



Relca[®] PD-805: New water-based matting resin

Hungarocoat - Budapest, 27-28 November 2018

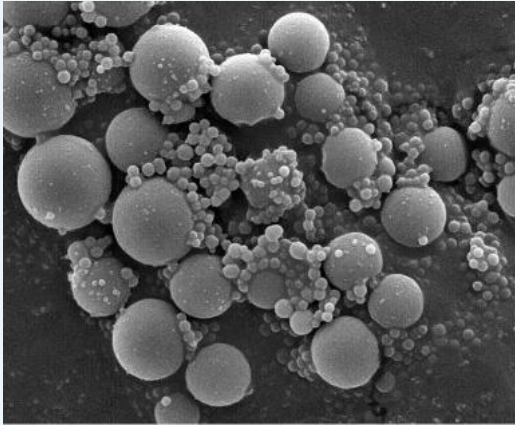
Content

- Introduction
- Key benefits
- Matting agents: properties and differences
- Application test results
- Conclusions

Relca[®] PD-805 matting resin



The secret: particle size distribution

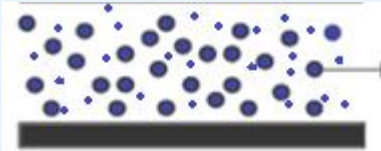


Specifically designed particle size distribution

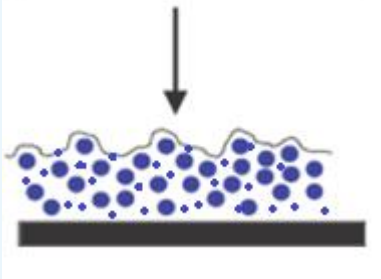


Hard and matt surface

Wet film



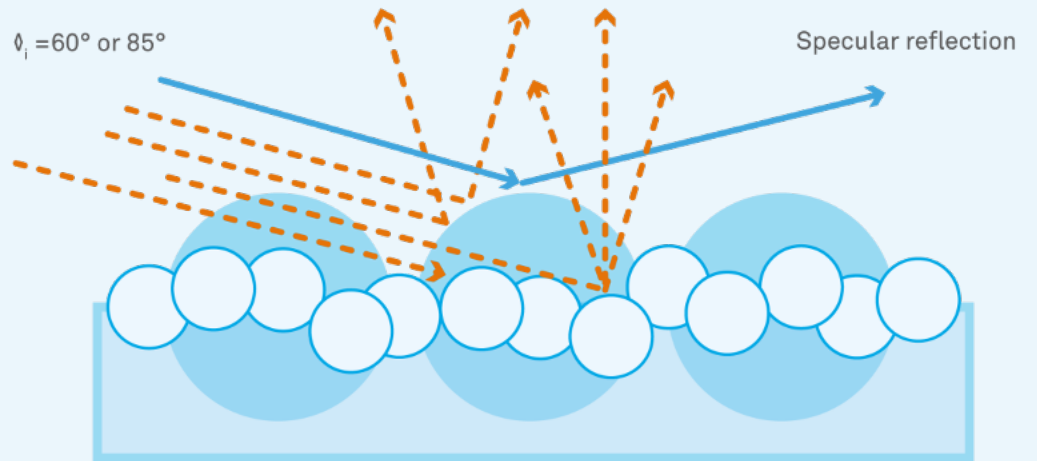
Dry film



Diffusive reflection

$\phi_i = 60^\circ \text{ or } 85^\circ$

Specular reflection



Key benefits

- Excellent compatibility with other binders
- Surfactant-, formaldehyde- and VOC-free
- No loss of chemical/stain resistances
- High scratch resistance
- Reduces tackiness and dirt pick up
- Improves anti-fingerprint behaviour
- Improves blocking resistance

Matting agents comparison

	Silica	Micronized wax	Organic matting agent	X-linked beads	Soft water-based matting resin	Relca PD-805
Matting effectiveness	++	+	+	+	++	+
Micro scratch resistance	--	++	+/-	+/-	++	++
Transparency	+	+/-	+/-	+/-	++	++
Stain resistance	--	++	+	+	+	++
UV resistance	+/-	+/-	+/-	++	++	++
Heat resistance	++	--	+/-	+	-	++
Soft touch	--	+	+	+/-	++	-
Lasting properties	+	-	+	+/-	+	++
Cost	+	+	+/-	+/-	+/-	++

