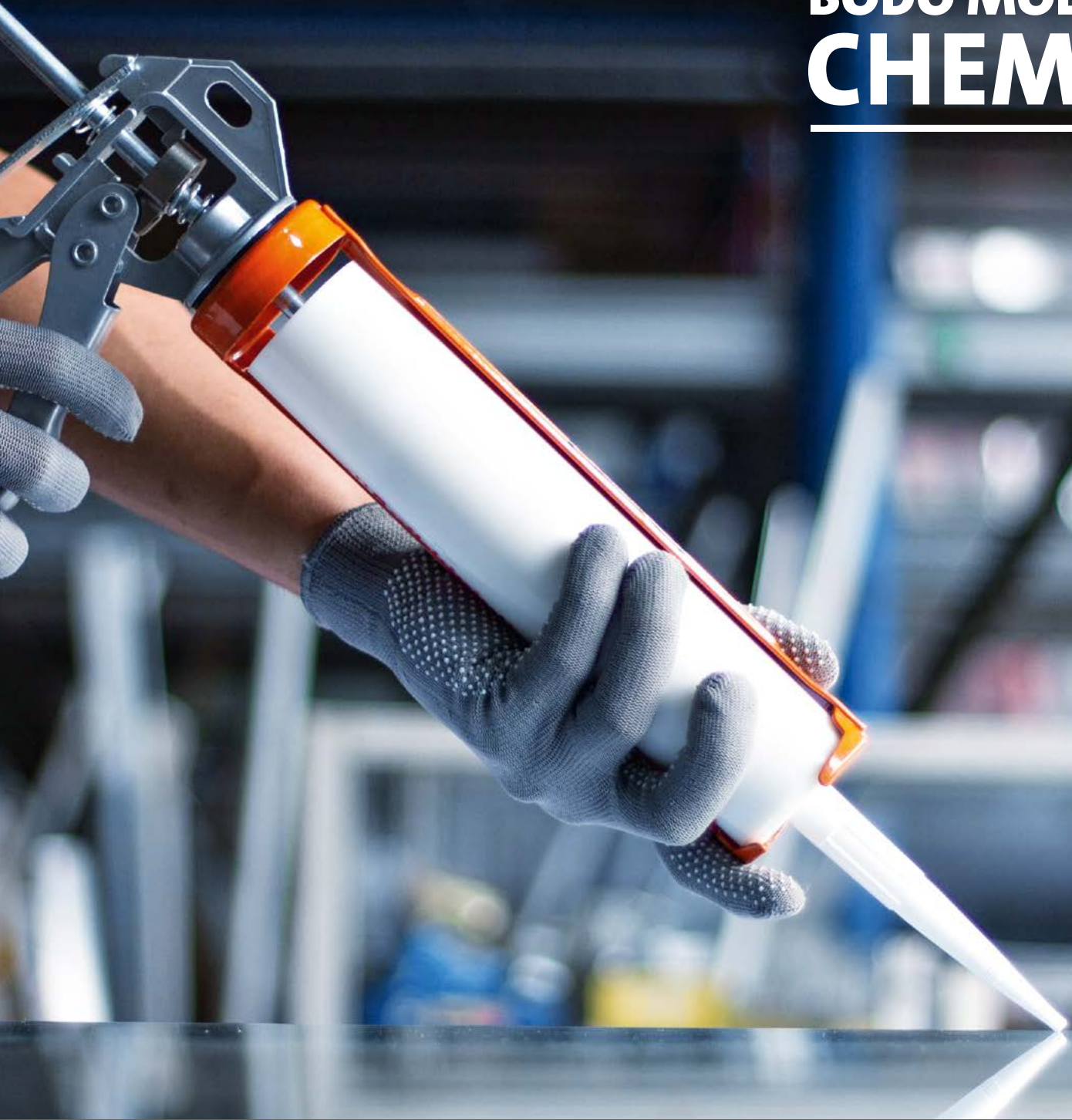


BODO MÖLLER
CHEMIE

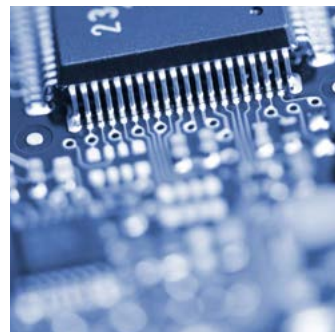


Adhesive systems
for industrial applications

Adhesive solutions

BODO MÖLLER CHEMIE is a specialist for adhesive systems and applications in many industrial areas, especially in the automotive, aerospace, railway, medical and electronics industries. We offer a wide range of solutions specifically tailored to structural, semi-structural or elastic bonding of different materials like metal, glass, composites, wood and plastic.

We support customers with individual services such as design of adhesive joints and testing in our adhesive laboratory, process testing and troubleshooting, customer-specific training as well as preparation and implementation of certification audits in accordance with EN 17460 and ISO 21368.



for various industries

Adhesive solutions

Epoxy resin adhesives (EP)

Araldite® Epoxy resin adhesives (1C / 2C)

Araldite® Epoxy core and edge fillers (2C)*

BERGQUIST® **LIQUI BOND** Thermally conductive adhesives (1C / 2C)

BETAMATE™ Epoxy resin adhesives (1C / 2C)

Epibond® Epoxy resin adhesives (2C)*

Epocast® Epoxy core and edge fillers (1C / 2C)*

LOCTITE® **AERO** Products: paste adhesives, film adhesives (with & without lightning strike protection), wet peel plies, syntactic, core fill & abradable (1C / 2C)*

LOCTITE® **ABLESTIK** Electrically conductive adhesives (1C / 2C)

* partially with FR/FST fire properties

Polyurethane adhesives (PUR)

Araldite® Polyurethane structural adhesives (2C)

BETAFILL™ Polyurethane sealants (1C)

BETAFORCE™ Thermally conductive adhesives

