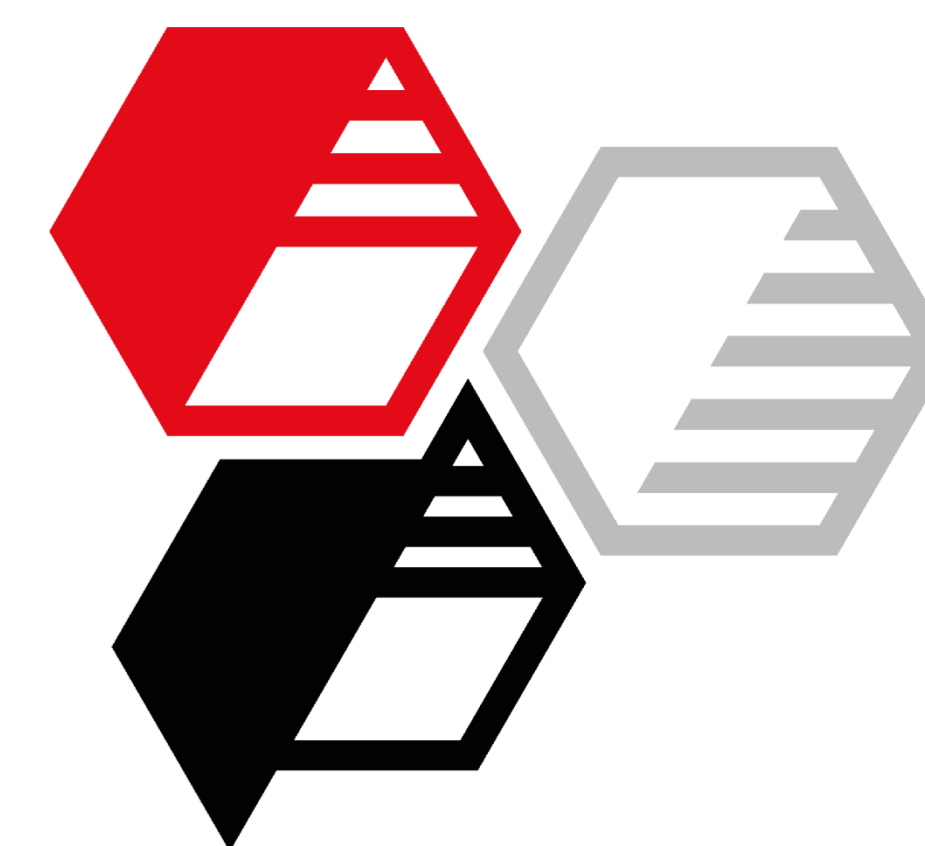


Neuburg Siliceous Earth in water-based 2C Epoxy Primer grey e.g. for Trains of Deutsche Bahn AG

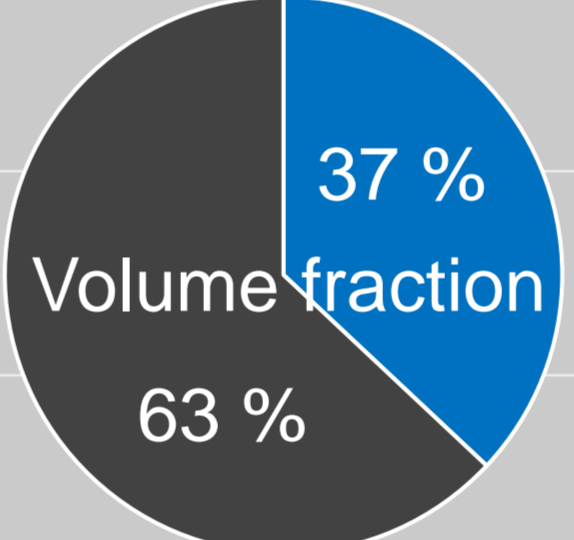
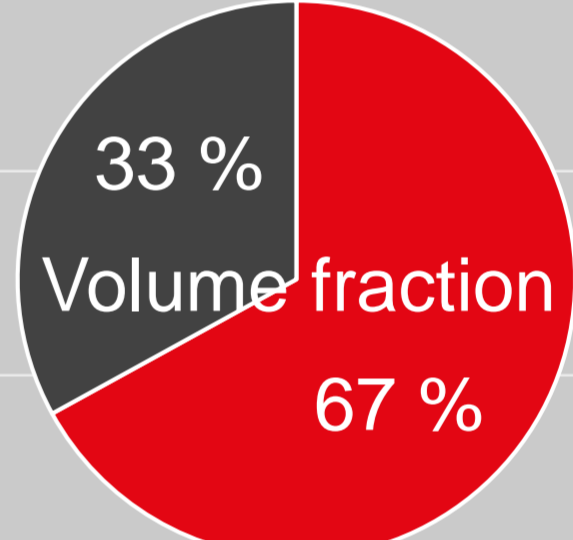


