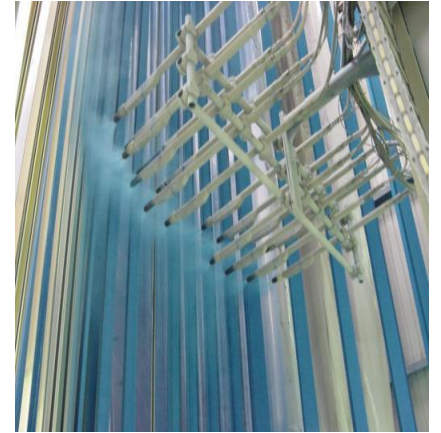


Coatings Trends & Technologies SUMMIT



<https://aluminium-guide.com/wp-content/uploads/2017/02/1-gorizontaalnoe-nanesenie-poroshka.jpg>

Super-Durable Technology Metallic - (Interference) Pigments



<https://aluminium-guide.com/wp-content/uploads/2017/02/2-vertikalnoe-nanesenie-poroshka.jpg>

The Startup Trigger

- Metal pigments are becoming increasingly important in powder coatings due to their attractive optical properties, especially in outdoor applications such as high-quality facades. This presentation will demonstrate ways in which metal-pigmented powder coatings can be tailored to meet the demands of these high-performance applications, which are known to be often exposed to severe
- weather conditions.

Requirements ????

How realistic are they?



AAMA 2604 powder coatings are formulated with super durable or modified polyester resins. This finish provides good color and gloss retention for approximately five years of exposure.

AAMA 2605 is the high-performance exterior specification. These finishes are resistant to moisture, weathering, ozone and UV radiation. An application for this finish would include architectural projects that require long term functional protection (approx. 10 yrs).

Test-Conditions

Standard	Country of Origin	Countries Primarily Specified in Today
GSB	Germany	Germany, Austria, Northern European Countries
Qualicoat	Switzerland	Switzerland, Italy, Spain, France, Other European Countries, China
AAMA	United States	United States, Worldwide
HG/T 3793-2005	China	China and some other Asian Countries

Florida Exposure Natural Weathering Tests				
	1 Year (Standard Grade Coating)	3 Year (Super Durable Coating)	5 Years	10 Years (Hyper Durable Coating)
GSB	Standard Minimum Gloss Retention 50%	Master Minimum Gloss Retention 50%	Premium Minimum Gloss Retention 30%	
Qualicoat	Class 1 Minimum Gloss Retention 50%	Class 2 Minimum Gloss Retention 1 year, 75% 2 years, 50% 3 years, 50%		Class 3 Minimum Gloss Retention 1 year, 90% 4 years, 70% 7 years, 55% 10 years 50%
AAMA	2603-02 Slight Fading No Checking, Cracking or Loss of Adhesion		2604-05 Chalking Minimum Rating #8	2605-11 Color Uniformity Chalking Minimum Rating #8


Artificial Weathering Tests				
	1 Year	3 Years	5 Years	10 Years
GSB	300h Fluorescent UV B Minimum Gloss Retention 50%	600h Fluorescent UV B Minimum Gloss Retention 50%	1000h Fluorescent UV B Minimum Gloss Retention 50%	
Qualicoat	Xenon 1000h Minimum Gloss Retention 50%	Xenon 1000h Minimum Gloss Retention 50%		Xenon 2000h Minimum Gloss Retention 90%
AAMA	No Test		No Test	No test
HG/T 3793-320				Xenon 4000h Minimum Gloss Retention 90%


Currently, the best known and most widely used standards for architectural powder coatings are:

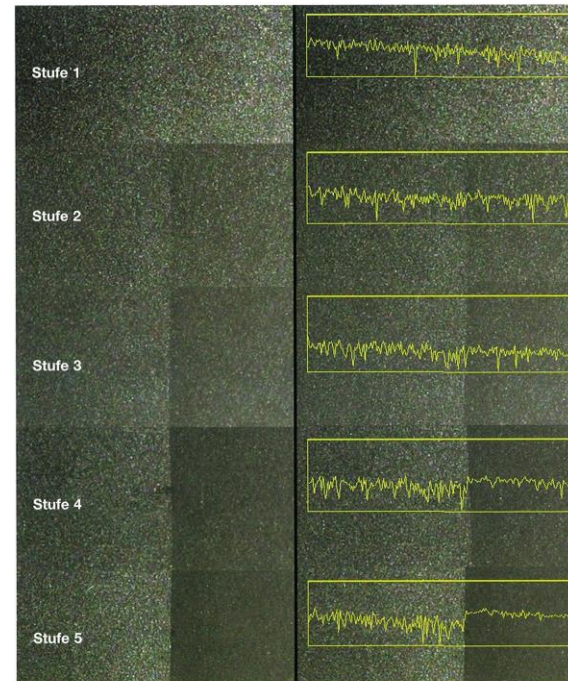
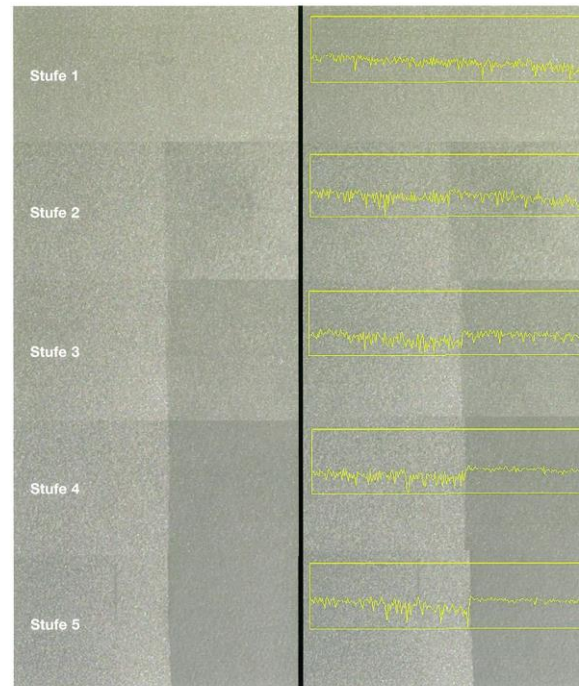
- GSB AL 631
- Qualicoat-Spezifikationen
- AAMA 2603, AAMA 2604 und AAMA 2605
- HG/T 3793.

