

PSA in Action

Acrylic Foam Tapes in Dialogue with Painted OEM Surfaces



Inventing
a New Future

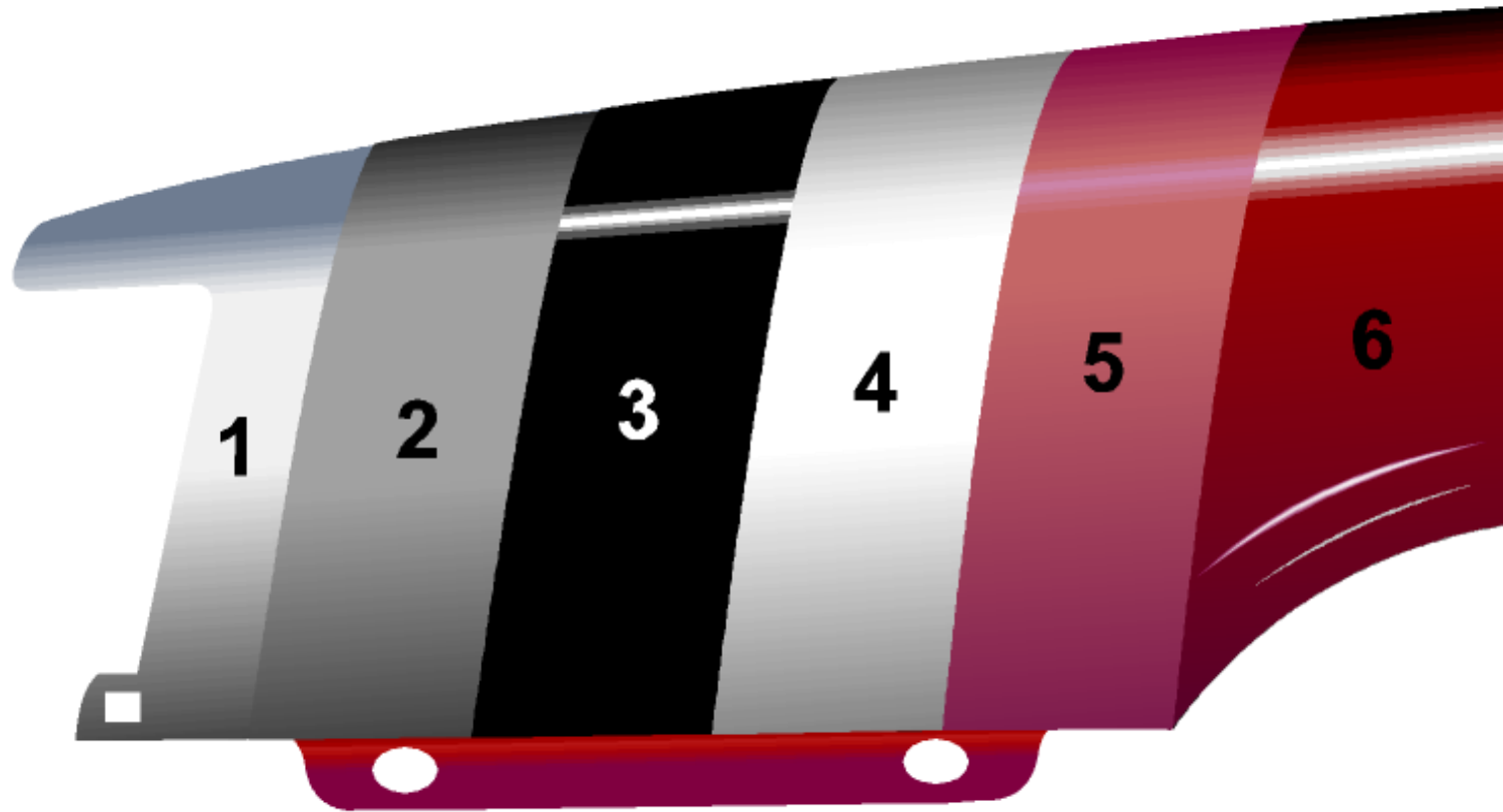


Technology
Platform

What?

The Introduction

Clear Coats – Dialogue Partner I



- 1. Metal
- 2. Pretreatment (e.g. Zink)
- 3. e-Coat
- 4. Primer-Surfacer
- 5. Base Coat
- 6. Clear Coat

- Corrosion Protection
- Corrosion Protection
- Stone Chip Performance
- Colour and Effects
- Gloss and Resistances



PSA – Dialogue with Clear Coats: Applications I

Roof Ditch

Spoiler

Park Sensors

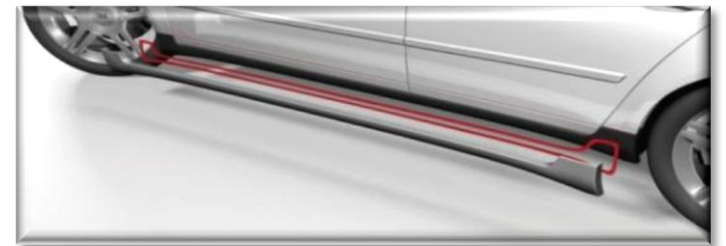
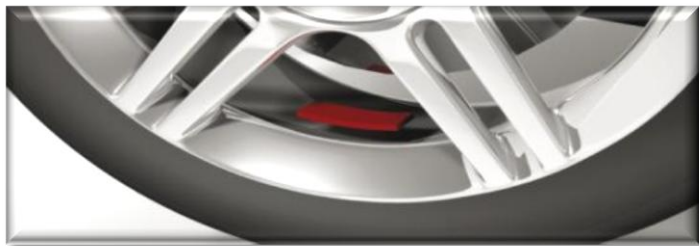
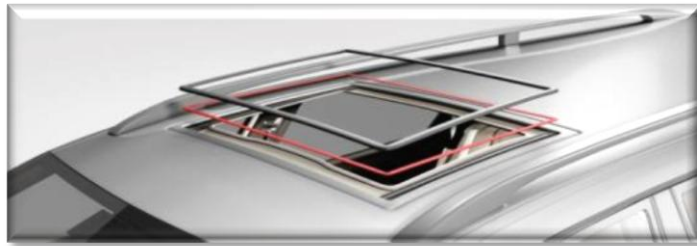
Door Seal

