

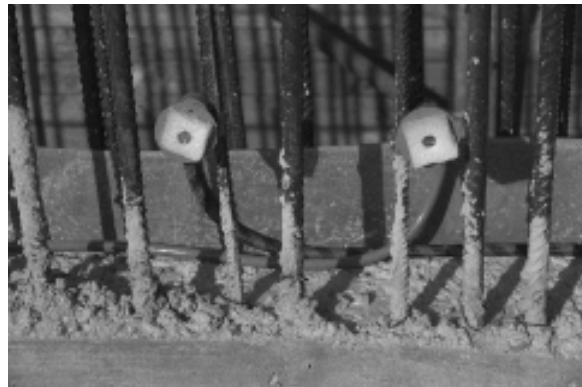
WEBAC 2000 INJECTION TUBE SYSTEM

INJECTION



WEBAC Inject Screws (IPS) shall be attached to the Inject sleeves prior to injection. The quick release zerk coupler allows for easy connection to the pressure grout line. The injection with WEBAC polyurethane resins shall be done after the concrete is cured and all the cold joints are set. Injection pressures may range between 200 to 1500 psi.

In case of water infiltration into the tube it might be useful to leave the distant end open for drainage purposes. Grout shall be injected under low pressure until it leaks out from the distant end of the tube thereby replacing the water. Immediately the opening should be closed with an Inject Screw and the injection process should continue. It is desired to see material penetrating from the cold joint as the injecting process progresses. Continues penetration of material from the injection end of the tube to the far end is a good indicator for complete injection but will not always be achieved. Reason may be extremely tight sections in the cold joint or sections of materials adhesion where resins cannot penetrate. In any case material consumption and injection pressures should be closely monitored as an indicator for material flow, injection progress and injection success.



The material to be injected can be of foaming and non-foaming nature. Foaming materials should not foam too fast to allow for full penetration through the tube and cold joint. The amount of accelerator added should be determined prior to any injection attempts. Most cold joints show minimal seepage and a fast setting foam may not be advised! Good results have been achieved with non-foaming flexible sealants such as WEBAC 1403. The material stays open long enough for good penetration and permits lower injection pressures.

Consumption of injection grout is determined by two factors. One: product consumption to fill the tube. This amount is very low at a rate of approximately one quart of material per 150 feet of tube. Two: Consumption to seal cold joint / joint. Thickness of the structure and joint width determine the amount of product needed. Altogether the total consumption of product in inject tube injection is similar to grout use by injection with packers.

Please do not hesitate to call your local distributor or the WEBAC technical support line for help with the choice of the right material or any questions you might have with the installation of the Inject Tube System.



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WEBAC 2000 INJECTION TUBE SYSTEM

WATERTIGHT COLD JOINTS

When building water tight structures such as a tank or a basement, the concrete serves two purposes: it provides the structural support and it seals against water, either in a way to keep it in the structure or to keep it out. In either situation, special attention must be paid to the construction of "cold" joints.

WEBAC introduces the WEBAC 2000 Injection Tube System as a practical method for making cold joints watertight.

A well known characteristic of concrete is shrinkage while curing. Stress caused during this time and temperature changes provoke the development of small cracks and fissures. Several design and reinforcement techniques help to control this effect, but cannot control them completely. Fine cracks of sometimes less than 0.1 mm are inevitable. These cracks are considered normal and generally do not cause any problems. However, at cold joints, the tendency to form larger cracks cannot be reduced. Since old and new concrete do not bond together homogeneously and do not form a monolithic concrete body, stress cracks concentrate mainly in these areas. They easily conduct water and may cause severe damage.

The WEBAC 2000 Injection Tube System for sealing cold joints utilizes the natural tendency of concrete to form cracks. A special tube system is installed at the joint where leaks are most likely to occur. The system allows resin injection directly into the joint through a protected porous tube after completion of the structure. The resin penetrates through the perforation of the tube and fills the cracks and voids of the cold joint area thereby sealing the structure.

To be effective, the system must have certain properties. The tube must be sturdy enough to withstand the high pressure of placed concrete and it must resist concrete slurry penetration. On the other hand the injection resin must be able to penetrate the hose at a moderate injection pressure. The installation and injection process must be suitable for construction sites. The WEBAC Injection Tube System is designed to meet these requirements:

- o A sturdy PVC hose withstands pressures of at least 60 ft of poured concrete.
- o A layer of tightly woven fabric (filter) prevents concrete particles from entering the Inject Tube.
- o A large number of holes in the hose allows the resin to penetrate the tube with little loss of pressure.
- o A top layer of tough plastic fabric protects the filter fabric against mechanical damage during the installation on the rough concrete surface.
- o The WEBAC Inject Sleeves and Inject Screws provide for easy installation and resin injection.

INTRODUCTION

Before pouring the new concrete the tube shall be attached to the existing surface as tight as possible and usually towards the middle of the future cold joint using suitable clips or by attaching it to the existing rebars. It is crucial that the hose is tightly fixed in the center of the joint area so that it can neither move nor lift during the concrete placement. Six to twelve inches between clips are typically recommended.

The hose must be placed in a manner that it will not touch the outside surface of the structure at any point. To allow sufficient injection pressures, the maximum length of injection tube should not exceed 30 ft.

WEBAC Inject Sleeves have to be attached to both ends of the Inject Tube prior to installation. The Inject Sleeves are solid and cannot be penetrated by the resin. Two thirds of the sleeves must be poured into the concrete to allow a successful injection procedure. The WEBAC Injection Screws attach to the sleeves prior to injection. For detailed information, please refer to our product data sheet.

A new method of injection offers the WEBAC static connector or packer. The connectors are nailed or screwed to the inside of the form and are exposed when the form is removed. Forms do not have to be drilled or modified in any way.

