SACHTLEBEN MINERALS

ALBAWHITE 110
ALBASOFT 110

PRODUCT INFORMATION

Albasoft 110

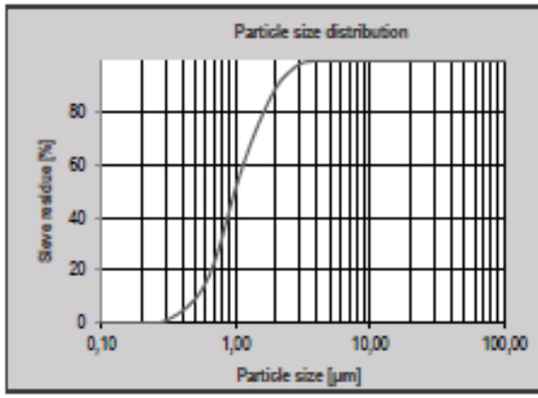
Product Information

Deutsche Baryt-Industrie

Albasoft 110 is manufactured by Deutsche Baryt-Industrie in Bad Lauterberg - in Germany's mountainous Harz region - from selected natural barium sulphate concentrates. By using a special preparation and refining process, this product can replace synthetic barium sulphates even in bright and high gloss applications.

Technical data	Method	Values Albasoft 110
Medium particle size / x50 [µm]	Cilas 920	approx. 1.0
Top-cut / x97 [µm]	Cilas 920	approx. 3.0
Sieve residue at 20 µm [%]	DIN EN ISO 787-7	< 0.05
Humidity at 105°C [%]	DIN EN ISO 3146	max. -
$BaSO_4$-content [%]	DIN EN ISO 3262-2	approx. 98
Si-content [%]	DBI-Method	approx. 0.3
Electr. conductivity [µS/cm]	DIN EN ISO 787-14	< 100
Brightness Ry / L*	DIN 53163	approx. 93 / 97
pH-Value	DIN EN ISO 787-9	approx. 8
Density [g/cm³]	DIN EN ISO 787-10	approx. 4.4
Refractive index	Literature	1.64
Hardness [Mohs]	Literature	3 - 4

The above mentioned values should be taken as indications only and not as guaranteed properties.



Typical properties:

- Resistant to acids and alkalis
- Insoluble in water and organic solvents
- Lightfast and weatherproof
- Extremely high brightness, guaranteed
- Colour neutral due to low refractive index
- Constant low yellowness index
- High wettability due to low specific surface area
- Enables high gloss values
- Low abrasiveness due to low silica content
- Low electrical conductivity
- Free of calcium carbonate

Typical applications:

Extra high quality Top Coats, High quality Powder Coating Systems & Pigment Preparations, Adhesives & Sealants.

Albawhite 110

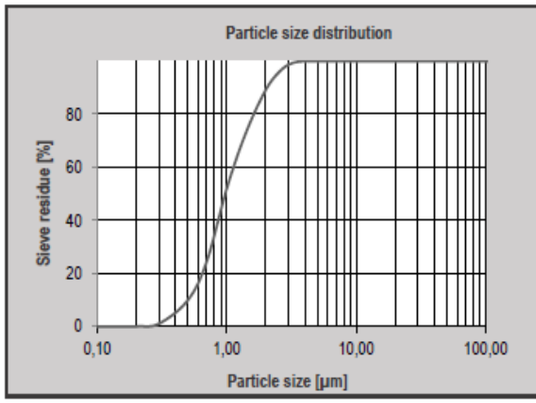
Product Information

Deutsche Baryt-Industrie

Albawhite 110 is manufactured by Deutsche Baryt-Industrie in Bad Lauterberg - in Germany's mountainous Harz region - from selected natural barium sulphate concentrates. This product provides a high brightness, enhances hiding power and gloss and can be used for partial replacement of expensive pigments as well.

Technical data	Method	Values Albawhite 110
Medium particle size / x50 [µm]	Cilas 920	approx. 1.0
Top-cut / x97 [µm]	Cilas 920	approx. 3.0
Sieve residue at 20 µm [%]	DIN EN ISO 787-7	< 0.05
Humidity at 105°C [%]	DIN EN ISO 3146	max. -
$BaSO_4$-content [%]	DIN EN ISO 3262-2	approx. 98
Si-content [%]	DBI-Method	approx. 0.3
Electr. conductivity [µS/cm]	DIN EN ISO 787-14	< 100
Brightness Ry / L*	DIN 53163	approx. 90 / 96
pH-Value	DIN EN ISO 787-9	approx. 8
Density [g/cm³]	DIN EN ISO 787-10	approx. 4.4
Refractive index	Literature	1.64
Hardness [Mohs]	Literature	3 - 4

The above mentioned values should be taken as indications only and not as guaranteed properties.



Typical properties:

- Resistant to acids and alkalis
- Insoluble in water and organic solvents
- Lightfast and weatherproof
- High brightness
- Colour neutral due to low refractive index
- Extremely low electrical conductivity
- High wettability due to low specific surface area
- Low binder demand
- Low abrasiveness due to low silica content
- Enables high gloss values

Typical applications:

High quality Top Coats, high end Powder Coating Systems, Pigment Preparations & Plastics.

Storage:

Keep the product in dry and closed rooms at normal temperature and air humidity, do not pile the pallets.

To achieve best possible results, we recommendstorage under the conditions stated above and usage within 12 months after receipt (FIFO).