Door Treads

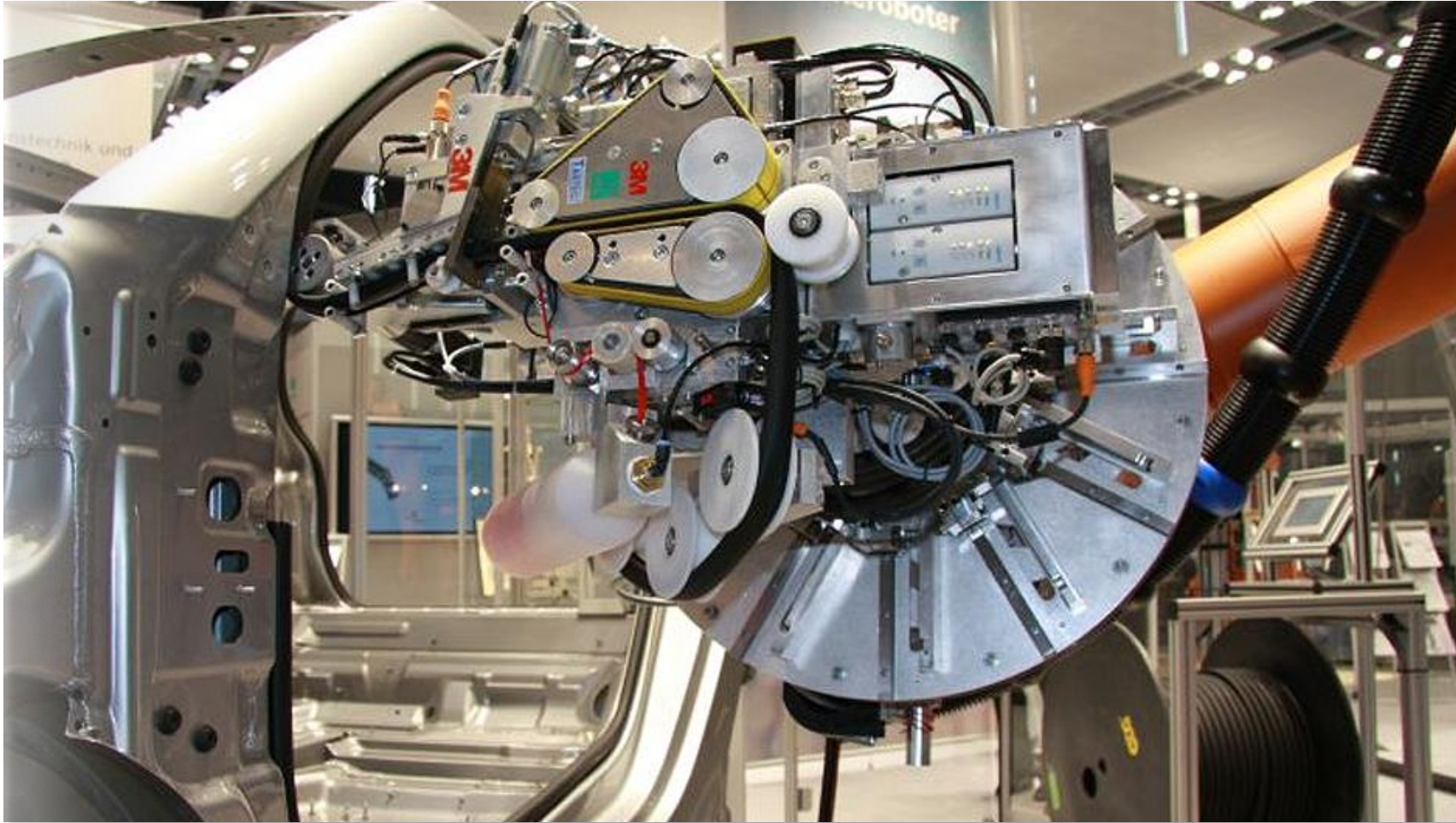
Rocker Panel

- Sealing and Tolerance Coverage
- Damping with Constant Force Distribution
- Compensation of Thermal Elongation

PSA – Dialogue with Clear Coats: Applications II



PSA – Dialogue with Clear Coats



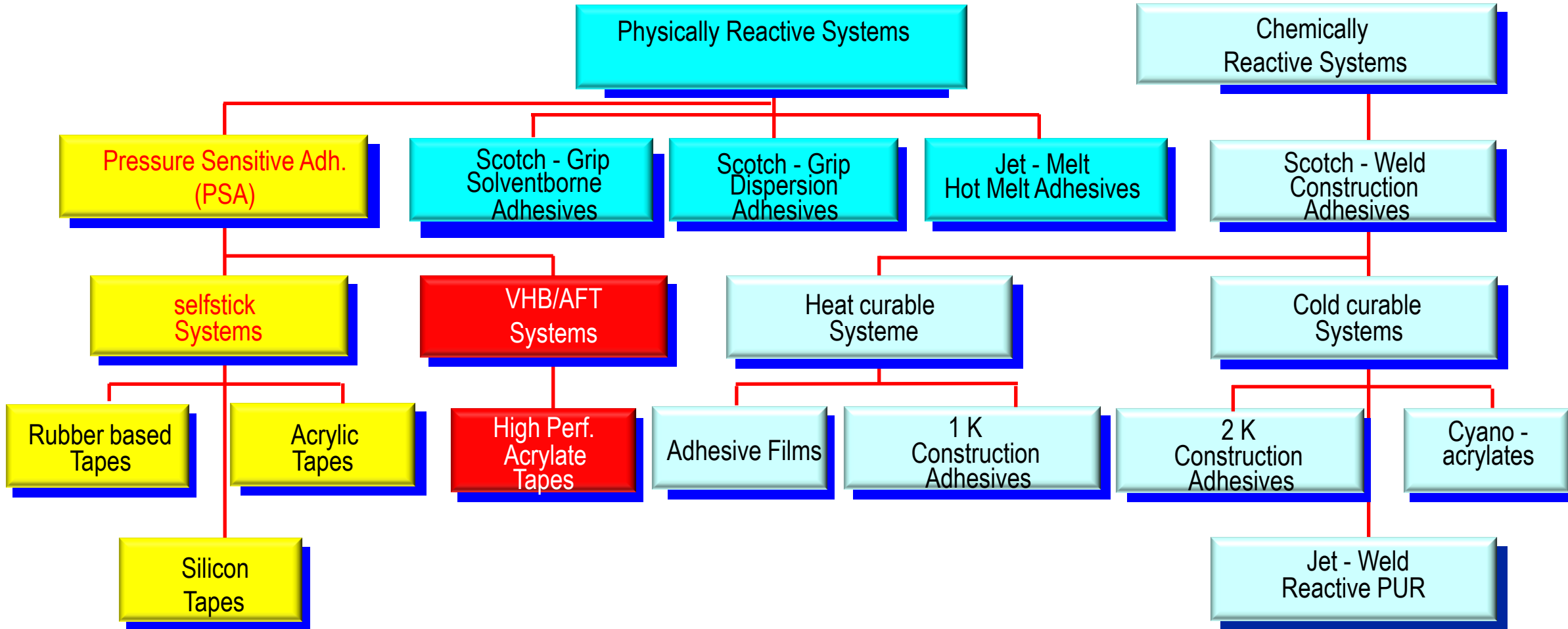


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How?