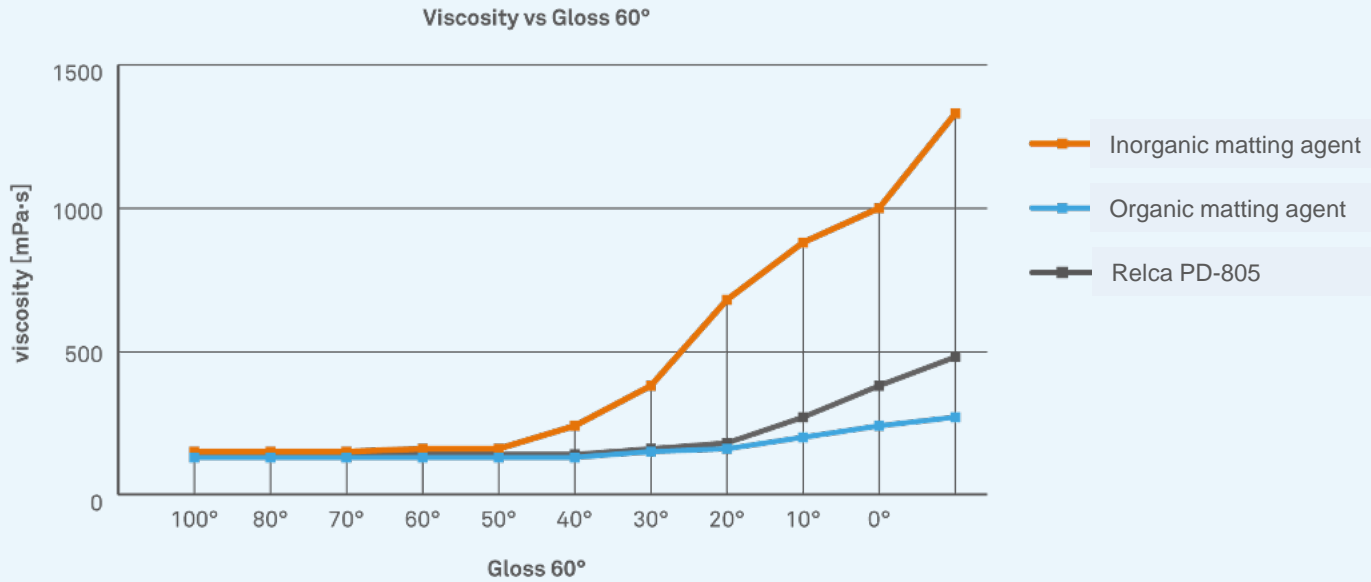
Test results
combined with a
water-based
acrylic

Guide formulation

Guide Formulation	Relca PD-805	Inorganic matting agent	Organic matting agent
Picassian AC-290	64.6	64.6	60.0
BYK 028	0.1	0.1	0.1
Butyldiglycol	2.1	2.1	1.8
Tafigel PUR 61	0.3	0.3	0.3
Water	9.9	9.9	9.3
Matting agent	23.0	23.0	28.5
Total	100.0	100.0	100.0
Cost of matting agent	↓↓	↑	↑↑
Solid content	35.92	33.62	32.55
pH / viscosity	8.38 / 275 cP	8.84 / 950 cP	8.74 / 240 cP
Gloss (20°/60°/85°)	1.1 / 8.7 / 28.1	0.9 / 7.7 / 24.5	1.0 / 7.9 / 23.5

Inorganic and organic matting agents → previously pre-dispersed in water
 Relca PD-805 → added directly.

Rheology, viscosity and density



Density (g/cm³)

Micronized wax	Relca PD-805	Inorganic matting agent	Organic matting agent
0.85 - 0.95 g/cm ³	1.1 g/cm ³	2.50 - 2.70 g/cm ³	1.5 - 1.7 g/cm ³