Objective

Improving storage stability and mechanical flexibility for verification of DBS 918300 requirements

Neuburg Siliceous Earth: Aktisil AM, Sillitin V 85

Formulation


Low VOC PVC 32 %		Active pigment / Inhibitor free Fast drying / Mechanically flexible		Control		Filler blend by equal volume with Neuburg Siliceous Earth	
Component A							
Pigment Preparation	Water demineralized						11.94
	Dispersing additive						3.52
	Defoamer						0.16
	Texanol						0.64
	Titanium dioxide						21.85
	Pigments yellow / black						1.60
	Talc			9.06			
Barite			24.62			13.00	
Neuburg Siliceous Earth						15.37	
Let Down	Rheology modifier						0.64
	Methoxypropanol						1.07
	Beckocure™ EH 2261w/41WA (Amine hardener)*1						24.90
Total			100.00				94.69
Component B							
	Beckopox™ EP 387w/52WA (Epoxy resin)*1		49.80				49.80
	Solids content w/w [%]		64.1				62.8
	Stoichiometric crosslinking ratio amine / epoxy 0.53						


Results Requirements of DBS 918300 Deutsche Bahn AG in green

Producibility

A-Component: Laboratory dissolver with toothed disc, Cowles Blade
30 min 8 m/s, ice water cooling

Good filler / pigment incorporation and dispersing process:

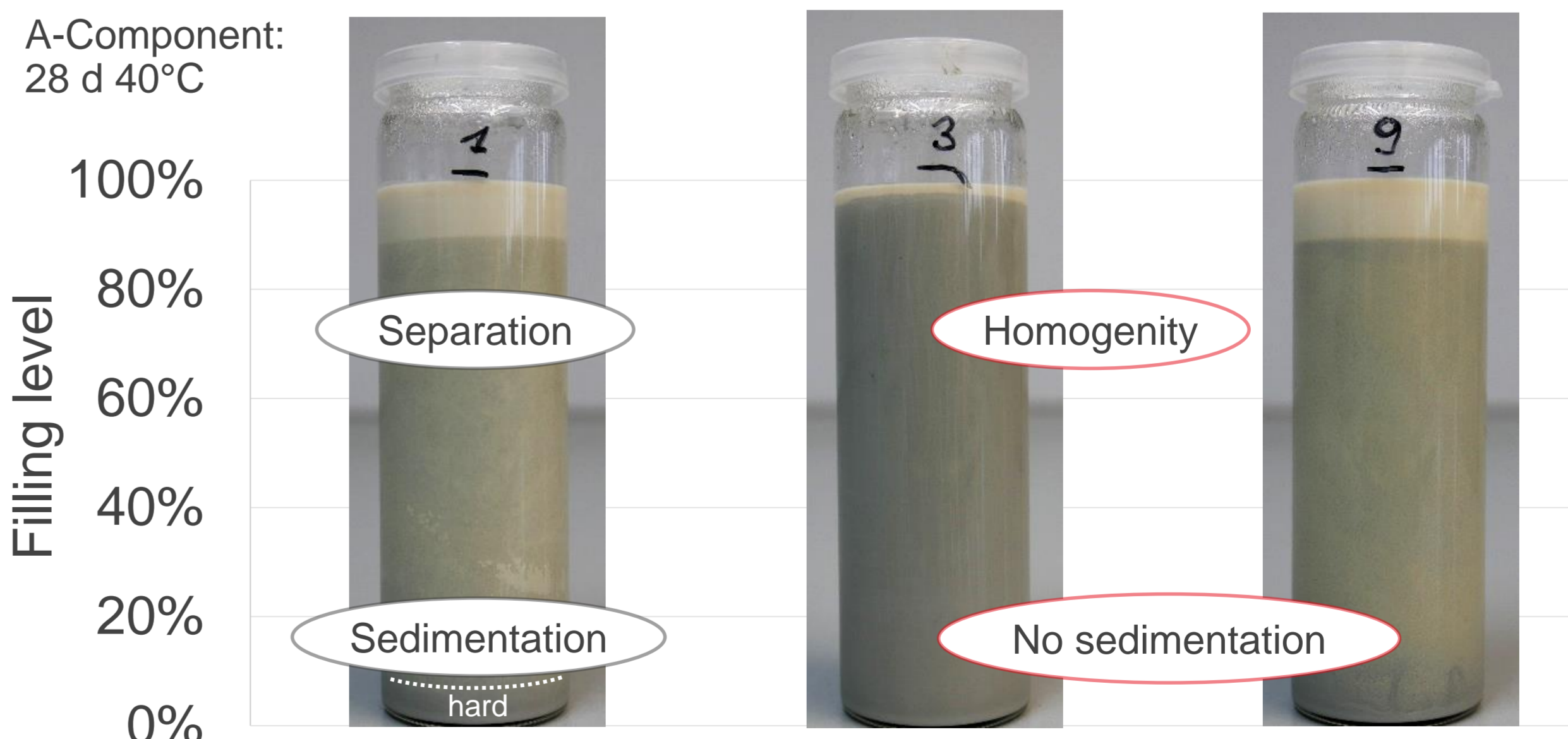
Variant with **Sillitin V 85** 15 - 20 µm
all other 10 - 15 µm
fineness of grind 

Solids content v/v ≥ 45 % 

A + B Component: Overhead