

KLEBEN +
DICHTEN +
VERGIESSEN

Kisling

Kisling Präsentation

28.03.2023, Günter Bittner



INTRODUCTION



Günter Bittner (Market Development Manager & Senior Application Engineer)

- Employed at Kisling since 2015
- European Adhesive Specialist (2005), European Adhesive Engineer (2019)
- More than 15 years in the adhesive industry



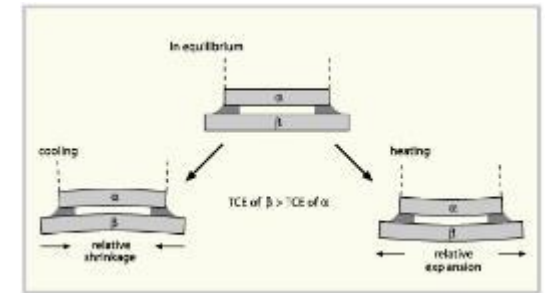
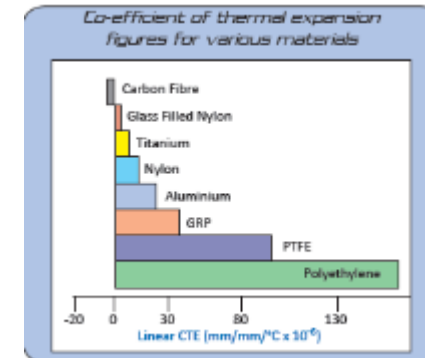
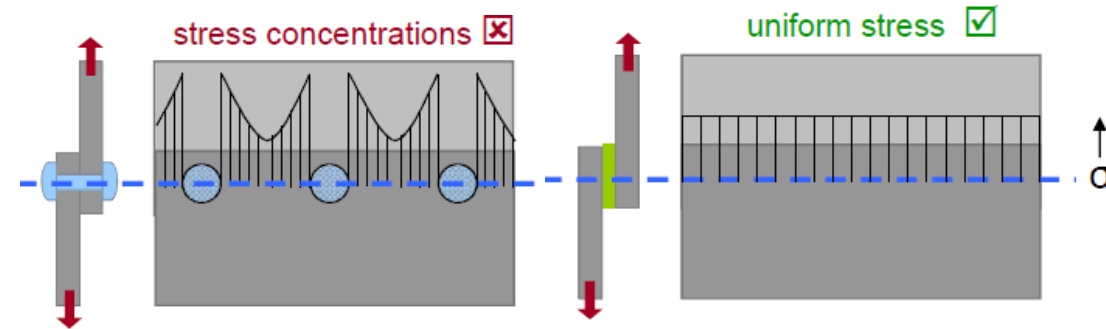
Andrey Konovalov (Sales Agent)

- Employed at Kisling since 2018
- More than 10 years in the adhesives industry

LIGHTWEIGHT MATERIALS & COMPOSITES

ADVANTAGES OF BONDING

- + No damage to the to be bonded materials (no or only relatively low heat input, no drilling of holes etc)
- + Uniform stress distribution and planar force transfer
- + Joining of different materials (compensation of different CTE)
- + Adhesive joints fulfil several requirements at once
 - Impermeable / sealing up
 - pressure and vacuum tight
 - resistant to many chemical media
 - Material fit and therefore corrosion-reducing
- + Weight reduction / lightweight design (no screws, bolts, rivets etc.))
- + Design freedom (invisible bonded joints)
- + Compensation of part intolerances, especially on high-area bonded joints