Mortartest

Reliability ????

	Mörteltest Bewertung der Metallic-Effektveränderung	GSB AL 631 Ausgabe 5/2007
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	Mörteltest Bewertung der Metallic-Effektveränderung	GSB AL 631 Ausgabe 5/2007
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EN 12206-1 (paragraph 5.9)



QUALICOAT Specifications 2021
Master version (V02)

REFERENCE FOR EVALUATING MORTAR TEST RESULTS
(FOR INFORMATION)



Test Conditions - GSB

Life service - GSB Quality -Classes

GSB Florida 10years

30 Years

Coatings: Fluorpolymer, e.g. PVDF

GSB Florida 5years

15 Years

Coatings: modified Polyester (HWR) Fluorpolymers

GSB Florida 3years

9 Years

Coatings: standard Polyester, modified Polyester HWR

GSB Florida 1year

3 Years

Coatings: standard Polyester

The following applies to the service life of all quality classes: 50% gloss retaining middle european climate

AAMA 2604

Prüfung	Aluminium Florida 1	Aluminium Florida 3 & 5	Aluminium Florida 10
Beständigkeit gegen Alkalien/Mörtel			
Farb- und Effektänderungen Farb- und Effektänderung bei Metallics	max. ΔL^* 1 max. Kennwert 3	max. ΔL^* 1 max. Kennwert 2	max. ΔL^* 1 max. Kennwert 2
Kurzbewitterung	UV B (313 nm)	UV B (313 nm)	
Prüfdauer	300h	600h für Florida 3 1000h für Florida 5	
Restglanz	$\geq 50\%$	$\geq 50\%$	
Freibewitterung Florida			
ca. Prüfzeit (Monate)	12	36/60	120
UV-Energie (MJ/m ²)	max 300	max. 840 (36) max. 1400 (60)	-
Restglanz	$\geq 50\%$	$\geq 50\%$	$\geq 80\%$ (60) $\geq 50\%$ (120)
Farbabstand ΔL^* , ΔC^*	siehe 2.4	siehe 2.4	-

QuV-B

EN 12206-1 (paragraph 5.9)

This laboratory test offers a perfect simulation of sunlight in the critical shortwave range of 295 nm up to 365 nm, which is mainly responsible for the destruction of polymers!!!!

From what is the authorization derived to judge on the pigment behavior to the loss of gloss?

Aluminum is not susceptible to UV exposure. In addition, the QuV-B test is not a pigment test in itself - it rather determines the susceptibility of the binder.

The faster the test, the lower the correlation to practice

Lebensdauer - GSB Qualitätsklassen

GSB Florida 20 Jahre	30 Jahre*
Beschichtungen: Fluorpolymere, z.B. Duraflex®, PVDF	
GSB Florida 15 Jahre	15 Jahre*
Modifizierte Polyester (HMF), Fluorpolymere	
GSB Florida 10 Jahre	10 Jahre*
Standard Polyester (Pulverlack), Modifizierte Polyester (HMF)	
GSB Florida 5 Jahre	5 Jahre*
Standard Polyester (Pulverlack)	

* für die Lebensdauer aller Qualitätsklassen gilt: Restglanz > 50%, gleichbleibender Farbeindruck, mitteleuropäisches Klima

Test Conditions- Qualicoat

DIN 2810

QUALICOAT Specifications 2021
Master version (V02)



ISO 16474-2

Accelerated weathering test

Accelerated weathering test for classes 1, 1.5 and 2

REQUIREMENTS:

Gloss

The gloss retention shall be at least 50% for class 1 organic coatings.