mixer with propeller blade 2 min 1000 rpm

Storage stability

A-Component: 28 d 40°C



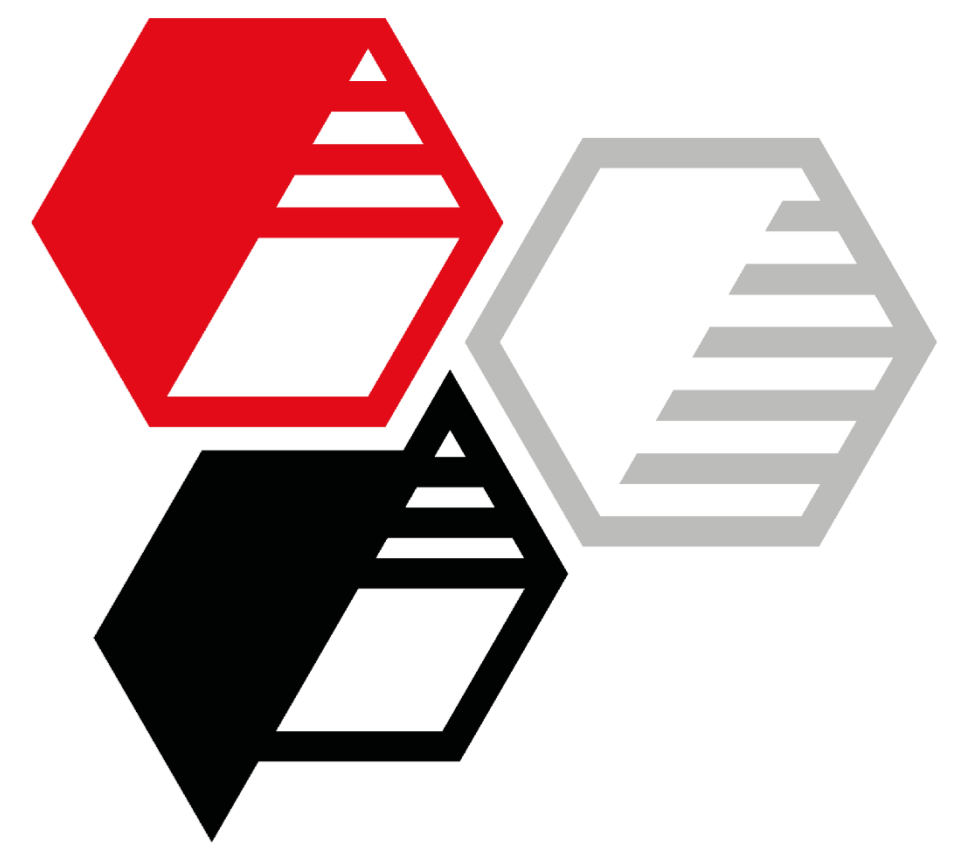
Control Barite / Talc: Separation, Sedimentation hard

