

TITLE OF INVENTION: Holcim Super Ultra HS Concrete

SPECIFICATIONS / DESCRIPTION

Considering global issues of terrorism it is important that public properties, important installations and human lives are protected. In view of this a special concrete combined with ultra high strength of more than 100 MPa and blast energy absorption capacity is developed. In view of this, we have developed a concrete which has multi-fibres, high amount of green cement and ultra high strength. This concrete when attacked by an high impact external force, would not be affected adversely and such attempt would be foiled.

This concrete specifications are describe below:

Strength: 100 to 120 MPa

Workability (Flow): 600 ± 100mm

Fluidity: High

Segregation resistance: High

Slump retention: about 8 hours

In today's demanding technical needs of utilizing lower natural resources and get extra usable space it has been necessary to use 100 MPa and above concrete to address global warming. However till now, the higher grade of concrete produced has lots of other issues, which have been addressed in this invention thus converting challenges into opportunity thus it makes this invention revolutionary, green and beneficial to environment at large.

Novelty

It is unique combination of the following contents which are mixed for an minimum time of more than 5 minutes:

1. Ordinary Portland Cement (OPC): 13%
2. Ground Granulated Blastfurnace Slag(GGBS): 34.3%
3. Silica Fume: 4.2%
4. Fourth generation polycarboxylate based admixtures: 1500ml per 100 kg of cementitious materials
5. Polypropylene fibres: 0.4 % by volume
6. Steel fibres of size 35/65mm: 0.8% by volume
7. Water: water/cement ratio of 0.17

Holcim Super Ultra HS concrete is a specialty product developed having ultra high strength, high performance, generally with specified compressive strength of 100 MPa and above, having anti-blast and high energy absorption characteristics.

This product has many specialties as described below:

1. It is an ultra high strength concrete (>100 MPa) which can act as a barrier to prevent any vehicles to enter the restricted area. It can also absorb any major impact of blast resulting from external forces like explosion.
2. Using this ultra high strength concrete have advantages such as increased in flexural strength and modulus of elasticity of the concrete.
3. Unlike normal high strength concrete, the Holcim Super Ultra HS concrete has low shrinkage even when compared with Grade 40 normal concrete. This is achieved by up to 65% replacement of Ordinary Portland cement by Ground granulated blast furnace (GGBS) and having very low water-cement ratio.
4. It consists of environment advantages, such as reduction of resources requirement compared with lower grades; Reduced CO₂ emission. This is a environment-friendly product using green cement and lower usage of aggregates.
5. This concrete contains very high proportions of fibers of different types. The fibers significantly increase both the tensile strength and ductility of the concrete.
6. The judicious use of the combination of different type of fibers gives the concrete high energy absorption.

Claims

1. This unique product Holcim Super Ultra HS concrete characterized by the unique combination of Ordinary Portland Cement (OPC) (13%), Ground Granulated Blastfurnace Slag (GGBS) (34.3%), Silica Fme (4.2%), fourth generation polycarboxylate based admixture (1500ml per 100 kg of cementitious materials), polypropylene fibres (0.4% by volume), steel fibres of size 35/65mm (0.8% by volume), water with water-cement ratio of 0.17 shall be having exclusive intelligent property rights for the inventor and anyone trying to utilize this combination directly or indirectly and copying the same would be breaching the patent rights filed for this product by the inventor and the said party would be liable for legal actions.