Wanhua waterborne solutions for industrial coatings

Wanhua Chemical
Emerging Technology Business Group
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Product categories and applications

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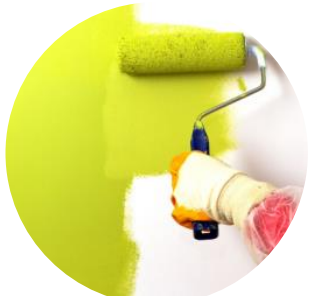
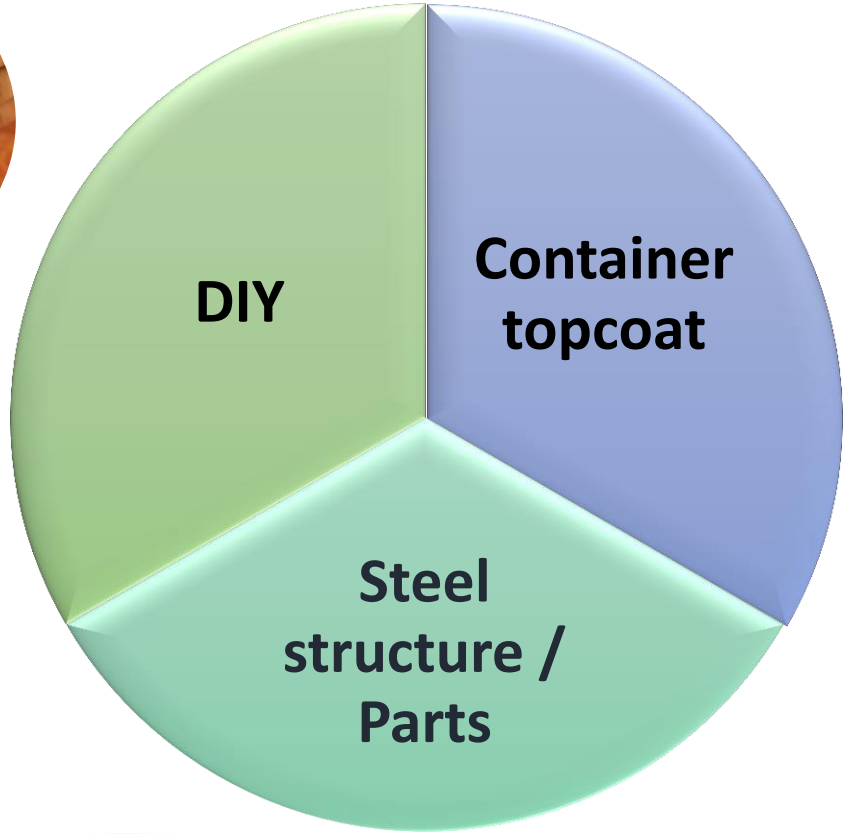
Antkote®	OH-PA dispersion		**2K PU**
Aquolin®	WB polyisocyanate hardener		**Baking coating**
Vesmody®	Rheology modifier		**Plastic coating**

02 Light duty anticorrosion

Light duty anticorrosion





Excellent adhesion to various substrates

Low odor

Excellent outdoor durability

Excellent workability

Good salt spray resistance

Excellent water resistance

Characteristics analysis of WB 1K anticorrosive resin

	Substrate adaptability	Early resistance	Anticorrosion ability	Drying speed	Weather resistance	Gloss	Cost
Acrylic emulsion							
Waterborne alkyd							
Waterborne epoxy							

*  Not good  Normal  Excellent

Product guide

Wantipro® 0620

Faster Drying speed and hardness build, Excellent blocking resistance.

Blend resin

Faster hardness build

Better anti-blocking

Wantipro® 0612

High gloss and good comprehensive properties.

Topcoat

Higher gloss

Higher anticorrosion ability

Wantipro® 0626

High gloss and fullness, Excellent anticorrosion ability.

Topcoat or primer

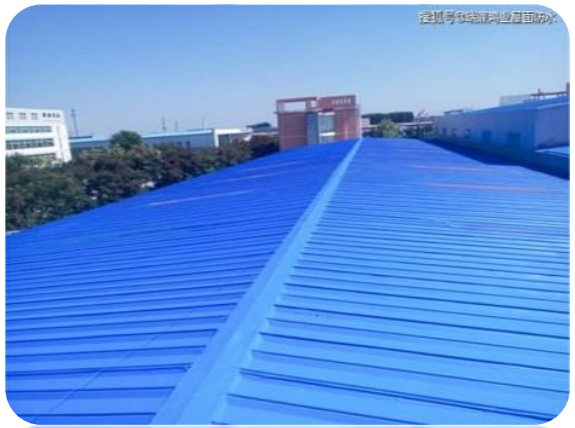
Better water whitening resistance

Better early water resistance

Wantipro® 0624

Excellent water whitening resistance and early water resistance.

DTM or primer



Product guide

Wantipro® 0612

Type ： PA
Solids ： 43%
MFFT ： 37 °C

- High comprehensive properties
- High gloss
- Good chemical resistance
- REACH compliance

Wantipro® 0620

Type ： PA
Solids ： 45%
MFFT ： 55 °C

- Anti-blocking
- High hardness
- Fast drying
- REACH compliance

Wantipro® 0626

Type：PA
Solids：48%
MFFT：37 °C

- High gloss and fullness
- Excellent anti-corrosion ability
- REACH compliance

Wantipro® 0624

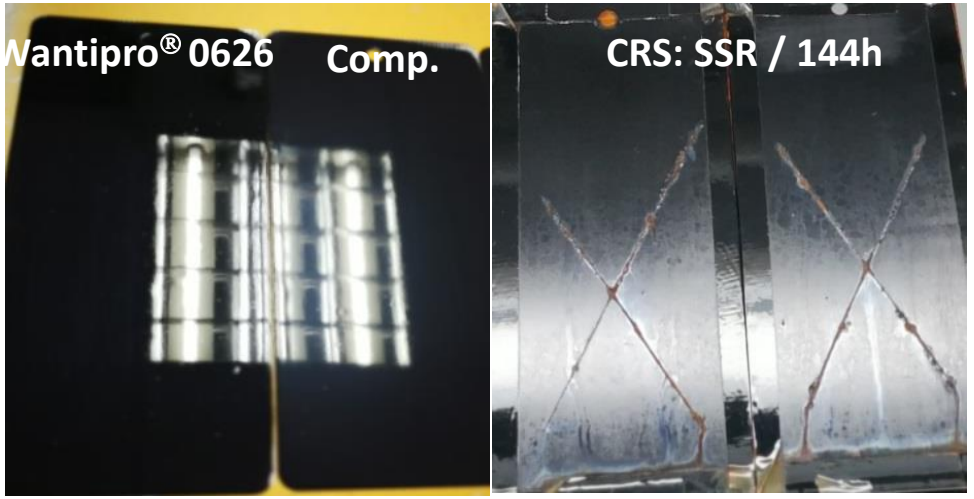
Type：PA
Solids：46%
MFFT：24 °C

- Excellent water whitening resistance
- Excellent early water resistance
- REACH compliance

Wantipro® 0626 - High gloss and anti-corrosion

Properties:

- ✓ **High gloss and film fullness**
- ✓ **High anticorrosion**
- ✓ **Good Salt water resistance**



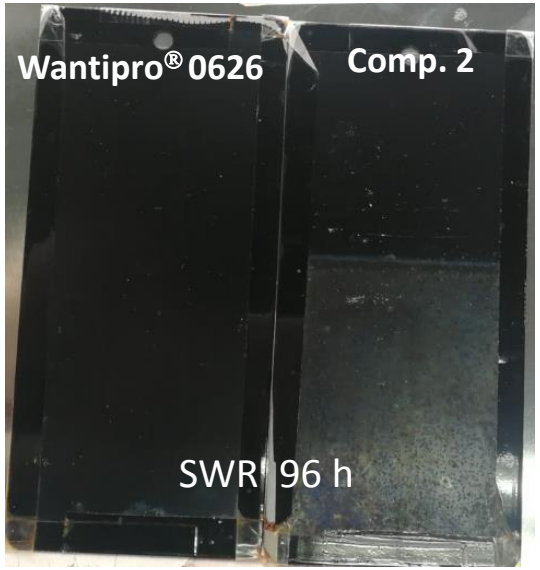
Properties	Wantipro ® 0626	Comp.1
Gloss (20° /60°)	81/92	57/83
Water resistance	>168h	>168h
Salt spray resistance (SSR)	144h	96h
Salt water resistance (3%)	>168h	144h

- CRS；DFT 35-40um；Curing：25°C/ 50 % RH, 7 day.

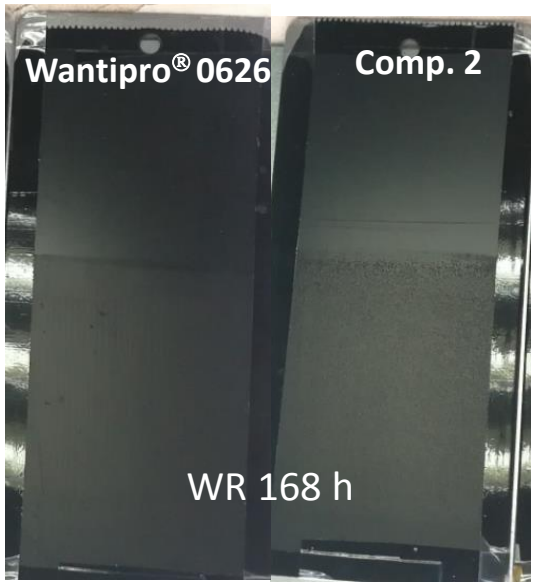
	Material	%	Function/Supplier
Grind			
1	DI water	8.0	/
2	Disper 755W	1.8	Dispersant/Tego
3	Surfynol 104BC	0.2	Wetting agent/Air product
4	DMEA	0.1	pH control agent
5	Airex 902W	0.1	Defoamer/Tego
6	BaSO4	8	Filler
7	MA100	2	carbon black/ TITSUBISHI
8	Heucophos ZMP	2	Antirust pigment/ Heubach
Letdown			
1	Wantipro® 0626	65	Resin/Wanhua
2	DMEA	0.1	pH control agent
3	Foamex 825	0.1	Defoamer/Tego
4	Mill base	22.2	/
5	Texanol	4	Coalescing agent Eastman
6	BCS	2	Coalescing agent
7	Nalzin FA-179	0.5	Flash-rust inhibitor/Elementis
8	Vesmody U605(50%)	0.2	Thickener/Wanhua
9	DI water	5.9	/
Total		100	

Wantipro® 0626 - High gloss and anti-corrosion

➢ Good salt water resistance



➢ Good water resistance



Properties	Wantipro ® 0626	Comp.2
Gloss (60° /85°)	41/81	42/80
Adhesion/level	0	0
Water resistance	>168h	24h
Pencil hardness	~B	~B
Salt water resistance (3%)	96h	24h

- CRS；DFT 35-40um；Curing：25°C/ 50 % RH, 7 day.

