Balancing Sustainability and Performance: Advancing Biobased Polymers in Furniture Applications

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Biobased EXP-PC-Mull 815

Biobased acrylic copolymer, with a calculated biobased content up to 15% for high-performance furniture and wood finishes. Comparable to conventional 100% fossil-based products.

Application

- Fast hardness development
- Excellent leveling,
- transparency and in-can clarity,
- flexibility,
- chemical resistance,
- water resistance

Industrial Wood OEM

- Sealer / Topcoat
- Spray

Specifications	
Weight Solids [%]	40 ± 1
Viscosity, 23 °C [mPa·s]	< 250
pH	8.0 – 9.0

Typical Properties		
MFFT	[°C]	± 30
Density @ 20 °C [kg/m3]		1055

Samples for evaluation will be available soon

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Side-by-side validation of biobased new development versus internal reference

Resin + Solvent:

- Solvent study
- The MFFT with different solvent
- Hardness development with different solvents
- Anfeuerung
- Clarity
- Early water resistance / Blushing

Clear and Pigmented Formulation

- Adhesion
- Gloss
- Blocking
- Chemical resistances

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Solvent study, used formulation

DJ3-115-1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	INSTRUCTIONS
	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	[gram]	
Resin (internal reference or EXP-PC-Mull® 815)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	Weight in a metal tank or 100 ml plastic cup
BG	4.0	8.0																	Premix in a plastic cup. Add solwly under good agitation (600 rpm). Mix 5 minutes
BDG			4.0	8.0															
EDG					4.0	8.0													
Dowanol PM							4.0	8.0											
Dowanol DPM									4.0	8.0									
Dowanol DPnB											4.0	8.0							
PROGLYDE DMM													4.0	8.0					
MPG															4.0	8.0			
Texanol																	4.0	8.0	
Water	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Ammonia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Tego Wet KL 245	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Add under agitation (600 rpm). Mix 5 minutes
Total:	88.7	92.7	88.7	92.7	88.7	92.7	88.7	92.7	88.7	92.7	88.7	92.7	88.7	92.7	88.7	92.7	88.7	92.7	

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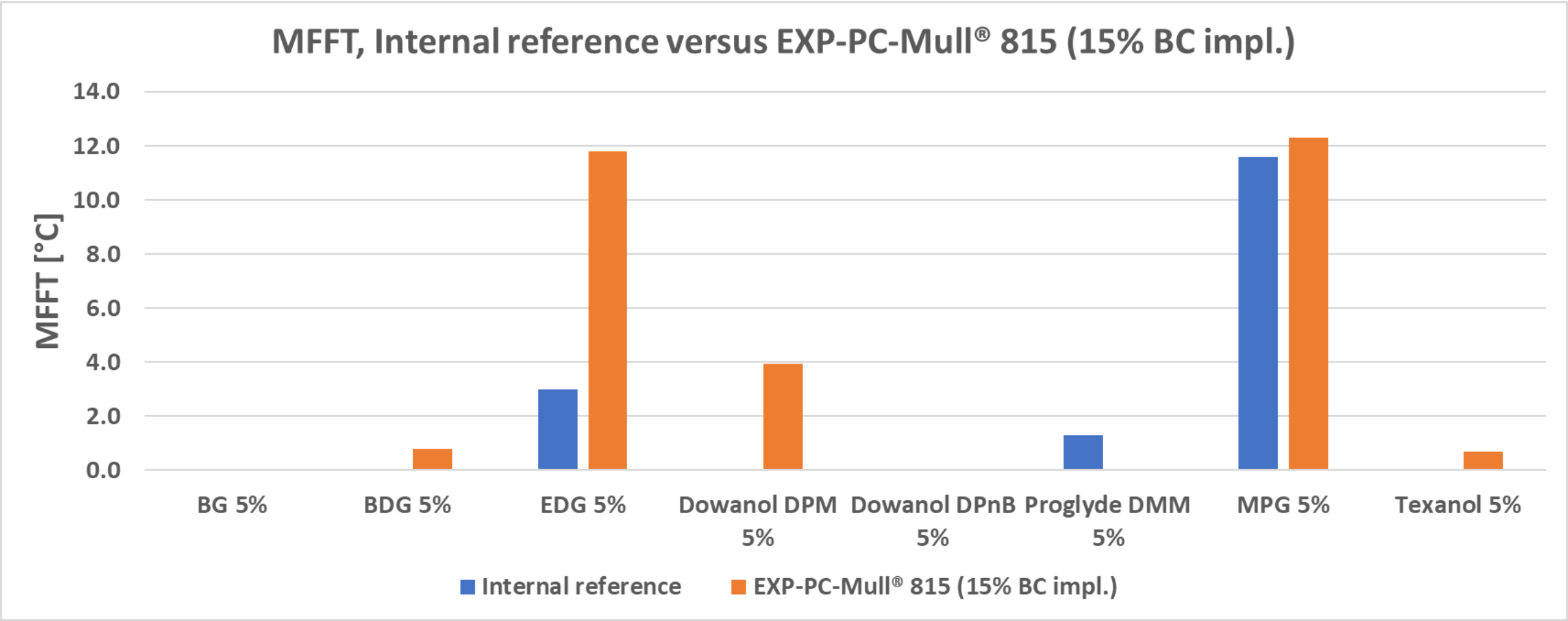
Solvent study, MFFT



