



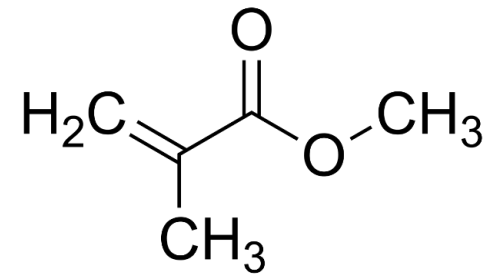
## Structural Adhesives – Engineering Adhesives – Hot Melt Adhesives Dispensing Accessories – Metering and Dispensing Equipment

- Chemical engineer, 45 years, married, 3 children
- EWS - EAE (European Adhesive Engineer)
- 6 sigma Black belt
- 1st contact with adhesives 1996, developer at Baxter (fibrin glues for human body repairs)
- Process Engineering in PCB business, AT, IND, CN, GER (technical & management)
- Technical sales at Polychem (composite distributor) (1st contact with industrial structural adhesives 2002)
- ITW Plexus (4 years)
- IPS Weld ON / Scigrip (6 years)
- EBS Acralock (since 2011)
- Owner of Mayer & Mayer HandelsgmbH and Coowner of EBS Acralock



**„Kleben ist mein Leben“**  
**„Bonding is my Purpose of Life“**

**„New Structural MMA Adhesives**  
as full  
technical and economic  
**replacement**  
for all  
**structural and semi – structural**  
bonding operations! “



### Mayer & Mayer:

- Trading company in AT, founded 2006
- Trader / Distributor of Adhesives, Metering and Dispensing equipment and Dispensing accessories
- Manufacturer of Metering and Dispensing Equipment
- Bonding Process development and Optimizations (EAE Expertise)
- DIN 6701 railroad certified testing laboratory.
- Loanpackaging and Logistic partner for EBS/Acralock

### Engineered Bonding Solutions:

- Adhesive manufacturer from USA, founded 2010 with European Headquarter in Austria
- Specialized in development and production of MMA adhesives (patented formulations # ACRALOCK)
- Unique MMA adhesive portfolio from High Strength to High Elongation products
- Customized products for special processes (e.g. products for injection)
- Top 3 MMA structural adhesive producer (around 750 to's 2018)

- Started mid 2006
- Adhesives
- Accessories
- Equipment
- Engineering



**Structural Adhesives – Engineering Adhesives – Hot Melt Adhesives  
Dispensing Accessories – Metering and Dispensing Equipment**





- Production
- Product Development
- Technical Laboratory
- World Wide Sales



- East Part of Austria
- In Mid of North/South Axis between Vienna and Graz
- Direct on Highway A2
- [www.bondingexperts.at](http://www.bondingexperts.at) and [www.acralock.eu](http://www.acralock.eu)





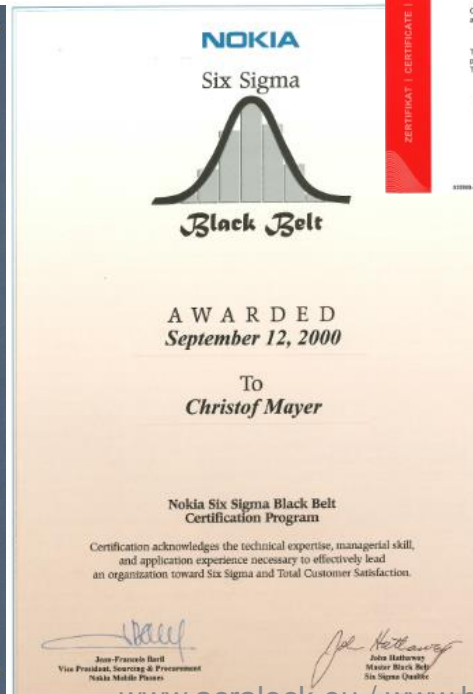
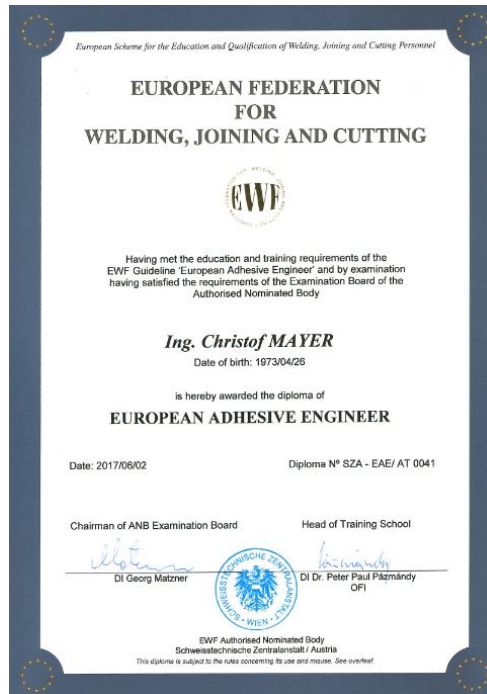
50 kN

- Chemical analysis
- Rheology
- Thermal Analysis
- Climate testing
- Quasistatic Testing
- Dynamic Testing
- Surface Testing
- Electrochemical Analysis





- Full ISO 9001-2015 certified
- Laboratory DIN 6701 certified



- EAE Expertise
- 6 Sigma Black Belt Expertise

- Fire Approval EN 45545-2
- Marine Approval Rina
- IMDS H&S approved

Engineered Bonding Solutions GmbH  
Attn. Mr. Mayer  
Gewerbeweg 16  
7411 Markt Althaus  
AUSTRIA

2014-05-20  
Bic

Re: Classification of adhesives PA. no. 412.239

Dear Mr. Mayer,

Hereby we can confirm,  
that the Acrolac adhesives as mentioned below, manufactured by Engineered Bonding Solutions  
tested as reference types to their product series with certain process time adjustments

Acralock SA 10-15 BLK, representative for the Acralock SA 10 LV series  
Acralock SA 1-15 NAT, representative for the Acralock SA 1 series  
Acralock SF 10-30 BLK, representative for the Acralock SF 10 series

tested according to below experimental setup according to the standard EN 45545-2

set up: Aluminium sheet, thickness = 1mm  
Adhesive layer, thickness = 1 mm  
Aluminium sheet, thickness = 1mm

fulfil the requirements of the European Standard EN 45545-2 as summarized in the tab.1 as follows:

**Tab.1: adhesives, test criteries, requirements and test results**

Test	Standard EN-480	Requirement	SA10- 15 BLK	SA1- 15 NAT	SF10- 30 BLK
Gas density	5659-2	R1, HL3	pass	pass	pass
Toxicity	5659-2	R1, HL3	pass	pass	pass
Heat release (Wahre)	5080-1	R1, HL3	pass	pass	pass
Spread of flame	5080-2	R1, HL3	pass	pass	pass
Inflammability	5080-3	R1, HL3	pass	pass	pass

Best Regards  
ing. Michael D. Jones



CERTIFICATO DI OMOLOGAZIONE DI TIPO  
TYPE APPROVAL CERTIFICATE  
N. DIP07491SCS

*Si certifica che il seguente prodotto soddisfa le prescrizioni delle norme RINA per l'omologazione di tipo.  
This is to certify that the product identified below is in compliance with the applicable requirements of the RINA type approval system.*

<b>Descrizione</b> <i>Description</i>	<b>Adesivo Strutturale</b> <i>Structural Adhesive</i>
<b>Tipi</b> <i>Type</i>	<b>ACRALOCK SA 10</b>
<b>Fabbricante</b>	<b>MATES ITALIANA SRL</b>
<b>Luoqo di produzione</b> <i>Manufacturer</i>	<b>VIA FACINOTTI 4</b>
<b>Place of manufacture</b>	<b>20099 Segrate (MI)</b>
<b>Norme di riferimento</b> <i>Reference standards</i>	<b>ITALY</b>
	<b>RENA Rules for the Classification of Pleasure Yachts</b>
	<b>RENA Rules for the Classification of Pleasure Yachts</b>



**RINA Services SpA**  
L. Fuoco

Rilasciato a Genova il 26 Gennaio 2017. Questo  
Certificato è valido fino al 25 Gennaio 2022  
*Issued in Genova on January 26, 2017. This Certificate is valid  
until January 25, 2022*

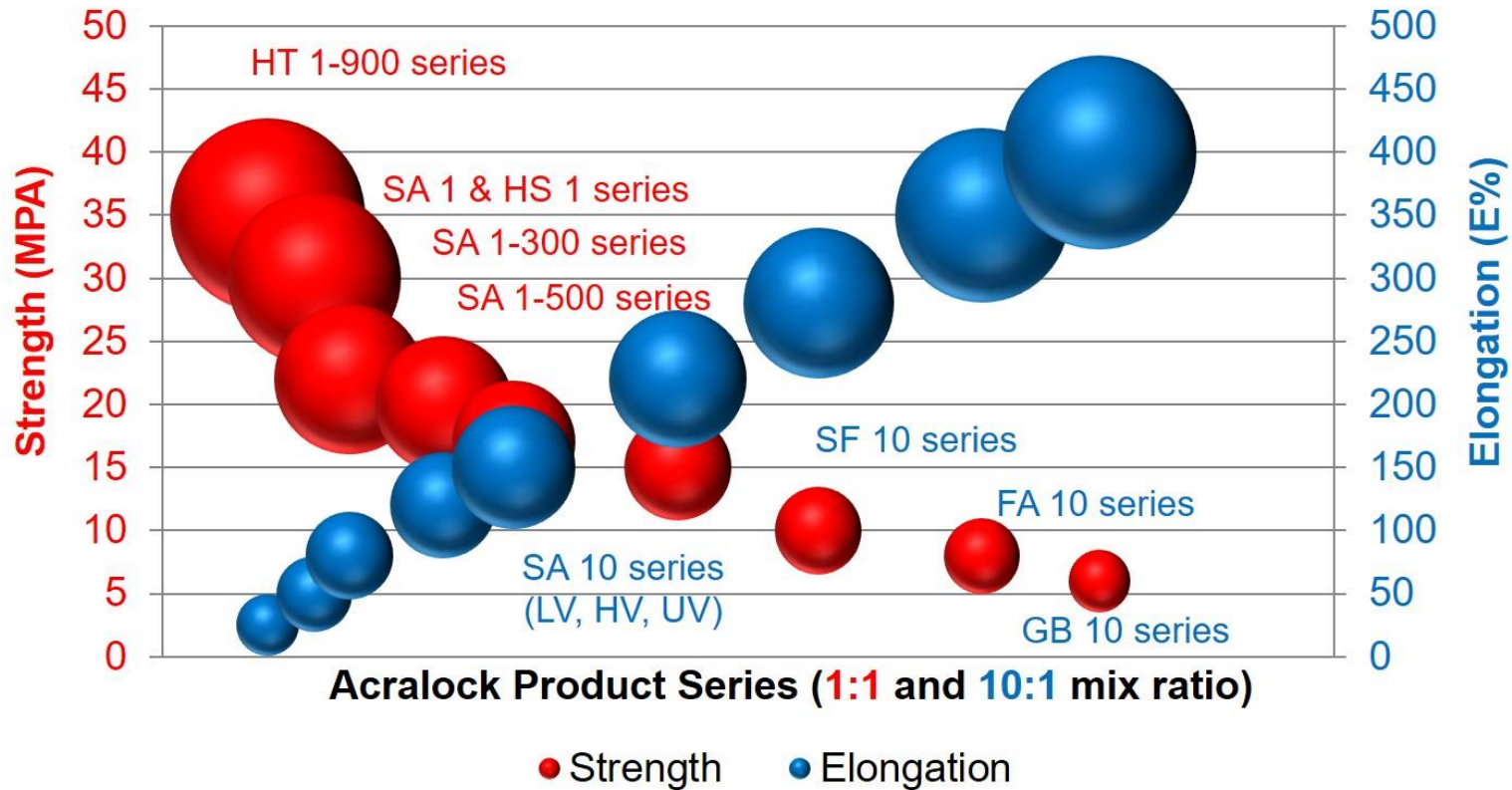
Questo Certificato e' composto di 1 pagina e di 1 allegato  
This certificate consists of this page and 1 enclosure

RMA Services S.p.A.

Extra

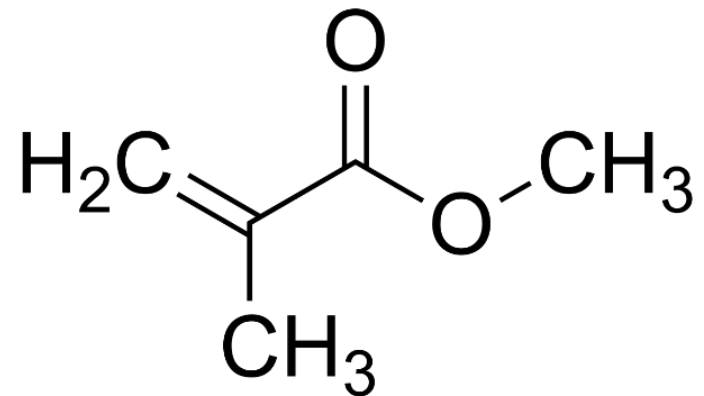
REMA Genova S.p.A.  
Via Corsica, 12 - 16126 Genova  
Tel. +39 010 53851  
Fax +39 010 5381000

