BOSTIK

ATTACHED TO YOUR WORLD

REPLACING MECHANICAL FASTENERS WITH STRUCTURAL ADHESIVES

Adhesive & Bonding Expo Europe
Stuttgart, December 5th 2024

Bostik, the Adhesives Solutions of Arkema

KEY FACTS

€ 3 billion
Annual Sales 2022

6,000+
Employees

4 Global
Smart Technology Centers

OUR MARKETS

DURABLE GOODS | ADVANCED PACKAGING
CONSUMER | CONSTRUCTION
Our adhesives are almost everywhere.

WORLD-CLASS
LEADER IN
ADHESIVE & SEALANT
TECHNOLOGIES

Pliogrip™
Structural Adhesives

ADHESIVE SOLUTIONS OF ARKEMA

ARKEMA

"A LEADER
IN SPECIALTY MATERIALS"

BOSTIK

€11.5 billion
Annual Sales 2022

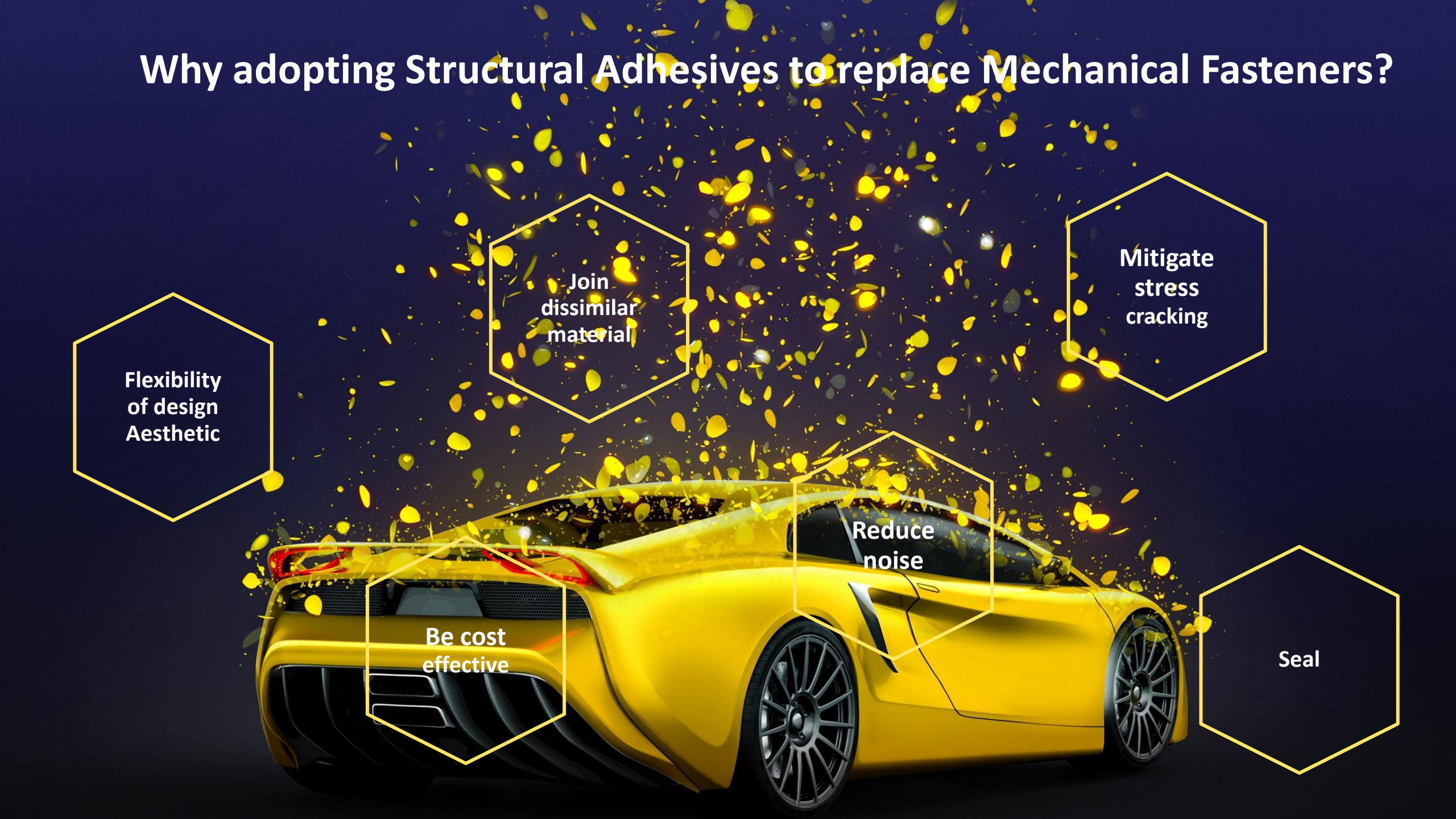
BUSINESS EXPANSION

Significant business expansion through recent acquisitions.

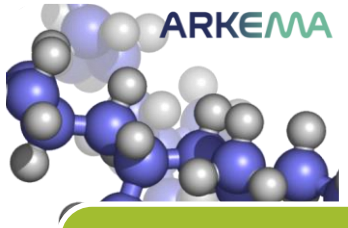
2023