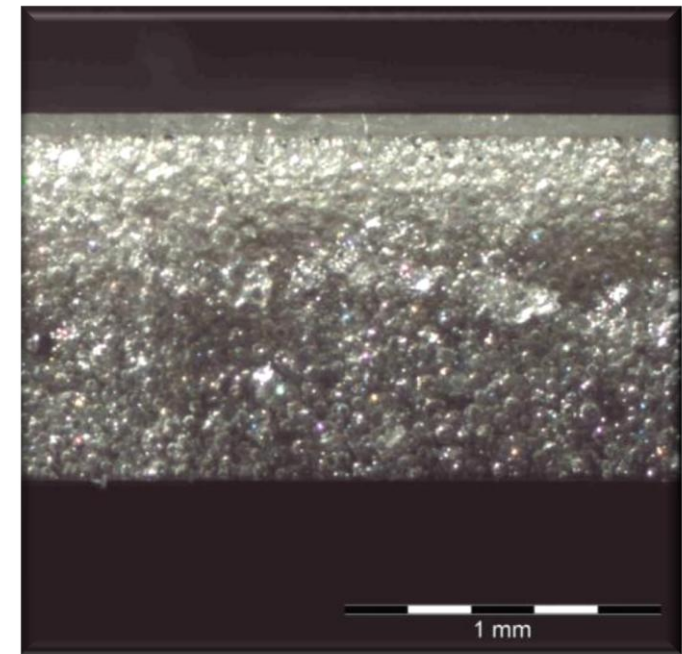
The Technology

Adhesive Systems



PSA Acrylic Foam Tapes – Dialogue Partner II

- Self Stick Adhesive in Uniform Layer Thicknes
- The Core / „Carrier Material“ is 100% Adhesive
- Pressure optimizes Adhesion to Surface
- NO Activation by Heat, Energy etc...
- Constant Physical Properties @ Normal Conditions



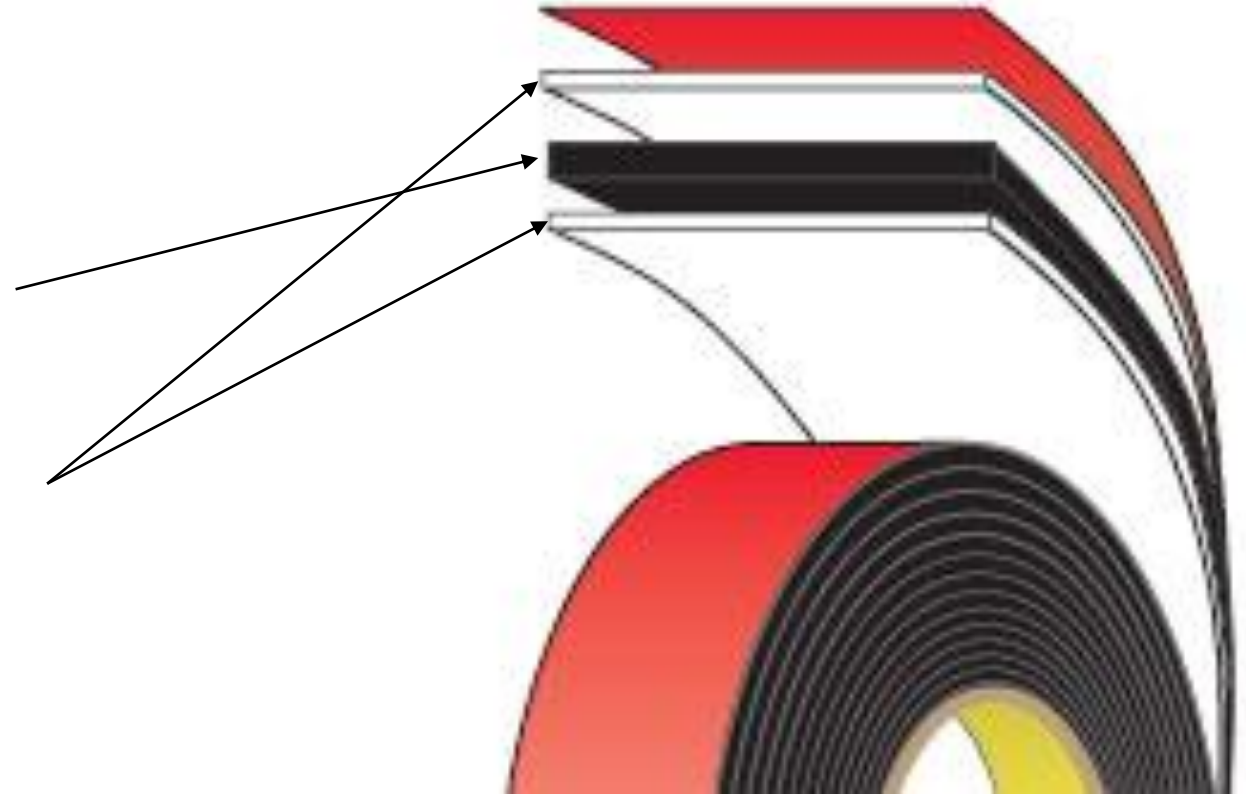
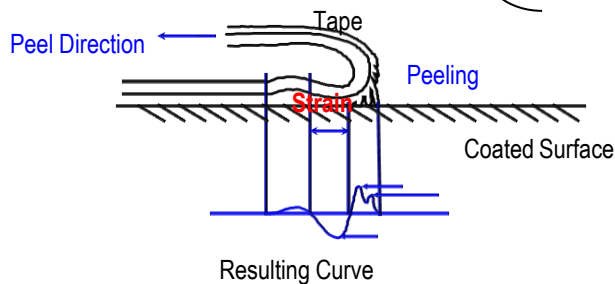
PSA Acrylic Foam Tapes – Dialogue Partner II

Main Feature is Thickness of Core Adhesive Material

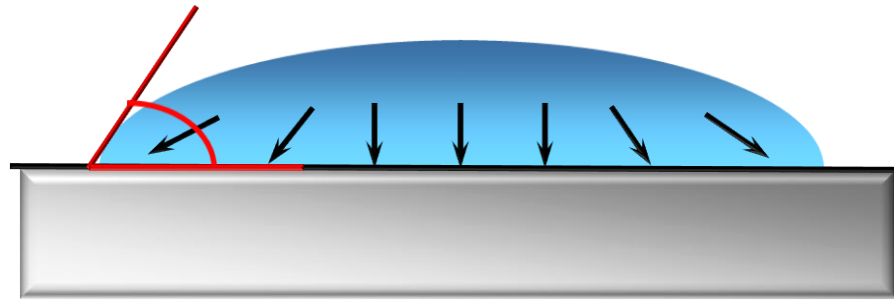
Important Influence
on Rheology
and Peel Performance!

Core, thick layer

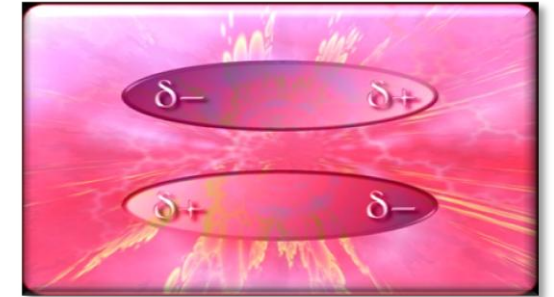
Skins, thin layers



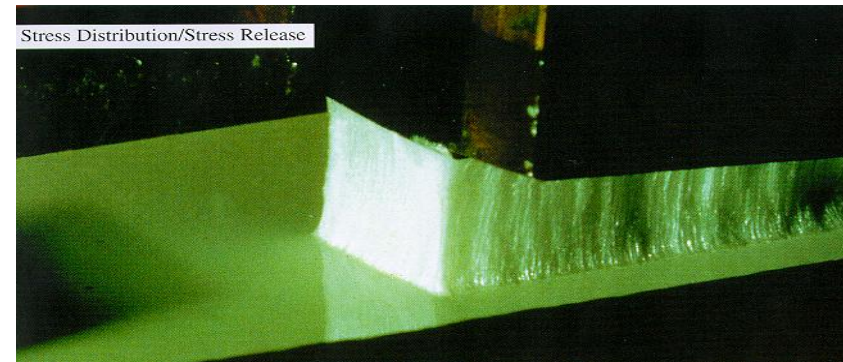
PSA – Adhesion on Clear Coats: Mechanism