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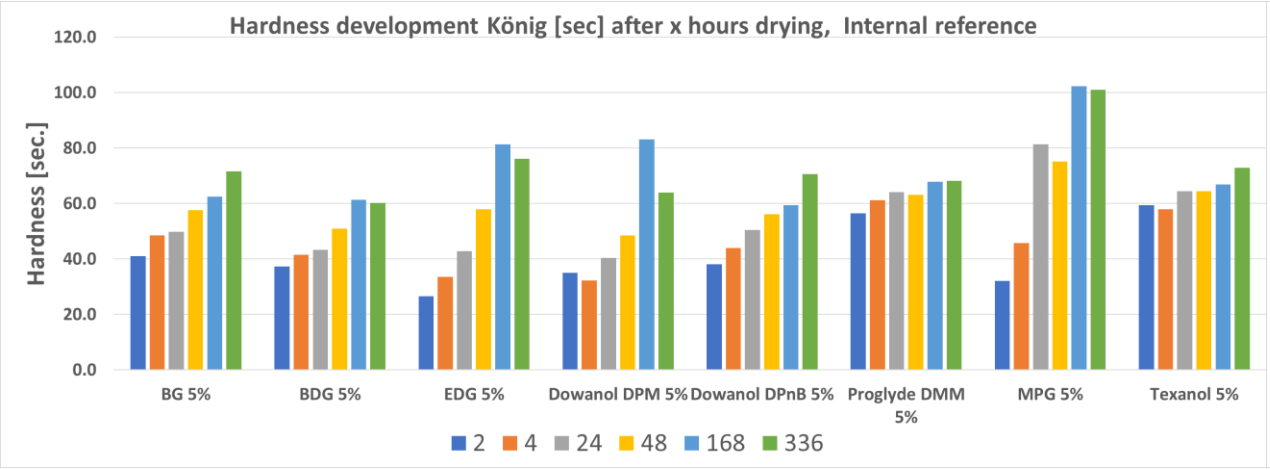
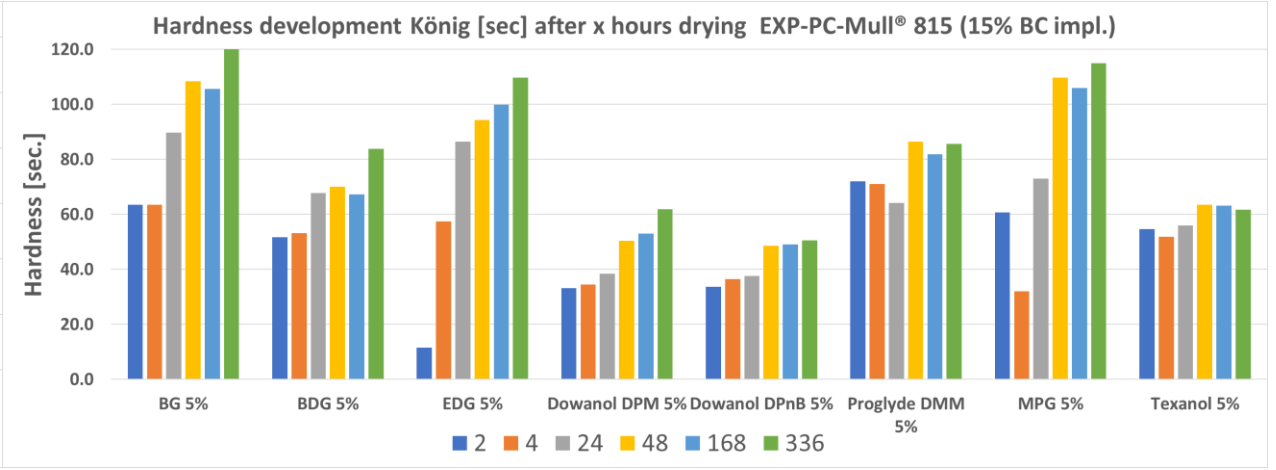
Solvent study, hardness development





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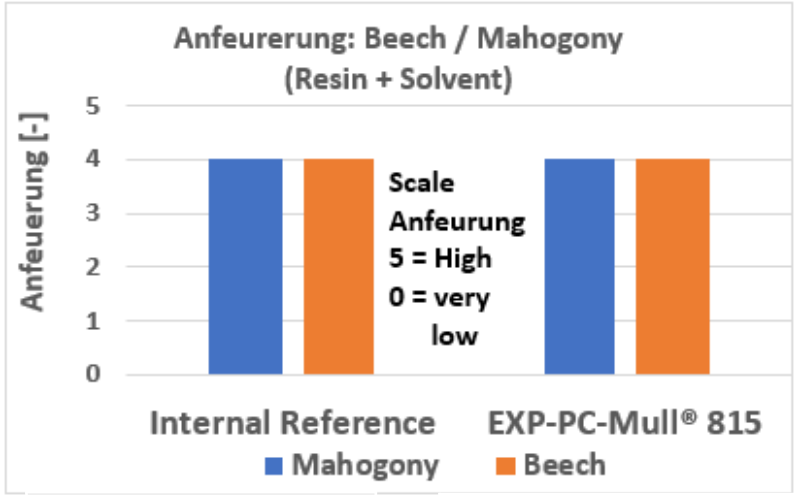
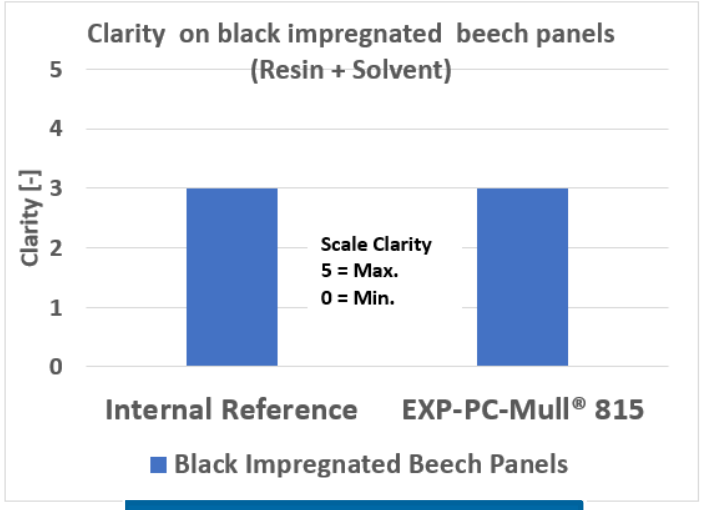
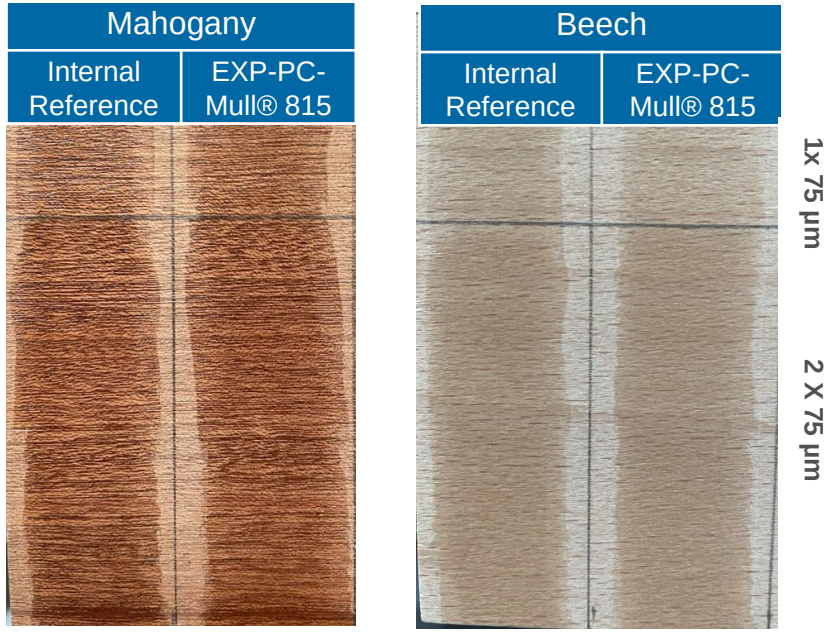
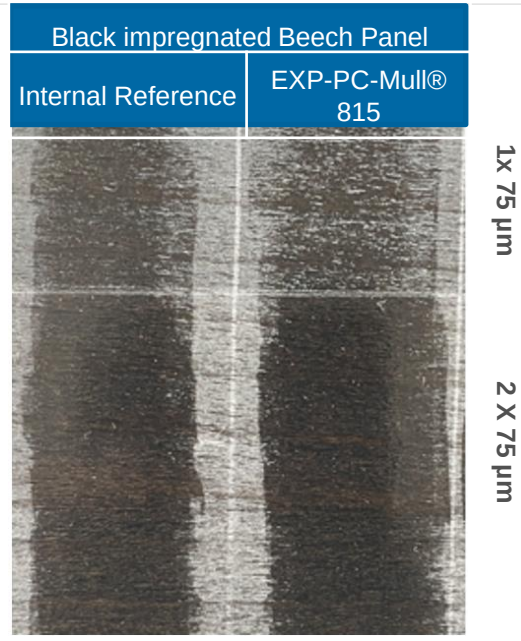
Anfeuerung / Clarity









