



Rheological additives for construction





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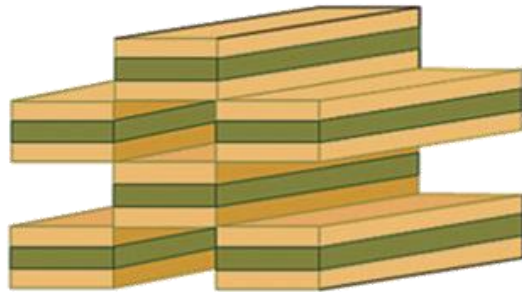
1. Introduction. Application & Benefits.
2. Tolsa's portfolio for construction.
3. Examples by application.



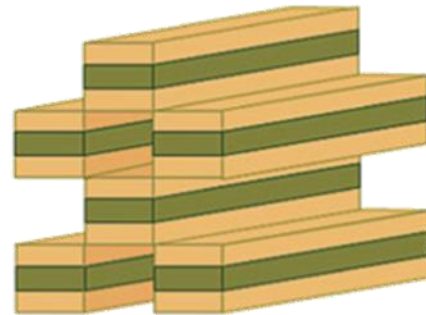
Introduction to special clays



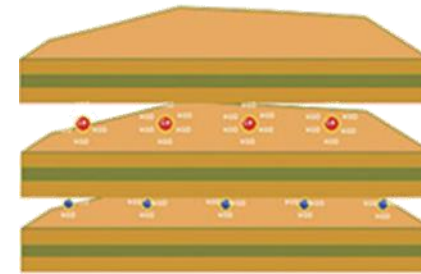
Clay minerals used in construction applications.



Sepiolite



Attapulgite



Smectites
(Bentonites)

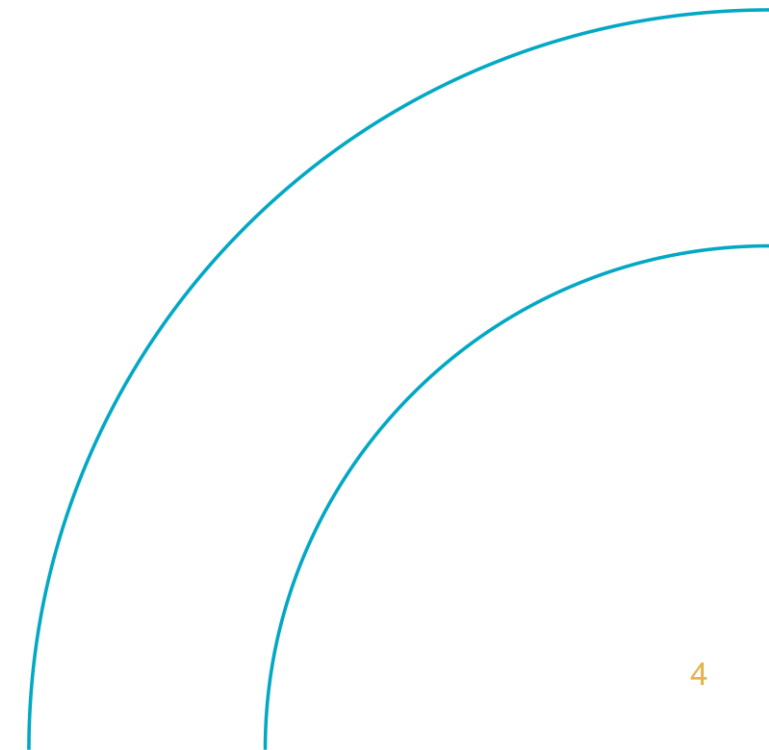
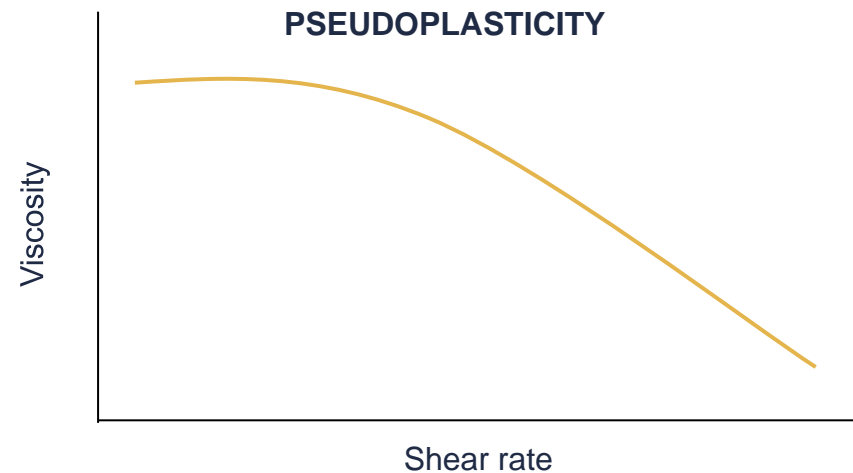
Introduction to special clays



