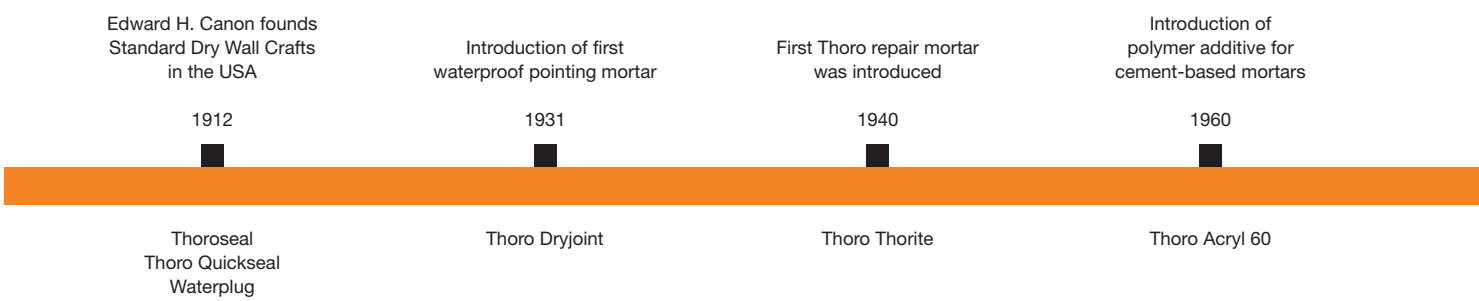
THORO®

Protection Systems

Contents



Welcome to the World of Thoro®

In 1912, construction engineer Edward H. Canon had no idea his Thoro product line would help to generate a major player in the global specialty construction product market. His company, Standard Dry Wall Crafts, had a simple goal: **to solve problems for the construction industry** by providing the best products for the job.

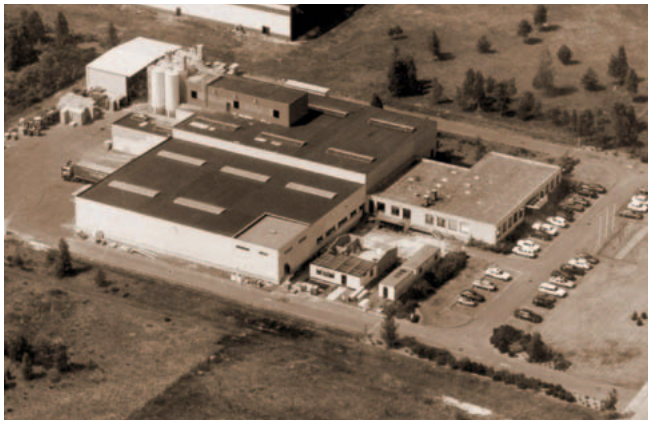
Standard Dry Wall Crafts was renamed into Thoro System Products, a company that obtained a global reputation for quality and reliability where it counts – jobsite after jobsite.

With almost 100 years of experience in concrete repair and waterproofing, Thoro has the know-how to provide the right solution, whatever the problem. The goal of Thoro has never changed – **offer innovative and job specific solutions for the construction industry**. Its unrivalled track record is backed by a product range renowned for quality and durability.

Thoro products are universally approved by internationally recognized test institutes in countries like Germany, UK, Norway, Finland, Spain, Belgium, USA, Italy and many others.

All Thoro products are produced according to the most strict procedures and norms, while being backed by research & development facilities.

The Thoro production unit in Ham, Belgium is certified under EN ISO9001 and EN ISO14001.



1976	1986	1990	1999	2009
Thoro opens European headquarters and production facility in Mol, Belgium	First polymer modified repair mortar was launched	Launch of flexible, crack bridging cementitious waterproofing slurry	Acquisition of Thoro by SKW.MBT nowadays BASF Construction Chemicals	Launch of a new range of waterproofing and repair products
	Thoro Structurite	Thoroseal FX100		Thoroseal WR Thoro Waterpack Thoro Swell Thoro Structurite Level

Protection of Concrete and Masonry

Structures are exposed to weather conditions. This means temperature changes from frozen winter to hot summer, rain or snow, high humidity or UV action. Sometimes, even aggressive chemicals are surrounding the structure.

