Expancel® Microspheres versatile filler for paint and coatings

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Hungarocoat 2016

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Blowing agent and lightweight filler. All in one.

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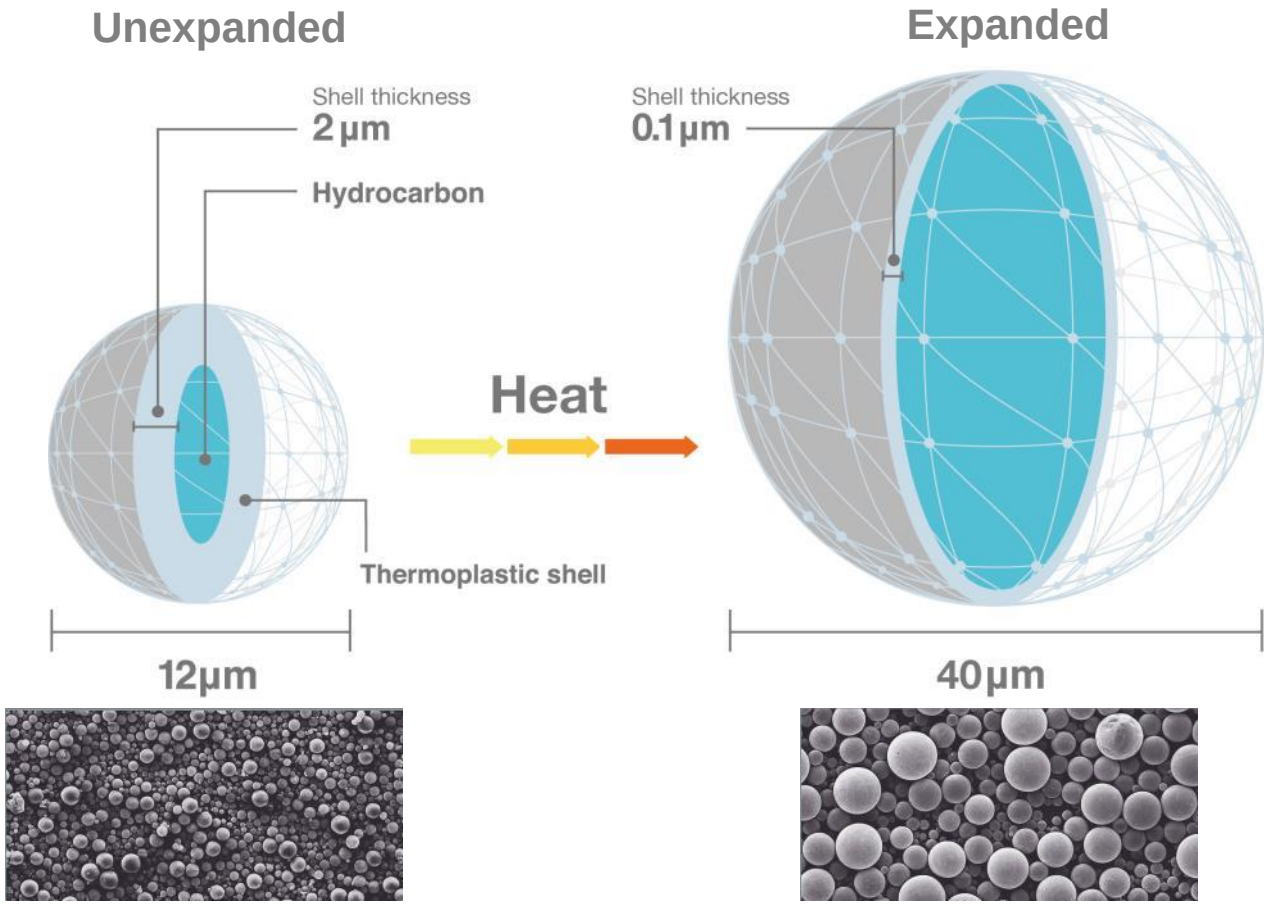

Density ~1200 kg/m³

Density ~30 kg/m³

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Features and properties

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Features and properties
Expansion

