

9370000 POST-INSTALLED ANCHORS SYSTEMS FOR STRUCTURAL APPLICATIONS
IN CONCRETE ELEMENTS
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comment: (Internal, 5-6-11)

1. There is no material section. Any polymer that meets structural needs is good?

Response: Generally, yes, but adding a definition may be beneficial. A good definition can be found in ICC Evaluation Services AC 308:

2.1.2 Adhesive compound – Any reactive adhesive comprised of chemical compounds (components) that react and cure when blended together. The adhesive compound may be formulated from organic polymer compounds, inorganic cementitious mortars or combination of organic and inorganic compounds. Organic adhesive materials include but are not limited to epoxies, polyurethanes, polyesters, methyl methacrylates and vinyl esters.

No change made.

937-4.1 General:

2. Only 2 part components?

Response: Only two part systems are commercially available to our knowledge. It is theoretically possible to have a multiple component system, but considering the automatic mixing requirements using a cartridge system this may not be practical. A dual component system is also consistent with AC 308:

2.1.11 Cartridge system – Adhesive compound components for anchor applications packaged in a dual chamber cartridge for use with either manually- or power-driven dispensers. Metering and mixing of the components occurs automatically as the adhesive is dispensed through a manifold and mixing nozzle system.

No change made.

3. *“Applications are limited to anchors and dowels installed in positions ranging from vertically downward to horizontal.”* So we would not use these for vertically upwards installations? Not sure what this statement means.

Response: That is correct. Steve Plotkin is looking at clarifying this definition. No change made.

4. *“Combining of epoxy bonding components from bulk supplies is not permitted.”* Just epoxies or are there other polymers where we would be OK with combining bulk materials?

Response: Bulk supplies are not permitted due to quality control problems with their installation. Historically only epoxies have been proposed using bulk supply; however the term “epoxy” in 937-4.1 has been changed to the generic term “adhesive”.

5. Define HV and HSHV.

Response: HV is an accepted industry acronym for horizontal/vertical and HSHV is an accepted industry acronym for high strength horizontal/vertical. No changes needed.

937-4.3 Product Identification (Fingerprint) Properties (FM 5-569):

1. Molecular weight would be a good fingerprint variable. Infrared is qualitative and will still allow manufacturers to change quantities of the 2 components without detection.

Response: Infrared is consistent with ICC Evaluation Services AC308, however they also required additional methods, which is redundant:

6.3 Fingerprinting of adhesive materials:

6.3.1 The adhesive components used for the qualification testing shall be tested to establish a standard fingerprint for comparison with future production as part of the required quality control inspections. It shall be permitted to test the components separately or their mixture, as appropriate. The manufacturer shall select from the following list a minimum of three (3) fingerprint tests for this purpose:

- a. infrared absorption spectroscopy according to ASTM E 1252;
- b. bond strength according to ASTM C 882 or equivalent method;
- c. specific gravity according to ASTM D 1875;
- d. gel time according to ASTM D 2471;
- e. viscosity according to ASTM D 2556, F 1080 or equivalent method;
- f. other tests that may be appropriate for the specific product and that can be shown to provide positive identification.

No change made.

Karen Byram
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Comments: (5-23-11)

1. Since these types of products will be new to the QPL, has a list of manufacturers been compiled and their products pre-evaluated?

Response: Yes a preliminary list of manufacturers and anchors has been compiled. This corresponds with your comment 3 below.

2. In section 937-5, the first paragraph identifies the requirement for 316 steel qualified for use in cracked concrete. How is that requirement to be ascertained? Can the manufacturer self certify?

Response: The manufacturers will need to provide their material specifications as well as their ICC-ES approval as stated in 937-5.2 for QPL approval. The certification (whether self or independent from manufacturer) must comply with ACI 355.2 and ICC-ES AC193 and have ICC-ES approval. However; for inclusion in the QPL, the testing must be done by an independent testing laboratory (refer to 937-2).

3. In the past we have tried to use ICC-ES acceptance criteria. This was later found to be not practical. Has the usefulness of this reference been confirmed and are manufacturers capable of supplying this information in a short time period?

Response: After looking at several manufacturers and their products, the majority have ICC-ES approval, for all anchors and anchor sizes.

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Comments: (6-16-11)

937-2 requires these materials to be on the QPL, however the undercut anchor has additional requirements. The undercut anchor is so different from the adhesive material that I think it deserves its own section. The adhesives seems to describe two part epoxy while the undercut anchor, as I understand it, is part and parcel of an anchor bolt system.

Response: Because both Adhesive bonded anchors and undercut anchors fall under Post-Installed Anchors they are in the same Section (416 and 937) and separated within the specification section (subsection).

No change made.

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Comments: (6-16-11)

(Comments by Daniel Haldi D5/M&R Construction Materials)

1. Title in 937-4 “Adhesive-bonded anchor system materials: and 4.1 Adhesive-bonding material (strike system here)

Response: From the Specs Office – 937-4 title is “Adhesive Bonding Material Systems”. Also, the Article is defining the entire system, not just individual materials.

2. 937-4.2 Table: Max Coefficient of Variation for Uniform Bond Stress: 20 % The – should be replaced with ± so as not to mislead minus 20 %.

Response: Change made.