Construction materials (concrete, masonry, etc.) are thus submitted to these phenomena that can damage their chemical structure and then their durability.

Protection, i.e. a barrier applied between the construction materials and the environment increases the durability.

The Thoro product range offers protection solutions for most structures using original and unique products based on cementitious, acrylic or siloxane/silane chemistries to be applied on concrete, render, masonry, brickwork, concrete block work, etc.

The European standard EN 1504 entitled: Products and systems for the repair and protection of structures which is fully implemented since January 1st, 2009 is organized in 10 parts.

EN 1504, Part 2 deals with product requirements for concrete protection and EN 1504, part 8 describes the quality control and evaluation of conformity. The tasks to comply with the norm require initial type testing, continuous factory production, control and certification by an independent institute, the so-called “notified body”.

Thoro protection coatings and hydrophobing agents have demonstrated their properties in external testing and fulfill the requirements stipulated in EN 1504, part 2 for products in accordance with repair principle 1 (protection against ingress) and principle 2 (moisture control).

Thoro protection products are used to protect concrete, but are also applicable to other mineral substrates as masonry, renders or block work.

BELGIAN CONSTRUCTION CERTIFICATION ASSOCIATION

BCCA

Rue d'Arlon 53

B – 1040 BRUXELLES

CE

EC-CERTIFICATE OF FACTORY PRODUCTION CONTROL

0749 – CPD

BC2-563-0013-0003-002

Products and systems for the protection and repair of concrete structures

Structural and non-structural repair

placed on the market by

BASF Construction Chemicals Belgium N.V.

Nijverheidsweg 89

B - 3945 HAM

and manufactured at the factory located at

BASF Construction Chemicals Belgium N.V.

Berkenbossenlaan 6

B - 2400 MOL

EN 1504-3

Thoro® Quickseal

Thoro Quickseal, a decorative cement-based paint with excellent weatherproof properties. The product exhibits a very hard, durable and light reflective finish. Thoro Quickseal is typically used in applications where a long-lasting, tough and UV-resistant coating is required, e.g. in the renovation of façades.

The product can also be applied over e.g. Thoroseal, to provide a smoother decorative finish in waterproofing applications.

Product benefits:

- Aesthetic, fine structure
- Can be applied on damp substrates
- For internal and external use
- Very hard, tough surface that ensures high mechanical durability
- High water vapour permeability

Technical data:

- Pot life: 45 minutes
- Wet density 1.95 kg/dm³
- Application thickness 0,3 – 0,5 kg/m² per layer, min. 2 layers required
- Water vapour permeability (μH_2O) ± 150
- Colours: white and pearl grey

Thoro® Sheen

Thoro Sheen is a specially formulated acrylic coating for indoor and outdoor use. It provides a tough weatherproof, decorative, durable film for painting concrete, renders and masonry. It is also used as a finish colour coat over Thoroseal waterproofing slurries.

It has a smooth finish and is available in a wide range of colours.

Product benefits:

- Resists frost, de-icing salts and UV light degradation
- For long-term internal and external use
- Alkali and mildew resistant
- Colours remain stable
- Excellent adhesion to the substrate
- Water vapour permeable, allows the substrate to breathe
- Excellent anti-carbonation properties
- Easy to apply
- Water based
- Equipment and spillages can be simply cleaned with water
- High coverage with low consumption

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BC2-562-0013-0005-001

EN 1504-2
Decorative, smooth, rigid, protective acrylic coating

Adhesion strength by pull-off test	≥ 0,8 MPa
Carbonation resistance	Sd > 50 m
Water vapour permeability	Class I
Capillary water absorption	w ≤ 0,1 kg/m² x $h^{-0.5}$
Adhesion after thermal compatibility - Freeze/Thaw with salt - Thunder/Shower	 ≥ 0,8 MPa ≥ 0,8 MPa
Artificial weathering	Pass
Fire resistance	F

Technical data:

- Capillary water absorption: < 0.1 kg/m^2/$h^{0.5}$
- CO_2 permeability (μCO_2) 2.102.898
- Water vapour permeability (μH_2O) 649
- Adhesive bond (28 days): 1.3 N/mm^2
- Curing time: ≥ 4 hours (20 °C / R.H. < 70 %)
- Application in 2 layers, coverage for 2 layers should be between 0.3 – 0.6 l/m^2 on smooth, dense surfaces
- Colours: all British Standard, RAL and NCS colours

Thoro® Lastic S

Thoro Lastic S is a 100 % acrylic coating with excellent elastomeric properties. The outstanding anti-carbonation properties make this material to be ideally suited for the protection of reinforced concrete structures against the aggressive action of carbon dioxide. Thoro Lastic S provides a flexible, weatherproof, protective and decorative coating to concrete, brickwork and masonry.