## Basic Mechanical Properties of EBS Acralock Structural MMA Adhesive Product Range



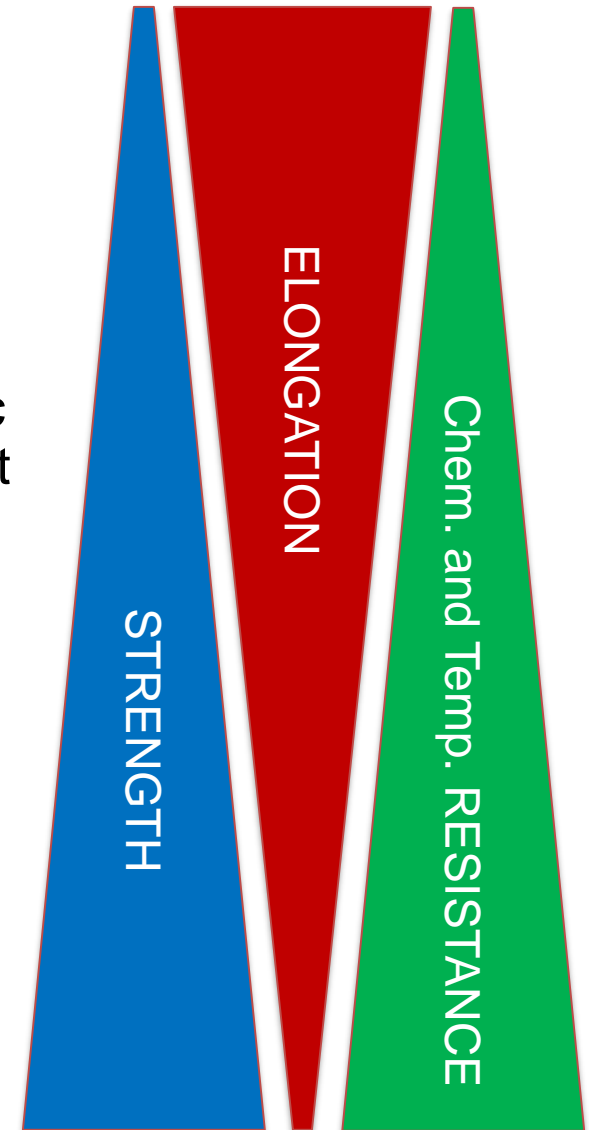
# 100 % MMA based Adhesive Technology

# „Introduction“

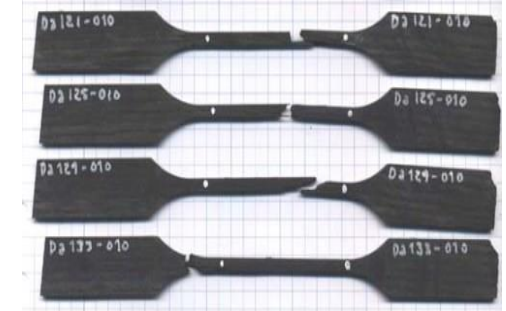
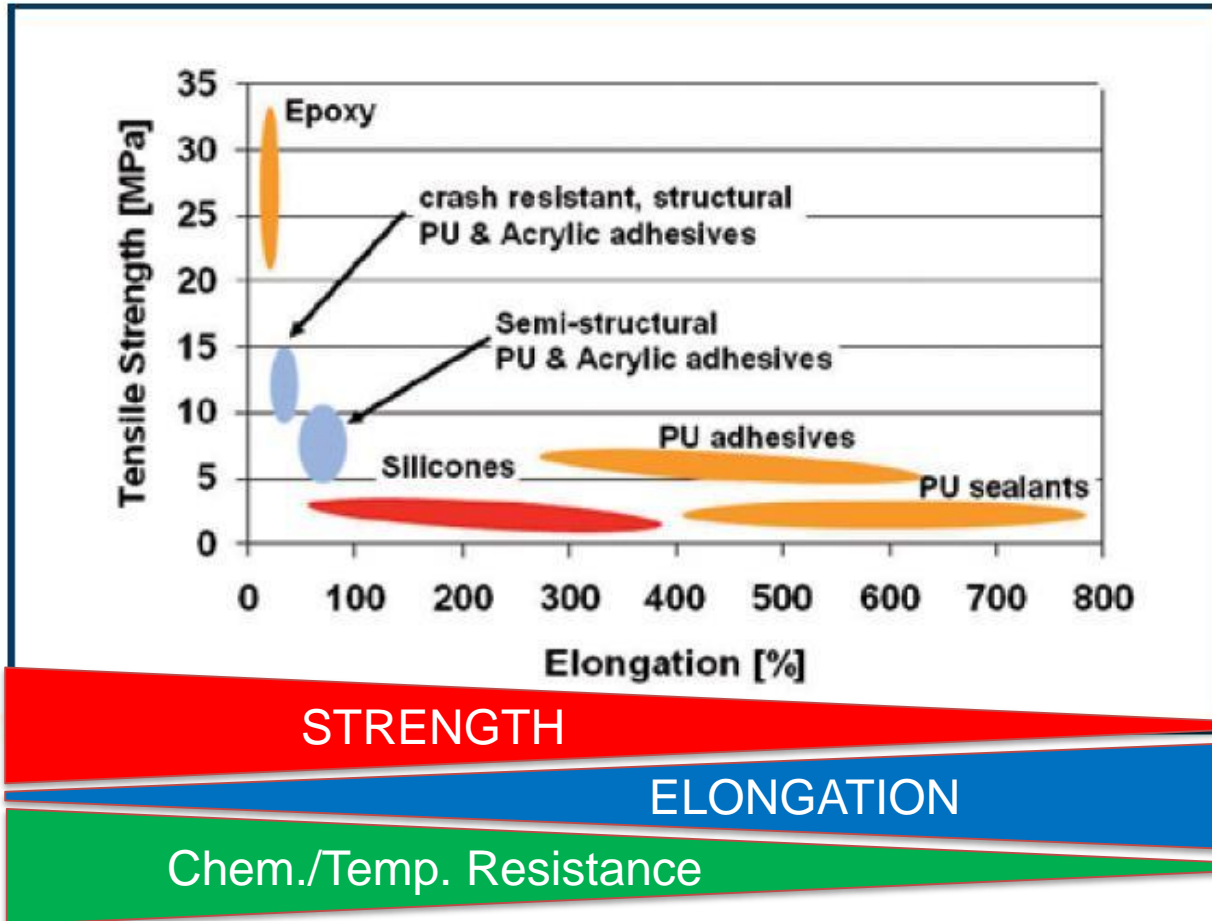




- Classic “sealing bonding” operations
  - 1 component systems like PU, MS and SI
  - Big bonding surfaces
  - Mainly used in combination with the classic joining methods or as direct glazing sealant adhesives
- Pure “real structural” bonding operations
  - Elastic/Semi - Structural Bonding
  - Structural Bonding
  - High Performance Structural Bonding

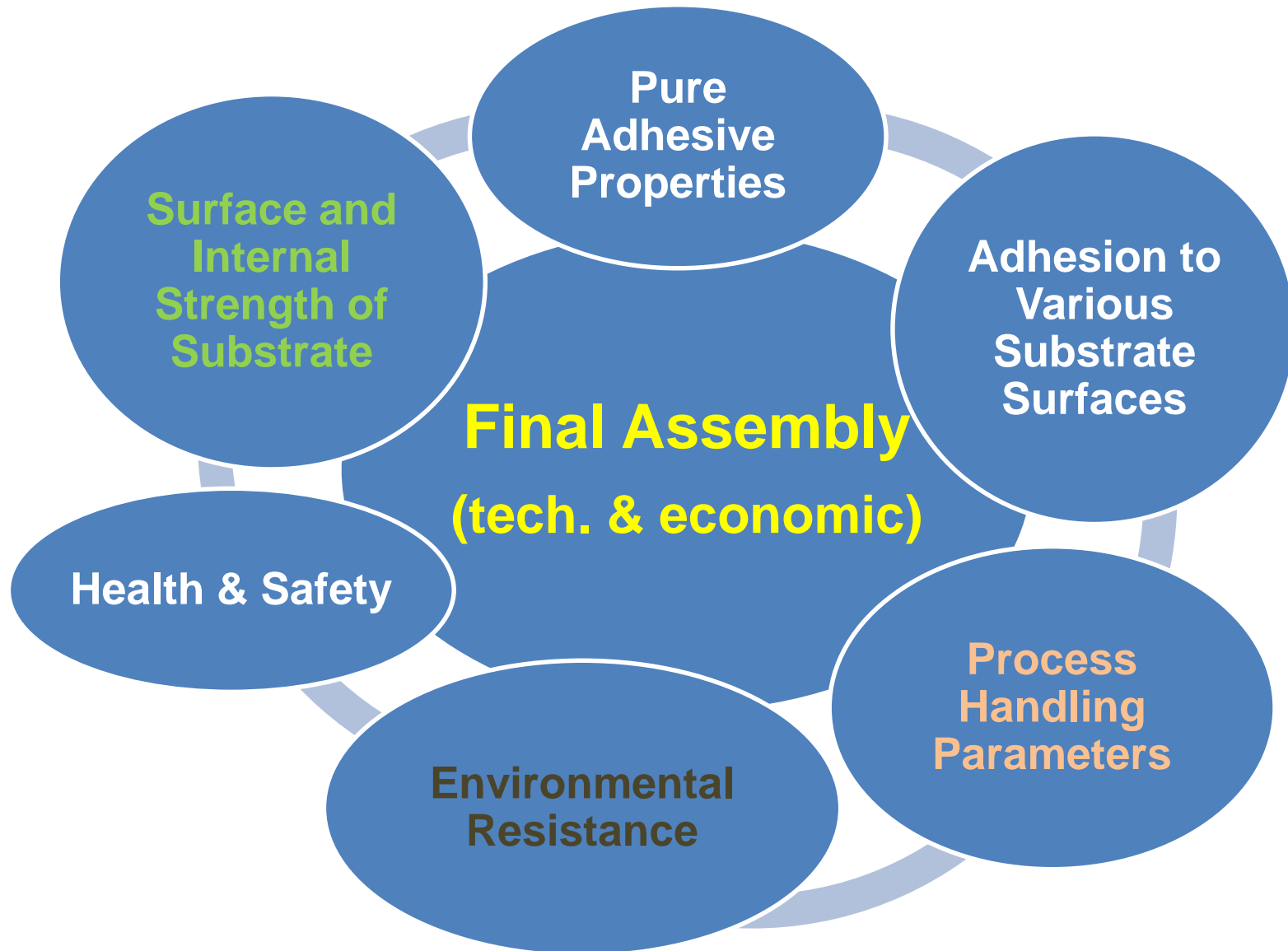


- System based on its chemical basic background.
- Chemical basic background = reason for certain basic properties of each adhesive system



## Quasistatic Stress as

- Tensile Strength
- Single Lap Shear Strength
- Elongation
- E-Modulus
- Poisson Ratio
- ...



- Less surface preparation on many substrate surfaces
- Fast room temperature cure
- Higher Peel resistance than PU`s and Epoxies
- Higher Creep resistance than PU`s
- Much higher fatigue resistance than PU`s and Epoxies
- Environmental resistance
  - Kataplasma cycle test resistance on most metal surfaces
  - High Temperature resistance (close to RT cure Epoxies)



- Heat Retention lower than high performance epoxy adhesives
- Much Lower creep resistance than Epoxies
- Limitation on bondable substrates
  - Difficult to bond Surfaces (special plastics, metals, etc.)
  - Low strength surfaces (paints, UPE FRP`s, design carbon)
  - Print through on very thin laminates
  - Thermoforming of thin plastic sheets at bondline
  - Deformation of asymmetric parts
  - Climate resistant glas bonding not possible (too strong)
- Certain Odour
- Adhesive / Activator package give again many products
- Material Price

**G` : E**

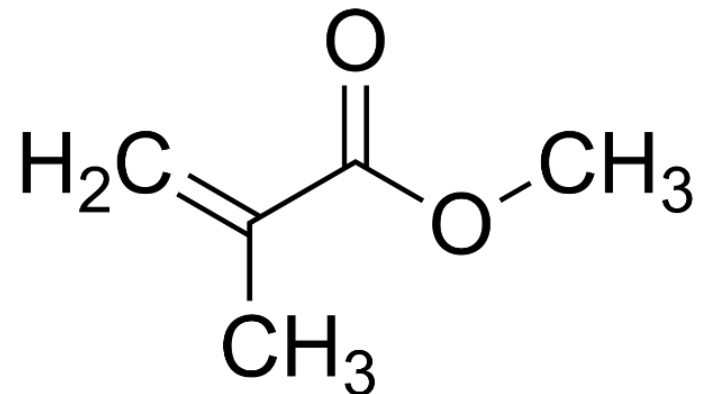
- ➔ Developement of new product range
- ➔ Test and qualify according DIN 6701 and DNV/GL criterias

- Analysis of Targets and Interactions mandatory for whole assembling process → process costs optimizations
- Use of MMA adhesives has several advantages compared to other 2 component room temperature adhesives
- Due to available products and history of MMA applications on the market → limitations in use
- Special actual requirements need special solutions
  - New Materials
  - Material changes (pure plastics to coextruded ones, etc.)
  - Lower part thicknesses
  - Change of process and process steps for cost optimizations (injection of adhesive, bonding before powdercoating, etc.)

Room temperature Curing Systems									
Class	Elastic / Semi Structural			Structural			High Performance		
Reaction	PA	PC		PA	PM	PA	PM	PA	PA
Adhesive System	2 K PUR	2 K MS/STP	2 K SI	2 K PU RI	2 K MMA	2 K EP RT	2 K MMA	2 K Epoxy	Phen / PI
Tensile	Low			Medium			High		
Elongation	High			Medium			Low		
Peel	High			High			Low		
Creep	Low			Medium			High		
Fatigue	Low			High			High		
Temp. Resistance	Low			Medium			High		
Climate Resistance	Low			High			Low		
Product Range	Moderate			Bad			Bad		
Gap Fill	Very Good			Moderate			Bad		
Handling	Bad			Moderate			Very Good		
Bondable Substrates	Moderate			Very Good			Bad		
Surface Preparation	Bad			Very Good			Bad		
Reactivity / Cure Speed	Bad			Very Good			Bad		
Shrink / Print Through	Moderate			Bad			Very Good		
Odour	Very Good			Moderate			Moderate		
Toxicity	Bad			Moderate			Bad		
Product Costs	Very Good			Moderate			Moderate		
Process Costs	Moderate			Very Good			Bad		

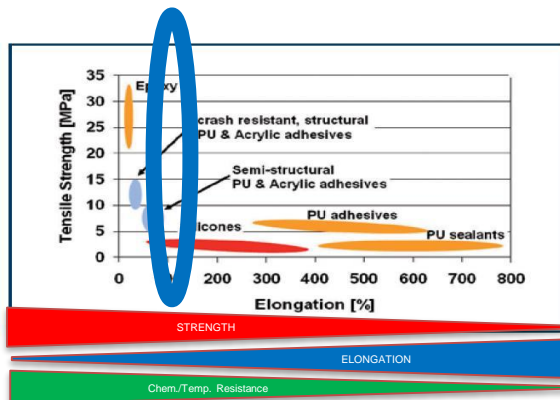
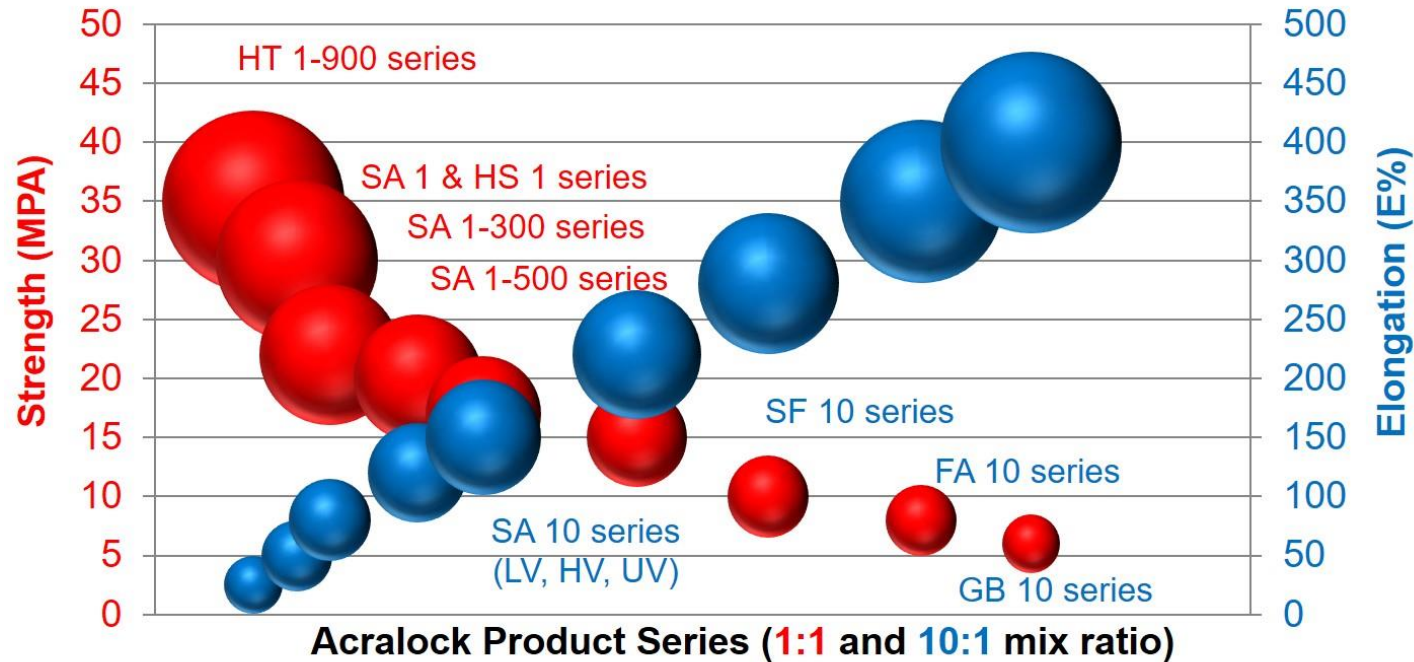
MMA adhesives show a lot of advantages in daily use, but are limited to niche applications due to their medium to high strength properties → Target had to be the development of a pure MMA range with modified mechanical properties without losing the MMA technology advantage lost by EP and PU Hybrid disadvantages!