Wetting



Viscosity



Elasticity



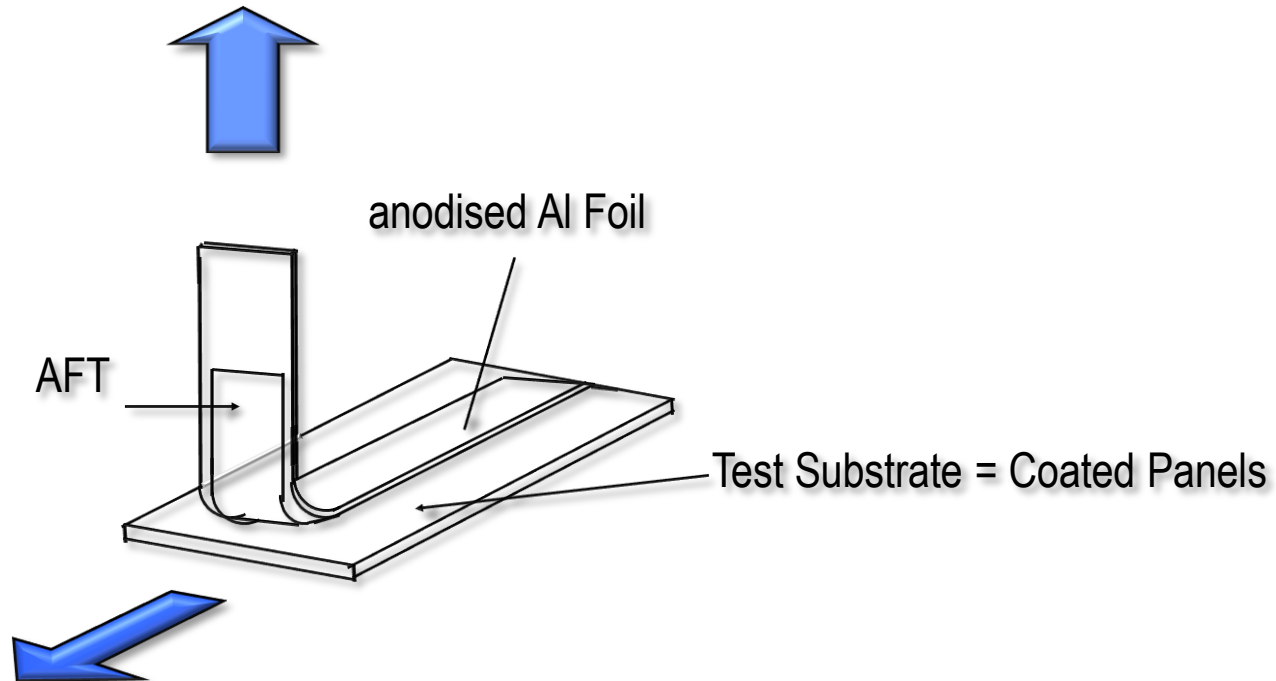
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Why?

The Task

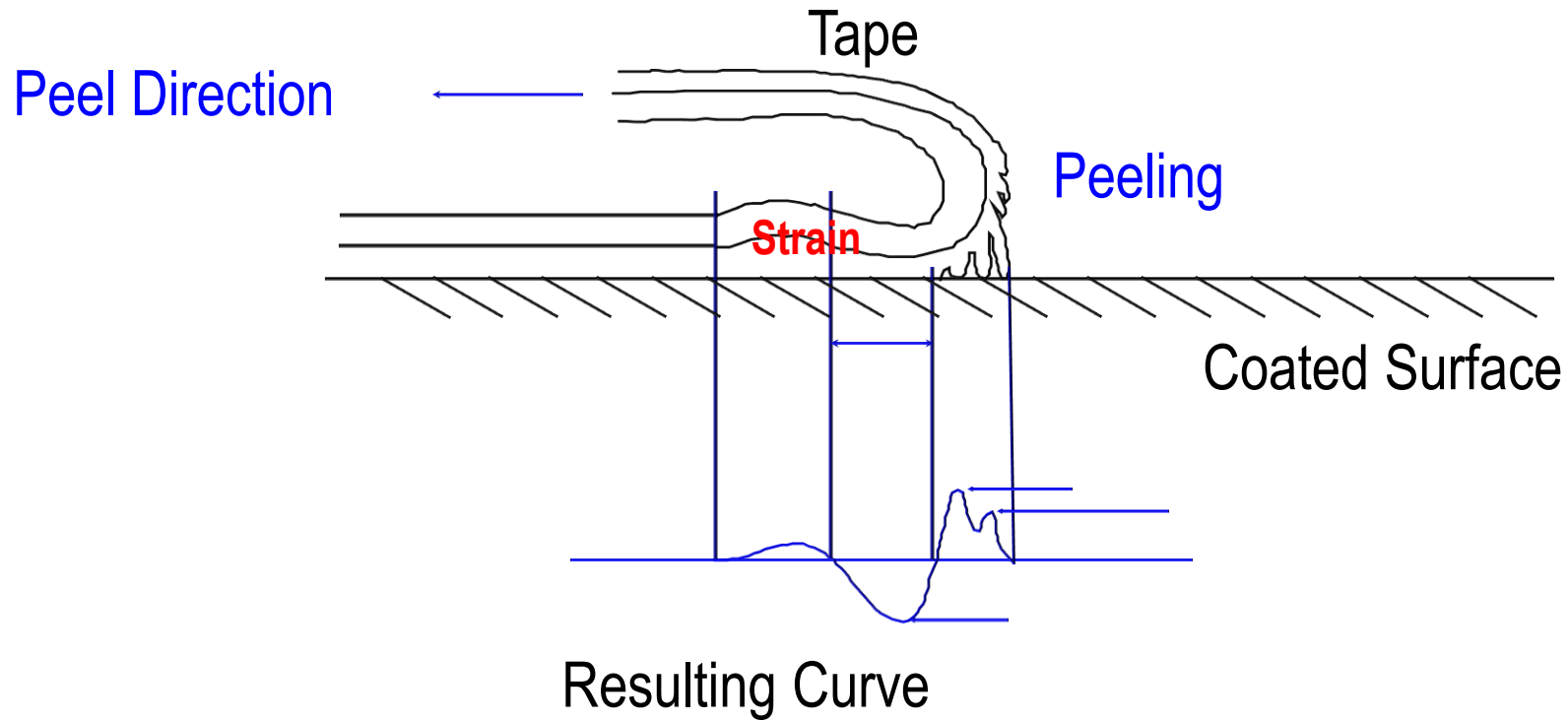
PSA – Adhesion on Clear Coats: Peel Adhesion Test