A smooth decorative finish can be achieved by using Thoro Lastic S, a texture finish can be achieved by using Thoro Lastic TF. Both are available in a wide variety of colours.

A crack bridging of life cracks up to 0.3 mm is achieved with a two layer application.

Product benefits:

- Resists frost, de-icing salts, CO_2 and ultra-violet light to exhibit extreme durability in external applications
- High elastomeric and CO_2 resistance properties for excellent protection performance
- Water vapour permeable to allow the substrate to dry out
- Supplied as a one component, ready-to-use liquid, easy to apply
- Water based, equipment and spillages can be simply cleaned with water

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EN 1504-2
Smooth, elastomeric, high-build protective acrylic coating

Abrasion resistance	Pass
Adhesion strength by pull-off test	≥ 0,8 MPa
Carbonation resistance	Sd > 50 m
Water vapour permeability	Class I
Capillary water absorption	w ≤ 0,1 kg/m² x $h^{-0.5}$
Adhesion after thermal compatibility - Freeze/Thaw with salt - Thunder/Shower	 ≥ 0,8 MPa ≥ 0,8 MPa
Crack bridging ability - Static - Dynamic	 A 2 (+23°C / -10°C) B 2 (+23°C)
Artificial weathering	Pass
Fire resistance	E

Technical data:

- Capillary water absorption: 0.07 kg/m²/$h^{0.5}$
- CO_2 permeability (μCO_2) 532.430
- Water vapour permeability (μH_2O) 3.240
- Adhesive bond (28 days): 1.9 N/mm²
- Crack bridging: up to 0.3 mm
- Dry film thickness: 240 – 380 µm
- Application in 2 layers
- Colours: all British Standard, RAL and NCS colours

Thoro® Glaze SG

Thoro Glaze SG is a ready-to-use emulsion of an acrylic polymer in water which dries to a transparent film and exhibits excellent protection for concrete and masonry against the harmful action of e.g. water or carbonation.

The product provides a clear, semi-gloss finish after application. Although it is only applied at a thickness of 20 to 60 microns it has excellent anti-carbonation properties.

Product benefits:

- Improves the aesthetics by reducing efflorescence and dirt pick-up
- Enhances the natural appearance of exposed aggregate concrete
- Protects concrete from carbonation
- Resistant to UV light, alkalis and air pollutants
- Water vapour permeable
- Single component, ready to use, no dilution on site guarantees consistent quality
- Water based, application equipment and spillages can be easily cleaned with soapy water

Concrete protection effect of THORO GLAZE SG

Technical data:

- CO_2 permeability (μCO_2) 10.003.915
- Water vapour permeability (μH_2O) 4.173
- Application in 2 layers
- Average dry film thickness 17 – 57µm
- Capillary water absorption <0.1 kg/m² x $h^{-0.5}$

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EN 1504-2

Transparent, protective coating

Capillary water absorption	w ≤ 0,1 kg/m² x $h^{-0.5}$
Water vapour permeability	Class I
Carbonation resistance	sd > 50 m
Artificial weathering	Pass
Adhesion after thermal compatibility - Dry cycling	≥ 1,5 MPa
Adhesion strength by pull-off test	≥ 0,8 MPa
Fire resistance	F