Produzent:
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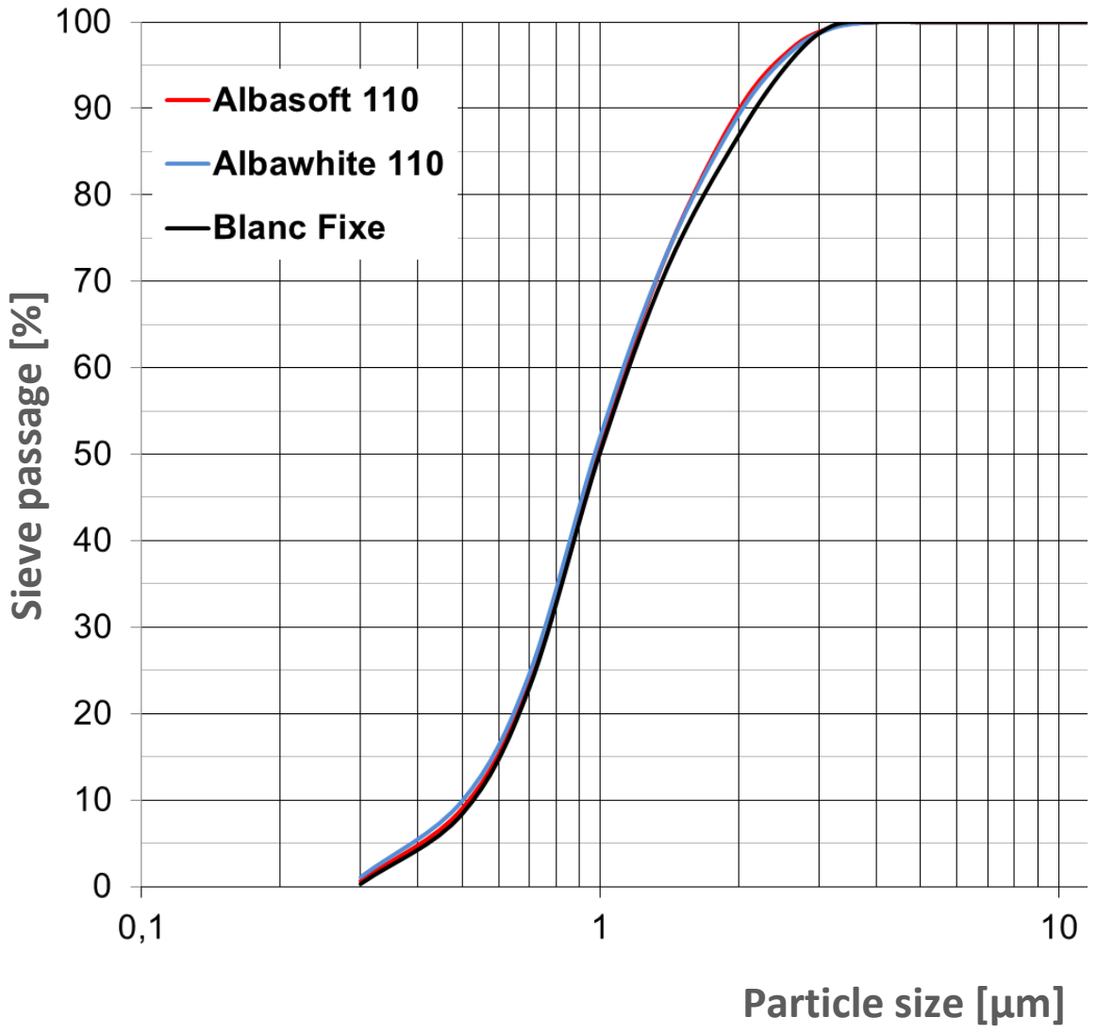
SACHTLEBEN MINERALS

COATING LABORATORY EVALUATION

PARTICLE SIZE DISTRIBUTION BY LASER DIFFRACTION (CILAS)

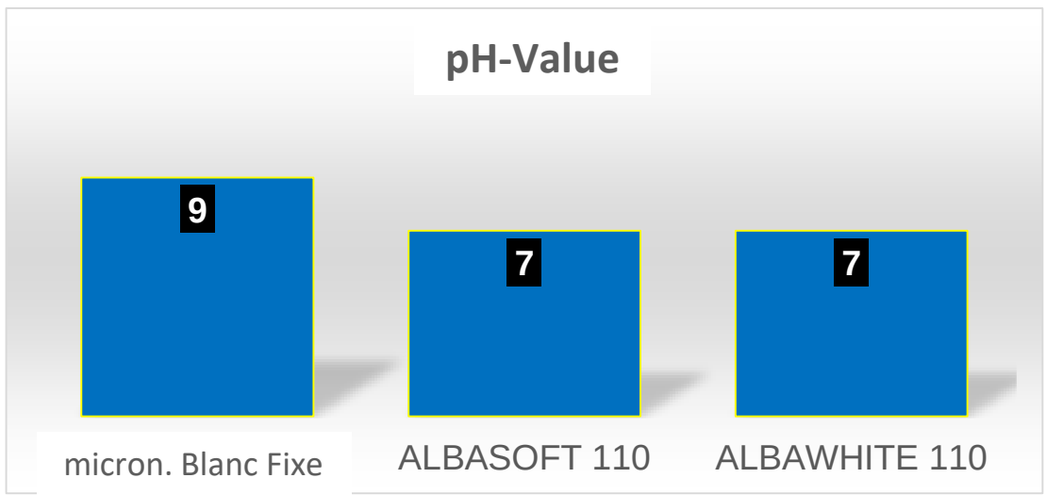


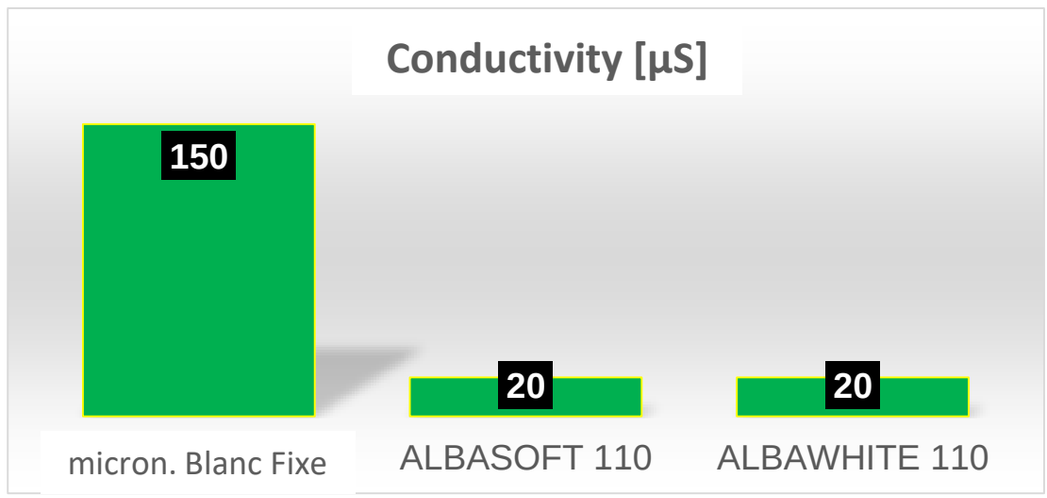
	d_{50} [µm]	d_{98} [µm]	d_{100} [µm]
micronized Blanc Fixe	0,99	3,04	3,99
ALBASOFT 110	0,98	2,86	3,99
ALBAWHITE 110	0,97	2,91	3,99

COATING LABORATORY EVALUATION

PH-VALUE AND CONDUCTIVITY

	pH-Value	Conductivity [µS]
micron. Blanc Fixe	9	150
ALBASOFT 110	7	20
ALBAWHITE 110	7	20





