Nico Sgrolli

31st January 2024



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

Typical Properties

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



Samples for evaluation will be available soon



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

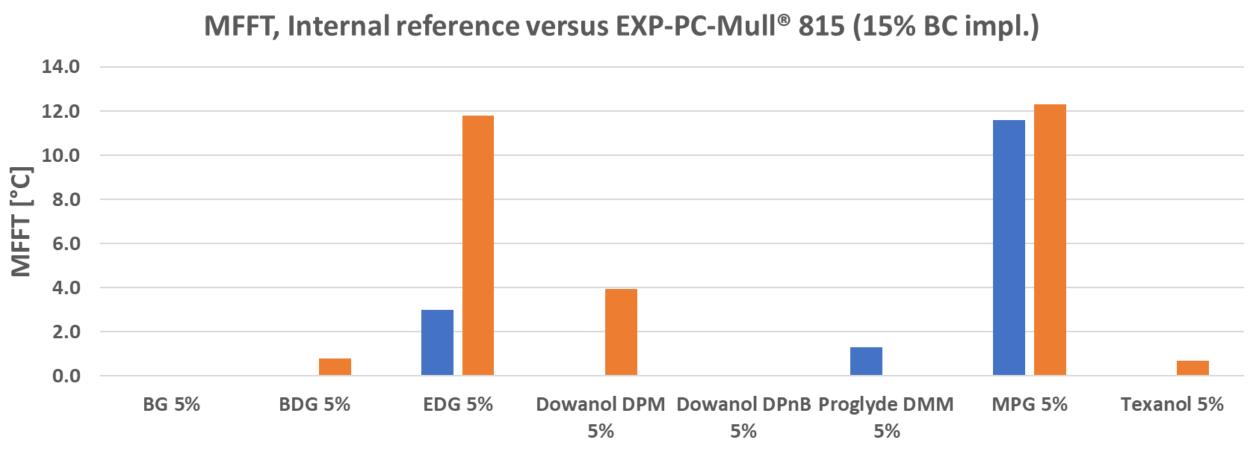




Solvent study, used formulation

DJ3-115-1	Α	В	С	D	E	F	G	Н		J	K	L	М	Ν	0	Ρ	Q	R	INSTRUCTIONS
	[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																	
BDG			4.0	8.0															
EDG					4.0	8.0													
Dowanol PM							4.0	8.0											Premix in a plastic cup. Add solwly under good agitation
Dowanol DPM									4.0	8.0									
Dowanol DPnB											4.0	8.0							
PROGLYDE DMM													4.0	8.0					(600 rpm). Mix 5 minutes
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	

Solvent study, MFFT



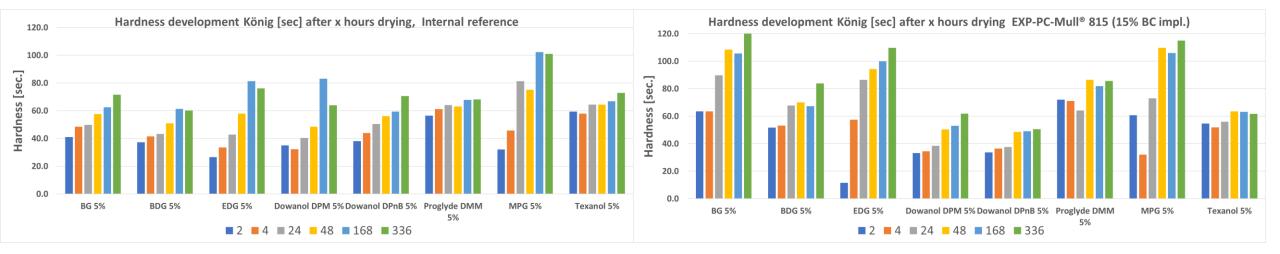
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Simplified

Internal reference EXP-PC-Mull[®] 815 (15% BC impl.)



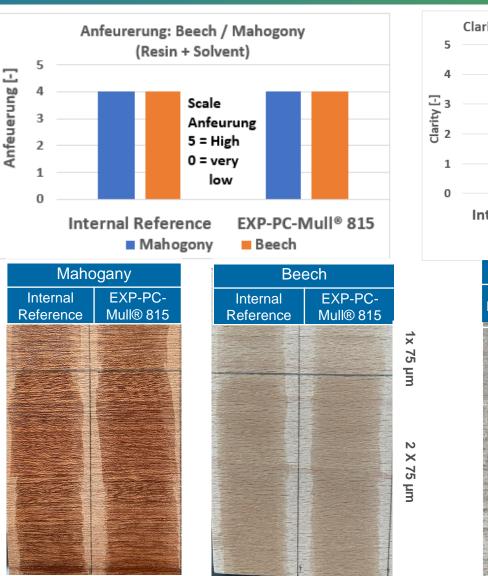


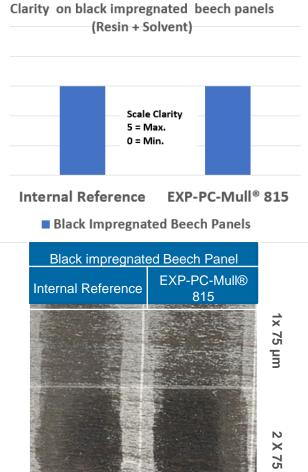
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Anfeuerung / Clarity





