BÖLLHOFF

ONSERT®

Quick and process-reliable bonding of fastening elements with light-curing adhesives

You want to join glass components or glass displays? You need attachment points on fibre-reinforced plastics? Extreme sealing or corrosion requirements imply further challenges to consider.

The potential joining process should furthermore present robust results and be suited for manual as well as completely integrated use – and all of that within seconds.

Your solution: The ONSERT® adhesive technology

Quick joining of fasteners using light-curing adhesives with high process reliability.

ONSERT® studs

ONSERT® for cable management

Basically, all geometries which can be produced in injection moulding are possible: screw joints on engineering plastic parts, detachable and non-detachable snap connections, bondable ball studs, etc. can be applied to materials such as CFRP, GRP, glass, paint, cathodic dip coating surfaces, plastics or metals.

You also benefit from our optimised system approach: We offer processing with manual, battery-powered tools and even completely integrated robot applications.

Convince yourself.

ONSERT® inserts

ONSERT® specials

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Our InfoPoint provides additional information in the form of further brochures and/or videos at the end of this brochure.

An efficient joint

The ONSERT® technology allows the quick bonding of fasteners on diverse materials using light-curing adhesives with high process reliability.

For the curing light to reach the adhesive, the ONSERT® fasteners are made from transparent plastic or from metal with a transparent plastic overmoulding.

The focus is on the short cycle times, the material-friendly process as well as the flexibility with respect to fasteners and method.

Your advantages

- Sophisticated appearance for design and visible surfaces (customer parts) – no breakthrough or rear projection
- Fastening elements do not become apparent on the visible side through heat input such as it happens during welding
- Strong joint immediately after exposure (no post-crosslinking)
- Short curing times (< 5 seconds possible)
- Bonding of joining points, also after measures for corrosion protection (e.g. on cathodic dip coating paint)
- Outstanding corrosion properties (no contact corrosion)

ONSERT® Product variants

As already mentioned, basically all geometries which can be produced in injection moulding are possible for the ONSERT® adhesive technology. Fasteners such as screws, threaded bushes, snap connections, etc. are provided with a transparent plastic overmoulding. The geometry provides for sufficient bonding surface. ONSERT® fasteners can be applied to materials such as CFRP, GRP, glass, paint, cathodic dip coating surfaces, plastics or metals.

Explore our different ONSERT® variants:

1 Plastic-metal hybrid versions

There are fields of use where full plastic components cannot withstand the application of high local loads, for example in metric screw joints. In such cases metal fasteners are moulded in plastics to combine the advantages of plastics and metal.

ONSERT® studs

- Engineering plastic part with steel or A286 (aviation) threaded bolt
- 10-32 UNF threads available in different lengths
- Alternative for studs and spacers with two-component adhesive

ONSERT® insert

- Engineering plastic part with thread insert – metric or imperial thread
- Engineering plastic part with HITSERT® Screwlock
- Insertion into plate material (no potting)
- Alternative for inserts acc. to NAS 1832-1836 and others

2 Full plastic version

ONSERT® Smart

If requirements allow, full plastic fasteners are used. This increases the freedom of design and also positively affects the adhesive curing time. Moreover, in most cases full plastic components can be produced more economically.

Modular version

- A bottom part to join a variety of top parts with different functions

One-piece version

- A function, e.g. ONSERT® Smart for cable management

3 ONSERT® specials

Your initial conceptional ideas are the starting signal to develop tailor-made solutions. Special design requirements, hybrid joints or mounting elements – benefit from our know-how.

The earlier we can contribute our competence, the greater the potential.

ONSERT® Adhesives

DELO is a leading manufacturer of industrial adhesives. For 60 years, the owner-operated company has been offering tailor-made special adhesives and device systems for applications in high-tech industries – from the automotive industry and aviation to optoelectronics to the electronics industry.

From DELO‘s adhesive portfolio, we decided to use the DELO PHOTOBOND product family. It cures within seconds when exposed to appropriate light and is well-suited for ONSERT® bonding. Since DELO and Böllhoff cooperate closely, the adhesive can be perfectly processed in combination with ONSERT® fasteners.

Properties of DELO PHOTOBOND:

- Light-curing acrylate
- Universal adhesive on different substrates
- Application-specific mechanical properties (elongation at break, TG, Young‘s modulus)

With the ONSERT® method, the adhesive cures perfectly because the translucent fasteners transmit the light.

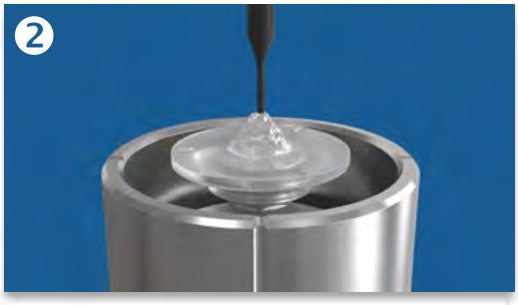
The provided standard adhesive portfolio already covers a wide range of potential applications. Beyond those, customer-specific solutions can also be realised. We are happy to accompany and support you through your development process.