2022
2020
2019
2018
2017

Polytec PT
Ashland always solving
Performance Adhesives
PROCHIMIR TECHNICAL FILMS
fixatti performance driven polymers
AFINITICA
Nitta Gelatin

Why adopting Structural Adhesives to replace Mechanical Fasteners?



Structural Adhesives are part of a complex ecosystem



Raw Material supplier

- Regulation expertise

Adhesives formulators

- Manufacturing structural adhesives
- Technical expertise

Dispensing OES

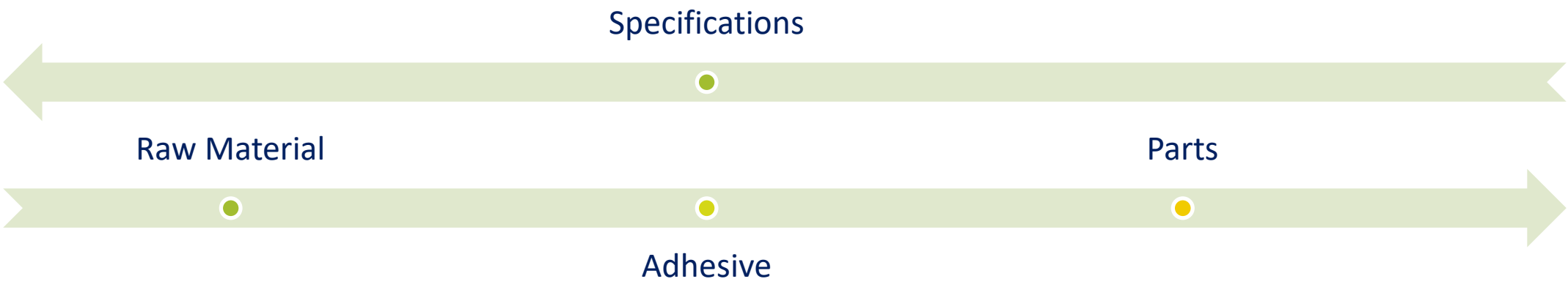
- Equipment offering
- Trials

Tiers 1

- Reactivity
- Processability
- Cycle time
- Adhesion validation
- Part cost calculation
- EH&S profile

OEM

- Final asembly
- Bonding on the production line
- Validation laboratory for adhesive mechanical profile
- Aging resistance
- Emissions.