Gelling mechanism

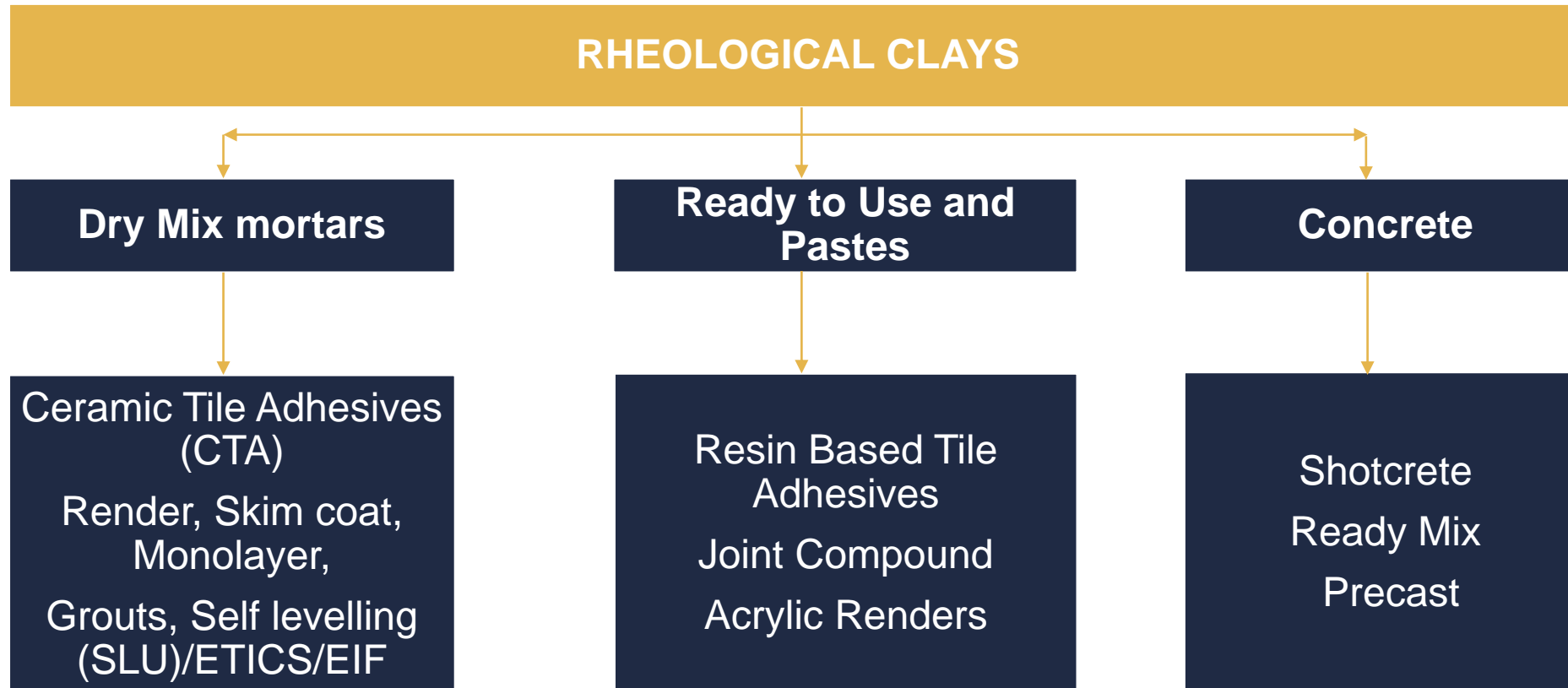
Clays additives are highly pseudoplastic products with excellent thixotropy based on different silicate minerals.

