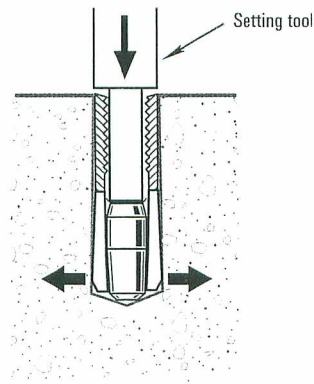


Anchoring Technology

6.2.4 DISPLACEMENT SETTING ANCHORS

DynaSet™ anchors are inserted into a drilled hole, and set by the displacement of the expander plug.



DISPLACEMENT SETTING DYNASET™ ANCHORS

The diameter of the drilled hole is slightly larger than the outer diameter of the anchor. When the expander plug is fully driven home (displaced), it expands the lower portion of the anchor body, to increase its effective diameter. Because the anchor is expanded by a series of blows from a setting punch, a certain amount of shock loading is imparted to the concrete immediately adjacent. The reaction of the concrete against the expanded body of the anchor creates a high friction force between the anchor and the wall of the drilled hole. The body of the concrete contains and restricts the expansion forces. A bolt is subsequently screwed into the anchor.

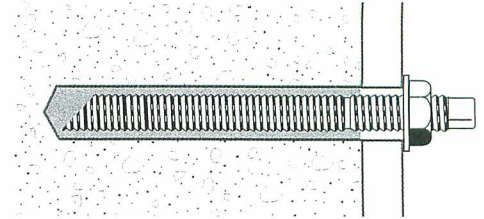
The mode of failure in concrete tension is characterised by the formation of a shear cone, the apex of which is located at the effective depth of the anchor.

Applied tensile loads are resisted by the following elements:

- ~ the bolt.
- ~ the steel annulus of the anchor.
- ~ friction between the expanded anchor and the drilled hole.
- ~ shear and tension at the surface of the potential concrete cone.

6.2.5 CHEMICAL ANCHORS

ChemSet™ Injection Systems, ChemSet™ Maxima™ Spin Capsules, ChemSet™ Hammer Capsules anchors are set in a drilled hole by the hardening of the chemical adhesive.



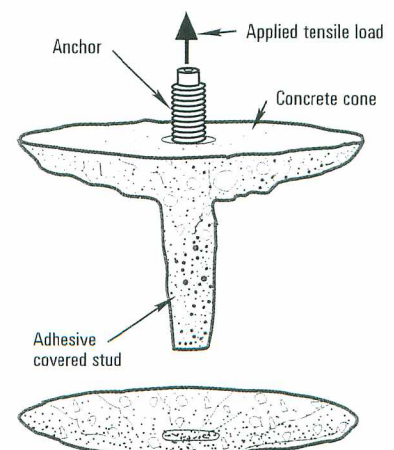
CHEMICAL ANCHORING

The adhesive penetrates the pores and irregularities of the base material and forms a key around the threads of the stud. The cured adhesive becomes a hard, strong material that transfers load to the base material via mechanical and adhesive bonds with the surface of the drilled hole.

When tested to failure, a shallow concrete cone may form at the top of the anchor. This cone does not necessarily contribute to the tensile strength of the anchor, but simply registers the depth at which the concrete cone strength happens to equate to the cumulative bond strength of the adhesive to the sides of the hole. For a given concrete strength, the stronger the adhesive bond, the deeper the cone.

Applied tensile loads are resisted by:

- ~ the stud.
- ~ bond between the stud and the adhesive shear in the adhesive bond between the adhesive and the concrete.
- ~ shear and tension in the concrete.



CONCRETE BOND FAILURE MODE