TECHNICAL PROPOSITION

NEW CONSTRUCTION PERMANENT WATERPROOFING

THE PENETRON® SYSTEM

PERMANENT WATERPROOFING BASEMENT WALLS AND CONCRETE SLABS (UNDER CONSTRUCTION) WITH THE INTEGRAL CRYSTALLINE WATERPROOFING SYSTEM OF PENETRON® COMPANY



PENETRON® ADVANCED WATERPROOFING & PROTECTION SYSTEMS

TOTAL CONCRETE PROTECTION®

1. Concrete waterproofing, using PENETRON ADMIX® P, integral crystalline admixture, added in the Ready-Mix Plant or in the Ready-Mix Truck

PENETRON ADMIX® P is a waterproofing integral crystalline admixture, designed for use with standard and low CFP cements, such as pozzolanic, blast furnace slag cement, etc. It is in powder form and the mixing ratios vary between 0.8 – 1%, by cement weight. Provided that the weight measurements are accurate, the consumption of 0.8% by weight of cement of PENETRON ADMIX® P is sufficient and secure quantity. The product can be added directly, in its powder form, in the Ready-Mix Plant, in the aggregates (dry aggregates, before adding water, usually on the transport belt) or in the Ready-Mix Truck, but it must be diluted in the water, prior to mixing. Mix PENETRON ADMIX® P with water, using a mixing drill. For better convenience, PENETRON ADMIX® P mixing with water can be carried in batch operations. Mix 20 lb (9 kg) PENETRON ADMIX® P (1/2 of the 18 kg bag) with 25 lb (11.5 kg) water in the special formulated with volume tape Mixing Drum of 6 gal (23 Lt) of PENETRON® company, mixing for about 1 minute. The mixture is then poured into the truck and mixed for at least 5 minutes, after the last portion of PENETRON ADMIX® P, at high speed, to ensure even distribution in the concrete mixture.

Example

Indicatively, for concrete mixture with cement content 300 kg-cement/m^3, 3 kg/m^3 PENETRON ADMIX® P are required (mixing ratio 1% by cement weight). If the drum is 9 m^3, then 3 kg x 9 m^3 = 27 kg PENETRON ADMIX® P are needed, that is three “halves” of 9 kg, and so three Mixing Drums of 6 gal (23 Lt) are needed.

The use of certified superplasticizer with the waterproofing integral crystalline admixture is highly recommended, for even better performance, based on the best workability and overall highest quality concrete, so as to reduce the cost of any subsequent repairs. The superplasticizer is added at the beginning, always at high mixing speed and as for the example above, the three PENETRON ADMIX® P Mixing Drums of 6 gal (23 Lt) must be added within the next 4 – 5 minutes, at the same mixing speed and then mix for at least 5 minutes, after the last Mixing Drum, at high speed, to ensure even distribution in the concrete mixture. The mixing time in the truck at high speed, based on the use of a certified superplasticizer, is 8 – 10 minutes in total. Then, the concrete is ready to use.

NOTE: The used amount of PENETRON ADMIX® P admixture in the concrete does not affect the normal practices of good concreting, liquidation, vibration and control curing.

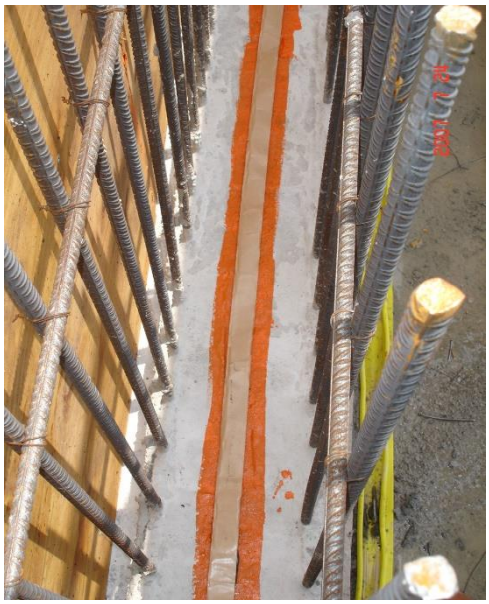
For a complete permanent waterproofing and protection of the concrete, with the use of integral crystalline system, cold joints and cracks, such as tie holes, spalled and honeycombed areas, must be patched, repaired or sealed with crystalline waterproofing mortars, which are the liquid-applied PENETRON®, the repairing mortar PENECRETE MORTAR® and the rapid set waterstop PENEPLUG®. Conventional polymer-modified repairing mortars drastically reduce the function of the crystalline system, where they are applied. Cold joint can be sealed with the use of water expanding strips, PENEBAR® SW, to seal concrete joints, prior to concreting.