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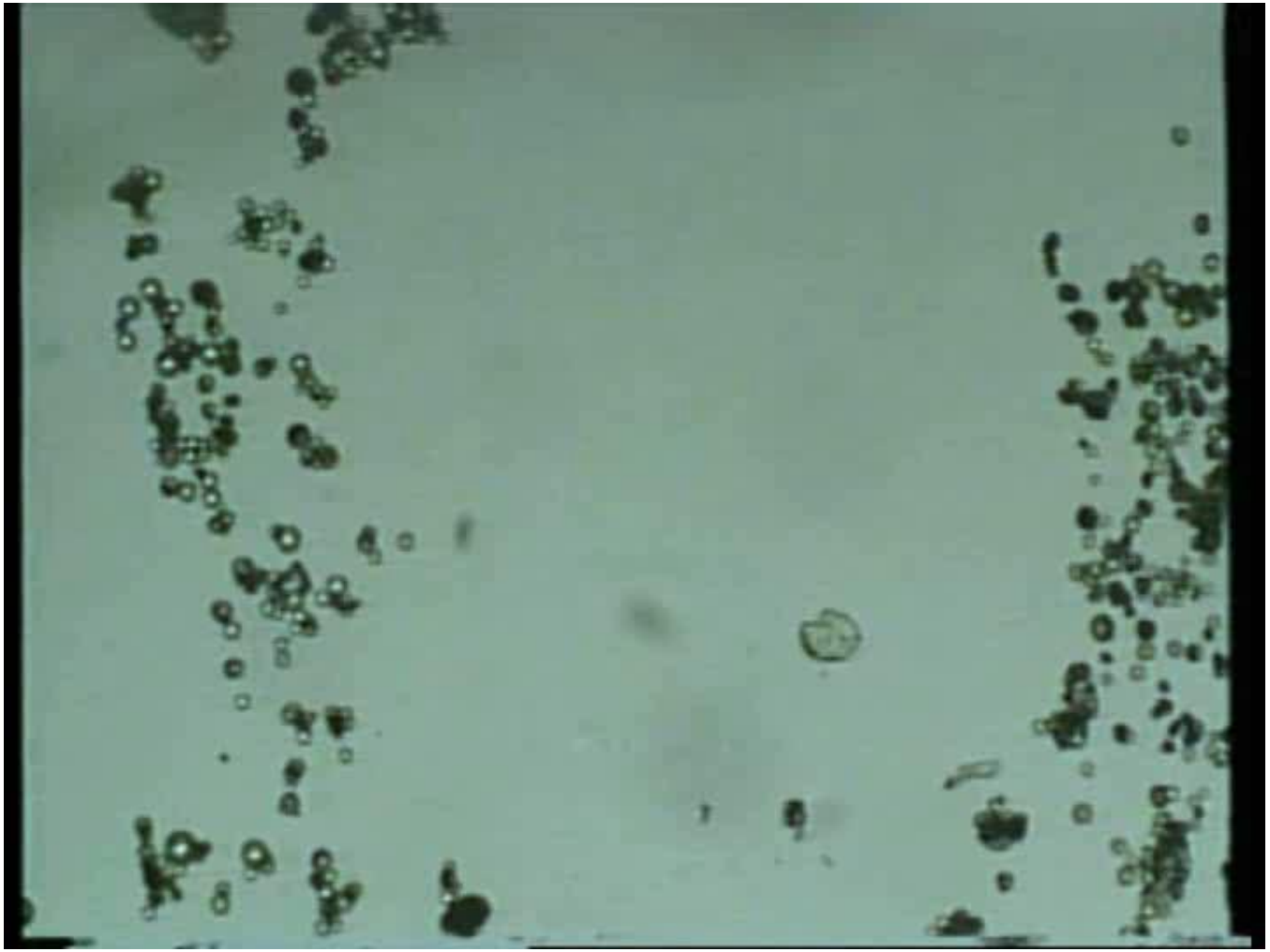

Features and properties
Elasticity

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Elasticity

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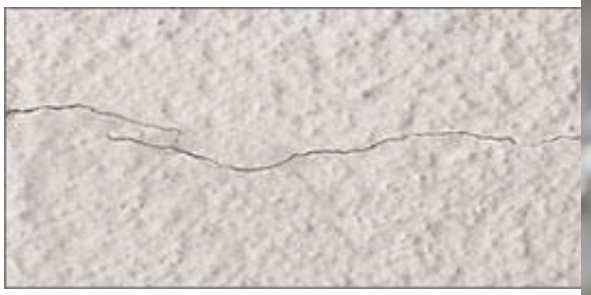
- This feature is especially used in elastomeric coatings.
- For Expancel microspheres there is no need for special dispersing procedure.