# „Acralock“ ... pure MMA based... Structural Adhesive product range

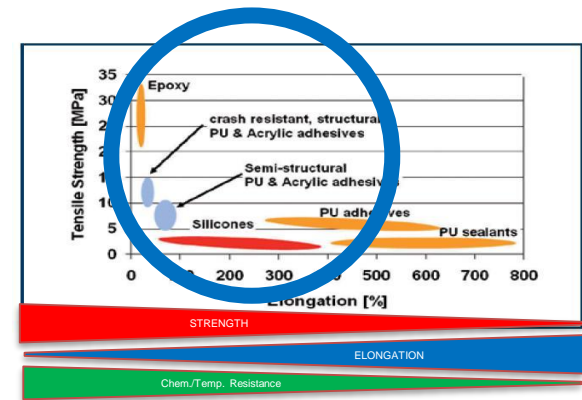




## Basic Mechanical Properties of EBS Acralock Structural MMA Adhesive Product Range

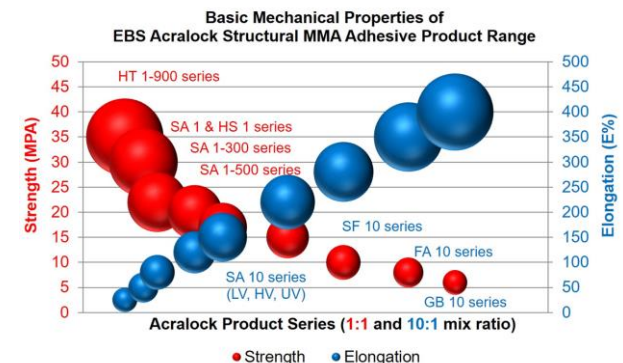


● Strength ● Elongation

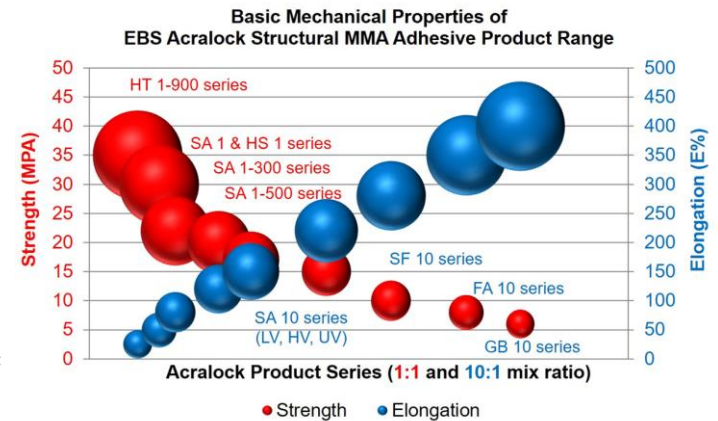
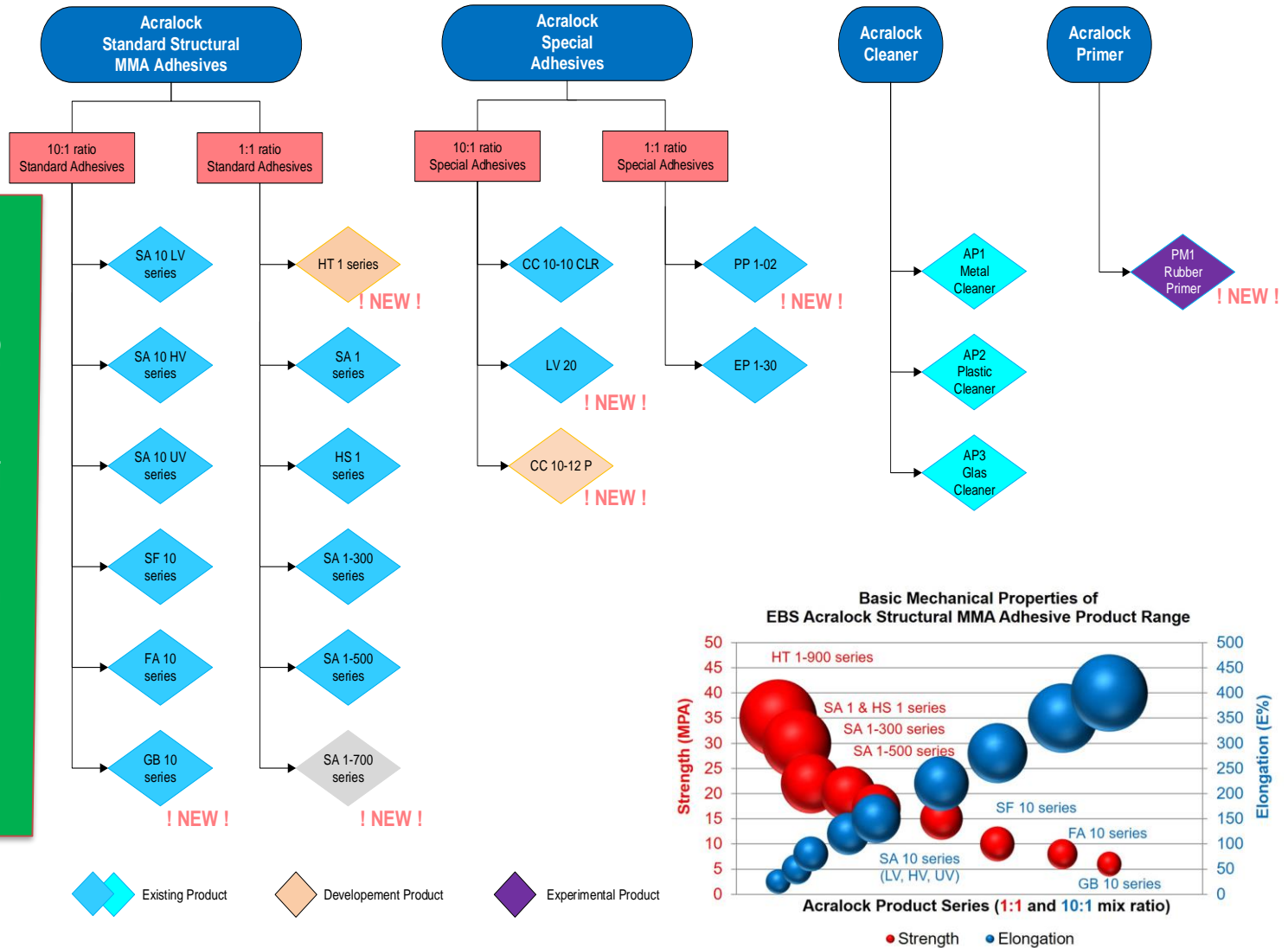


- Extending the product range to both sides
  - Acralock HT 1-900 series for high strength and high temperature retention applications
  - Acralock SF and FA 10 series as medium Elongation adhesives for all less surface strength applications
  - Acralock GB 10 series as low Modulus, high Elongation adhesives for all low surface strength and no print through applications
- Low limitation on bondable substrates
  - Difficult to bond Surfaces (special plastics, metals, etc.)
  - Low strength surfaces (paints, UPE FRP`s, design carbon)
- NO Print through on weak / Low Modulus substrates
- Optimized Glas Bonding performance
- Heat retention like high performance room temperature curing Epoxy adhesives
- Odour optimized

- Engineered Product Range
- Easy Handling
- Bonding a wide range of substrate
- With variable technical performance
- Environmental Resistant
- Health and Safety optimized
- Special Product Modifications on Request
- Odour Optimized
- Process Cost Optimizer



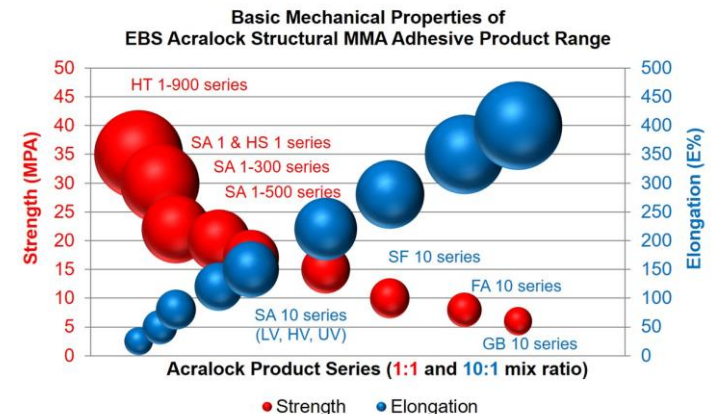
# Acralock Product Range





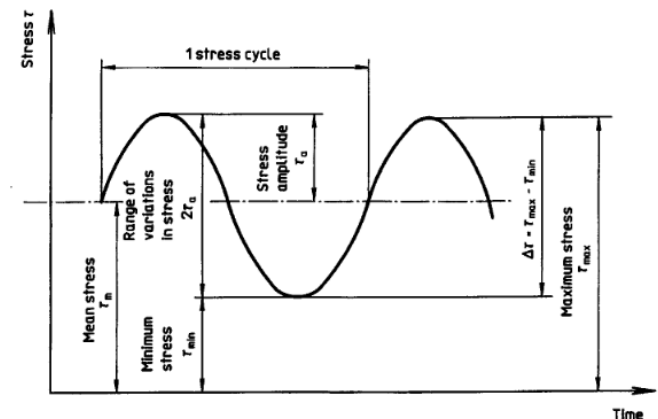
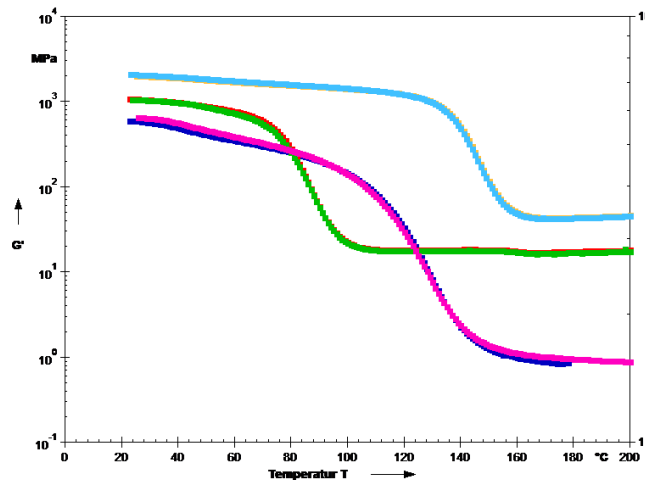
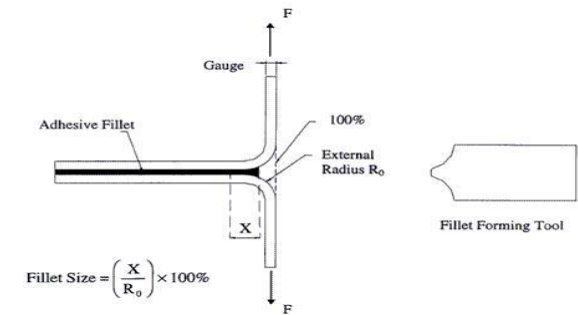
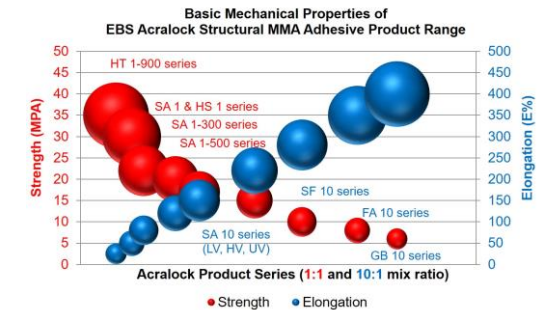
## Engineered Product Range:

- Special 10:1 Adhesive / Activator Packages
  - Adhesive type gives Mechanical Properties
  - Activator package gives Reactivity Properties
  - NO complex Adhesive / Activator combination system
- Special 1:1 Adhesive / Activator Packages
- Special 1:1 Adhesive for Low Surface Energy bonding
- Special Clear Adhesives
- Special Low Boil formulations
- Special Viscosity Grades for special applications
- Special Certifications
  - EN 45545-2 Fire and Smoke rail approvals
  - Rina Marine Approval
  - IMDS registrated
- ... and others ...



## Strength & Environmental Resistance:

- Product Choice according technical requirements
- Higher peel resistance than PU's and Epoxies
- Similar creep resistance like Epoxies
- Much higher fatigue resistance than PU's and Epoxies
- Better Heat Retention (DMTA)
- Short Term HR < 200 – 250° C



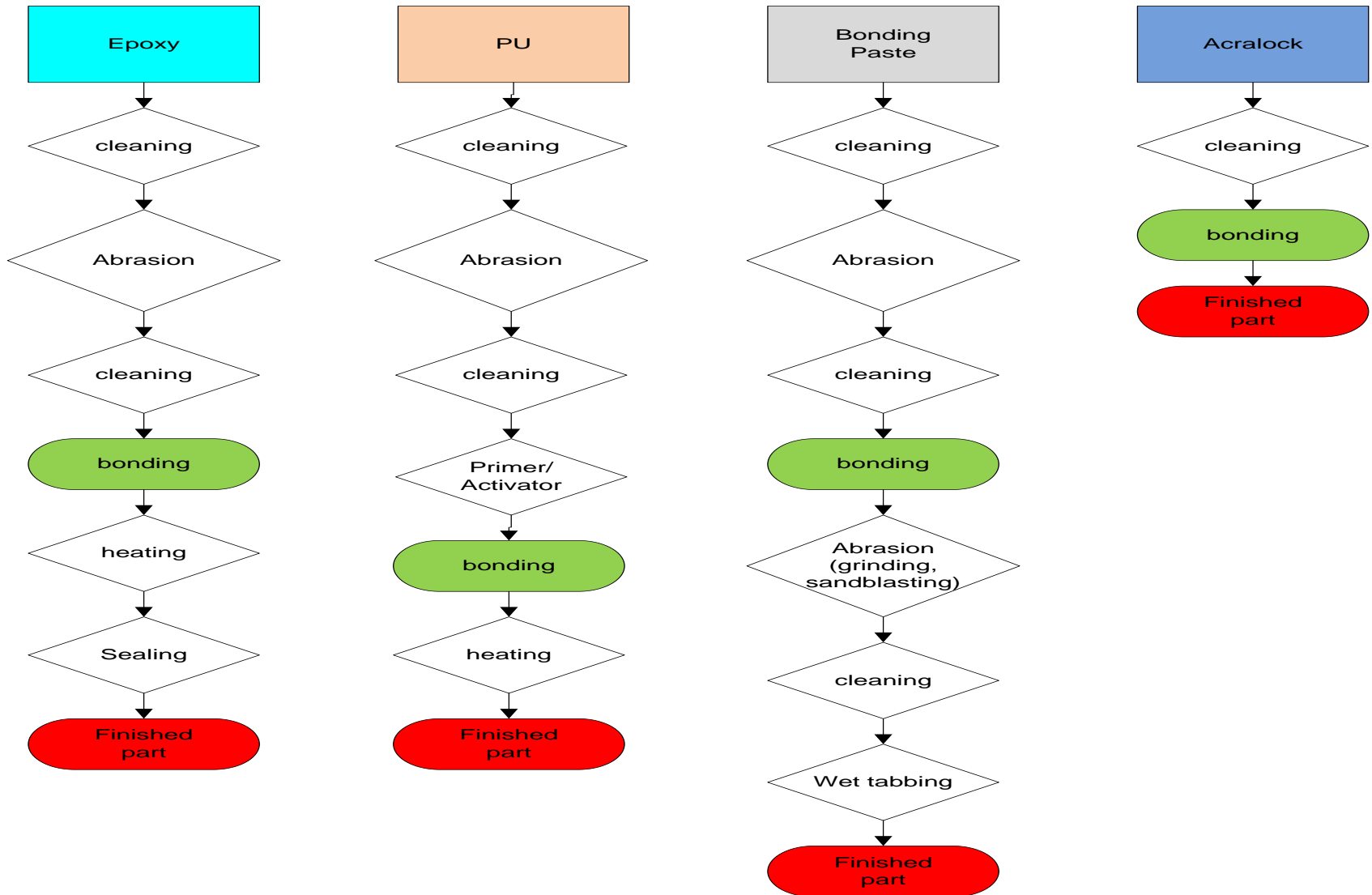
Adhesive System	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Lap Shear *1) (N/mm <sup>2</sup> )	Peel *2) (N/mm)	Creep *2) (% MLSS)	Fatigue *2) (cycles/50% LSS)	Kataplasmatest *2) (retention %)	70° heat strength (retention %)	Print through	Handling
	ISO 527	ISO 527	EN 1465	ISO 11339	EN 1465	EN	ISO 9142	EN 1465	No standard	DIN 6701
2 K PU system low strength/high elongation	5	400	5	5	< 10	< 100.000	< 30 %	>> 50 %	NO	-
GB 10 series	5	400	6	6	> 30	> 1.000.000	> 75 %	>> 50 %	NO	+
FA 10 series	8	350	8	8	> 35	> 1.000.000	> 75 %	>> 50 %	partially	+
2 K PU system medium strength/medium elongation	12	200	10	7		< 50.000	< 30 %	>> 50 %	partially	-
SF 10 series	8 - 10	200	12	12	> 40	> 1.000.000	> 75 %	>> 50 %	yes	+
SA 10 series	15 - 20	100	15	15	> 45	> 1.000.000	> 75 %	>> 50 %	yes	+
SA 1-500 series	15 - 20	100	15	14	> 45	> 1.000.000	> 75 %	>> 50 %	yes	+
2 K Epoxy system low temperature strength retention	20	< 20	20	6	50	< 800.000	< 50 %	>> 50 %	yes	-
SA 1 series	20 - 25	< 75	22	15	> 50	> 1.000.000	> 75 %	>> 50 %	yes	+
SA 1-300 series	18 - 20	< 80	17	15	45	> 1.000.000	> 75 %	>> 50 %	yes	+
2 K Epoxy adhesive with high temperature strength retention	30 - 40	< 10	28	4	> 60	< 250.000	< 25 %	> 50 %	yes	-
HT 1-900 series	30 - 35	< 30	31	10	> 60	> 1.000.000	> 75 %	> 50 %	yes	+
*1) lap shear on Alu AW 6060, 0,5 mm gap, surface preparation according TDS										
*2) T peel on Alu AW 6060, 1,0 mm gap, surface preparation according TDS										