COATING LABORATORY EVALUATION

Test Formulation

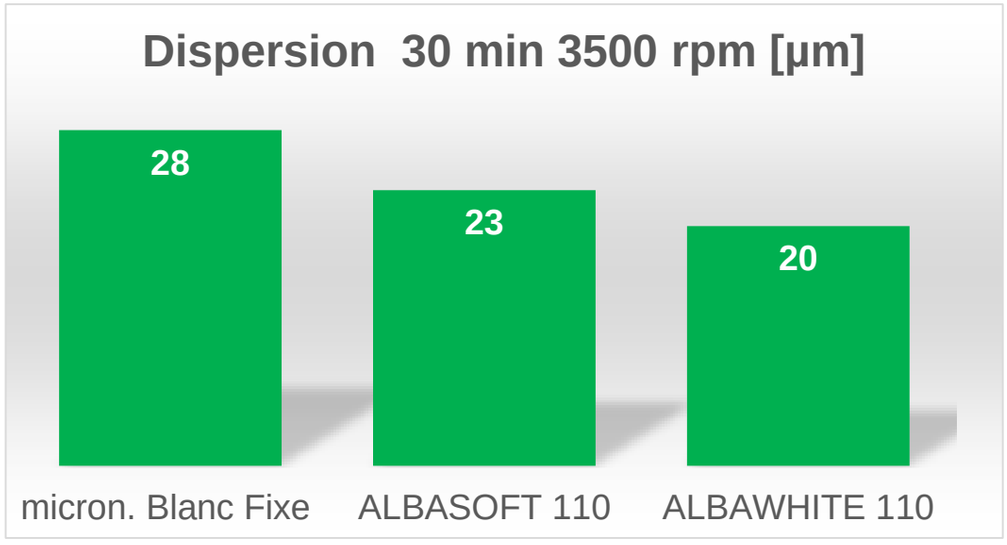
P1 - w/b Acrylate	function	description	Content [%]	Content [weight]
1	Binder	Acrylate, 44% w/b	50,00%	125,00 g
2	Additive	Wetting Agent	0,75%	1,875 g
3	Additive	Defoamer	0,30%	0,75 g
4	Filler/Extender	BF / ALBASOFT / ALBAWHITE 110	44,00%	110,00 g
5	Thickener	fumed Silica	0,60%	1,50 g
6	Solvent	d/i water	4,35%	10,875g

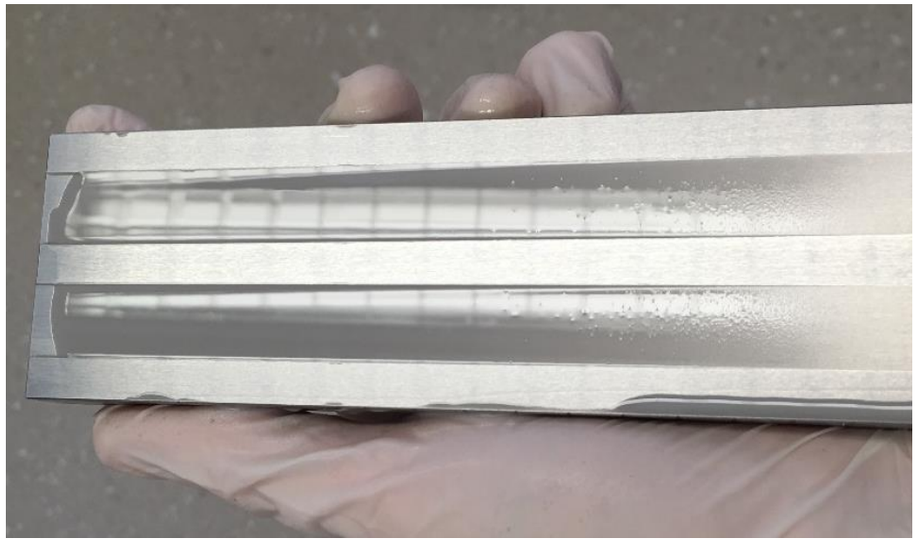
P2 - s/b Clearcoat, high gloss	function	description	Content [%]	Content [weight]
1	Binder	Clear Coat	43,00%	100,00 g
2	Filler/Extender	BF / ALBASOFT / ALBAWHITE 110	44,00%	80,00 g
3	Solvent	Solvent-Naphta	14,00%	20,00 g

COATING LABORATORY EVALUATION

Dispersibility, density, flow time, gloss on glass [P1 acrylate, P2 clear coat]