- The combination of pseudoplasticity and thixotropy allows to apply thick layer without sagging – Slid and sag control.
- For comparable consistency better workability.
- High pseudoplasticity leads to an excellent control of sedimentation.



Introduction to special clays

Applications



Introduction to special clays

Benefits

- Improvement of the **Workability** (easier and faster application and trowelling, easier to spray).
- Control of **Sagging** (renders), **Sliding** (in tile adhesives) and **Rebound** (in projected mortar or concrete).
- Reduction of segregation and **bleeding** in mortars.
- Improvement of surface **finishing**.
- **Consistency** control.



Introduction to special clays



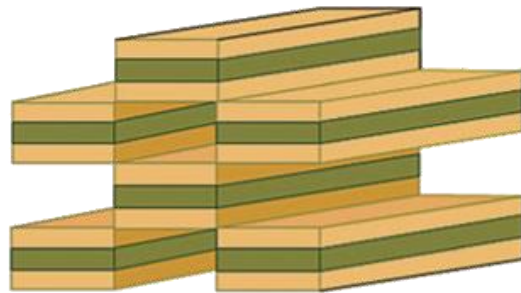
Construction additives

Products used in construction applications:

	Cimsil A55G / Cimsil A55	Cimsil A35	Cimsil G30	Pangel M280F
Mineral	Sepiolite	Sepiolite	Attapulgite	Natural sodium bentonite
Viscosity (mPa·s), 6% c/s, 25°C at 5 rpm	Typical values: 40.000-60.000	Typical values: 38.000 – 42.000	Typical values: 9.000 – 13.000	Typical values: 9.000 – 13.000



Introduction to special clays



Sepiolite

CIMSIL A55 - CIMSIL A55G

- Sepiolite based additive. Easy to disperse when electrolytes in the system.
- Low Shear rate is permitted.
- The most recommended product for cement, lime and gypsum.
- Market leader around the world.
- Cimsil A55 is same product than A55G but finer version.

CIMSIL A35

- Sepiolite based product but no electrolytes needed for the product dispersion.
- High Shear is needed for dispersion.
- Suitable for Dry mix (large experiences in CTA) even it is more recommended for ready to use products and paste products.

Introduction to special clays

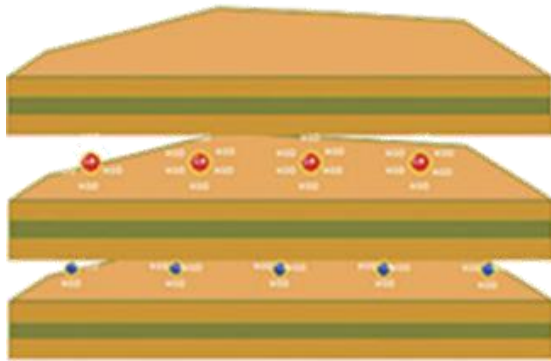


Attapulgite

CIMSIL G30:

- Attapulgite based product developed for gypsum systems and joint fillers.
- An economical alternative for CIMSIL A55 (G) in gypsum systems (joint compounds).
- With or without electrolytes but high shear is required.