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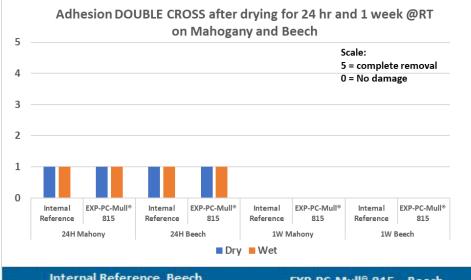
hm

Early Water

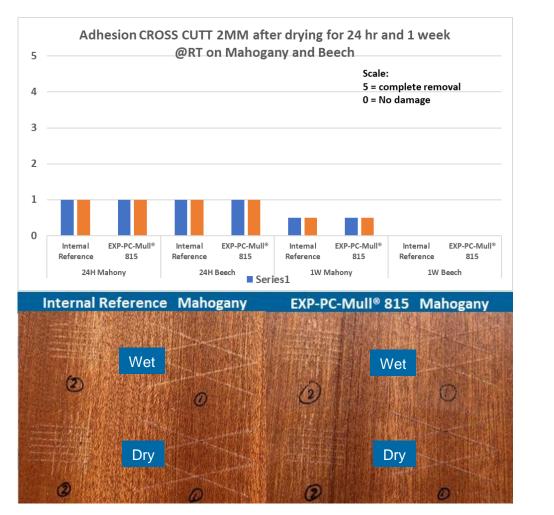


DIRECT **AFTER 24 hours RECOVERY** DJ2-115-1A DJ2-115-2 DJ2-115-1A DJ2-115-2 **Resistance: Blushing** Drying condition: 24 Drying condition: hours drying @ RT 24 hours drying @ RT Internal Reference EXP-PC-Mull® 815 EXP-PC-Mull® 815 **Internal Reference** 100 µm 200 µm 200 um 100 µm 200 µm 100 um 100 um 200 µm **1H 2H 4H** > 16 H

Adhesion Clear





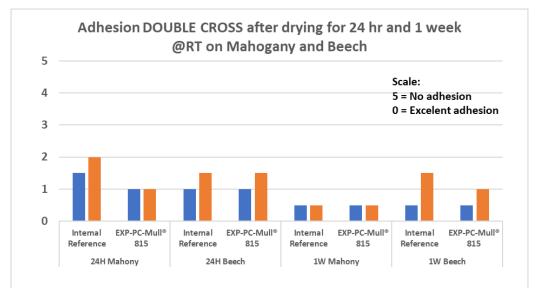


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Adhesion Pigmented



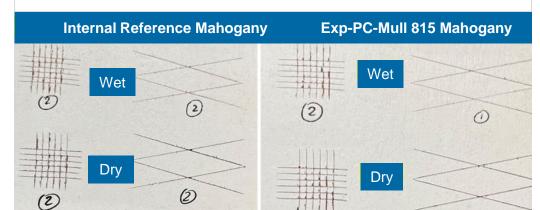
Adhesion CROSS CUTT 2MM after drying for 24 hr and 1 week @RT on Mahogany and Beech 5 Scale: 5 = No adhesion 0 = Excelent adhesion 3 0 EXP-PC-Mull[®] Internal FXP-PC-Mull Internal EXP-PC-Mull® Internal EXP-PC-Mull Internal Reference 815 Reference 815 Reference 815 Reference 815 24H Mahony 24H Beech 1W Mahony 1W Beech

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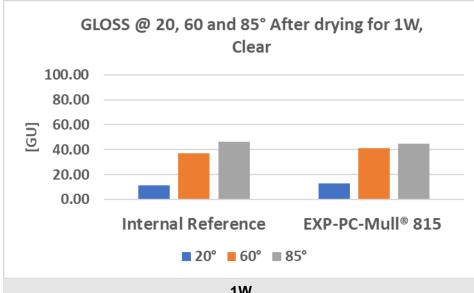
Simplified

Dry Wet



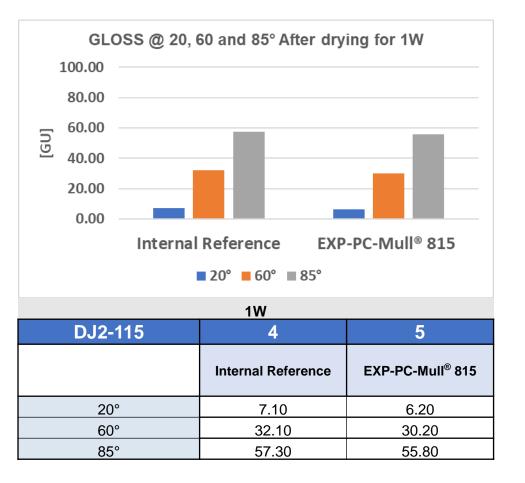
Internal Reference Beech Exp-PC-Mull 815 Beech

