to reduce the overall carbon footprint and make a sustainable contribution to weight reduction, air tightness and sound-damping.

Our top priority is individual customer support – which will naturally also include on-site assignments. We will support our clients in the selection of the sealants and adhesives, in the attendant surface preparation, in the project phase, the integration of our products in their manufacturing process, and in their specific quality and production control.

## Our Service Portfolio

- + Adhesion and compatibility tests
- + Application training at the processor's site
- + Support for working with independent laboratories for external testing
- + Development of quality assurance programmes





Want to learn more about our adhesive solutions for bus manufacturing?  
Just scan the QR code with your mobile device:



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For more information about our company, visit [www.hbfuller.com](http://www.hbfuller.com) or [www.koe-chemie.com](http://www.koe-chemie.com)



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IMPORTANT: It is the user's responsibility to test and determine the suitability of a product for the user's intended use. Any product samples provided for testing are provided in accordance with standard limited warranties as stated on our technical data sheets.

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