	Material	%	Function/Supplier
Grind			
1	DI water	14.0	/
2	BYK190	2.2	Dispersant/BYK
3	Surfynol 104BC	0.3	Wetting agent/Air product
4	DMEA	0.1	pH control agent
5	Airex 902W	0.2	Defoamer/Tego
6	BaSO4	14.0	Filler
7	Mica	2.0	Filler
8	MA100	2.0	carbon black/ TITSUBISHI
9	ZP-10	3.0	Antirust pigment/ Heubach
10	Heucophos ZMP	2.0	Antirust pigment/ Heubach
Letdown			
1	Wantipro® 0626	50	Resin/Wanhua
2	DMEA	0.1	pH control agent
3	FoamStar 2410	0.2	Defoamer/Basf
4	Mill base	39.8	/
5	Texanol	3.5	Coalescing agent Eastman
6	BCS	1.5	Coalescing agent
7	Nalzin FA-179	0.5	Flash-rust inhibitor/Elementis
8	Vesmody U505(50%)	0.3	Thickener/Wanhua
9	Vesmody U905(50%)	0.1	Thickener/Wanhua
10	DI water	4.0	/
Total		100	

Wantipro® 0626 -Application case

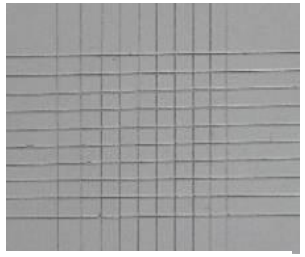
Wantipro® 0626 used for high gloss steel pipe topcoat

Wantipro® 0626 used for petroleum pipeline(DTM)

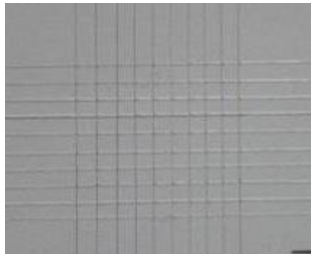
Wantipro® 0612

➢ Good adhesion

Carbon steel，0



Aluminum，0



Tinplate，0

➢ Other performance

Test items	Results
Gloss (60°)	90
Touch dry/hard dry	20min/ 1h
Hardness (Mitsubishi Pencil)	HB
Water resistance (25°C, d)	>14
Salt water resistance (3%, 25°C, d)	3
Salt spray resistance (d)	2

Formulation

	Material	%	Function/Supplier
Grind			
1	DI water	5.7	/
2	BYK-190	1	Dispersant/BYK
3	Ammonia	0.1	pH control agent
4	Tego 810	0.1	Defoamer/Tego
5	R-706	20	Titanium pigment/Dupont
Letdown			
1	**Wantipro® 0612**	**65**	**Resin/Wanhua**
2	Ammonia	0.3	pH control agent
3	Surfynol 104BC	0.2	Wetting agent/Air product
4	TiO_2 slurry	26.9	/
5	DPNB	5.2	Coalescing agent
6	DI water	1.3	/
7	FA-179	0.5	Flash-rust inhibitor/Elementis
8	**Vesmody® U905(50%,H_2O)**	**0.6**	**Thickener/Wanhua**
Total		100	

Wantipro® 0612 -Application case

Wantipro® 0612 used for Steel anti-corrosion pre-coating

Wantipro® 0612 used for guardrail topcoat

Wantipro® 0620

➢ Cost effective solution：Wantipro® 0620/ 0624

- ✓ Excellent water resistance
- ✓ Outstanding blocking resistance

Wantipro® 0620

- Fast dry
- Anti-blocking ability
- Early water resistance

+

Wantipro® 0624

- Excellent early water resistance
- Excellent filler loading capability

Drying@RT,2h; Soaking,48h

Stagging

Early water resistance

Curing time	2hour	1day	3day
0620/0624	>7d	>7d	>7d
Comp.	10min	30min	1d

Drying speed and hardness

Test items	Hardness	Touch free time
0620/0624	HB	30 min

Wantipro® 0620--Application case

➢ **Cost effective solution：Wantipro® 0620/ 0624**

Factory refurbished

Steel structure

Wantipro® 0624--Primer

➢ Primer solution：Wantipro® 0624/ Archsol® 8016

- ✓ Excellent adhesion
- ✓ Excellent flexibility/elasticity
- ✓ Good anti-corrosion
- ✓ Good anti-flash rust

Wantipro® 0624

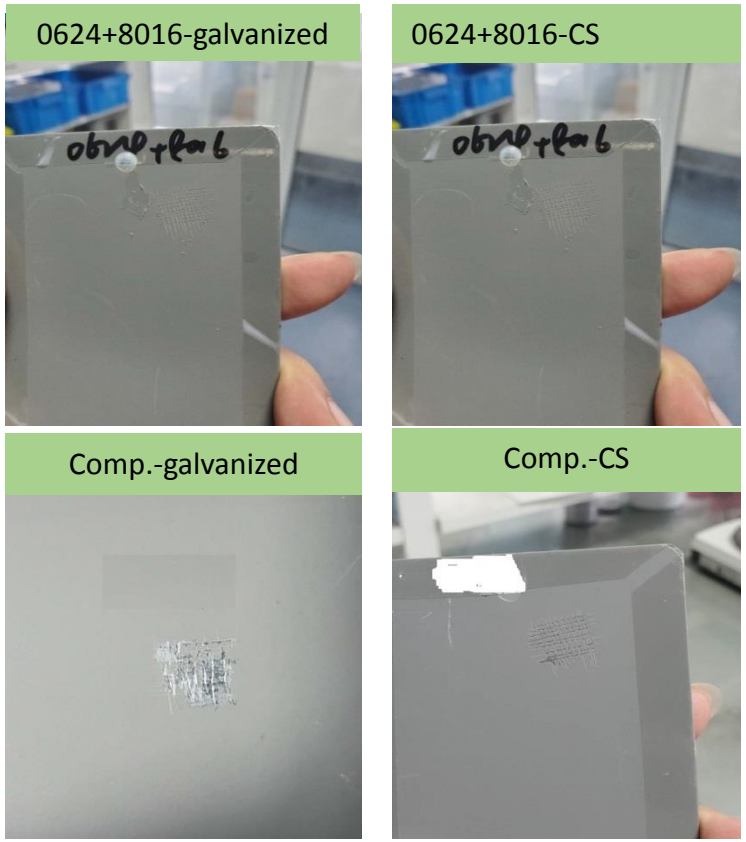
- Excellent anti-flash rust
- Excellent adhesion

+

Archsol® 8016

- Excellent mechanical properties
- Excellent low temperature elongation

☐ *Adhesion test: -20℃*4h, 45℃*4h, 10 cycles*



Excellent adhesion

Substrates	Polished tinplate	Polished CS plate	Galvanized plate
0620/0624	5B	5B	5B
Comp.	5B	5B	5B

Adhesion-after hot/cool cycle

Substrates	Polished tinplate	Polished CS plate	Galvanized plate
0620/0624	5B	5B	5B
Comp.	3B	4B	0B

Wantipro® 0624--Primer

➢ Primer solution: Wantipro® 0624+Archsol® 8016

☐ *Application case: Color steel tile roof primer*

	Material	Wt.%	Function/Supplier
Grind			
1	DI water	16.0	/
2	Orotan 731A	1.0	Dispersant/DOW
3	DMEA	0.2	pH control agent
4	7079	0.2	Defoamer/Elementis
5	CaCO3	15.0	Filler
6	Mica	3.0	Filler
7	Iron red	5.0	Pigment
8	801	0.5	Antirust pigment
9	Zinc phosphate	3.0	Antirust pigment
10	Talcum	10.0	Filler
11	Bentonite	0.3	Filler
Letdown			
1	Wantipro® 0624	30	Resin/Wanhua
2	Archsol ® 8016	10	Resin/Wanhua
3	DMEA	0.2	pH control agent
4	ST 2410	0.2	Defoamer/POLYWILL
5	Mill base	54.2	/
6	Texanol	1.5	Coagulant/Eastman
7	BCS	1.5	Coagulant
8	5100	0.3	Flash-rust inhibitor/POLYWILL
9	NaNO2(20%)	1	Flash-rust inhibitor
10	Vesmody A401(50%)	0.2	Thickener/Wanhua
11	Vesmody U905(50%)	0.2	Thickener/Wanhua
12	DI water	1.0	/
Total		100	

Wantipro® 0624--DIY

➢ Excellent substrate tolerance

Test items	Result
Drying speed (touch/hard)	20min/1h
Hardness (pencil)	HB
Water resistance (25°C/d)	>14
Early WR (25°C/d)	**>7(after 2h@RT)**
Salt water resistance (d)	1

	Material	%	Function/Supplier
Grind			
1	DI water	8.0	/
2	Orotan 731A	1.2	Dispersant/DOW
3	Surfynol 104BC	0.2	Wetting agent/Air product
4	NH3.H2O	0.2	pH control agent
5	NXZ	0.2	Defoamer/Nopco
6	BaSO4	6	Filler
7	R-996	3	TiO2,filler
8	Mica	8	Filler
9	CaCO3	18	Filler
10	Zinc phosphate	2	Antirust pigment
11	Black 6	0.2	Carbon black/Evonik
Letdown			
1	Wantipro® 0624	40	Resin/Wanhua
2	Mill base	56.2	/
5	Texanol	2	Coalescing agent Eastman
6	BCS	0.5	Coalescing agent
7	ZT-707	0.7	Flash-rust inhibitor
8	Vesmody A40	0.2	Thickener/Wanhua
9	DI water	0.4	/
Total		100	