Thoro® Enviroseal 20

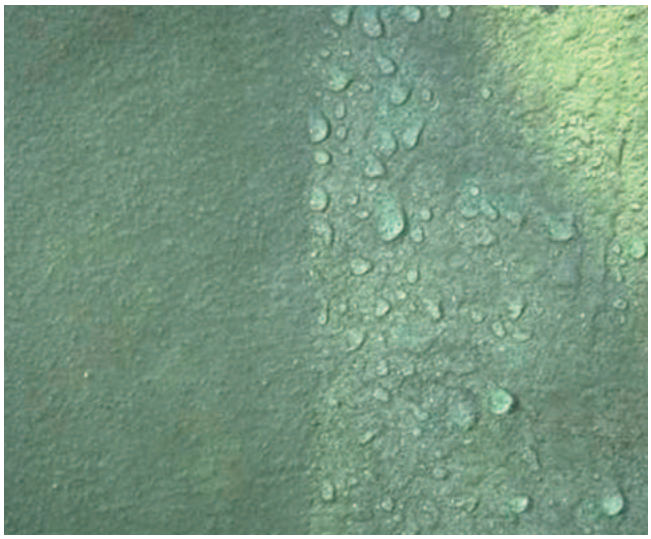
Thoro Enviroseal 20 is a water-based, alkyl alkoxy silane which penetrates deep into the concrete. It protects the concrete from the dangerous actions of e.g. water and chloride ions, while it neither changes the vapour permeability nor the visual aspect of the concrete to which it has been applied.

Dense concrete structures are ideally protected with Thoro Enviroseal 20 when a clear, penetrating water repellent treatment is required.

Thoro Enviroseal 20 can be used on old and new structures, for example, buildings, bridge structures, highway structures, car parks and many other architectural structures.

Product benefits:

- Provides a long lasting protection by penetrating deep into the surface
- Acts as a water repellent and prevents water, salts (chloride ions) and freeze-thaw cycles from deteriorating the concrete
- Improves the aesthetics by reducing efflorescence, algae growth and dirt build-up
- Surface appearance remains unchanged
- Water based, provides a much safer working environment for the applicator by minimizing health hazards associated with organic solvents
- Virtually no product evaporates during spray application. More active silane can reach its intended target minimising wastage and maximising coverage
- Approved by Bridge and Highway Departments



Technical data:

- Water absorption: 5.3 – 8.3 % of untreated substrate
- VOC content: < 350 g/l
- Flash point: > 93 °C
- Average penetration depth: 2.0 – 3.2 mm
- Resistance of chloride ion penetration: < 0.01 % on cement weight at 2 mm depth
- One layer application
- Chloride diffusion constant: 93 % reduction versus untreated substrate

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EN 1504-2

Transparent, protective coating

Capillary water absorption	w ≤ 0,1 kg/m² x $h^{-0.5}$
Water vapour permeability	Class I
Carbonation resistance	sd > 50 m
Artificial weathering	Pass
Adhesion after thermal compatibility - Dry cycling	≥ 1,5 MPa
Adhesion strength by pull-off test	≥ 0,8 MPa
Fire resistance	F

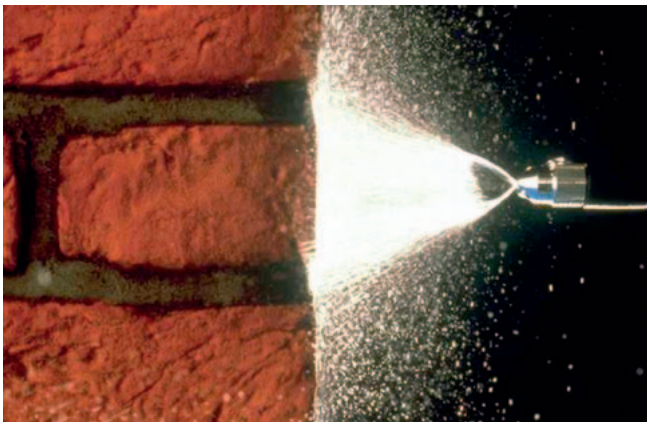
Thoro® Enviroseal B

Thoro Enviroseal B is a water-based silane/siloxane water repellent for masonry structures. The product exhibits excellent and early water beading. It can be used on any kind of clay, sandstone, sand-limestone or mortar substrates.

Thoro Enviroseal B penetrates deep into the substrate, without changing the visual aspect, to provide an effective and long-lasting water repellent surface, as proven by several independent test institutes.