90 ° Peel Adhesion



PSA – Adhesion on Clear Coats: Peel Process

Simplified Model

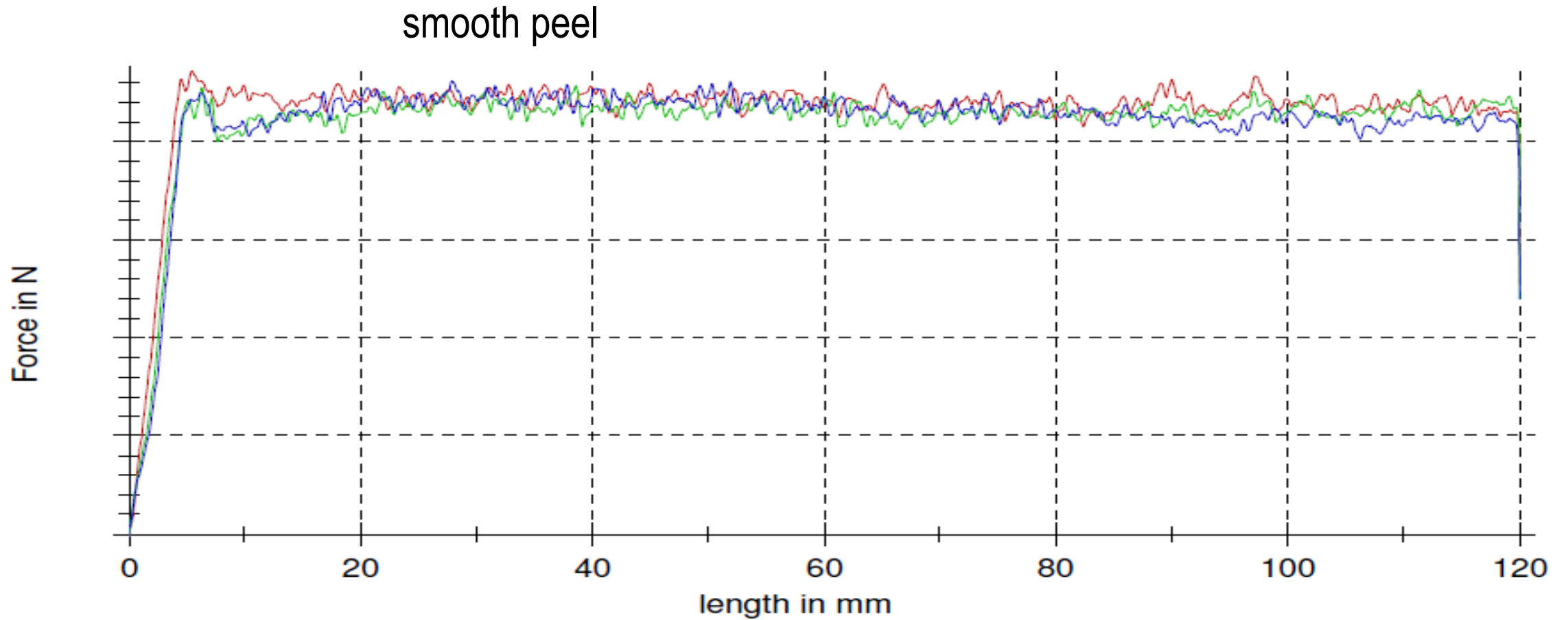


Kaelble (3M), Dahlquist (3M), Yarusso (3M)



PSA – Adhesion on Clear Coats: Peel Process I

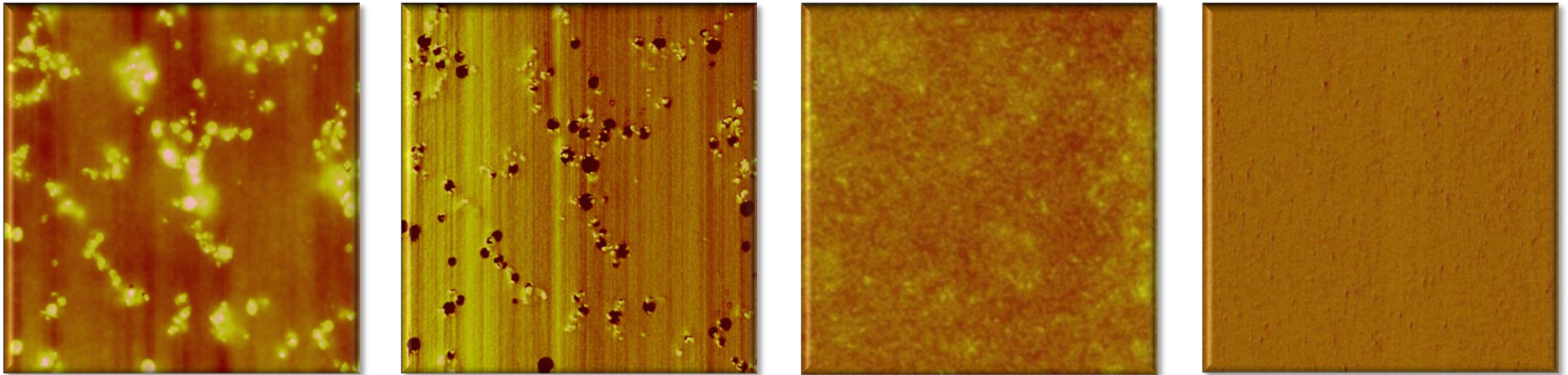
12-1



Original measurement with 3M AFTs



PSA – Adhesion on Clear Coats



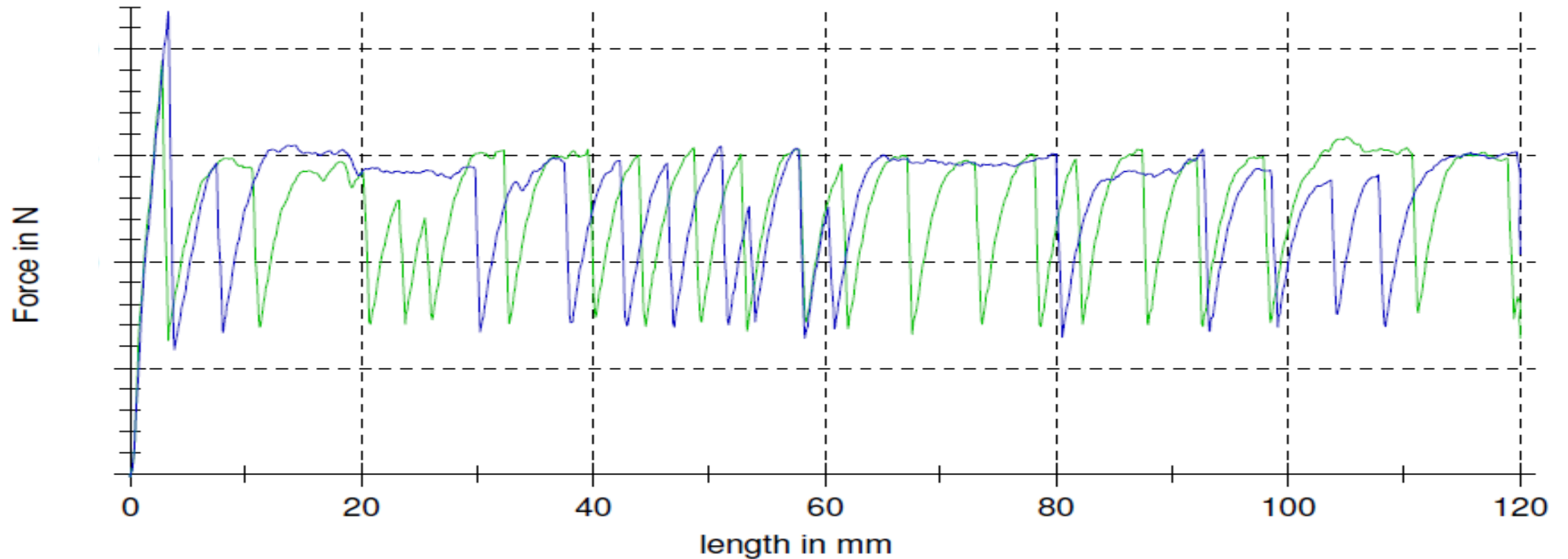
AFM – pictures, side = 0,005 mm

Even smaller modifications in the clear coat leads to different surface properties

-> large difference in adhesion performance possible!