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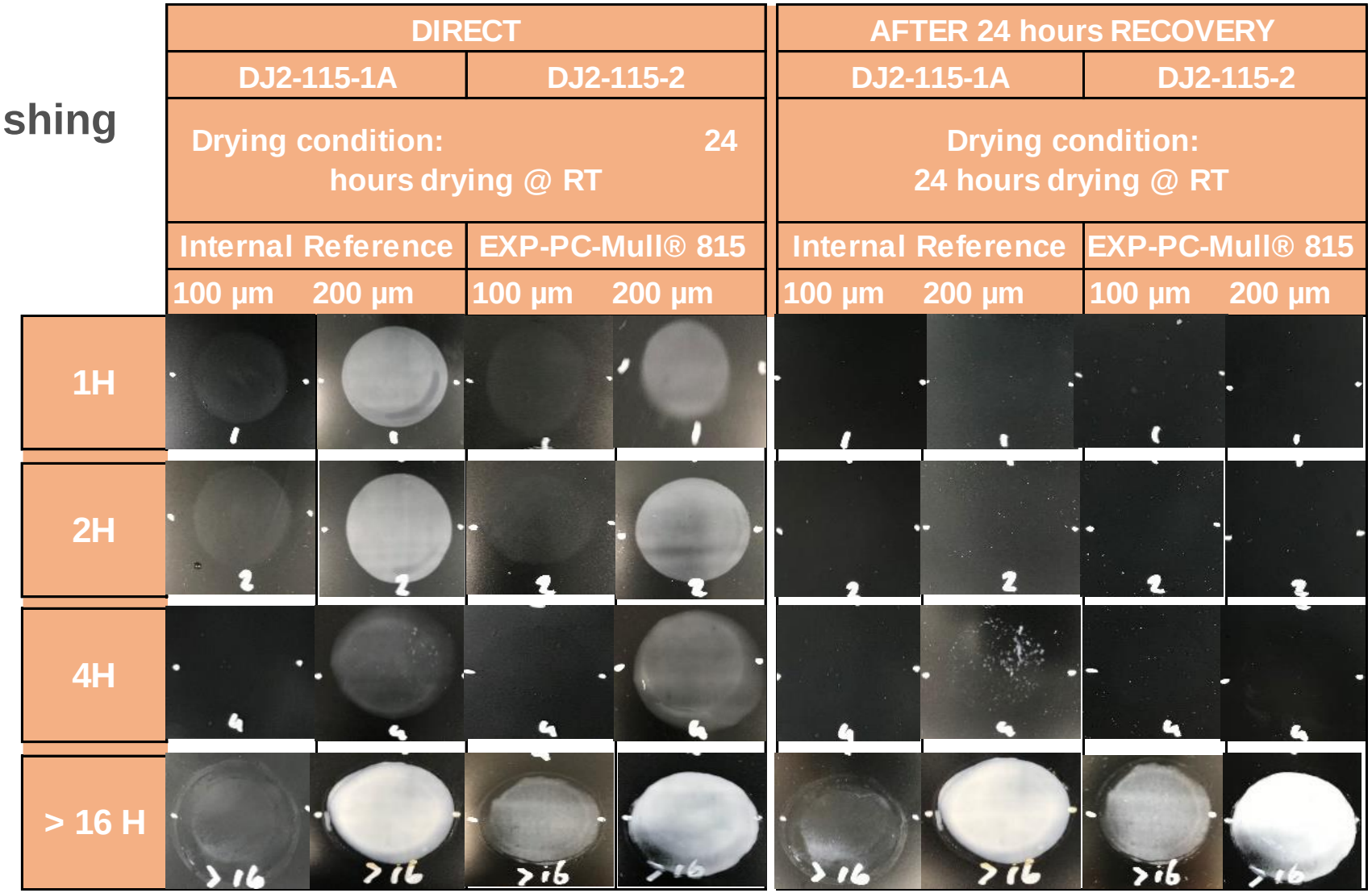
Early Water Resistance: Blushing