- Fibre-reinforced plastics: CFRP, GRP
- Glass, also painted and printed
- Plastics such as PBT, ABS or blends
- Metals

Process description

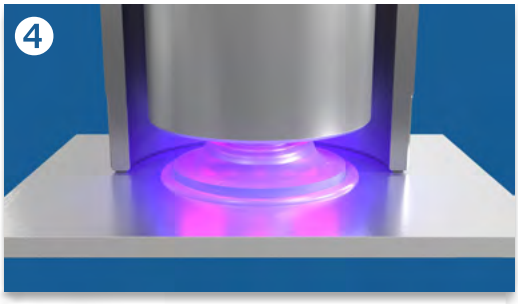
The joining process comprises only a few steps. They are illustrated below with the example of the ONSERT® Smart stud:

Feed of the ONSERT® fastener

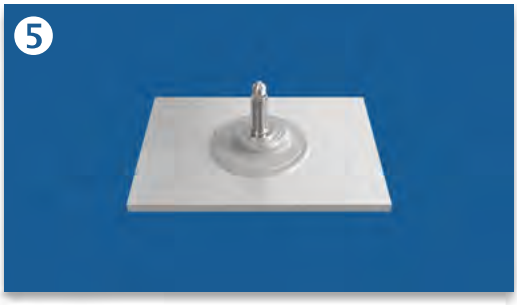


Application of the one-component adhesive

Touching the tool to the substrate



Exposure



Stable joint

Detailed information about the respective bonding process and amount of adhesive is also provided in our „Technical Manual ONSERT®“.
Do not hesitate to contact us.

The innovative battery tool for manual bonding

The first step into the ONSERT® process technology is with the Portable Mini, which is ideal for prototypes, small series and repairs.

Your advantages

- Small and easy to use
- Exchange units for different ONSERT® fasteners allow an easy adaptation of the setting tool to different fasteners
- Process control mechanisms for a safe use
- USB interface for tool setup and definition of process parameters

Delivery scope

- ONSERT® Portable Mini setting tool
- Control unit
- Battery and charger
- Exchange unit for M5/D5 and M6/D6
- Attachment for light intensity meter DELOLUXcontrol
- Dosing gun for 30-ml Semco® cartridges
- UV goggles
- USB stick with ONSERT® software
- USB cable

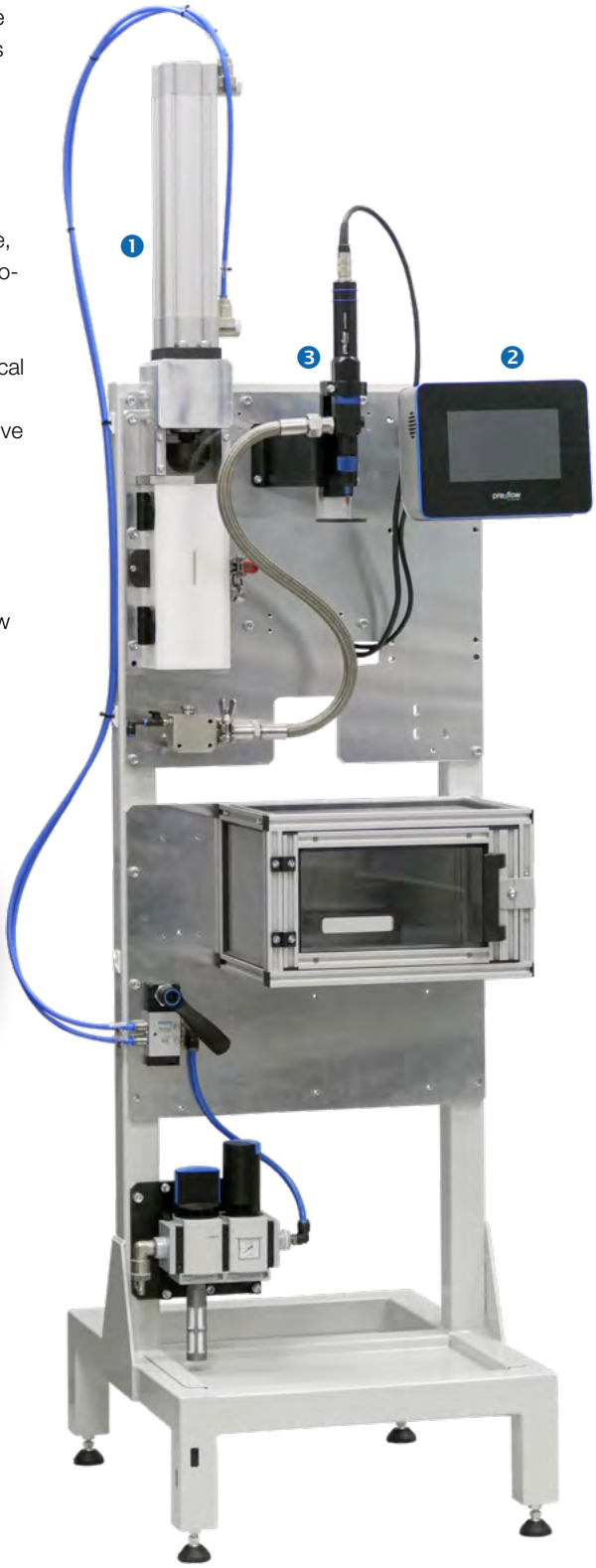
Application of adhesive with adhesive dispenser from 600-cc cartridge

If the numbers of pieces are larger and costs must be reduced, adhesive can be applied from big cartridges by means of volumetric application technology.

