

NANO PLIND

FACESTONE PLINDERS



NANO blind datasheet

PROPERTIES OF ULTRA HIGH STRENGTH CONCRETE INCORPORATING NANO-SILICA

ABSTRACTThe objective of this investigation is to study the effect of nano-silica addition on the fresh and hardened properties of ultra high strength concrete. Nano-silica with 99.8% SiO₂ content and particles size of 5 to 20 nm used in

concrete mixes as a replacement of silica fume content. The total percentage of silica fume and nano-silica was 20% of weight of binder content. Nano-silica was added in seven percentages (0.5%, 1.0%, 1.5%, 2%, 2.5%, 3.0%, 3.5%) of weight of cementitious materials. The

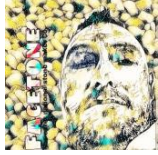
properties of ultra high strength concrete was investigated through twenty seven concrete mixes using nano-silica addition with three different binder content 450, 550, and 650 kg/m³. Nanomaterials have a larger value of the ratio between surface area and volume than other similar particles in larger size, making the nanomaterials

more reactive. Slump test, Compacting factor test and Ve-Be time test were used to determine the effect of nano-silica content on the workability of concrete, while compression test, indirect tensile strength test, flexural strength test,

modulus of elasticity test and permeability test were carried out to determine the properties of hardened concrete. Also to compare microstructure and nanostructures of concrete with and without nano-silica, scanning electron microscopy was used. The test result showed that the addition of nano-silica as cement replacement could improve the mechanical behavior of ultra high strength concrete. The results showed that the optimum dose of nano-silica was 2.5% by weight of cementitious materials. Using 2.5% nano-silica can produce ultra-high strength concrete with high workability without segregation. The workability of concrete decreases with the increase in nano-silica content. The use of NANOplasticizer was necessary in concrete mixes to improve the workability. Results indicated that nano-silica up to 2.5% nano-silica by weight could improve the mechanical and physical properties of ultra high strength concrete

parameter	Value (mass)
SiO ₂	96.5%
Al ₂ O ₃	2.00%
SiO ₂ +Al ₂ O ₃	98.5%
Fe ₂ O ₃	0.05%
MnO	0.01%
MgO	0.01%
Na ₂ O	0.01%
K ₂ O	0.01%
SO ₃	0.01%
CaO	0.15%
P ₂ O ₅	0.01%
CL	0.01%
L.O.I	1.30%

CHEMICAL ANALYSIS (XRF)FOR THE SUPER PLIND



FACESTONE

NANO BLIND *NB10

Silica fume mineral admixture

DESCRIPTION

NANO blind *NB10 is a dry, compacted, silica fume mineral admixture formulated to produce concrete with special performance qualities. It improves the hardened characteristics of concrete in two main ways.

Firstly, **NANO blind *NB10** is a pozzolan which reacts chemically to increase the amount of calcium silicate hydrate gel formed, thus improving the strength and impermeability of the concrete. Secondly, **NANO blind *NB10** is an ultra-fine material that physically fills the voids between cement particles resulting in an extremely dense and impermeable concrete. **NANO blind *NB10** meets ASTM C1240 requirements.

RECOMMENDED USES

The reduced permeability of concrete produced with **NANO blind *NB10** greatly limits the ingress of water, chlorides, sulphates, and aggressive chemicals known for promoting reinforcing steel corrosion and other distress in the concrete. This makes **NANO blind *NB10** an ideal product for use in basement structures, parking decks, bridge decks, marine structures, and any construction that requires the protection provided by impermeable concrete. It allows for design flexibility, resulting in reduced member size, increased span lengths, and improves overall structural economics which strengthen concrete. As a result of the preceding advantages, **NANO blind *NB10** will improve performance in wet and dry shotcrete, prestressed, precast, and ready-mixed concrete applications. When air entrainment is desired, an air-entraining admixture is recommended. Please consult your local FACESTONE Technical Sales Representative. It is also recommended that **NANO blind *NB10** be used in conjunction with a high range, water-reducing admixture, such.

FEATURES AND BENEFITS

NANO blind *NB10 aids in the production of concrete with the following special qualities:

- Dramatically improved durability
- Uniformly high compressive strength
- Abrasion and erosion protection
- Better flexural strengths at all ages
- Low permeability
- Excellent freeze/thaw resistance

TYPICAL PROPERTIES*

Silicone dioxide ASTM C1240-14	>96%
Loss on ignition ASTM C311 C311M-13	<1.3%
Chloride content ASTM C114-13	<0.1%
Bulk density ASTM C1240	400-650kg/m ³

PACKAGING

NANO blind *NB10 is available in SMALL bags of 25kg ± 3% (sold in kg and as per actual weight of NANO in bag).

COMPATIBILITY

NANO blind *NB10 is compatible with all Portland Cements and in combination with Ground Granulated Blast Furnace Slag (GGBS) and Fly Ash (PFA).

RATE OF HARDENING

Setting time of concrete is influenced by the chemical and physical composition of the cement and/or cement type used to produce the concrete, temperature of the concrete, weather conditions, and the use of chemical admixtures. Trial mixes should be made with the job materials to determine the setting time of a specific mixture. **NANO blind *NB10** silica fume will not initiate or promote corrosion of reinforcing steel embedded in concrete, prestressed concrete or concrete placed on galvanized steel floor and roof systems. Neither calcium chloride nor any chloride based ingredients are used in the manufacture of **NANO blind *NB10** silica fume.



NANO blind *NB10

warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products

for their intended use.

DISPENSING

NANO blind *NB10 is batched at the ready-mix plant in a manner similar to cement or other cementitious materials such as fly ash and granulated slag.

Note: For directions on the proper use of **NANO blind *NB10** specific applications, contact your local FACESTONE Technical Sales Representative.

DOSAGE

NANO blind *NB10 is recommended for use at an addition rate of 3 to 5% by weight of cement, depending on the amount of strength increase or impermeability desired. The exact amount for strength or durability requirements should be determined by trial batches using project materials.

PRECAUTIONS

For the full health and safety hazard information and how to safely handle and use this product, please make sure that you obtain a copy of the FACESTONE Material Safety Data Sheet (MSDS) from our office or our website.

STORAGE & SHELF LIFE

NANO blind *NB10 can be kept for 12 months if stored in original packaging, in a cool dry place and protected against physical damage.

NOTE

Field service, where provided, does not constitute NANO visory responsibility. For additional information contact your local FACESTONE representative.

FACESTONE reserves the right to have the true cause of any difficulty determined by accepted test methods.

QUALITY AND CARE

All products originating from FACESTONE's Cairo, EGYPT facility are manufactured under a management system independently certified to information and application advice given in this FACESTONE publication are based on the present state of **STATEMENT OF** our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be

RESPONSIBILITY made as to a product's suitability for a particular use or application and no

Field service where provided does not constitute NANOvisory responsibility. Suggestions made by FACESTONE either **NOTE** orally or in writing may be followed, modified or rejected by the owner, engineer or contractor since

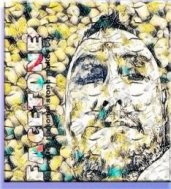


they, and not conform to the requirements of the quality, environmental and occupational health & safety standards

* Properties listed are based on laboratory controlled tests.

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THE INTERNATIONAL STONE MAKERS



GENESIS STYLE
ANTIQUÉ CREAM

INTEGRATED BINDER SOLUTIONS