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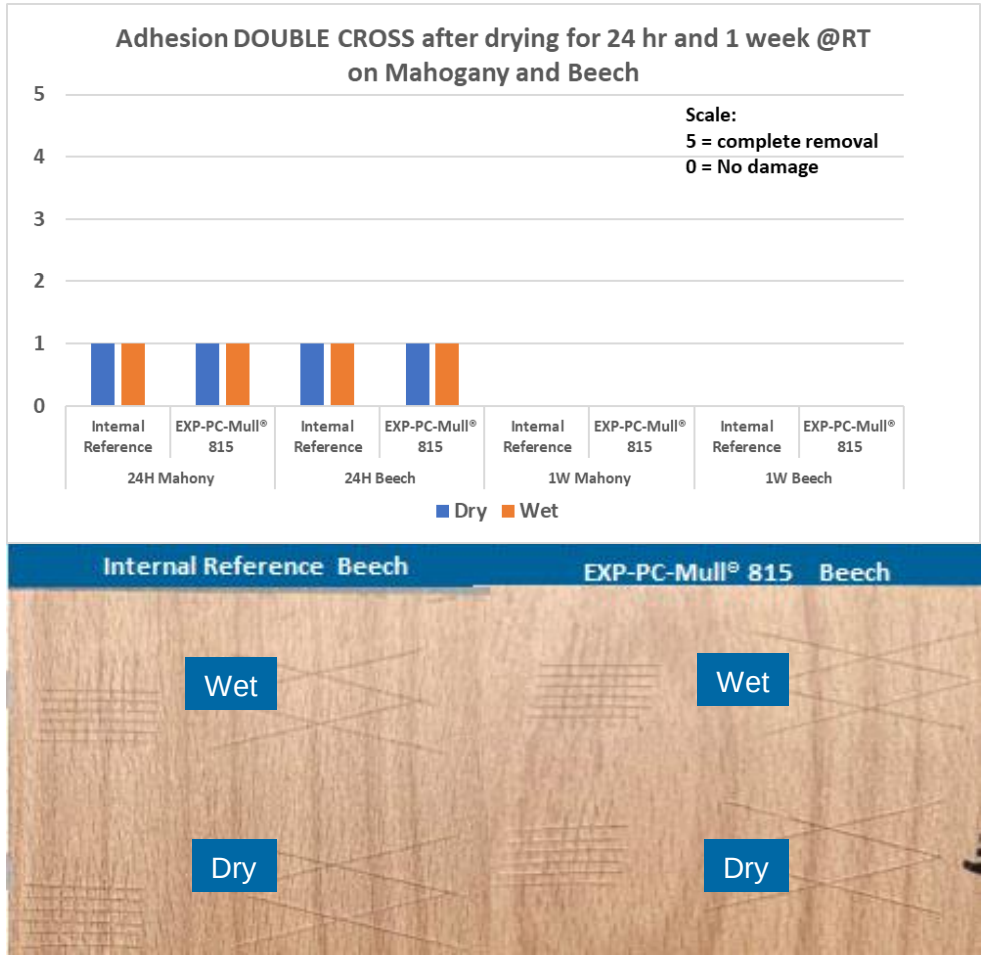
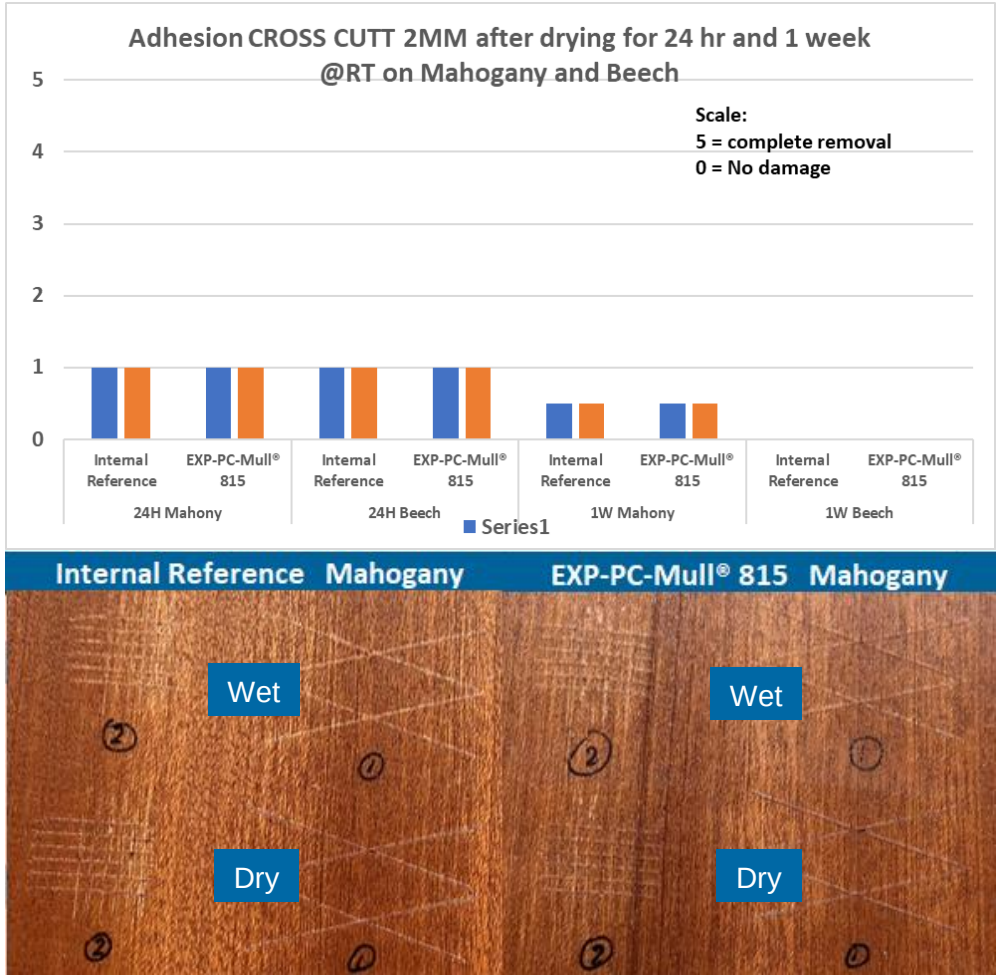
Adhesion Clear





