

SealBoss® Inject Tube System 2000

Grout Injection Tube System For Water Tight 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
- Re-Injectable & Double Hose Designs (ST)
- Competitively priced
- Very flexible Tube-System
- Composed of durable materials
- Free of metal

structures.

Type ST

Designed for efficiency, re-injection capability and double layout capability, the ST Inject Tube is not only our latest design but also our most affordable solution. This flexible SingleTube (ST) PVC constructed hose has hundreds of micro slits acting as one way valves permitting extrusion of resin under injection pressure but denying entry of water and debris from the outside in. This very simple but highly effective design does not require an outer membrane. Since the tube can be flushed after injection and its openings do not clog with most injection resins it is possible to re-inject the system in certain conditions. The system is also designed to be installed in a paired combination if so desired. The ST Inject Tube is simple, highly effective, extremely price competitive and highly

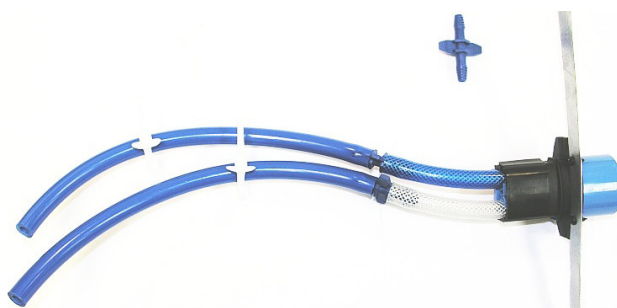
durable.

Type II

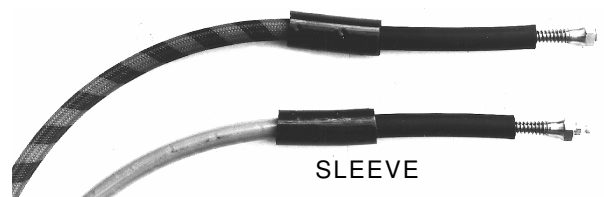
PVC tube with holes, constructed to withstand pressures of freshly placed concrete. Covered by two woven membranes (filter, membrane one) and abrasive effects of the concrete aggregates (protector, membrane two).

APPLICATIONS

The *SealBoss Inject TubeSystem 2000* 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



TYPE ST



TYPE II

SLEEVE



INJECT SCREW

SealBoss[®] Inject Tube System 2000

Grout Injection Tube System For Water Tight Cold Joints**Introduction**

The **SealBoss Inject TubeSystem 2000** is an efficient and easy to install system to create water tight cold joints.

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 0.1mm 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 **SealBoss Inject TubeSystem 2000** 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 **SealBoss Inject TubeSystem 2000** is designed to meet these requirements.

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.

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 Injection Screws attach to the sleeves prior to injection. For detailed information, please refer to our product data sheet.

The concrete should set for as long as necessary to allow shrinkage. Polyurethane grout is then injected by attaching a packer and pumping grout 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 **SealBoss Inject TubeSystem 2000** 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 System reduces the amount of labor and material drastically.

Some Inject Tubes may be re-injected under certain limited conditions. Please contact our technical support staff for further informaion.

SealBoss® Inject Tube System 2000

Grout Injection Tube System For Water Tight Cold Joints

ASSEMBLY

Cut the 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. 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

The 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 with 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 rebar 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.

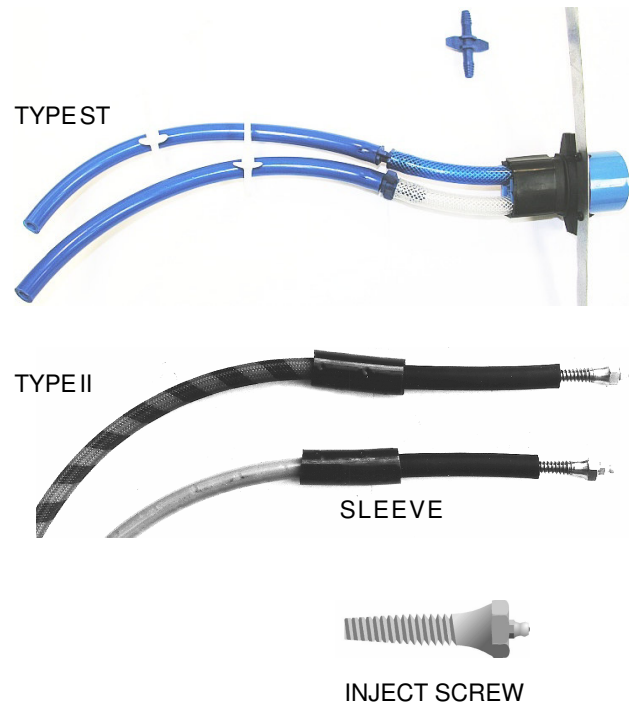
If continuous lengths of cold joint are in excess of 30 feet (10 meters), two or more sections of Inject Tube have to be installed. Adjacent 2000 Inject Tube segments shall overlap 12 inches in tight contact to ensure continuous resin injection.