The following values apply to class 1.5 organic coatings:

- After 1 year in Florida : at least 65%
- After 2 years in Florida : at least 50%

The following values apply to class 2 organic coatings:

- After 1 year in Florida : at least 75%
- After 2 years in Florida : at least 60%
- After 3 years in Florida : at least 50%

The following values apply to class 3 organic coatings:

- After 3 years in Florida : at least 80%
- After 7 years in Florida : at least 55%
- After 10 years in Florida : at least 50%

REQUIREMENTS:

Gloss retention⁵

The gloss retention shall be at least

- 50% for class 1
- 75% for class 1.5
- 90% for class 2

AAMA 2604

Accelerated weathering test for class 3

For class 3 the accelerated weathering test is replaced by a Florida exposure test of 3 years.

REQUIREMENTS:

Gloss retention:

The gloss retention shall be at least 80% after 3 years

What can your formulation?

Test-Conditions

We have tested in three different resin systems

- a. Polyester HAA-HWR – enabled for AAMA 2604
- b. PUR – System based on saturated PES-resin
- c. PVDF

We are talking about endurance test conditions- as to the fact that all stress directly is transferred on the only in these formulation containing pigment, which is the pure al-component.

Bewertung von Beschichtungssystemen/Evaluation des systèmes de revêtement

Gütesiegel/Label de qualité	Qualicoat Klasse 2 Qualicoat Classe 2				Qualicoat Klasse 1 Qualicoat Classe 1		
Eigenschaft bzw. Beschichtung Caractéristique/Revêtement	HWF PE	PVDF	2K F	PFC	PE	2K PU	Sil PE

What about the options for decision-making

Below facts might be the base of decision for your formulation- make a calculation and decide what you trust yourself with your metallic pigmented system.
It's of course a matter of required warranty.

PVDF (Feve) - **Systems**

- might work with an enhanced encapsulated al-pigment for certain warranty conditions.

PES- SYSTEMS HWR - might work with double-layered super-durable al-pigments as well!?

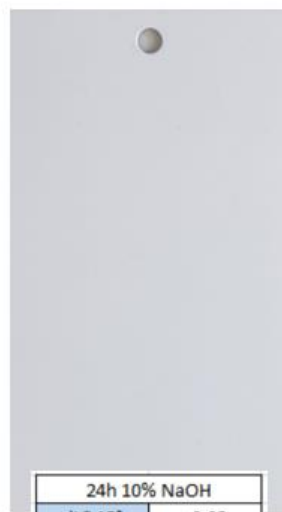
Unless color effect-data are required more & more, you should not feel obliged to accept these as final decision-making criteria.

Accelerated weathering results will not really be able to imitate on outdoor exposure conditions- aluminum pigments are anyway insensitive to UV-radiation and will withstand humidity & industrial atmosphere conditions by right preparation.

Powdercoating: Polyester HAA-HWR

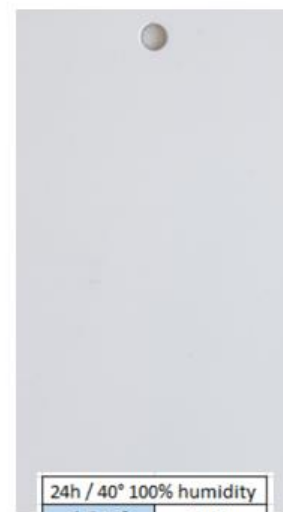
- Perfect for outdoors
- Outstanding weather resistance
- Very good scratch resistance
- Homogeneous baking conditions
- Qualicoat class 2, GSB Florida 3 and AAMA2604
- With a guarantee of up to 25 years (Depending on the powder coating system)

Chemical Test



24h 10% NaOH	
dL* 15°	-0,05
dL* 25°	0,04
mDE*	0,66

Mortar Test



24h / 40° 100% humidity	
dL* 15°	0,22
dL* 25°	0,12
mDE*	0,27

QUV-B Test



Remaining gloss: 60,30% (1000h)

Florida Test



Test in accordance with ISO 2810

Qualicoat CL2
 Test period: 36 month
 UV-Energy (MJ/m²)
 Max. 840h
 Remaining gloss ≥ 50%

Qualicoat CL2 requirement successfully passed



Aluminium Florida 3

Aluminium Florida 3
 Test period: 36 month
 UV-energy (MJ/m²)
 Max. 840h
 Remaining gloss ≥ 50%