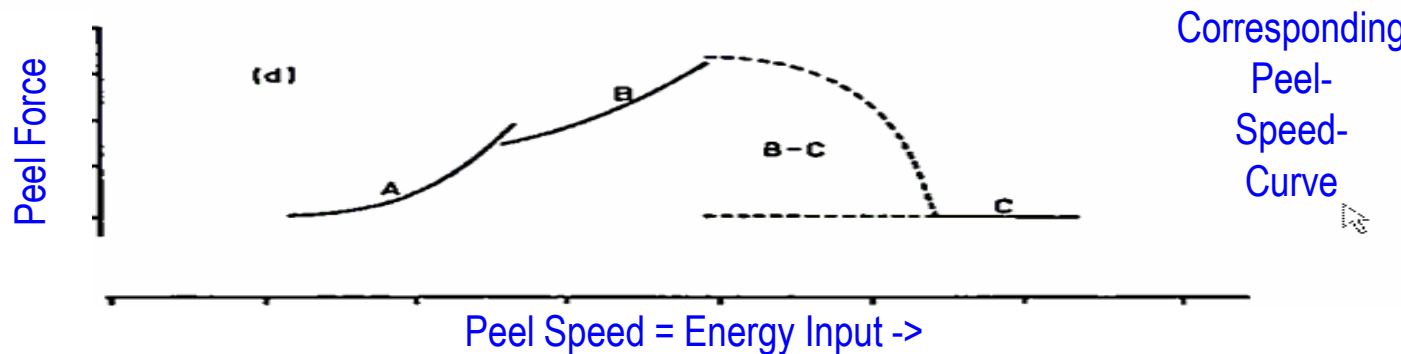
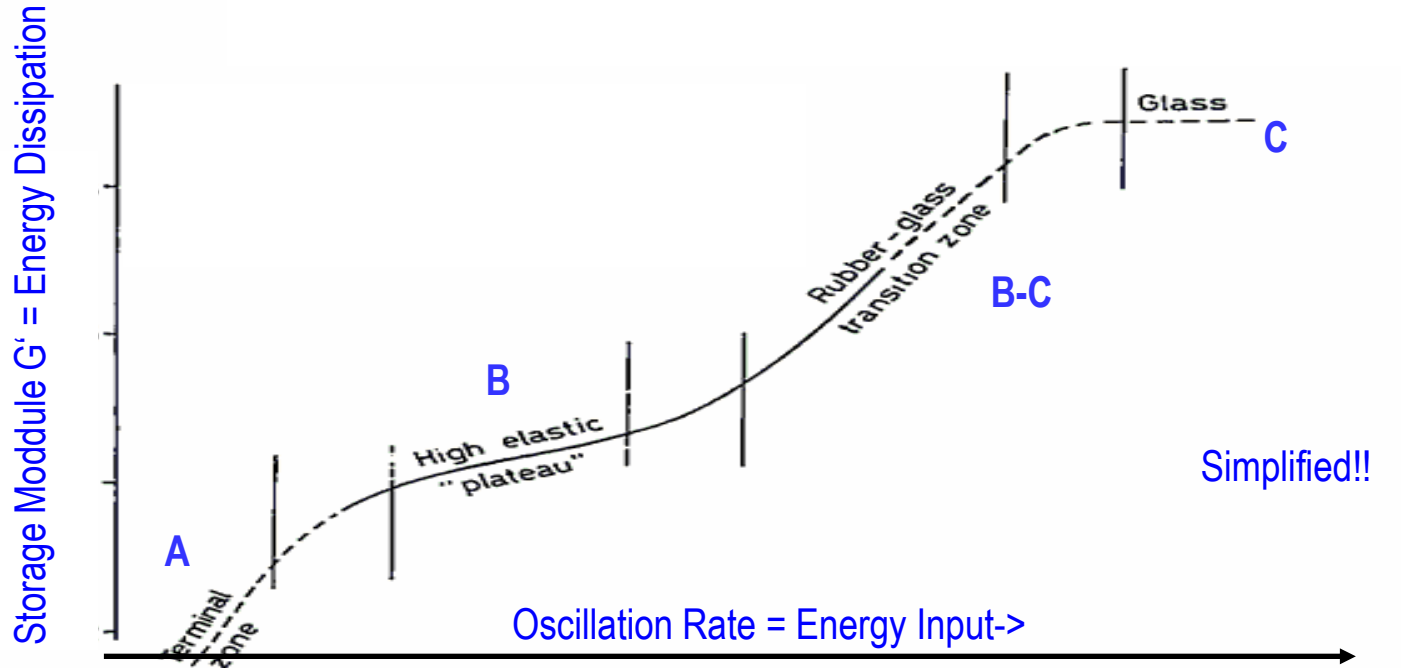
PSA – Adhesion on Clear Coats: Peel Process II