## Easy Handling:

- Less surface preparation on most surfaces
  - NO Primers and Activators
  - NO Abrasion
  - Simple Cleaning Step
- Less Influence Process influence parameters
  - Humidity
  - Temperature
  - Mix ratio
- Fast room temperature cure system
  - Short Fixture and Demoulding Time
  - NO additional heat cure necessary
- Foolproof System

# Less Surface Preparation

**Most surfaces, if possible to bond**





## Substrates:

- Chemically bonds to a wide range of substrates

### Acralock Structural Adhesives bond:

Polyesters	Acrylics	Poly DCPD (Telene)	Aluminum
Polyester Gelcoats	ABS	SMC/BMC	Stainless Steel
Topcoats	PVC/FPVC/CPVC	PU - Rim	Carbon Steel
Vinyl Esters	Styrenics	PA - RIM	Coated Metals
Epoxies	PET	Nylon	Hot Dipped Galvanized Steel
Polyurethanes	PMMA	Rubbers	E - Galvanized Metals
Elastomers	Polycarbonate	Wood	Ceramics
Floatglas	Coated Floatglas	Concrete	Natural Stones
...and others...			

- Low limitation on bondable substrates
  - Difficult to bond Surfaces (special plastics, metals, etc.)
  - Low strength surfaces (paints, UPE FRP`s, design carbon)
  - Non reinforced and short fibre reinforced Plastics

- Acralock MMA adhesives have a typical odour but have
  - NON SVHC formulations
  - NO Styrene inside
  - NOT Mutagenic
  - NOT Cancerogen
  - Just risk of dermal skin sensibilization (just by direct skin contact!, never by inhalation!)
- Acralock MMA adhesives have less dangerous warning label requirements than Epoxy and PU systems

– Acralock MMA:



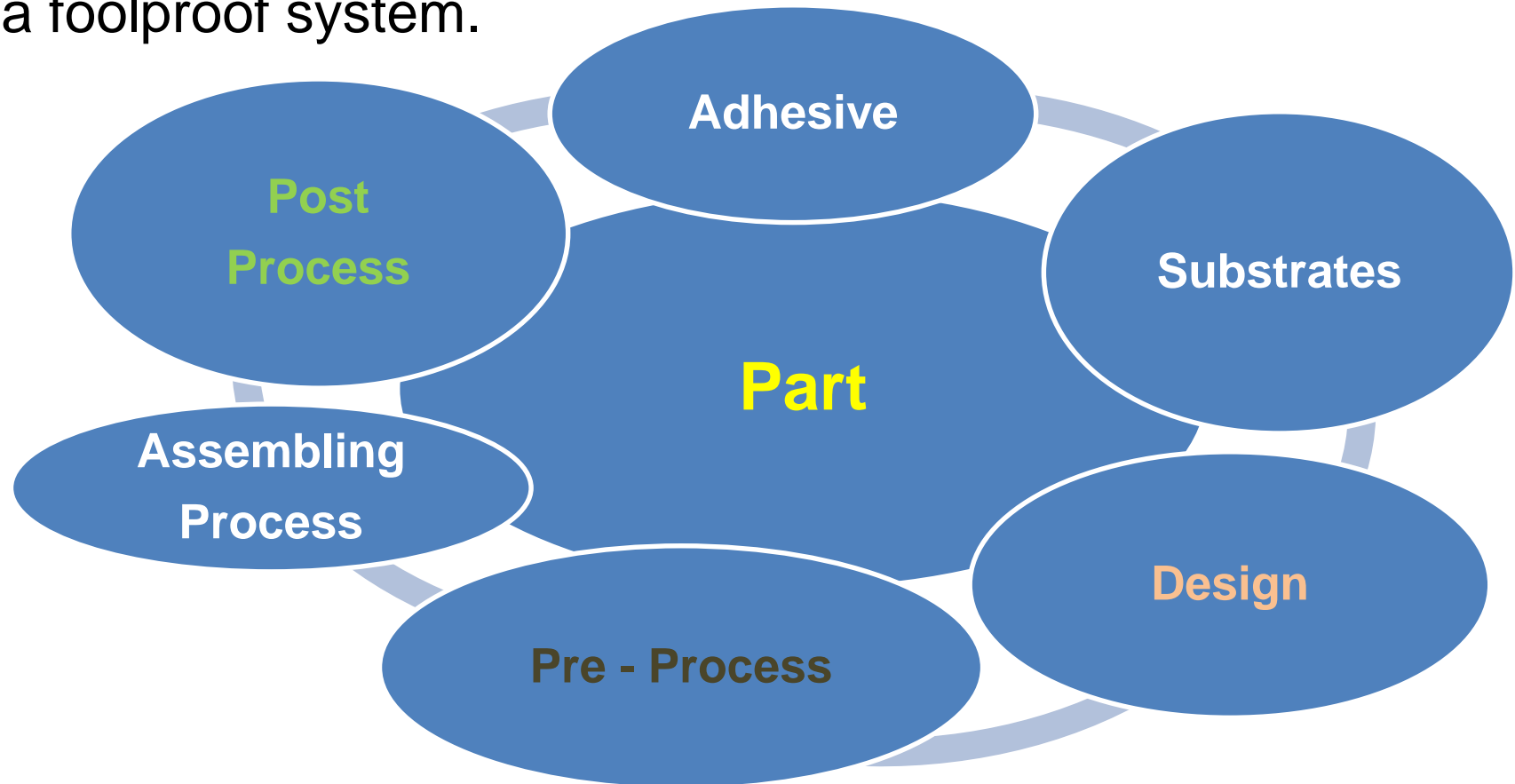
– Epoxy and PU`s:



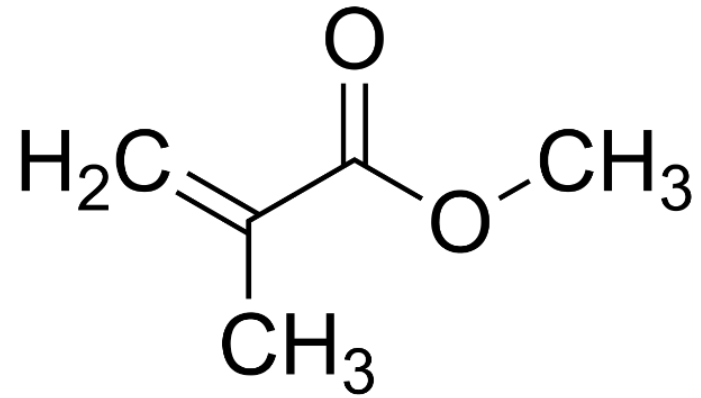
– Actually used MMA`s:



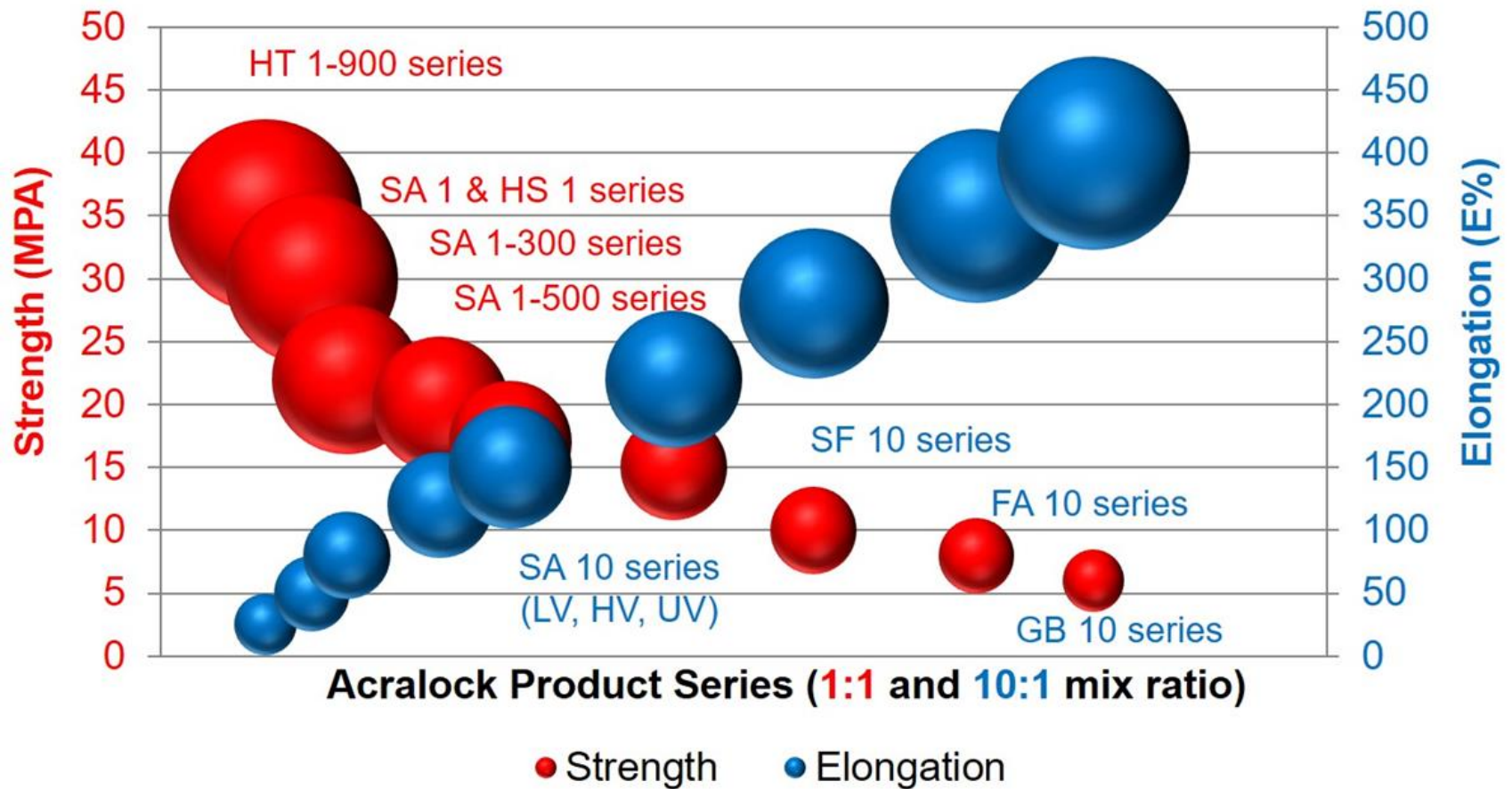
**Cost Optimizer**, one of the major parts in the assembly cost structure it is important to have one solution, which positively effects as well the other cost parameters by giving a foolproof system.



# „Case Studies“



## Basic Mechanical Properties of EBS Acralock Structural MMA Adhesive Product Range





- More Flexible / less strength 10:1 adhesive families
  - SF 10 series
  - FA 10 series
  - GB 10 series
- Special NEW High Heat Resistance 1:1 adhesive families
  - HT 1-900 series
- Special Low Viscosity Version of SA 10 series
  - LV 20 series
- Special NEW transparent adhesive
  - CC 10-12 P & CC 10-12PHV
- Special Low Energy Surface Bonder
  - PP 1
- Special LOW ODOUR / ~~NON-ODOUR~~ formulations
  - SA/SF 10 LO

- More Flexible / less strength 10:1 adhesive families
  - SF 10 series
  - FA 10 series
  - GB 10 series
- Same product and process features as classic MMA formulations incl. pure metal surface bonding
- Pass also Powdercoating and KTL Process
- Less stress on sensitive materials
  - During cure → read/print through
  - During use → stress adsorption

### Important:

Avoid stress induction into weak surface by too strong adhesive in 2 directions:

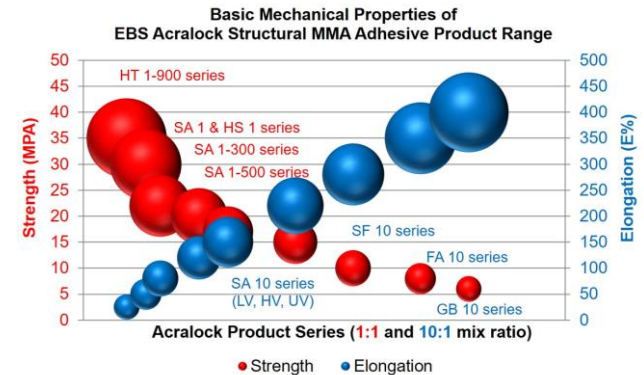
- During cure reaction (read through)
- During daily use (sudden stress failures)

➔ correct product choice as key issue

- Bonding on paints (clear coat)
- Bonding on coatings (KTL, Powder)
- Bonding Duroplasts FRP (UPRFRP, EPCFP, etc.)
- Bonding Thermoplasts (Co-TP`s, PC)
- Bonding on glas



No	Type	TSF1 (N)	Failure 1	TSF2 (N)	Failure 2
11	SA1-15NAT	6510	Cohesive	5250	Substrate
12	SA1-305NAT	4795	Cohesive	5110	Substrate
13	SA1-530GRY	6300	Cohesive	5000	Substrate
19	SA10-15LVBLK	5200	Cohesive	5750	Substrate
20	SA10-15BLK	5904	Cohesive	5600	Substrate
15	Comp10:1	5480	Cohesive	5275	Substrate
16	SA10-35HVBLK	5104	Cohesive	4800	Substrate
17	SF10-10GRY	4990	Cohesive	5200	Substrate
17	FA10-10BLK	2750	Cohesive	2550	Cohesive
18	GB10-05BLK	2350	Cohesive	2750	Cohesive

