



Keyfix AE15

(Epoxy acrylate anchoring system in cracked and uncracked concrete under seismic conditions)



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Section A : General Comments

General Notes:

The information below is a detailed overview for the application of DCP's **Keyfix AE15** anchoring system and should be read in conjunction with the relevant technical data sheet prior to application. All DCP Products should be applied by experienced specialist contractors.

All the points below assume correct preparation of the relevant surface.

High Temperature Working:

It is suggested that, for temperatures above 30°C, the following guidelines are adopted as good working practice:

- i. Unmixed materials and equipment should be stored in a cool shaded area and away from direct sunlight.
- ii. Avoid application during peak temperature of the day.
- iii. Plan for enough materials, tools and labor to ensure continuous application process.

Low Temperature Working:

It is suggested that, for temperatures below 10°C, the following guidelines are adopted as good working practice:

- i. Unmixed materials should be stored in a warm (preferably temperature controlled) environment, avoiding exposure to frost or temperatures below 5°C.
- ii. Cold temperatures will affect the properties of the resin.
- iii. Avoid applying the grout if the temperature is around 5°C and falling.
- iv. Do not apply under rain or snow, and avoid dew points conditions during application.

Tools and Equipment:

It is suggested that the following list of equipment are adopted as a minimum requirement

Personal protection

- : Protective overalls
- : Goggles or a face mask
- : Good quality gloves
- : Safety shoes
- : Safety helmet



Equipment

- : Hammer drill (Fig.1)
- : Drill bit (Fig.2)
- : Cartridge gun (Fig.3)
- : Cleaning brush (Fig.4)
- : Hand air pump (Fig.5)



Fig.1: Hammer drill



Fig.2: Drill bit



Fig.3: Cartridge gun



Fig.4: Cleaning brush



Fig.5: Hand air pump

Section B : Application

1.0 Substrate Preparation

1.1 Substrate preparation

- 1.1.1 Substrate should be sound, clean, and free from grease or any contaminants.
- 1.1.2 The area to be drilled should be marked on the structure using spray paint.
- 1.1.3 **Hole:** for optimum anchoring, use a rotary hammer drill for better practice and clean the hole with compressed air and the holes steel brush, the hole should be rough-sided and dust-free.
- 1.1.4 After drilling, holes should be brushed and blown out twice, to remove all drilling debris.

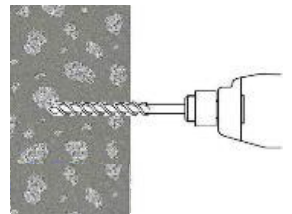
1.2 Steel preparation

- 1.2.1 **Bars and anchors:** should be clean and rust-free to achieve the design bond strength. Deformed bars will have a better bond strength.

Note: Holes should be dry and dust-free.

2.0 Drilling

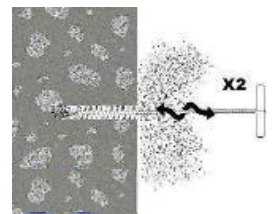
- 2.1 Use a suitable drill bit diameter and drill hole in the concrete to the required embedment depth. (See below table for reference).



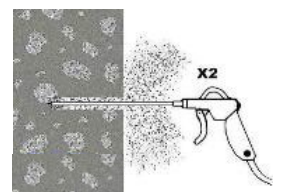
Bar diameter (mm)	Hole diameter (mm)	Embedded length (mm)	Bar area (mm ²)	Maximum pull out force (kN)*	Needed quantity of Keyfix AE15 per hole (ml)
10	12	110	79	36	8.3
12	14	130	113	51	13.3
14	16	160	154	69	21.4
16	20	190	201	94	39.8
20	26	240	314	140	48.9
25	31	290	491	204	145.9

* Maximum pull-out force that yield a concrete splitting failure pattern.

- 2.2 Insert the steel brush to the back of the hole and pull out in a back and forth twisting motion.



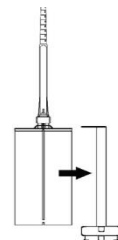
- 2.3 Insert the nozzle extension of the hand air pump into the back of the hole and blow out the dust 2 times.