Product benefits:

- Improves the aesthetics by reducing efflorescence
- Water vapour permeable
- Long-term protection due to deep penetration
- High effectivity, more active silane can reach its intended target minimising wastage and maximising coverage
- Ultraviolet and acid rain resistant
- Water based, reduces volatile organic emissions into the atmosphere, non flammable



Technical data:

- Solid content: approx. 7 % by weight
- Water absorption: 95 % reduction
- VOC content: < 350 g/l
- Flash point: > 100 °C
- One layer application

Thoro® Tect CR

Thoro Tect CR, the “soft way” to re-establish the alkalinity of carbonated concrete. Thoro Tect CR protects concrete structure, such as bridges, motorway abutments, tunnels and structures in a marine environment, from the aggressive elements of chlorides, carbonation, water and freeze-thaw cycling.

Mixed with Thoro Acryl 60 it forms a slurry suitable for application by brush, broom or spray.

Product benefits:

- Re-alkalizes carbonated concrete
- Excellent protection against carbonation
- Chloride and freeze-thaw resistant
- Can be applied above and below ground level
- Water vapour permeable
- High bond strength, becomes an integral part of the substrate

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EN 1504-2
Cementitious, carbonation and chloride resistant protective coating

Carbonation resistance	Sd > 50 m
Adhesion strength by pull-off test	≥ 2.0 MPa
Water vapour permeability	Class I
Capillary water absorption	w < 0.1 kg/m^2 x h$^{-0.5}$
Adhesion after thermal compatibility - Freeze/Thaw with salt - Thunder/Shower	 ≥ 2.0 MPa ≥ 2.0 MPa
Fire resistance	F
Dangerous substances	Complies with 5.4

Technical data:

- Capillary water absorption: < 0.1 kg/m^2·h$^{-0,5}$
- Water vapour permeability Sd < 5 m
- CO_2 permeability Sd > 50 m
- Adhesive bond (28 days) 3.2 N/mm^2
- Carbonation depth of the already carbonated is reduced with a factor of ± 5 after application of Thoro Tect CR

Carbonation study:
new concrete exposed to the elements

Carbonation depth in mm after						
Months	2	5	8	12	14	20
Reference concrete	8	8	10	10	11	11
Concrete treated with THORO TECT CR	0	0	0	0	0	0

Thoro® Clear Special

Thoro Clear Special is a ready-to-use liquid dispersion of a siliconate in water to be used as invisible weather-proofing of aged limestone where typical silane based hydrophobing agents do not react.

Product benefits:

- Surface appearance remains unchanged
- Ready to use, no dilution on site means consistent quality
- Can be applied on slightly damp surfaces
- Water based
- Environmentally friendly

Technical data:

- One layer
- Coverage 0.2 – 0.5 l/m^2
- Density 1.03 kg/l

Thoroseal® FX110

Thoroseal FX110 is an elastomeric, crack-bridging cement-based waterproofing coating for concrete and masonry. It can be applied using a Thoro brush or traditional spraying equipment in a thickness of approx. 2 mm in 2 coats. It is typically used for the waterproofing and protection of structures in wet or moist environments and sensitive to movements, vibrations and slight settlement. It protects the structures from the aggressive actions of water penetration and freeze-thaw cycles.

Product benefits:

- Crack bridging capacity up to 0.3 mm or 1.2 mm when reinforced with a Thoroseal FX mesh
- Protects concrete from water, carbonation and de-icing salt
- Water vapour permeable
- Approved for contact with drinking water
- Suitable for internal and external use, against positive and negative water pressure
- Approved by Bridge and Highway Departments

Technical data:

- Resists negative water pressure up to 1 bar
- Resists positive water pressure up to 1.5 bar
- Adhesion strength: ≥ 0.8 MPa
- Adhesion strength after freeze-thaw: ≥ 0.8 MPa
- Static crack bridging properties: Class A2
- Dynamic crack bridging properties: Class B1
- Application thickness of approx. 2 mm in 2 layers

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EN 1504-2
Flexible cementitious waterproofing and protective coating

Abrasion resistance	Pass
Adhesion strength by pull-off test	≥ 0,8 MPa
Water vapour permeability	Class I
Capillary water absorption	$w \leq 0{,}1\ kg/m^2 \times h^{-0.5}$
Adhesion after thermal compatibility - Freeze/Thaw with salt - Thunder/Shower	 ≥ 0,8 MPa ≥ 0,8 MPa
Crack bridging ability - Static - Dynamic	 A 2 (+23°C) B 1 (+23°C)
Artificial weathering	Pass
Fire resistance	F
Dangerous substances	Complies with 5.4

Thoro® Primer 1000

Thoro Primer 1000 is an ultra-fine, acrylic polymer dispersion in water that stabilizes and improves the cohesive strength of a mineral substrate prior to the application of an acrylic coating, such as Thoro Lastic or Thoro Sheen, or other organic paint systems.