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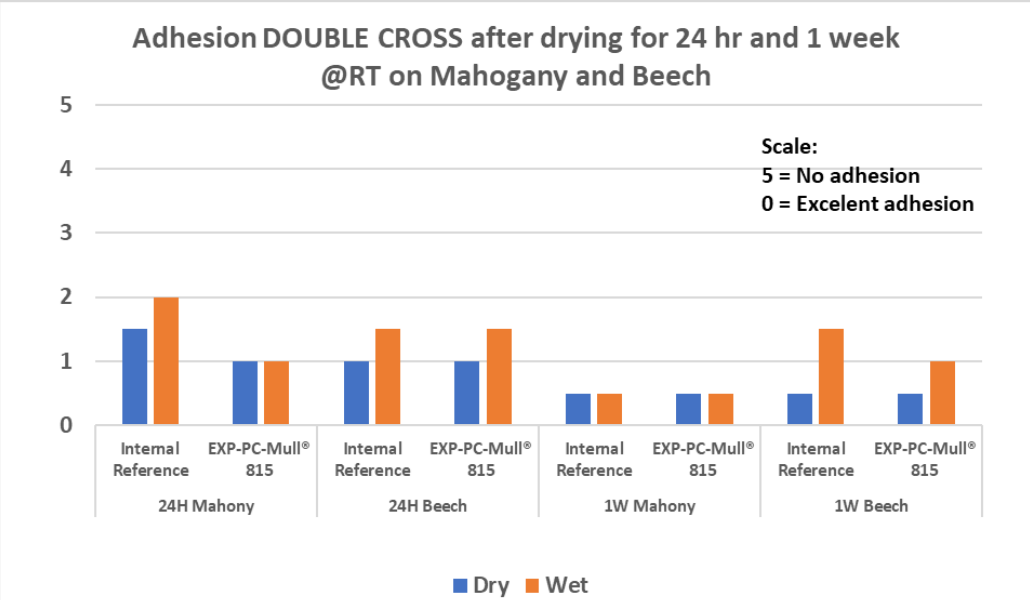
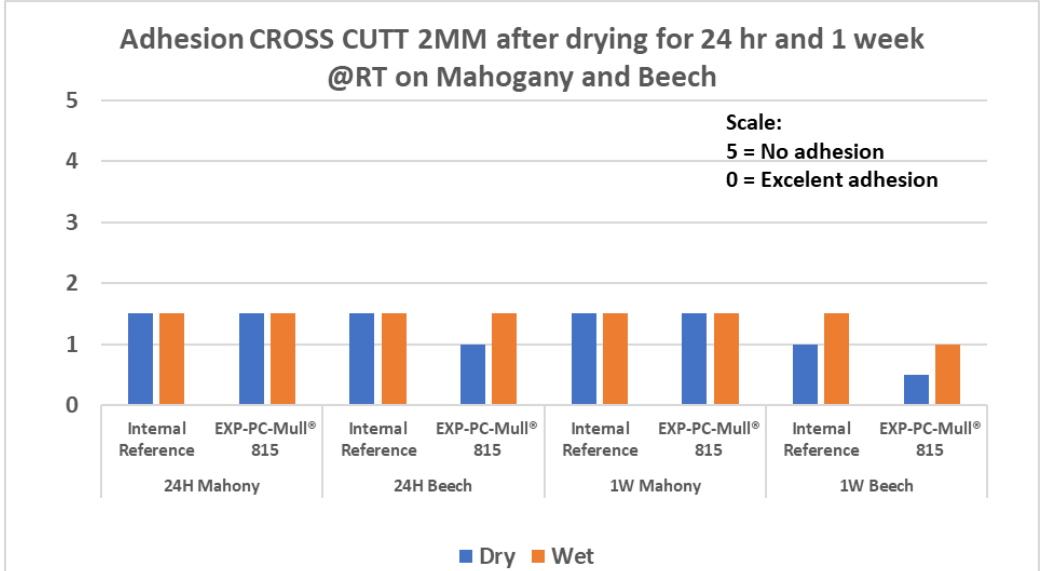
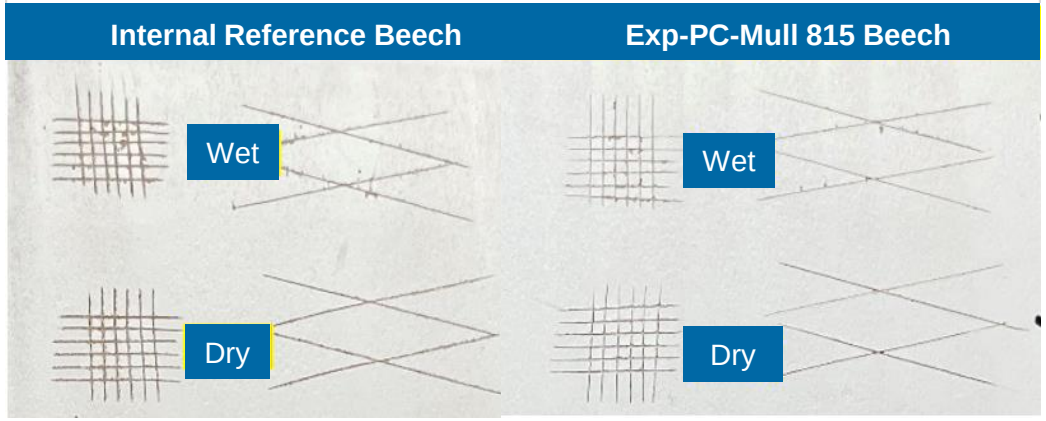
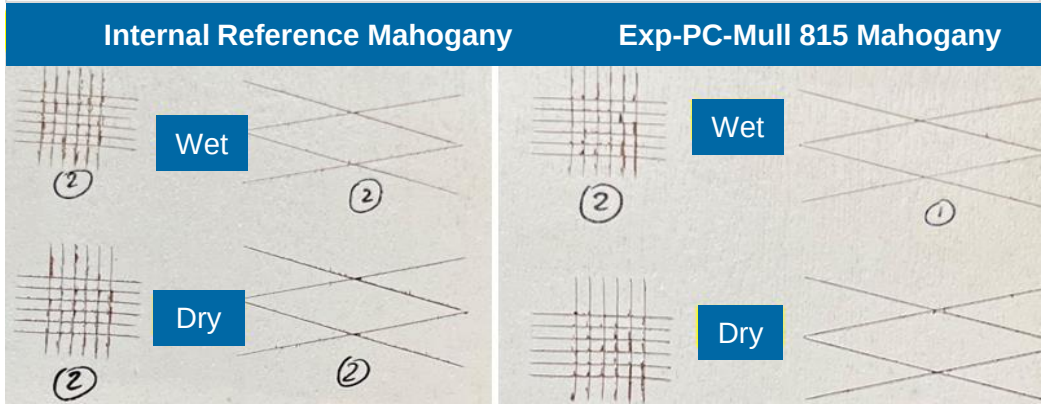
Adhesion Pigmented









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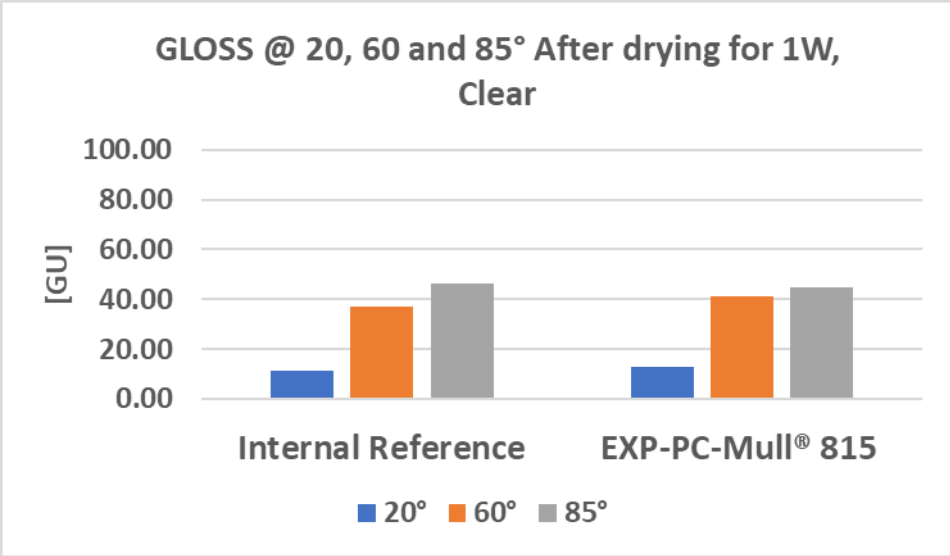
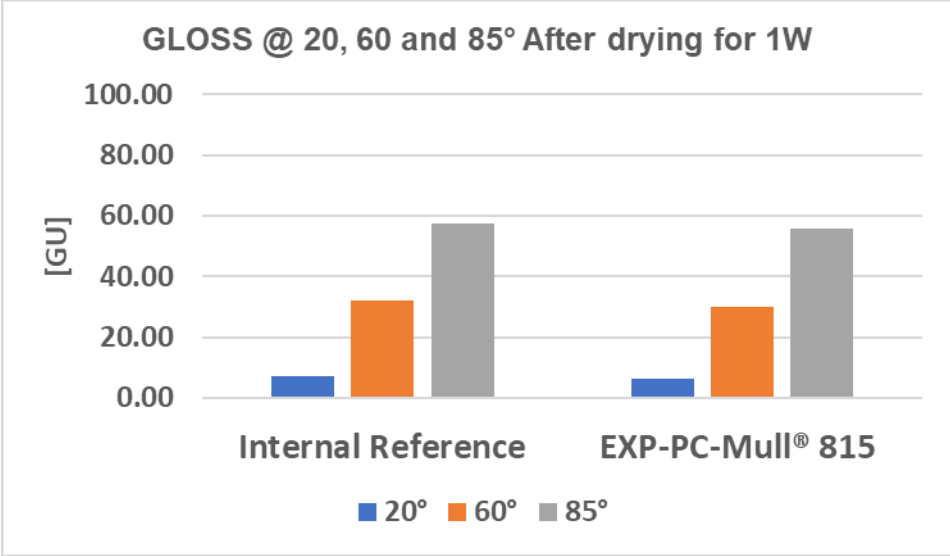
Gloss Clear