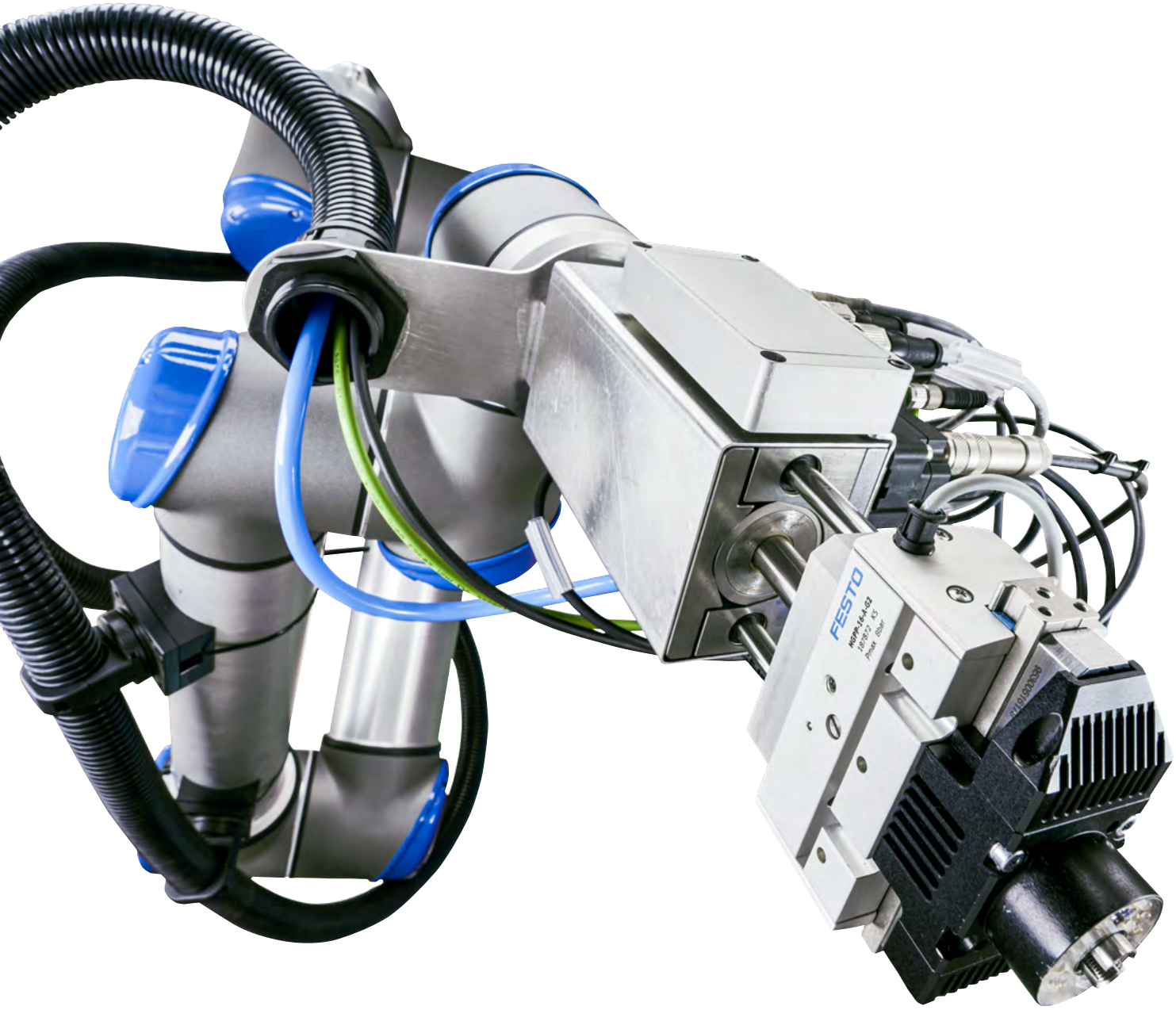
Another option to apply the adhesive is the use of 600-ml cartridges (20 oz). For those devices, an adhesive dosing system is required. The motives to use 600-ml cartridges are the reduced adhesive price, more precise dosing, more comfortable and faster processing as well as a more robust process in general.