Aluminium Florida 3 requirement successfully passed

Remaining gloss: 89%



Powdercoating: PVDF - transparent

Powdercoating: PUR - transparent

Chemical Test

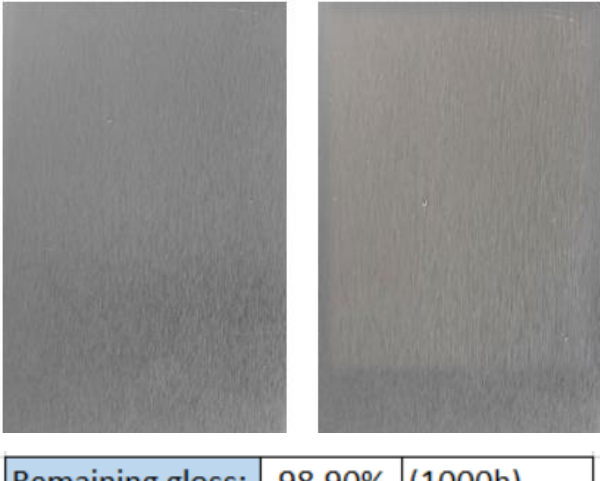
Mortar Test

QUV-B Test

Chemical Test

Mortar Test

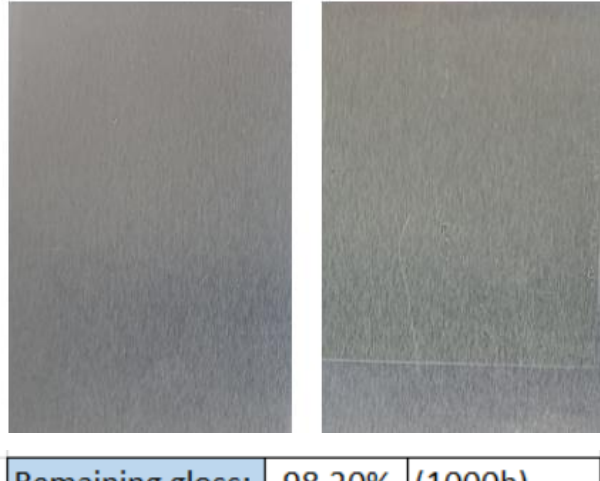
QUV-B Test



24h 10% NaOH	
dL* 15°	-0,02
dL* 25°	-0,02
mDE*	0,11

24h / 40° 100% humidity	
dL* 15°	0,08
dL* 25°	0,12
mDE*	0,18

Remaining gloss: 98,90% (1000h)



24h 10% NaOH	
dL* 15°	-0,03
dL* 25°	0,04
mDE*	0,28

24h / 40° 100% humidity	
dL* 15°	0,38
dL* 25°	0,17
mDE*	0,38

Remaining gloss: 98,20% (1000h)

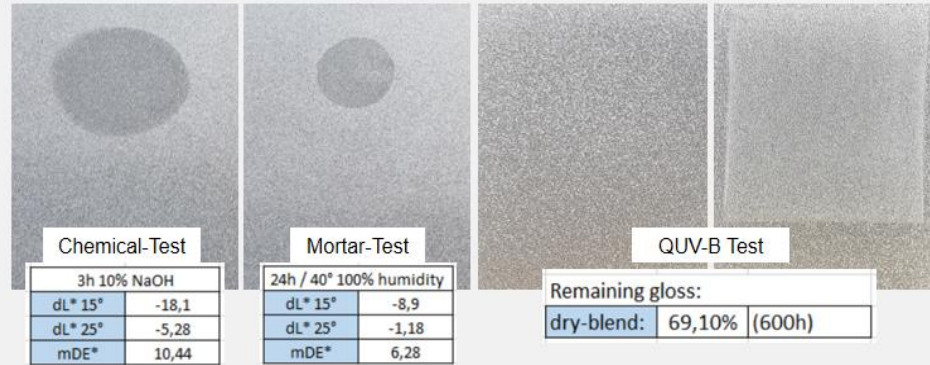
- best weather resistance among powder coatings
- It is an ideal surface protection material
- Excellent resistance to ultraviolet rays, high temperatures, moisture, chemical pollution and other erosion properties

- Excellent light and weather resistance
- Applications:
Facade elements, window profiles
agricultural machinery

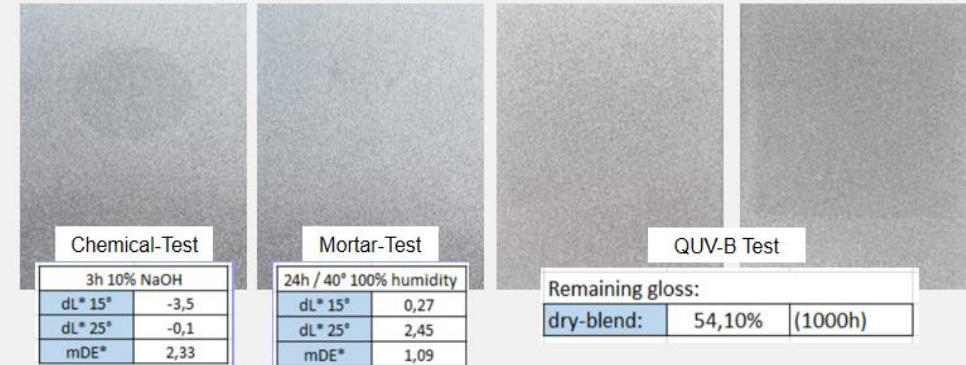
54 μ m encapsulated metallic-pigment in Polyester HAA-HWR powder-coating

Dry-blend (4%)