PVC Inject Sleeves shall be bent in a ninety degree angle before exiting 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.

INJECTION

Inject Screws 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 polyurethane grout 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 also been achieved with non-foaming flexible LV-Resins.

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. Alltogether 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 SealBoss 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.

SealBoss® Inject Tube System 2000

Part 1: General

1.01 Scope

Under this section the Contractor shall furnish and install permeable grout tubes where required to prevent leakage through construction joint.

1.02 Work Included

Cleaning concrete surface.
Installation of permeable grout tubes.
Injection of permeable grout tubes with sealing materials.

1.03 Product Data

Submit product data in accordance with Section 03151.
Comply with instructions for storage, shelf life and handling.

Part 2: Products

2.01 Permeable Grout Tubes

Shall be composed of a perforated inner PVC tube, inner filter membrane and an outer protective synthetic membrane or a precision pre-cut PVC tube. The tube shall be permeable for the injected sealing materials and impermeable for cement particles. The tubes shall be equal to **Injet Tube System 2000 by SealBoss.**

All materials shall be delivered to the site in undamaged, unopened containers bearing the original labels.

2.02 The Sealing Materials

a. GENERAL

The sealing materials shall be an MDI based, solvent-free, hydrophobic polyurethane grout with accelerator system. All materials shall be delivered to the site in undamaged, unopened containers bearing the manufacturer's original labels.

b. POLYURETHANE GROUT AND ACCELERATOR

The polyurethane grout shall have the ability to react with water and to expand in volume. The accelerator shall be able to control the reaction time from one minute to one hour. After reaction, the polyurethane grout shall form a flexible closed cell polyurethane foam.

c. MIXING AND HANDLING

Mixing and handling of the chemical grout and the accelerator, which are non-toxic and non-hazardous under normal conditions, shall be in accordance with the recommendations of the manufacturer and all applicable safety codes and shall

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be performed in such a manner as to minimize hazard to personnel. It is the responsibility of the contractor to provide appropriate protective measures to insure that chemicals or foam produced by said chemicals are under the control of the contractor at all times. Plastic or metal mixing tanks shall be used. Tanks of concrete or wood should not be used.

d. PUMPS

Hand operated, air driven, electrical positive displacement and airless pumps can be used. Pressures of 500 to 1500 psi may be adequate.

Part 3: Execution

The permeable grout tubes are required at all formed joints in concrete walls and slabs which separate habitable spaces, machinery and equipment areas from ground water or from water filled tanks, basins, flumes, manholes, etc. It shall also be placed in vertical joints in tank walls and in other joints as shown on the drawings.

3.01 Preparation

Clean concrete surface of dirt, laitance, corrosion, or other contamination prior to installation of the tubes to insure direct contact of tube with concrete surface.

3.02 Installation of Permeable Grout Tube

Tube shall be wired to reinforcing steel on concrete surface (approx. each 10-12 inches).

The PVC tube endings will be bent so that they will protrude through or under the form.

Each end of the tube shall cross the next one so that there will be no default in the injected zone.

3.03 Injection of Sealing Materials

After the concrete has cured for ___days the grout tubes shall be injected with a sealing material to fill cold joint and honeycombs.

Start injection at one end of the grout tube. As soon as sealing material appears at other end, close this other end with inject screw and increase pump pressure. Stop injection when sealing material percolates out of cold joint. Patch injection ports with cementitious mortar.