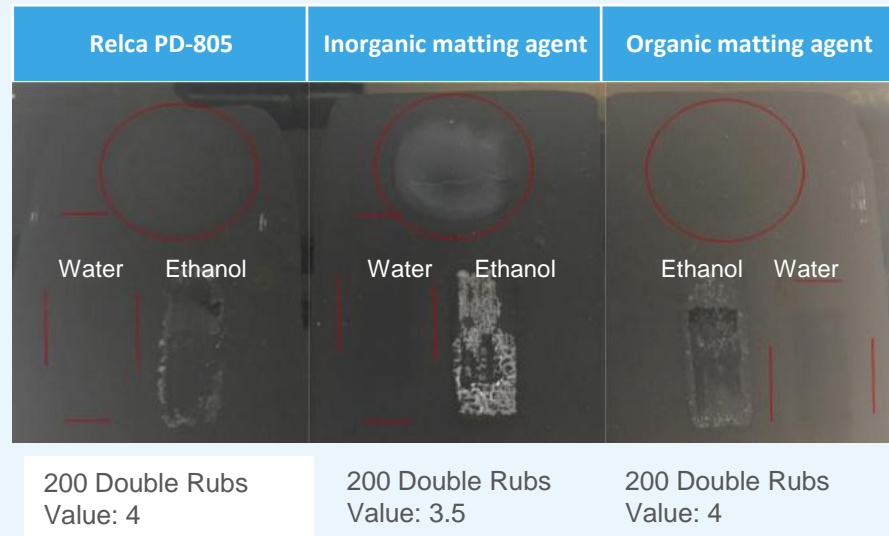
Early water uptake & Veslic rub test

Early water uptake test method

- Apply 90 wμ on a black glass
- Dry 24h at RT
- 24h water spot
- Evaluation:
 - 5-transparent (no change)
 - 4-translucent
 - 3-white translucent
 - 2-white opaque
 - 1-milky

Veslic rub test (water and ethanol)

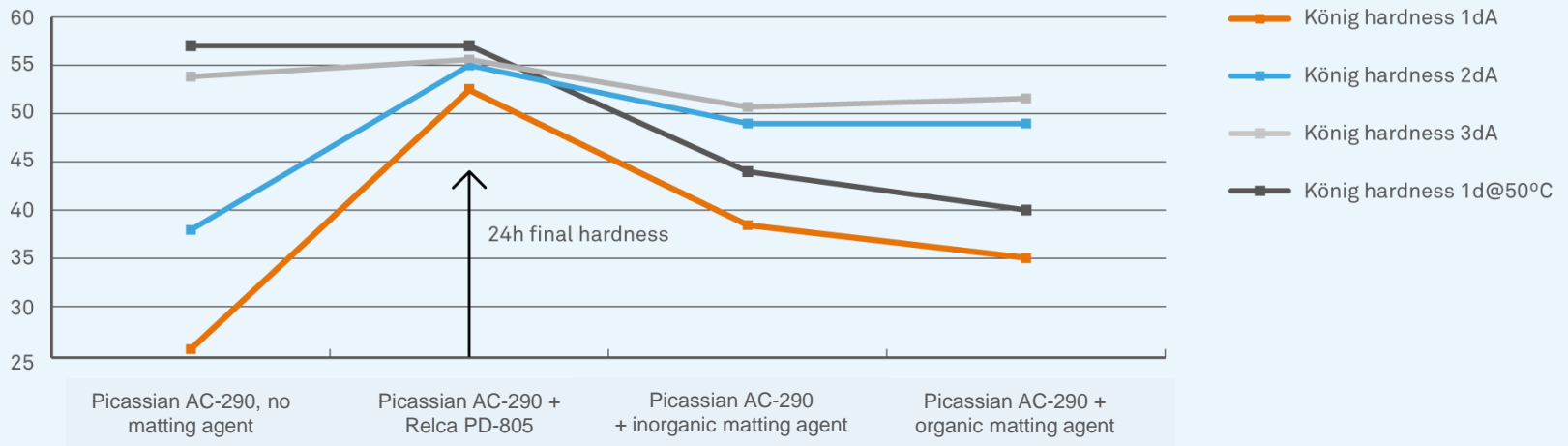
- Apply 90 wμ on a black glass
- Dry 1 week at RT
- Evaluation
 - Color change of the coated surface



Hardness development

Drying speed may vary depending on matting agent

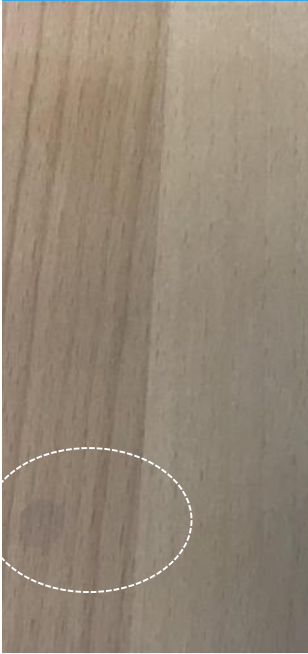


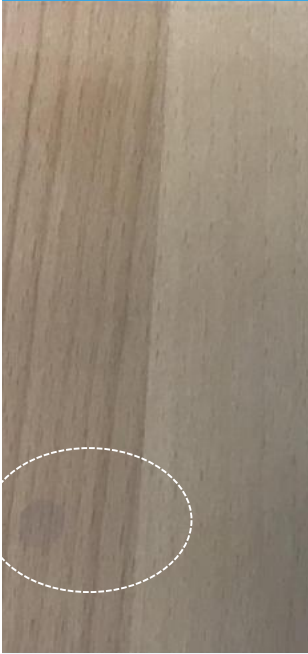


Relca PD-805 → hardness after 1 day at RT is very close to final result.