Standard SiO₂

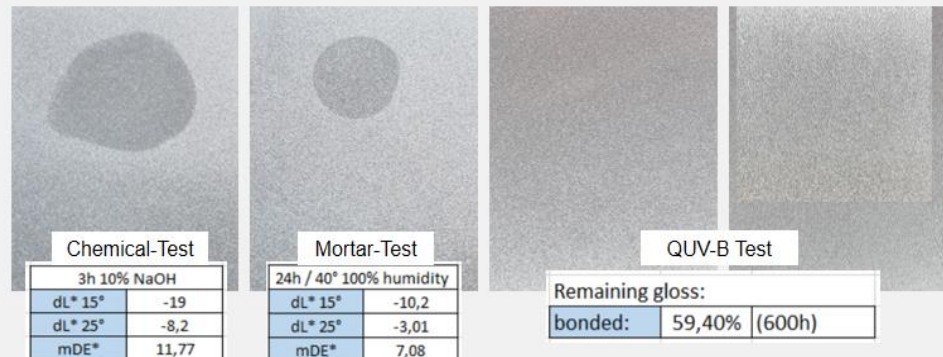


Improved SiO₂

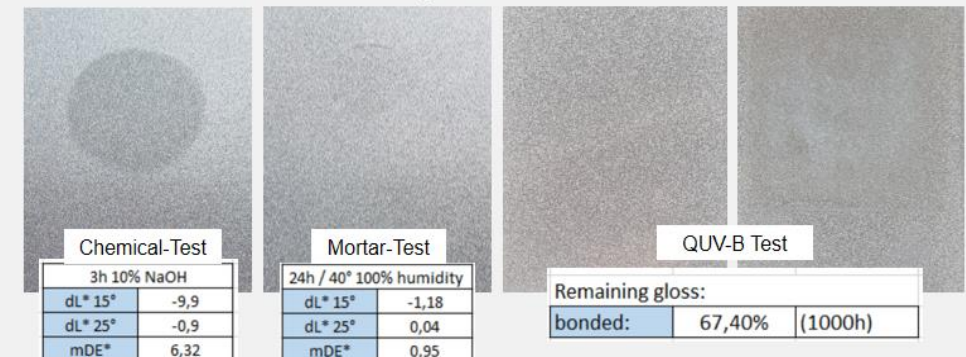


Bonded (4%)

Standard SiO₂



Improved SiO₂



54µm encapsulated metallic-pigment in Polyester HAA-HWR powder-coating

Dry-blend (4%)

Bonded (4%)

Double-Layer / dry-blend

Double-Layer / bonded

Chemical-Test	
3h 10% NaOH	
dL* 15°	-0,49
dL* 25°	-0,14
mDE*	0,45

Mortar-Test	
24h / 40° 100% humidity	
dL* 15°	0,77
dL* 25°	0,39
mDE*	0,79

QUV-B Test	
Remaining gloss :	
dry-blend	94,50% (600h)

Chemical-Test	
3h 10% NaOH	
dL* 15°	-0,8
dL* 25°	0,95
mDE*	0,86

Mortar-Test	
24h / 40° 100% humidity	
dL* 15°	-0,57
dL* 25°	-0,29
mDE*	0,94

QUV-B Test	
Remaining gloss :	
bonded	95,20% (600h)

Mortar-Resistance (dryblend-bonded)

Weather Fastness (dryblend-bonded)

Florida Exposure

certificates

The certificates are technical reports from SCHLENK detailing the performance of the 54µm encapsulated metallic-pigment in Polyester HAA-HWR powder-coating. Each certificate includes:

- Technical Information:** Product name (PuroSP 3300 027), resin system (PES - Powder System (2-component)), and pigment type (4% / dry blend).
- Test Results:**
 - Mortar-Resistance:** dL* 15° (0,77), dL* 25° (0,39), mDE* (0,79).
 - Weather Fastness:** dL* 15° (-0,8), dL* 25° (0,95), mDE* (0,86).
 - Florida Exposure:** Remaining gloss > 95% (300h), 92% (600h).
- Signatures:** I.V. Dr. Frank J. Mele and L.A. Joachim Schulz.

21µm iron oxidized aluminum-pigment (copper)

dry-blend / bonded (4% Pigmentation)