BETAFORCE™ Polyurethane structural adhesives, high modulus (2C)

BETAMATE™ Polyurethane structural adhesives (1C / 2C)

BETASEAL™ Polyurethane adhesives for direct glazing (1C / 2C)

LOCTITE® Polyurethane adhesives (1C / 2C)

Uralane® Polyurethane adhesives (2C)

Methacrylate adhesives

Agomet® Methyl methacrylate adhesives (MMA, No-Mix / 2C)

Araldite® Methyl methacrylate adhesives (MMA, 2C)

Araldite® Low odor methacrylate adhesives (2C)

Anaerobic adhesives

LOCTITE® Anaerobic adhesives

Cyanoacrylate adhesives

LOCTITE® Cyanoacrylate

Phenolic resins & polycondensation adhesives

Araldite® Phenolic polycondensation adhesives

Hybrid adhesives & sealants

BETAMATE™ Silane-modified polymer adhesives (1C)

LOCTITE® Hybrid adhesives (2C)

LOCTITE® **ABLESTIK** Electrically conductive adhesives (1C / 2C)

L&L Seal Silane-modified polymer adhesives (1C)

Silicone adhesives & high temperature silicones

Bluesil™ RTV silicones (2C)

BERGQUIST® **LIQUI BOND** Thermally conductive adhesives (1C / 2C)

CAF® Silicone adhesives (1C / 2C)

Dowsil™ Silicone adhesives and sealants

LOCTITE® **ABLESTIK** Electrically conductive adhesives (1C / 2C)

PACTAN Silicone adhesives and sealants (1C / 2C)



UV-curing adhesives

- LOCTITE®** UV-Alkoxy silicones
- LOCTITE®** UV-Cyanoacrylate
- LOCTITE®** Acrylate
- LOCTITE®** Acrylate Urethane

Packaging & labeling adhesives

- Aquence®** Water-based adhesives
- Technomelt®** Hotmelts adhesives

Furniture & building industry adhesives

- Aquence®** Water-based adhesives
- LOCTITE®** Polyurethane adhesives (1C / 2C)
- Technomelt®** Hotmelt adhesives

