

## METHOD OF TEST FOR SALT SPRAY OF EPOXY-COATED REINFORCING BARS

### 1. SCOPE

1.1 This test method determines the resistance to disbonding of an epoxy coating system applied to reinforcing bars, after the coated bars, each with six damage sites on the coating, are exposed to water spray containing 5% NaCl at 35°C for 800 hours. The sampling frequency and acceptance requirements are described.

### 2. RELEVANT DOCUMENTS

- 2.1 ASTM A 775M 96: ANNEX A1.2.3 Salt Spray Resistance
- 2.2 ASTM B 117

### 3. APPARATUS

- 3.1 SALT SPRAY CABINET: Salt spray cabinet, as described in ASTM B 117.
- 3.2 SALT SOLUTION: 5% NaCl by mass dissolved in distilled water.
- 3.3 UTILITY KNIFE: Utility knife with sharp blades.

### 4. PREPARATION OF TEST SAMPLE

- 4.1 Specimens, each 200 mm in length, and free from holidays and bare areas, shall be cut from production coated bars. Both ends of each bar shall be completely sealed with silicone or plastic coating.
- 4.2 On each bar, drill six 3 mm diameter holes, as shown in Figure 1. Three of the holes shall be on the top of the bar, and three on the bottom. The first hole on each side shall be drilled approximately 50 mm from one end of the bar, the second hole drilled approximately 50 mm from the other end, and the third hole drilled approximately half-way in between. Each hole shall be centred between deformations and just deep enough to expose the steel.

### 5. PROCEDURE

- 5.1 Place the bars with the damage sites facing to the side in the salt spray cabinet for  $800 \pm 10$  h at  $35 \pm 2^\circ\text{C}$ . The bars shall not be stacked and shall be placed at one level.
- 5.2 After  $800 \pm 10$  h, remove the bars from the salt spray cabinet and rinse them in distilled water. Store the bars in air at  $23 \pm 3^\circ\text{C}$  for  $24 \pm 2$  h before preparing them for adhesion testing.
- 5.3 At each damage site and its adjacent area, scrape the surface gently with the front side of the utility knife to remove the corrosion products which have loosely deposited on the surface. Do not apply force such that the coating is damaged.
- 5.4 Using a new blade, make 4 cuts through the coating at each damage site, extending outward from the site at  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ , and  $270^\circ$ , providing 4 sections of coating for adhesion testing, as shown in Figure 2. Ensure

that the cuts extend through the coating such that the metal is visible. Replace the knife blade if it becomes dull or damaged. The length of each cut shall be not less than 5 mm or the distance between adjacent deformations.

5.5 Perform the adhesion test as follows:

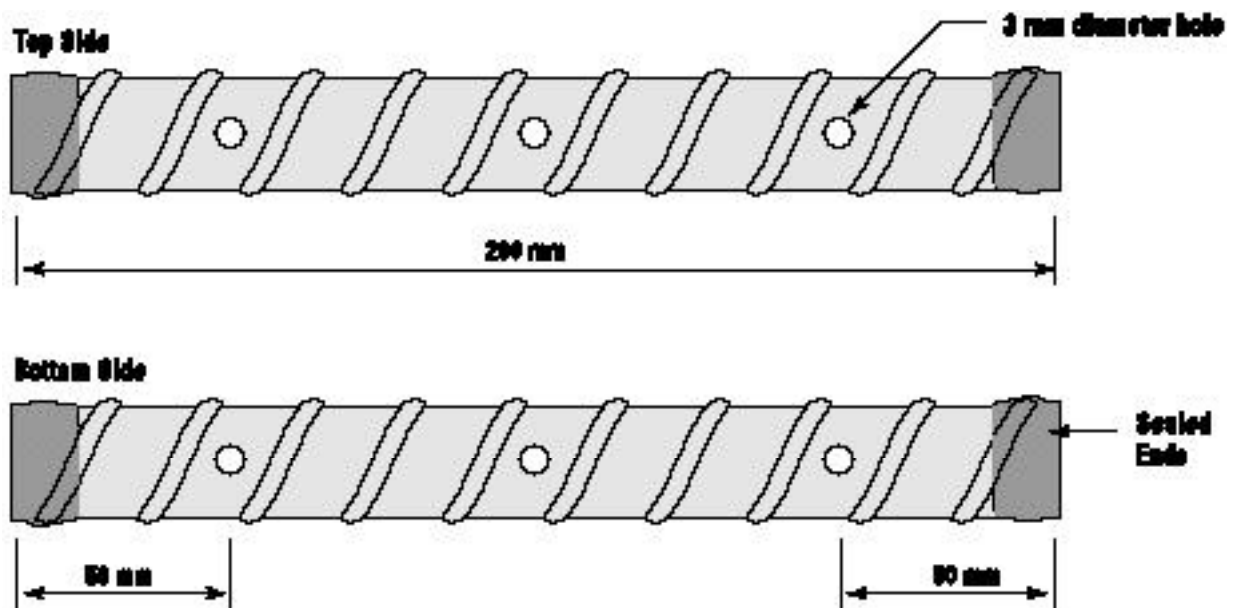
Insert a new blade in the knife. Position the knife vertically on the bar so that the point of the blade touches the edge of a section of coating and the plane of the blade aligned midway between the cut lines; rotate the knife so that it makes a shallow (approximately 30°) angle with the bar while maintaining the tip of the blade in contact with the bar as shown in Figures 3 and 4, but without applying force to the coating. Determine the adhesion of the coating by inserting the blade slowly and applying steady force equivalent to approximately 2 kg until the coating resists the insertion. Maintain the force for at least 5 seconds. Do not apply force such that the coating is cut. Use a lever action on the blade to remove any coating which has been disbonded as a result of inserting the blade under the coating.