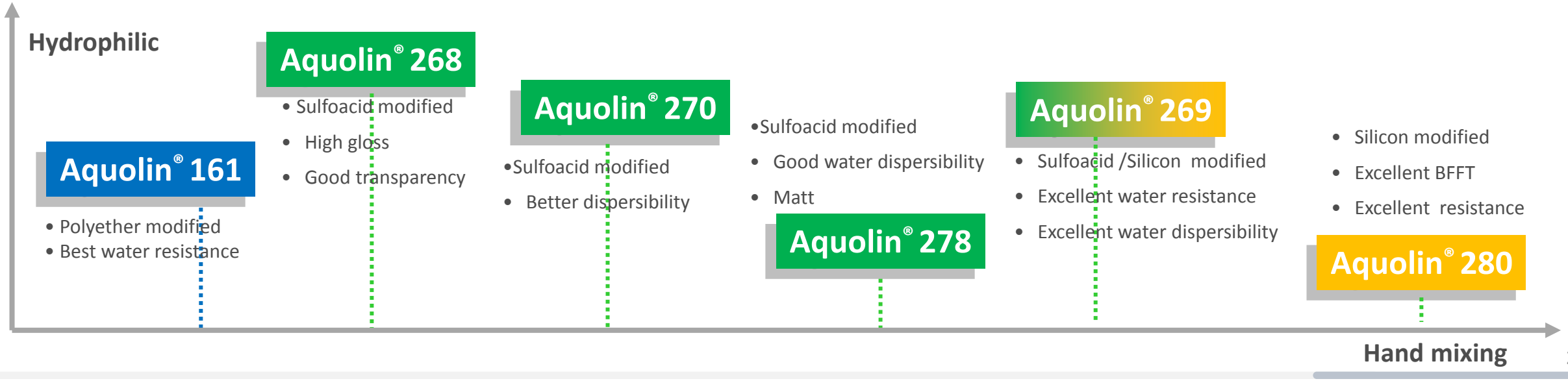
03 WB 2K PU solutions

WB polyisocyanate hardener

Wanhua WB 2K PU solutions

WB polyisocyanate hardener - products

Product	REACH	Solids, %	NCO, %	Viscosity, mPa.s	Performance
Aquolin® 161	√	~100	18-19	2000-4000	Excellent water resistance, long pot life
Aquolin® 163	√	~100	17-18	1500-3500	Long pot life,good gloss and build up
Aquolin® 268	√	~100	20-21	5000-7000	High gloss, high hardness, good compatibility
Aquolin® 270	√	~100	21-22	1500-3500	Good hand mixing abilty, high gloss, high hardness
Aquolin® 269	√	~100	18.8-19.8	500-2000	Excellent hand mixing abilty, high gloss, good water resistance
Aquolin® 278	√	~100	22-23	1500-3500	Matting effect, good hand mixing ability, fast drying speed
Aquolin® 280	√	~100	19.2-20.2	≤ 1000	High gloss, excellent BFFT, excellent water and weather resistance



WB polyisocyanate hardener - Handlings

Benefits of dilution by cosolvent

- Lower viscosity, better dispersion with component A
- Better gloss, film appearance

Hand-mixing test demonstration

(1) Hardener/Water=1/9 by weight

(2) Hand Mixing 2min

(3) Pour out the liquid and check the settling

Aquolin® 270 **Aquolin® 268** **Aquolin® 268:MPA (4:1)**

Particle sizes in water with different cosolvent diluted to 80%

Cosolvent	BA	MPA	PGDA	BGDA	BGA	DMM
Aquolin® 161	272 nm	245 nm	250.5 nm	272.2 nm	302.7 nm	338.2 nm
Aquolin® 268	1568 nm	151.9 nm	171.3 nm	171.7 nm	253.8 nm	157.1 nm

WB polyisocyanate hardener

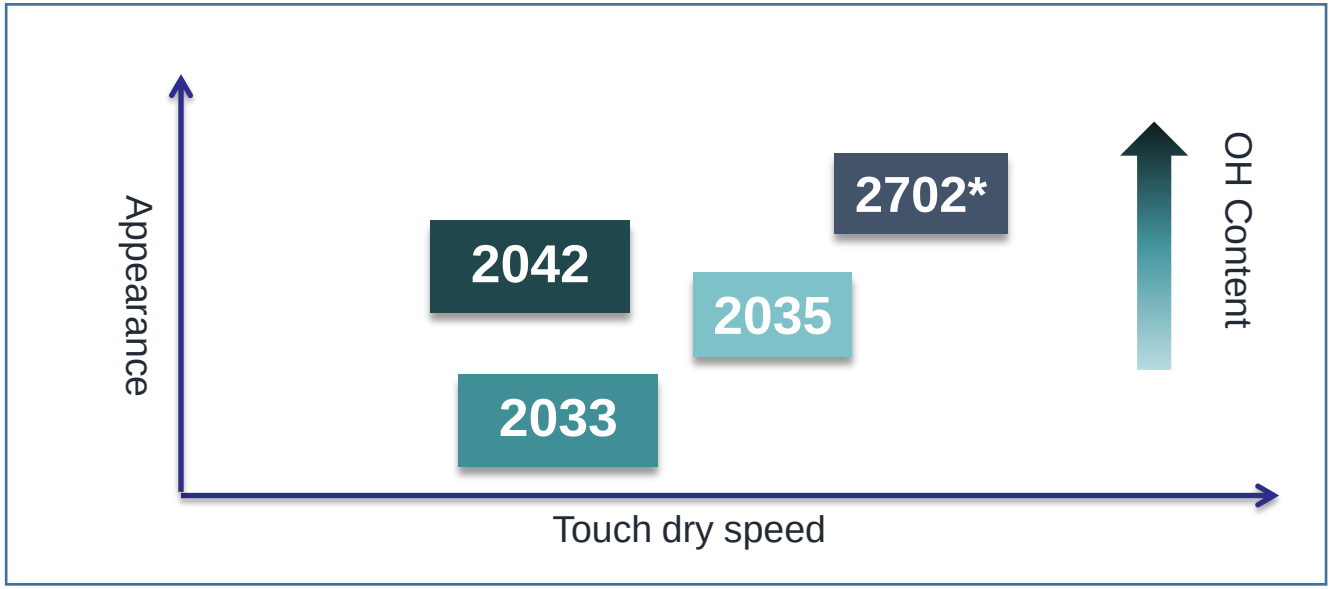
Wanhua WB 2K PU solutions

WB 2K PU relevant typical coating system

Application	Coating system		
	Primer	Base coat	Topcoat
Construction machinery	Epoxy	/	**2K PU**
Transportation	Epoxy	**2K PU**	**2K PU**
Bus	Epoxy/ CED	**2K PU**	**2K PU**
Port machinery	Epoxy/ Zinc-rich epoxy primer	Micaceous iron oxide epoxy primer	**2K PU** / Polysiloxane/ Fluorocarbon coating
Wind energy towers barrel	Zinc-rich epoxy primer	Micaceous iron oxide epoxy primer	**2K PU** / Polysiloxane/ Fluorocarbon coating
Steel structure	Zinc-rich epoxy or inorganic primer/ Alkyd	(Micaceous iron oxide epoxy primer)	**2K PU** / Polysiloxane/ Fluorocarbon coating / Alkyd/ Acrylic

Wanhua OH-PA dispersion – Antkote® Series

Product	REACH	OH content (%)	Property
Antkote® 2033	Y	3.3	Standard
Antkote® 2035	Y	3.0	Better anti-blistering, better leveling
Antkote® 2042	Y	4.2	Higher gloss, higher hardness
Antkote® 2702	--	3.9	Good hardness development, faster drying



* New product

2K PU solutions for metal coating

➢ Typical applications

Steel Structure
Antkote® 2033+Aquolin® 161/269

- Gloss >85%
- Good applicability
- Hardness H
- Good appearance
- Excellent outdoor durability

Machinery
Antkote® 2033/ 2035+Aquolin® 270/269

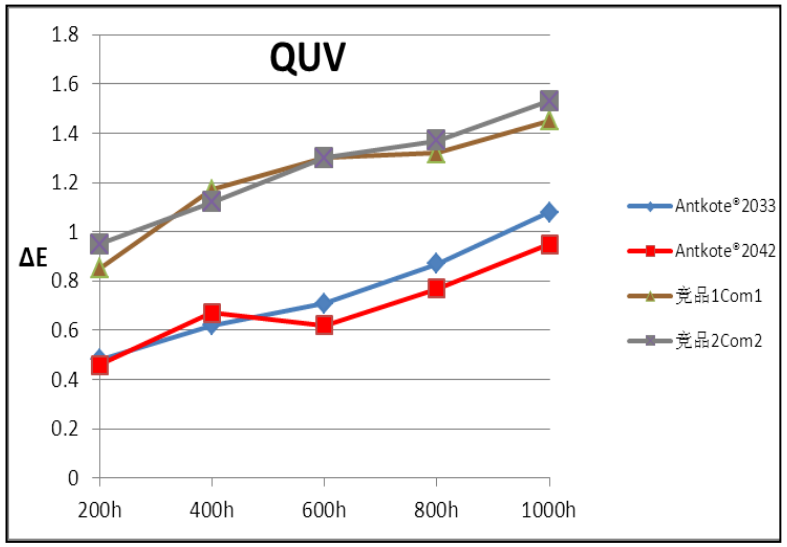
- Gloss >90%
- Chemical resistance
- Hardness H
- Better dispersity
- Excellent outdoor durability

Vehicle
Antkote® 2042/2702+Aquolin® 268/270

- Gloss >90%
- Better chemical resistance
- Hardness H-2H
- Excellent appearance
- Excellent outdoor durability