Features and properties
Oil absorption value

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Low oil absorption number as a result of small surface area of spherical shape.
According to ASTM D 1483 – 35 to 45 g/100 cm3

100 cm3 with density 30 kg/m3 is 3 g

Filler	Density (g/cc)	Oil absorption (vol %)	CPVC (%)	PVC when Q = 0.7
Expancel 461 DET 20d30	0.03	42.0	69.0	48.3
$CaCO_3$ (20 µm)	2.7	45.9	67.0	47.0
$CaCO_3$ (4 µm)	2.7	56.7	59.6	41.7
$CaCO_3$ (0.7 µm)	2.7	72.9	56.1	39.3
Caolín (6 µm)	2.6	96.2	49.3	34.5
Caolín (1 µm)	2.6	174.2	34.9	24.4

Features and properties
PVC, CPVS and Q-value

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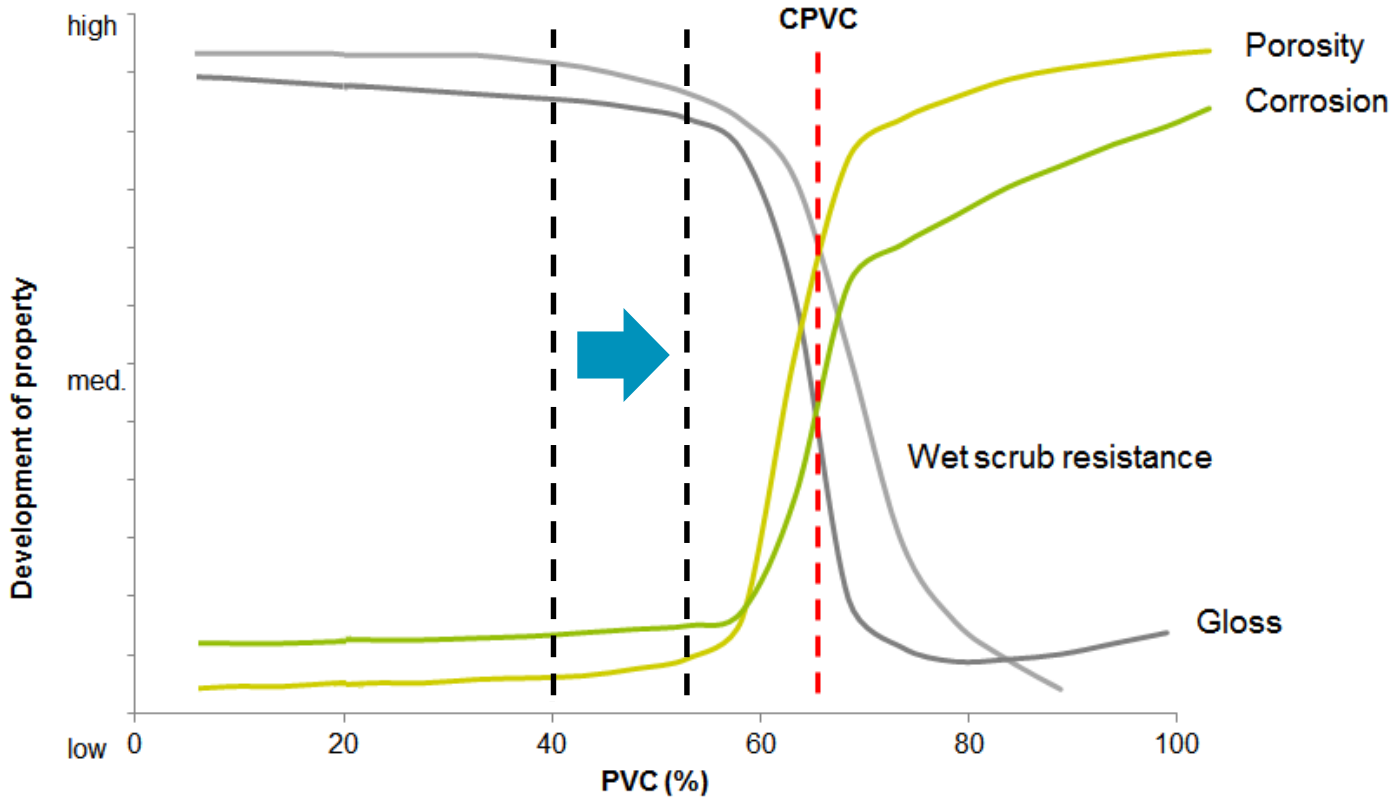
Exchanging mineral fillers by microspheres results in increase of CPVC,
this allows for higher PVC having still the same Q-value, the same coating properties