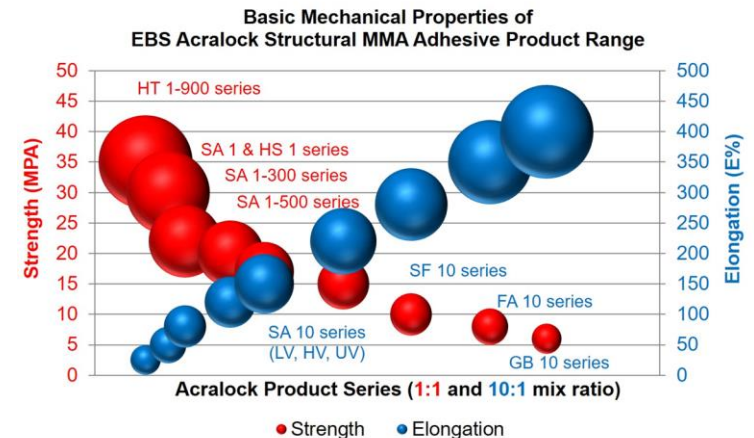


**Influence on strong surfaces is not as critical as on weak ones**

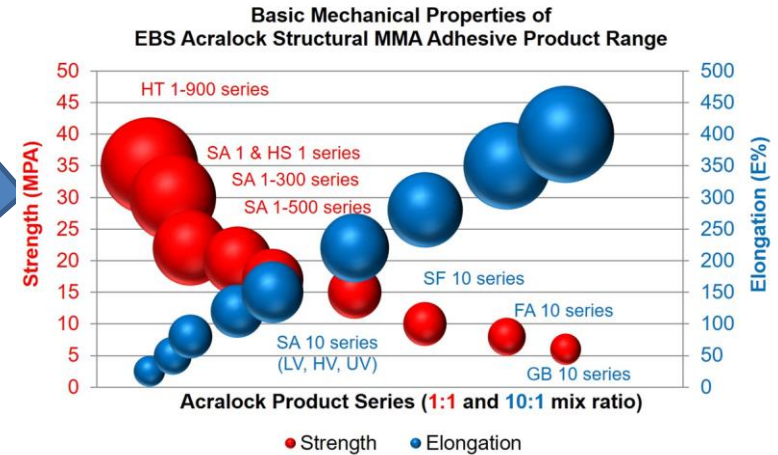
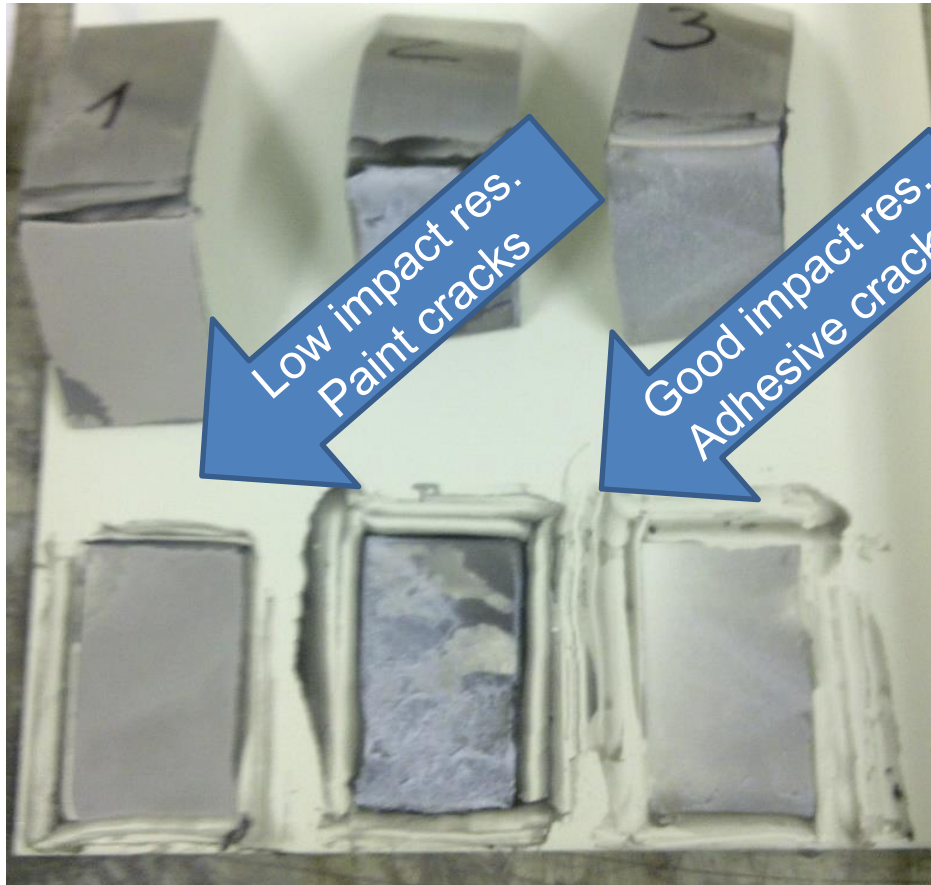


No	Type	TSF (N)	Failure
11	SA1-15NAT	3160	Substrate
12	SA1-305NAT	3050	Substrate
13	SA1-530GRY	2550	Substrate
19	SA10-15LVWH	2250	Substrate
14	SA10-15BLK	3580	Substrate
20	Comp10:1	2430	Substrate
15	SA10-35HVBLK	3063	Substrate
16	SF10-10GRY	3350	Substrate
17	FA10-10BLK	2500	Cohesive
18	GB10-05BLK	2400	Cohesive

**Influence on ductile surfaces is not as critical as on brittle ones**







**Influence on brittle  
surfaces is more  
critical**

## SA10

Structural  
Paint delam.  
Low force  
< 2 Mpa

## SF 10

Semistructural  
Cohesive  
high force  
10 Mpa

## FA 10

Flexible  
Cohesive medium  
medium force  
7 MPa



## SA1 series

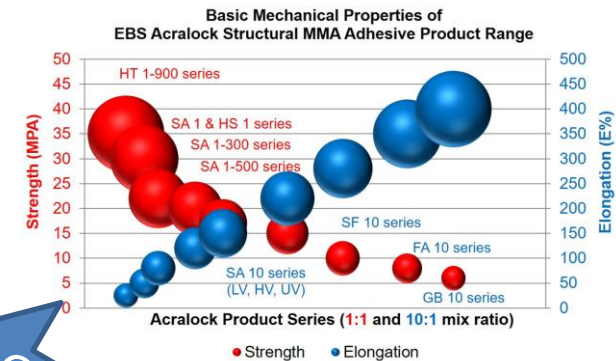
HPF Structural  
Paint Delamination  
Medium Force  
3 MPa

## SA10 series

Structural  
Paint Delamination  
Medium Force  
3,5 MPa

## GB 10 series

Flexible  
Cohesive Crack  
Best Force  
6 MPa



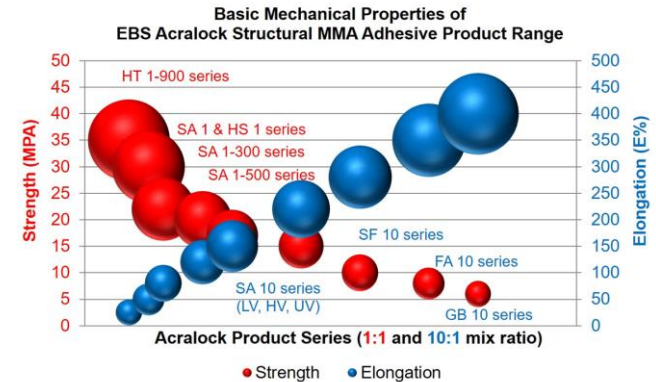
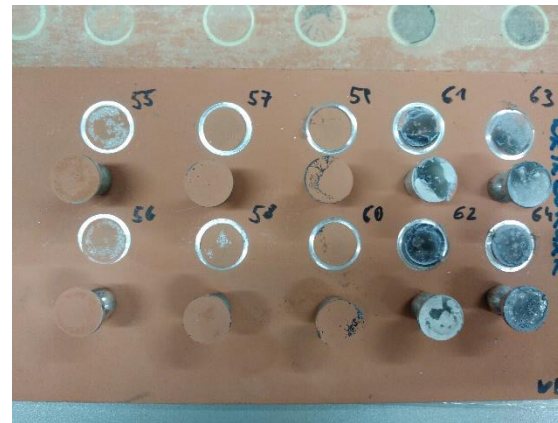
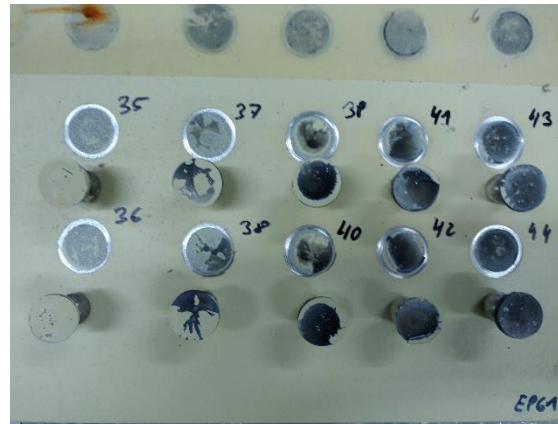
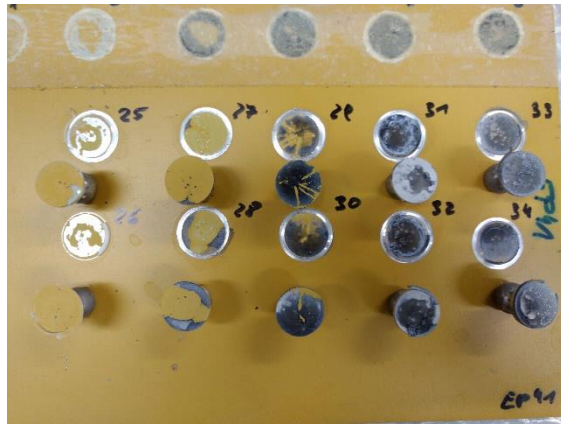


SA10

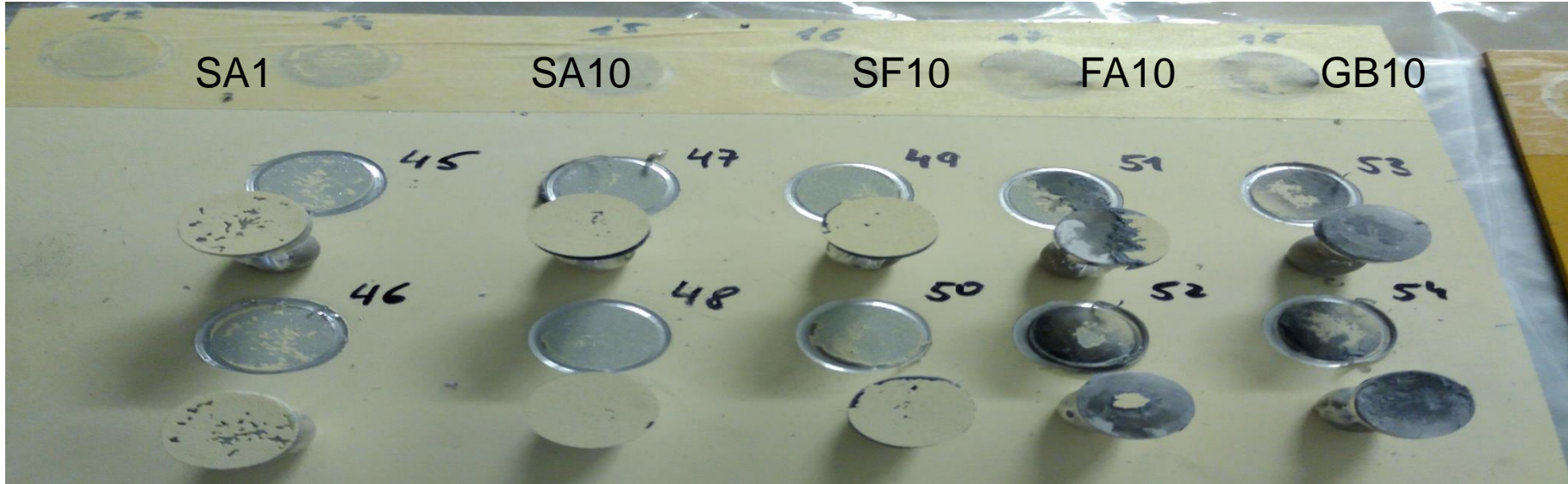
GB10

SF10

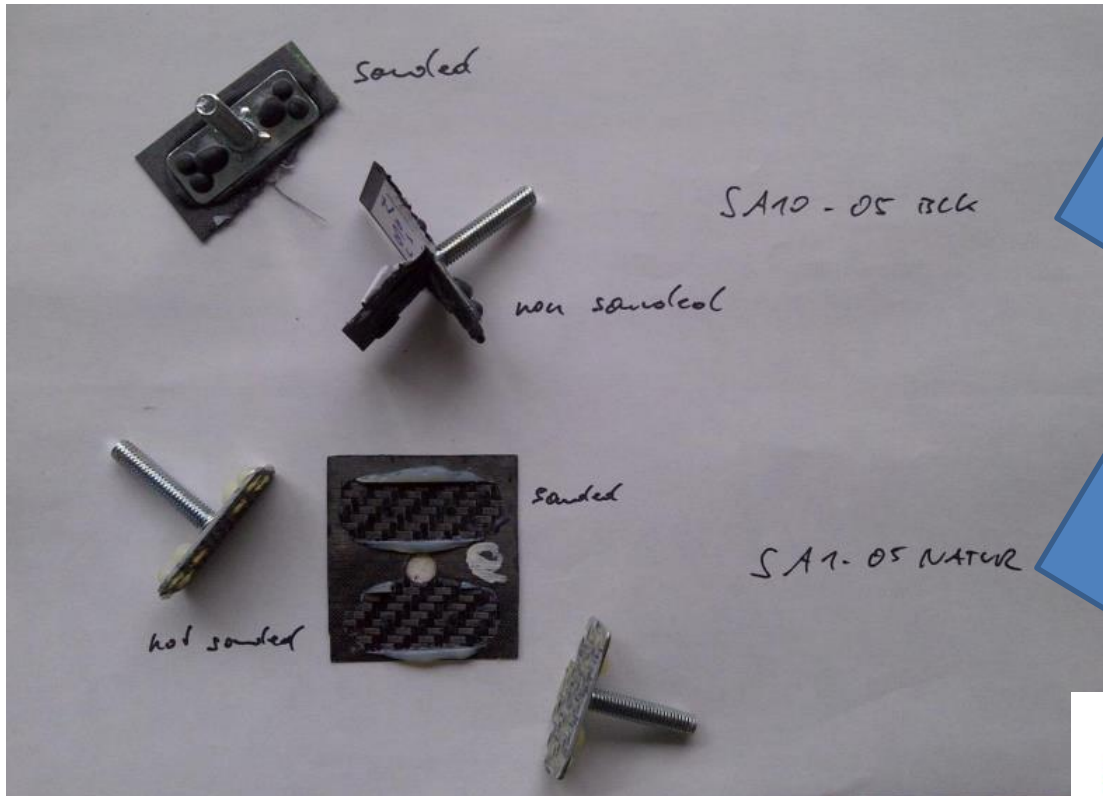
FA10



- Various Paint systems on Aluminum surface
- Epoxy Adhesive gave paint failure at 1 MPA after Climate Cycle Test



Substrate Coating	Sample Nr.	Adhesive	Climate Test	Stress max.	Failure mode	result
Lankwitzer	14	SA1-05NAT	None	1,5 N/mm <sup>2</sup>	100% SF	Fail
	45,46	SA1-05NAT	Kat (-30/+70° C), 5 cycles	3,3 N/mm <sup>2</sup>	100% SF	Fail
	15	SA10-05BLK	None	2,3 N/mm <sup>2</sup>	100% SF	Fail
	47, 48	SA10-05BLK	Kat (-30/+70° C), 5 cycles	2,6 N/mm <sup>2</sup>	100% SF	Fail
	16	SF10-05BLK	None	3,1 N/mm <sup>2</sup>	100% SF	Fail
	49, 50	SF10-05BLK	Kat (-30/+70° C), 5 cycles	4,0 N/mm <sup>2</sup>	100% SF	Fail
	17	FA10-05BLK	None	5,7 N/mm <sup>2</sup>	30% SF, 70% CF	Fail
	51,52	FA10-05BLK	Kat (-30/+70° C), 5 cycles	6,5 N/mm <sup>2</sup>	20% SF, 80% CF	Fail
	18	GB10-05BLK	None	7,0 N/mm <sup>2</sup>	5% SF, 95% CF	Pass
	53,54	GB10-05BLK	Kat (-30/+70° C), 5 cycles	6,5 N/mm <sup>2</sup>	5% SF, 95% CF	Pass