Appearance

WB 2K PU solutions for general demands



Weather ability

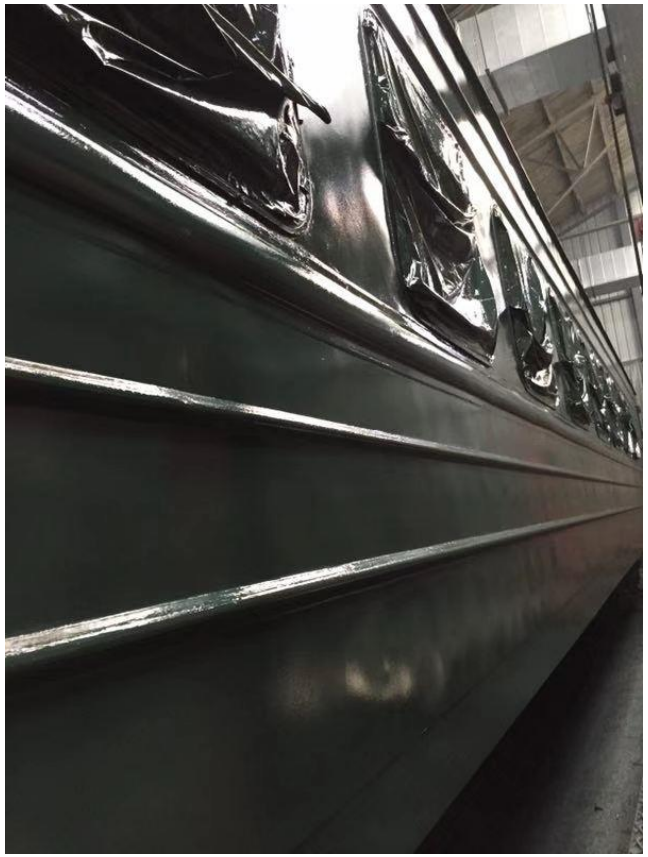
Test items	Antkote® 2033+Aquolin® 270
Gloss, 20° /60°	81%/92%
Touch dry	1.5h
Hard dry	<8h
Hardness	H
Water resistance	3d
QUV 1000h/UVB 313	ΔE<1.2 Gloss loss<20%

Antkote® 2033 + Aquolin® 270 Topcoat for Steel Structure/ Machinery

	Material	%	Function/Supplier
TiO_2 slurry			
1	DI water	5.7	/
2	BYK-190	1	Dispersant/BYK
3	LR-996	20	Titanium pigmen/Lomon
4	Foamex 810	0.1	Defoamer/ Tego
Component A			
1	**Antkote® 2033**	**60**	**Resin/Wanhua**
2	DMEA	0.1	pH control agent/Elementis
3	TiO_2 slurry	26.8	/
4	BYK-011	0.3	Defoamer/BYK
5	DPNB/DBG (1/1)	5	Cosolvent
6	TEGO 270	0.3	Wetting agent/Tego
7	Glide 100	0.2	Leveling agent/Tego
8	DI water	6.9	/
9	**Vesmody® U905**	**0.4**	**Thickener/Wanhua**
Component B			
1	**Aquolin® 270**	**16.2**	**Hardener/Wanhua**
2	PGDA	6.9	Solvent

* NCO/OH=1.5， RT 15min+ 80°C/30min

WB 2K PU solutions for general demands



Antkote® 2033 used for train repainting

Antkote® 2033 used for topcoat of watering cart

WB 2K PU solutions for high gloss and performance

Antkote® 2042+Aquolin® 268 Topcoat for Vehicle

Test items	Antkote® 2042+Aquolin® 268
Gloss, 20° /60°	85/94%
Touch dry	0.5h
Hard dry	<8h
Hardness	H-2H
DOI	92.5
Lw/Sw	0.2/1.0
Acid resistance （H_2SO_4, 10%）	>3d
Alkali resistance （NaOH，20%）	>4d
Water resistance	7d
QUV 1000h/UVB 313	ΔE<1.0 Gloss loss<15%

	Material	%	Function/ Supplier
1	DI water	5.5	/
2	Tego 755w	1	Dispersant/ Tego
3	R-706	19.5	Titanium pigment/Dupont
4	Foamex 810	0.1	Defoamer/ Tego
Component A			
1	**Antkote® 2042**	**62**	**Resin/Wanhua**
2	DI water	3	/
3	DMEA	0.1	pH control agent/Elementis
4	TiO_2 slurry	26.6	/
5	DPNB/DBG (1/1)	6	Cosolvent
6	Surfynol 104BC	0.5	Wetting agent/ Evonik
7	BYK-011	0.3	Defoamer/ BYK
8	Tego 4100	0.3	Wetting agent/Tego
9	BYK-381	0.3	Leveling agent/BYK
10	Glide 110	0.2	Leveling agent/ Tego
11	**Vesmody® U905**	**0.3**	**Thickener/Wanhua**
12	DI water	1.2	/
Component B			
1	**Aquolin® 268**	**22**	**Hardener/Wanhua**
2	PGDA	9.5	Solvent

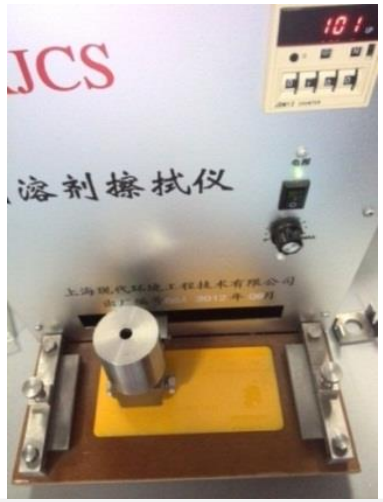
WB 2K PU solutions for high gloss and performance

Antkote® 2042+Aquolin® 268
Topcoat for Vehicle

High gloss
20°/60°: 85/94%

High gloss
20°/60°: 82/92%

Impact:
100/80 kg·cm



Alcohol rubbing:
100 times/kg, no change

WB 2K PU solutions for higher gloss and faster drying

Antkote® 2702+Aquolin® 270--Topcoat for Vehicle

Test items	Antkote® 2702	Comp.	Antkote® 2702
Gloss, 20° /60°	**86/93**	**85/93**	**82/91**
Touch dry	**23min**	**23min**	**35min**
Hardness	2H	2H	2H
Pot life(35°C)	2.5h	2.0h	1.5h
DOI	94.3	91.2	/
Lw/Sw	3.9/9.5	6.0/22.9	/
Acid resistance（H_2SO_4, 10%）	2d gloss loss 8%	2d gloss loss 20%	
Alkali resistance（NaOH, 10%）	2d gloss loss 10%	2d gloss loss 28%	
Water resistance(40°C)	4d	3d	/
Hardner compatibility **(Aquolin280)**	**Gloss 75/89 BFFT 74um**	**Gloss 72/87 BFFT 68um**	

Curing condition: RT 10min, 80°C 0.5h, DFT 40um

	Material	%	Function/ Supplier
TiO_2 slurry			
1	DI water	21.4	/
2	BYK 190	3	Dispersant/ BYK
3	R-996	75	Titanium pigment/Dupont
4	Foamex 810	0.1	Defoamer/ Tego
Component A			
1	**Antkote® 2702**	**55**	**Resin/Wanhua**
2	DMEA	0.1	pH control agent/Elementis
3	TiO_2 slurry	33.4	/
4	BYK-011	0.3	Defoamer/ BYK
5	Tego 4100	0.3	Wetting agent/Tego
6	Glide 110	0.2	Leveling agent/ Tego
7	DPNB	2	Cosolvent
8	BCS	2	Cosolvent
9	DI water	1.2	/
10	425/BCS/DI water(5/3/2)	1.2	**Thickener/BYK**
Component B			
1	**Aquolin® 270**	**16.6**	**Hardener/Wanhua**
2	PGDA	7.1	Solvent

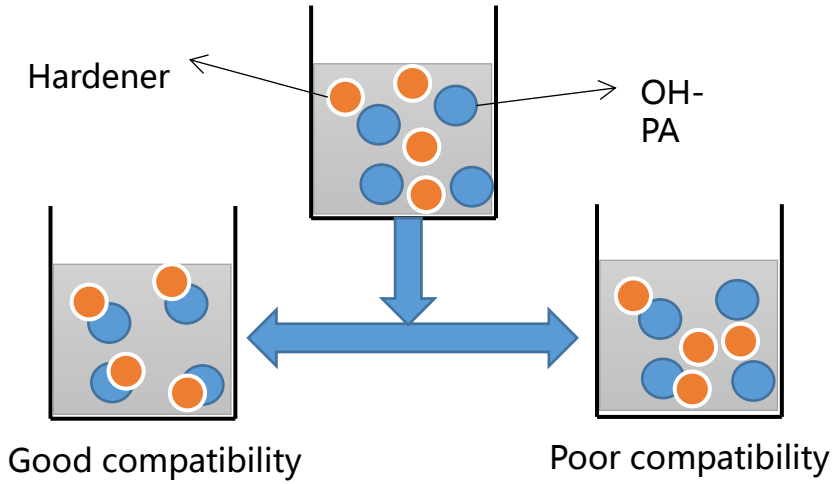
WB 2K PU solutions for anti-blistering

➢ The possiblecause of thick film blistering

- Hardener reacts with water too fast
- Coating surface dries too fast
- Improper use of some additives or cosolvent
- Improper spray temperature and humidity
- Unsuitable process

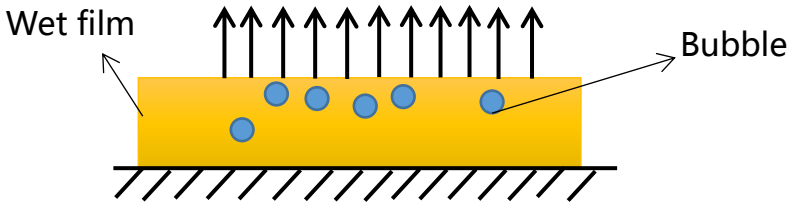
➢ Enhancement of Film Thickness without Bubbles