Challenges & Keys for Structural Adhesive successful use

Raw Material supplier
- Regulation expertise

Adhesives formulators
- Manufacturing structural adhesives
- Technical expertise

Dispensing OES
- Equipment offering
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- Reactivity
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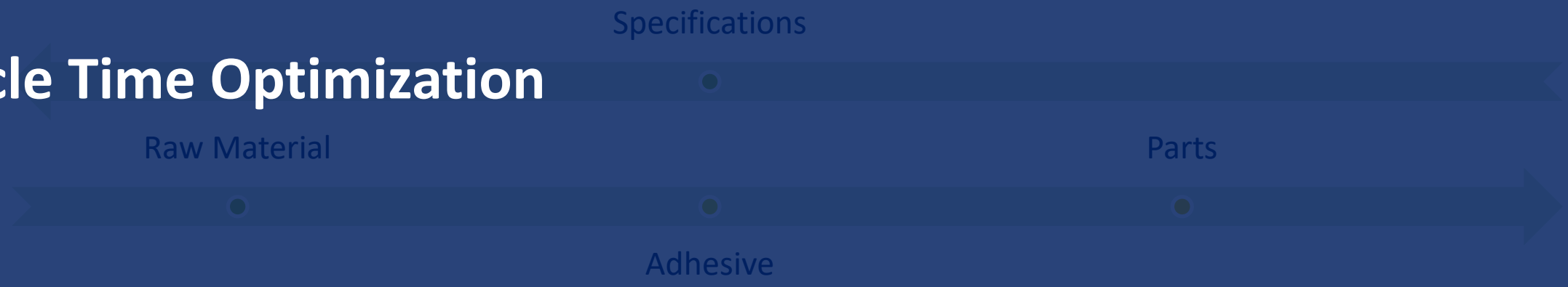
Bonding Design Validation

Ease of Application

Cycle Time Optimization



How Bostik Structural adhesive answer the challenge?

High performance two component structural, semi-structural and elastic adhesive systems

Innovative systems focusing on quality, productivity and steady technological progression

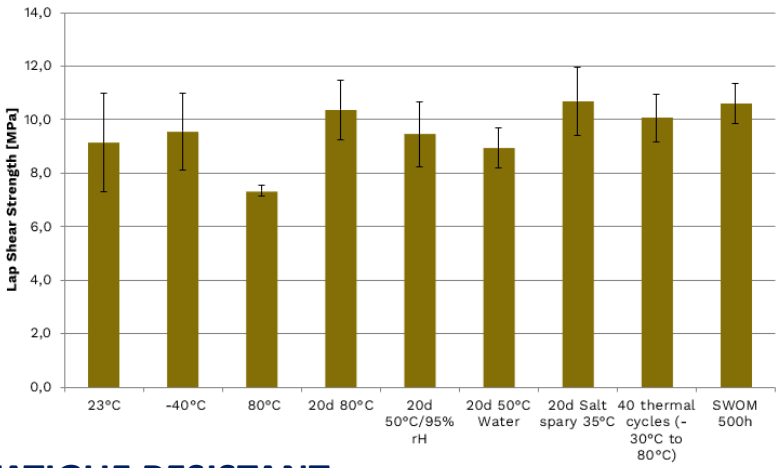
Product development based on market requirements and predominantly automotive OEM specifications

