

**SECTION 937**  
**ADHESIVE BONDING MATERIAL SYSTEMS**  
**FOR STRUCTURAL APPLICATIONS**

**937-1 General Requirements.**

Adhesive bonding material systems for structural applications shall consist of pre-packaged 2-part chemical components. The material systems shall be specifically intended for use in structural applications for bonding anchors and dowels to hardened concrete. Applications are limited to anchors and dowels installed in positions ranging from vertically downward to horizontal.

Do not use material from containers which are damaged or have been previously opened. Use only full packages of components. Combining of epoxy bonding components from bulk supplies is not permitted.

Material systems for Type HV and HSHV shall be pre-packaged to automatically proportion and mix the materials for use. Manual proportioning of the components will not be permitted.

**937-1.1 Type HV Adhesives:** Use Type HV adhesive bonding materials for all horizontal installations and vertical installations other than constructing doweled pile splices, except when Type HSHV is required. Type HV adhesives may not be substituted for Type HSHV adhesives.

**937-1.2 Type HSHV Adhesives:** Use higher strength Type HSHV adhesive bonding materials for installation of traffic railing barrier reinforcement and anchor bolts into existing concrete bridge decks and approach slabs. Type HSHV adhesives may be substituted for Type HV adhesives.

**937-2 Qualified Products List.**

Manufacturers of adhesive bonding material systems may apply for inclusion of individual products on the Qualified Products List. The application shall be made in accordance with 6-1 and shall include certified test reports from an independent testing laboratory which shows the material system meets all the requirements specified herein.

**937-3 Certification.**

The Contractor shall provide the Engineer with certification from the manufacturer of the adhesive bonding material system, confirming that the requirements of this Section are met. The certification shall conform to the requirements of Section 6. Each certification shall cover only one LOT of adhesive materials.

**937-4 Minimum Performance Requirements (FM 5-568).**

When tested in accordance with FM 5-568, the adhesive bonding material system, for general use, shall meet the following requirements:

Uniform Bond Stress		
	Type HV	Type HSHV
Confined Tension	2,290 psi	3,060 psi
Damp-Hole Installation	1,680 psi	1,830 psi
Elevated Temperature	2,290 psi	3,060 psi

Uniform Bond Stress		
	Type HV	Type HSHV
Horizontal Orientation	2,060 psi	2,060 psi
Short Term Cure	1,710 psi	1,710 psi
Specified Bond Strength	1,080 psi	1,830 psi

Maximum Coefficient of Variation for Uniform Bond Stress ..... 20%

**Long Term Load (Creep):**

- (1) The rate of displacement shall decrease during the 42 day application of load.
- (2) At 42 days the total displacement due to creep (with load still applied) shall be less than 0.03 inch and during the last 14 days of the 42 day load duration, the total displacement due to creep shall be less than 0.003 inch.
- (3) After removal of the 42 day load, the uniform bond Stress from a subsequent Confined Tension Test shall not be less than 1,826 psi.

**937-5 Product Identification (Fingerprint) Properties (FM 5-569).**

References for comparison including Infrared Absorption, Density or Average Weight, Gel Time or Setting Time, and Bond Strength shall be determined in accordance with FM 5-569.

**937-6 Packaging and Marking.**

The adhesive bonding material system shall be delivered to the project site in original unopened containers with the manufacturer’s label identifying the product. Each package shall be clearly marked with the following information:

- Manufacturer’s name and address
- Product Name
- Date of Manufacture
- Expiration Date
- LOT Identification Number
- Storage and Handling Requirements

Each package shall include the manufacturer’s instructions for anchor and dowel installation. The instructions shall include the following information:

- Diameters of drilled holes for applicable anchor and dowel sizes.
- Cleaning procedure for drilled holes, including a description of permitted and prohibited equipment and techniques.
- Allowable temperature ranges for storage, installation and curing.
- Identification of acceptable mixing/dispensing nozzles.
- Fabrication requirements for anchors and dowels.
- Description of tools permitted or required for installation.
- Method of identifying properly proportioned and mixed adhesive materials.
- Time and temperature schedule for initial set and full-strength cure.
- Special requirements for special installation conditions such as damp holes, or horizontal or near horizontal orientation of the anchor or dowel.