The main components of the device are the mechanical extrusion for the adhesive cartridge ❶, the control system for the adhesive dispenser ❷ and the adhesive dispenser ❸.

The preferred method is to use an adhesive dosing system, in which case the adhesive does not need to be applied with a handgun. Instead, the ONSERT® Portable Mini is positioned with the bolt centred below the dispenser tip and automatic adhesive extrusion started by pushing down the foot pedal switch.



ONSERT® Processing systems

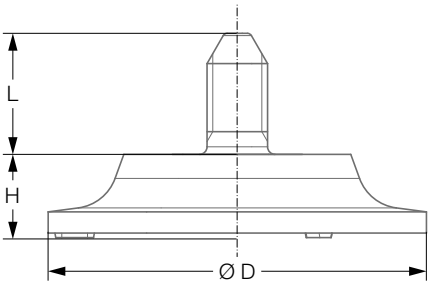


The most extensive expansion stage of automation is the ONSERT® pick-and-apply system. In combination with the application of adhesive it is an expansion and can be fully integrated into robot-controlled processing cells.

Your advantages

- Processing of fastening elements in pick-and-apply mode
- Flexible adaptation to a new component geometry and workstation (e.g. if using cobots)
- The robot can bond most diverse fastening elements (bolt diameter from 4 mm to 6 mm, bolt length from 10 mm to 50 mm)
- Nuts and special fasteners can be bonded if the gripper jaws are exchanged
- Employing the latest LED technology, curing times as short as 1.5 seconds can be realised

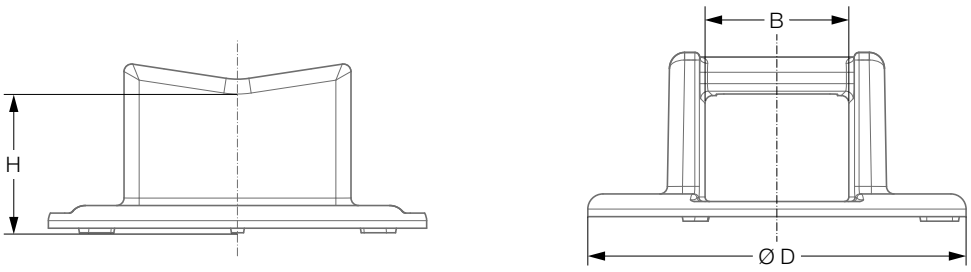
ONSERT® studs



Item code	Thread	D	H	L	Material	Surface
48301040024	M4	25	5.5	8	steel	ZiNi
48301040025	M4	25	5.5	12	steel	ZiNi
48301050026	M5	25	5.5	10	steel	ZiNi
48301050027	M5	25	5.5	15	steel	ZiNi
48301060028	M6	25	5.5	12	steel	ZiNi
48301060029	M6	25	5.5	18	steel	ZiNi
48402211010	10-32	25	5.5	10	A286	passivated*
48402211015	10-32	25	5.5	15	A286	passivated*
48402211020	10-32	25	5.5	20	A286	passivated*
48402211025	10-32	25	5.5	25	A286	passivated*

*ASM2700

ONSERT® Smart for cable management



Item code	Passage B	D	H	Material
48409100002	9.5	25	10	PAPACM12
48409100003	9.5	25	6	PAPACM12

Plastic-metal hybrid versions

ONSERT® studs

Materials

- **Plastic overmoulding**
  - → PA PACM 12
- **Metal fastener** [1)]
  - → Steel with zinc-nickel coating, sizes M5 and M6
  - → Alloy A286 (passivated, 0.1900-32)

ONSERT® inserts

Materials

- **Plastic overmoulding**
  - → PA PACM 12
- **Metal fastener** [1)]
  - → Alloy EN AW-6061-T6 with X5CrNi18-10HC (1.4301, 0.1900-32)
  - → Alternative: brass

[1)] Others on request

Full plastic versions

ONSERT® for cable management

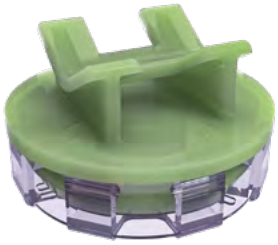
Materials

- **Plastics**
  → PA PACM 12

Materials

- **Plastics**
  bottom part
  → PA PACM 12

  Top part [1)]
  → PEI
  → PA



ONSERT® specials

Materials

- **Plastics**
  → PA PACM 12

Information about the adhesive

Adhesive

- One-component acrylate (modified)
- Compliant with RoHS Directive 2017/2102/EU
- Fast curing – full strength within seconds
- Compliant with FAR 25 and ANSI/UL 94

Advantages

- Fast curing and immediate strength
- No visual impairment of sensitive surfaces
- Suited if thermal methods cannot be used
- One-component adhesive – adhesives are not mixed
- Manual and automated processing systems available