1W

DJ2-115	1	2
	Internal Reference	EXP-PC-Mull® 815
20°	11.50	12.90
60°	36.80	41.00
85°	46.30	44.90

Gloss Pigmented



1W

DJ2-115	4	5
	Internal Reference	EXP-PC-Mull® 815
20°	7.10	6.20
60°	32.10	30.20
85°	57.30	55.80

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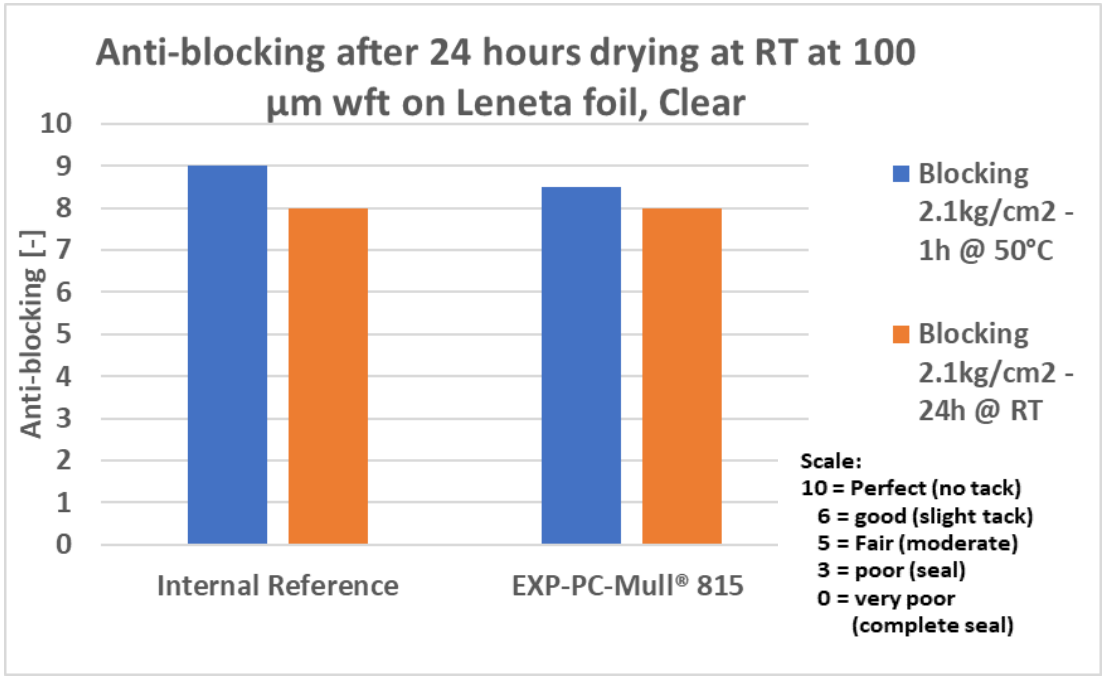
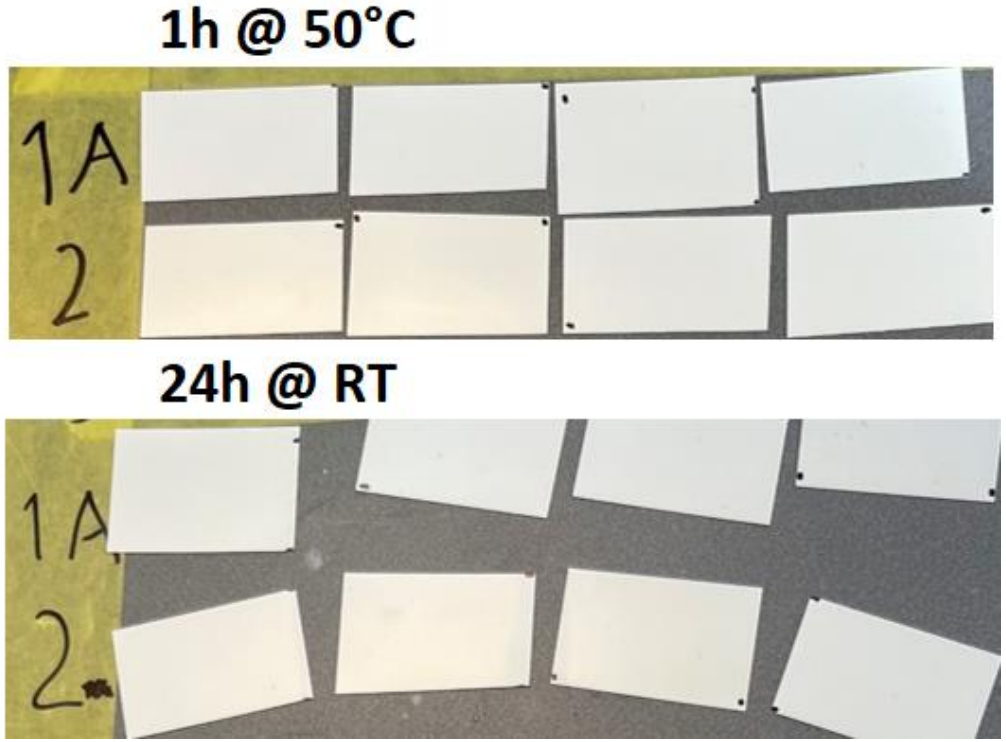
Anti-blocking Properties, Clear