Introduction to special clays



Smectites
(Bentonites)

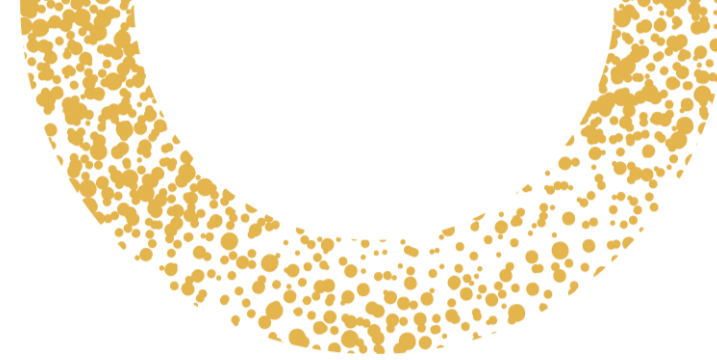
PANGEL M280F

- Natural sodium bentonite based additive.
- High shear is recommended when dispersing the product.
- Easy dispersion and good interaction with other components in the formulation.

PANGEL M90F

- Activated sodium bentonite based additive.
- The product can be dispersed at low shear.
- Easy dispersion and good interaction with other components in the formulation.

Applications in dry mix mortars



CIMSIL A55G – CIMSIL A55
CIMSIL A35



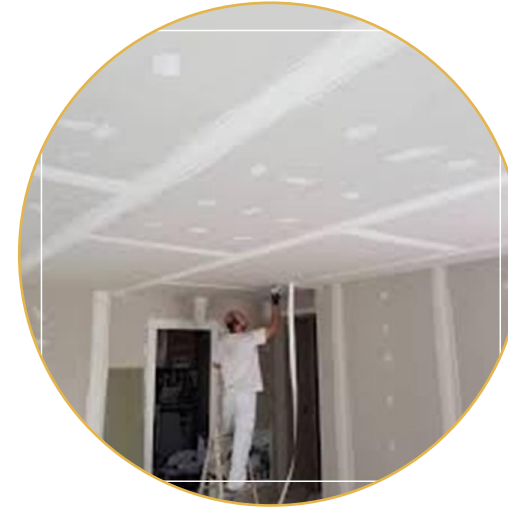
Cement-based Tile
Adhesives

CIMSIL A55G – CIMSIL A55



Cement-based
Renders

CIMSIL A55G – CIMSIL A55

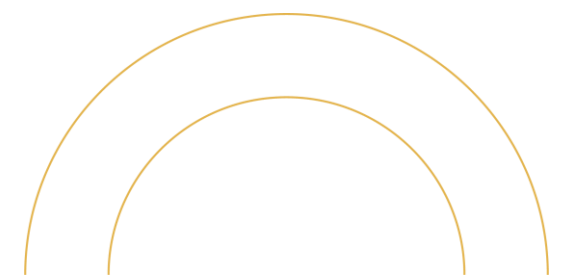


Joint compounds

CIMSIL A55G – CIMSIL A55
CIMSIL G30



Cement-based
Self-Levelling mortars



Applications in dry mix mortars



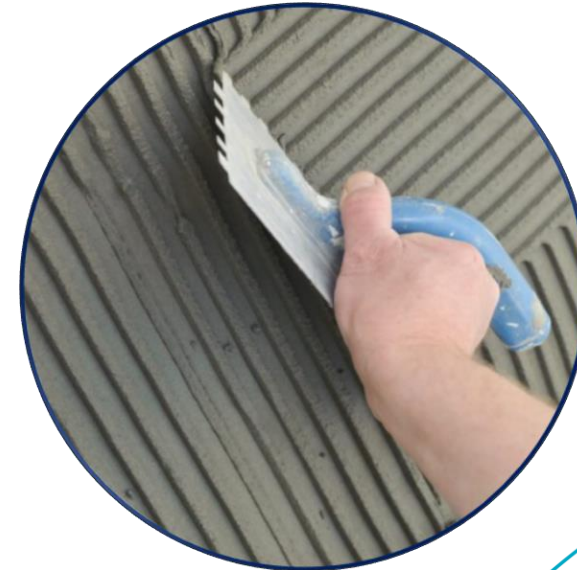
Cement based CTA

Dry mix, powdered thin-set comes as a bagged powder that you mix with water. The mortar begins setting once it's mixed.