Features and properties
PVC, CPVS and Q-value

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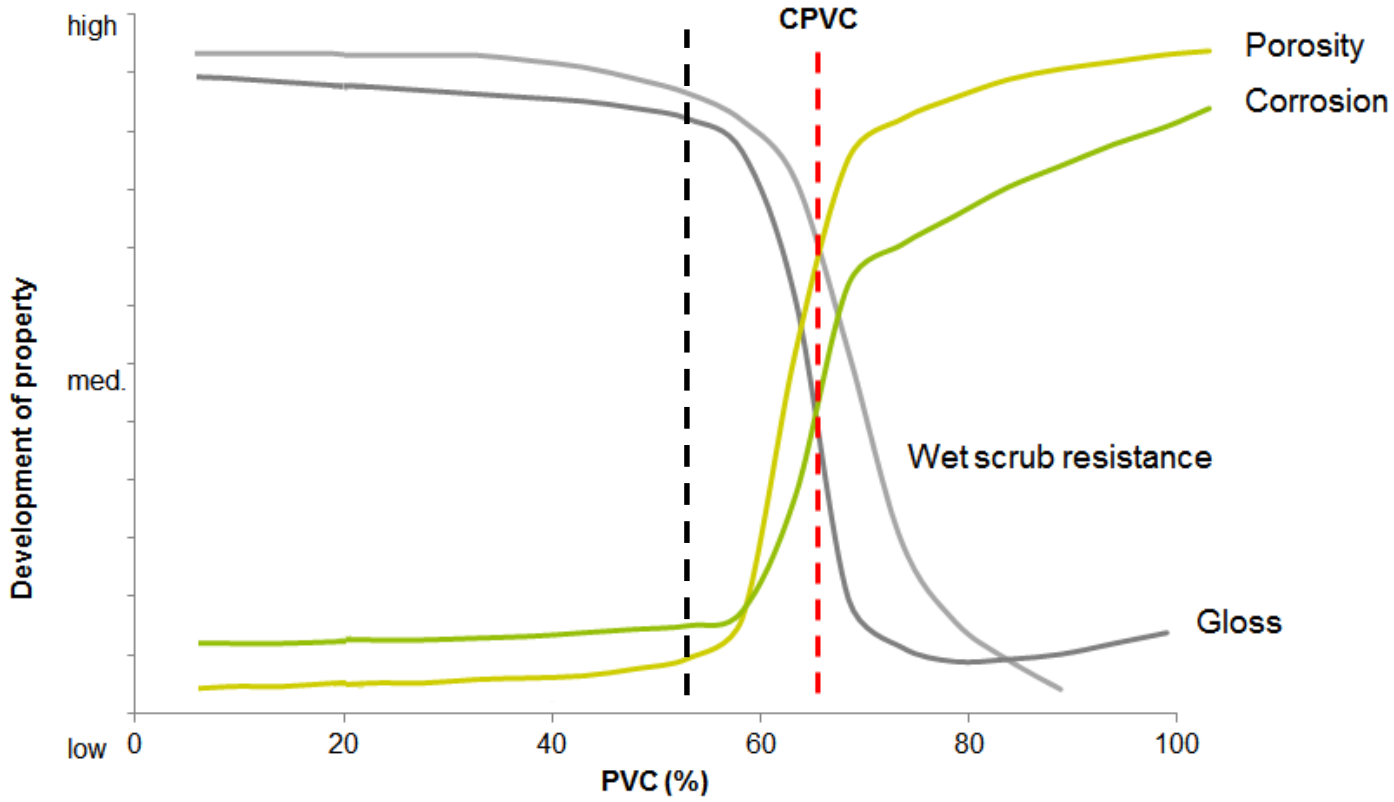
Formulation containing microspheres can has higher PVC but the same Q-value

