PENETRON
TOTAL CONCRETE PROTECTION®

PENETRON INJECT™

CRYSTALLINE WATER CUT-OFF INJECTION GROUT

DESCRIPTION

PENETRON INJECT™ is an advanced two-component water cut-off injection grout with integral crystalline waterproofing ability. It waterproofs concrete and rock by filling and sealing cracks and fissures and can be used to fill hollow spots and voids to bring stability and strength to repaired areas. The extremely fine particle size of its ingredients allows PENETRON INJECT™ to penetrate into micro-fine, hairline cracks in concrete or rock fissures and seal them. In addition to the water cut-off grout, the integral crystalline waterproofing technology forms an insoluble structure to further aid in sealing these cracks and fissures. In the case of concrete, the crystalline network not only seals the cracks, but also the pores and micro-fine voids in the surrounding concrete, making the concrete itself waterproof. PENETRON INJECT™ has a very low, water-like viscosity, which allows it to enter and follow extremely fine cracks and displace any water present under injection pressure. Through its water cut-off action and its unique chemistry, it provides corrosion protection for embedded steel and anchors. In concrete, it also aids in re-passivating areas around injection sites reducing corrosion and restoring a protective layer around reinforcing and other steel embeds.

APPLICATIONS

Tunnels and subway systems
Mines
Foundations
Water retaining structures
Underground vaults
Sewage and water treatment plants
Channels and reservoirs
Bridges
Basement retaining walls Parking structures
Construction joints

ADVANTAGES

Becomes an integral part of concrete, forming a complete body of strength and durability
Penetrates deeply due to its extremely low viscosity and micro-fine particle size
Has a very stable and low heat of reaction, allowing for a controlled injection and ability to fill larger voids completely Protects embedded steel (reinforcing steel, wire mesh and rock anchors) in areas around injection sites
Can be injected into moist or wet areas
Contains no organic or combustible solvents or other harmful ingredients (such as amines, which can cause heavy skin irritation), unlike other organic-based injection materials
Easy to use and labor and cost effective
Only water is required for clean up. No solvents are needed for dilution and cleaning of equipment
Non-toxic
Zero Voc - PENETRON powdered products contain zero volatile organic content and are safe for use both outdoors and in confined indoor spaces

DIRECTIONS FOR USE

Normal set mix ratio (pot life is approximately 2 hours):

PENETRON INJECT™, PART A (Powder)	25 kg (55 lb)
PENETRON INJECT™, PART B (Liquid)	2 l (2.1 qt)
Water	9 l (9.5 qt)

Fast set mix ratio (pot life is approximately 30-60 minutes):

PENETRON INJECT™, PART A (Powder)	25 kg
PENETRON INJECT™, PART B (Liquid)	1 l (1 qt)
Water	10 l (10.5 qt)

Mixing procedure:

Put PENETRON INJECT™ - PART B (LIQUID) into the mixing bucket. Add water to the bucket and mix. Remove 10% of this mixture and store for later re-addition. Slowly add PENETRON INJECT™ - PART A (POWDER) to the 90% mixture mixing continuously with a suitable mixing tool. Mix for at least 2 minutes until a smooth, homogeneous, lump free mix is achieved. Add the stored 10% mixture to the combined powder/liquid mix and continue to mix for an additional one minute.

This completed mixture should have a viscosity of approximately 30 seconds in a DIN 4 mm cup. In cases where an extremely low viscosity mix is needed (e.g., to fill very fine cracks), an additional 0.5 l (0.5 qt) to a maximum of 1 l (1 qt) of water can be added until a viscosity of 18 DIN-seconds is reached.

Once this mix is poured into the funnel of the injection pump, it is ready to be injected. It is helpful to slightly agitate the mix from time to time, approximately every 10-15 minutes, in case all of the mix is not used immediately. Initiation of the curing reaction can be noted by an increase in the viscosity. To avoid solidification in the equipment, the remaining mix should be cleaned out of the funnel, pump and injection tubes.