Aktisil AM / Barite: Homogeneity

Sillitin V 85 / Barite: No sedimentation

*1 <http://allnex.com/the-easy-cure-system>

Neuburg Siliceous Earth in water-based 2C Epoxy Primer grey e.g. for Trains of Deutsche Bahn AG



Results

Dry film thickness: 95 µm single-layered

Drying / Sandability

All variants complete drying of coating surface ≤ 2 h

Sandability indicator for drying and for early recoatability of primer
DBS 918300 Deutsche Bahn, Appendix B, Sheet 2:
„Sandable without heavy "smearing" and quick "clogging" of the sandpaper. Slight pre-sanding must be possible"

1. ≤ 16 h 23°C / 50% RH resp.
2. 15 min flash-off + 2 h 40°C convection drier

All variants very good sandability ✓ **DB compliant**

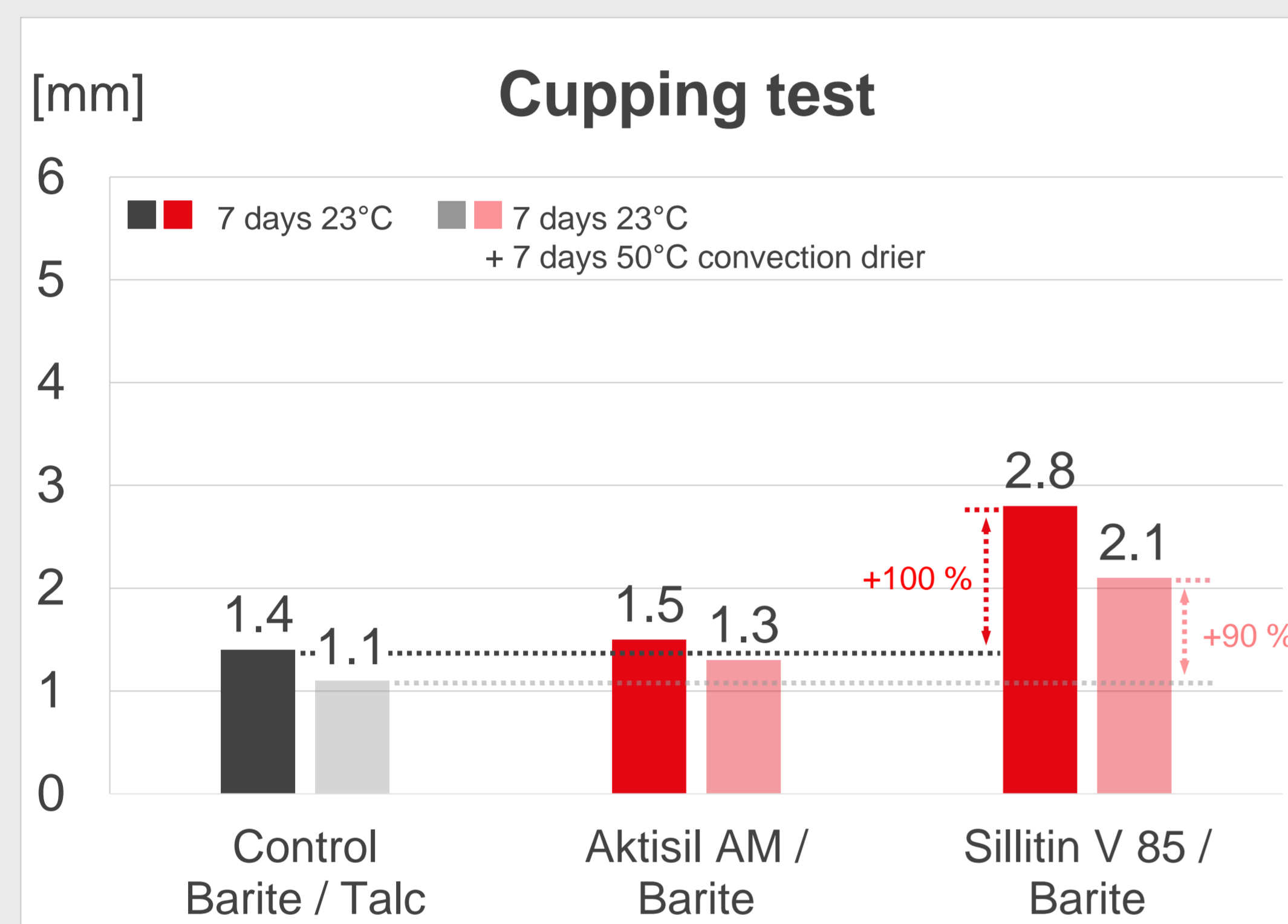
Adhesion test

Cross cut with tape tear-off [GT]
Drying 7 d 23°C as well as + 7 d 50°C convection drier

Cold rolled steel
Slightly sanded steel
Blasted aluminum
Blasted steel

All variants adhesion $GT \leq 1$ ✓ **DB compliant**

Blasted aluminum



Cyclic corrosion test

Drying 14 days 23°C

Parameter	4 Cycles = 672 h	... to 1680 h
Adhesion 0 h	$GT \leq 1$ ✓	$GT \leq 1$
Blistering	0(S0) ✓	1(S2)
Rusting	Ri 0 ✓	Ri 0