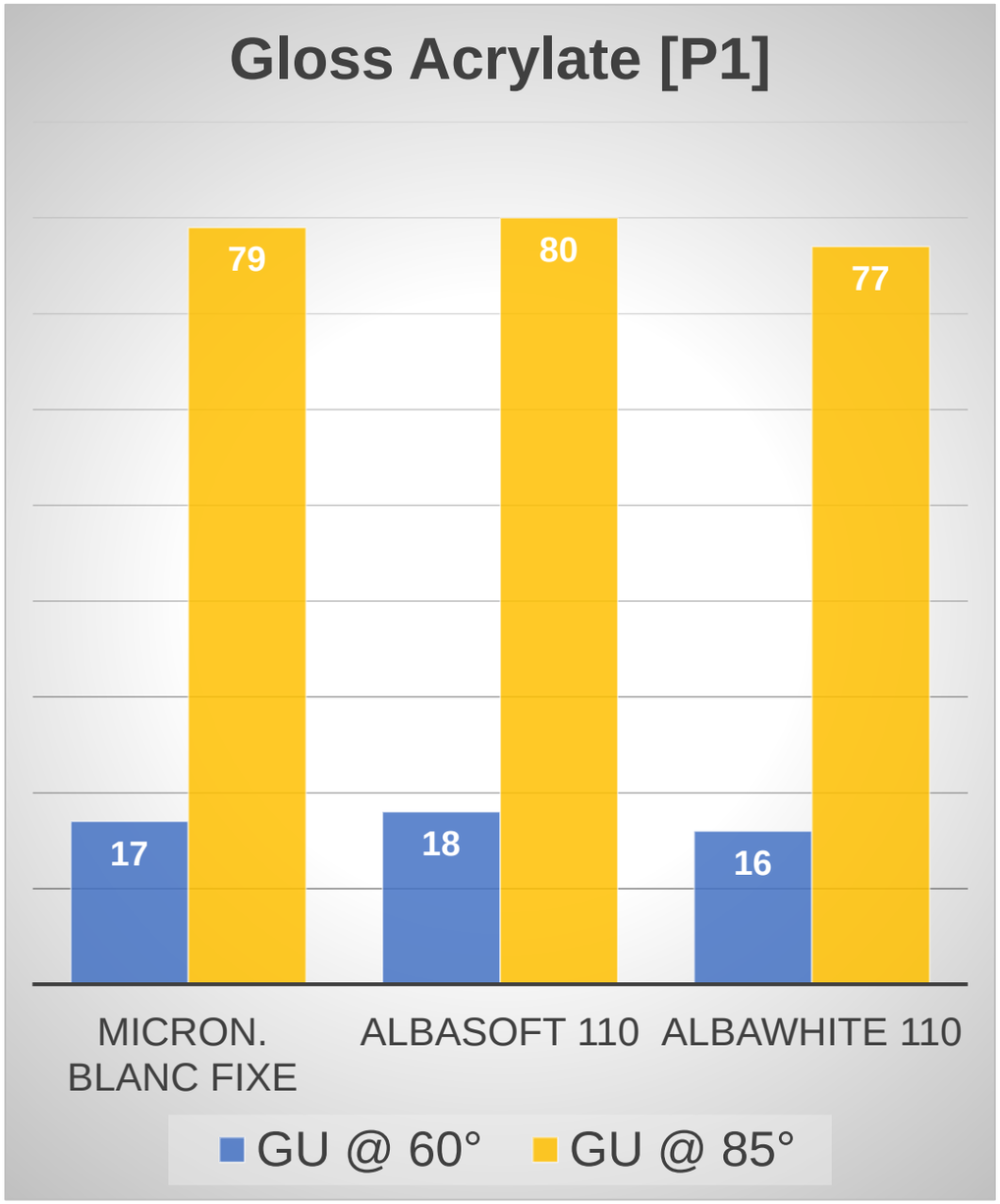
	Dispersion 30 min 3500 rpm [µm]	density [g/ml]	Flowtime 4mm [sec]	Viscosity Spindle 4 60 rpm [mPas]	Gloss in Acrylate [P1] @ 60°/ 85° GU	Gloss in Clear Coat [P2] @ 20° / 60° GU
micron. Blanc Fixe	25 – 30	1,62	38	400 mPas	17/ 79	75/ 91
ALBASOFT 110	20 - 25	1,61	29	450 mPas	18/ 80	85/ 95
ALBAWHITE 110	~20	1,61	30	450 mPas	16/ 77	82/ 94