5.6 Measure the diameter of the disbonded area from the 0° to 180° coating edges and the 90° to 270° coating edges, and average the two values. Subtract the diameter of the original damage site from this average to obtain the test value.

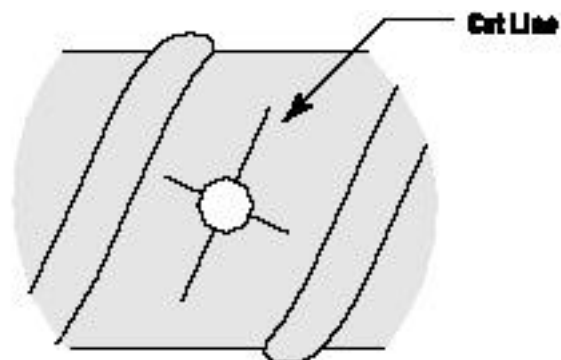
## 6. REPORT

6.1 The report shall include the following information for each test bar:

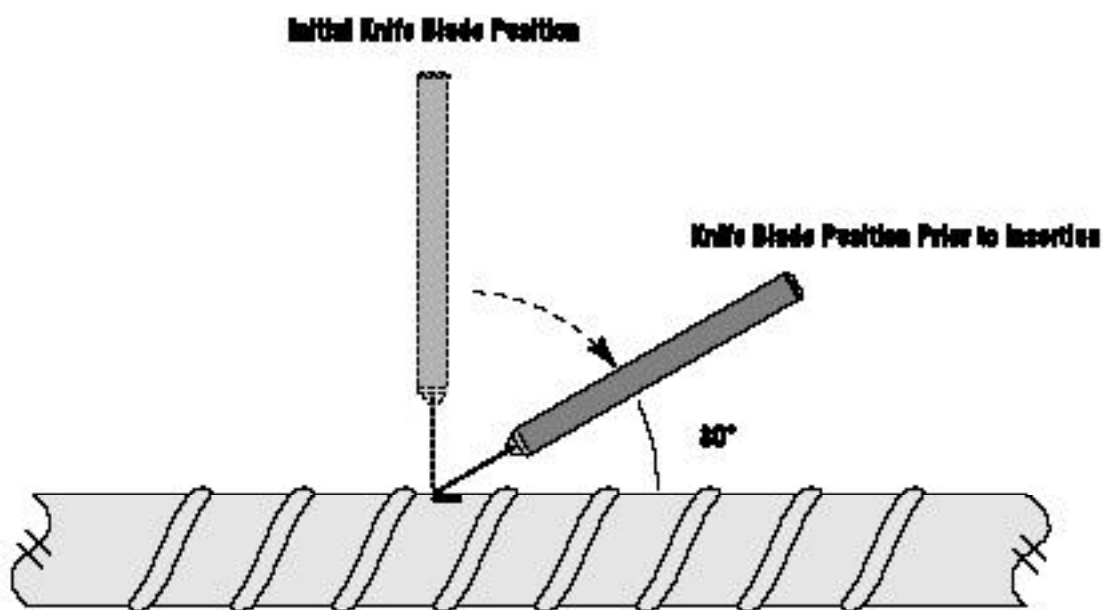
- (a) date of testing
- (b) epoxy powder description
- (c) primer description (if any)
- (d) bar batch number
- (e) disbondment radius for each of the six test locations



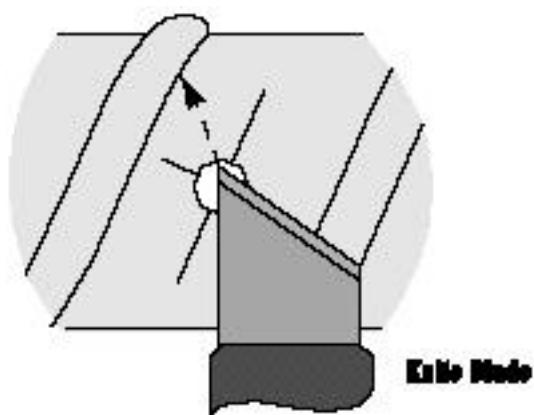
**FIGURE 1**  
**TEST LOCATIONS ON BAR**



**FIGURE 2**  
**PREPARATION OF CUT LINES AT DAMAGE SITE FOR ADHESION TESTING**



**FIGURE 3**  
**KNIFE BLADE - INITIAL PLACEMENT**



**FIGURE 4**  
**KNIFE BLADE - ORIENTATION PRIOR TO INSERTION**