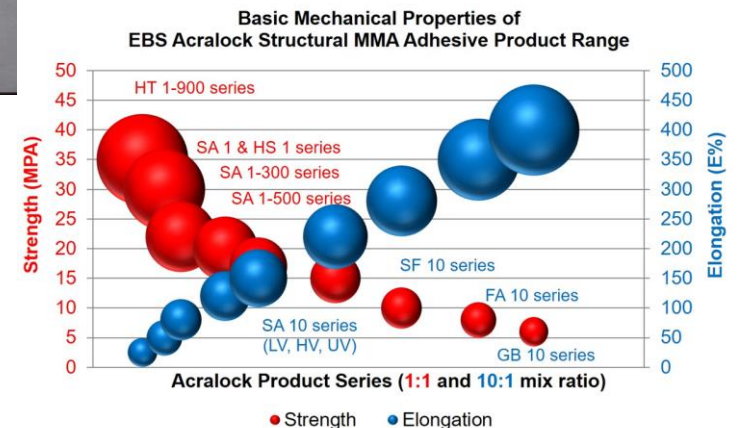


Good impact res.  
Laminate resists

Low impact res.  
Laminate cracks

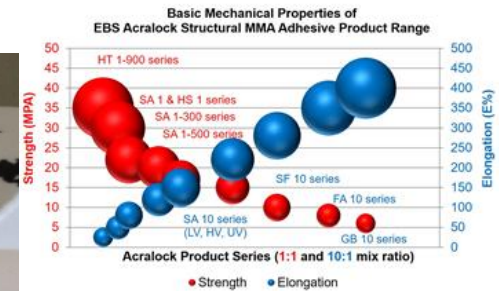
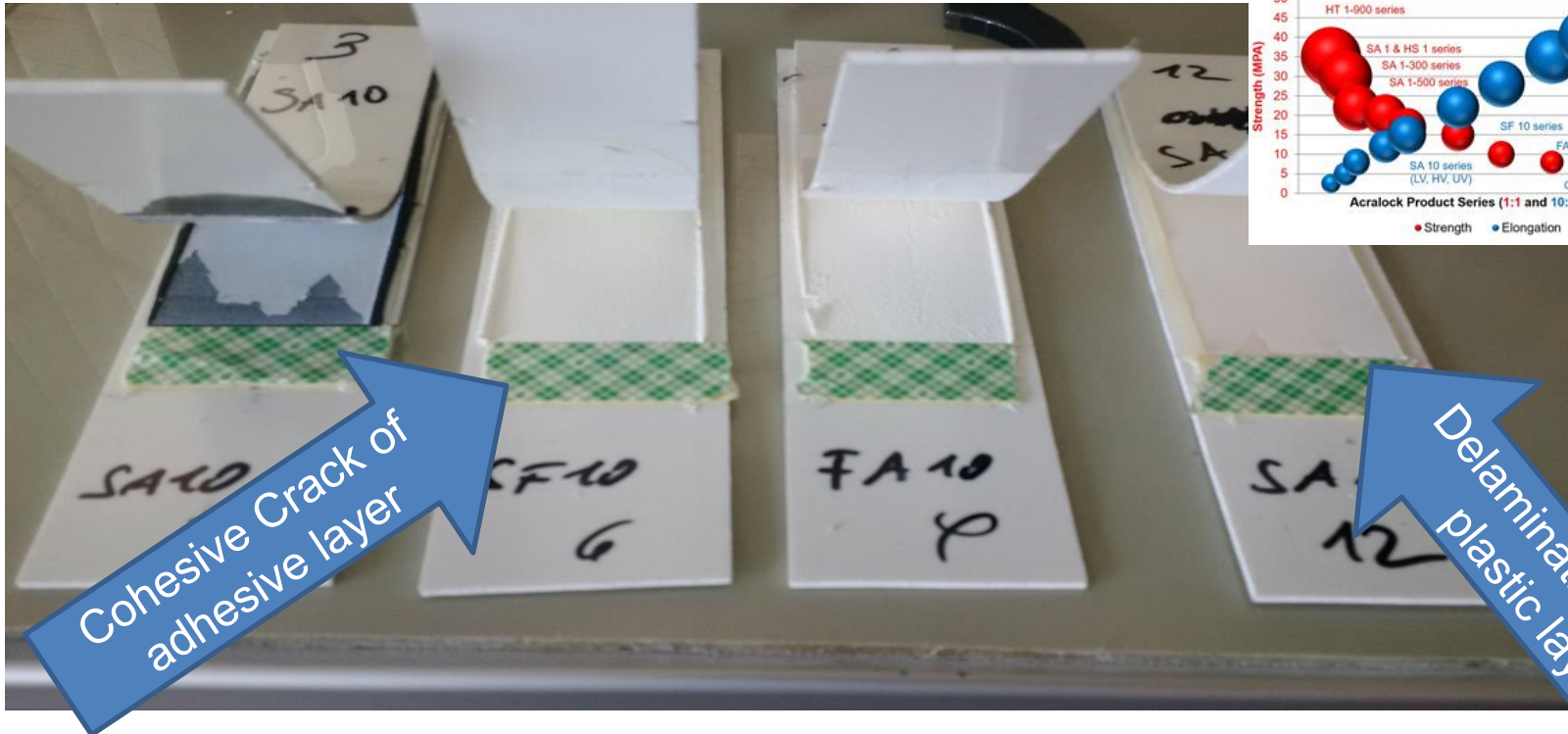
**SA10**  
Structural  
Cohesive.  
High force  
15 Mpa  
(15-20MPa)

**SA 1**  
HPF  
Surface layer delamination  
very low force  
2 Mpa  
(20-25MPa)





Important: avoid stress induction into weak surface by too strong adhesive → correct product choice



**SA10 series,**  
Structural adhesive  
**substrate delamination**  
**Stress level: 4 N/mm**

**SF10 series,**  
SemiStructural adhesive  
**100 % Cohesive**  
**Stress level: 8 N/mm**

**FA10 series,**  
Flexible adhesive  
**100 % Cohesive**  
**Stress level: 5 N/mm**

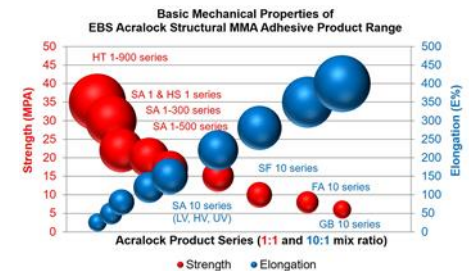
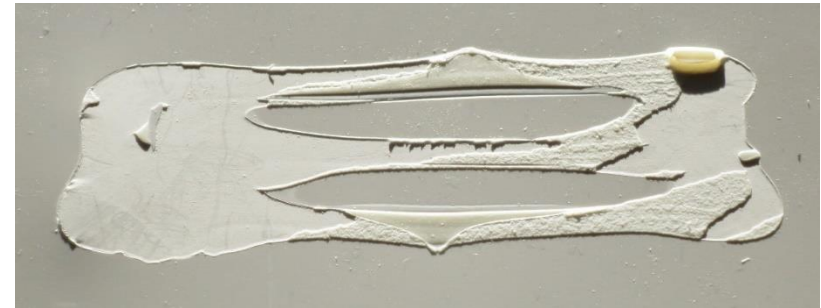
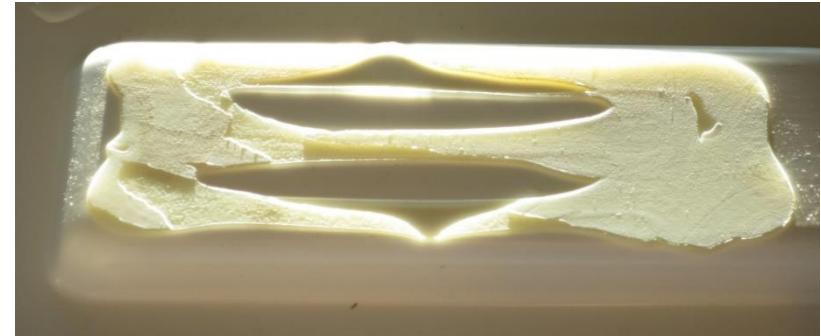
**SA 1-300 series,**  
Structural adhesive  
**Substrate delamination**  
**Stress level: 5 N/mm**

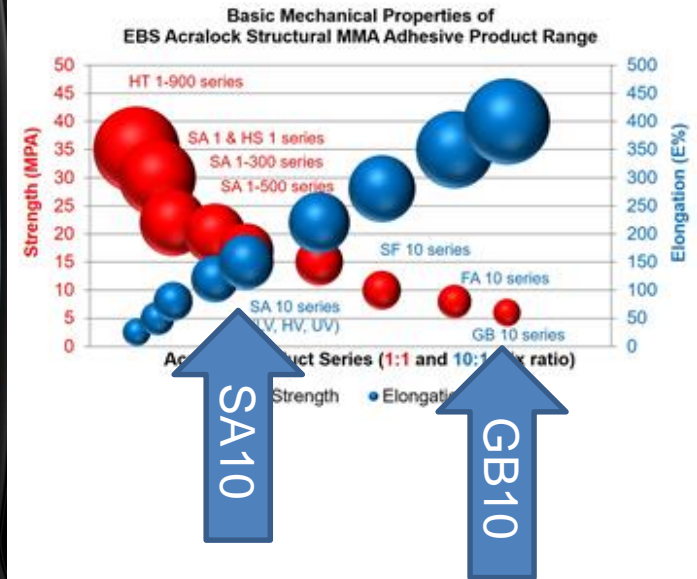
Important: avoid stress induction into weak surface by too strong adhesive → correct product choice



Delamination of first plastic layer

**Classic 1:1 MMA**, Structural adhesive,  
high strength / low elongation  
100 % Substrate delamination at impact in  
the field (on the road!)

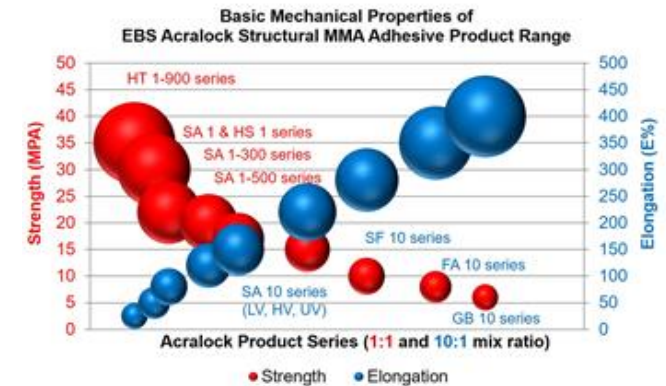
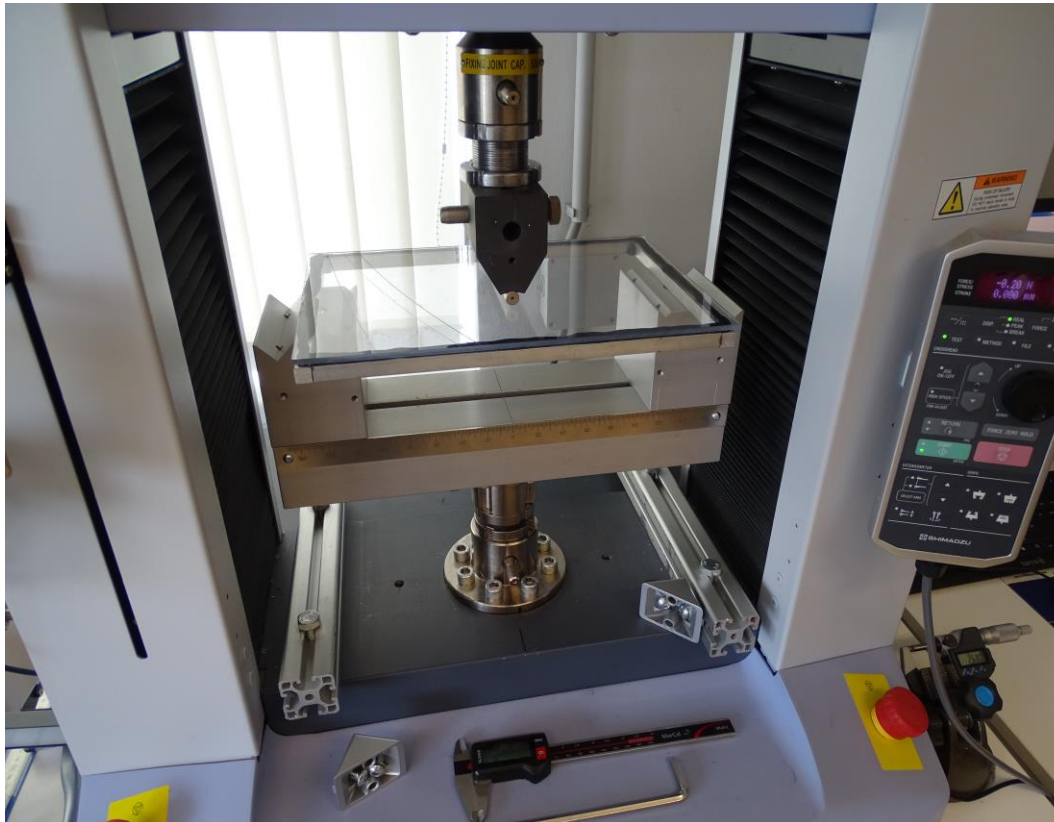




## Separation walls in Vans:

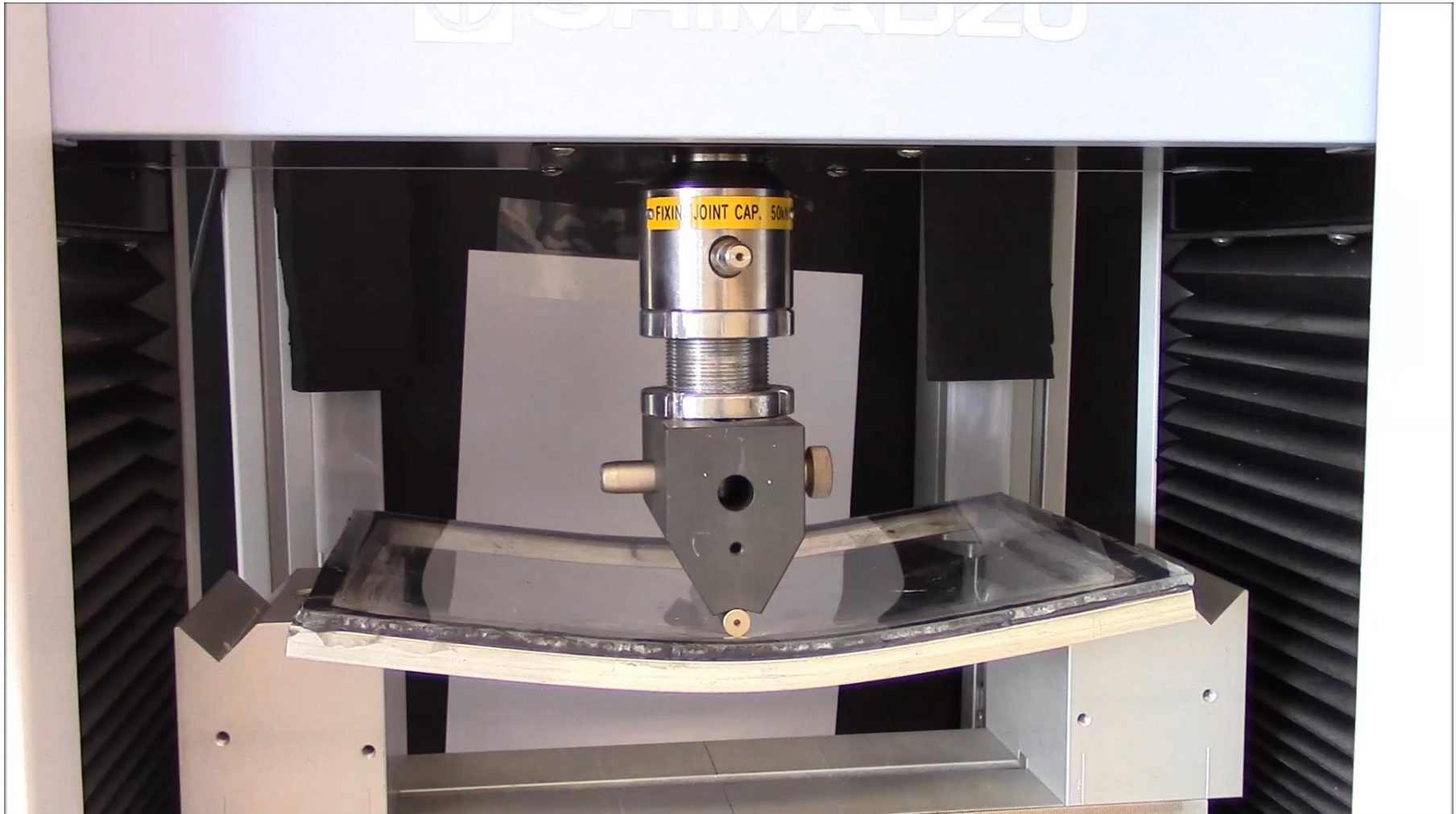
- **SA 10 series vs. GB 10 series**
- Structural adhesive, medium strength / medium elongation vs. more flexible, less strength version
- **PC window bonded to ABS frame**
- Metal sliding hinge on ABS
- Comparison of strength of final assembly by 1 point bending with stress induction on PC surface, simulation with Aluminum frame