„shocky“ peel – stick/slip effect



Originalmessung mit 3M AFTs

PSA – Adhesion on Clear Coats: Master Curves



Apparatus:
Oscillation Rheometer
 z.B. ARES / 25 mm PP

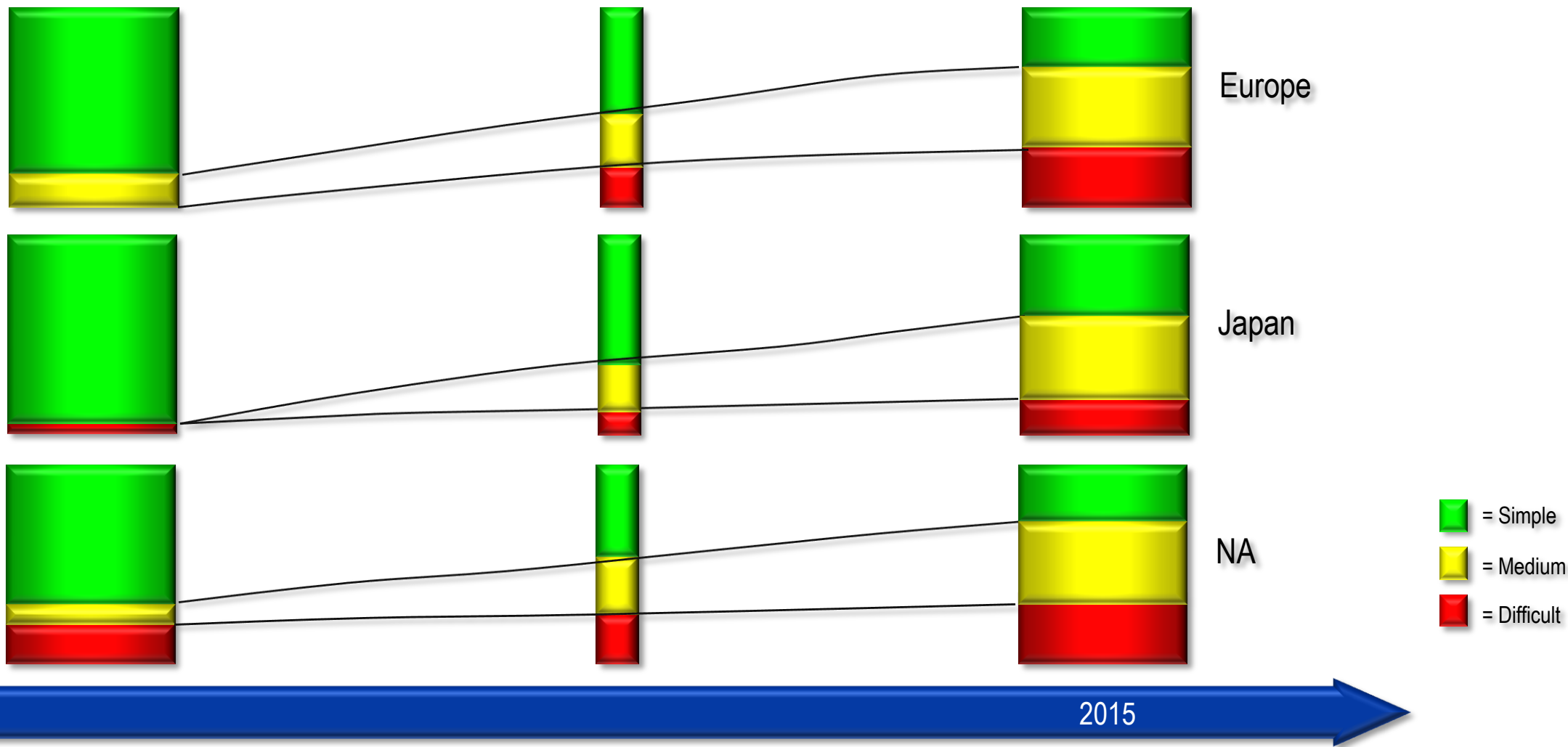
Stress: Oscillation
 0.1Hz – 30Hz

Temperature:
 -50°C – 150°C

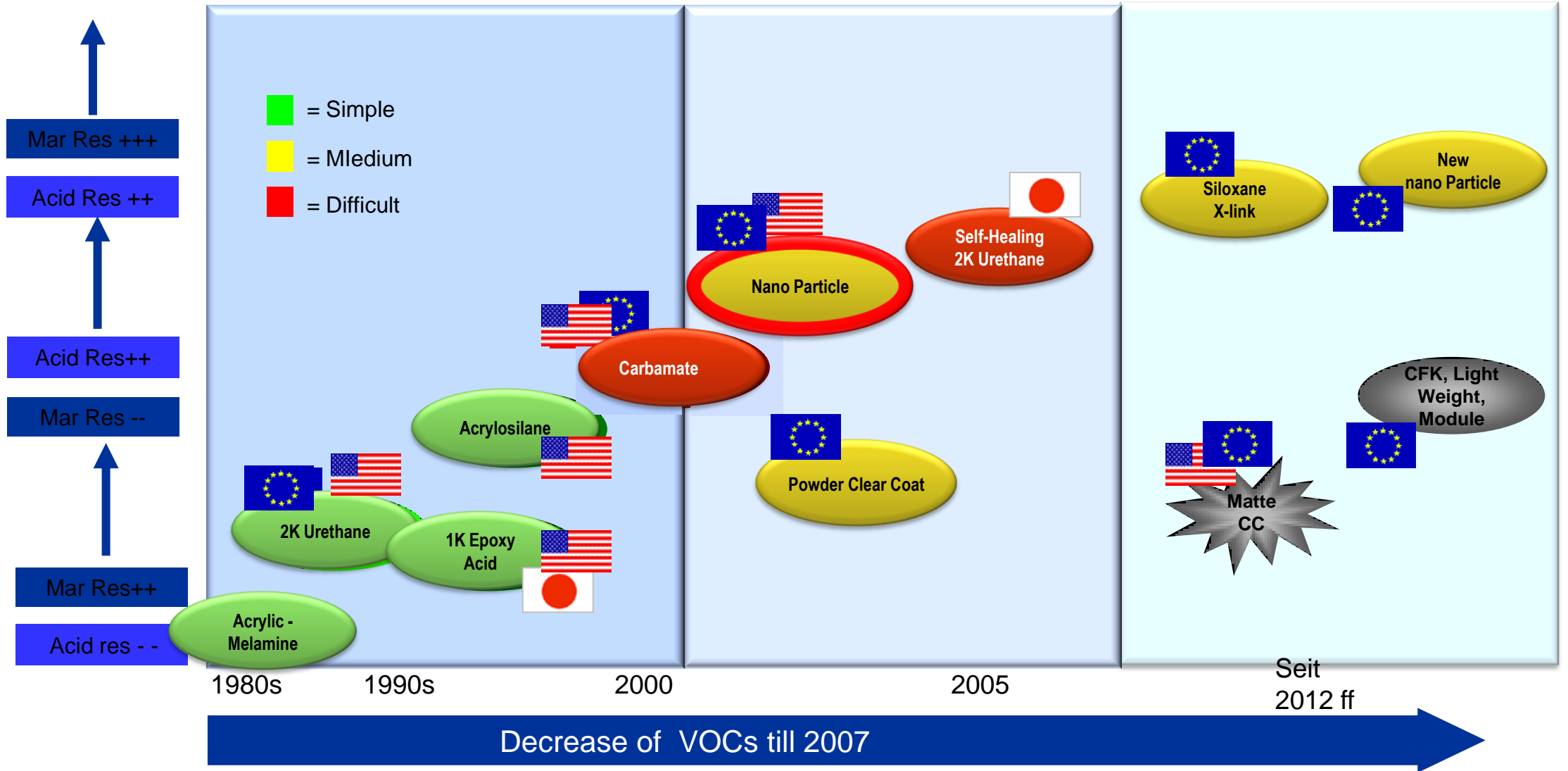
Realx. time: 5 min

Strain: 5%

The Challenge

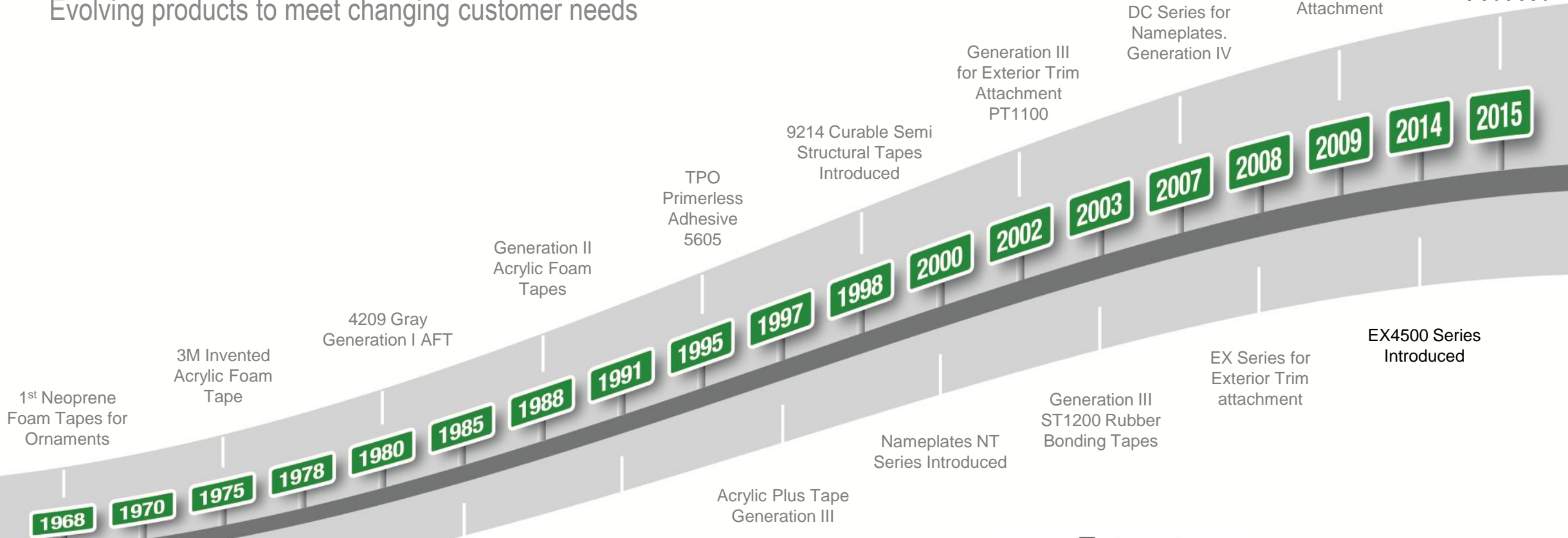


The Answer!



The Answer!

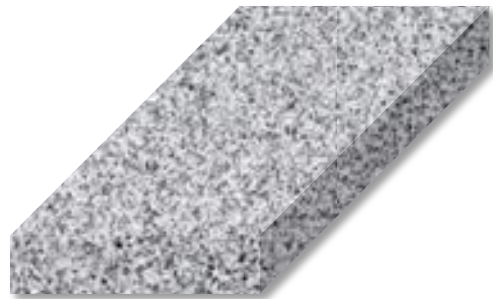
Evolving products to meet changing customer needs



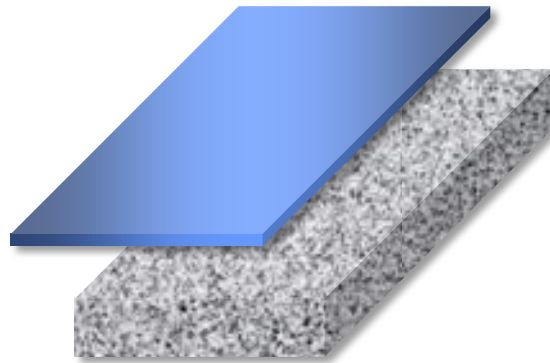
45
over years of
Innovation



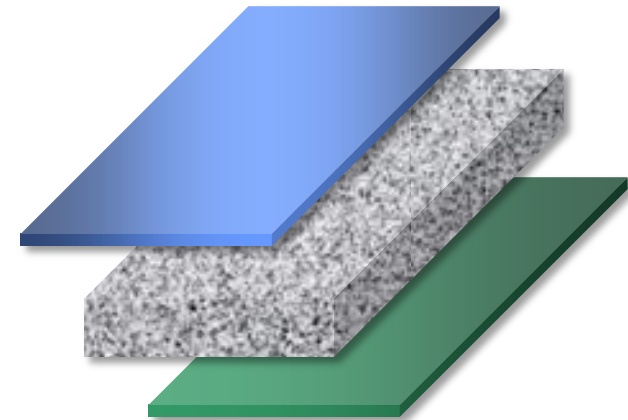
PSA – Constructions



Self Stick



w/ 1 skin adhesive
Single Sided



w/ 2 skin adhesives
Double Sided

Ab Abrasives		Fl Films	Pm Pm	Se Se				
Ad Ad	Ce Ce	Ac Acoustic Control	In In	Md Md	Nt Nt	Po Po	Sm Sm	
Ad Adhesives	Is Is	Ce Ceramics	Me Me	Mr Mr	Pd Pd	Nw Nonwovens	Pp Pp	Su Su
As As	Do Do	Fe Fe	Mf Mf	Pe Pe	Rp Rp	Wo Wo		

Technology
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Really? The Proof

Paint Change @ OEM – Standard Tape



		90° Peel Adhesion on painted panel after 20 min. @ RT		90° Peel Adhesion on painted panel after 72 hrs @ RT			
Plant A	CC 1	Average of 3 samples N/cm		Failure Mode	Average of 3 samples N/cm		Failure Mode