Better hardener and resin compatibility, less reaction bubbles



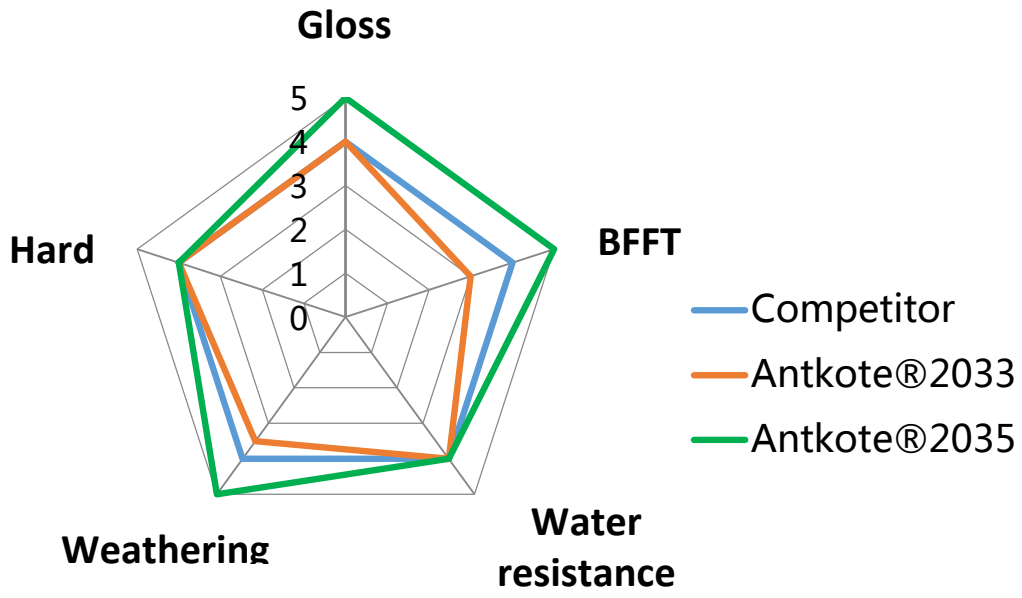
$2RNCO + H_2O \rightarrow RNHCONHR + CO_2\uparrow$

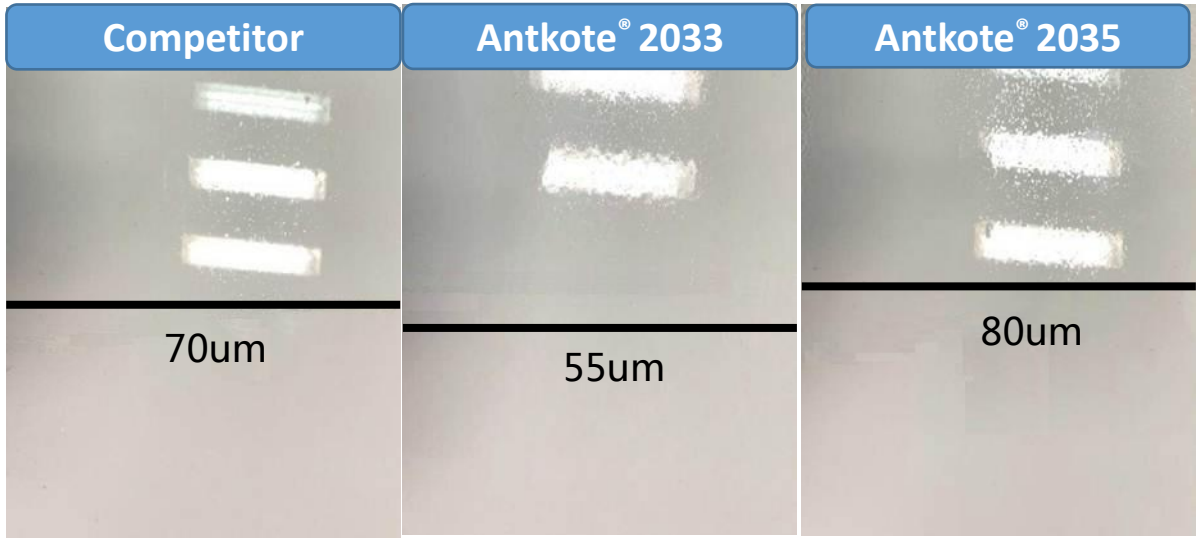
Long open time for bubble emission



WB 2K PU solutions for improving blistering

Antkote® 2035





* Drying curing condition: flow leveling 10 min, 80 ℃ 30min

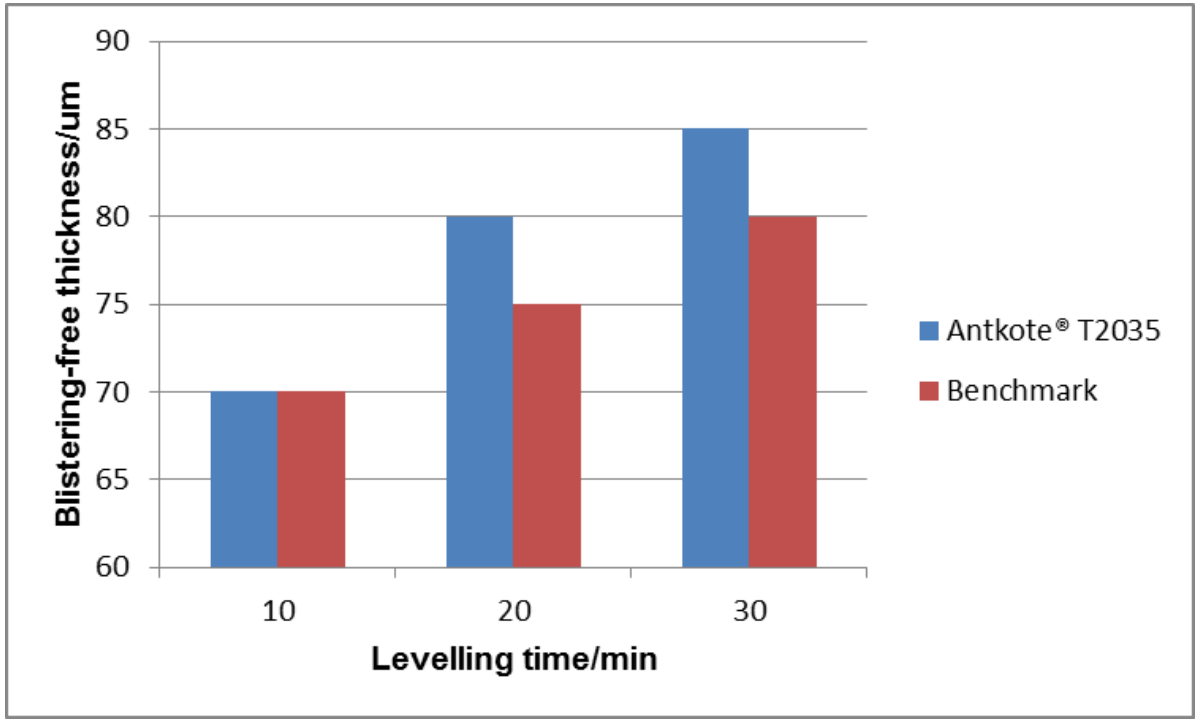
➢ Recommended application

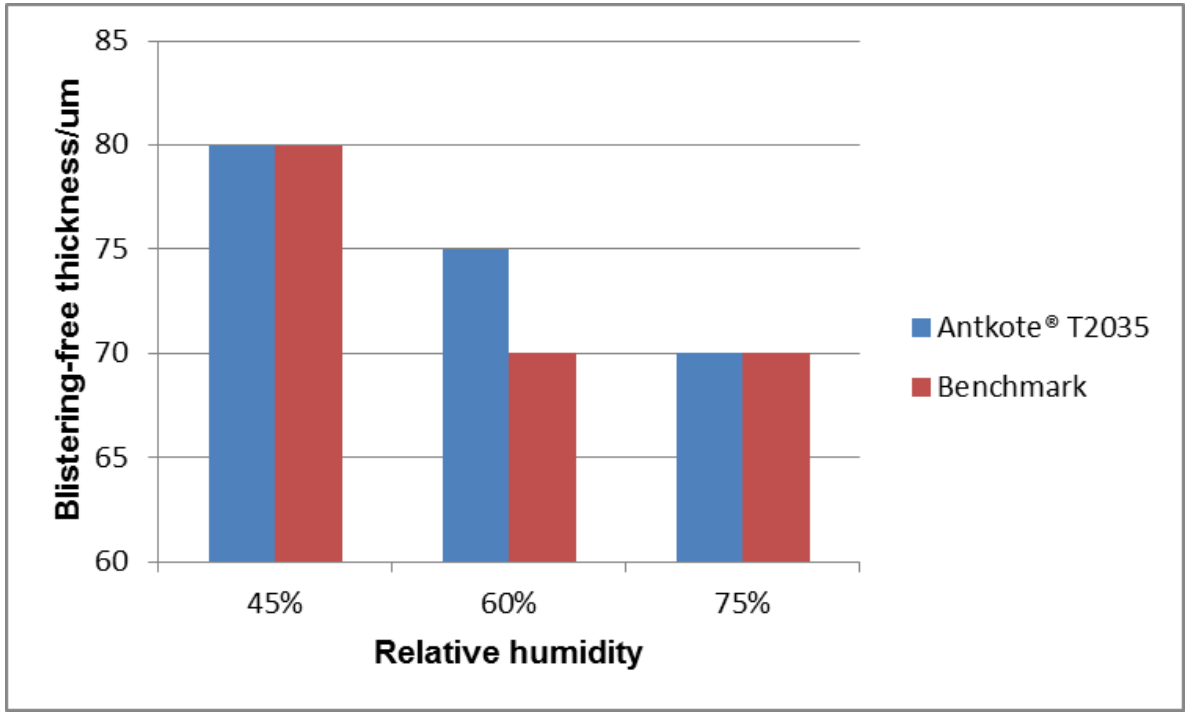
Gloss （20°/60 °）with different hardener of Antkote®2035	
Aquolin® 270	85/90
Aquolin® 268	83/91
HT600+270(1:2)	84/91
HT600+268(1:2)	81/91

WB 2K PU solutions for improving blistering

Antkote® 2035

➢ **Excellent blistering-free thickness**





* Curing condition: 80°C, 30min

* Drying curing condition: flow leveling 10 min, 80 ℃ 30min

WB 2K PU solutions for improving blistering

Antkote® 2035

- Good impact resistance in low temperature(10-15° C)

Curing time after 80° C, 30min	Antkote® 2035	Benchmark
1d	100/100	100/100
7d	100/100	100/80
15d	100/80	100/60
30d	100/50	50/20

- Other performance

Test items	Antkote® 2035	Benchmark
Gloss, 20° /60° (%)	**86/91**	**82/90**
Touch dry	40min	40min
Hardness	H	H
Acid resistance （H_2SO_4，5%）	7d	7d
Alkali resistance （NaOH，5%）	1d	1d
ΔE (UVB, 500h)	**0.28**	**0.50**
20° /60° gloss loss (UVB, 1000h)	**20%/ 2%**	**42%/10%**

* Curing condition: 80°C, 30min+RT 1d Hardener: Aquolin® 270， DFT 40um

WB 2K PU solutions for improving blistering

Antkote® 2035

- **Application case**

Antkote® 2035 used for topcoat of bus

Antkote® 2035 used for topcoat of construction machinery

WB 2K PU solutions for improving blistering

Antkote® 2035

➢ **Recommended application**

Construction machinery

Lorry

Recommended for the field with requirement of high gloss and high build system.