Sealants

- BETAFILL™** Polyurethane sealants
- BETAFILL™** Polyurethane seam sealer (1C)
- BETAGUARD™** Rubber-based sealants, relining adhesives
- Bluesil™** RTV silicones (2C)
- CAF®** Silicone adhesives (1C / 2C)
- CeraPur®** Polyurethane foam gasket (1C)
- Dowsil™** Silicone adhesives and sealants
- L&L** Hybrid sealants
- L&L** Room temperature curing sealants/adhesives
- PACTAN** Silicone sealants
- RTF** Silicone foam gasket (2C)

Products for surface treatment, pretreatment & posttreatment of adhesive surfaces

- BETACLEAN™** Surface cleaners
- BETAPRIME™** Primer
- BETAWIPE™** Activators
- BONDERITE® AERO** Metal Pretreatment, Chemical Milling, Depaint & Repaint, Engine Maintenance
- BONDERITE®** Cleaners
- BONDERITE®** Pretreatment technologies
- LOCTITE®** Activators & cleaners
- LOCTITE®** Polyolefin primer for pretreatment
- LOCTITE® AERO** Resin-saturated tear-off fabric

Adhesive tapes & sprays

- 3M™** Double-sided adhesive tapes
- 3M™ VHB™** Double-sided adhesive tapes
- 3M™ VHB™** Double-sided adhesive tapes LSE
- 3M™ Dual Lock™** Reclosable fastener
- 3M™** Spray adhesives

For any application

The construction with adhesive joints has several advantages compared to conventional joining technologies. Adhesives are suitable for bonding a variety of different materials. With the correct surface treatments most metallic, glass, plastic and polymer composite materials can all be joined to either themselves or each other with joint strengths that might even be superior to other joining techniques.

Due to the continuous nature of adhesive bonding, it helps reducing high stress concentrations that occur in mechanical fastening systems and results in stiffer joints and structures. Superior fatigue resistance can be achieved compared with welded or riveted joints. Moreover a continuous bead of adhesive can also provide sealing properties. In addition to the mechanical properties, bonding also brings aesthetic advantages. Compared to welding or mechanical fasteners, the adhesive seam can be applied invisibly.

Comparison of properties

	Speed		Substrate diversity												Stability			Handling	
	Handling strength, time	Final strength, time	Plastic	Metals	Elastomers	Glass	Fibre composites (CFRP / CFRP)	Paper / Cardboard	Wood	Textiles	Leather	Concrete / Stone	Ceramics / Porcelain / Clay	Impact strength & resistance	Chemical resistance	Moisture resistance	EHS Classification labeling	Smell	
1C-Epoxy resin adhesives (EP)	■	■	■	●	■	■	●	●	●	■	■	●	●	●	●	●	■	●	
2C-Epoxy resin adhesives (EP)	■	▲	■	●	■	■	●	●	●	■	■	●	●	●	●	●	■	●	
Polyurethane adhesives (PUR)	■	▲	●	■	■	■	●	●	●	■	■	●	●	●	●	▲	■	●	
Methyl methacrylate adhesives (MMA)	●	●	●	●	■	■	●	▲	▲	▲	▲	●	●	●	●	●	■	▲	
Phenolic resins & polycondensation adhesives	●	●	▲	●	▲	▲	▲	▲	▲	▲	▲	●	■	●	●	●	■	■	
Silicone adhesives & high temperature silicones	■	▲	■	■	▲	●	■	■	■	■	■	●	●	●	●	●	●	■	
Hybrid adhesives & sealants	■	▲	●	■	▲	●	●	■	●	■	■	●	●	■	■	●	●	●	
Cyanoacrylate adhesives	●	●	●	■	●	▲	●	●	●	●	●	●	●	■	■	▲	●	■	
Hotmelt adhesives	●	●	●	■	●	■	■	●	■	●	●	■	■	■	●	●	●	●	
Anaerobic adhesives	■	▲	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	■	●	■	●	●	●	

