

## Nanosilica Additive for Durable Sprayed Concrete

### DESCRIPTION



TamCem NanoSilica is a pozzolanic alternative to traditional cementitious replacements for durable concrete that provides sulphate resistance equivalent to typical microsilica (silica fume) at a much reduced dose. TamCem NanoSilica is used in wet mix sprayed concrete processes for tunnelling and mining applications.

The product is suited as an addition to concrete providing improved fresh state and hardened properties. Importantly, TamCem NanoSilica enhances durability of permanent sprayed concrete ground support. Such durability enhancement includes excellent resistance to underground structures exposed to high sulphate and chloride containing groundwater and ground types.

### KEY BENEFITS

- > A very active pozzolan that imparts excellent durability performance for concrete and sprayed concrete, such as sulphate and chloride resistance.
- > Can be used with CEM I and CEM II cement types, providing enhanced durability coupled with greater early age strength performance.
- > Improved final compressive strength and reduced permeability.
- > Reduces bleeding and segregation of concrete mixes, improves cohesion and aids pumpability.
- > Added at batching plant with standard admixture dosing equipment without the safety precautions and special dosing equipment associated with silica fume (microsilica) handling.

- > Site logistics improved as lower dosage of product required.
- > Stable dispersion that does not require agitation in order to retain its suspension.
- > Used to produce high performance concrete.

### TYPICAL APPLICATIONS

TamCem NanoSilica is typically used as a replacement to other pozzolans such as microsilica, PFA and GGBS to impart durable concrete qualities without sacrificing early age setting and strength performance when using alkali-free set accelerators, typically observed with other cement replacements.

Sulphate resistance can be provided with the use of TamCem NanoSilica and either CEM I or CEM II cements. This negates the requirement for using sulphate resisting cements that further show poor setting behaviour when combined with alkali-free accelerators.

TamCem NanoSilica can also be used in standard and high performance concrete applications where it can enhance both fresh and hardened state properties, but can also improve finish when cast against formwork. Furthermore TamCem NanoSilica can be used to impart stabilising properties for injection grouts and TBM annulus backfill solutions.

### TECHNICAL DATA

TamCem NanoSilica	
Form	White Liquid
Density	1.17 ± 0.03 g/cm <sup>3</sup>
Solids content	25.0 ± 1.0%
pH	9.5 ± 1.0
Viscosity (20°C)	≤ 15 mPa·s
Alkali content	≤ 0.2 %
Chloride content	≤ 0.1 %

All technical data stated herein is based on tests carried out under laboratory conditions.

Whilst any information and/or specification contained herein is to the best of our knowledge, true and accurate, we always recommend that a trial be carried out to confirm suitability of the product. Please note regional climatic conditions may cause a variation in the performance of the product. No warranty is given or implied in connection with any recommendations or suggestions made by us or our representatives, agents or distributors. The information in this data sheet is effective from the date shown and supersedes all previous data. Please check with your local Normet office to confirm that this is current issue.

## APPLICATION GUIDELINES

TamCem NanoSilica is added to concrete and grout mixes at the batching plant using standard admixture dosing equipment and storage tanks.

TamCem NanoSilica should be incorporated at the batching plant in the mixing water or added to the mixer after the water has been added and dispersed throughout mix constituents.

The dosage recommendations below are based on typical replacement of microsilica. As with all projects, the mix design should be validated through site trials and product performance testing to achieve the levels of durability required, such as sulphate and chloride resistance, or water impermeability.

- > 0.1 to 0.3 kg TamCem NanoSilica replaces 1 kg of microsilica powder (or 2 kg of microsilica in slurry form)

Refer to your local Normet representative for further detailed information and support on the application of TamCem NanoSilica.

## PACKAGING

TamCem NanoSilica is normally supplied in IBCs. Packaging size may vary subject to local regulations and requirements, and other packaging sizes can be agreed, please contact your local Normet representative for more details.

## STORAGE

TamCem NanoSilica should be transported and stored between min 5°C and max 35°C, kept dry and out of direct sunlight. If these conditions are maintained and the product packaging is unopened, then a shelf life of 12 months can be expected. It is important that the product is not allowed to freeze (freezing point ~0°C) as the product will irreversibly precipitate upon thawing.

For bulk storage, the tank should be sealed and constructed of plastic, fiberglass reinforced plastic, or stainless steel.

## HEALTH & SAFETY

TamCem NanoSilica should only be used as directed. We always recommend that the Safety data sheet (SDS) is carefully read prior to application of the material. Our recommendations for protective equipment should be strictly adhered to for your personal protection. The Safety data sheet is available upon request from your local Normet representative.