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Pure50+™ Adhesive Anchoring System and Installations with DEWALT DustX+™ Automatic Dust Extraction

ACI 318-19, Chapter 17 and ACI 318-14 Chapter 17 (and by reference to the 2021 IBC, and the 2018 IBC and 2015 IBC, respectively) requires that adhesive anchors for concrete be installed using a specific drilling method. This is because the drilling method used to create a hole in concrete and the subsequent manufacturer recommended hole cleaning procedure for the adhesive system has a significant effect on the bond strength of the installed adhesive anchors.

Up until now, DEWALT published bond strengths for Pure50+ adhesive anchors that are based on drilling into concrete using a hammer-drill with a carbide drill bit followed by a traditional hole cleaning process (e.g. blowing the hole clean, brushing the hole, blowing the hole clean again). Fortunately, additional hole drilling and cleaning options are now available for end users from DEWALT due to the increased attention being given to dust control solutions on jobsites in construction.

DUSTX+ SYSTEM COMPONENTS		
DEWALT Hammer-drill & Hollow Drill Bit (HDB)	DEWALT HEPA Vacuum (DWV012 & DWV015)	Pure50+ Adhesive & Steel Rod or Rebar Anchor
DEWALT DustX+ System (Hammer-drill + Hollow Drill Bit + Vacuum + Adhesive + Steel Rod or Rebar Anchor)		

The DustX+ system allows users to drill holes in concrete and clean the holes during the drilling process at the same time (no extra cleaning steps are necessary with this system). The hollow drill bits are attached to a self-cleaning HEPA vacuum which provide the dust collection during drilling. DEWALT has conducted extensive supplemental laboratory testing on Pure50+ adhesive anchors installed in holes drilled and cleaned using the DustX+ system in dry concrete.

The table below shows the results of the testing adhesive anchor system crossed with the installation and cleaning method along with the corresponding reduction factor derived from testing that should be applied to the bond strength when calculating the bond strength capacity for the given adhesive anchor and relevant conditions.

Adhesive Anchor System	Drilling Method	Cleaning Method	Bond Strength Reduction Factor, α_{hdb}
DEWALT PURE50+	Hammer-drilling with standard carbide drill bits	Blow 2x, Brush 2x, Blow 2x	N/A (baseline values)
	Hammer-drilling with hollow drill bits (DustX+)	Hollow drill bits (DustX+)	1.0 (no reduction)

N/A = Not applicable.

- Results shown are based on tension tests conducted in accordance with ACI 355.4/ASTM E488 in dry cracked and uncracked normal weight concrete; holes were drilled with a hammer drill and standard carbide drill bit or hollow drill bit, as applicable.
- Standard carbide drill bits and hollow drill bits must meet the requirements of ANSI B212.15; ANSI compliance for hole drilling is required by ICC-ES ESR-3576.
- See published literature for the specific adhesive anchor system for additional design and installation information which is available at anchors.DEWALT.com.

Pure50+ adhesive anchors will achieve published design strengths when the product is installed properly into holes drilled and cleaned in dry concrete with the DustX+ system.