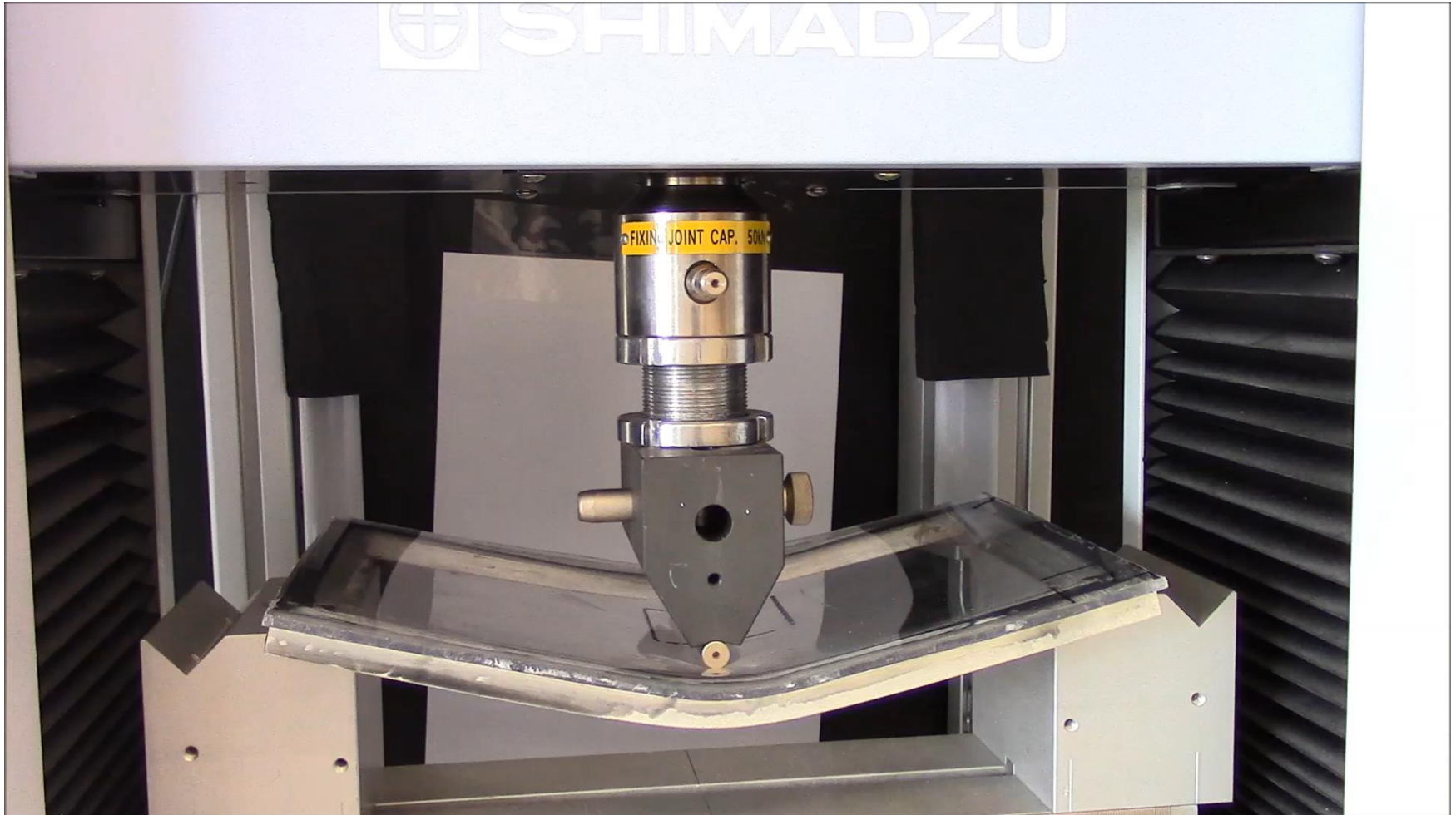


- **SA 10 series vs. GB 10 series**, Structural adhesive, medium strength / medium elongation vs. More flexible, less strength version
- Polycarbonat panel to bonded Aluminum frame
- 2 different types of PC
- Comparison of strength of final assembly by 1 point bending on PC surface

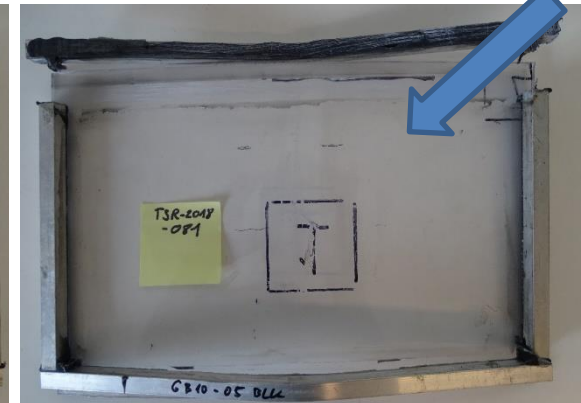
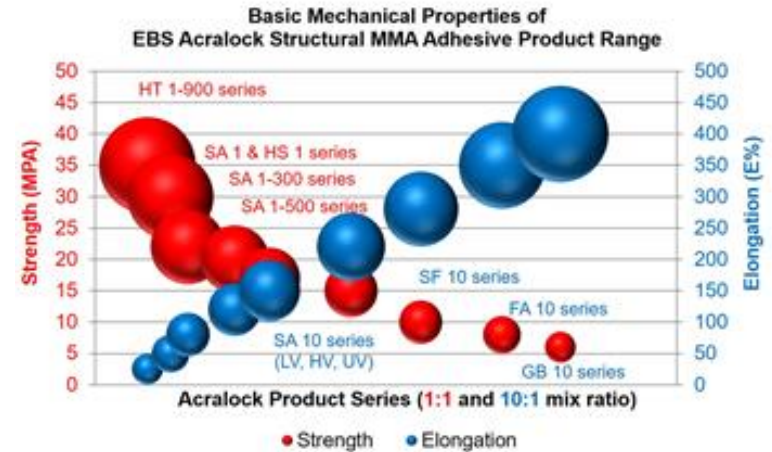
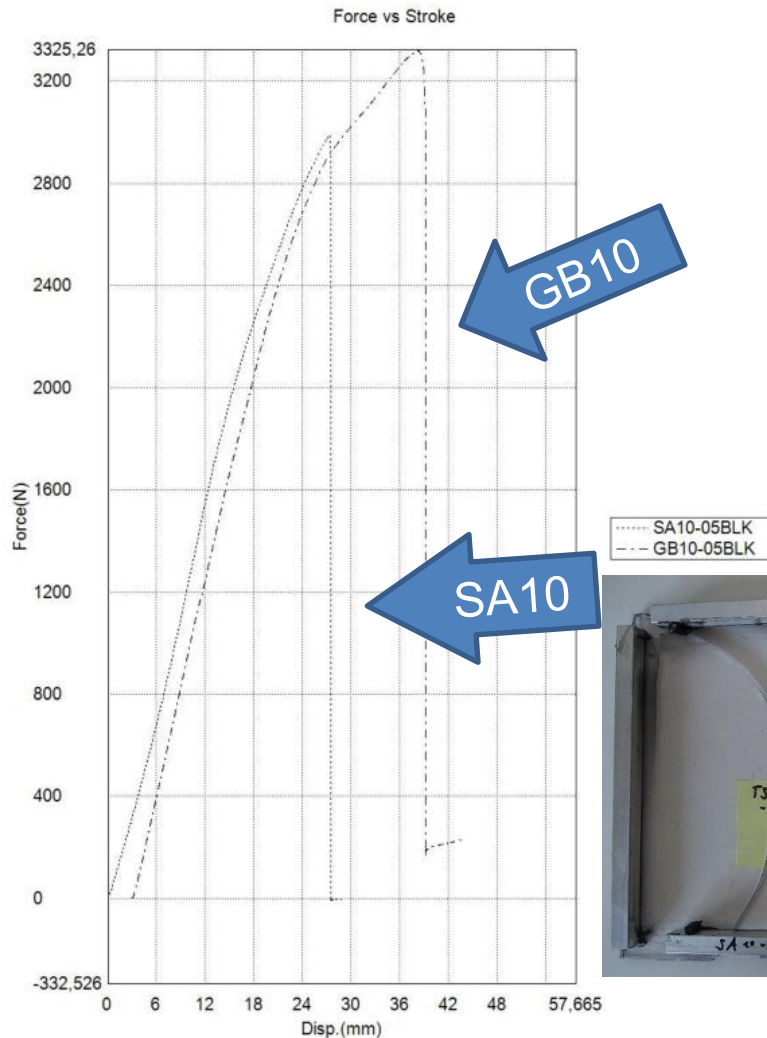
## Acralock SA 10 series



### Acralock GB 10 series







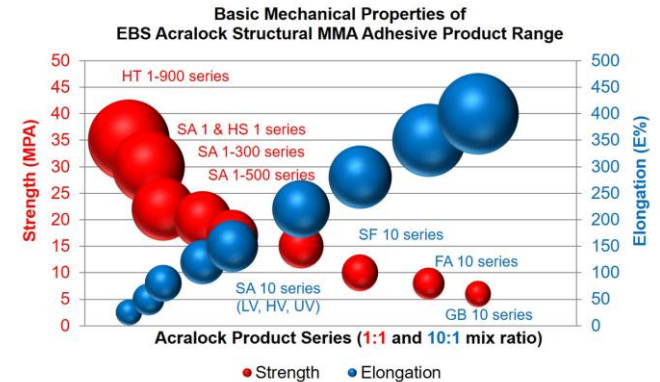
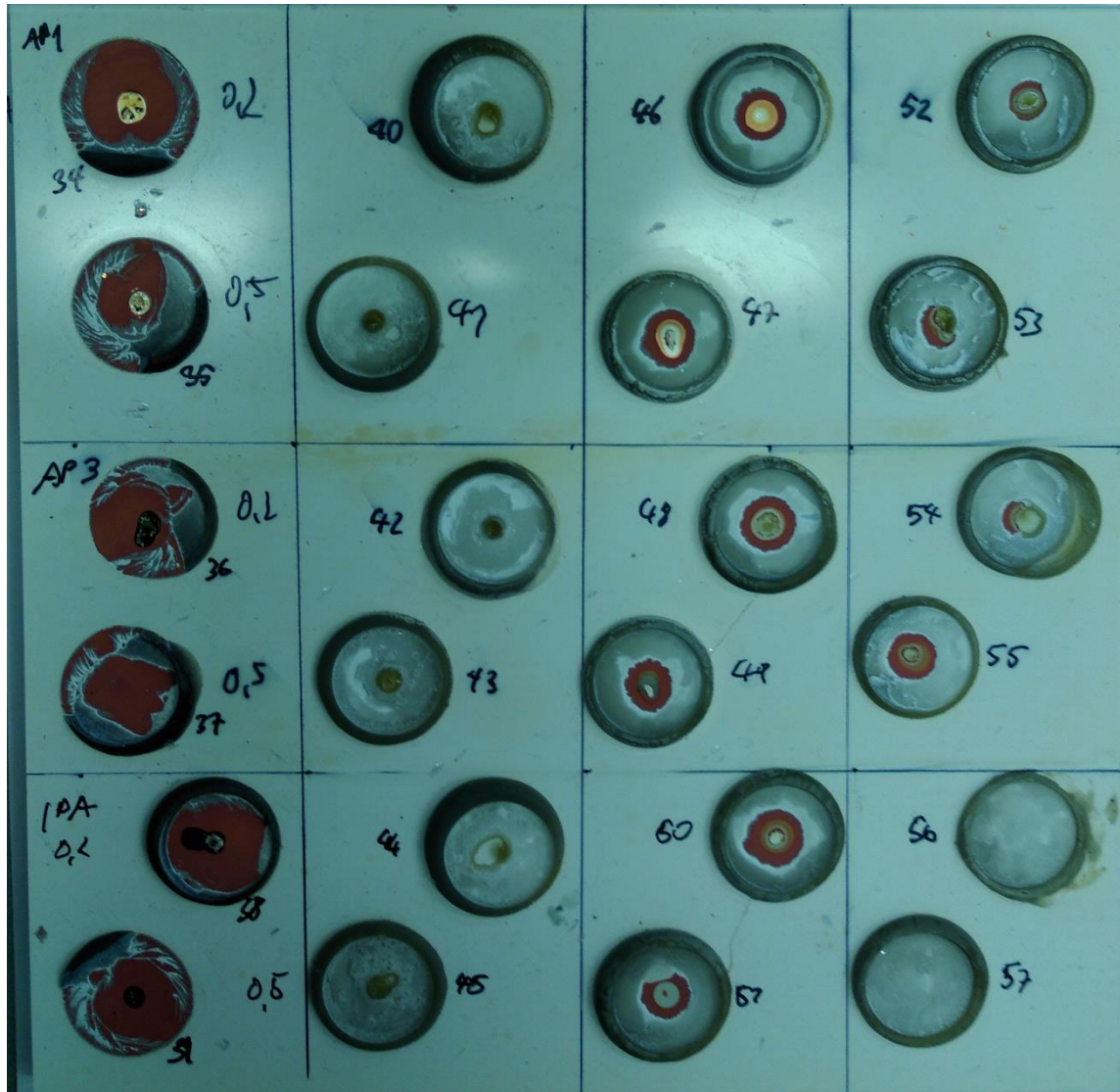
Result: GB 10 gives higher stress level and cohesive crack  
 ➔ avoids stress induction into weak surface ➔ correct product choice

SA10-15BLK

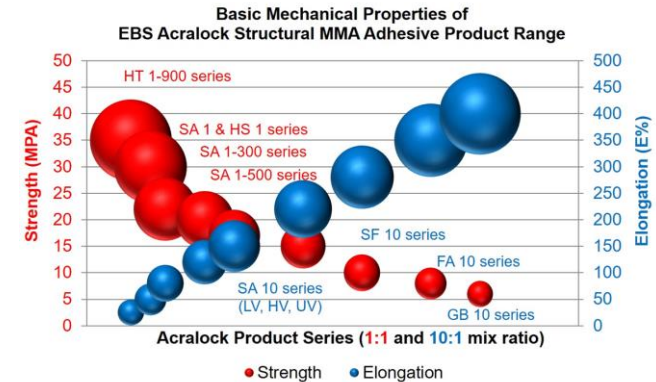
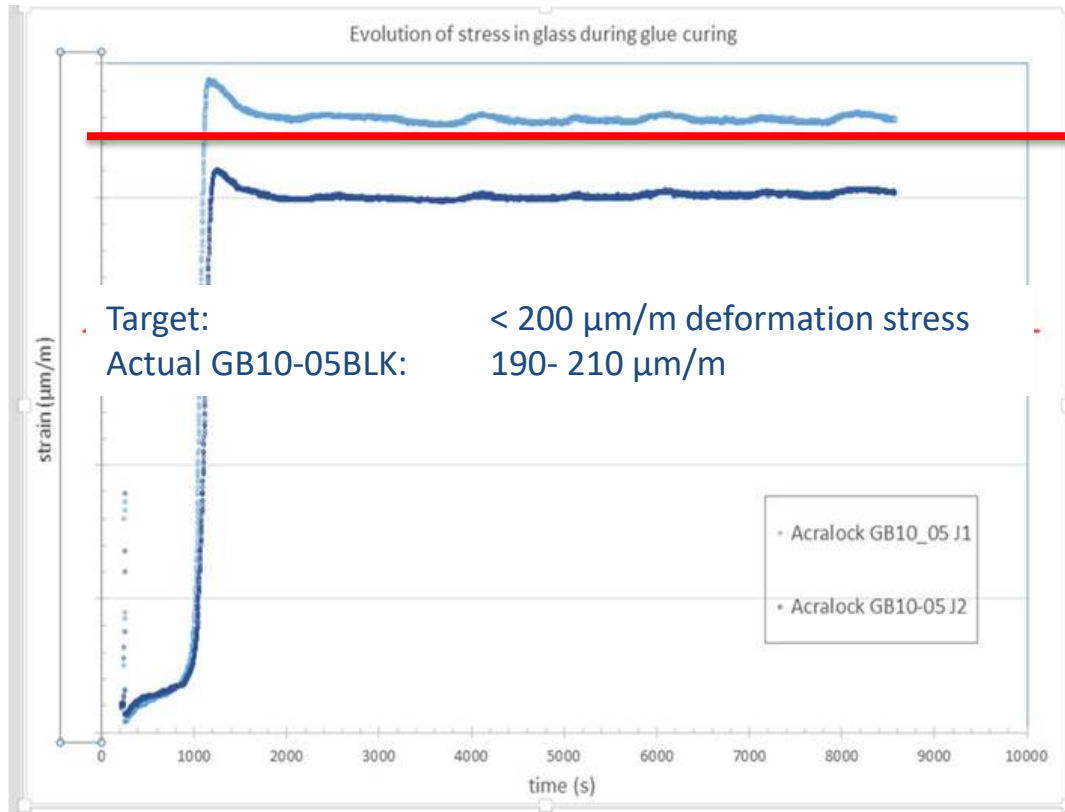
GB10-10GRY

SF10-10GRY

FA10-10GRY



Ceramic Coating on ESG  
glas surface



Plastic holder to glass bonding gives measurable stress which was with  $> 1\text{mm/m}$  far out of clients process rules with classic and modified MMA's!