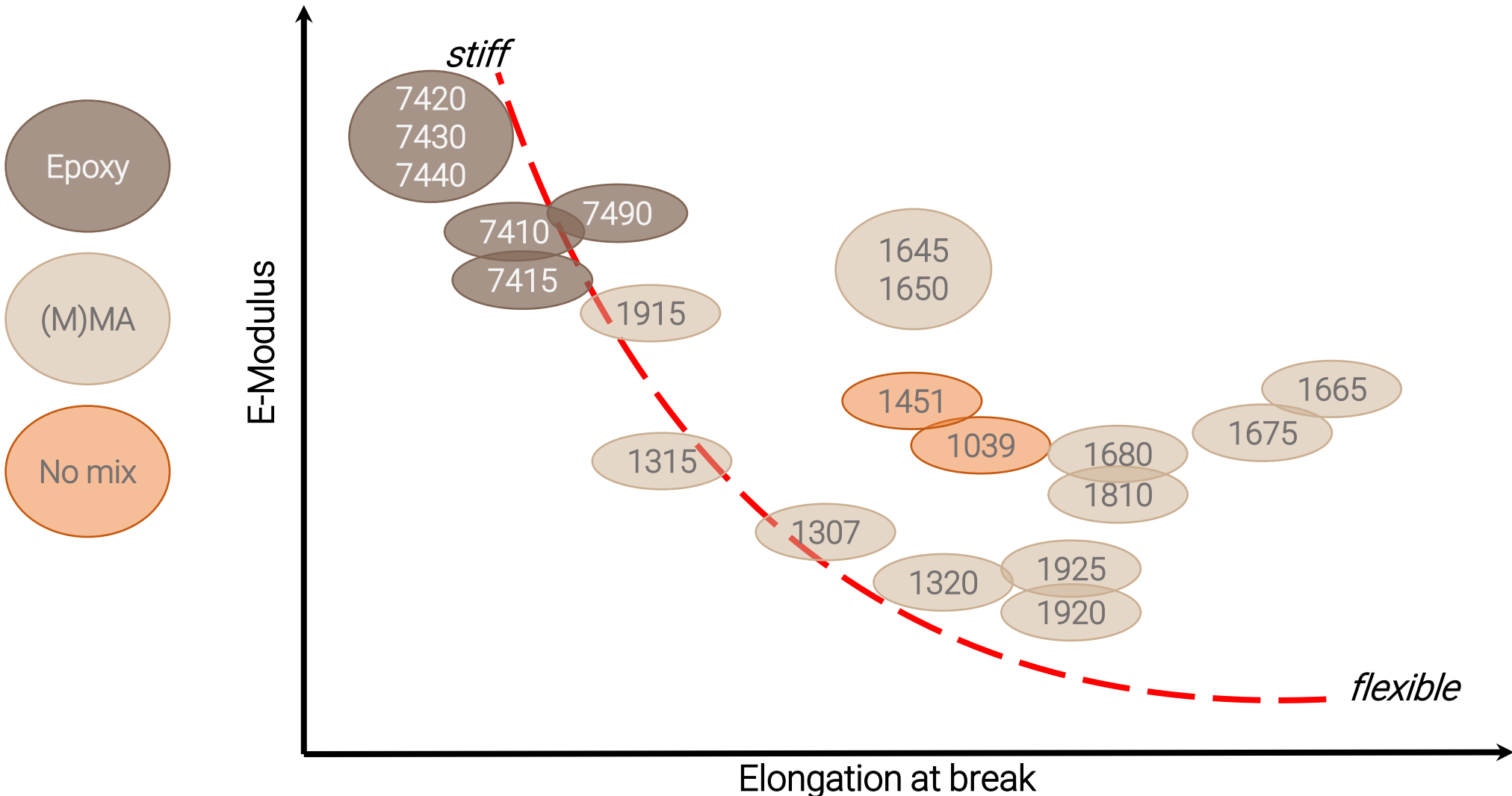


BONDING +
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Product information

LIGHTWEIGHT MATERIALS & COMPOSITES

OVERVIEW OF OUR STRUCTURAL ADHESIVES



LIGHTWEIGHT MATERIALS & COMPOSITES

TWO-COMPONENT EPOXY RESIN ADHESIVES



7430 - the all-rounder

Fire retardant acc. to DIN EN 45545-2

- + Long working time 40 - 50 minutes
- + Very good gap bridging
- + Temperature resistance >100°C
Short-term up to 140°C
- + Elongation break 3-5%
- + Good chemical resistance



Low odour and
high flashpoint



Post-processing
possible



7440 - specialist for high temperatures

Fire retardant acc. to DIN EN 45545-2

- + Long working time 40 - 60 minutes
- + Very good gap bridging
- + Very high temperature resistance >180°C
- + Elongation at break 4-5%
- + Good chemical resistance



Low odour and
high flashpoint



Post-processing
possible



Fast strength
build-up



7490 - for extreme loads

Fire retardant acc. to DIN EN 45545-2

- + Working time 2 hours
- + Very good gap bridging
- + Elongation at break 6-7%
- + Very high temperature stability >180°C
- + Good chemical resistance



