



## Product information

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### Metaver<sup>®</sup> R

**Thermal treated kaolin (metakaolin)  
pozzolanic hardening admixture for cementitious building materials**

#### Description

Metaver<sup>®</sup> R is produced by calcination of kaolin and is a reddish, mostly amorphous aluminosilicate reacting with Portlandite (calcium hydroxide) to build cementitious CSH-phases.

#### Chemical composition (M.-%, approx.)

SiO <sub>2</sub>	67-69	CaO	< 0,8
Al <sub>2</sub> O <sub>3</sub>	25-27	MgO	< 0,1
Fe <sub>2</sub> O <sub>3</sub>	< 2,5	Na <sub>2</sub> O	< 0,1
TiO <sub>2</sub>	< 1,5	K <sub>2</sub> O	< 0,2
		LOI	< 1,5

#### Physical characteristics

Specific density		2,5 g/cm <sup>3</sup>
Particle size distribution	D 10	~2 µm
	D 50	~ 30 µm
	D 90	~ 100 µm
Specific surface (BET)		ca. 16 m <sup>2</sup> /g
Colour		reddish
Whiteness (Dr. Lange)		ca. 42
Apparent density freely settled		0,5 – 0,7 g/cm <sup>3</sup>
	tapped	ca. 0,9 g/cm <sup>3</sup>

#### Function

Metaver<sup>®</sup> R mostly consists of the mineral Kaolinit – a layered silicate mineral with a lattice distance of 7,2 Å between the layers. Between the layers of SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> in proportions of 1:2 there is another layer where water is imbedded that can be evaporated through heat treatment by calcination. The kaolin is then activated.

Portland cement develops up to 25 % calcium hydroxide (free lime) in its hydration process. This alkaline by-product is very soluble and is primarily attacked and dissolved in the presence of acids or sulphates.

Metaver<sup>®</sup> R special feature is its capacity to bind large amount of free lime by forming new stable CSH-phases. Speed and amount of this reaction may be controlled through chemical and construction adequate methods

With respect to its reactivity Metaver<sup>®</sup> R can be qualified as „very reactive“. Together with lime and water the setting will occur in about 3 hours (method Newchem).



## Application

Metaver<sup>®</sup> R is a pozzolanic mineral additive that may improve many performances of hydraulic cementitious mortars, concrete and analogous products.

Metaver<sup>®</sup> R is easily mixed in and gives a soft plastic consistence that is easy to work. Through its particle size distribution very low increase in water demand is given.

Metaver<sup>®</sup> R has shown its advantages in applications where strength, density and resistance are requested.

In the following applications Metaver<sup>®</sup> R should be very useful:

Lime binding	cement free mortars, coatings, injection for antique buildings
Efflorescence	roofing tiles, facade precast
Strength	with silicates for geopolymers, renders based on lime and cement
Resistance	coatings of waste water or see water constructions
Durability	improved alkali silicate reaction

## Dosage

5 to 20 % replacement of cement by weight

## Stability

unlimited in dry conditions

## Storage

in protected and dry rooms

## Packaging

in big bags of 1000 kg or bulk

The above information and recommendations are based upon our experience and are offered merely for advice. They do not absolve the consumer from making his own tests. Responsibility for damage arising from the use of our products cannot be derived from the recommendations given. The observance of any intellectual property rights of third parties is the responsibility of the consumer in each case.

MDS Metaver<sup>®</sup> R 2019