● = good ■ = medium ▲ = bad



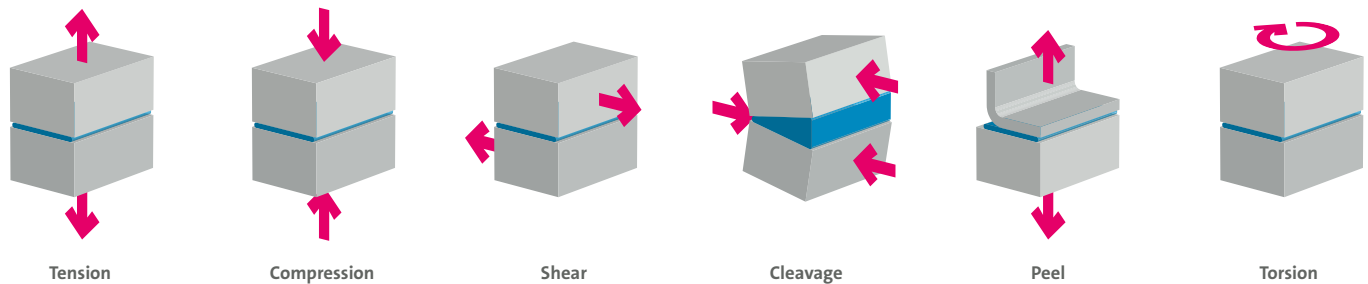
Advantages and applications of adhesive systems

	Advantages	Applications
1C-Epoxy resin adhesives (EP)	High strength, crash-stable	Automotive, General Industry
1C-Epoxy resin adhesive films	Enables large part manufacture, bond line thickness control, uniform areal weight, long shop life	Large & complex parts manufacturing like engine nacelles, acoustic panels, flaps, spoilers
1C-Epoxy resin surface films	With or without lightning strike protection, high surface quality: low flow, process labor reduction	Large & complex parts manufacturing like wings, fuselage, radome
2C-Epoxy resin adhesives (EP)	High strength, very versatile, environmental, chemical & temperature resistance	General Industry, Aerospace, BTR, Automotive, Electronics and many other industries
1C-Polyurethane adhesives (PUR)	High flexibility, perfect strength too, elongation ratio, easy to use, humidity cure	Glass Bonding, General Industry, BTR, Automotive and many other industries
2C-Polyurethane adhesives (PUR)	High flexibility, perfect strength too, elongation ratio, humidity independent cure	Glass Bonding, General Industry, BTR, Automotive and many other industries
No-mix Methyl methacrylate adhesives (MMA)	Snap cure after open time, long pot life due no-mix process	General Industry, Aerospace, BTR, Automotive, magnet bonding and many other industries
2C-Methyl methacrylate adhesives (MMA)	Snap cure after open time, very versatile, good adhesion properties without pretreatment	General Industry, Aerospace, BTR, Automotive and many other industries
Phenolic resins & polycondensation adhesives	Very high temperature resistance	Automotive, Brake Bonding
Silicone adhesives & high temperature silicones	Flexible and high temperature resistant, easy to use	General Industry, Aerospace, Electronics and many other industries
Hybrid adhesives & sealants	Flexible, easy to use, EHS friendly, humidity cure	General Industry, BTR, Automotive and many other industries
Cyanoacrylate adhesives	Very fast adhesion built up, extremely versatile	General Industry, BTR, Automotive and many other industries
UV-curing adhesives	«On demand» cure possible, curing within seconds	Medical, Electronics, Glass & PC, PMMA Bonding
Hotmelt adhesives	Very fast cycle times	Electronics, Packaging
Sealants	High flexibility, easy to use	General Industry, BTR, Automotive and many other industries
Anaerobic adhesives	Unlimited open time on air, only reacts when in contact with reactive surfaces	Threadlocker in every industry
Products for pretreatment & posttreatment	High guarantee of bonding quality	Should be checked in every bonding process

Do you need support in selecting a suitable product for your application? Please contact our technical consultants for detailed product information, samples and process advice. We will be pleased to support you.

