Important Facts about **TioCem®**

- **TioCem**® is a premium cement that reduces the level of nitrogen oxides (NOx) by means of an integrated photocatalyst.
  - The photocatalytic oxidation of NOx into harmless NO3⁻ is a contact reaction activated by light and only takes place on the surface.
  - The produced NO3⁻ is neither toxic nor hazardous to health. It reacts with the calcium hydroxide on the concrete surface and washes off with the next rain.
  - The role of the photocatalytic oxidation depends on the light intensity and the air flow. In laboratory tests, 40% NOx was immediately oxidized to NO3⁻.
  - Natural daylight is sufficient for initiating the photocatalytic effect.
  - The photocatalyst is not consumed during the photocatalytic reaction. It is safe for use in mass processing and provides long lasting protection.
  - Proprietary TiO₂ technology is used for TioCem®. TiO₂ is used in many articles of daily life, for example, in cosmetics.

- **TioCem**® can be processed like any other cement, no special measures are necessary.
  - **TioCem** cement (skills EN 197 part 1 and ASTM C 150 for cement with pigment).
  - In processing and durability properties are the same as those of standard cement.
  - No special technical approval is necessary.

**TX Active®**: It’s What’s Inside

**TX Active**® is the active ingredient empowering the photocatalytic process in **TioCem** cement. Developed by license partner Italcementi S.P.A., **TX Active**® is manufactured to strict standards and precisely formulated into HEIDELBERG Cement Group’s **TioCem**® to provide optimum durability, as well as aesthetic and environmental benefits.

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Photocatalysis: The Power of Light

Photocatalysis is a natural phenomenon in which a substance known as a photocatalyst uses light to expedite the rate of a natural oxidation process.

Using light energy, photocatalysts can induce the formation of strong oxidizing agents which decompose some organic and inorganic substances in the atmosphere by oxidation.

Photocatalysts enable an acceleration of oxidation processes that already exist in nature. They promote faster decomposition of pollutants and prevent their harmful accumulating.

For over a decade, photocatalysts have been applied to various materials—glass, ceramics, concrete, and textile finishes—to obtain a "self-cleaning" effect.

Even increasing air pollution affecting urban areas has recently compelled researchers to take advantage of photocatalytic properties to stay the noxious substances that are contaminating the environment.

Introducing the Photocatalytic City: A Vision of the Environmental Future.

Photocatalysts, cement with TX Active®, were developed in 1996 to achieve the exact design specifications demanded by Richard Meier for his Dives in Misericordia Church project in Rome: purity of white, eye-opening brilliance and the preservation of these final aesthetic qualities throughout the ensuing decades.

Since then, photocatalytic cements like TioCem® formulated with TX Active® have been the product of choice for many prestigious architectural works in which the quality of the building materials and their final appearance are equally important in achieving the original architectural vision.

In addition to ensuring the same physical and mechanical properties of traditional concrete, TioCem® made with TX Active® offers extraordinary brilliance and "self-cleaning" properties so that the original beauty is retained for years.

TioCem® provides a comprehensive range of cement products for formulating into all varieties of mortars, stuccos, cementitious veneers, and many other concrete and cementitious end uses.

Applications of TioCem®:

**Horizontal Structures**
- Concrete sidewalks
- Interlocking concrete pavers
- Pavement and road surfacing
- Concrete roof tiles

**Vertical Structures**
- Architectural precast panels
- Tilt-up concrete panels
- Concrete medians
- Noise barriers for roads and highways
- Exterior plaster
- Exterior finishes

**Preserves the Environment**

Photocatalysis is the power of light.