

# Water Proofing

Eco-compliant to California VOC requirements



**ZYCOSIL**<sup>®</sup>

Nano Technology

**Zydex**

# WATER

## The Great Destroyer

### BUILDING MATERIAL DETERIORATION

Most of the building materials in the world are mineral based. Typical construction materials like bricks, cement, gravel, etc. are porous and water-loving by nature. A typical unprotected building can absorb over one liter of water per sq. ft., in 6 hours, during 32 km per hour wind-driven rain. Under similar conditions, a concrete block would absorb almost 2 liters of water.

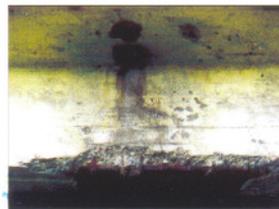
Rain water absorption causes multiple damage (1) Aesthetic damage due to fungi, mold, and efflorescence (visible on the surface) which spoils the appearance (2) Structural damage by inducing (a) ASR (Alkali-Silica Reaction) where water leaches out inorganic binders, when it dries (b) carbonation (where carbonic acid reacts with calcium silicate) (c) Corrosion of reinforced bars.



Efflorescence



Premature ageing



Spalling



Fungus formation

### CONVENTIONAL WATER REPELLANTS

Conventional water repellent products, because of their **micron range** particle size, cannot penetrate the structure, but form a film on the surface. This leads to temporary protection from water. Film formation leads to a loss of breathability for the building material. Wind erosion and UV, along with thermal degradation

easily destroy and damage this surface film within 1-2 yrs. This leads to renewed water absorption. Hence conventional film formers cannot offer more than 5 yrs protection to mineral based building materials. Long term protection can only be ensured by water repellants with deep penetrative property.

### WATER REPELLANTS (FILM FORMERS)

- Acrylic
- Silicones
- Waxes
- Urethane
- Epoxy
- Stearate

# NEW GLOBAL LAUNCH

# ZYCOSIL

## NEW AGE NANO TECHNOLOGY

4-6 nanometers (0.005 micron)

Organo Silicon based, Nano size, Eco-friendly, Water based waterproofing agent.

Meets the toughest VOC\* standards of California, USA.

Forms a clear, water like solution.

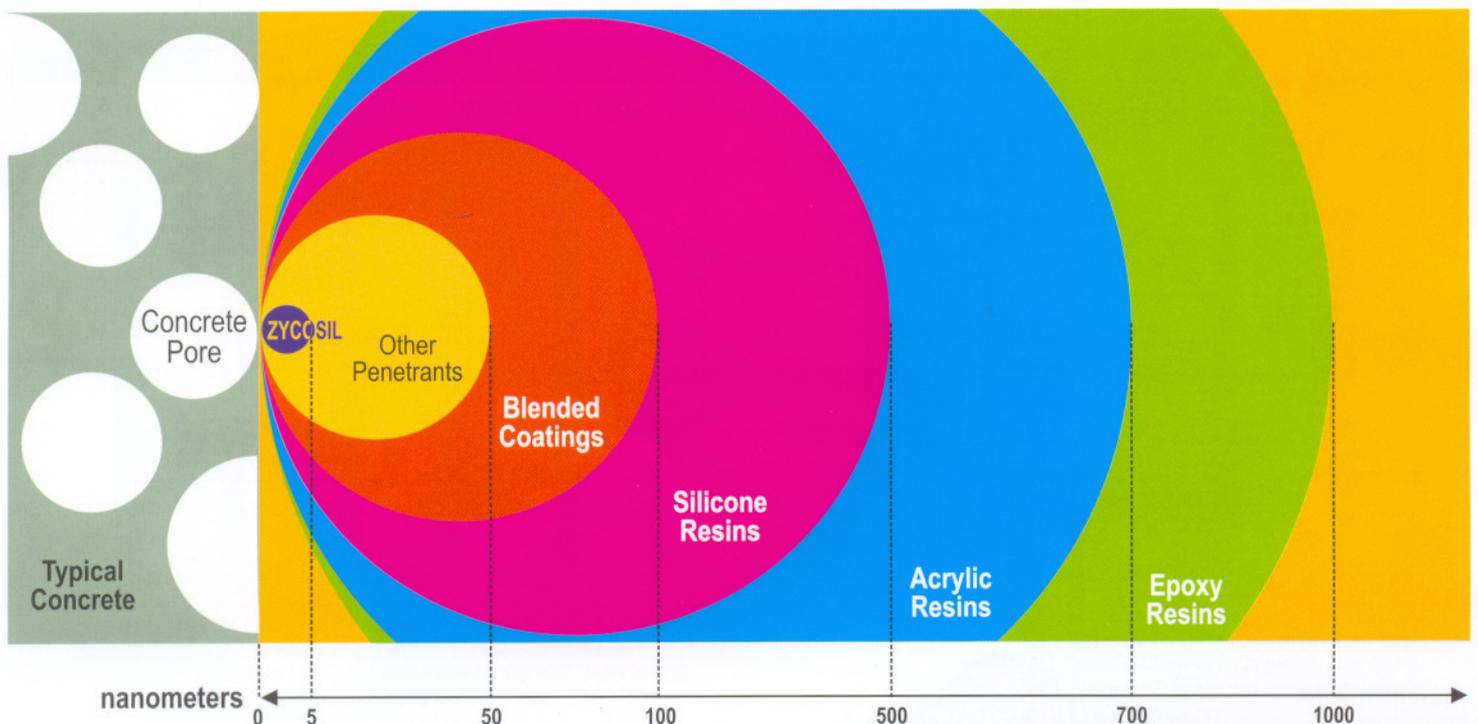
Useful for new and existing concrete and masonry structure

