

Solid Masonry Connector



Introduction

Originally developed in conjunction with British Rail, the Cem Flex method of pinning delaminating rings in masonry arches has now become widely accepted as a simple and economic solution.

Cem Flex ties are also used in standard construction repair techniques for bonding across cracks in masonry and as a restraint for bowing solid walls. The 8 mm diameter austenitic Grade 304 stainless steel helical reinforcing rod is combined with Bond Flex XL, a unique formula of pumpable, but thixotropic, non-shrink cementitious grout.

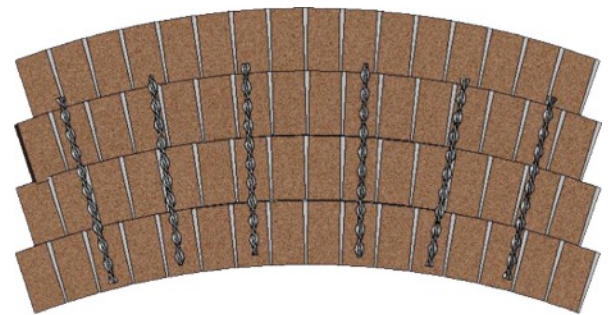
As the installation of Cem Flex is via a 12 to 16 mm diameter drilled hole, the potential disfiguration to the structure can be minimised, and the installation time is greatly reduced - this is especially important where access and working times are restricted



Performance Requirement

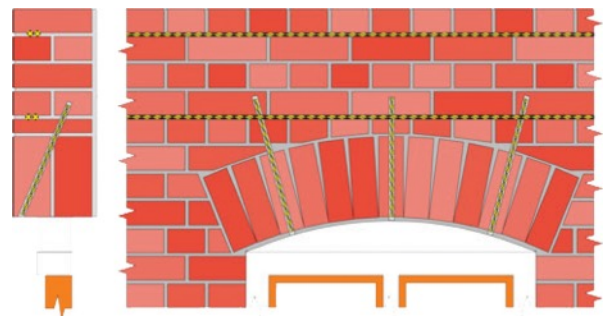
Because of the method of installation, it is not possible to perform random, non-destructive site testing. Bond strengths can, however, be checked prior to the full installation programme. An overlong Cem Flex can be installed as normal, leaving a short length (50-75 mm) proud of the surface.

A Target Load Test unit can be used to determine the tensile loading. The full cure time for the Bond Flex XL grout is 28 days, but limited testing can generally be performed after 24 to 48 hours. To check the flow of Bond Flex XL grout into any voids requires destructive testing methods and is normally only performed in critical situations.



Fixing Detail

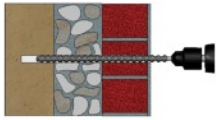
The only restriction on the length of Cem Flex that may be fixed is the length of hole that can be drilled. In general terms this is restricted to 1.5 m. The insertion hole is varied from 12 to 16 mm diameter and is usually formed with a SDS-plus hammer drill. To ensure a good bond strength between the Bond Flex XL cementitious grout and the substrate, it is necessary to thoroughly wet the drilled hole before the installation of the tie. Installation of the tie is performed very simply by the use of a hand-held grout injection gun kit. The Bond Flex XL grout is installed under hand pressure and flows readily under light pressure to fill any voids in the masonry structure. Full installation details are given on the overleaf.



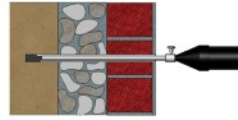
Special Features

- One piece design - no moving parts to lose
- Easily tested after installation
- Quick and easy installation
- Minimal disruption to building occupants
- Fixes into end grain and side grain
- Virtually invisible and unobtrusive

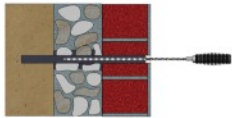
Installation.



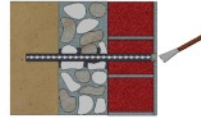
1. Drill a 12 to 16 mm hole to the required depth
2. Blow out any debris
3. Thoroughly wet the hole



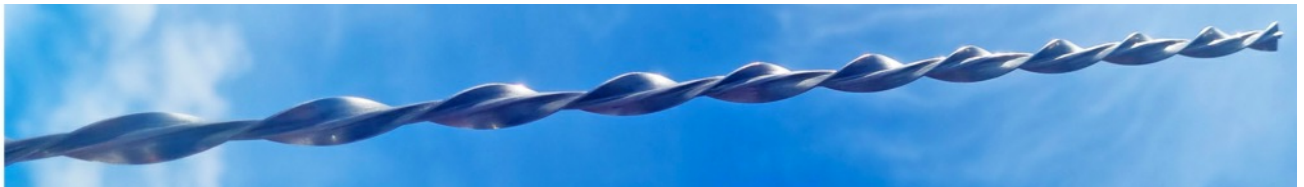
4. Insert the grout gun nozzle to the bottom of the drilled hole and pressure inject the Bond Flex



5. Using the Cem Flex insertion tool, push the Cem Flex tie into the grout-filled hole.



6. Remove any excess Bond Flex cementitious grout and finish the hole in the desired manner



Materials

The compatibility of the Bond Flex XL and the 8 mm Cem Flex have been assessed and approved to work together. Whilst the Bond Flex XL cementitious grout (right top) is a Very high strength material - $\approx 40 \text{ N/mm}^2$ - by incorporating the flexible and elastic Cem Flex, the treated structure is permitted a degree of movement.

Experience has shown that allowing continual but controlled movement in a structure is very beneficial to its long term life. A heavy duty anchor that attempts to stop movement altogether has been shown to store up potential problems, and may even end in a sudden and catastrophic failure.

Bond Flex XL cementitious grout is formulated to produce a thixotropic material that flows readily under pressure - allowing rapid void filling in deep holes - but will not drip if used overhead. The initial cure time is very rapid, and a non-shrink agent ensures that a good even bond is achieved. It is supplied as a complete material in either 3 or 6 litre packs offering a consistent mixture time after time. The contractor does not need to add any extra material, and has a clean mixing bucket for each mix. The working life of the material can be extended by re-agitation and will be in excess of 30 minutes. Cem Flex is a Grade 304 austenitic stainless steel material with a very pronounced profile to ensure a good bond with the Bond Flex XL cementitious grout. Being stainless steel, the issue of 'coverage' requirements does not arise.

(Right) Cem Flex
installed in a brick
archway