Polyester HAA-HWR

dry-blend			bonded																																																						
<p>Chemical-Test</p> <table border="1"> <tr><td>3h 10% NaOH</td><td></td></tr> <tr><td>dL* 15°</td><td>-0,6</td></tr> <tr><td>dL* 25°</td><td>-0,3</td></tr> <tr><td>mDE*</td><td>1,14</td></tr> </table>			3h 10% NaOH		dL* 15°	-0,6	dL* 25°	-0,3	mDE*	1,14	<p>Mortar-Test</p> <table border="1"> <tr><td>24h / 40° 100% humidity</td><td></td></tr> <tr><td>dL* 15°</td><td>-0,91</td></tr> <tr><td>dL* 25°</td><td>-0,93</td></tr> <tr><td>mDE*</td><td>0,99</td></tr> </table>			24h / 40° 100% humidity		dL* 15°	-0,91	dL* 25°	-0,93	mDE*	0,99	<p>QUV-B Test</p> <table border="1"> <tr><td>Remaining gloss:</td><td></td></tr> <tr><td>dry-blend:</td><td>53,80% (600h)</td></tr> </table>			Remaining gloss:		dry-blend:	53,80% (600h)	<p>Chemical-Test</p> <table border="1"> <tr><td>3h 10% NaOH</td><td></td></tr> <tr><td>dL* 15°</td><td>-2,29</td></tr> <tr><td>dL* 25°</td><td>-0,91</td></tr> <tr><td>mDE*</td><td>1,78</td></tr> </table>			3h 10% NaOH		dL* 15°	-2,29	dL* 25°	-0,91	mDE*	1,78	<p>Mortar-Test</p> <table border="1"> <tr><td>24h / 40° 100% humidity</td><td></td></tr> <tr><td>dL* 15°</td><td>-1,99</td></tr> <tr><td>dL* 25°</td><td>-1,6</td></tr> <tr><td>mDE*</td><td>1,69</td></tr> </table>			24h / 40° 100% humidity		dL* 15°	-1,99	dL* 25°	-1,6	mDE*	1,69	<p>QUV-B Test</p> <table border="1"> <tr><td>Remaining gloss:</td><td></td></tr> <tr><td>bonded:</td><td>46,00% (600h)</td></tr> </table>			Remaining gloss:		bonded:	46,00% (600h)
3h 10% NaOH																																																									
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certificates

Mortar-Resistance (dryblend-bonded)	Weather Fastness (dryblend)	Florida Exposure
<p>SCHLENK</p> <p>TECHNICAL INFORMATION Mortar - Resistance</p> <p>Business Unit Effect Pigments</p> <p>System: Schlenk CopperGreen WR 2100 Technology: Powder Coating Resin system: PEG-Primer System (Thermoplastic) Pigment(s)/Application: 4% / dry blend</p> <p>Qualification: GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100)</p> <p>Validation: DQ 12200-1 (Schlenk) / Color & Effect Design of Schlenk / Release for Qualifier to GSB</p> <p>Requirements: approved color C.1 / assessment step C.2</p> <p>SCHLENK METALLIC PIGMENTS GmbH I.V. Dr. Frank J. Male / I.A. Joachim Schürz 08000 Technical Center / 08000 Technology Center Powder Coating Business Unit Effect Pigments / Business Unit Effect Pigments</p>	<p>SCHLENK</p> <p>TECHNICAL INFORMATION Mortar - Resistance</p> <p>Business Unit Effect Pigments</p> <p>System: Schlenk CopperGreen WR 2100 Technology: Powder Coating Resin system: PEG-Primer System (Thermoplastic) Pigment(s)/Application: 4% / dry blend</p> <p>Qualification: GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100)</p> <p>Validation: DQ 12200-1 (Schlenk) / Color & Effect Design of Schlenk / Release for Qualifier to GSB</p> <p>Requirements: approved color C.1 / assessment step C.2</p> <p>SCHLENK METALLIC PIGMENTS GmbH I.V. Dr. Frank J. Male / I.A. Joachim Schürz 08000 Technical Center / 08000 Technology Center Powder Coating Business Unit Effect Pigments / Business Unit Effect Pigments</p>	<p>SCHLENK</p> <p>TECHNICAL INFORMATION Weather Fastness</p> <p>Business Unit Effect Pigments</p> <p>System: Schlenk CopperGreen WR 2100 Technology: Powder Coating Resin system: PEG-Primer System (Thermoplastic) Pigment(s)/Application: 4% / dry blend</p> <p>Qualification: GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100)</p> <p>Validation: DQ 12200-1 (Schlenk) / Color & Effect Design of Schlenk / Release for Qualifier to GSB</p> <p>Requirements: approved color C.1 / assessment step C.2</p> <p>SCHLENK METALLIC PIGMENTS GmbH I.V. Dr. Frank J. Male / I.A. Joachim Schürz 08000 Technical Center / 08000 Technology Center Powder Coating Business Unit Effect Pigments / Business Unit Effect Pigments</p>
<p>SCHLENK</p> <p>TECHNICAL INFORMATION Florida Exposure</p> <p>Business Unit Effect Pigments</p> <p>System: Schlenk CopperGreen WR 2100 Technology: Powder Coating Resin system: PEG-Primer System (Thermoplastic) Pigment(s)/Application: 4% / dry blend bonded</p> <p>Qualification: GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100) / GSB (Schlenk WR 2100)</p> <p>Validation: DQ 12200-1 (Schlenk) / Color & Effect Design of Schlenk / Release for Qualifier to GSB</p> <p>Requirements: approved color C.1 / assessment step C.2</p> <p>SCHLENK METALLIC PIGMENTS GmbH I.V. Dr. Frank J. Male / I.A. Joachim Schürz 08000 Technical Center / 08000 Technology Center Powder Coating Business Unit Effect Pigments / Business Unit Effect Pigments</p>		