RAW MATERIAL	% WEIGHT
Cement 42,5 R	38
Aggregates (silica or limestone)	50
Filler (silica o calcium carbonate)	6.75
CIMSIL A55G / CIMSIL A35	0.35 / 0.35
Cellulose Ether (low viscosity / No modification)	0.4
Redispersable polymer	4
Calcium Formiate	0.5

Products recommended:

- CIMSIL A55G – CIMSIL A55
- CIMSIL A35

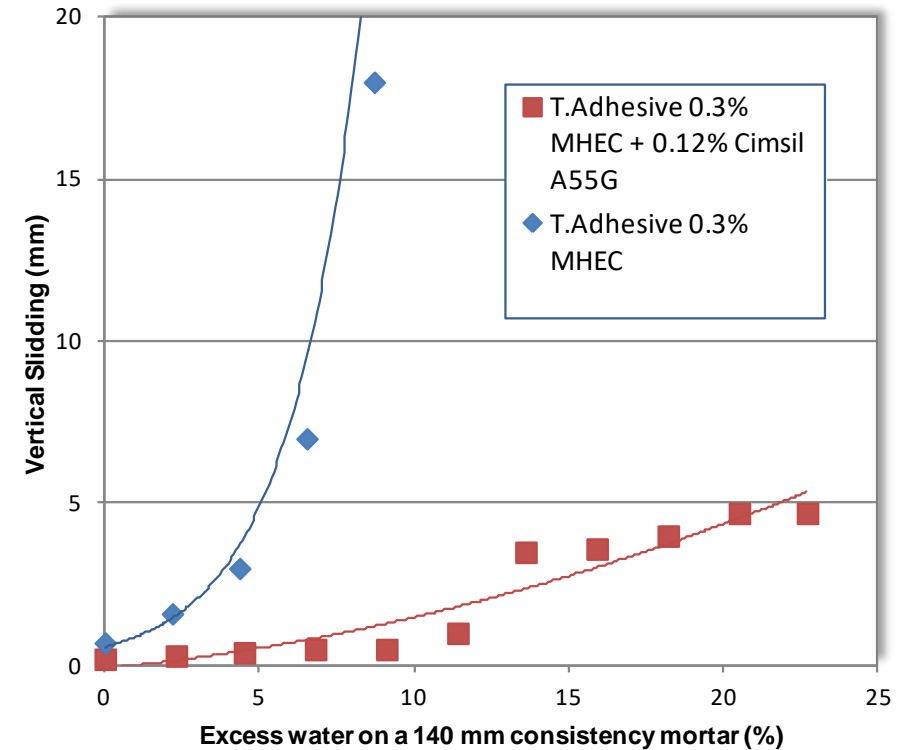




Applications in dry mix mortars

Cement based CTA

- Clays are an excellent anti-slip additive.
- Combination of Cimsil and Cellulose Derivative improves slip resistance.
- The used of mineral based additives does not affect the setting time of the cement.
- Even with unexpectedly high water dosage, allowing more flexibility for the workers with the water mix.