Automotive and heavy truck application references from more than 50 years

Bostik is supporting the Bonding Design Validation

EXCELLENT STRENGTH RETENTION

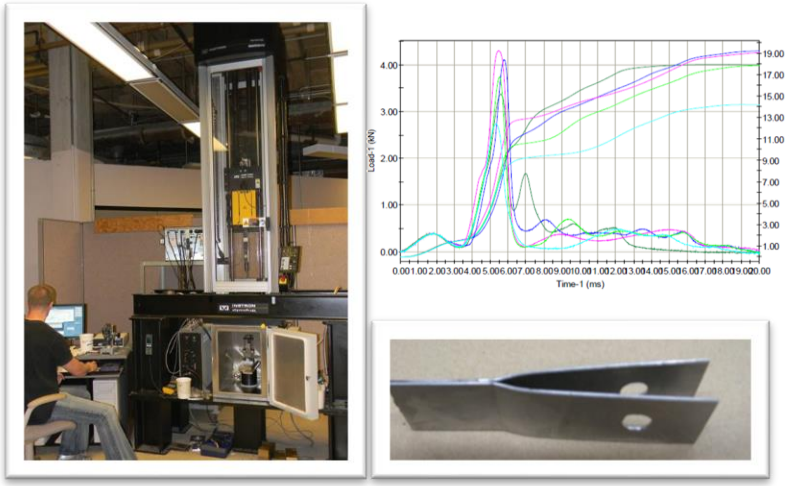
EN1465– Lap shear performance CFRP



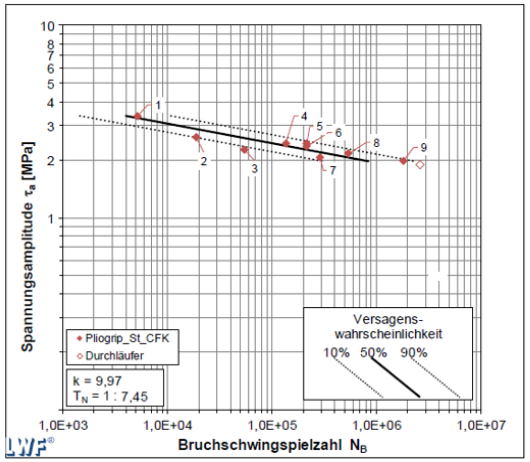
Joint Robustness can be assessed in many ways to validate adhesive suitability versus final OEM expectation

BOSTIK provide data to support application and adhesive integration

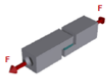
IMPACT TOUGHNESS



FATIGUE RESISTANT



Prüfmethode
Wöhlerversuch
Prüffrequenz
f = 10 Hz
Lastverhältnis
R = 0,1
Abbruchkriterium
Bruch
Werkstoffkombination
S235 JRG2+C / CFK
Klebstoff
Pliogrip 9100-9115
Klebparameter
Oberfläche CFK: Korund
Überlappungslänge: 12 mm
Klebschichtdicke: 1 mm
Probengeometrie
Dicke Scherzugprobe

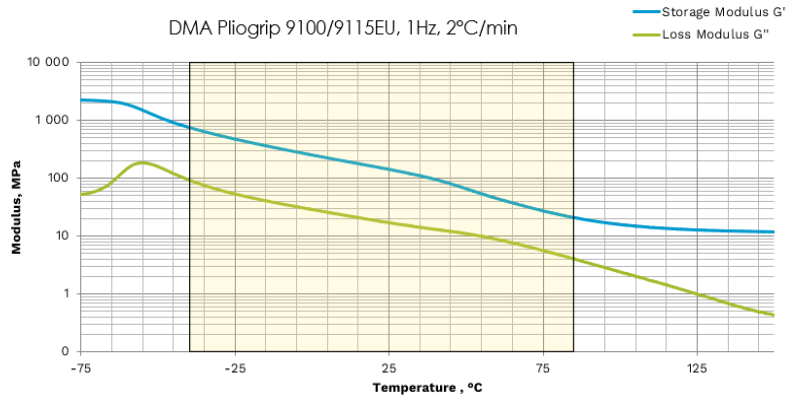


Note: Data generated on Steel / CFRP bonds.
SCF failure mode
Wöhler curves are substrate specific