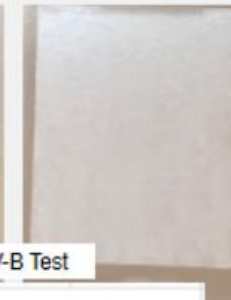
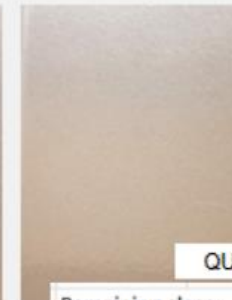
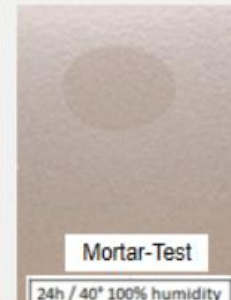
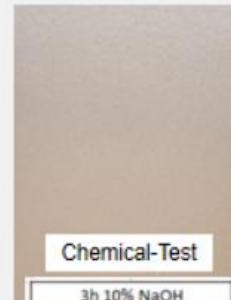
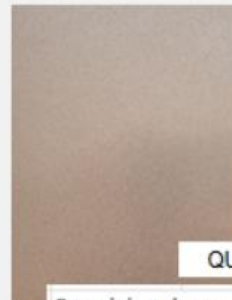
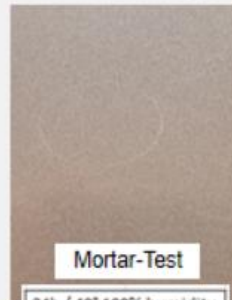
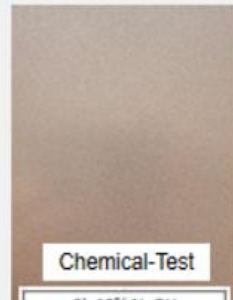
21µm iron oxidized aluminum-pigment (champagne)

dry-blend / bonded (2% Pigmentation)

Polyester HAA-HWR

dry-blend

bonded



Chemical-Test

3h 10% NaOH	
dL* 15°	-1,3
dL* 25°	-0,91
mDE*	1,1

Mortar-Test

24h / 40° 100% humidity	
dL* 15°	0,5
dL* 25°	0,14
mDE*	0,55

Remaining gloss:

dry-blend:	57,90%	(600h)
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Chemical-Test

3h 10% NaOH	
dL* 15°	-1,21
dL* 25°	-0,11
mDE*	1,3

Mortar-Test

24h / 40° 100% humidity	
dL* 15°	-2,93
dL* 25°	-1,46
mDE*	1,89

Remaining gloss:

bonded:	29,50%	(600h)
---------	--------	--------

Mortar-Resistance (dryblend-bonded)

Weather Fastness (dryblend)

Florida Exposure

certificates

TECHNICAL INFORMATION
Mortar - Resistance

Business Unit
Effect Pigments

Pigment: Sironox® Goldox/White W9 21 15
Technology: Powder Coating
Resin system: PEG - Powder System (Thermoplastic)
Pigment/concentration: 2% / dry blend

Qualification: GSB (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931)
Evaluation: EP 1.276-1 (dL*, S*) | Color & Block Change of standard | Reference for Qualitest & GSB

Equipment: unexposed step 1-2 | unexposed step 1-2

SCHLENK METALLIC PIGMENTS GmbH
I.V. Dr. Frank J. Male
Global Technical Director
Business Unit Effect Pigments

TECHNICAL INFORMATION
Mortar - Resistance

Business Unit
Effect Pigments

Pigment: Sironox® Goldox/White W9 21 15
Technology: Powder Coating
Resin system: PEG - Powder System (Thermoplastic)
Pigment/concentration: 2% / dry blend

Qualification: GSB (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931)
Evaluation: EP 1.276-1 (dL*, S*) | Color & Block Change of standard | Reference for Qualitest & GSB

Equipment: unexposed step 1-2 | unexposed step 1-2

SCHLENK METALLIC PIGMENTS GmbH
I.V. Dr. Frank J. Male
Global Technical Director
Business Unit Effect Pigments

TECHNICAL INFORMATION
WEATHER FASTNESS

Business Unit
Effect Pigments

Pigment: Sironox® Goldox/White W9 21 15
Technology: Powder Coating
Resin system: PEG - Powder System (Thermoplastic)
Pigment/concentration: 2% / dry blend

Qualification: GSB (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931)
Evaluation: EP 1.276-1 (dL*, S*) | Color & Block Change of standard | Reference for Qualitest & GSB

Equipment: unexposed step 1-2 | unexposed step 1-2

SCHLENK METALLIC PIGMENTS GmbH
I.V. Dr. Frank J. Male
Global Technical Director
Business Unit Effect Pigments

TECHNICAL INFORMATION
Florida Exposure

Business Unit
Effect Pigments

Pigment: Sironox® Goldox/White W9 21 15
Technology: Powder Coating
Resin system: PEG - Powder System (Thermoplastic)
Pigment/concentration: 2% / dry blend