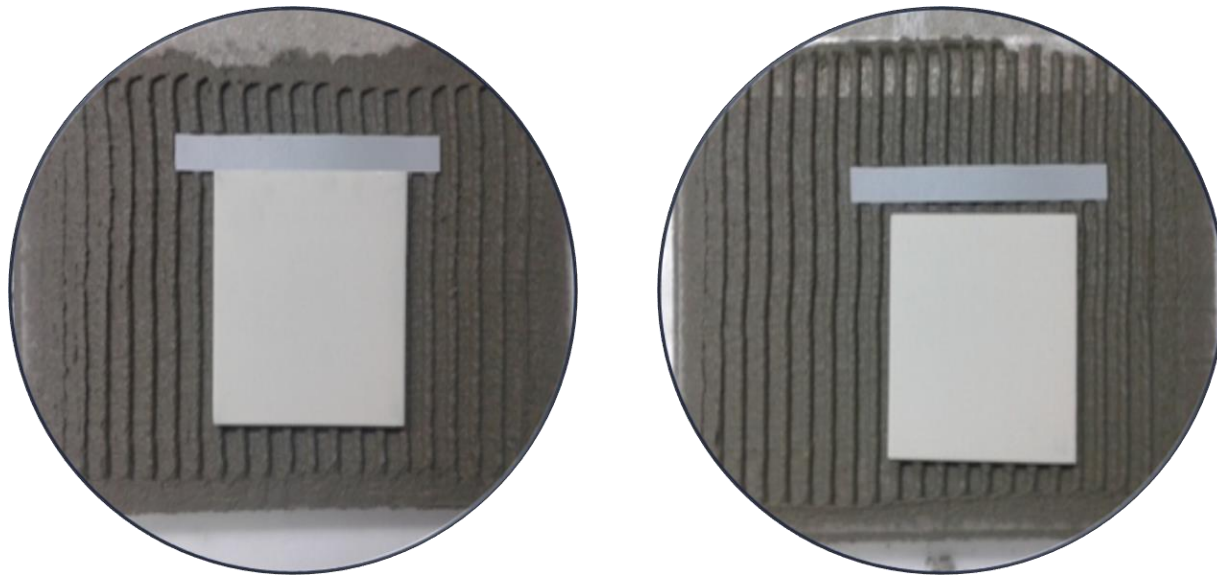


Applications in dry mix mortars

Cement based CTA

CIMSIL A55G

Improves CTA workability while enhances slip resistance



BENEFITS of CIMSIL additives on the CTA:

- CIMSIL additives provide better workability.
- CIMSIL additives avoid sliding.
- CIMSIL additives provide excellent stability to unexpected variations in water dosage.
- CIMSIL additives does not affect: open time, water immersion or heat aging requirements, fulfilling the Standards.



Applications in dry mix mortars

Cement based renders

Render is a premixed layer of sand and cement to brick, concrete, stone...

RAW MATERIAL	% WEIGHT
Cement White 42,5 R	17,00
Lime	4,00
Limestone 0-1 mm	44,80
Limestone 1-2	32,00
Sodium oleate (hydrophobic agent)	0,20
CIMSIL A55G	0,35
Cellulose Ether 15.000 mPas	0,15
Redispersable powder	0,50
Cellulose Fiber	0,50
Lightweight aggregate (Perlite/Verniculite)	0,50



Products recommended:
CIMSIL A55G – CIMSIL A55



Applications in dry mix mortars

Cement based renders

Benefits of CIMSIL A55 additives on the mortar:

- CIMSIL additives provide better workability.
- CIMSIL additives avoid sagging.
- CIMSIL additives provide excellent surface finishing.

CIMSIL additives improve the overall quality of mortars, specially on those with pumpability, workability or sagging problems.