Higher PVC results in lower binder demand



Features and properties microspheres size

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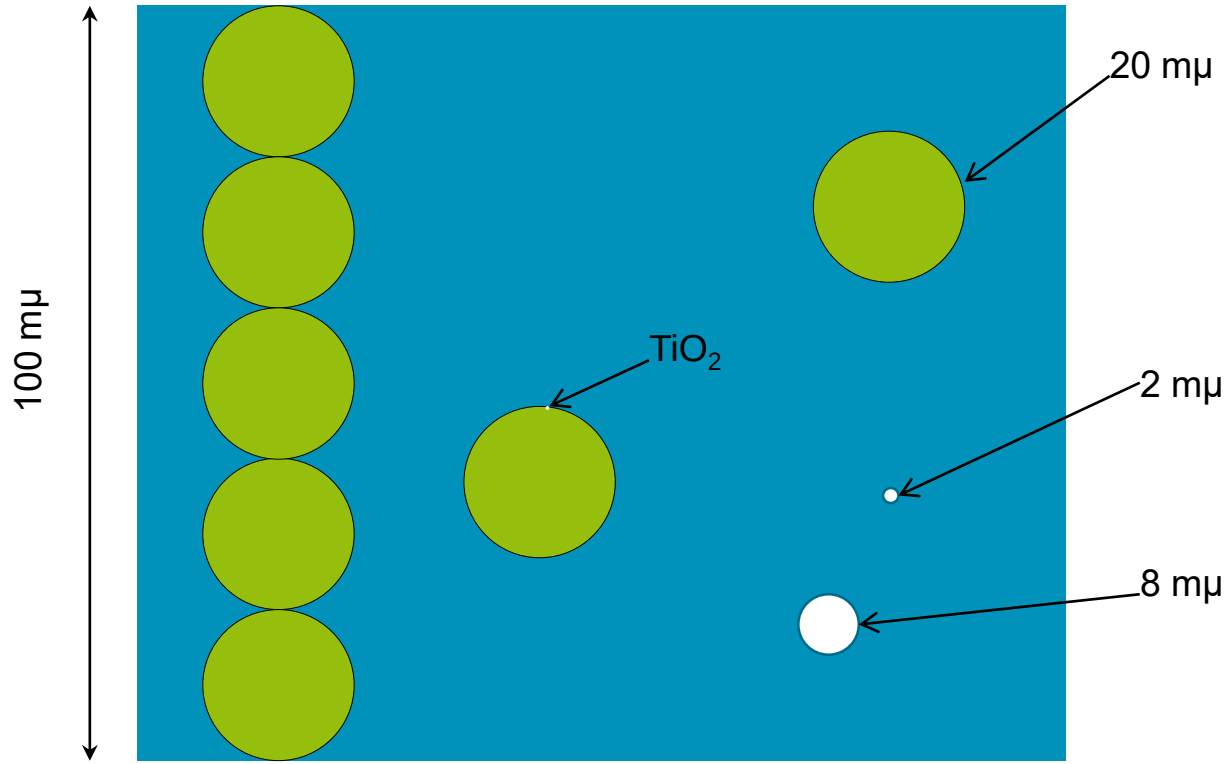
- Expancel as filler/extender is quite large in size.



Features and properties Expancel WE and DE (T)

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Expancel as a lightweight filler is available in two forms:

- WE(T) – wet expanded with 15% solid content, for water based coatings.
- DE(T) – dry expanded, for solvent based coatings.

Expancel WE(T)
Wet expanded microspheres.
Solid content: 10 or 15 %
Density of Expancel: 24 or 36 kg/m^3

Expancel DE(T)
Dry, expanded microspheres.
Solid content: > 99 %
Density of Expancel: 25 to 70 kg/m^3

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Expancel® microspheres in action

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Acrylic exterior plaster with Expancel microspheres

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No.	Raw materials	Basic
1	Water	83,20
2	Dispersing agent	X,XX
3	Acticide MBS	2,00
4	Acticide MKB3	5,00
5	BYK 014 (2/3)	5,00
6	Crilat 4724 Vinavil	120,00
7	Tytanpol R-001	10,00
8	Omyacarb 40VA	325,00
9	Finntalk M-15	25,00
10	BYK 014 (1/3)	2,50
11	Dowanol DPnB (4% for polymer)	4,80
12	Technocel 1000-1	4,00
13	Carolith 0,5-1,0 mm	60,00
14	Carolith 1,0-1,5 mm	350,00
15	Tylose HS 30 000 YP2	1,50
	Total	1000,0 g