Qualification: GSB (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931) | SCHLENK (DIN EN ISO 12931)
Evaluation: EP 1.276-1 (dL*, S*) | Color & Block Change of standard | Reference for Qualitest & GSB

Equipment: unexposed step 1-2 | unexposed step 1-2

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21µm iron oxidized aluminum-pigment (gold)

dry-blend / bonded (4% Pigmentation)

Polyester HAA-HWR

dry-blend

Chemical-Test	
3h 10% NaOH	
dL* 15°	0,33
dL* 25°	0,46
mDE*	0,65

Mortar-Test	
24h / 40° 100% humidity	
dL* 15°	-1,89
dL* 25°	-0,18
mDE*	1,02

QUV-B Test	
Remaining gloss:	
dry-blend:	56,80% (600h)

bonded

Chemical-Test	
3h 10% NaOH	
dL* 15°	-5,55
dL* 25°	-1,85
mDE*	3,44

Mortar-Test	
24h / 40° 100% humidity	
dL* 15°	-5,96
dL* 25°	-1,38
mDE*	5,54

QUV-B Test	
Remaining gloss:	
bonded:	38,20% (600h)

certificates

Mortar-Resistance (dryblend-bonded)

SCHLENK

TECHNICAL INFORMATION
Mortar - Resistance

Business Unit
Effect Pigments

Pigment: Schlenk Goldschleier WB 21 TT

Technology: Powder Coating

Resin system: PES - Primal System (Changemaster)

Pigmentation/Application: 4% / dry blend

Validation: EN 12390-1 (EN 12390-1) GSB (Schlenk AG, 12.01.2019) GSR AL 431-4 (Schlenk AG / 2020, AL, 15.4.2020) SCHLENK GSB (Schlenk AG, 12.01.2019) Color & Effect Change of weather

Equipment: assessment step = 1 assessment step = 2

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Issue: 10.08.2022

SCHLENK

TECHNICAL INFORMATION
Mortar - Resistance

Business Unit
Effect Pigments

Pigment: Schlenk Goldschleier WB 21 TT

Technology: Powder Coating

Resin system: PES - Primal System (Changemaster)

Pigmentation/Application: 4% / dry blend

Validation: EN 12390-1 (EN 12390-1) GSB (Schlenk AG, 12.01.2019) GSR AL 431-4 (Schlenk AG / 2020, AL, 15.4.2020) SCHLENK GSB (Schlenk AG, 12.01.2019) Color & Effect Change of weather Release for Operation and Use

Equipment: assessment step = 1 assessment step = 2

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Weather Fastness (dryblend)

SCHLENK

TECHNICAL INFORMATION
WEATHER FASTNESS

Business Unit
Effect Pigments

Pigment: Schlenk Goldschleier WB 21 TT

Technology: Powder Coating

Resin system: PES - Primal System (Changemaster)

Pigmentation/Application: 4% / dry blend

Validation: GSB (Schlenk AG, 12.01.2019) GSR AL 431-4 (Schlenk AG / 2020, AL, 15.4.2020) SCHLENK GSB (Schlenk AG, 12.01.2019)

Equipment: QUV-B (12.01.2019) with accelerated impregnation

Issue: GSR Florida 1, 2, 3 (impregnation resistance) passed

Remaining gloss: Dry Blend: 56,80% (1000h)

Different test systems can lead to different test results.

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Florida Exposure

SCHLENK

TECHNICAL INFORMATION
Florida Exposure

Business Unit
Effect Pigments

Pigment: Schlenk Goldschleier WB 21 TT (bonded 400 mesh)

Technology: Powder Coating

Resin system: PES - Primal System (Changemaster)

Pigmentation/Application: 4% / dry blend

Validation: Test in accordance with ISO 2814 Assessment Florida 303 Test Report Florida

Equipment: Qualitest C2.2 Test period: 60 weeks Remaining gloss after 1 year > 90% Assessment Florida 303 Test period: 60 weeks Remaining gloss > 90% In accordance with accelerated impregnation

Issue: Qualitest C2.2 impregnation open area completely passed Assessment Florida 303 assessment successfully passed 90%

Colors maintained along with ASTM 3004

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IMPORTANT:

- *As known from literature: the correlation of accelerated to outdoor weathering tests is tricky.*
- *Therefore the statements/results should be considered as guideline only.*

What 's the message:

Coarser Al-pigment qualities (30 μ m and above and up to 4% pigmentation rate) with enhanced inorganic treatments might be able to fulfill AAMA 2604 (2605) conditions in PVDF-binder systems. Warranty time up to 20 years not unrealistic. Those requirements are also realizable by using correspondent PES-HWR resins in combination with double - layered al-pigment.

For middle sized al-pigments (e.g. 20-25 μ m and up to 2% pigmentation rate) already double-layered al-pigment qualities should be considered in order to go with AAMA 2604 conditions.

Aluminum-pigments below 15 μ m still will have their limitations in this field and will require toughest controls.

USA – Future - Outlook



*Bonded metal interference pigments
(MIP's) for facade application*