Designing strong bonds

Loading of adhesive joints – The strength of an adhesive bonding strongly depends on the direction and distribution of the stresses formed in the joint as a result of the loads applied to it. Typical forces are illustrated below. In practice, a bonded structure has to simultaneously sustain a combination of forces.



Strong bonded joints need to be designed that the loading stresses will be directed along the lines of the adhesive's greatest strengths. A poorly designed joint can lead to high-stress concentrations in the joint itself and/or in the substrates connected. Adhesives are more resilient under shear, compression and tension stresses. Cleavage and peel loading are the most severe as they concentrate the applied force into a single line of high stress.

Surface preparation and pretreatment are decisive factors for the strength and fatigue performance of an adhesive bond. In order to ensure an optimum wetting on the substrate, a thorough surface preparation is required to remove contaminations, offer a clean surface and increase the bonding area and surface energy of the substrate. Common surface preparation methods are degreasing, abrading and special pretreatments. BODO MÖLLER CHEMIE offers a wide range of cleaners and surface technologies to provide adhesive joints an optimum strength and reliability.

Degreasing

The removal of oil or greases residues from the surface is essential but should be combined to other surface preparation like mechanical abrasion followed by loose particle removal or chemical pretreatment for optimizing the bonding.

Degreasing methods: Vapor degreasing, solvent immersion, brush or wipe with degreasing agent, detergent degreasing, alkaline degreasing, ultrasonic degreasing

Abrading

Lightly abraded surfaces provide better anchoring to adhesives than highly polished surfaces. After abrading the surface further treatment methods are required to ensure complete loose particles removal, like degreasing operation, lightly brushing with a clean soft brush or vacuum cleaning.