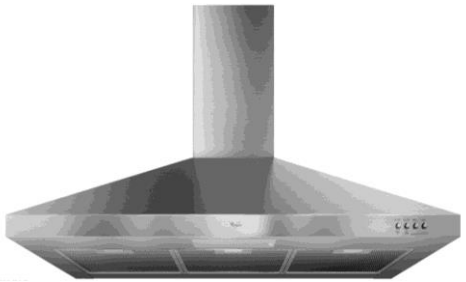
Modified truck

Special container

Bus

04 Metal baking coating solutions

Metal baking coating application



Appliance housings

Aluminum profile

Hub

Bikes

Electro-tricycle

Application system						
	Case 1	Pigmented Primer	+	Pigmented Topcoat		
	Case 2	Pigmented Primer	+	Silver Paint	+	Varnish

Metal baking coating used product

Antkote® 2043 (REACH)

- Type： OH-PA dispersion
- Solids：44%
- OH%： 4.2%
- Viscosity：500-6500 cP
- pH：7.0-9.0

Recommended for general baking system

Pigmented primer

Pigmented topcoat

- **High gloss and hardness**
- **Excellent chemical resistance**
- **Excellent adhesion**
- **Excellent impact resistance**

Antkote® 2057 (REACH)

- Type： OH-PA dispersion
- Solids：37%
- OH%： 2.6%
- Viscosity：10-8000 cP
- pH：7.0-9.0

Recommended for high gloss, metallic paint

Pigmented topcoat

Vanish

- **High build up and gloss**
- **Excellent chemical resistance**
- **Excellent adhesion**

Wantipro® 0678 (REACH)

- Type： OH-PA emulsion
- Solids：26%
- OH%： 1.2%
- Viscosity：100-500 cP
- pH：6.0-7.5

Recommended for metallic paint

Metallic Paint

- **Excellent orientation of metallic pigment**
- **Excellent storage stability**
- **Thickener free**

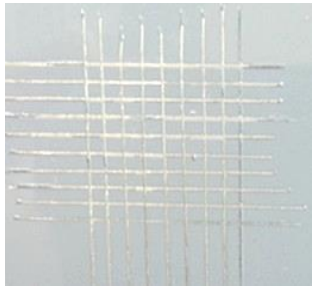
Metal baking coating for general market

Antkote® 2043

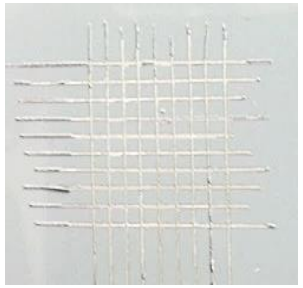
➢ **Key performance**

Test items	Gloss 20°/60°	Impact resistance (DFT: 25μm , 45μm)	Pencil hardness
Results	70%/86%	100/100, 100/50	H

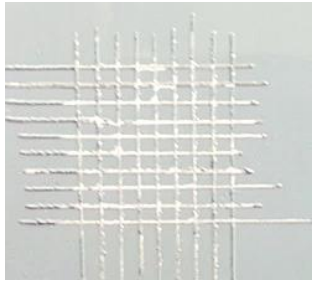
➢ **Excellent adhesion**



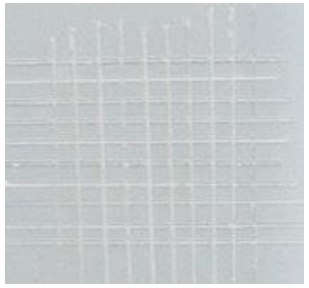
Tinplate, 40μm , Grade 0



CRS, 40μm , Grade 0



Aluminum, 40μm , 1



Aluminum, 40μm, +1% Lubrizol 2063

Formulation

Material	%	Function/Supplier
Grind		
DI water	7	/
BYK-190	1.8	Dispersant/BYK
R-706	25	Titanium /Dupont
Special Black 6	1	Carbon black/Evonik
Tego 902W	0.1	Defoamer/Tego
Letdown		
Antkote® 2043	**52**	**Resin/Wanhua**
DMEA	0.3	pH control agent/Elementis
TiO_2 slurry	34.9	/
Cymel 325	4.8	Amino resin/Allnex
Tego 270	0.5	Wetting agent/Tego
Tego 100	0.3	Leveling agent/Tego
Tego 902w	0.2	Defoamer/Tego
DI water	6.7	
Vesmody® U605	**0.3**	**Thickener/Wanhua**
Total	100	

- Spraying, leveling @ RT 10 min, 140 ℃ 30 min, overnight @ RT

Metal baking coating for general market

➢ Antkote® 2043 for Oil drum baking coating

Antkote® 2043 is the first successful product of " oil-to-water " test line

Test items	Performance
Gloss (20°/60°)	70/86%
Pencil hardness	H
Impact resistance	100cm
Water resistance	>10d
Acid resistance (5%H_2SO_4)	>24h
Alkali resistance (5%NaOH)	>24h
Water resistance (80℃/1h)	NO blistering or gloss loss
BFFT	42um
Recoatability (Cross hatch test method)	Grade 0-1
Artificial aging QUV 1000h/ UVB 313	ΔE<1.2 Gloss loss <25%

Metal baking coating for general market

- **Application case:**

  Antkote® 2043 for Oil drum baking coating

Metal baking coating for general market

➢ Antkote® 2043 for engine cowling baking coating

Motorcycle engine

Tricycle engine

Test items	Performance
Gloss (20°/60°)	80/90%
Pencil hardness	H
Impact resistance	>50cm
Acid resistance (0.1mol/L H_2SO_4)	>24h
Alkali resistance (0.1mol/L NaOH)	>24h
Heating aging — black coating (200℃/2h)	No obvious discoloration
Recoatability (Cross hatch test method)	Grade 0-1

Metal baking coating for high gloss silver paint

Antkote® 2057

- High gloss, no need vanish
- Excellent water resistance
- Good aluminum powder orientation

☐ Application of Monocoat

Items	Performance
Gloss (20°/60°), %	65/105
Pencil hardness	2H
Shock (DFT 15um)	100cm
Boiling water, 2h(CRS board)	No blistering, good adhesion after cooling
Water resistance (40℃)(CRS board)	> 120h
0.1M NaOH/H_2SO resistance	> 48h
Alcohol rub (95%)（100 times）	No obvious change in gloss
UVA 340 (300h)	dE≈0.6, gloss loss 10% (60°)

Material	Wt.%	Function/Supplier
Aluminum paste		
DI water	6	/
BCS	6	Cosolvent
BYK 192	0.5	Dispersanr/BYK
PA 9314	5	Silver powder/RISUN
Total	17.5	
Letdown		
Antkote® 2057	57	Resin/Wanhua
DMEA	0.2	pH adjuster
DI water	13	/
CYMEL 325	5.3	Amino resin/Cytec
DGBE	2	Cosolvent
AQ800	1	Alumimum powder orientation additive/ Disparlon
Aluminum paste	17.5	/
BYK 011	0.3	Defoamer/BYK
104BC	0.5	Wetting agent/Evonik
Glide 100	0.2	Leveling agent/Tego
DMEA	0.2	pH adjuster
DI water	2.8	/
Total	100	

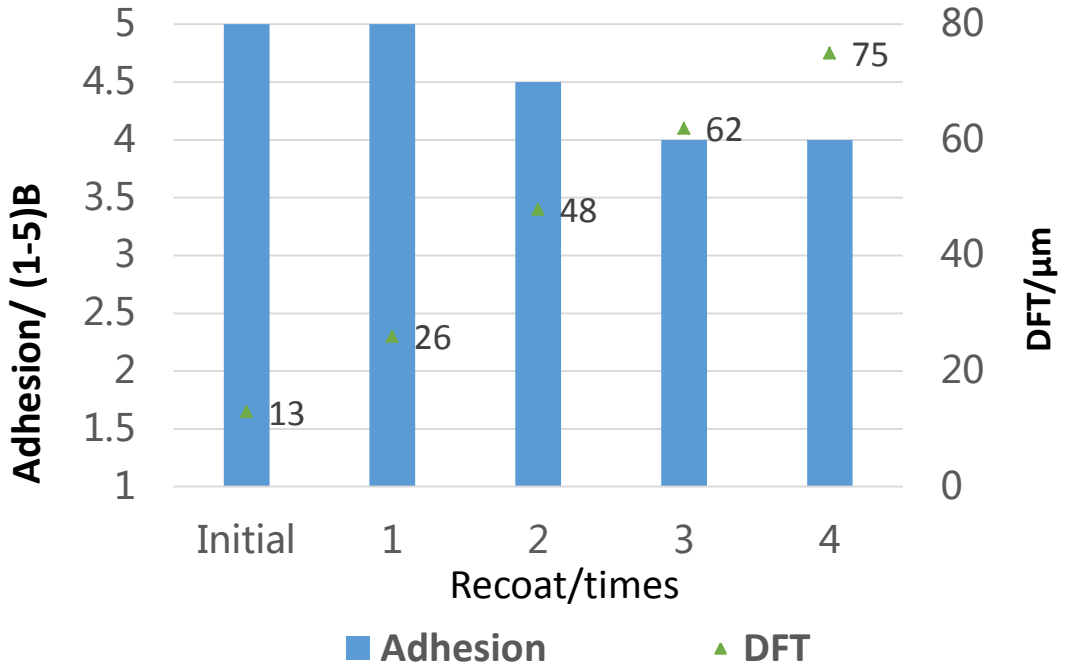
Metal baking coating for high gloss silver paint