Restrictions

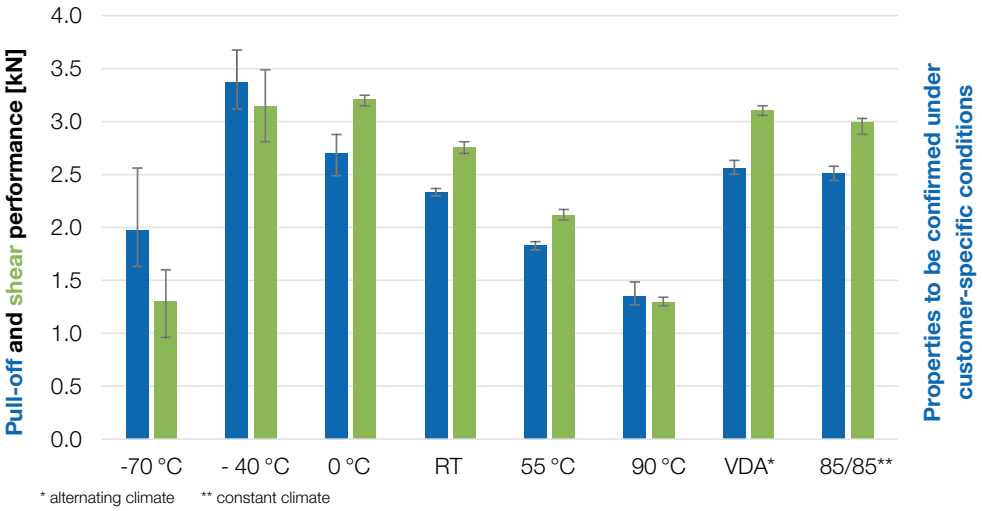
- Constant ambient temperature < 90 °C
- For metals: AL, steel after electrostatic painting or paint coating
- For plastics: epoxy composite materials, PC, PA
- For glass: with or without paint coating

[1)] Others on request

Parameters

Product type	ONSERT® stud
Item code	4840 221 1020
Plastic overmoulding	PA PACM 12
Metal fastener	alloy A286
Surface	passivated
Adhesive	4839 100 4150
Amount	0.25 g
Tool	Portable Mini, 8 sec., 90 %
Substrate	aluminium
Surface	sanded
Thickness	4 mm

Typical type of failure



* alternating climate ** constant climate

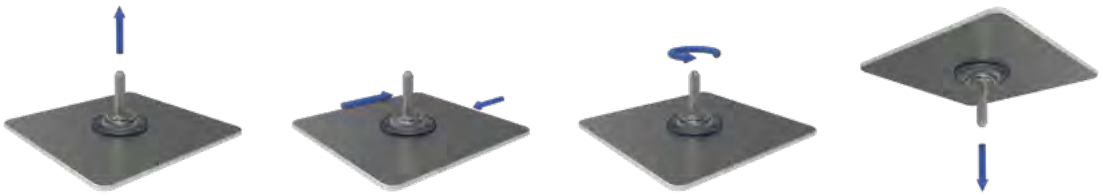
Further properties*

Salt spray tests	–
Static load	5 kg over 90 days at 90 °C
Stripping torque	>11 Nm

* Not all properties apply to all available combinations.

- Dynamic test acc. to RTCA-DO 160F Ch. 8 – 200 g
- Dynamic test acc. to RTCA-DO 160F Ch. 7 – 200 g
- Imbalance tests/nose wheel acc. to ABD 0100.1.2 – 200 g
- Media resistance acc. to DO 160 G Sec. 11.4
- Burning behaviour during 60 seconds, vertical acc. to FAR 25 (materials)

Load case

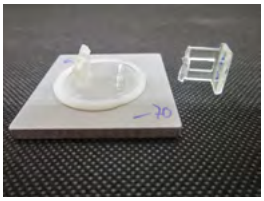


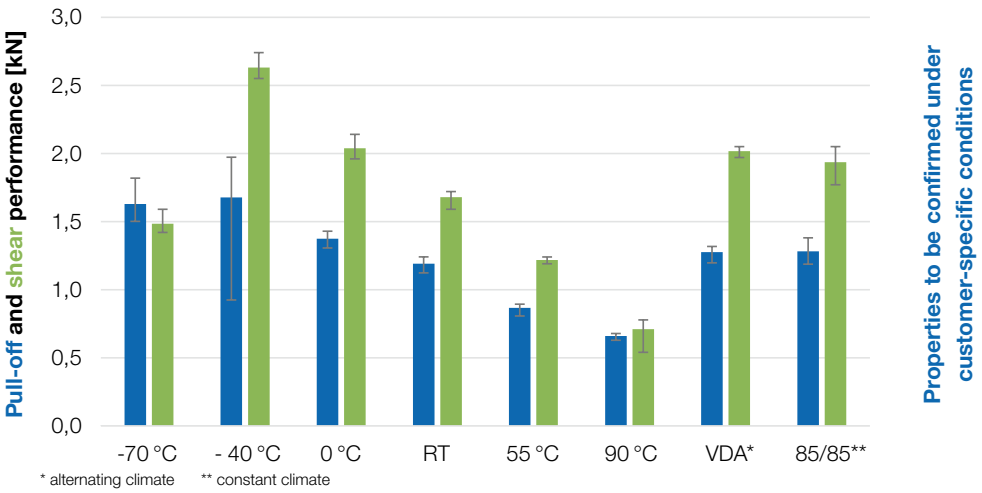
Pull-off | Shear | Torque test | Continuous load