Abrading methods: Grit blasting, wire brush, abrasive cloth, abrasive paper

Special pretreatments

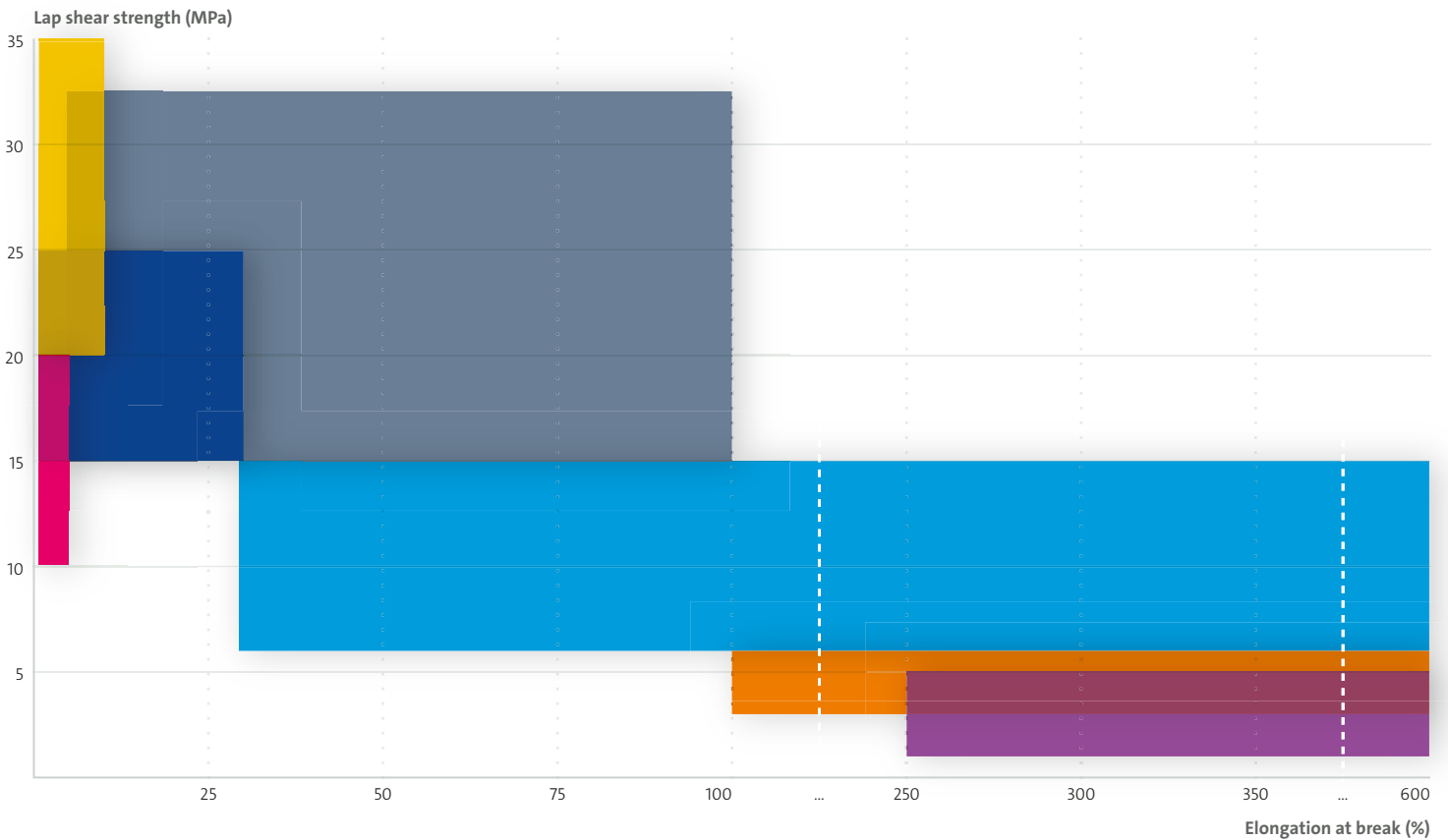
Degreasing and abrading methods are sufficient for most adhesive joints. In order to obtain maximum strength, reproducibility and long-term resistance to deterioration, a chemical or electrolytic pretreatment may be required.

Metal: Acid etching, anodising, primer applications

Plastics/composites: Low pressure plasma, atmospheric plasma, corona treatment, flame treatment



