

Deformation Controlled (Drop-in) Expansion Anchors.

1 INTRODUCTION

CFA Sample Method Statements are the first stage of a programme of assistance provided by the CFA for supervisors and installers to make sure anchors are installed correctly*. This is a guide only. The manufacturer's installation instructions should always be followed.

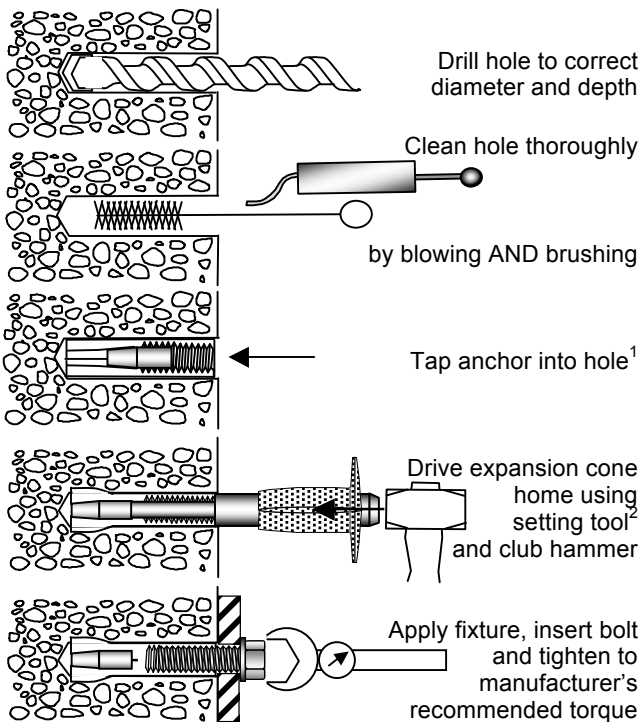
2 BASE MATERIAL SUITABILITY

Drop-in anchors are intended for use in concrete. Some manufacturers allow use in hard natural stone in which case their recommendations on positioning within the stone units, and other dimensional limitations, must be followed. They should not be used in brickwork or blockwork.

3 INSTALLATION

This method statement is a guide only and covers drop-in anchors - flared or lipped - set at the surface or standard types set at or close to the surface.

Before installation check that the anchor to be used is as specified. Only substitute another make or type if approved by the responsible engineer.



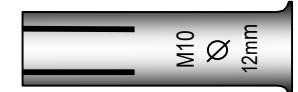
Tightening torques

Drop-in anchors are not set by tightening. Once set, as shown above, tightening the bolt to the manufacturer's recommended torque will ensure the required clamping force is exerted through the fixture and also protect the bolt and anchor shell from being over stressed. A calibrated torque wrench should be used for safety critical applications. If bolts stronger than those recommended by the manufacturer are used the torque should not be increased as it is governed by the strength of the anchor shell.

Standard version



Flared or lipped



Points to note:

1 When tapping the anchor into the hole take care not to damage the mouth of the anchor or internal threads. If using a slave bolt ensure it is engaged at least 5 turns. If using the reverse end of a setting tool check it is not burred.

2 Never try to expand a drop-in anchor by turning a bolt against the expansion cone, the threads do not reach far enough to achieve full expansion.

Hole depths

For most anchors, including lipped or flared versions, the hole depth will be the length of the anchor plus 5mm. Only when non-flared anchors are to be set back in the concrete should hole depths be increased, then bolt lengths must take this into account. Setting standard anchors just back from the surface will ensure that the clamping force is transmitted through the fixture into the concrete rather than into the anchor shell which is undesirable.

Structural dimensions

Drop-in anchors exert significant stresses into the concrete during expansion. The manufacturer's recommendations for close edge distance, anchor spacing and minimum structural thickness must be followed or the structure may be cracked during installation. As a guide allow at least the following: minimum edge distance = 3 x anchor length, minimum spacing = 3 x anchor length, minimum structural thickness = hole depth + 2 x anchor length. Some manufacturers may allow closer distances.

Thread engagement

Adequate thread engagement is important to ensure quoted load capacity can be achieved. Choose bolt lengths to ensure manufacturer's recommended minimum thread length can be achieved without exceeding the actual thread length available within the anchor or the shell may be broken on tightening. Take account of any packers. 9 full turns, when inserting bolts or threaded rods, will ensure an engagement of the minimum required thread length.

Clearance hole diameters

Clearance holes in fixtures may be at least 1mm larger than the bolt diameter but, as the anchor is not usually fixed through the fixture, care must be taken to locate holes accurately to ensure accurate alignment.

Removal

Drop-in anchors cannot generally be removed. If it is known that they may become redundant in the future they should be set back far enough to enable the hole to be filled.

Other aspects

More aspects of drop-in anchors, including selection and applications, are outlined in a Guidance Note *Deformation Controlled Anchors* downloadable from www.fixingscfa.co.uk.

CFA Sample Method Statement: Deformation Controlled (Drop-in) Expansion Anchors

Information you will need:

Anchor specification	Make
	Type
	Order code
	Finish
	Length
Diameter	M
Fixture thickness mm
Hole diameter mm
Embedment depth mm
Hole depth mm
Bolt Length mm
Tightening torque Nm

Equipment you will need:

Drilling machine SDS+	
Drill bit	Diametermm
	Working length mm
Blow out pump	
Cleaning brush	
Setting tool	
Club hammer	
Torque wrench for installation torque above	
Socket	Width across flats mm

Thread diameter	M8	M10	M12	M16	M20	M24
Typical width of nut/socket – across flats mm	13	17	19	24	30	36

*This Sample Method Statement is one of a series available free of charge from the **Construction Fixings Association**. A more comprehensive **Guidance Note: Deformation Controlled Expansion Anchors** is available from the CFA website at www.fixingscfa.co.uk. Training courses are available for contractors to a syllabus approved by the CFA leading to certification as competent installers of anchor systems. For more details logon to www.fixingscfa.co.uk and go to “Safer Installations” page. **Note:** This guidance is given in good faith, however the **Construction Fixings Association** can accept no liability for adverse consequences arising from this guidance being followed.