Parameters

Product type	ONSERT® for cable management
Item code	4840 910 0002
Plastic overmoulding	PA PACM 12
Metal fastener	–
Surface	–
Adhesive	4839 100 4150
Amount	0.25 g
Tool	Portable Mini, 8 sec., 90 %
Substrate	aluminium
Surface	sanded
Thickness	4 mm

Typical type of failure





Further properties*

Salt spray tests	–
Static load	–
Stripping torque	–

* Not all characteristics apply to all combinations available

- Dynamic test acc. to RTCA-DO 160F Ch. 8 – 200 g
- Dynamic test acc. to RTCA-DO 160F Ch. 7 – 200 g
- Imbalance tests/nose wheel acc. to ABD 0100.1.2 – 200 g
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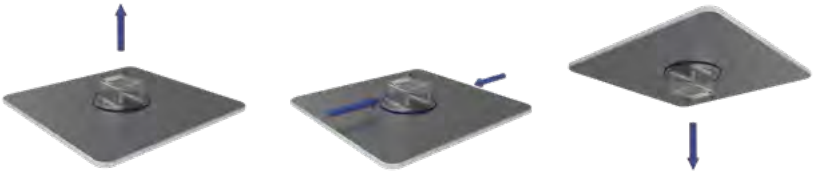
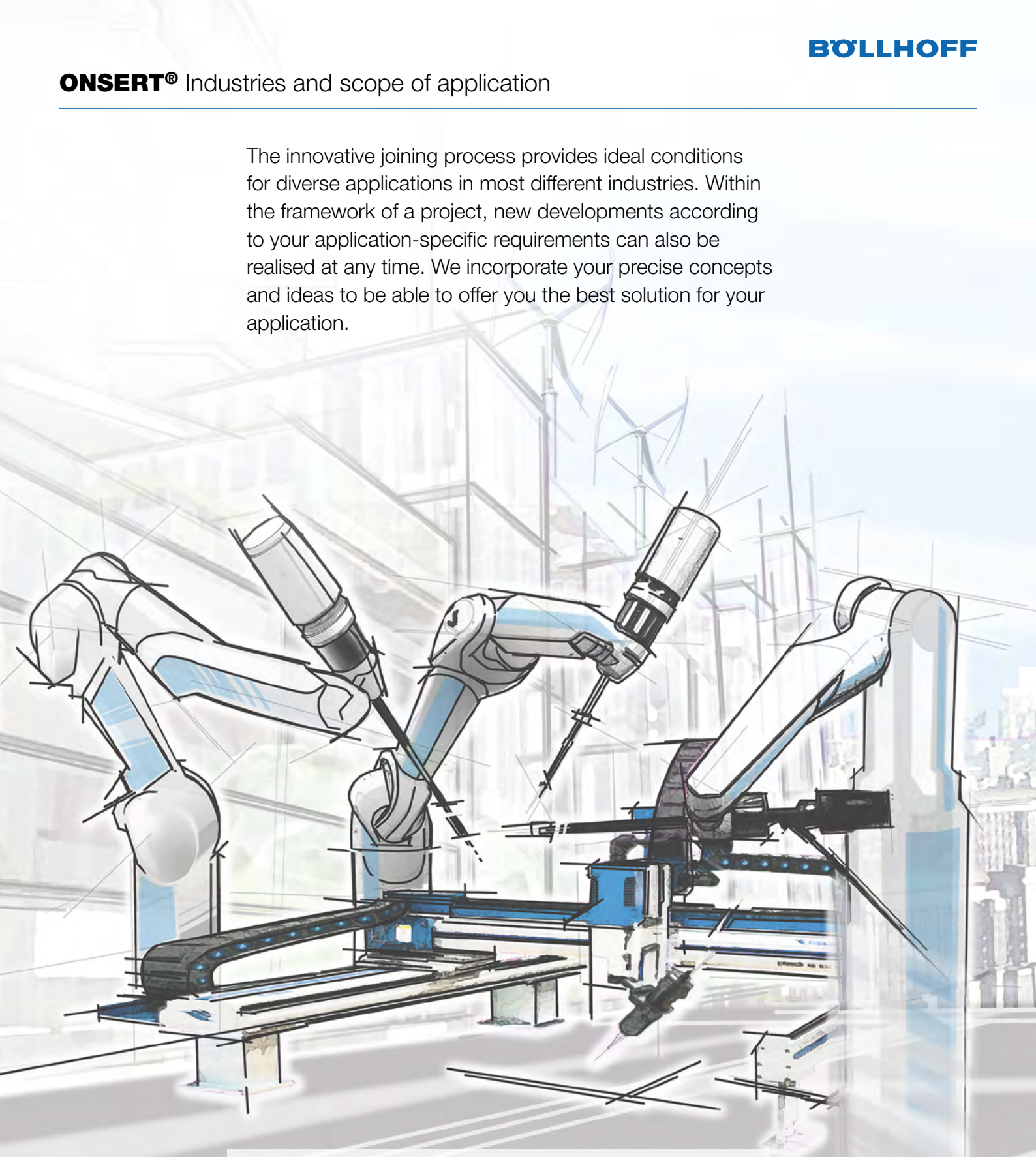
Load case