Spray / brush / roller application.

UV, Thermal stability (20+ years)

*\*VOC (Volatile Organic content)*

Nano sized ZYCOSIL delivers protection deep into the masonry pores (5-200 nm) where other conventional film formers cannot reach.



## WHY ZYCOSIL (PENETRANT) IS SUPERIOR THAN CONVENTIONAL FILM FORMERS



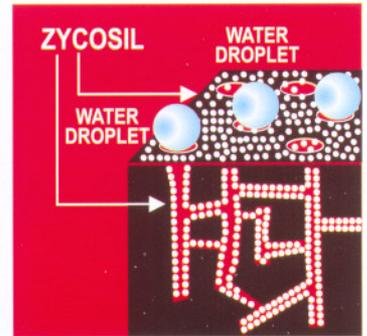
Rain water seeps into the building through pores & micro-cracks



Micro film formers can only form a surface film over the structure. They cannot penetrate into masonry pores, due to their large particle size.



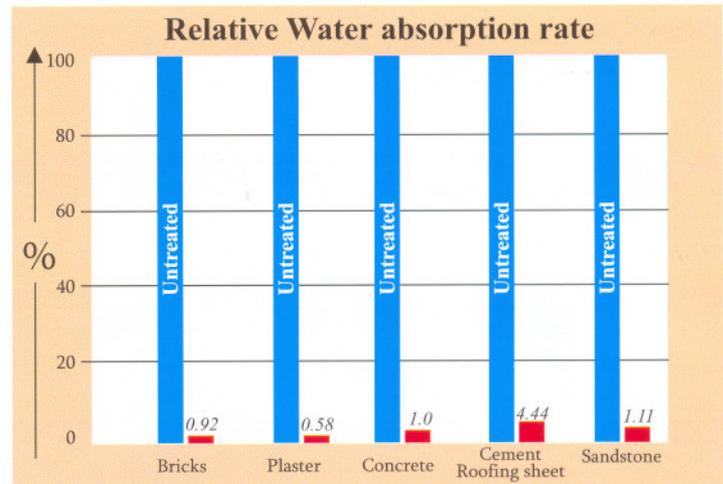
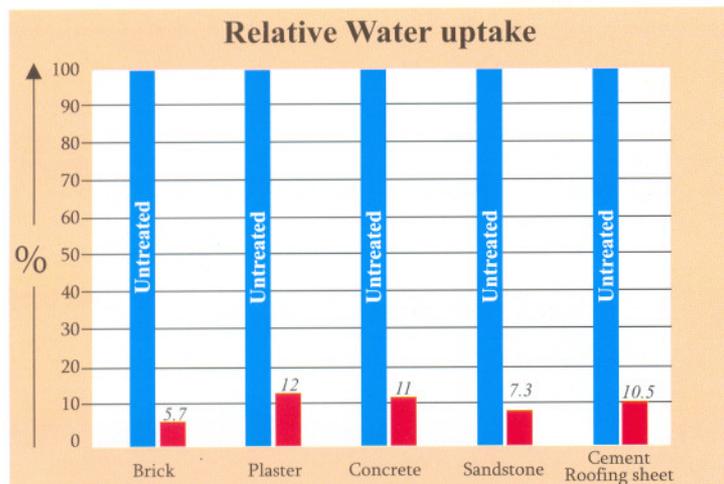
Wind erosion, UV exposure and thermal degradation destroy the surface film & develop micro cracks, leading to renewed water absorption.