Acrylic exterior plaster with Expancel microspheres

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Apparent viscosity acc. to ISO 2555. Dispersing agent dosage: % per Σ fillers and pigments
Microspheres: 461 WE 40 d36. Effective amount for 5% vol. concentration of microspheres

Dispersing agent	Dosage: 0,1%	Dosage 0,25%	Dosage: 0,75%	Dosage 1,00%
Byk 154	4.200	3.600	4.600	4.950
Metolat 514	3.700	2.500	2.670	3.250
Bamax 85	7.260	7.050	6.200	6.950
Axilat 32S	7.940	7.620	6.800	6.200
Orotan 731-A-ER	5.700	5.420	5.460	5.900

Microspheres: 461 WE 80 d36. Effective amount for 5% vol. concentration of microspheres

Dispersing agent	Dosage: 0,1%	Dosage 0,25%	Dosage: 0,75%	Dosage 1,00%
Byk 154	2.720	2.970	3.200	3.500
Metolat 514	1.920	1.760	2.400	2.680
Bamax 85	5.090	4.200	4.750	5.600
Axilat 32S	6.280	5.400	4.280	5.100
Orotan 731-A-ER	3.100	3.050	2.900	2.980

Acrylic exterior plaster with Expancel microspheres

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- Plaster adhesion to concrete substrate according to EN1542

Microspheres: without microspheres

Dispersing agent	Dosage: 0,1%	Dosage 0,25%	Dosage: 0,75%	Dosage 1,00%
Byk 154	0,76	0,70	0,52	0,55
Metolat 514	0,82	0,94	0,26	0,22
Bamax 85	0,51	0,53	0,42	0,26
Axilat 32S	0,24	0,31	0,35	0,35
Orotan 731-A-ER	0,64	0,62	0,64	0,60

Improvement

Deterioration

Microspheres: 461 WE 40 d36.

Dispersing agent	Dosage: 0,1%	Dosage 0,25%	Dosage: 0,75%	Dosage 1,00%
Byk 154	0,80	0,75	0,50	0,42
Metolat 514	0,77	1,05	0,24	0,16
Bamax 85	0,15	0,12	0,22	0,05
Axilat 32S	0,22	0,20	0,21	0,11
Orotan 731-A-ER	0,52	0,64	0,44	0,52

Acrylic exterior plaster with Expancel microspheres

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- Plaster water absorption according to EN1062-3

Microspheres: without microspheres

Dispersing agent	Dosage: 0,1%	Dosage 0,25%	Dosage: 0,75%	Dosage 1,00%
Byk 154	0,26	0,25	0,28	0,26
Metolat 514	0,34	0,32	0,33	0,35
Bamax 85	0,42	0,52	0,54	0,90
Axilat 32S	0,49	0,55	0,60	0,62
Orotan 731-A-ER	0,27	0,25	0,25	0,23

Microspheres: 461 WE 80 d36.

Dispersing agent	Dosage: 0,1%	Dosage 0,25%	Dosage: 0,75%	Dosage 1,00%
Byk 154	0,19	0,10	0,11	0,12
Metolat 514	0,13	0,10	0,09	0,13
Bamax 85	0,30	0,30	0,26	0,28
Axilat 32S	0,42	0,51	0,55	0,53
Orotan 731-A-ER	0,22	0,21	0,20	0,16

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Expancel® microspheres versatile use

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Coatings with Expancel microspheres

- Flat interior paints
  Expancel microspheres used as matting agent
- Exterior paints
  Microspheres helps in building dedicate coating thickness, contributions to NIR reflection reduce that surface temperature
- Texture paints and decorative coatings. Large microspheres combined with other coarse fillers create different texture effects

Coatings with Expancel microspheres

- Hydro-insulating coatings
  Similarly like in exterior paints, microspheres helps in building dedicate coating thickness additionally elasticity contribute to maintain coating elasticity.
- Putties / spackling compounds / renders
  For instant in putties give easier sanding, in renders reduce water absorption
- Sealants
  Microsphe

Coatings with Expancel microspheres

- Printing ink for wallpaper, fabrics and textiles
- Artificial leather
- Genuine leather coatings
- Automotive underbody coatings
- … and others depending on you creativ

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Thank you

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