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Chemical Resistance: Clear

Coating system

2 x 100 - 125 µm wet on Beech

1st layer FD: ½ hr @ 40 °C

2nd layer FD: 72 hr @ 40 °C

TESTED CHEMICALS
1: Ammonia (10 % sol) -10 min
2: Alcohol (48 % sol.) - 10 min.
3: Alcohol (48 % sol.) - 1h
4: Fatty acid - 1hr
5: Hand Cream -1h
6: Hand fat -1h
7: Coffee (4 % sol.) -6h
8: Red Wine -6h
9: Water 24h
10: Parafine oil 24h
11: Olive oil 24h
12: Lemon Acid 1h

Internal Reference	Exp-PC-Mull 815
	

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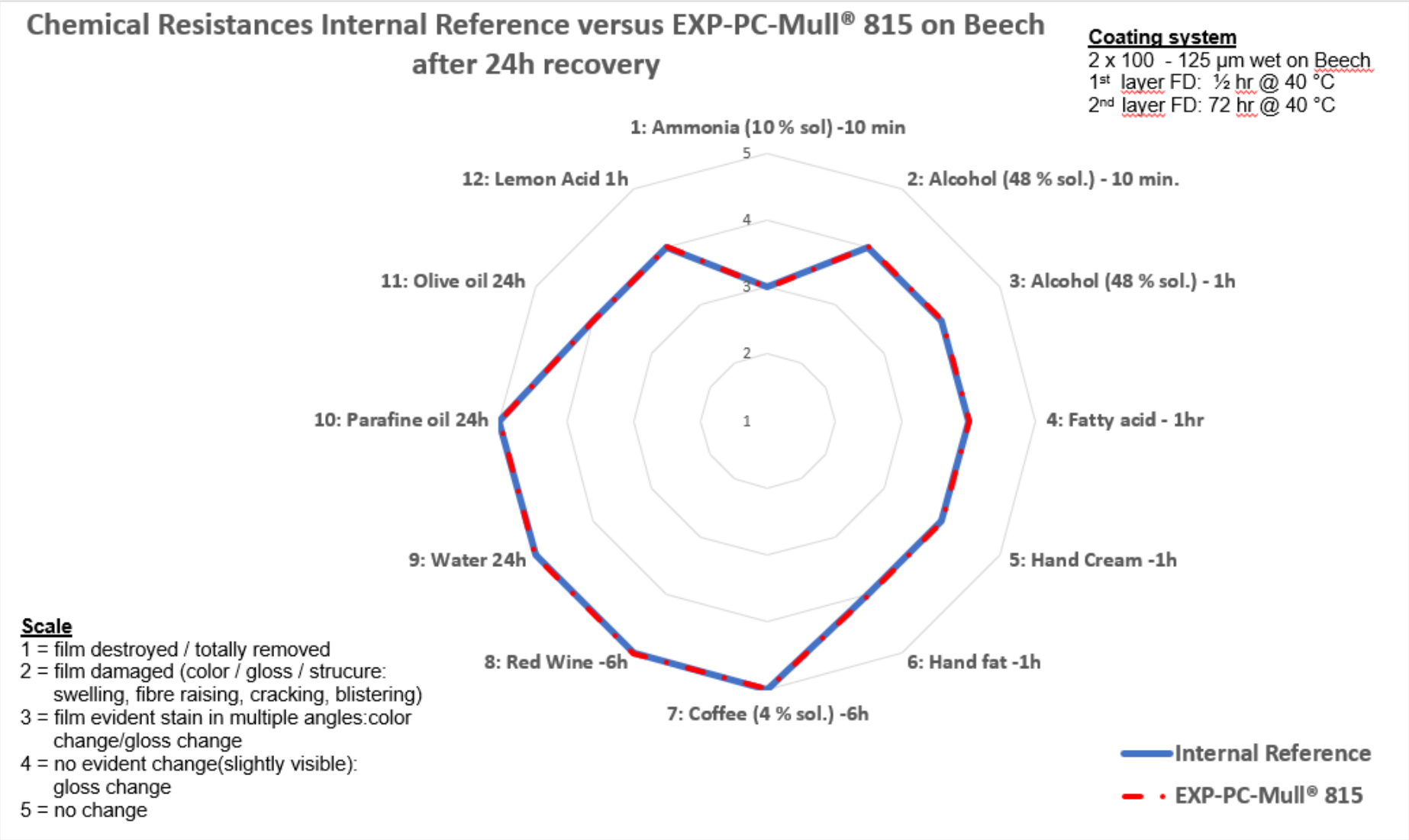
Chemical Resistance: Clear



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Chemical Resistance: Pigmented

Chemical Resistances (125 m wet Melamile foil)	Internal Reference	EXP-PC-Mull® 815
1: Ammonia (10%) 10 min	4	4
2: Ammonia (10%) 1 hr	4	4
3: Alcohol (48%) 10 min	4	4
4: Alcohol (48%) 1h	4	4
5: Coffee (4% sol) - 6h	3	3
6: Coffee (4% sol) - 16h	3	3
7: Water 24h	4	4
8: Red Wine -6h	3	3
9: Olive Oil 6h	4	4
10: Olive Oil 16h	4	4
11: Lemon acid 1h	5	5
12: Lemon acid 16h	4	4
13: Acetic Acid 4% 1h	5	5
14: Acetic Acid 4% 16h	4	4
15: Fatty acid - 1hr	4	4
16: Hand Cream -1h	4	4
17: Hand fat -1h	4	4
18: Hand fat -24h	4	4
19: Parafine oil 24h	5	5
20: Gasoline 1hr.	4	4