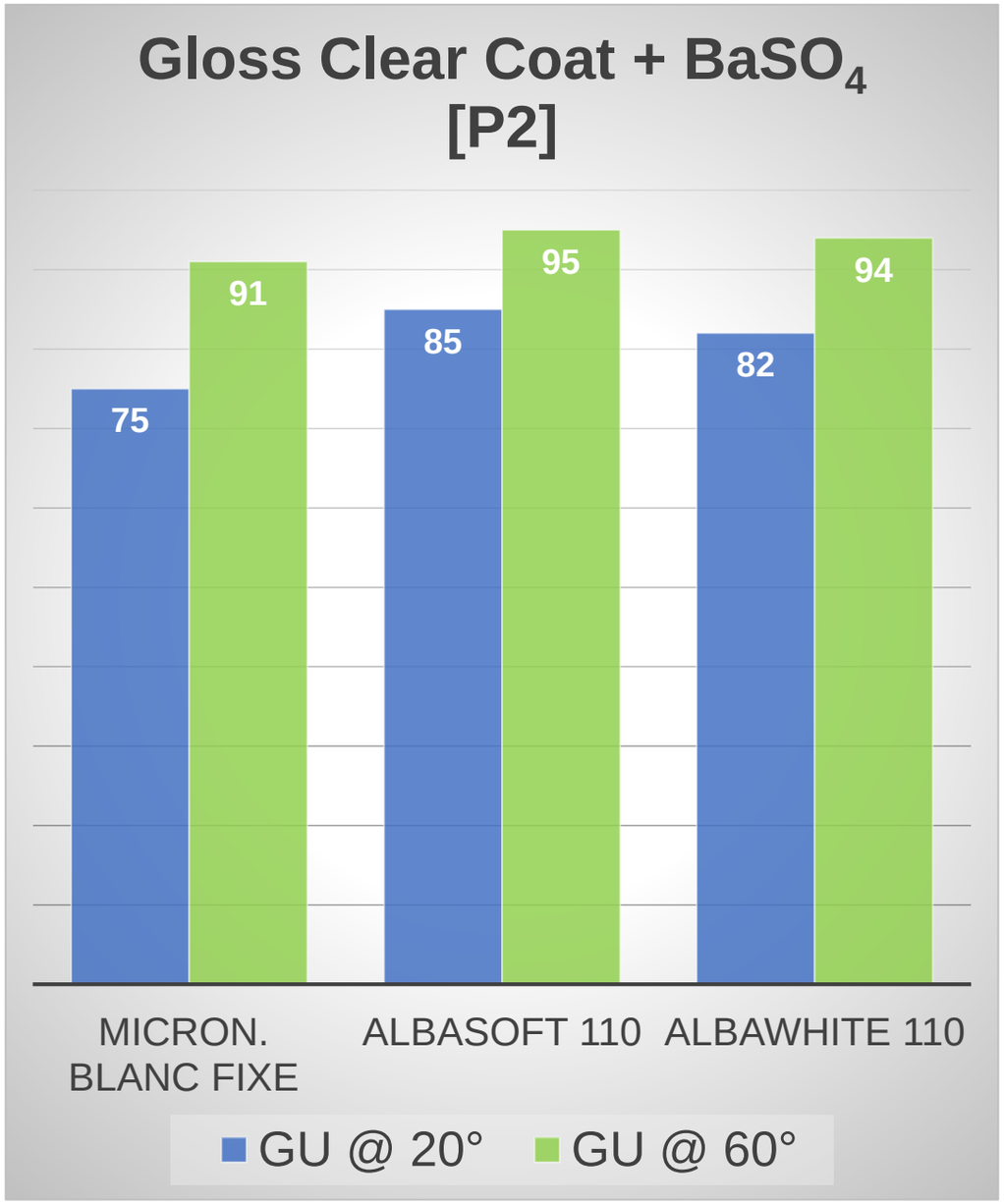




COATING LABORATORY EVALUATION

Test Formula
Gloss





COATING LABORATORY EVALUATION

Test Formulas

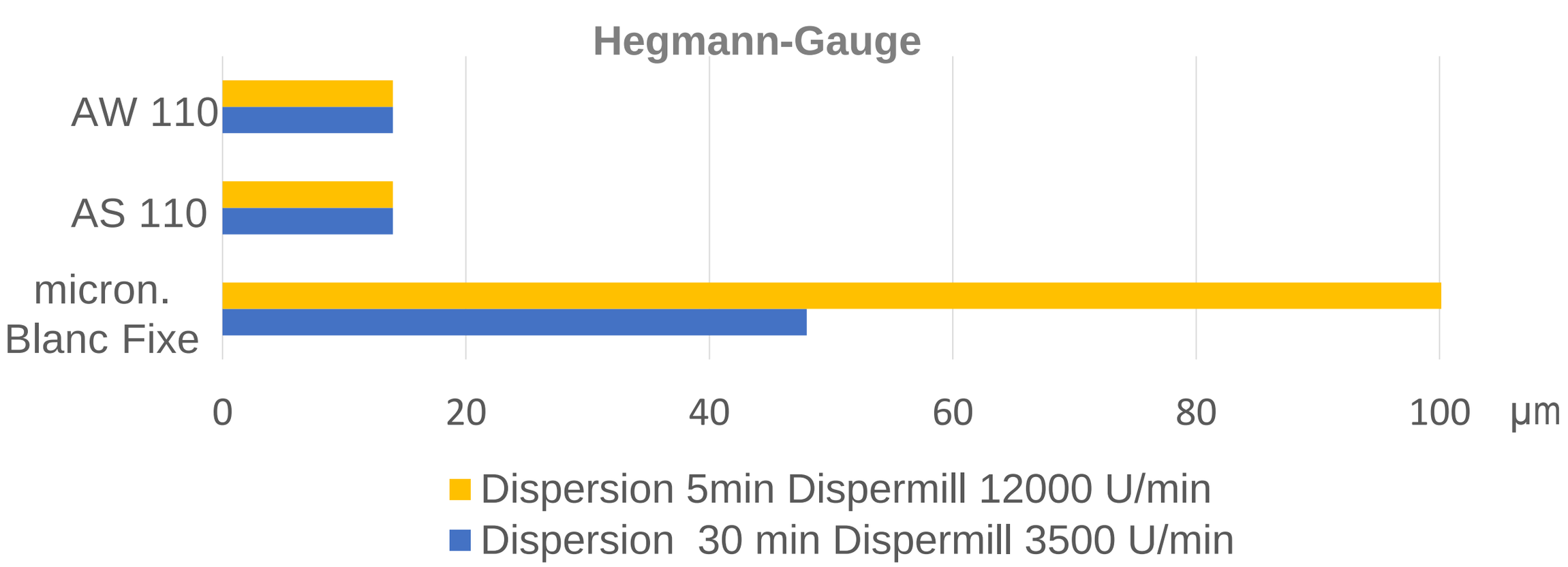
P3 - s/b Alkyd	function	description	Content [%]	Content [weight]
1	Binder	Alkyd	43,00%	107,5 g
2	Filler/Extender	BF / ALBASOFT / ALBAWHITE 110	43,00%	107,5 g
3	Solvent	Solvent-Naphta	14,00%	35,0 g

P4 - s/b Clearcoat, high gloss - Alkyd	function	description	Content [%]	Content [weight]
1	Binder	Clear Coat	34,00%	85,0 g
2	Filler/Extender	BF / ALBASOFT / ALBAWHITE 110	60,00%	150,0 g
3	Solvent	Solvent-Naphta	6,00%	15,0 g

COATING LABORATORY EVALUATION

Milling-Dispersion

	P3: Dispersion 30 min Dispermill 3500 rpm	P4: Dispersion 5 min Dispermill 12000 rpm
mikron. Blanc Fixe	45 – 50 µm	> 100 µm
ALBASOFT 110	< 15 µm	< 15 µm
ALBAWHITE 110	< 15 µm	< 15 µm



COATING LABORATORY EVALUATION

SUMMARY
COMPARISION ALBASOFT / ALBAWHITE 110
VS. micronized Blanc fixe

▪ Particle size and PSD	congruent
▪ electric conductivity	lower
▪ pH-value	more neutral
▪ Dispersion	superior to similar
▪ Special Dispersion	superior
▪ Density/Flowtime/Viscosity	congruent
▪ Gloss	similar to superior

COATING LABORATORY EVALUATION

Partial titanium dioxide replacement in an EP industrial paint

Test Formulation

Epoxy Primer	STD [%]	50:50 [%]	75:25 [%]	85:15 [%]	90:10 [%]	92:8 [%]
Mill Base	71.0	71.0	71.0	71.0	71.0	71.0
TiO_2 Rutile	12.0	6.0	9.0	10.2	10.8	11.0
Albawhite 110/ Albasoft 110	0	6.0	3.0	1.8	1.2	1.0
Let Down	17.0	17.0	17.0	17.0	17.0	17.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

COATING LABORATORY EVALUATION

Partial titanium dioxide replacement in an EP industrial paint

Results with AW110

Parameter	STD [%]	50:50 [%]	75:25 [%]	85:15 [%]	90:10 [%]	92:8 [%]
L*	94.5	91.4	93.4	94.0	94.2	94.4
a*	-2.4	-2.8	-2.5	-2.4	-2.4	-2.4
b*	5.1	4.5	4.7	4.9	4.9	5.1
ΔL	\	3.1	1.1	0.5	0.2	0.1
Δa	\	0.4	0.1	0.0	0.0	0.0
Δb	\	0.6	0.4	0.2	0.2	0.0
ΔE	\	3.2	1.2	0.6	0.3	0.1

COATING LABORATORY EVALUATION

Partial titanium dioxide replacement in an EP industrial paint

Results with AS110

Parameter	STD [%]	50:50 [%]	75:25 [%]	85:15 [%]	90:10 [%]	92:8 [%]
L*	94.5	91.6	93.4	94.0	94.5	94.5
a*	-2.4	-2.9	-2.6	-2.5	-2.4	-2.4
b*	5.1	4.3	4.7	4.8	4.9	5.0
ΔL	\	2.9	1.1	0.5	0.0	0.0
Δa	\	0.5	0.3	0.1	0.0	0.0
Δb	\	0.8	0.4	0.3	0.2	0.1
ΔE	\	3.0	1.2	0.6	0.2	0.1