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

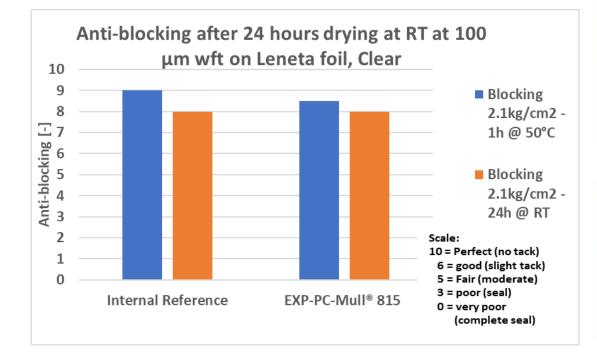


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Anti-blocking Properties, Clear



1h @ 50°C



24h @ RT





In

7

10

2

Chemical Resistance: Clear

Coating system

 $2 \times 100 - 125 \mu m$ 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 3 5 . 5 5 2 6 8 7 9 8 9 12 11 14 H 12 A



Coating system 2 x 100 - 125 µm wet on Beech

Science

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after 24h recovery 1st laver FD: ½ hr @ 40 °C 2nd layer FD: 72 hr @ 40 °C 1: Ammonia (10 % sol) -10 min 2: Alcohol (48 % sol.) - 10 min. 12: Lemon Acid 1h 3: Alcohol (48 % sol.) - 1h 11: Olive oil 24h 10: Parafine oil 24h 4: Fatty acid - 1hr 1 5: Hand Cream -1h 9: Water 24 Scale 88 1 = film destroyed / totally removed 8: Red Wine -6h 6: Hand fat -1h 2 = film damaged (color / gloss / strucure: swelling, fibre raising, cracking, blistering) 7: Coffee (4 % sol.) -6h 3 = film evident stain in multiple angles:color change/gloss change Internal Reference 4 = no evident change(slightly visible): gloss change EXP-PC-Mull[®] 815 5 = no change

Chemical Resistances Internal Reference versus EXP-PC-Mull[®] 815 on Beech

Chemical Resistance: Clear

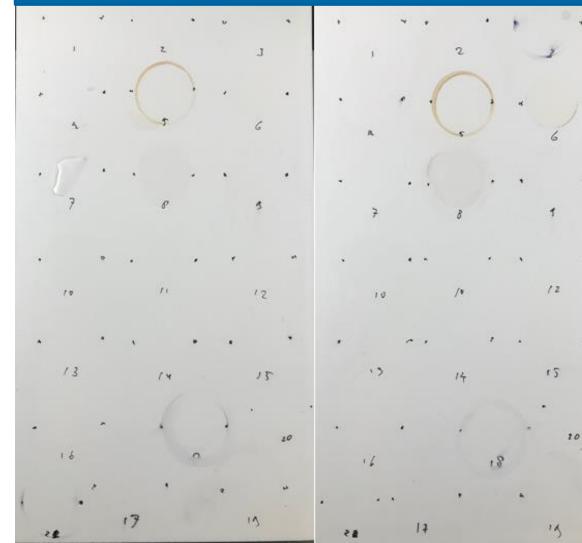


Chemical	
Resistance:	
Pigmented	

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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DIN 68861 Chemical Resistances Internal Reference versus Melamine-foil, 125 µm wet **EXP-PC-Mull[®] 815** White Pigmented Top Coat on Melamine 1: Ammonia (10%) 10 min 20: Gasoline 1hr. 2: Ammonia (10%) 1 hr 3: Alcohol (48%) 10 min 19: Parafine oil 24h 18: Hand fat -24h 4: Alcohol (48%) 1h 5: Coffee (4% sol) - 6h 17: Hand fat -1h 6: Coffee (4% sol) - 16h 16: Hand Cream -1h 0 15: Fatty acid - 1hr 7: Water 24h Scale 14: Acetic Acid 4% 16h 8: Red Wine -6h 1 = film destroyed / totally removed 13: Acetic Acid 4% 1h 2 = film damaged (color / gloss / 9: Olive Oil 6h strucure: 12: Lemon acid 16h 10: Olive Oil 16h swelling, fibre raising, 11: Lemon acid 1h cracking, blistering) 3 = film evident stain in multiple angles:color change/gloss change ----- Internal Reference EXP-PC-Mull[®] 815 4 = no evident change(slightly visible): gloss change 5 = no change

Chemical Resistance: Pigmented

THANK YOU QUESTIONS?

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The data in this presentation represents typical values. Since application variables are a major factor in product performance, this information should serve only as a general guide. EPS assumes no obligation or liability for use of this information.

Clear Formulation

Total

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

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



WHITE PIGMENTED TOPCOAT Formulation

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