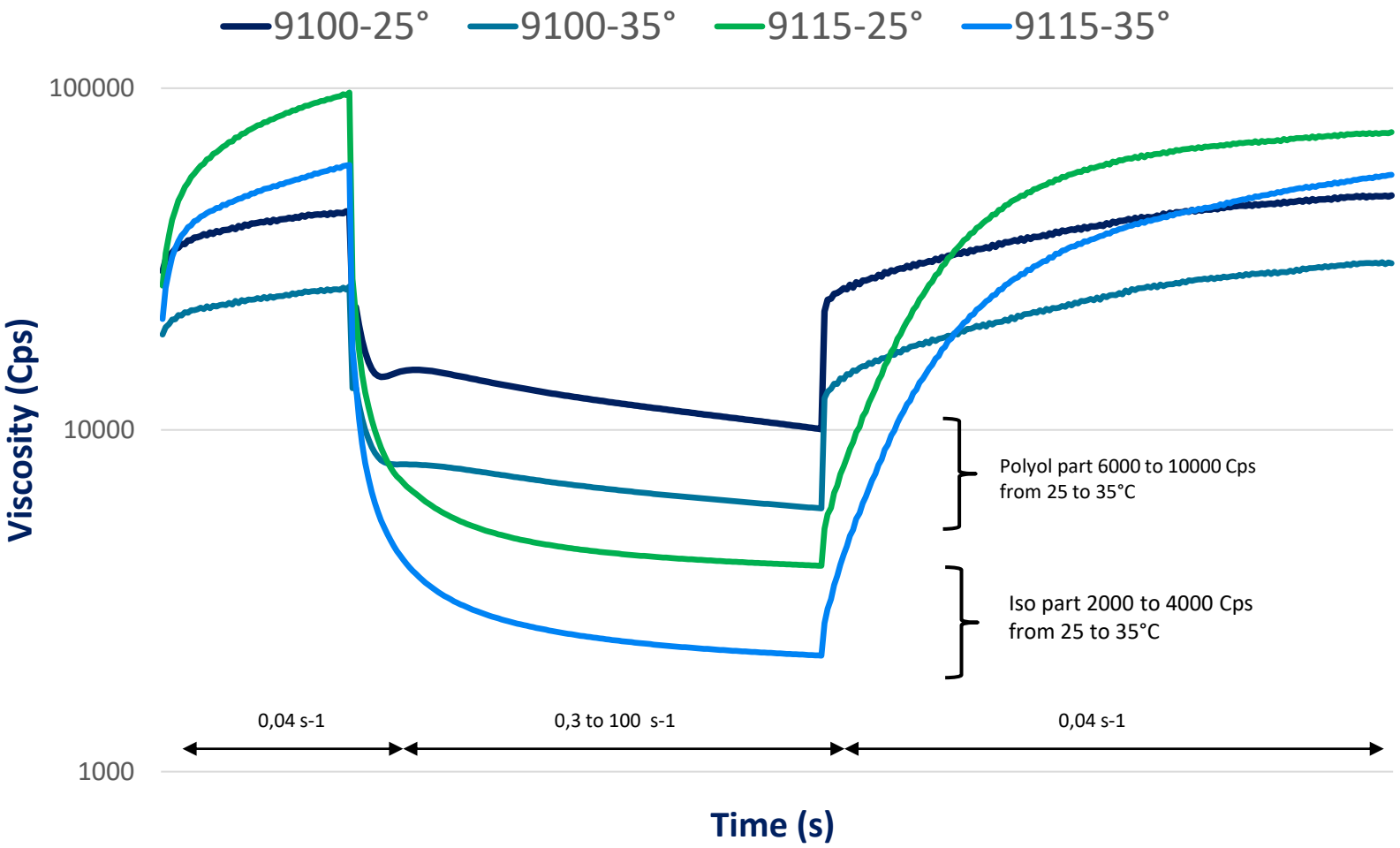
Tensile Strength	17 -20 MPa
E-Modulus	250 -350 Mpa
Elongation	60-70 %
Paint T°C	up to 190°C

NEARLY FLAT STORAGE MODULUS

Dynamic Mechanical Analysis (DMA)