Nano technology & penetrative ability allow ZYCOSIL to penetrate in to cementitious pores of 5-10 nanometers making them water repellent.

**COMPARATIVE PERFORMANCE**

PROPERTY	FILM FORMERS	ZYCOSIL
SIZE (nm)	100 -500	4-6
WATERPROOFING MECHANISM	Water repellency by coating & closing pores of the substrate	Water repellency by nano level hydrophobation
DILUENT	Hydrocarbon	Water
SIMULATED 10 YRS. STABILITY TEST USING ALBERTA DOT. 1B	Loses 90 % protection	Loses only 2% protection
UV STABILITY	Not Stable	Stable
BREATHABILITY	Not breathable	Breathable
DEPTH OF PENETRATION (mm)	< 0.5 mm	upto 5 mm
FUNGUS / MILDEW PROTECTION	Poor	Excellent
CORROSION PROTECTION	Limited Protection	Long term protection
MICRO-CRACKS PROTECTION	Not Protected	Long term protection
DURABILITY	2-5 Years	20+ years



These tests were carried out using ASTM D6489. Each sample was soaked in water for 24 hours and the water uptake was calculated.

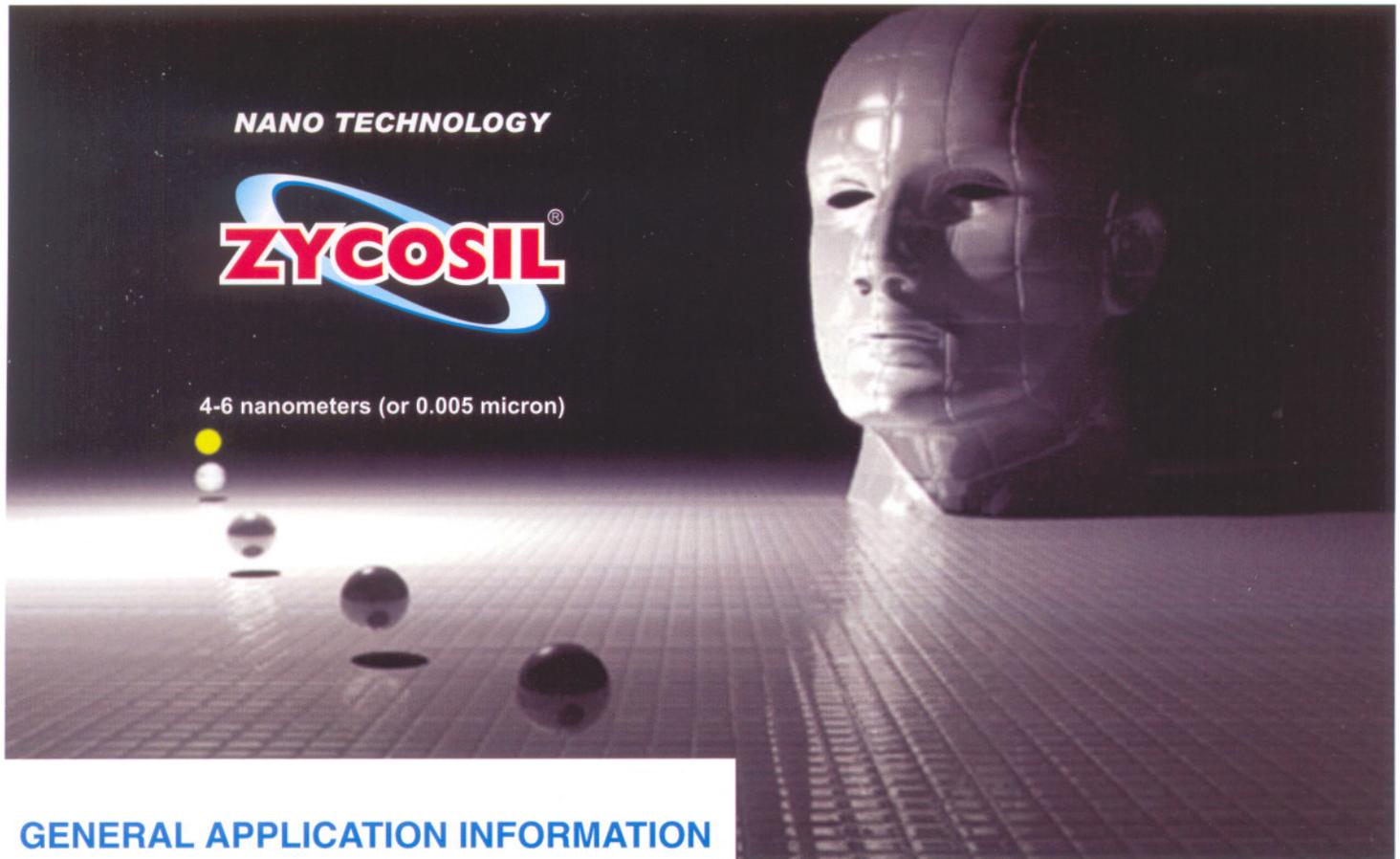
■ Untreated  
■ Treated with ZYCOSIL

These tests were carried out using RILEM Test Method II.4. The RILEM tube was affixed on the substrate surface. Water was filled up to the 5 ml mark. The rate of water absorption was measured. Hydraulic pressure generated on the substrate surface was equivalent to 140 Km / hr. wind driven rain.

NANO TECHNOLOGY

**ZYCOSIL**<sup>®</sup>

4-6 nanometers (or 0.005 micron)



## GENERAL APPLICATION INFORMATION

**Zycosil** should be diluted with water.

Avoid hard water (>1000 ppm)

Apply **Zycosil** using low pressure spray equipment. (E.g. Agro spray pump)

Always clean & flush spray equipment.

**Zycosil** can also be applied using a brush or paint roller.

For cracks > 0.5 mm, best results are obtained by flooding the surface with diluted **Zycosil** solution.

Use diluted **Zycosil** within 48 hours.