2. Waterproofing of cold joints with the use of water expanding strips PENEBAR® SW

PENEBAR® SW 45 RAPID (rapid expansion) water expanding strips or PENEBAR® SW 55 (slow expansion) are recommended for cold joint waterproofing. PENEBAR® SW 55 is highly recommended for cold joint waterproofing at moist environment, or, when rain is forecasted. PENEBAR® PRIMER is used as a primer of water expanding strips, for maximum bonding on the concrete surface and as a water barrier of the substrate. PENEBAR® SW is applied, when the primer is “tacky”, usually half to one hour, since its application. At rare application, when the substrate damp, the use of slow expansion water expanding strip is recommended, using a metal perforated strap fastening, instead of the primer, width 3/64’’ (10 mm) (in 10-meter rolls), positioned along on the surface of the strip and fixing it each 9.8’’ - 11.8’’ (25 - 30 cm), with appropriate concrete nails.

PENEBAR® SW Type B is used for concrete element of width up to 7.8’’ (20 cm) (4-meter rolls, 25 x 9 mm intersection), while PENEBAR® SW Type A is used for concrete element of width above 20 cm (5-meter rolls, 25 x 19 mm intersection). For concrete element above 15.7’’ – 19.7’’ (40 – 50 cm), two parallel expansion strips can be used, at a distance of approx. 30 cm between them. PENEBAR® SW expanding strips must be covered with 4 – 5 cm width reinforced concrete. To connect two expanding strips, their edges must be cut at 45° angle and then bring them together with adequate pressure. Overlapping of the expanding strips must be avoided.









3. Repairing and waterproofing of honeycombed areas, tie holes and pointing applications, with the crystalline waterproofing system of the liquid applied PENETRON® and the repairing PENECRETE MORTAR®

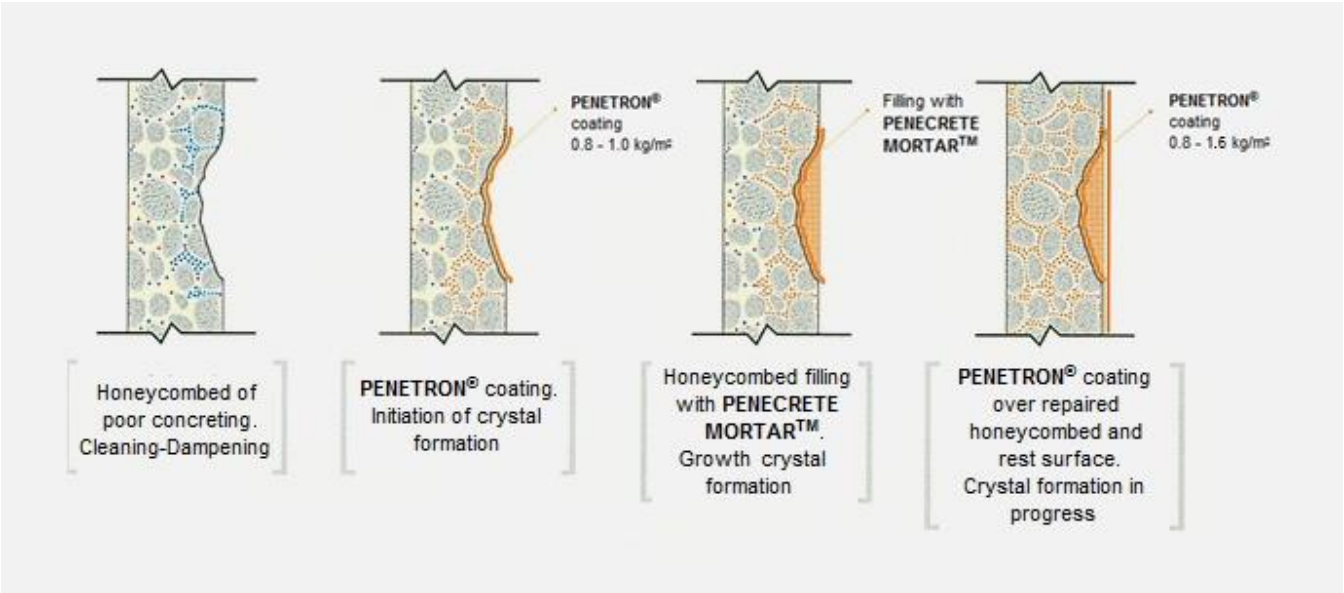
Cracks, honeycombed and spalled areas, of new or existing concreting, should be routed out with mechanical means, to remove dirt, loose materials and aggregates. Clean honeycombed areas with excess water, to remove loose materials and moisten the surface to a dull dampness, which is prerequisite for the application of the liquid-applied integral crystalline waterproofing coating PENETRON® and crystalline waterproofing mortar PENECRETE MORTAR®. When the concrete is damp, with no wet sheen on the surface, apply a slurry coat of PENETRON®, at a mixing ratio of 5 part PENETRON® powder to 3-3.5 parts of water (by volume), on the areas to be patched or repaired and 2/5" (10 mm) around them. While PENETRON® coating is still "green" (tacky), mix PENECRETE MORTAR® with adequate amount of water, until the desired consistency is achieved [usual mixing ratio is 4.5 parts of PENECRETE MORTAR® to 1 part of water (by volume)] and filling the cracks and spalled areas. When PENECRETE MORTAR® has set, but is still moistened, apply a second layer of PENETRON® slurry coat, on the repaired areas.