Ease of application with Bostik Structural Adhesive



Low viscosity components
Easy dispensing

High stability
Easy storage

Similar in pails, drums and cartridges
Easy for scale-up

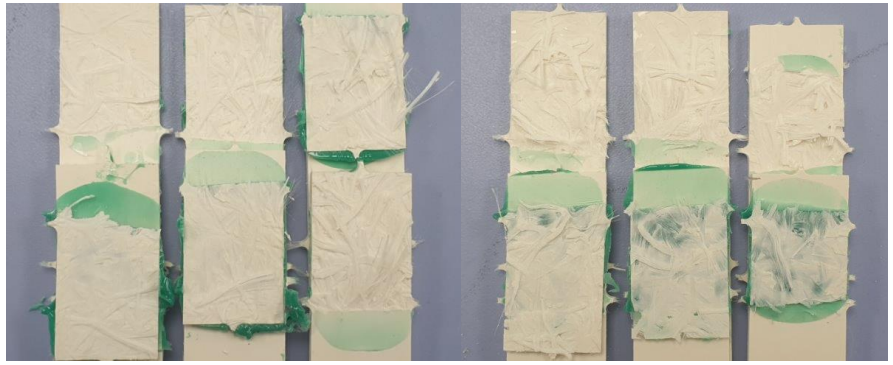
High sag resistance
Suitable for vertical and overhead applications

High reproducibility
Robust process

Cycle time optimization with limited surface preparation

For large volume applications with short cycle times

Comfortable Open Time (15 - 20 min)



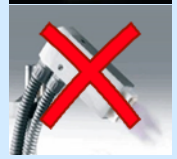
2nd substrate applied 10 & 15 min after bead application.
1 mm bond line / water wipe / 210 sec at 83°C

Ideal for structural composite and mixed material assemblies

Fiber reinforced composites (RTM, SMC, CFRP)
Coated metals
Many thermoplastic materials

