

## **SECTION 07902**

### **TURBO-SEAL U INJECTED POLYMER RUBBER BENTONITE GEL SPECIFICATION**

#### **SCOPE:**

The work covered by this division of the specification consists of furnishing all labor, materials and equipment to perform all operations in connection with the complete installation of the pressure injected polymer rubber bentonite gel as shown on the Drawings and/or as specified herein.

#### **MATERIALS:**

All material shall be new, of first grade quality.

Rubber bentonite injection resin (for wet or dry application) shall be Turbo-Seal U as supplied by RE-Systems Group of Minneapolis, MN.

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#### 1. General Requirements

- a. Capable of penetration and performance in concrete separation 5 mils and greater in width
- b. Chemical resistant
- d. Self Sealing
- e. Non-curing
- f. Non-toxic
- g. No VOC content
- h. Single component
- i. Adhesive to wet substrate, and heterogeneous materials
- j. Non-flammable

## 2. Special requirements

### Application Properties:

PROPERTY	RESULTS
pH	7.5 ~ 8.0
Specific Gravity	1.1 ~ 1.3
Freezing Point	Below -25°
Softening	Below 30°
Physical State	Liquid
Appearance	Black
Viscosity – ASTM D-2202	3,600,000 Cps
Flash Point	> 200° F
Mix Ratio	N/A
Initial Cure	N/A
Initial Cure	N/A
Packaging	20L pails

### Physical Properties:

PROPERTY	RESULTS	TEST METHOD
Solids Content	75%	ASTM D1353
Flow	113 ± 4mm	ASTM D2202
Penetration, in mm	28 ± 0.8mm	ASTM D5329 sec. 6
Flash Point	No observable flash point	ASTM D56
Toughness	1.64 ± 0.15 lbs	CGSB 37.50 – M89
Elongation	14.93 ± 1.82 inches	CGSB 37.50 – M89
Energy to Break	11.70 ± 1.08 in-lbs	CGSB 37.50 – M89
Adhesion	Rating of 1 (Excellent)	CGSB 37.50 – M89
Softening	Below 30C	ASTM D36
Viscosity	3,600,000 CPS @ 72° F	ASTM D2196
Water Absorption	Gain 7 ± 3.2 gr.	CGSB 37.50 – M89
Low Temperature Flexibility	No cracks	CGSB 37.50 – M89
pH	7.71	

## **SPECIALTY EQUIPMENT:**

1. Hammer drill, drill bits.
2. The equipment used to inject the polymer rubber bentonite gel shall be acceptable to the polymer rubber bentonite gel manufacturer and shall conform to all of the following:
  - a. Capacity to mix and circulate the polymer rubber bentonite gel material.
  - b. Capacity to inject the polymer rubber bentonite gel under controlled, variable pressures.
  - c. Capacity to keep polymer rubber bentonite gel material and injection hose at a temperature above freezing, so as to enable the optimal injection flow rate.

## **EXECUTION:**

1. The thickness of the concrete shall be determined.
2. For injection of a restorative waterproofing membrane, 5/8" diameter ports shall be drilled to the waterproofing layer at 3.25' intervals. For high pressure injection >500 psi, 10mm ports shall be drilled at 1.75" intervals. For injecting cold joints, joints or cracks, entry ports for polymer rubber bentonite gel shall be drilled, spaced in a zig zag pattern on either side of the crack to assure that when the polymer rubber bentonite gel material shows at the adjacent port, it has completely filled the crack to its full depth. Entry ports shall be spaced along cracks and spacing usually determined by the tightness of the crack and the depth of the concrete substrate. Spacing is generally between 6 and 14 inches.
3. Install the injection packers. For low pressure injection < 500 psi, an injection pipe with an outer diameter of 5/8" shall be used. For high pressure injection > 500 psi 10 mm zirc fittings shall be used.
4. Injection of the polymer rubber bentonite gel into concrete, unless permitted by the engineer, begin first at the entry port of lowest elevation and continue until uncontaminated polymer rubber bentonite gel flows out of the adjacent port. Injection pressure shall be kept as low as practical and shall generally be between 200 psi and 300 psi plus any hydrostatic head. The connection between the entry port and the mix head of the injection nozzle must be sufficiently tight to prevent polymer rubber bentonite gel from running out on the concrete surfaces.

5. After injection at a given port is complete, this port shall be plugged and injection started at the next adjacent port. This procedure shall be repeated until the affected area is completely filled. Upon completion surface to be left as noted on the drawings.
6. Holes shall be filled with non-woven cloth and high strength fast set mortar. If high pressure conditions exist or the specified drill hole is larger than 5/8", wood dowels or alternative material can be used to fill injection holes. Repeat process as necessary.

**QUALITY CONTROL:**

1. The overall quality of the work shall be judged by the contractor's ability to achieve watertightness of the area of injection.
2. If feasible, water tests shall be performed to test the adequacy of the repair.

**EXPERIENCE:**

The pressure injected polymer rubber bentonite gel installation shall be performed by a contractor who is an authorized applicator of the process, for not less than 1 year. The contractor must have also installed no less than 5000 gallons of injection. 2500 gallons of this work shall be in not more than 1 job. Alternately, the contractor may make arrangements for a factory technician with the above experience to supervise the work. It is expected that the contractor will furnish adequate labor, material and equipment such that the work will progress with out any undue and unnecessary interruption.