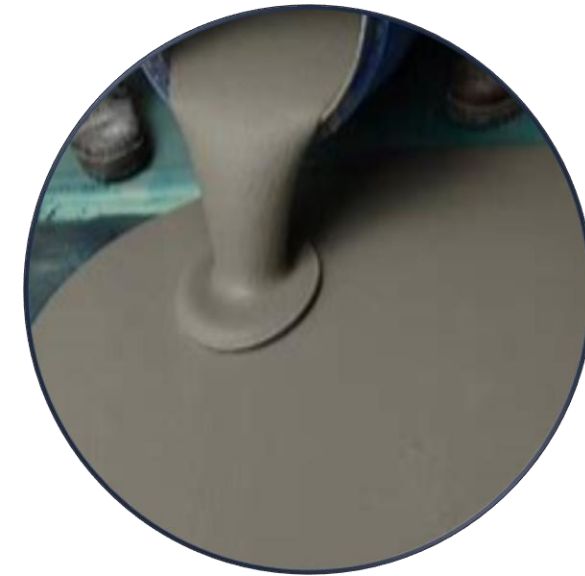
Applications in dry mix mortars



Cement based SLU

Self Levelling Underlayment is a polymer modified portland cement and gypsum based mortar, flowable mortar.

RAW MATERIAL	% WEIGHT
Portland Cement type I	13
Calcium Alumina Cement (CAC)	15
Anhydrite	3.5
Silica sand 0.3-0.6 mm	33
Silica sand 0.1-0.3 mm	23.79
Silica sand filler	10
Cellulose ether low viscosity (HEC)	0.08
CIMSIL A55G	0.15
Plasticizer	0.2
Redispersable polymer	1
Antifoamer	0.15
Citric acid	0.12
Lithium carbonate	0.1



Products recommended:
CIMSIL A55G – CIMSIL A55



Applications in dry mix mortars

Cement based SLU

Benefits of CIMSIL A55 additives on the SLU:

- CIMSIL additives provide better workability.
- CIMSIL additives avoid bleeding and segregation.
- CIMSIL additives enhance pumpability.
- CIMSIL additives provide excellent surface finishing .

CIMSIL additives improve the overall quality of mortars, specially on those with pumpability, workability or sagging problems.





Applications in dry mix mortars

Gypsum based joint compound

Joint compound is a white powder of primarily gypsum dust mixed with water to form a mud the consistency of cake frosting, which is used with paper or fiber joint tape to seal joints between sheets of drywall to create a seamless base for paint on interior walls.

RAW MATERIAL	% WEIGHT
Gypsum, α or β hemi hydrated	62
Mica aggregates <100 μ m	5
CIMSIL G30	1.5
Calcium Carbonate	28.5
Retarder Gypsum	0.1
Redispersable Polymer	2.5
Cellulose Ether	0.4

Products recommended:

- Sepiolite: CIMSIL A55G – CIMSIL A55
- Attapulgate: CIMSIL G30



Applications in dry mix mortars

Gypsum based joint compound

Benefits of CIMSIL additives:

- CIMSIL additives provide better workability.
- CIMSIL additives increase sag resistance.
- CIMSIL additives provide excellent surface finishing.

CIMSIL additives improve the overall quality of mortars, specially on those with pumpability, workability or sagging problems.





Applications in dry mix mortars

Summary

APPLICATION	PRODUCT	RECOMMENDATIONS
Tile Adhesives & Tile grouts	Cimsil A55G	Additive to combine with cellulose derivatives.
Monolayer & projected mortars Rendering Mortars	Cimsil A55G	Additive to combine with cellulose derivatives.
Self Leveling	Cimsil A55G	Additive to combine with cellulose derivatives.
Joint compounds gypsum based	Cimsil A55 Cimsil G30	Additive to combine with organic thickeners.

Applications in ready to use and pastes



ACRYLIC TILE ADHESIVES



CIMSIL A35

Pangel M90F y Pangel M280F

JOINT COMPOUNDS READY TO USE



Powder

(Based on 4 bags of Joint Filler)

1 hour and 40 minutes of prep time

10 litres of Water

CIMSIL A35

CIMSIL G30

Pangel M90F y Pangel M280F

Applications in the concrete industry



SHOTCRETE



Pangel RMA 400

ALKALI-FREE ACCELERATORS



Cimsil A55G

Applications in the concrete industry



wet shotcrete



Wet Mix Process:

Water is added in the concrete in wet mix process and then, sprayed.