Low odour and
high flashpoint

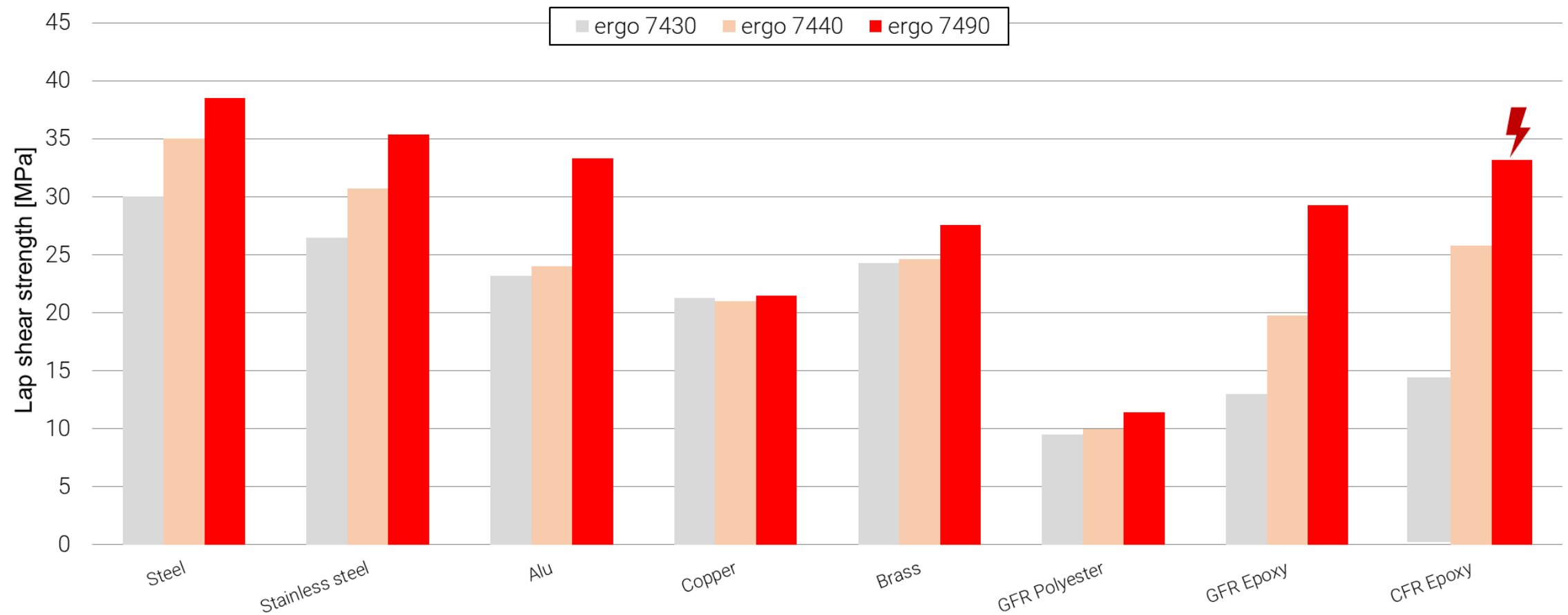


Post-processing
possible

LIGHTWEIGHT MATERIALS & COMPOSITES

TWO-COMPONENT EPOXY RESIN ADHESIVES - LAP SHEAR STRENGTH

- Tensile shear strength acc. to DIN EN 1465
- Curing: 16 hours at 40°C
- Test temperature: 23°C



LIGHTWEIGHT MATERIALS & COMPOSITES

(METHYL-) METHACRYLATE ADHESIVES



1680 – the slow one

Fire retardant acc. to DIN EN 45545-2

- + Processing time 8-12 minutes
- + Gap bridging up to 10mm
- + Thermal range -55°C to +120°C
- + High elongation at break >65%
- + High strength >17N/mm²



Fast strength
build-up



Post-processing
possible



Low odour and
high flashpoint



1665 – the allrounder

- + Working time 3-6 minutes
- + Gap bridging 10 mm
- + Thermal range -55°C to +120°C
- + 50% final strength after 15-18 minutes
- + High elongation at break ~100%