Shear strength and elongation at break comparison



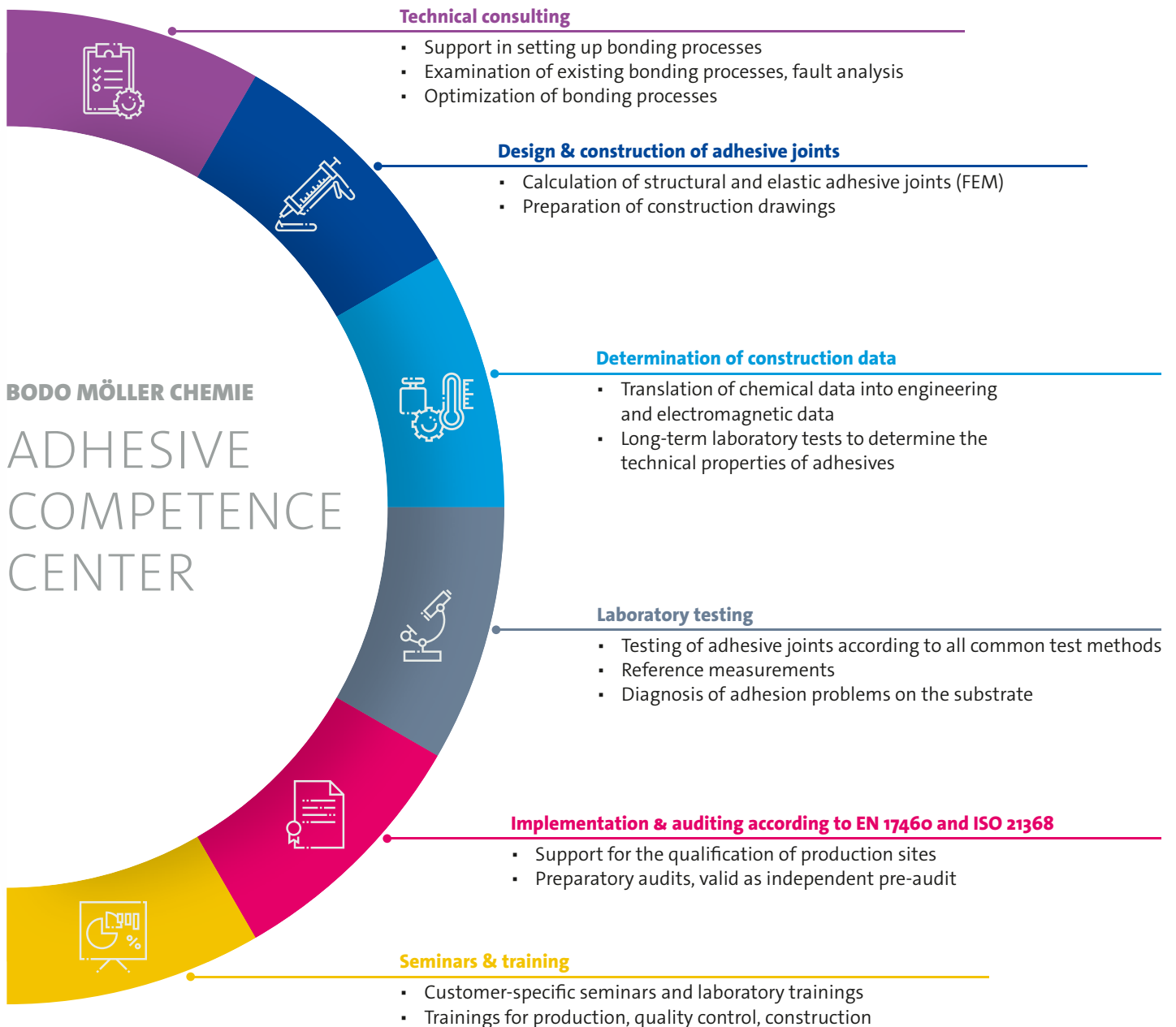
- Epoxy resin adhesives 20–35 MPa / 1–10%
- Phenolic resins & polycondensation adhesives 10–20 MPa / 1–5%
- Cyanoacrylate adhesives 15–25 MPa / 1–30%
- Methyl methacrylate adhesives 15–33 MPa / 5–100%
- Polyurethane adhesives 6–15 MPa / 30–600%
- Hybrid adhesives & sealants 3–6 MPa / 100–600%
- Silicone adhesive & high temperature silicones 1–5 MPa / 250–600%

The specialists of our **Adhesive Competence Centers** support customers in the design and construction of adhesive joints with extensive product and application know-how, FEM calculation and application tests in our Adhesive Laboratories.

Application technology centers

With our **Adhesive Competence Centers**, we offer full service in all matters related to adhesive technology – from product selection all the way to product validation, process simulation and engineering data.

The Adhesive Competence Centers are certified for the designing of bonding joints according to ISO 21368 and EN 17460 and our Adhesive Laboratory has a Competence Approval for ISO 21368 and EN 17460. All measurements are carried out in accordance with international DIN, EN and ISO standards.





QUALITY & SAFETY

ISO 9001 Quality management**ISO 14001** Environmental management**ISO 45001** Occupational health & safety**EN 9120** Distribution and repacking for aviation industry**EN 17460** Adhesive bonding of railway vehicles (laboratory)**ISO 21368** Quality requirements for adhesive bonding processes (laboratory)

AN EXCERPT OF OUR LONGTIME PARTNERS



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State 02/2026



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