Pull-off | Shear | Continuous load

ONSERT® Industries and scope of application

The innovative joining process provides ideal conditions for diverse applications in most different industries. Within the framework of a project, new developments according to your application-specific requirements can also be realised at any time. We incorporate your precise concepts and ideas to be able to offer you the best solution for your application.



Industry

- Design and sight surfaces – sophisticated appearance
- Glass applications – glass control elements
- No damage to surfaces or coatings
- ...

ONSERT® Industries and scope of application

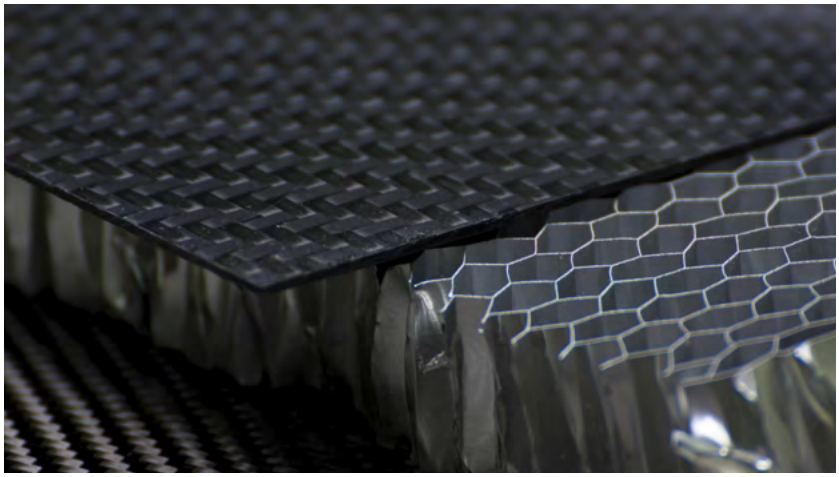
Aerospace

- Cable management
- Studs and spacers
- Screw joints – locking elements
- Insulation attachment
- ...

Automotive

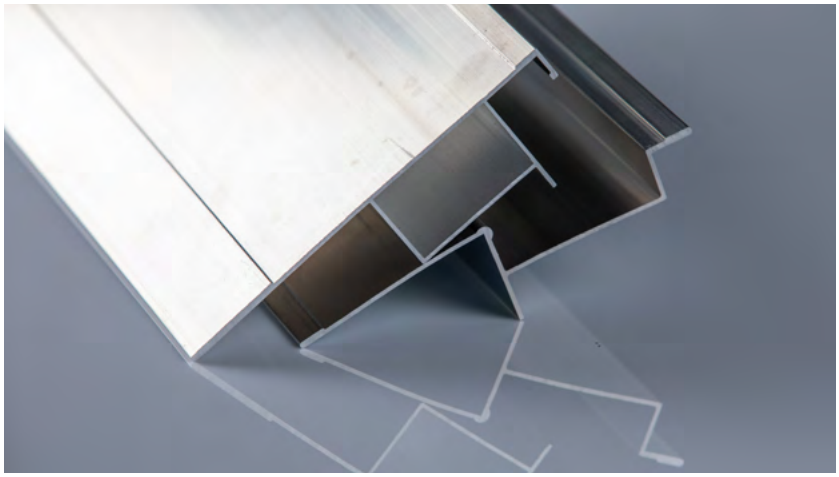
- Composite applications
- Glass applications
- Cable management
- For applications without pre-punching
- ...

ONSERT® Main fields of application – Material-related perspective



ONSERT® for composite applications

- No holes, no damage to the fibre structure
- No mechanical or thermal load on the substrate
- Very good corrosion behaviour (no contact corrosion)



ONSERT® for profile applications (e.g. battery packs)

- 100 % tight, through avoidance of holes
- No thermal load, no deformation
- Steel thread on aluminium sheet possible
- Very good corrosion behaviour
- No thermal damage to the joining zone

ONSERT® Main fields of application – Material-related perspective

ONSERT® for glass applications

- No application of stress due to a flexible adhesive system
- Extremely simple processing compared to tapes, 2C or thermosetting adhesive systems
- Detachable joints instead of structural bonds

ONSERT® for high-quality surfaces

- No standout – not even on thin sheets (e.g. 0.6 mm steel)
- No deformation or heat input in sheet materials
- Suited also for finished surfaces
- Fast and integrable process

These are examples of the good cooperation with our customers.