The concrete should set for as long as necessary to allow shrinkage. WEBAC polyurethane resin is then injected by attaching a WEBAC packer and pumping resin into the tube. Electrical or hand pumps may be used for the resin injection. To ensure that the tube is filled, resin shall be pumped until it emerges from the other end of the hose at the packer, which is then plugged with a zerk fitting. The resin shall be pumped slowly and steadily. High pressure forces the resin out of the hose and into the fine cracks and voids. Injection shall be continued until resin emerges from the joint. Typically the applied pressure should not exceed 1500 psi. It is recommended to make several injections while the resin is still workable. The typical working time is 20 minutes at 68 F. The concrete temperature and presence of water will effect this time. The cured product will permanently seal against penetrating water.

When used appropriately, the WEBAC 2000 Injection Tube System is the most convenient and effective way to seal construction joints. The non-invasive application through the pre-installed system minimizes the risk of damage. Compared to the injection method through mechanical packers that have to be installed by drilling holes into the concrete, the WEBAC 2000 System reduces the amount of labor and material drastically. (Although WEBAC Inject Tubes might be re-injected under certain limited conditions WEBAC does not endorse this method as practical and reliable.)

WEBAC 2000 INJECTION TUBE SYSTEM

WATERTIGHT COLD JOINTS

CHARACTERISTICS

- Waterproofing of Cold Joints
- Injection of resin when leakage occurs or as preventive measure after total curing of the concrete
- Injection of joints in different sections possible
- Easy installation with no damage to the concrete

ADVANTAGES OF THE WEBAC INJECTION TUBE

- Very flexible Tube-System
- Composed of durable materials
- Free of metal
- Competitively priced

APPLICATIONS

The WEBAC 2000 Injection System is designed for use in concrete structures which contain joints where a hydrostatic load on the face of the structure is expected. After injection it reliably prevents water seepage through concrete joints in structures such as parking garages, stadiums, subways, tunnels, swimming pools, water reservoirs, locks, canals, dams, sewage treatment plants, water tanks and similar structures.

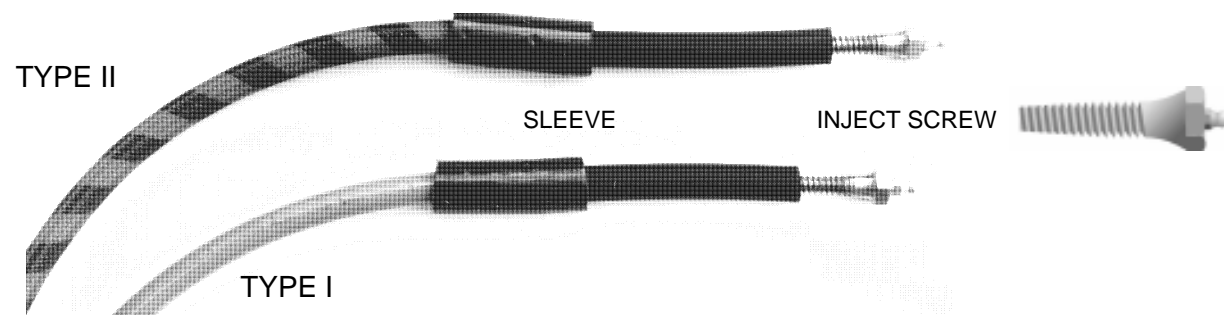
TYPES

Type I

PVC tube with holes, constructed to withstand pressures of freshly placed concrete. Covered by a thin perforated PVC membrane to protect the inner tube from the entry of cement particles and abrasive effects of the concrete aggregates. (Patent No.3507806)

Type II

PVC tube with holes, constructed to withstand pressures of freshly placed concrete. Covered by two woven membranes to protect the inner tube from the entry of cement particles (filter, membrane one) and abrasive effects of the concrete aggregates (protector, membrane two).



WEBAC 2000 INJECTION TUBE SYSTEM



ASSEMBLY

Cut the WEBAC inject Tube to required length (maximum 30 feet). In order to prepare the tube for resin injection at a later date, each section must have one PVC Inject Sleeve attached to each end. PVC Inject Sleeves are installed by pulling the end with the larger diameter as

far as possible over each end of the Inject Tube. WEBAC Inject Screws with zerk fittings can be attached to the sleeves now or at a later time prior to injection by screwing them clockwise into the sleeve opening. Proper length of tube is now ready for installation.

INSTALLATION

WEBAC Inject Tube with the adapted end sleeves is to be fastened directly to the concrete surface or to existing rebar in a fashion that the tube has continuous contact to the surface. Sweep concrete to remove any material that may interfere with direct contact between the Tube and the surface. Position the Tube as required and use clips or rebars and wire to keep the Tube in place. Clips may be nailed or glued with epoxy a maximum of 12" apart or as necessary to maintain consistent contact of the Tube with the concrete. Tension on the Tube must be sufficient as not to allow Tube to shift during concrete pour. Note: Continuous contact between Inject Tube and surface is essential for the system to work. Thorough preparation is the key to successful results.

If continuous length of the cold joint is in excess of 30 feet (10 meters) two or more sections of Inject Tube have to be installed. Adjacent WEBAC 2000 Inject Tube segments shall overlap 12 inches in tight contact to ensure continuous resin injection.

PVC Inject Sleeves shall be bent in a ninety degree angle before exiting towards the face of the concrete. The black colored connection piece must be embedded a minimum of 2" inside concrete face to allow high injection pressures without any failure to the connection. End piece shall protrude past concrete face 1" - 3" to allow access for future resin injection. After stripping forms, PVC Inject Sleeves must remain clearly visible in order not to complicate or prohibit injection.