Product benefits:

- Deep penetration that increase bonding and substrate cohesion
- Reduces substrate porosity and absorption
- Improves the coverage rate of paint and protective coatings
- Water based, may be applied to a damp surface
- Non-hazardous, non-flammable
- Water vapour permeable

Technical data:

- Density (at 25 °C): approx. 1 kg/l
- Coverage: 0.05 – 0.20 l/m², depending on the condition and porosity of the substrate
- Colours: translucent white solution

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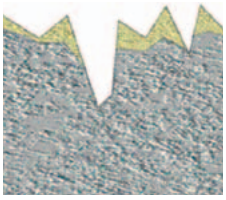
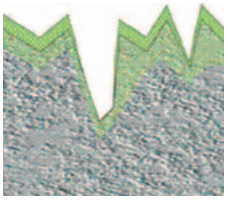
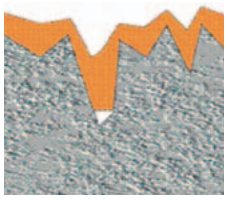
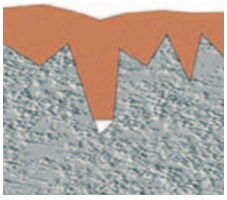
EN 1504-2
Stabilizing primer

Thoro® specification guide

Selecting the right product for each application …

With this specification guide you can easily find which product to use for your needs. Contact your nearest BASF Construction Chemical technical office or your nearest Thoro distributor for further advice.

	Hydrophobing impregnation	Impregnation	Coating	Thick coating
				
Permeability to liquid water (without pressure)	Impermeable	Impermeable	Impermeable	Impermeable
Permeability to liquid water (with pressure)	Permeable	Permeable	Permeable	Impermeable
Water vapour permeable	Yes	Yes	Yes	Yes
CO_2 barrier	No	Yes	Yes	Yes
Examples	Thoro Enviroseal Thoro Clear	Thoro Glaze SG	Thoro Quickseal Thoro Sheen Thoro Lastic	Thoroseal FX110 Thoro Tect CR

	Substrate					Protection against concrete carbonation	Finished surface	
	Concrete	Brick masonry	Concrete block masonry	Limestone	Sandstone		Coated (coloured)	Unchanged
Thoro Quickseal	X	X	X				X	
Thoro Sheen	X	X	X			X	X	
Thoro Lastic S	X	X	X			X	X	
Thoro Glaze SG	X	X	X		X	X		X
Thoro Enviroseal 20	X							X
Thoro Enviroseal B		X	X		X			X
Thoro Tect CR	X	X	X			X	X	
Thoro Clear Special				X				X
Thoroseal FX110	X	X	X			X	X	
Thoro Primer 1000	X	X	X	X	X			

Welcome to the world of Thoro®

Thoro offers innovative and job specific solutions for the construction industry. Since 1912, and with almost 100 years of experience in waterproofing and concrete repair, Thoro has the know-how to provide the right solution for your problem. Thoro products are universally approved by internationally recognized test institutes, while the Thoro production unit in Mol, Belgium is certified under EN ISO9001 and EN ISO14001.

Thoro® offers:

Thoroseal® – cementitious waterproofing products
Waterplug® – fast setting cementitious waterstop
Thoro® Swell – hydroswelling gaskets
Thoro® Acryl 60 – acrylic bonding agent
Thoro® Structurite – concrete repair mortars
Thoro® Crete – horizontal concrete repair mortars
Thoro® Lastic – elastomeric protective coatings
Thoro® Enviroseal – water repellents
Thoro® Grout – cementitious precision grouts

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Your Thoro distributor:

V.04/2012