Fast strength
build-up



Post-processing
possible



1675 – the specialist

Fire retardant acc. to DIN EN 45545-2

- + Processing time 2-4 minutes
- + Gap bridging up to 10mm
- + Thermal range -55°C to +120°C
- + Low modulus ~780 N/mm²
- + High elongation at break >85%



Fast strength
build-up



Post-processing
possible

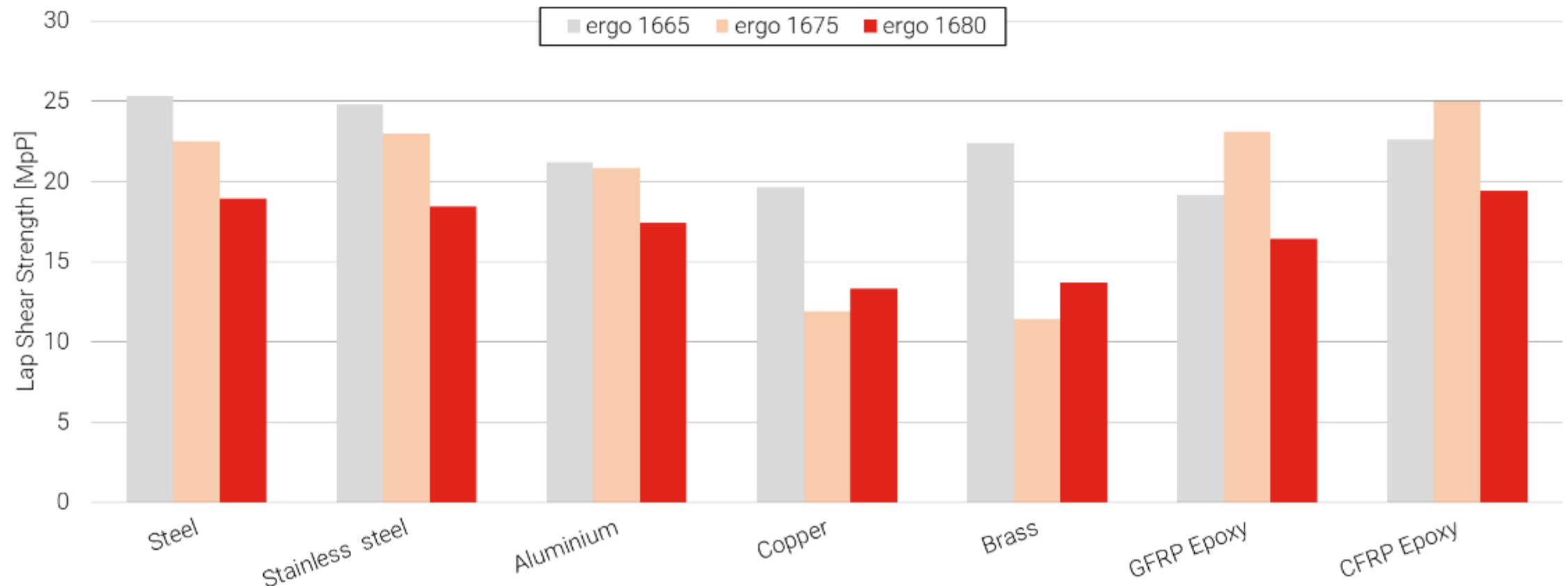


Low odour and
high flashpoint

LIGHTWEIGHT MATERIALS & COMPOSITES

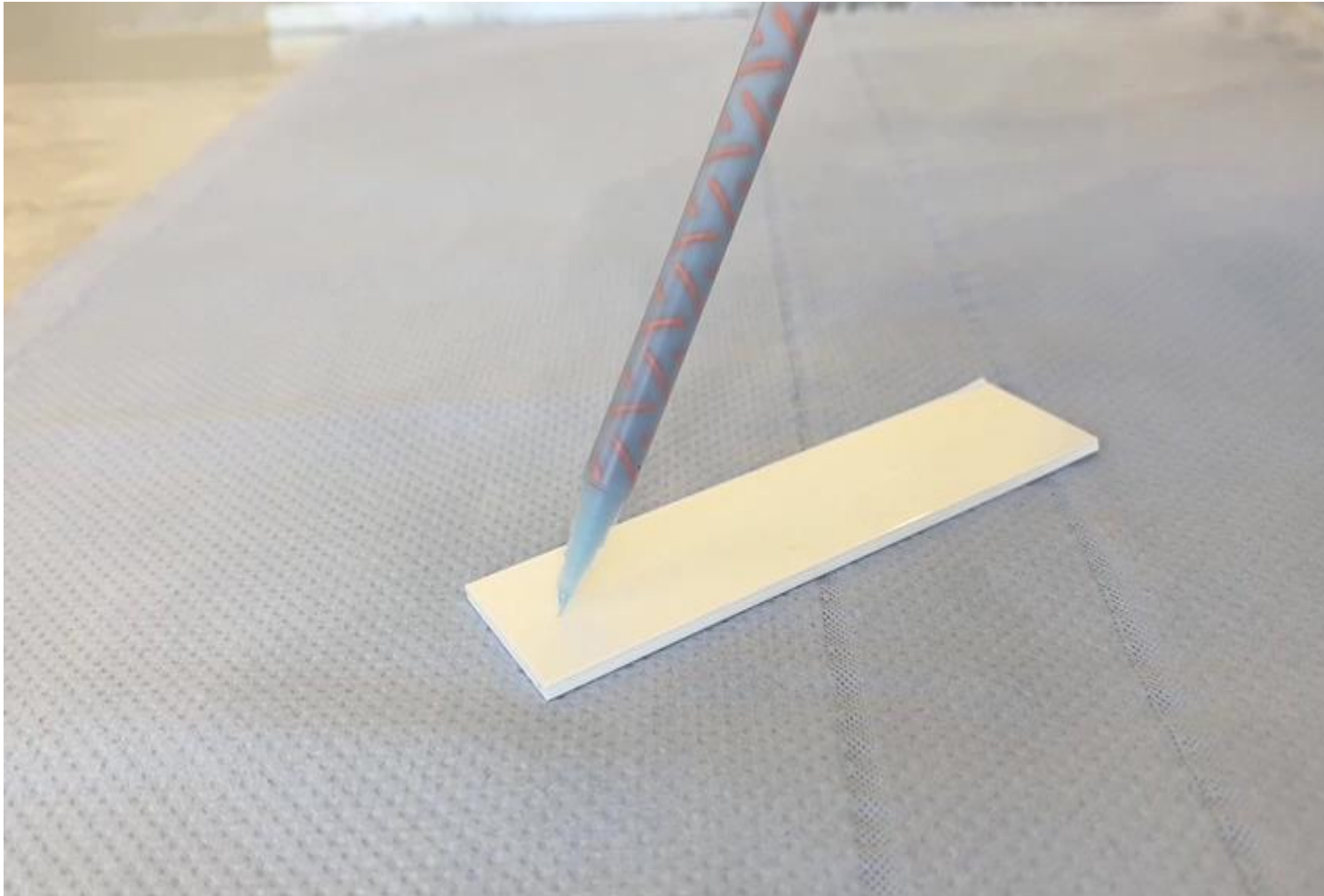
(METHYL-) METHACRYLATE ADHESIVES - LAP SHEAR STRENGTH

- Tensile shear strength acc. to DIN EN 1465
- Curing: 24 hours at 23°C
- Test temperature 23°C



LIGHTWEIGHT MATERIALS & COMPOSITES

INLINE-QUALITY CONTROL: COLOR-SHIFT FROM BLUE TO DARK GREEN



adhesive is applied



„Big Head®“ set in position



adhesive nearly 70% cured



LIGHTWEIGHT MATERIALS & COMPOSITES

PRODUCT PROPERTIES



Product	Chemistry	Colour	Pot life	Handling strength	Viscosity	Temperature range	Elongation at break	Tensile-shear (Alu-Alu) / *compression shear strength	Product benefits
Unit	---	---	min	min	mPas	°C	%	MPa	
7430	Epoxy	Grey	40 - 50	~ 240	pasty	-60 bis +100	3 - 5	> 23	 
7440	Epoxy	Black	40 - 60	~ 180	pasty, thixotropic	-60 bis +180	4 - 6	> 24	  
7490	Epoxy	Black	120	~ 510	pasty, thixotropic	-40 bis +180	4 - 6	> 33	 
1665	Methacrylate	Green	3 - 6	8 - 13	100.000 thixotropic	-55 bis +120	~ 100	> 19	 
1675	Methacrylate	Green	2 - 4	~ 4	100.000 thixotropic	-55 bis +120	~ 85	> 21	  
1680	Methacrylate	Green	8 - 12	~ 17	100.000 thixotropic	-50 bis +120	~ 65	> 17	  