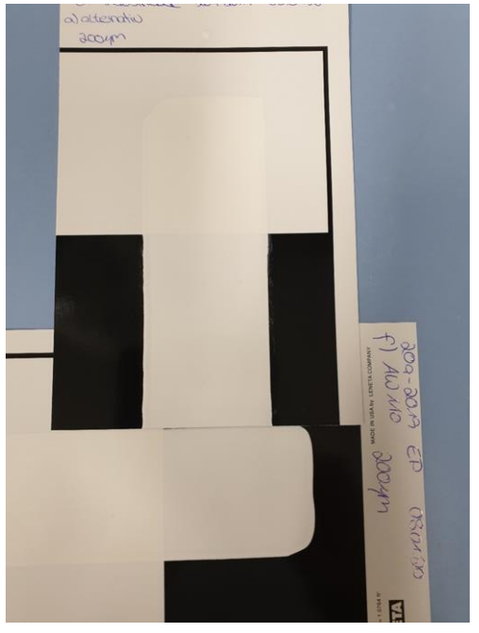
COATING LABORATORY EVALUATION

Partial titanium dioxide replacement in an EP industrial paint

Summary

- Hiding power with a pigment-filler ratio
  TiO_2 vs. Albawhite 110/ Albasoft 110 (50:50, 75:25%)

  → very large deviations in color and / or opacity



- Hiding power with a pigment-filler ratio
  TiO_2 vs. Albawhite 110/ Albasoft 110 (85:15%)

  → large deviations in color and / or opacity (ΔE = 0.6/ 0.6)

- Hiding power with a pigment-filler ratio
  TiO_2 vs. Albawhite 110/ Albasoft 110 (90:10, 92:8%)

  → practically no deviations in color and opacity (ΔE = 0.3/ 0.2, 0.1/ 0.1)

EXTERNAL EVALUATION

Fraunhofer IFAM

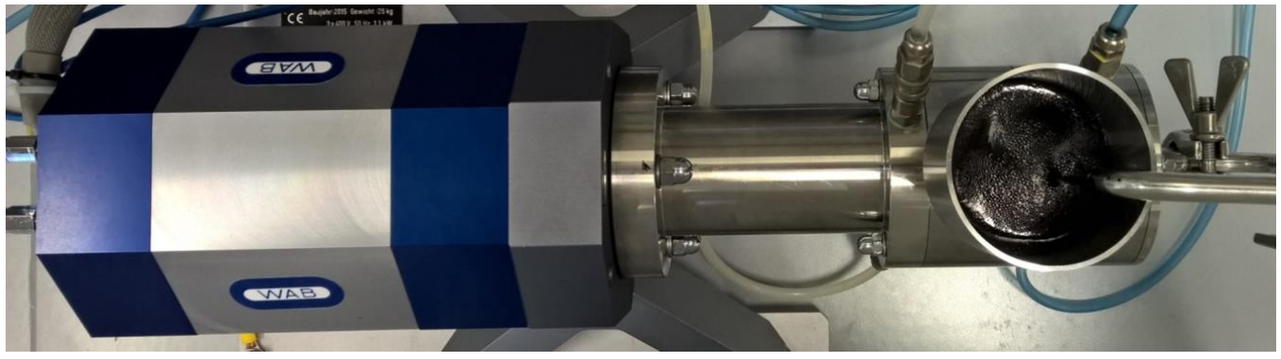
Filler Formulation (FR)

a)	
	m[g]
Setaqua BE 270	8,7
DMEA (10% i Water)	1,5
Water	25
Dispex Ultra PX 4575	0,85
Spezialschwarz 250	1,3
$BaSO_4$	26

b)	
	m[g]
Setaqua BE 270	17,5
Water	15
BYK 346	0,4
Maprenal MF 904	3,75

Evaluation Plan

Test	Automotive - OEM Filler	Automotive - OEM Filler + Basecoat + Clear Coat
SST DIN EN ISO 9227	2	2
Mandrel bending test	1	1
Erichsen Indentation	1	1
Multi Impact Test (compatible to DIN EN ISO 20567-1)	1	1
Settling, Dispersion, Gloss	1	1



EXTERNAL EVALUATION

Fraunhofer IFAM

Results Salt Spray Test (NSS)

Specimen	Film thickness [µm]	240h NSS	1000h NSS	Ø Infiltration	Lattice Cut
ALBAWHITE 110 Filler FR1	17-26	0	single blisters	0,86	1
ALBAWHITE 110 Filler FR2	12-22	0	single blisters	1,31	0
ALBAWHITE 110 Filler Base Coat_Clear Coat FR1	73-82	0	0	1,11	5*
ALBAWHITE 110 Filler_Base Coat_Clear Coat FR2	69-76	0	0	1,32	4*
Blanc Fixe Micro Filler FR1	15-19	5(S1)	5(S4)	complete corroded	-
Blanc Fixe Micro Filler FR2	20-24	5(S1)	5(S4)	complete corroded	-
Blanc Fixe Micro Filler_Base Coat Clear Coat FR1	77-91	0	0	1,73	5*
Blanc Fixe Micro Filler_Base Coat_Clear Coat FR2	67-75	0	0	1,62	5*