GB hardly pass as first MMA the requirements

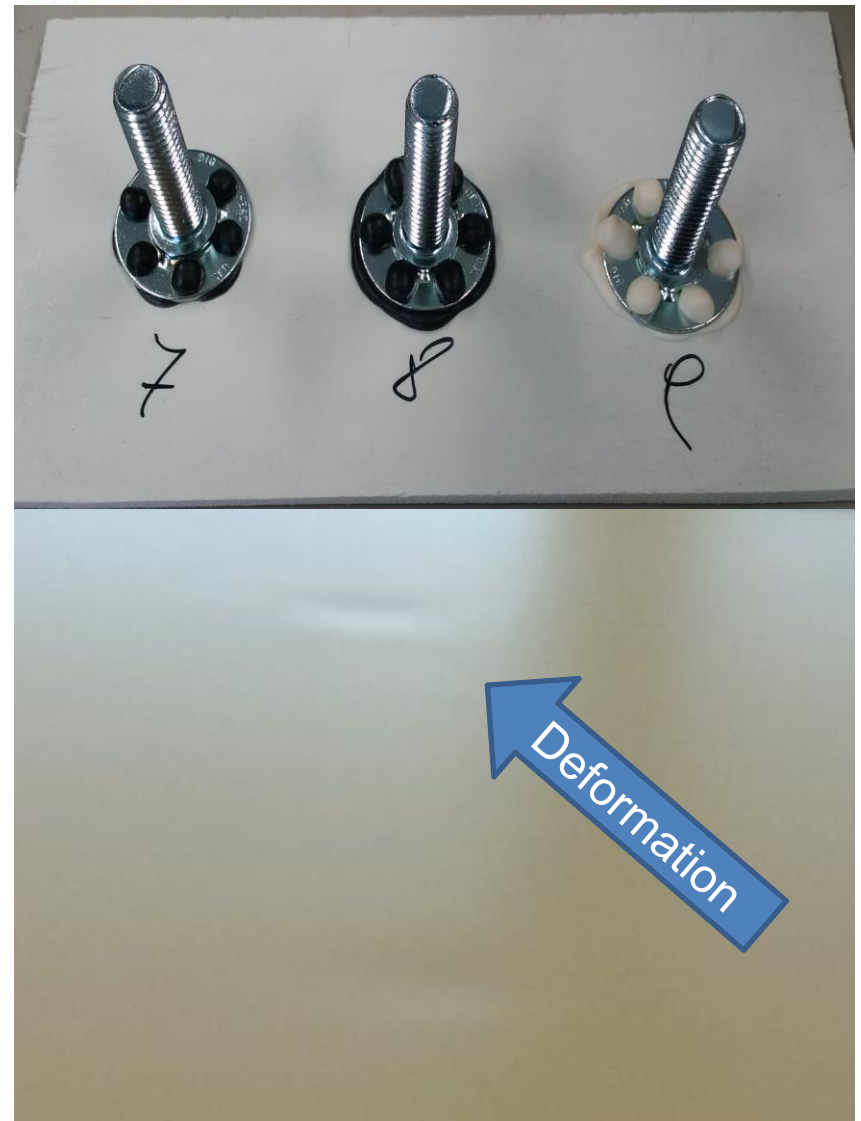
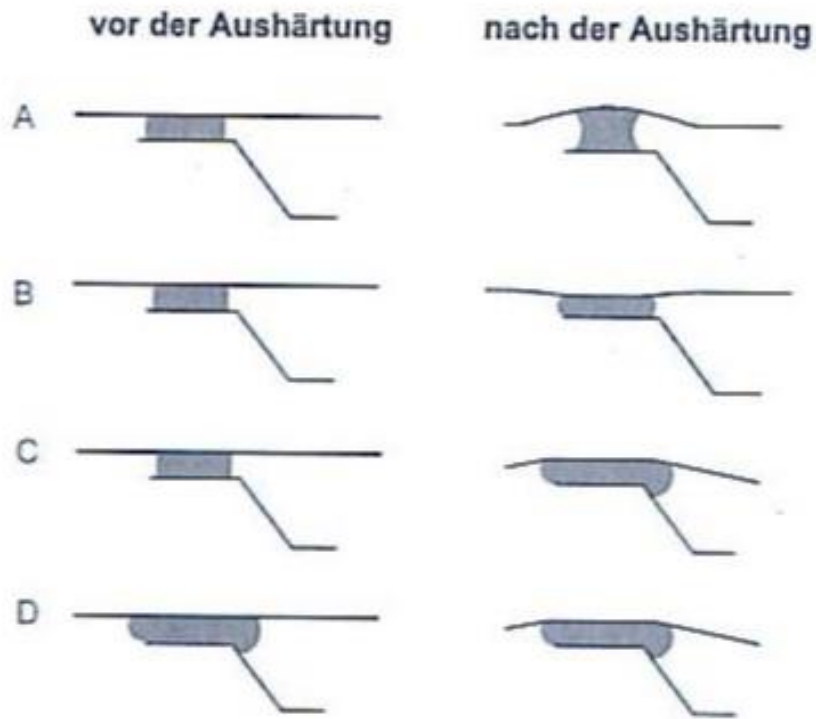
New Modification positiv tested with  $< 100 \mu\text{m/m}$



## As function of:

- Heat induction to the part  
→ postcuring effect  
→ read through
- Force induction to the part  
(forming due to Modulus  
and adhesive shrinkage  
during cure), partly  
supported by temperature  
development





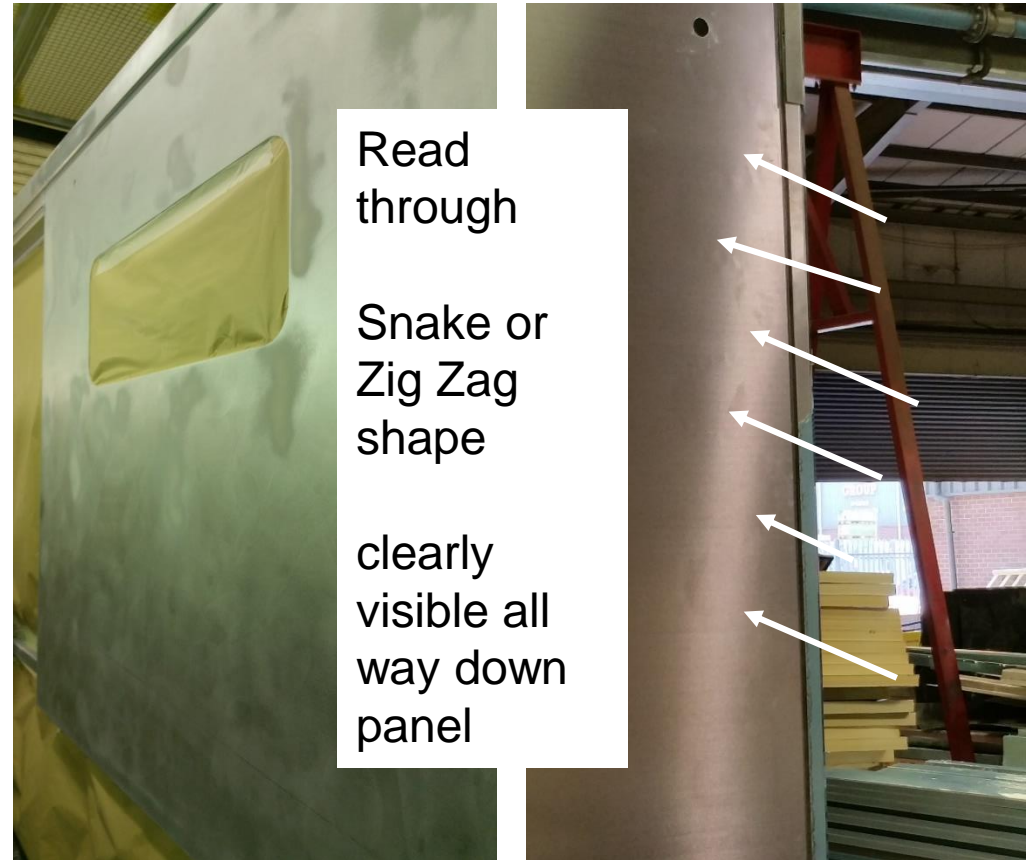
Important: avoid stress induction into weak material by too strong adhesive → correct product choice



**GB 10 series,**  
NO read through on Al/PE/AL  
sandwichpanels

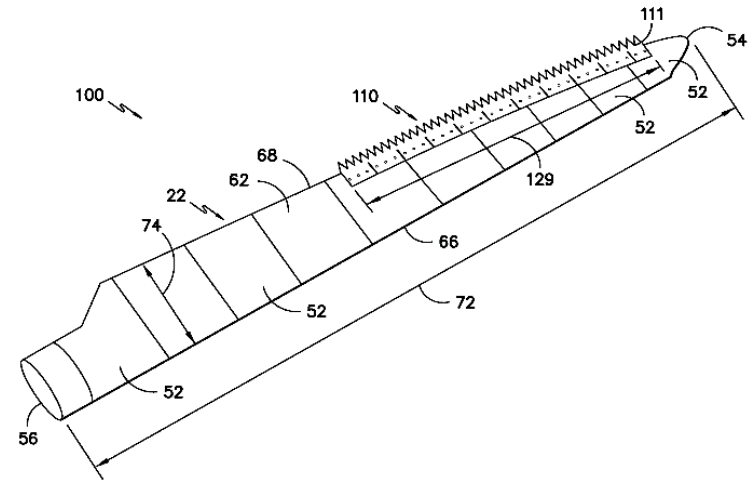


Important: avoid stress induction into weak material by too strong adhesive → correct product choice



**FA 10 and GB 10 series, NO read through on thin Al panels**

- FRP Epoxy / SAN Vortex
- 2 K classic MMA
- High Gap (2 mm) for Infusion
- Deformation of SAN in summer
- Read through of adhesive
- Blow restrictor necessary



## Solution:

Acralock LV 20 (SA10 infusion grade)

Gap reduction to 0,5 – 1 ,0 mm

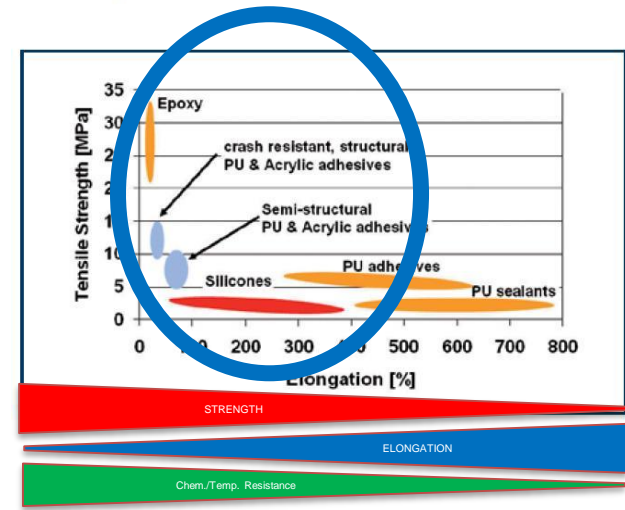
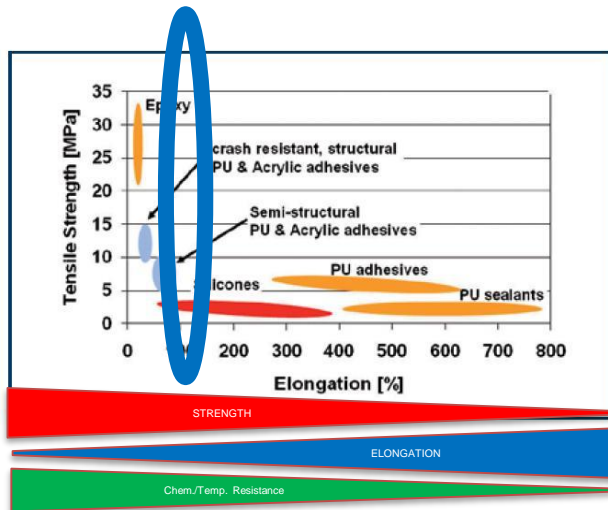
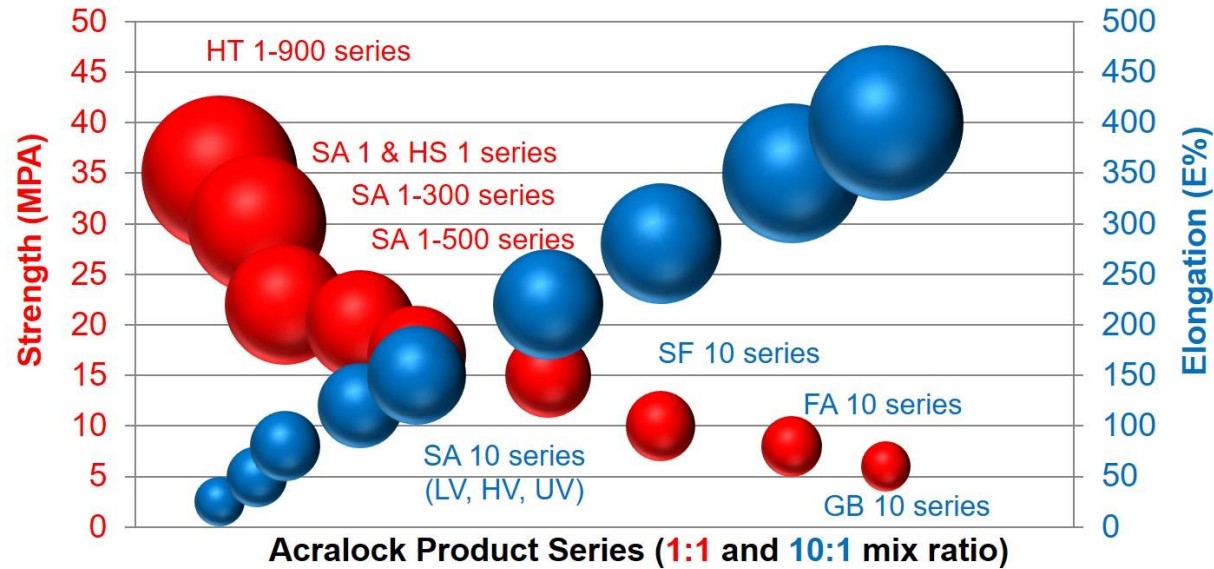
50 % adhesive cost reduction

(10 to`s to 5 to`s!)

NO Deformation



## Basic Mechanical Properties of EBS Acralock Structural MMA Adhesive Product Range



[\*\*www.acralock.eu\*\*](http://www.acralock.eu)

[\*\*www.bondingexperts.at\*\*](http://www.bondingexperts.at)