Scribe Blistering: no
Delamination / Corrosion: ≤ 2 mm

All DB compliant

Humidity test

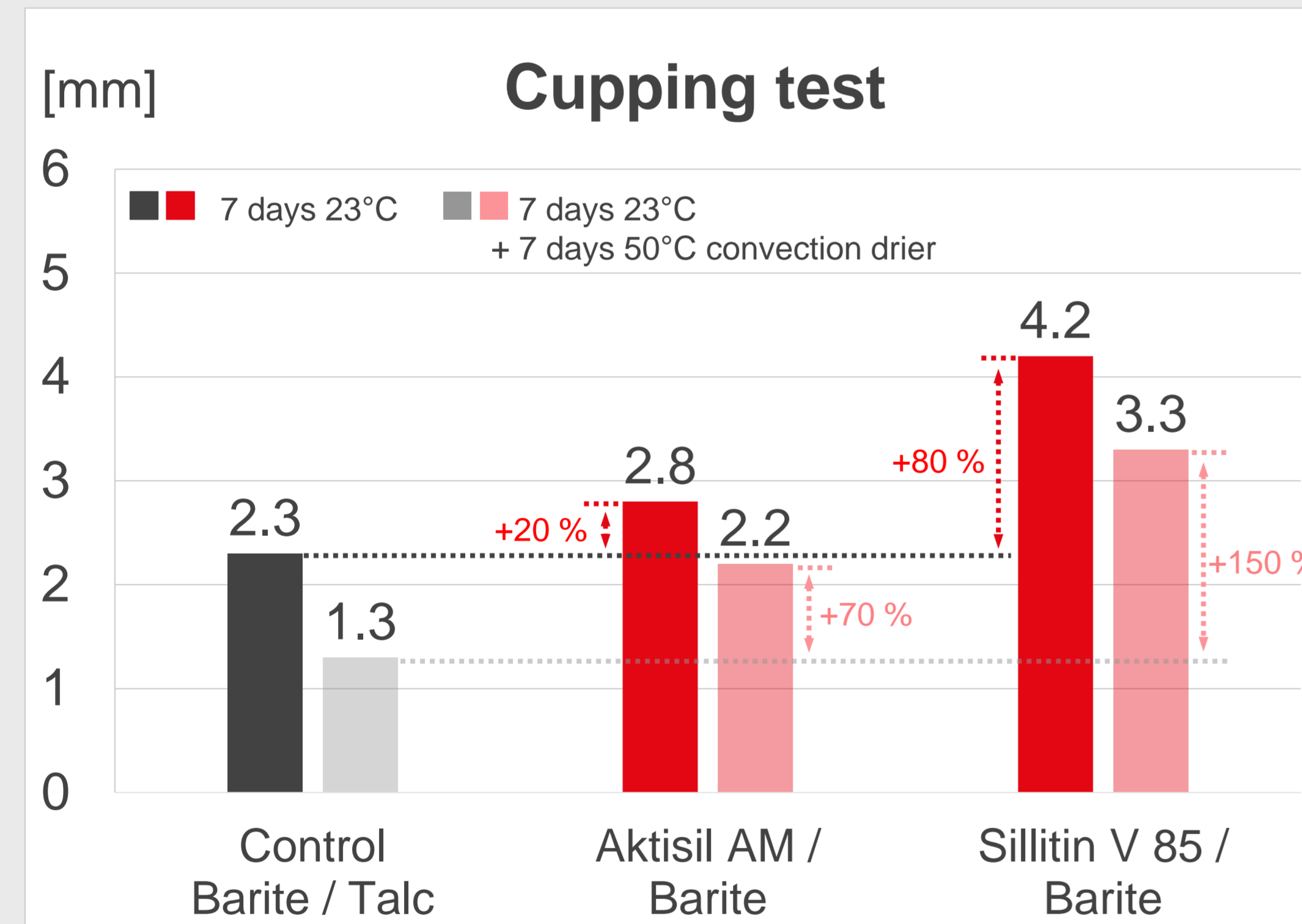
Drying 14 days 23°C

Parameter	480 h ... to 1000 h
Adhesion 0 h / 24 h	$GT \leq 1$ ✓
Blistering	0(S0) ✓
Rusting	Ri 0

Scribe Blistering: no
Delamination / Corrosion: no

All DB compliant

Blasted steel



Cyclic corrosion test

Drying 14 days 23°C

Parameter	4 Cycles = 672 h	... to 1680 h
Adhesion 0 h	$GT \leq 1$ ✓	$GT \leq 1$
Blistering	0(S0) ✓	≤ 2 (S2)
Rusting	Ri 0 ✓	max. punctual