Antkote® 2057

✓ ***Excellent gloss, good aluminum powder orientation***

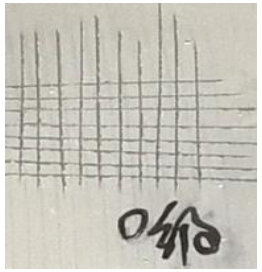
Hub
(Electrophoresis primer+ silver topcoat)

Gloss(20°/60°): 65/105
Silver topcoat



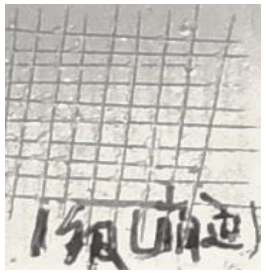
✓ ***Excellent recoating adhesion***

Initial/L 0



Recoat 1 time
/L 0

Recoat 2 times
/L 0-1



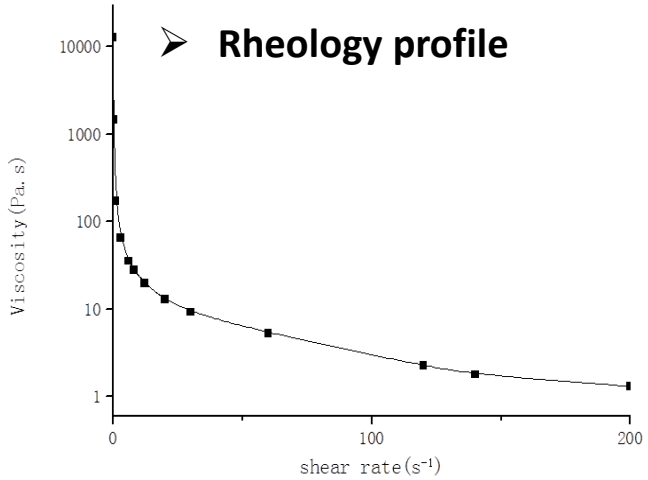
Recoat 2 times
/L 1

Recoat 4times
/L 1

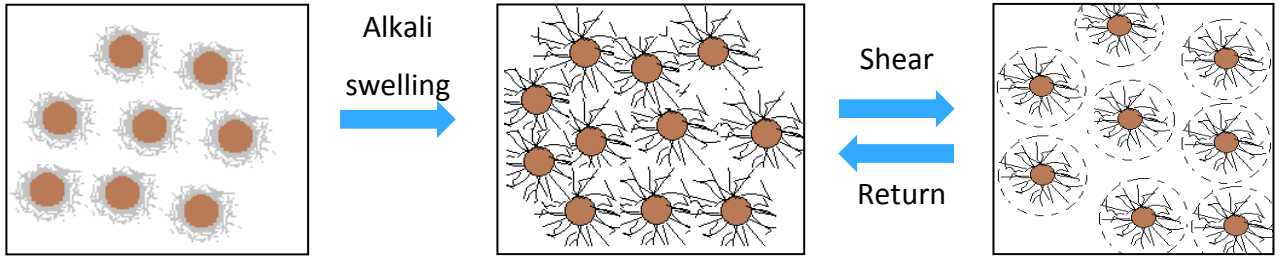
Metal baking coating for good metallic pigment orientation

Wantipro® 0678

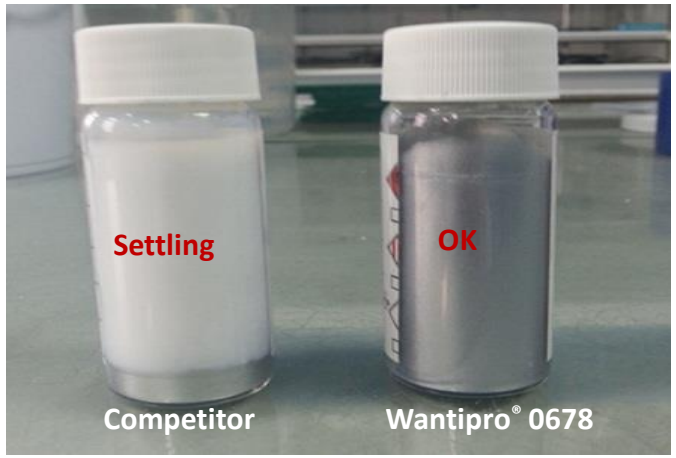
➢ Rheology profile



➢ Alkali swelling control



➢ Storage stability

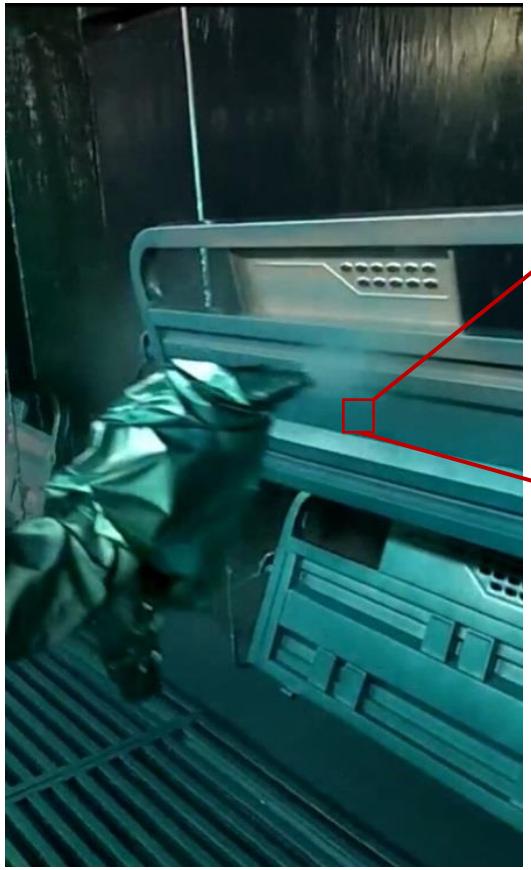


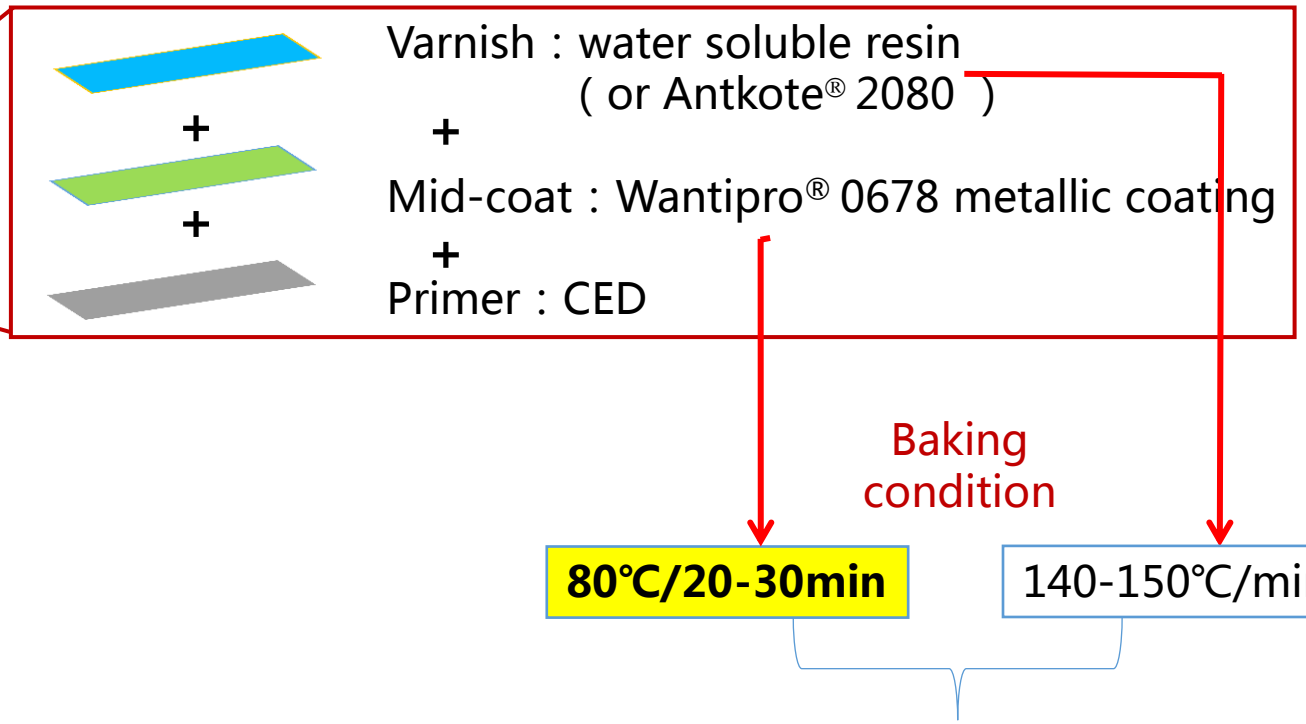
Wantipro® 0678 stored one month at RT, no settlement or Al oxidation.