**Do not store diluted Zycosil.**

## WATCHPOINTS [Before using **Zycosil**, read the label and Material Safety Data Sheet (MSDS)]

New concrete, concrete patches and plaster; should be cured completely.

**All topping/finishing** must be completed and allowed to be cured.

Concrete surface repairs and replacements (of visible cracks > 0.5 mm) must be completed before treatment with **Zycosil**.

If rains have preceded the application, the surface should be allowed to **dry completely**.

Application of **Zycosil** would create a hydrophobic (**water repellent**) surface.

This will improve the **coverage & bonding** of water based acrylic paints.

However, adhesion of any other water based cement paint, re-plastering or fixing of tiles, granite, stones or other cementitious material would not be possible. In such a case, use **Zycoprime** or consult with Zydex representative.

**Do not stop Zycosil application halfway. Once dried, the surface will not allow Zycosil (of the same concentration) to penetrate further. In case re-application is required, use Zycosil solution of higher concentration compared to the concentration previously used.**

**Zycosil application is suitable for surfaces capable of water absorption.**

**TECHNICAL INFORMATION**

- Color** Clear to pale yellow
- Flash Point** >100<sup>o</sup>C, Non flammable
- Specific Gravity (25 °C)** 1.07
- Solubility** Soluble in water
- Dilution** One liter Zycosil with 10 liters water (*horizontal surface*)  
One liter Zycosil with 20 liters water (*Vertical Surface*)
- Coverage** Typically 30-40 m<sup>2</sup> / liter (*for horizontal surfaces*)  
Typically 60-80 m<sup>2</sup> / liter (*for vertical surfaces*)

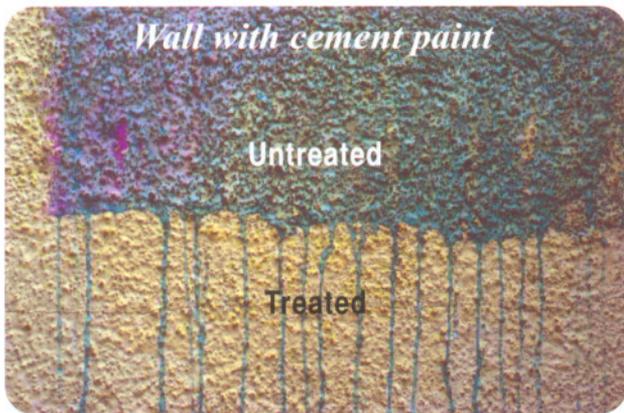
Consumption for a specific substrate will depend on the porosity of the substrate. This data is based on our simulated laboratory experiments. For a specific substrate, check with your Zydex representative.