König hardness (sec)	Picassian AC-290 no matting agent	Relca PD-805	Inorganic matting agent	Organic matting agent
1 day RT	26	53	38	35
2 days RT	38	55	49	49
3 days RT	54	56	51	52
1 day 50 °C	57	57	44	40

Chemical and stain resistance

Application: 2 x 150 wet μm on beech veneer

	Relca PD-805		Organic matting agent		Inorganic matting agent	
Et		Ac Et		Ac Et		Ac
Am		W Am		W Am		W
Ink		Hc Ink		Hc Ink		Hc
St		Ns St		Ns St		Ns

Et: Ethanol 48%
Am: Ammonia 10%
Ac: Acetone
W: Water

Ns: Nivea soft hand cream
Hc: Hot coffee
St: Sun tan lotion

Blocking resistance

Keeping surfaces separated

Matting agents tend to improve blocking resistance.

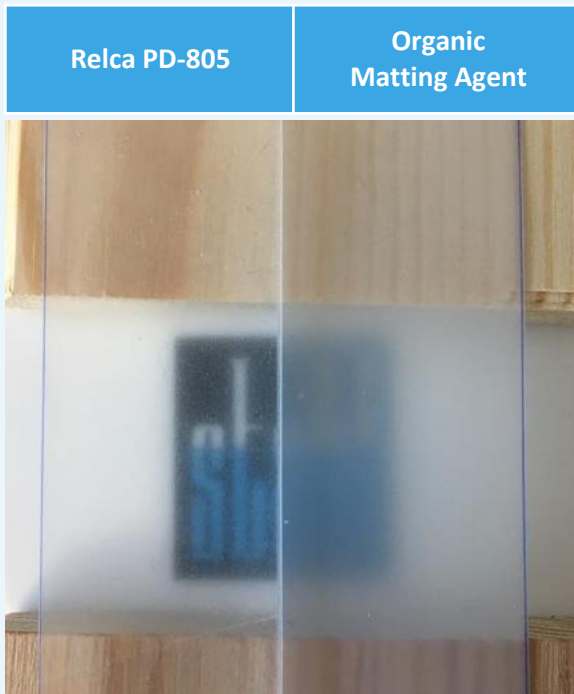
Relca PD-805 → better results than organic matting agents, and similar to those of inorganic ones

Picassian AC-290	AC-290 + Relca PD-805	AC-290 + inorganic matting agent	AC-290 + organic matting agent
3.1 N	0.66 N	0.82 N	1.8 N

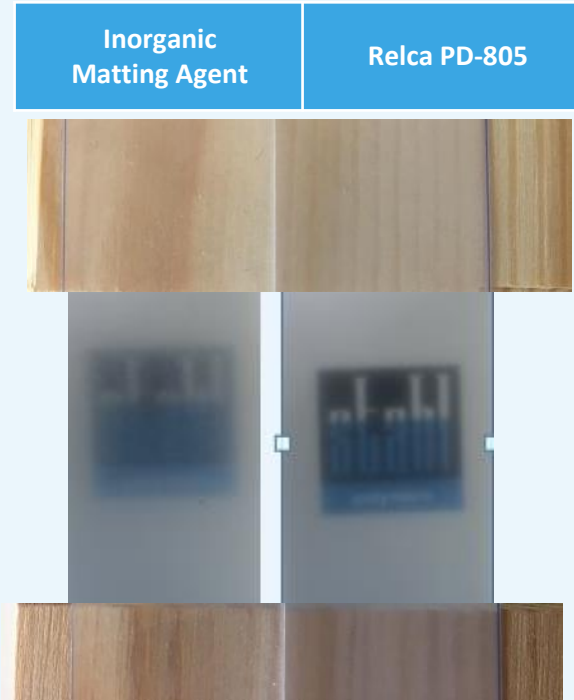


Transparency

Special particle size distribution → highly transparent films



DFT: 100 μm



DFT: 100 μm

Weak points



Weak points

Relca PD-805 → not recommended for flexible substrates.
Bending can cause whitening.



Conclusions

Best balance of performance and aesthetics

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high
matting
effect

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clean
product

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high
matting
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chemical & stain
resistance

Best balance of performance and aesthetics

