



SIGMA® is a concrete additive in gel form based on silica fume technology. It is used as a high effective additive for the production of high quality concrete. SIGMA reacts chemically within a cementitious matrix to increase the amount of calcium silicate hydrate (CSH gel) that is formed (pozzolanic reaction). The CSH gel is the bonding agent that holds the matrix of the cementitious mixture together in the hardened state. The additional CSH gel due to silica fume increases strength and decreases permeability.

Applications

- High performance concrete
- Structural concrete
- Precast concrete
- Shotcrete applications
- Parking structures
- Bridge decks
- Road infrastructures
- High-rise buildings
- Cable & oil well grouting
- Marine and port structures
- Water, sewage and drainage structures
- Tunnels (Precast, shotcrete)
- Mines (shotcrete)

Approvals / Standards

- ASTM C1240
- ASTM C494

Advantages / Benefits

- Dramatically improved durability
- Reduces water-cement ratio
- Uniformly high compressive strength
- Lower permeability
- Improved internal cohesion

- Improved pumping properties
- Improved surface finish
- Better flexural strengths at all ages
- Reduced chloride diffusion
- Excellent freeze/thaw resistance
- Abrasion and erosion protection

Guideline for Use

Mixing

SIGMA could be added to ready-mix concrete before placing concrete or could be added to a part or whole of concrete mixing water then added to the concrete.

Dosage

Recommended dosage ranges from 5 To 10 kg per 100 kg of total cementitious material. Other dosages may be recommended in special cases according to the specific site conditions. It is highly recommended that trial mixes be prepared to determine the optimum dosage for your specific performance requirements.

Compatibility

SIGMA is compatible with all known Portland cements manufactured under ASTM specifications. Always conduct trials before combining products in specific mixes and contact our Technical Service Department for information about specific combinations.

Effects

SIGMA reacts chemically within a cementitious matrix to increase the amount of calcium silicate hydrate (CSH gel) that is formed (pozzolanic reaction). The CSH gel is the bonding agent that holds the matrix of the cementitious mixture together in the hardened

state. The additional CSH gel due to silica fume increases strength and decreases permeability.

Storage

Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect from direct sunlight. For specific storage condition contact RAMKA Technical Services Department.

Basis Of Data

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Precautions

Health and Safety

SIGMA does not fall into the hazard

Product Information

State	Slurry
Packaging	22KG Pail
Chloride Content	< 0.1%
Corrosion Behavior	-
Appearance / Color	Grey
Shelf Life	12 months from date of production if stored properly in undamaged unopened, original packaging.
Storage Condition	Store in dry conditions at temperatures between +10°C and +30°C. Protect from direct sunlight and frost.
PH-Value	3-7
Recommended Dosage	5 – 10% by weight of cementitious

classifications of current regulations. However, it should not be swallowed or allowed to come into contact with skin and eyes. Suitable protective gloves and goggles should be worn. Splashes on the skin should be removed with water. In case of contact with eyes rinse immediately with plenty of water and seek medical advice.

Additional Information

For additional information on SIGMA admixture, consult to our Technical Services Department .



RAMKA

CONSTRUCCION CHEMICALS

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Important Notes: The information, and, in particular, the recommendations relating to the application and end-use of RAMKA products, are given in good faith based on RAMKA's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with RAMKA's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. RAMKA reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.