Scribe Blistering: ≤ 2 mm
Delamination / Corrosion: ≤ 2 mm

~ 1.7 mm ✓

~ 3.2 mm

All DB compliant

Humidity test

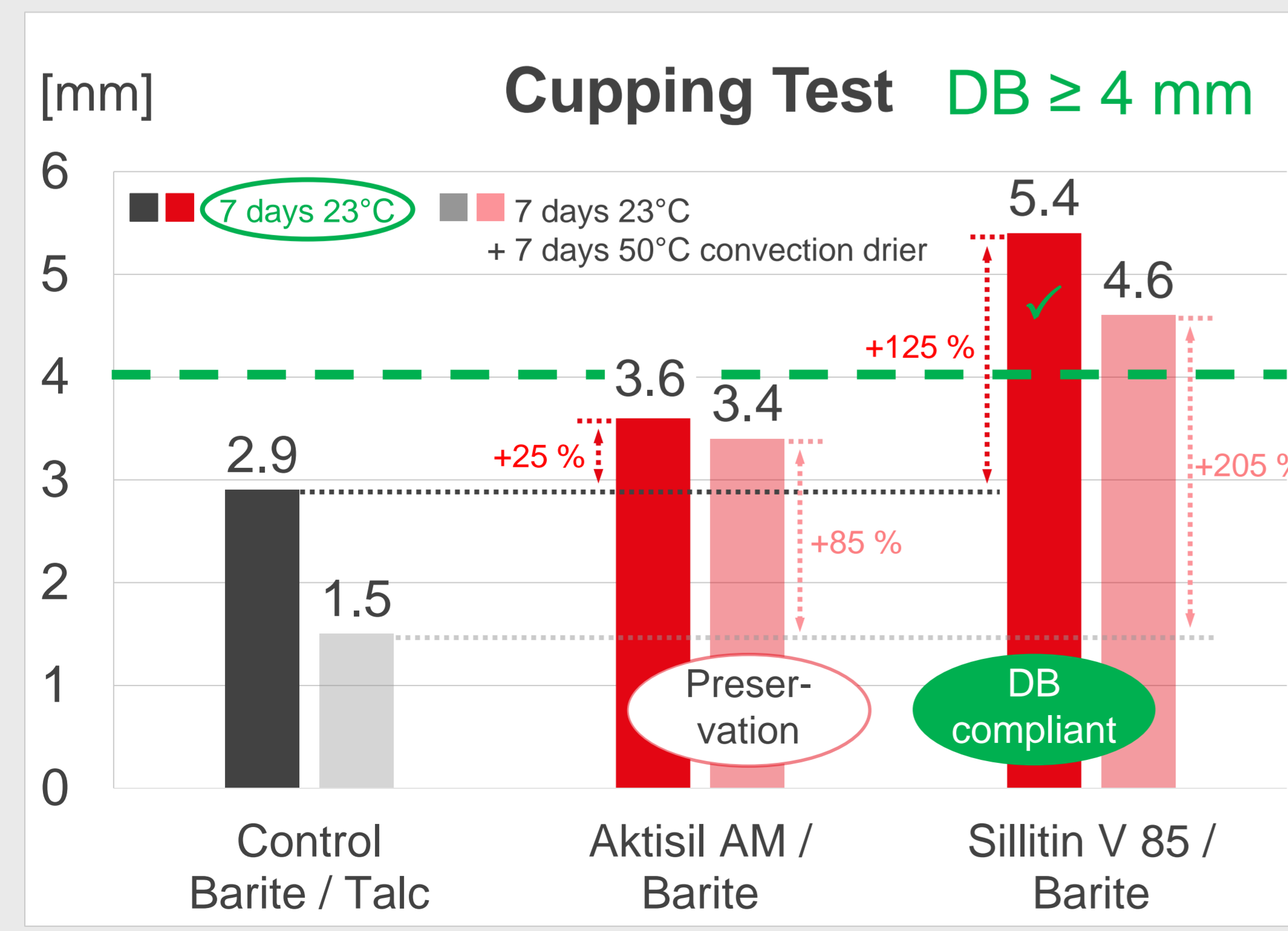
Drying 14 days 23°C

Parameter	480 h ... to 1000 h
Adhesion 0 h / 24 h	$GT \leq 1$ ✓
Blistering	0(S0) ✓
Rusting	Ri 0

Scribe Blistering: ≤ 1 mm
Delamination / Corrosion: ≤ 1 mm

All DB compliant

Slightly sanded steel



Summary

Retained features

- ✓ Excellent wet/dry adhesion performance
- ✓ Perfect corrosion protection compliant to DB
- ✓ No active anti-corrosive pigment or inhibitor needed

Improved features with Neuburg Siliceous Earth

- + Better storage stability without sedimentation, particularly with Aktisil AM.
- + Outstanding mechanical cupping flexibility and cost-effective filler combination specially with Sillitin V 85.