NO PLASMA

NO FLAME



NO PRIMER / ACTIVATOR

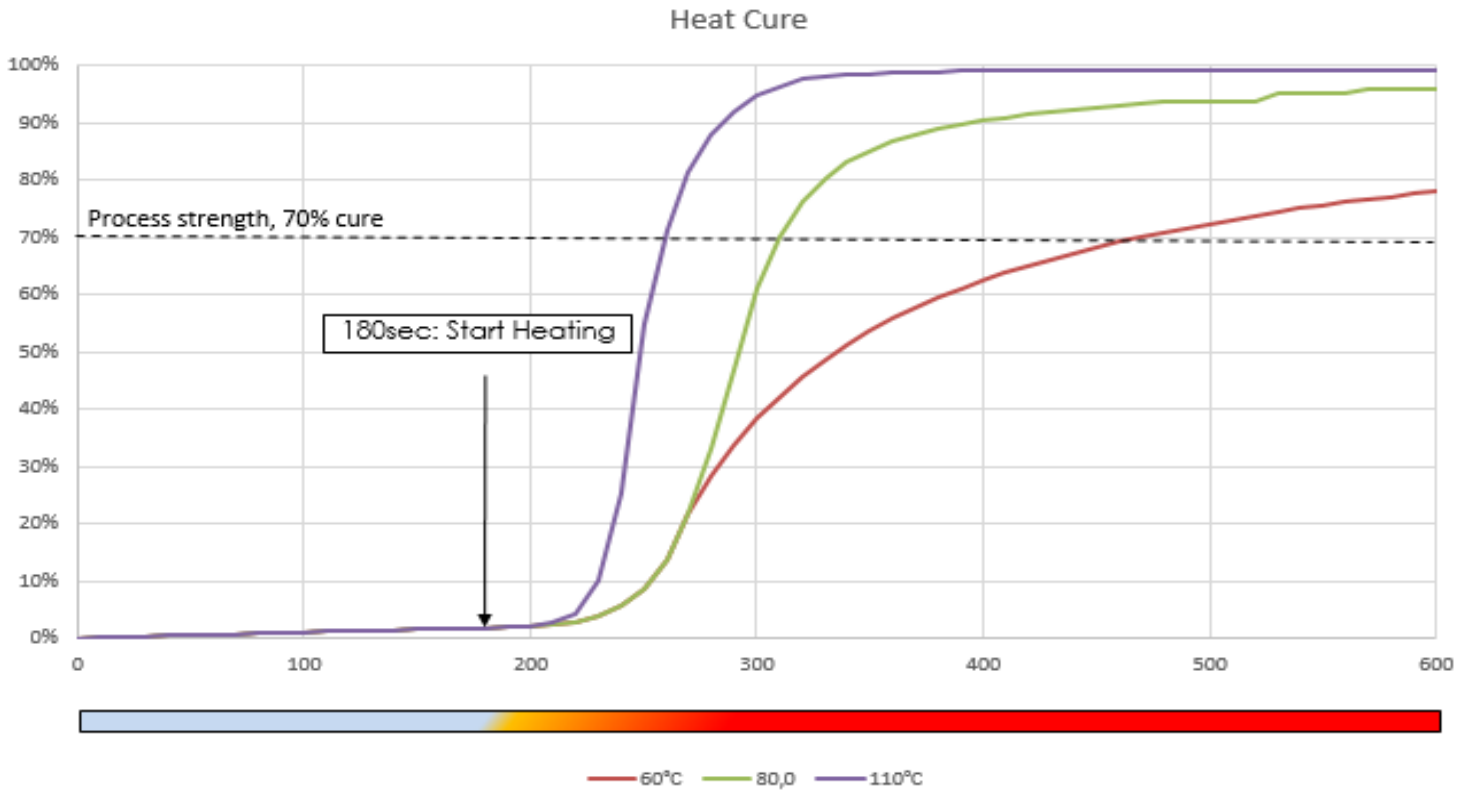
NO ABRASION

Conditions : Heat Cure > 80°C

For inline processes : No preparation
For stored parts : dry or solvent wipe
For parts stored outside and curing at lower temperature, a slight scuff of the surface is recommended

Cycle time optimization through cure profile

Crosslinking profile versus applied heat cycle



Heat rate ca 10°C/min until max temperature of 60, 80 or 110°C is reached.

Conversion (crosslinking) calculated from kinetic data (DSC).
Verified on production parts.

Process strength (hot part) is reached at app 70% conversion.

The adhesive in this state can be trimmed, cut and milled after cool down.

Extensive options for cycle time reductions and productivity increase

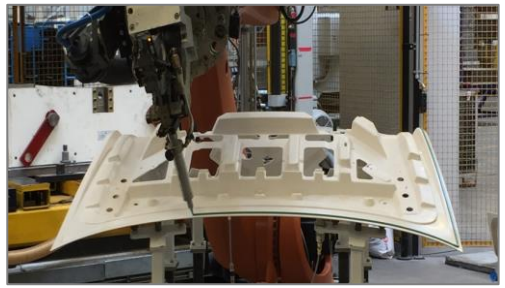
Case study of Bostik Pliogrip™ successful use

“Switching to Pliogrip 9100/9115 was a game changer”