ONSERT® flies business class

Aiming at reducing the weight of business class seats CL6720 and making processes more efficient, RECARO Aircraft Seating worked together with joining technology expert Böllhoff and DELO Industrie Klebstoffe to create a solution based on the ONSERT® method.

Business class seat CL6720

Bonded ONSERT® Smart for cable management

ONSERT® Smart for cable management

Touch display from kessler systems on a tool dispensing system from the Gühring Company

Bonding of ONSERT® studs inside touch displays for tool dispensing systems with high process reliability

The kessler systems company relies on the ONSERT® adhesive technology for the production of touch displays for tool dispensing systems. Fasteners with high process reliability shall be used to attach the displays.

ONSERT® is the ideal solution:
kessler systems uses the ergonomic ONSERT® Portable with short curing times to efficiently process smaller as well as larger numbers of pieces.

Bonded ONSERT® inside a display from kessler systems


We are looking
forward to our next
joint success
story.

Your partner to succeed in joining – and what that means for you:

Development and design competencies

- Committed experts for innovation, product, project and design management
- Trend scouting
- Design thinking
- FMEA
- Feasibility studies
- Activities in R & D (FEM, Moldflow analysis)
- Diverse CAD softwares, e.g. Catia V5, Ansys, Creo Parametric
- Customer-specific developments
- Application engineering and engineering consulting
- Prototyping and additive manufacturing
- Value stream mapping, e.g. cost optimisation
- Certified laboratory acc. to DIN EN ISO/IEC 17025

Production

- Technical production know-how
- Fourteen modern production facilities worldwide
- Main production technologies
  - Injection moulding
  - Cold and hot forming
  - Turning and milling processes
  - Thread rolling
  - Wire profiling and winding
  - Surface treatment (passivation, cadmium plating, silver coating)
  - Mechanical and plant engineering
- Zero-defect concept
- Well-trained production personnel and continuous internal training
- Company training centre

Qualification

- Quality management systems – requirements for
  - aviation, space and defence organisations (EN 9100) and
  - the automotive industry (IATF 16949)
- DIN EN 9145 Requirements for Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP)
- FAIR acc. to EN 9102
- Certified laboratory acc. to DIN EN ISO/IEC 17025
- Environmental management acc. to DIN EN ISO 14001
- Energy management systems acc. to DIN EN ISO 50001
- Occupational health and safety management systems acc. to DIN ISO 45001 (replaces OHSAS 18001)
- Product qualification for customers and third parties

Supply

- Supply solutions
- Worldwide network within the Group
- Large warehouses in France, Germany and Great Britain
- Proximity to customers thanks to global presence
- After-sales service
- Repair kits available
- eShop
- Customised packaging

Catalogues

Product catalogues

ONSERT®

Quick and process-reliable bonding of fastening elements with light-curing adhesives
Catalogue No 0250

https://www.boellhoff.com/en/pdf/onsert

Product Guide

360° Joining Technology
Catalogue No 1190

https://www.boellhoff.com/en/pdf/product-guide

Industry-specific catalogues

Aerospace industry meets 360° Joining Technology

Catalogue No 0951

https://www.boellhoff.com/en/pdf/aerospace

E-mobility meets 360° Joining Technology

Catalogue No 8024

https://www.boellhoff.com/en/pdf/e-mobility

Success stories

ONSERT® flies business class

Catalogue No 0342

https://www.boellhoff.com/en/pdf/success-story/recaro

kessler systems and Böllhoff create points of contact

Catalogue No 0332

https://www.boellhoff.com/en/pdf/success-story/kessler

Good2Know cards

ONSERT® adhesive technology

https://www.boellhoff.com/en/good2know/onsert

Videos

Fasteners and processing systems

ONSERT® studs

Quick and process-reliable bonding of fastening elements with light-curing adhesives

https://www.boellhoff.com/video/onsert-stud

ONSERT® insert

Quick and process-reliable bonding of fastening elements with light-curing adhesives

https://www.boellhoff.com/video/onsert

ONSERT® Portable Mini

Battery-powered manual assembly tool for bonding ONSERT® fasteners

https://www.boellhoff.com/video/onsert-portable-mini

ONSERT®

Bonding of fasteners using a collaborative robot

https://www.boellhoff.com/video/onsert-automation

Industry-specific videos

360° Joining Technology meets automotive engineering

https://www.boellhoff.com/video/automotive

360° Joining Technology meets e-mobility

https://www.boellhoff.com/video/e-mobility

Aerospace industry meets 360° Joining Technology

https://www.boellhoff.com/video/aerospace

Good2Know videos

ONSERT® adhesive technology

https://www.boellhoff.com/videos/en/good2know/onsert

BÖLLHOFF

Passion for successful joining.

Böllhoff Group
Innovative partner for joining technology with assembly and logistics solutions.

Find your local partner at www.boellhoff.com or contact us at fat@boellhoff.com.