- 2.4 Brush over the whole length of the hole again in a twisting motion.
- 2.5 Blow out again using the hand air pump until the hole is clean and dust-free.

3.0 Placing

- 3.1 Unscrew and remove the cartridge protective cap.
- 3.2 Remove the insert plug and attach the static mixing nozzle tightly.

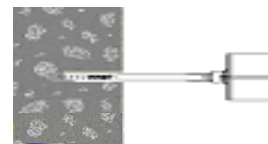


- 3.3 Insert cartridges into the double cartridge gun and dispense sufficient material (typically 10 ml) until an even homogeneous color is achieved.

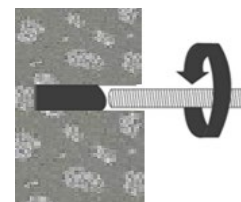


- 3.4 Insert the nozzle into the back of the hole and start applying pressure to the gun, slowly withdraw the nozzle as the hole fills.

Note: As the mixer nozzle is withdrawn, ensure that no air voids are created.



- 3.5 Normally it's sufficient to fill the hole approximately half to two-thirds full.
- 3.6 Immediately, press the stud/steel rebar in a circular motion into the hole to the required embedment depth with slight agitation.
- 3.7 The bar should be left undisturbed until materials reach the final setting.
- 3.8 Clean any excess resin around the hole.
- 3.9 Allow the resin to cure completely. (see table below).



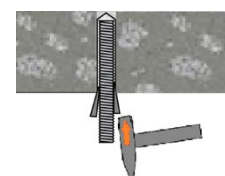
Keyfix AE15 Standard Grade			
Resin Cartridge Temperature	Working Time	Base Material Temperature	Loading Time
5 to 10°C	10 min	5 to 10°C	145 min
10 to 15°C	8 min	10 to 15°C	85 min
15 to 20°C	6 min	15 to 20°C	75 min
20 to 25°C	5 min	20 to 25°C	50 min
25 to 30°C	4 min	25 to 30°C	40 min

Keyfix AE15 – T (For high-temperature environments)			
Resin Cartridge Temperature	Working Time	Base Material Temperature	Loading Time
15 to 20°C	15 min	15 to 20°C	5 hr
20 to 25°C	10 min	20 to 25°C	145 min
25 to 30°C	7.5 min	25 to 30°C	85 min
30 to 35°C	5 min	30 to 35°C	50 min
35 to 40°C	3.5 min	35 to 40°C	40 min

Keyfix AE15 – W (For cold temperature environments)			
Resin Cartridge Temperature	Working Time	Base Material Temperature	Loading Time
Min 0°C	50 min	-10 to 5°C	12 hr
	15 min	-5 to 0°C	100 min
0 to 5°C	10 min	0 to 5°C	75 min
5 to 20°C	5 min	5 to 20°C	50 min
+20°C	100 seconds	+20°C	20 min

- Working time is set at the highest base material temperature in the range.
- Loading time is set at the lowest base material temperature in the range

3.10 The anchor can be loaded after the required curing time.



Notes:

- When filling holes overhead or in porous blockwork, the use of plastic sleeves is recommended.
- Partly used cartridges are reusable, remove the static mixer and surplus base and catalyst components from the cartridge nozzle, insert the plug, and screw on the protective cap.

4.0 Cleaning

4.1 All tools should be cleaned immediately after finishing. Hardened materials can be cleaned mechanically.



Section C : Cautions

Health and safety

Keyfix AE15 is an irritant to the skin, eyes, and respiratory system. Wear suitable gloves and eye protection.

Fire:

Keyfix AE15 is flammable and should be kept in a cool place.

For further information on refer to the Material Safety Data Sheet.

Section D : Approval and Variations

This method statement is offered by DCP as a 'standard proposal' for the application of **Keyfix AE15**. It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to DCP for approval, in writing, prior to commencement of any work. DCP will not accept responsibility or liability for variations to the above method statement under any other condition.