Pot life times are based on a temperature of 20°C (68°F). In higher temperatures the pot life and workability will be reduced. In such cases more of PENETRON INJECT™ - PART B (LIQUID) can be added with a corresponding and equal reduction in mix water. Penetron International, Ltd. strongly recommends trial testing, should such changes from the standard instructions be necessary.

Application:

PENETRON INJECT™ can be applied using most standard injection procedures; however, as each individual application case will have its own unique parameters, please contact your Penetron technical representative for the most accurate support for your project. The following are the typical application steps:

Step 1: Prepare crack to receive repair materials by sawcutting along the length of the crack at a width of approximately 19-25 mm (3/4-1”). Sawcut should be a reverse “V” or “U” shaped channel to avoid repair materials from popping out.

Step 2: Remove the concrete in the crack area to a depth equal to the width of the sawcut or 50% deeper. (e.g., if a 25 mm (1") wide sawcut is made, a 38 mm (1.5”) depth channel should be cut out).

Step 3: Clean the sawcut channel with a water pressure washer (3000 psi min).

Step 4: Drill holes to receive the injection packers. Diameter and depth of the holes will be as defined by the type and style of injection packer used. Holes should be spaced out at 25-38 cm (10-15”).

Step 5: Place and tighten the injection packers.

Step 6: Partially fill the bottom of the channel and around each injection packer with PENEPLUG® so escaping water is able to flow only through the injection packers.

Step 7: Brush on a slurry of PENETRON® on PENEPLUG® and along the remaining visible channel surfaces, as well as 7-15 cm (3-6”) on the sides of the channel.

Step 8: As soon as the PENETRON® slurry is dry to the touch but still green, fill the remaining channel with PENECRETE MORTAR™. PENECRETE MORTAR™ should be dry packed into the channel using a wood block and hammer to ensure a tight fit with no voids.

Step 9: Allow PENETRON® / PENECRETE MORTAR™ / PENEPLUG® to completely set and dry for 2-3 days. During this time, water may flow freely through the injection packers.

Step 10: Start injecting PENETRON INJECT™ from the lowest injection packer. Pump until PENETRON INJECT™ starts to flow from the next highest injection packer or until the pressure rises (maximum pressure - 5 bar). Close the first injection port and begin filling from the second injection packer. Follow this sequence until the entire length of the repair is filled.

Step 11: Allow PENETRON INJECT™ to cure and harden for at least 2 days. At this point, a visual inspection can confirm that all leaks have been stopped and the injection packers can be loosened and removed.

Step 12: Dry pack all holes left by the injection packers with PENECRETE MORTAR™. Use a dowel to tightly compress PENECRETE MORTAR™ into the holes.

Please see **Typical Application Instruction** Sheet for more detailed information.

SPECIAL CONSIDERATIONS

DO NOT apply PENETRON INJECT™ at temperatures below 40ºF (4ºC), to a frozen substrate or if temperatures will drop below freezing during the curing period (approximately 24 hours).

PACKAGING

PENETRON INJECT™ PART A (POWDER): 25-kg. (55-lb) pails PENETRON INJECT™ PART B (LIQUID): 2-l (2-qt) jugs.

STORAGE / SHELF LIFE

PENETRON INJECT™ must be stored in a dry enclosed area off the ground at a minimum temperature of 7ºC (45ºF). Shelf life when stored in proper conditions in unopened, undamaged packaging is 12 months.

SAFE HANDLING INFORMATION

PENETRON INJECT™ contains Portland cement and is highly alkaline. The use of rubber gloves, goggles and other appropriate protective gear during mixing and application is recommended. Avoid contact with eyes and skin. In case of eye contact, rinse immediately with plenty of water and seek medical advice. Refer to the Safety Data Sheets for additional safety precautions. KEEP OUT OF REACH OF CHILDREN.

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injection product for force transmitting filling of cracks
U (F1) W (1) (5/30) (1-3) (0)
Adhesive by tensile bond strength: > 2 MPa
Adhesion by slant shear strength: monolithic failure
Glass transition temperature: NPD
Shrinkage: < 3 %
Workability: crack width from 0,1 mm, dry and damp
Corrosion behaviour: deemed to have no corrosive effect
Reaction to fire: NPD
Dangerous substances: NPD

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