Internal Reference

Exp-PC-Mull 815

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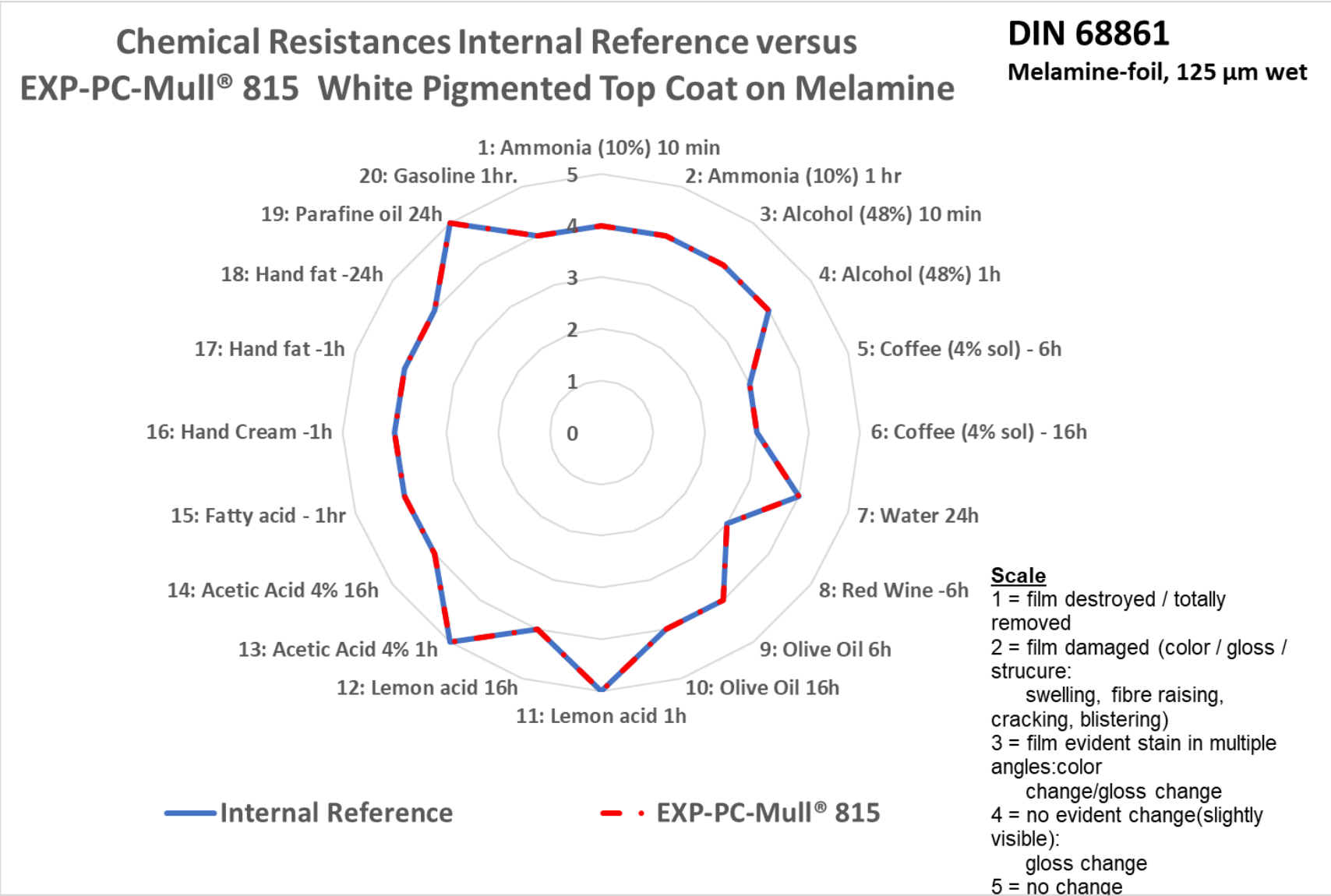
Chemical Resistance: Pigmented



THANK YOU
QUESTIONS?

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Clear Formulation

Raw materials	[%]	[%]	Instructions
Internal Reference	86.00		Charge in Letdown tank
EXP-PC-Mull® 815		86.00	
BG (Butyl Glycol)	3.50	3.50	
Dowanol DPnB	0.80	0.80	Premix before addition in small
Ammonia (18%)	0.10	0.10	tank Add while mixing
Demi water	3.80	3.80	
Total:	8.20	8.20	
Ceraflour 929	1.00	1.00	Add while mixing
Acematt TS 100	0.50	0.50	Mix till Momogeneous / no lumps
Aquacet 539	1.00	1.00	Add while mixing
Tego Foamex 810 solution	0.30	0.30	Add while mixing
Tego Foamex 822	0.60	0.60	Mix till Momogeneous
Silco Glide CT 5052	0.30	0.30	Add while mixing
Acticide ICB 5	0.10	0.10	Add while mixing
Rheobyk 7420 ES	1.00	1.00	Add while mixing
Rheolate 288 Solution	1.00	1.00	Mix till Momogeneous
Total	**100.00**	**100.00**	

Tego Foamex 810 solution

	[%]
Tego Foamex 810	10.00
Ethylene Glycol	90.00
Total:	100.00

Rheolate 288 Solution

	[%]
Demi-water	15.00
Butyl Glycol (BG)	15.00
Rheolate 288	70.00
Total:	100.00

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WHITE PIGMENTED TOPCOAT Formulation

Raw material	[%]	[%]	Instructions
			I phase (mill base)
Water	2.10	2.10	Charge dissolver tank with water
PC-Mull GR100	2.60	2.60	Add while mixing: low shear.
Ammonia 18% solution in water	0.20	0.20	
Tego Foamex 810	0.10	0.10	
Tronox 828 / Tioxide TR 92	15.75	15.75	
Water	0.25	0.25	Rinse tank wall with water (removal of dry pigments)
Rheolate 288 Solution	0.20	0.20	Add while mixing: low shear. Mix for 3 - 5 min.
			Disperse @ High shear for 15- 20 min. Temperature < = 40 °C. CHECK: Fineness grind < 10 µm
Total mill base	21.20	21.20	
			II phase
Internal Reference	73		Charge resin and add Mill-base (I phase) while mixing
EXP-PC-Mull® 815		73.0	
BG (butyl glycol)	4.00	4.00	Premix the raw materials here below in a separate tank. Adjust the pH of this mixture with Ammonia 18% solution in water. pH level: 8.0 - 9.0
BDG (butyl diglycol)	1.00	1.00	
DPnB	1.00	1.00	
Water			
Rheolate 288 Solution	0.20	0.20	
Ammonia 18% solution in water	0.10	0.10	
Total:	6.30	6.30	Add this Premix very slowly to the let down tank while mixing
			CHECK: Fineness grind < 10 µm
Deuteron PMH C	1.50	1.50	Add and mix for 5 - 10 minutes @ mid - high shear
			CHECK: Fineness grind < 10 µm
Aquacer 539 (or Ultralube D 838: 1.5 %)	2.50	2.50	Add while mixing @ low sheare
Tego Airex 902 W / Tegofoamex 822	0.60	0.60	Add while mixing @ low sheare
Silco CT 5052 (	0.30	0.30	Add while mixing @ low sheare
Tego Twin 4100	0.30	0.30	Add while mixing @ low sheare
Mergal 721 K3	0.10	0.10	Add while mixing @ low sheare
Rheolate 288 Solution	0.40	0.40	
Adjust pH : 8.0 - 9.0			
Ammonia 18% solution in water	0.00	0.00	
Adjust viscosity: ~80 sec DIN 4			
Rheolate 288 Solution	0.10	0.10	
Total	**106.30**	**106.30**	

Tego Foamex 810 solution

	[%]
Tego Foamex 810	10.00
Ethylene Glycol	90.00
Total:	100.00

Rheolate 288 Solution

	[%]
Demi-water	15.00
Butyl Glycol (BG)	15.00
Rheolate 288	70.00
Total:	100.00