	BC 1.1	14,2			23,5		POP
	BC 1.2	14,8			21,6		
	BC 1.3	14,9			22,0		
	BC 1.4						
	BC 1.5						
		Tape	Condition	Average N/cm	Failure Mode	amples	Failure Mode
	Plant B	Tape New Generation BC 2.7	< 2min.	20,3	S/POP		
	CC 2		20 min.	45,3	50%FS		
			24 h.	44,2	100%FS		
	BC 2.1	25,6		POP	36,8		POP
	BC 2.2	25,6			37,0		
	BC 2.3	27,9			39,1		
	BC 2.4	26,8			37,7		
	BC 2.5	27,6			38,3		
	BC 2.6	28,4			37,2		
	BC 2.7	26,5			39,0		




PSA – Applikation on Carbamate and 2K Clear Coats

Substrate w/ 1K Carbamate	GT 6012	GTI 6512	GTE 6212	GTE 6112	PT 1100	EX 4011
90° Peel Adh.: 20 min @ RT (N/cm)	6	11	14	12	19	43
90° Peel Adh.: 72 h @ RT (N/cm)	8	13	16	13	24	44

Substrate w/ 2K nano Particle CC	GT 6012	GTI 6512	GTE 6212	GTE 6112	PT 1100	EX 4011
90° Peel: 20 minutes (N/cm)	12	18	20	14	44	44
90° Peel: 72 h RT (N/cm)	18	21	21	18	52	44

Paint Change 2K -> 2K nano Particle



Substrate w/ 2K	GT 6012	GTI 6512	GTE 6212	PT 1100	EX 4011
90° Peel: 20 min (N/cm)	13	22	36	43	41
90° Peel: 72 h RT (N/cm)	16	24	29	49	44

Substrate w/ 2K nano Particle CC, V2	GTI 6512	GTE 6212	PT 1100	EX 4011
90° Peel 20 min RT (N/cm)	11	14	11	20
90° Peel 72 h RT (N/cm)	13	16	23	31



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And? The Link

12 = -1





Thanks a lot

for your attention!