* no lattice cut between Filler and Base Coat

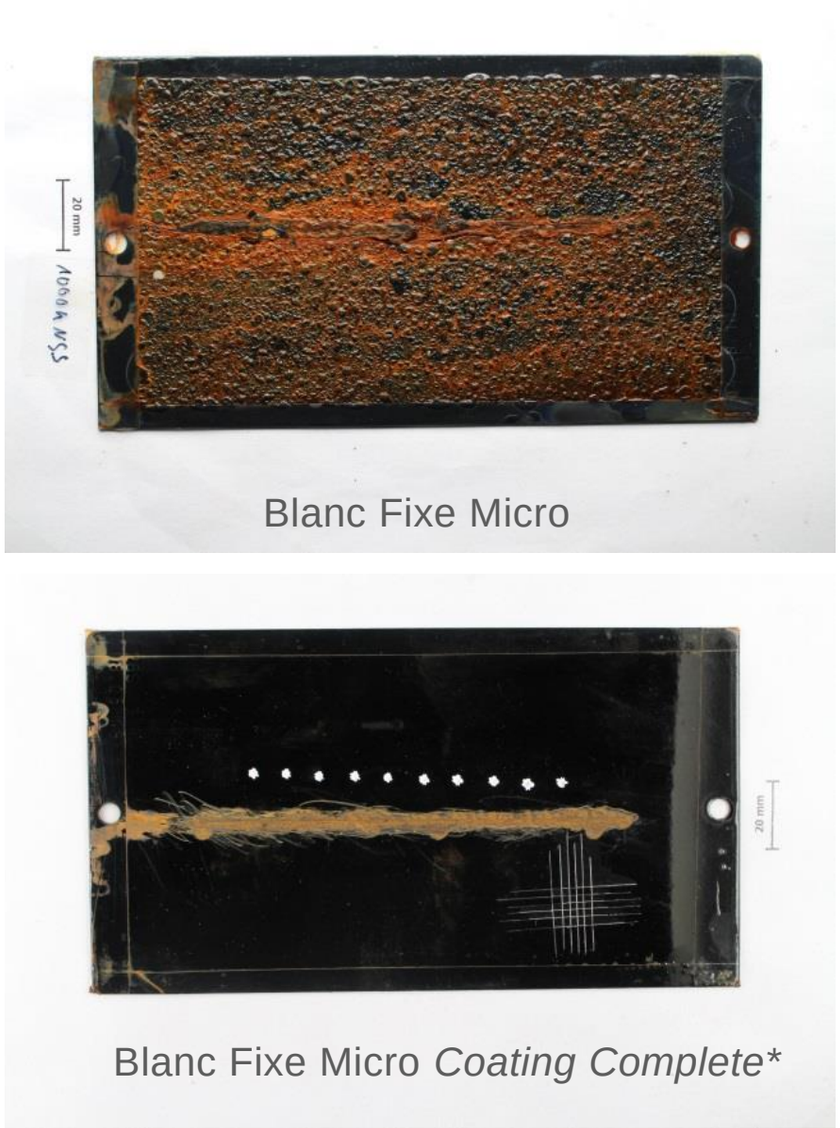
EXTERNAL EVALUATION

Fraunhofer IFAM

Results Salt Spray Test (NSS)

ALBAWHITE 110

*ALBAWHITE 110 Coating Complete**



Blanc Fixe Micro

Blanc Fixe Micro *Coating Complete**

The Filler containing ALBAWHITE 110 appears clearly better than the Filler containing Blanc fixe micro. The infiltration on the coating completion along the cut is significantly less with ALBAWHITE 110.

* Coating Complete – Filler+Base+Clear Coat

SACHTLEBEN MINERALS

EXTERNAL EVALUATION

Results

Erichsen Indentation

Mandrel Bending

System	Erichsen Indentation / mm	Mandrel Bending Test
Blanc fixe micro Filler	1,5 – 2,0	no harm
Albawhite 110 Filler	1,5 – 2,0	no harm
Blanc fixe micro Coating Complete	3,0 – 3,5	no harm
Albawhite 110 Coating Complete	2,5 – 3,0	no harm

Multi Impact Test

System	Rating
Blanc fixe micro Filler	1,5 – 2,0
Albawhite 110 Filler	1,5 – 2,0
Blanc fixe micro Coating Complete	3,0 – 3,5
Albawhite 110 Coating Complete	2,5 – 3,0

EXTERNAL EVALUATION

Results

Gloss

System	Gloss @ 20°	Gloss @ 60°	Gloss @ 85°
Blanc fixe micro Filler	22,4	69,7	82,9
Albawhite 110 Filler	58,3	95	94,8
Blanc fixe micro Coating Complete	88,3	92,6	98,9
Albawhite 110 Coating Complete	87,9	92,2	98,6