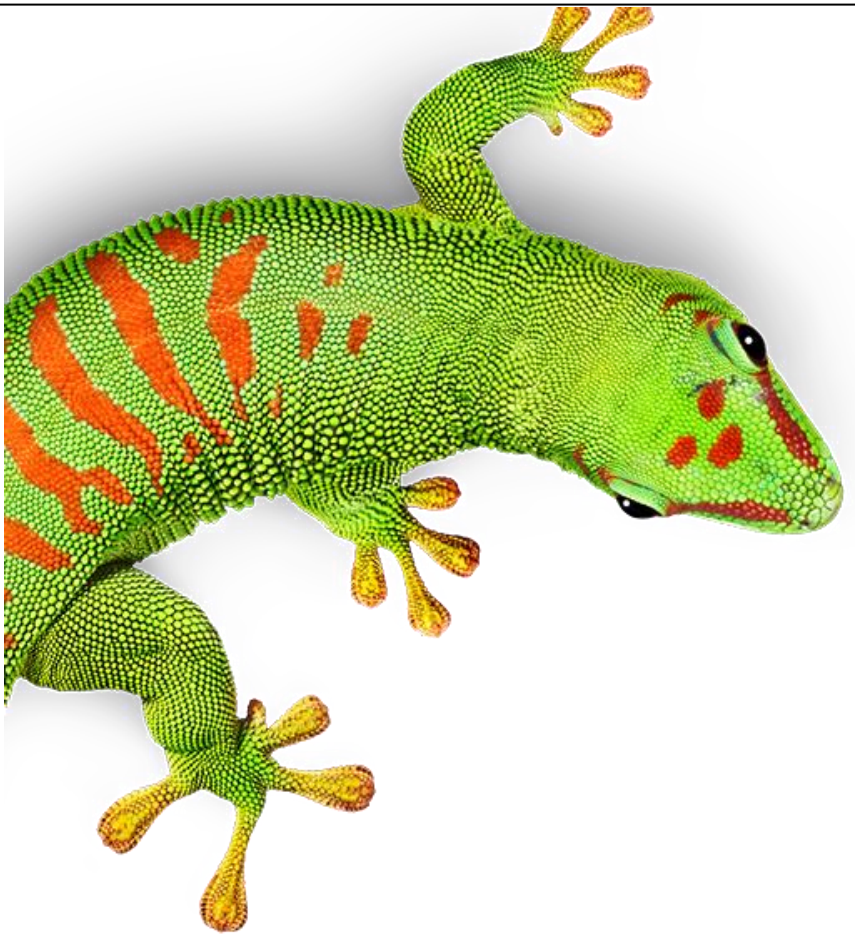
From a commodity RT curing 2-part PU system to Pliogrip 9100/9115 with blocked catalyst

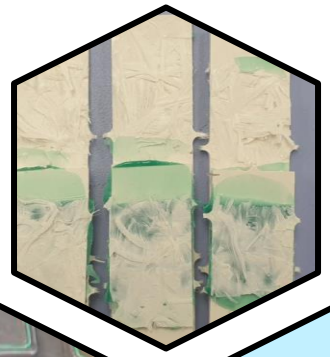
- robust processing through static mixer with reliable mix ratio
- elimination of drum stirrer
- from plasma pretreatment to “no surface prep”
- savings for mixers of app several X0.000€ / yr
- introduction of Inline process (moulding, application, cure)
- vertical and over head application, no sagging or leaking
- reduction of cycle times from 45 min (RT cure) to 90 sec (heat cure)
- class A optical parts

The capital invest of heating fixture was amortized in no time



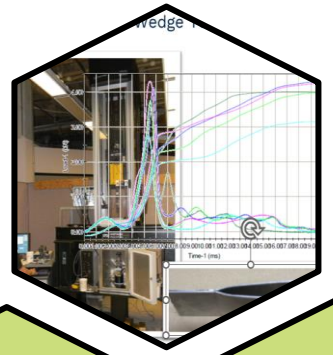
Bostik Pliogrip™ Structural Adhesive Benefits





Join dissimilar material

Flexibility of design Aesthetic



Limited surface preparation

Bonding design validation

Mitigate stress cracking

Reduce noise

Ease of application

Be cost effective

Cure profile optimization

Seal

We welcome any questions

Benoît PERRIER
Global Automotive Director
Durable Goods

benoit.perrier@bostik.com

Nathalie PARENT
Global Business Development Manager
Structural Adhesives Mobility

nathalie.parent@bostik.com