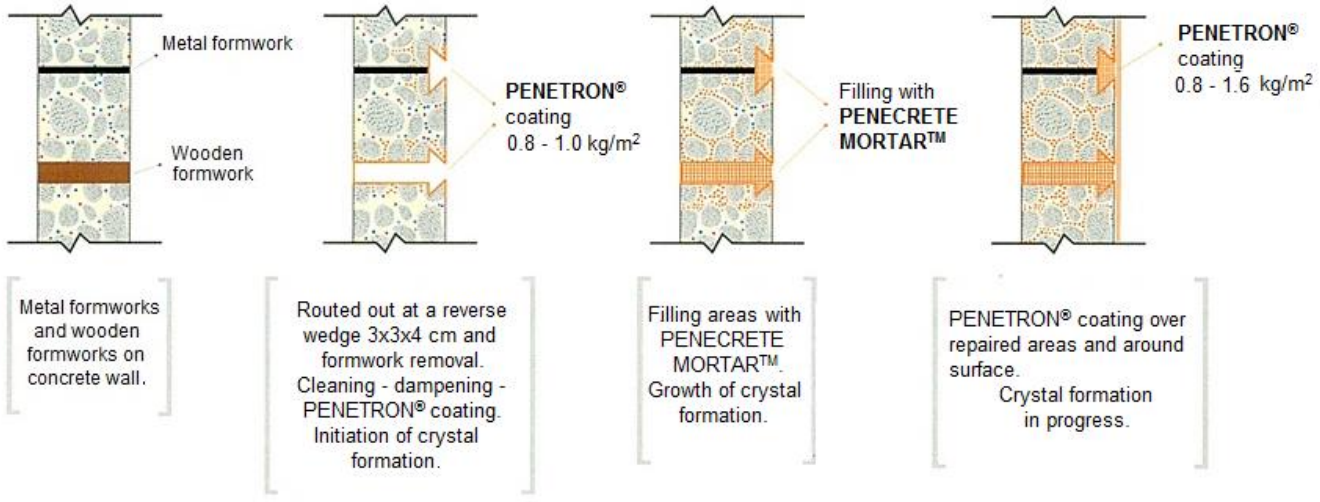
Tie holes must be repaired, as mentioned below. Areas should be chiseled back to sound concrete, by mechanical means and the area of 1.4'' (35 mm) around them and ¾'' – 1.2'' (20 -30 mm) in depth. Metal formworks must be sawcut in ¾'' (20 mm) in depth. Wooden formworks must be removed completely or routed out at a reverse wedge of 1.2''x1.2''x1.6'' (30 x 30 x 40 mm). Clean areas with excess water, to remove loose materials and moisten the

surface to a dull dampness, as mentioned above. When the concrete is damp, with no wet sheen on the surface, apply a slurry coat of the integral crystalline waterproofing coating PENETRON®, on the areas to be patched or repaired and 2/5" (10 mm) around them. While PENETRON® coating is still "green" (tacky), apply PENECRETE MORTAR® on the cracks and spalled areas created by formworks. When PENECRETE MORTAR® has set, but is still moistened, apply a second layer of PENETRON® slurry coat, on the repaired areas.



A schematic description of repaired services with PENETRON® integral crystalline waterproofing system of PENETRON INTERNATIONAL LTD is depicted below:





The description texts mentioned above are not subject of a case study, but technical propositions, according to our best of knowledge and based on our experience and knowledge up to date. For more information, regarding the safe use, treatment and storage of our products, contact PENETRON HELLAS and refer to the *Product Data Sheet* and *Material Safety Data Sheet* of every product you use.

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