**Protects** Concrete, Brick, Mortar, Plaster, Cement sheets, Lime stone, Sandstone, Granite, Tile, Grout

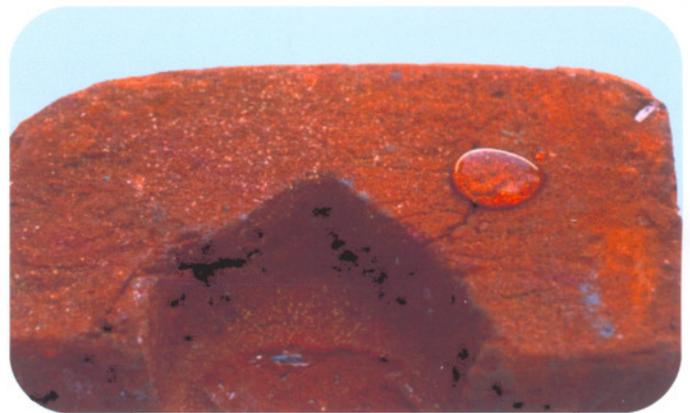
**Protect Against** Mildew, Fungus, Efflorescence, Leaching, Staining, Premature aging, Scaling, Spalling, Corrosion of Reinforcing Steel, Salt burst

**Application Equipment** Paintbrush, Roller or Spray

**Zycosil -  
Unmatched hydrophobicity on various building materials**



*Water treated with blue dye was used to increase the visibility of the results*



*Brick treated with ZYCOSIL*



## APPLICATION GUIDELINES

*Zycosil is water soluble and ideally suited for making old & new cementitious buildings water repellent.*

**Zycosil** is easy to dilute & apply. One coat ensures long term protection. Diluted **Zycosil** protects all horizontal & vertical surfaces, particularly those subject to high abrasion and weathering.

### SURFACE PREPARATION

Clean the surface thoroughly. Remove dirt, dust efflorescence, mold, grease, oil, asphalt, paint, coating and any other foreign materials. **Cleaning will ensure proper penetration of Zycosil.**

#### (1) HORIZONTAL SURFACES (ROOF OR FLOOR) (Dilution 1:10, use within 48 hours)

Deep penetration of **Zycosil** ensures maximum protection, therefore surfaces should be saturated with **Zycosil**.

*24 hours after **Zycosil** treatment, use **ZYCOFIL** to fix the roof micro-cracks. **ZYCOFIL** - a ready to use nano polymer solution in water, fills the micro-cracks & pores.*

#### (2) VERTICAL SURFACES (WALLS) (Dilution 1:20, use within 48 hours)

Diluted **Zycosil** solution can be easily applied in one coat, using paint brush or roller or spray equipment.

### TYPICAL COVERAGE



#### HORIZONTAL SURFACES

11 liters of diluted Zycosil solution

Brick	40 M <sup>2</sup>
Concrete	40 M <sup>2</sup>
Sandstone	40 M <sup>2</sup>
Lime stone	40 M <sup>2</sup>
Plaster	60 M <sup>2</sup>
Cement roof sheet	80 M <sup>2</sup>

#### VERTICAL SURFACES

21 liters of diluted Zycosil solution

Brick	80 M <sup>2</sup>
Sandstone	80 M <sup>2</sup>
Lime stone	80 M <sup>2</sup>
Plaster	80 M <sup>2</sup>

#### (3) CAPILLARY RISE (Dilution 1:10, use within 48 hours)

Ground water rises up the wall through capillaries. Water leakage due to capillary rise causes paint blisters & efflorescence on the walls.

#### Water proofing method for capillary rise

**Injection Method:** Drill 1-2 cms (dia) holes, 10 cms apart, throughout the wall-floor junction. Depth of these holes should be almost equal to the wall width. Inject **Zycosil** solution till the holes overflow. Close the holes immediately after application.