PANGEL RMA 400

Applications in the concrete industry



Shotcrete

Main effects of PANGEL RMA additives:

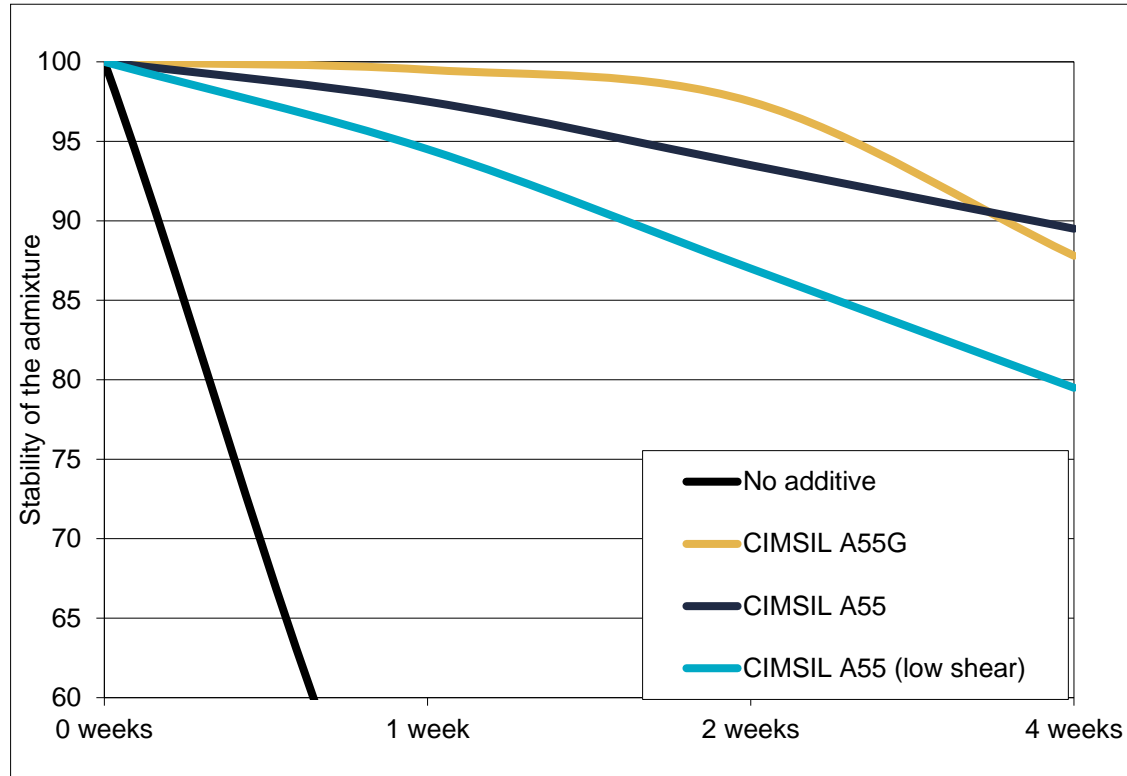
- High performance rheology modifier additives.
- Leads lower rebound and larger thickness build-up comparing with microsilica.
- Reduces segregation and stabilizes concrete.



Applications in the concrete industry



Alkali-free accelerators



Main effects of CIMSIL A55G additive:

- Sepiolite based additive.
- High performance powder rheology modifier additive.
- Leads suspension of the components in alkali-free accelerators.
- Reduces segregation and stabilizes mixture.



Applications in the concrete industry

Summary

APPLICATION	PRODUCT	RECOMMENDATIONS
Resin Based Joint Fillers (joint compounds)	Cimsil A35 Cimsil G30 Pangel M90F	High performance additive Thixotropic additive to improve the workability and sag resistance.
Resin Based tile adhesives	Cimsil A35 Pangel M280F	Additives to combine with cellulose derivatives.
Shotcrete Alkali-free	Pangel RMA 400 Cimsil A55G	Liquid thixotropic additive. Solid suspending additive for Alkali-free accelerators and other admixtures.



Thank you