Settling after 24 h

Filler Blanc Fixe Micro: stable

Filler Albawhite 110: table

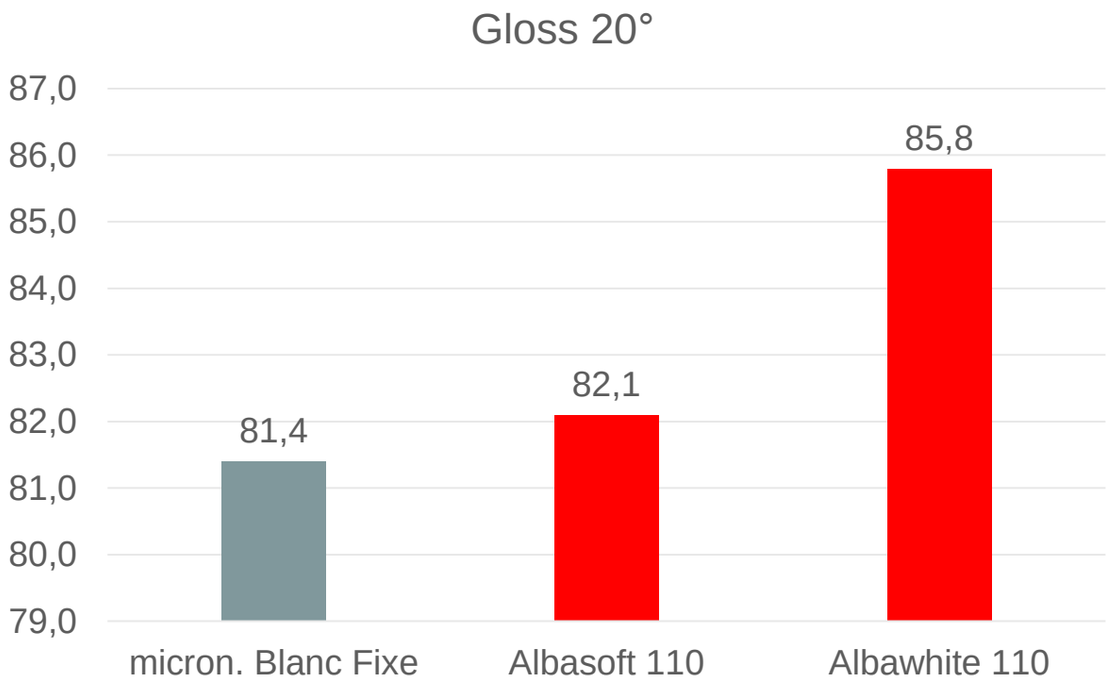
EXTERNAL EVALUATION

Fraunhofer IFAM

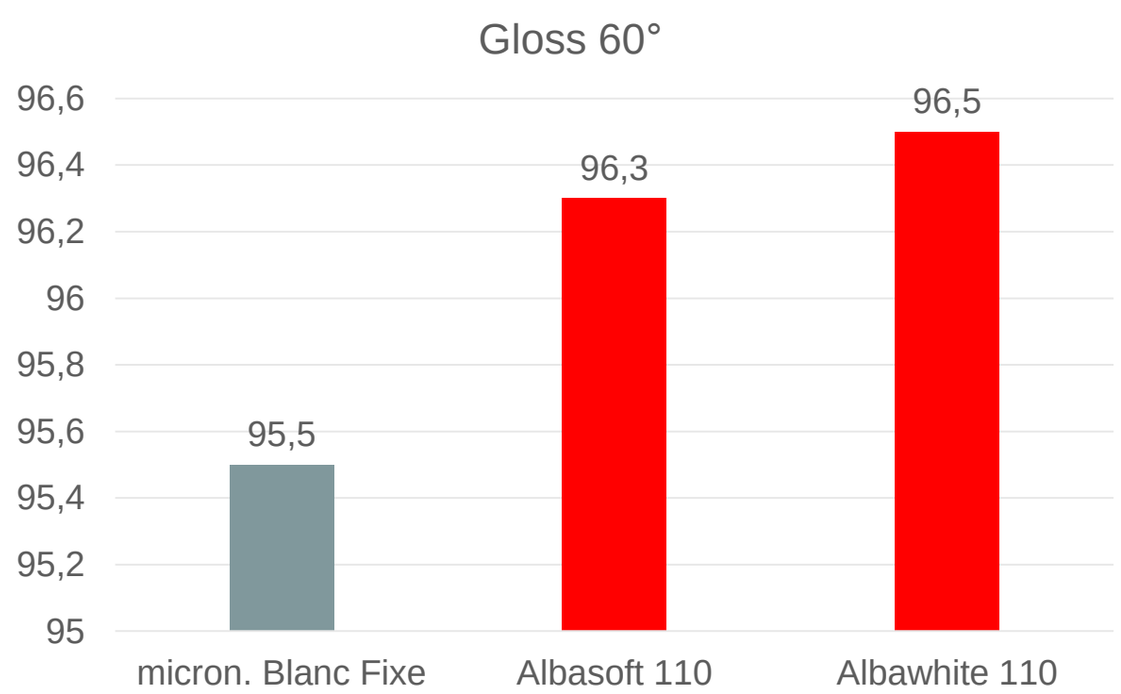
SUMMARY COMPARISION ALBASOFT / ALBAWHITE 110 VS. micronized Blanc fixe

Salt Spray Test	-	improvement at blisterrate and infiltration
Erichsen Indentation / Mandrel Bending	-	congruent good
Multi Impact Test	-	improvement in Complete Coating
Gloss	-	improvement in Filler, similar in Complete Coating
Setting after 24 h	-	congruent stable
Dispersability	-	congruent to similar dispersion behavior

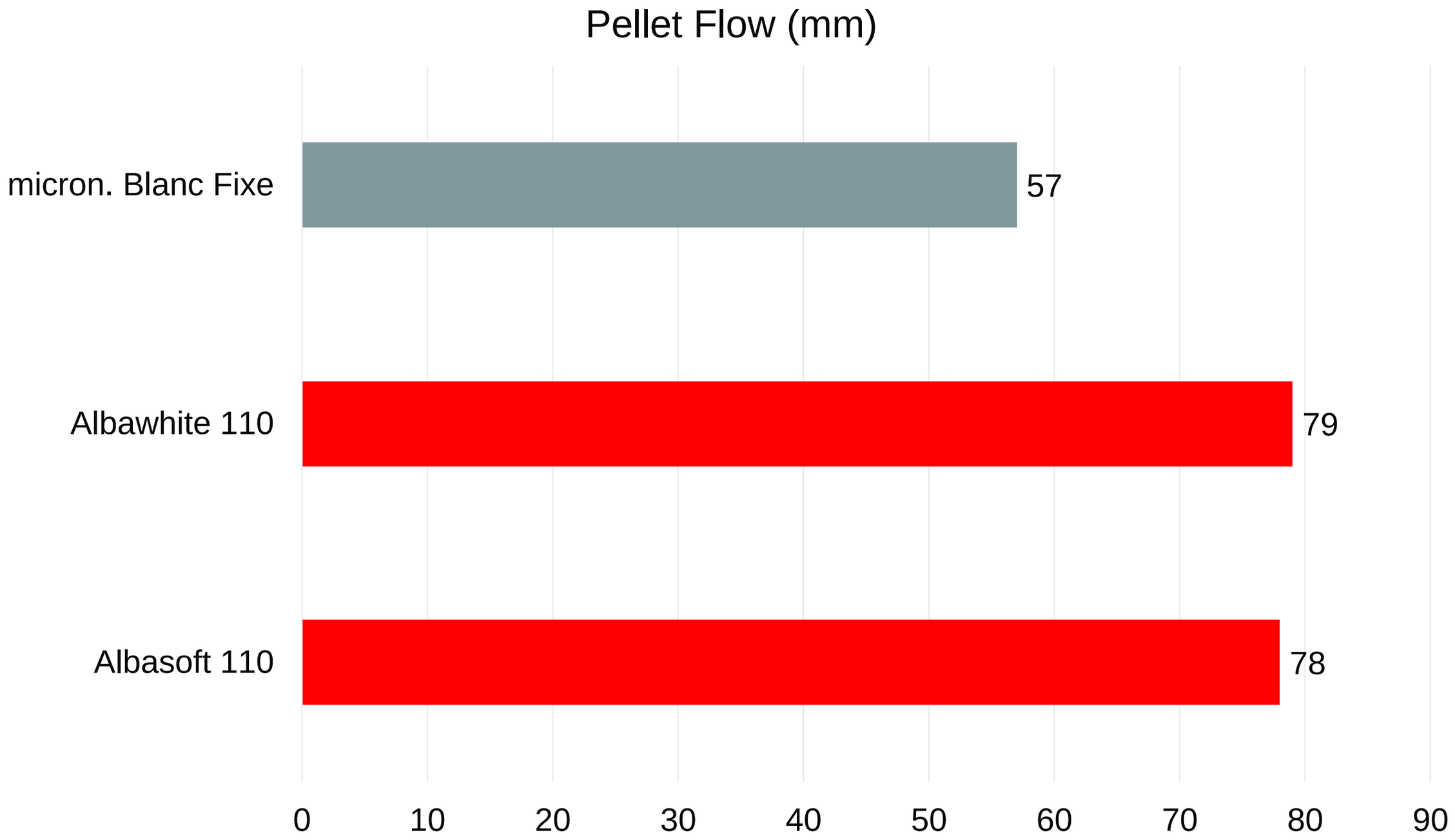
SMIN POWDER TECHNOLOGY



Powder Coating
Epoxy-formulation



SMIN POWDER TECHNOLOGY



SUMMARY

COMPARISION ALBASOFT / ALBAWHITE 110 vs. micronized Blanc fixe

Conclusion:

The results generated, show that with

ALBASOFT 110/ALBAWHITE 110

an equivalent replacement of Blanc fixe micro is possible.
In some cases the replacement of Blanc fixe micro with ALBASOFT 110 / ALBAWHITE 110 deliver superior results.