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Success Stories and application solutions

SUCCESS STORY

BONDING CFRP-CFRP: VISIBLE PART OF A SPORTS CAR (EXTERIOR)

Challenges/ Requirements

- + Accomplishment of an invisible glue line «Bond line read through»
- + No reduction of performance criteria after 2000 h test at @ 180°C
- + Ensurance of a defined bonding gap
- + Processing time of 45 min due to manual application
- + Fulfilling of Ferrari/FCA specifications

Kisling Solution : 7440

- + Temperature range up to +180°C
- + Excellent bonding on composite and metals
- + Low shrinkage capabilities
- + Excellent chemical and aging resistance

Customer Benefit

- + Improved optical glue line quality due to black 2K epoxy and low shrinkage capabilities (no BLRT)
- + Reduction of part production cost as part can be painted directly. No post processing of glue line necessary.
- + Ideal compliance with cycle time (part vs. curing)
- + Fulfillment of Ferrari/FCA specifications



SUCCESS STORY

BONDING CFRP-PLASTIC: PLASTIC HOLDER

Challenges/ Requirements

- + Good adhesion of ABS to CFRP
- + Fast handling strength and curing (<15min)
- + Easy to dosing
- + Reliable supply and quality of the adhesive

Kisling Solution : 1665

- + Good adhesion to many different materials
- + Gap filling up to 10 mm
- + Excellent resistance to dynamic loads
- + Colour change during curing enables visual process control
- + Resistant to environmental and damp climates

Customer Benefit

- + Fixture time saving of 20% due to very fast strength build-up of the adhesive
- + Very good adhesion of ABS to CFRP
- + Reliable supply of adhesive



SUCCESS STORY

BONDING GFRP-METAL: BUS - BONDING OF FRONT END MODULE

Challenges/ Requirements

- + Replacement of screws by adhesive
 - improved mechanical performance (no damage of substrate)
 - bonding and sealing in one
- + Non-sag due to vertical application of the adhesive
- + Gap filling properties in order to compensate part tolerances
- + Flexible adhesive due to different CTE of the materials

Kisling Solution : 1665

- + Gap filling up to 10 mm
- + Minimum adhesive layer 75 µm (spacer)
- + Colour change during curing enables visual process control
- + low odour
- + DIN EN 45545-2 certification

Customer Benefit

- + Very good gap filling properties of the adhesive
- + Reliable quality and supply of the adhesive
- + Strong support by Kisling AG



SUCCESS STORY

RAILWAY- BONDING OF FRONT END MADE OF GFRP

Challenges/ Requirements

- + Long open time of min. 45min
- + Fast curing after pot life - important for post-processing steps
- + Very good grindability properties (very dry adhesive surface) for subsequent painting process
- + Gap filling properties in order to compensate part tolerances
- + Material to pass EN 45545-2 R1 & R17

Kisling Solution : 7430

- + Universal and high strength
- + Good gap filling properties
- + Very good adhesion to metals
- + Good chemical resistance
- + Certification acc. to DIN EN 45545-2 R1, R7, R17; HL 1-3

Customer Benefit

- + Optimal processing time of up to 50min (manual application of adhesive, positioning & fixing of the parts)
- + Fast curing after pot life in order to shorten time to post-processing work (grinding)
- + Very dry adhesive surface after cure for optimal grinding operation
- + 7430 passing DIN EN45545-2 R1& R17, HL1-3



SUCCESS STORY

HOLDER ON MEDICAL DEVICE

Challenges/ Requirements

- + Good adhesion to different materials
- + No smell during bonding process and afterwards in operation
- + Very fast curing of <5min

Kisling Solution : 1675

- + Gap filling up to 10 mm
- + Minimum adhesive layer 75 µm (spacer)
- + Colour change during curing enables visual process control
- + low odour
- + DIN EN 4545-2 certification

Customer Benefit

- + Inline quality control: Colour change of adhesive indicates initial strength
- + 20% time saving to reach handling strength
- + no smell during bonding process (low odour)



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**Thank you for your
attention!**



Kisling