Raw material	wt%	Description/ Supplier
Aluminum paste		
BCS	10	Cosolvent
Water	10	/
10% DMEA	0.35	pH control agent/Elementis
BYK-192	0.5	Dispersant/BYK
Metallic pigment/ W153	6	Aluminium powder/ Domestic
Paint formula		
Wantipro® 0678	50	Resin/Wanhua
10% DMEA	3.65	pH control agent/Elementis
Water	16.3	/
CYMEL 327	2.6	Amino resin/Allnex
TEGO Wet 270	0.3	Wetting agent/Tego
BYK 011	0.3	Defoamer/BYK
Aluminium paste	26.85	/
Total	100	

Metal baking coating for good metallic pigment orientation

➢ **Wantipro® 0678 — High aluminium orientation tricycle solution**





Metal baking coating for good metallic pigment orientation

➢ **Application case**

Motorcycle wheel

Metal security door

- **Wantipro® 0678 has excellent orientation of metallic pigment**

05 Plastic coating solutions

Product for plastic coating

Crysol® 6319 (REACH)

- Type： PA emulsion
- Solids：40%
- MFFT： >90 ℃
- Viscosity：10-200 cP

Recommended for silver paint

- **Good alcohol resistance**
- **Excellent adhesion to various plastic substrates(PC, PC+ABS, ABS, PS etc.)**
- **Hard and high gloss**

Flexibility

NEW

Crysol® 6136 (REACH)

- Type： PUA dispersion
- Solids：40%
- MFFT： >60 ℃
- Viscosity：10-500 cP

Recommended for pigmented primer and silver paint

- **Good adhesion to various substrates**
- **Excellent boiling water resistance**
- **Good aluminum powder orientation**
- **Matching with UV coating well**




1K PA-Crysol® 6319

- Curing conditions: 60°C*30min and RT for 1d

DFT		20um
Adhesion (ABS)		5B
Flexibility (tinplate)		<1mm
Hardness (ABS)		F
Alcohol scrub resistance at different curing time		Times
95% alcohol (ABS)	RT 3 day	70
	60°C*30min+RT 3day	>200
	70°C*30min+RT 3day	>200
	80°C*30min+RT 3day	>200

- *Outstanding alcohol scrub resistance*

Alcohol scrub 200 times

Crysol® 6319 silver paint recommended formula

No.	Materials	Portion, %	Function	Supplier	Process	
	Preparation of the paint				Add one by one while stirring	
1	Crysol 6319	50.0	Emulsion	Wanhua	600 rpm	1 min
2	DMEA	0.3	pH adjuster		600 rpm	1 min
3	Tego Wet 270	0.3	Wetting agent	Evonik	600 rpm	1 min
4	Tego Airex 902w	0.3	Defoamer	Evonik	600 rpm	1 min
5	RDS(3%)	10.0	Anti-settling agent	BYK	600 rpm	1 min
6	DPNB	5.6	Coalescent		600 rpm	5 min
7	Silver paste	28.5	/	/	600 rpm	5 min
8	BYK-8421	5.0	Silver orientant	BYK	600 rpm	10min
	Total	100.0				
	Preparation of millbase				Add one by one while stirring	
1	BCS	10.0	Coalescent		600 rpm	1 min
2	Water	10.0	/	/	600 rpm	1 min
3	BYK-192	0.5	Dispersant	BYK	600 rpm	1 min
4	SW6806	8.0	Silver powder	SIPAC (local company)	600 rpm	10 min
	Total	28.5				

Crysol® 6136-general primer

- ✓ Good adhesion on various substrates
- ✓ Excellent boiling water resistance
- ✓ Good aluminum powder orientation
- ✓ Matching with UV coating well

Curing condition	Substrate	Adhesion	Nail pick
60℃*30min	PC	5B	No change
	ABS	5B	difficultly
	ABS+PC	5B	No change
60℃*60min	PC	5B	No change
	ABS	5B	No change
	ABS+PC	5B	No change
70℃*20min	PC	5B	No change
	ABS	5B	No change
	ABS+PC	5B	No change

Black pigment paint, DFT=10μm; After curing, test them overnight

Substrate: PC/ABS
Primer: Crysol® 6136, DFT= 12μm; Topcoat: WB-UV, DFT= 15μm;
Curing condition: 60℃, 30min; Test immediately

Items		Performance
Adhesion	HIPS	5B
	PA (TR-90)	5B
	PC+GF	5B
	PA+GF	5B
Alcohol scrub(500g , 99.7%)		40 times
Silver paint (8%) L value		90.6
Boiling water resistance	60℃ 5h	No blistering, no whitening,5B
	80℃ 4h	No blistering, no whitening,5B
	100℃ 2h	Blue at the edges, 5B
Match with UV (UV:15um)		5B
Adhesion(boiling,80℃4h)		No blistering, no whitening,5B
Adhesion(boiling,100℃2h)		No blistering, no whitening,5B

Crysol® 6136--recommended formula

➢ *Black pigmented paint*

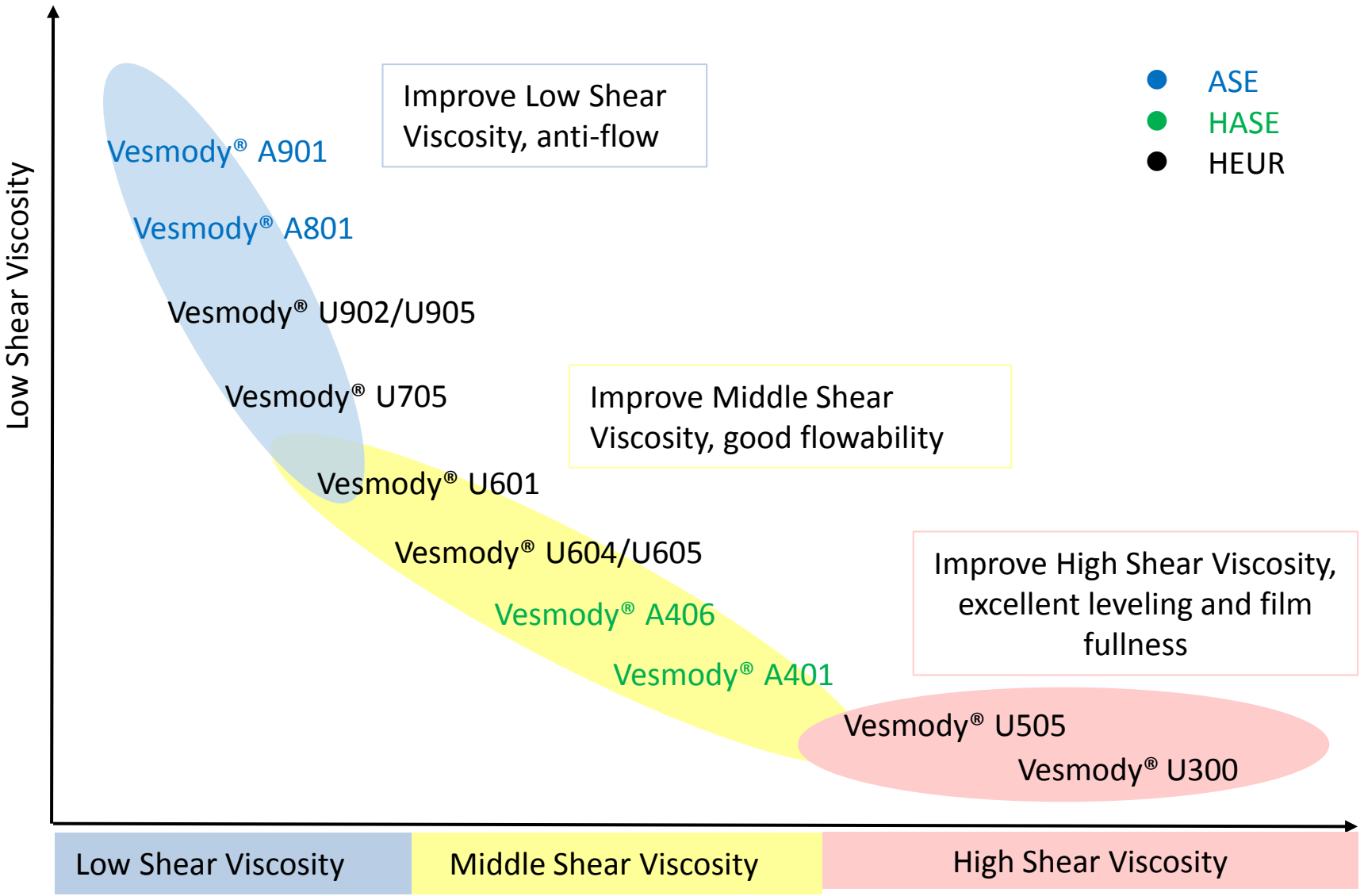
NO.	Material	Wt. %	Function	Supplier
1	Crysol 6136	60.0	Resin	Wanhua
2	DMEA	0.1	pH adjuster	/
3	Tego Airex 902w	0.1	Defoamer	Evonik
4	U605/BCS/water (2:1:1)	0.2	Thickener	Wanhua
Check oil shrinkage				
5	DPnB	4	Coalescent	DOW
6	DPM	2	Coalescent	DOW
7	Tego 270	0.3	Wetting agent	Evonik
8	Black paste	26.5	/	/
9	DI water	6.6	/	/
10	U605/BCS/water (2:1:1)	0.2	Thickener	Wanhua
	Total	100		

➢ *Silver paint*

NO.	Material	Wt. %	Function	Supplier
1	Crysol 6136	63.0	Emulsion	Wanhua
2	DMEA	0.3	pH adjuster	/
3	TEGO 4100	0.5	Wetting agent	Evonik
4	BYK 011	0.3	Defoamer	Evonik
5	Surfynol 104E	0.5		
6	DPNB	2.0	Coalescent	DOW
7	DPM	1.0	Coalescent	DOW
8	Silver paste	16.5	/	/
9	DI water	13.0		
10	BYK-8421	3.0	Alumimum powder orientation additive	BYK
	Total	100.0		
	Silver paste			
1	BCS	4.0	Coalescent	
2	DI water	4.0	/	/
3	BYK-192	0.5	Dispersant	BYK
4	1405L	8.0	Silver powder	Eckart
	Total	16.5		

06 Rheology modifier

Rheology modifier products line



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