

BRE Test Report

Compression and shear testing of Swifix fixings

Prepared for: Paul Brown, Swifix Ltd

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Summary

Compression and load testing of Swifix fixings

Product: Swifix fixings

Date of Test: April 2016

Place of Test: Building Research Establishment, Garston, Watford, WD25 9XX

Specimen: The fixings are made of high tensile plastic and can be cut to length using a standard tube cutter, hacksaw or pipe cutters. The standard range of products used for testing were 120mm overall system finish.

Swifix fixings - Compression test

Test set up with plate across base of machine to give a flat and true base to work from.

Test was set up with a loading rate of 4mm/min

Test sample	Ultimate load (Kg)	Deflection (mm)
T1	595	3
T2	593	4
T3	595	4

Specimens all failed in the same way, plastic deformed from top and 'mushroomed'
Test was stopped when load had dropped by 20%

Swifix fixings - Pull down strength test

Calibrated weights and force gauge were used to apply vertical load to the fixing when fitted using the installation guide supplied by client.

Test sample	minor pulling out of fixing (Kg)	Fixing failed (Kg)
T1	76	123
T2	71	131
T3	74	127



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1 Introduction

This report describes the strength characteristic testing that was carried out on samples of Swifix fixings. The tests were carried out to determine the performance of the fixings under compression and shear force loads.

The testing was carried out at BRE.

The report describes the tests conducted and the results obtained.



2 Description of Swifix fixings

The fixings are made of high tensile plastic and can be cut to length using a standard tube cutter, hacksaw or pipe cutters. The standard range of products used for testing were 120mm overall system length.





3 Test Procedure

Testing of SwiFix fixings

1.0 Aim of Test Programme

The aim of the test programme is to determine the strength characteristics of the SwiFix fixings.

2.0 Test Programme

The following tests will be carried out within this test programme.

- (a) Pull down testing of installed fixing - Install three fixings into a mortar joint and pull down (shear test). Fixing can be tested with insulation if insulation is provided.
- (b) Compression testing of SwiFix tube
- (c) Compression test three SwiFix tubes of a set length. Tube will be tested without insulation.

Each test sample was examined for defects in materials, manufactured quality etc., before, during and after the tests with any such defects recorded.



Installation guide used for testing

Mark existing render to identify position of Item to be secured

1



Drill a 16mm hole through the insulation and render until the Original substrate is reached.

2



Insert tube, or measure depth of hole from finished render back to the original substrate. Reducing to make an allowance for the 8mm neoprene washer.

3



Cut tube to length using pipe cutter or alternatively a hacksaw or pipe cutters

4



5

Place the neoprene washer onto tube and Insert tube into wall.



6

Drill through tube into substrate to the appropriate depth for fixing (site specific) Insert plug and attach fixing cap, insert fixing and secure.

7



4 Test Results

The fixings were fixed into a sample sheet of rendered 80mm external insulation using the installation guide provided by the client, the fixing were consistent within the sets of tests performed (see table 1 and 2). They managed to hold substantial loads of circa 130kg in the pull down (shear tests) and withstand compression loads of circa 595 Kg (see accompanying videos of compression test) with only minor deformation.



Figure 1 – Fixing starting to come away from surface.

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Figure 2 – Further movement away from surface.



Figure 3 – Fixing failed at this point, (see table 2) notice the cracking of the bracket.

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Figure 5 – Compression loads of circa 595 Kg with only minor deformation.



Figure 6 – Compression loads of circa 595 Kg with only minor deformation.



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Table 1:

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Swifix fixings - Pull down strength test

Calibrated weights and force gauge were used to apply vertical load to the fixing when fitted using the installation guide supplied by client.

Test sample	minor pulling out of fixing (Kg)	Fixing failed (Kg)
T1	76	122
T2	71	131
T3	74	127

Table 2:



5 Conclusion

Tests have been carried out at BRE

Based on the test results the following conclusion can be drawn:

The results from these tests show that the Swifix fixings if installed correctly following the installation guide can hold substantial loads of circa 130kg in the pull down (shear tests) and withstand compression loads of circa 595 Kg (see accompanying videos of compression test) with only minor deformation.

Further observations: - not tested

If installed as manufactures instructions any potential movement of a satellite bracket in wind is expected to be minimal and is not expected to affect the structural performance of the bracket plate (SWI-SP)

Regarding mounting the Swifix fixings through either mineral wool or eps it is BRE's opinion that the amount of load and performance of the products should not be significantly different than the samples tested.