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# European Technical Assessment ETA-15/0406 of 2019-12-09

## General Part

| | |
|---|---|
| **Technical Assessment Body issuing the European Technical Assessment: SINTEF** | |
| **Trade name of the construction product** | FIXFAST SureFast Fastening System |
| **Product family to which the construction product belongs** | Fasteners for mechanically fastened flexible roof waterproofing systems |
| **Manufacturer** | FIXFAST<br>Merlin House<br>Seven Mile Lane<br>Borough Green<br>Sevenoaks<br>Kent<br>TN15 8QY |
| **Manufacturing plant(s)** | Factory codes: 100 and 105 |
| **This European Technical Assessment contains** | 15 pages including 2 Annexes which form an integral part of this assessment |
| **This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of** | EAD 030351-00-0402 February 2019 Systems of mechanically fastened flexible roof waterproofing sheets |
| **This version replaces** | ETA 15/0406, version 01 of 2017-01-13 |

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## 1. Technical description of the product and intended use

FIXFAST SureFast flat roofing fastening system is a system for mechanical fastening of insulation, of bitumen-based multi-layer, of single-ply waterproofing membranes, or polymeric single-ply waterproofing membranes for flat roofing. The supporting roof structure may be of steel, concrete, lightweight concrete or wood as defined in EAD 030351-00-0402, Systems of Mechanically Fastened Flexible Roof Waterproofing Membranes, paragraph 1.1.

The range of fasteners consists of seven different screws, seven steel washers and four tube washers as illustrated in Annex 1.

The fastener system is introduced to the market separately from the other components of roof waterproofing membrane kits, and this ETA covers only the performance characteristics of the FIXFAST SureFast Fastening System. A separate ETA according to EAD 030351-00-0402 is necessary in order to cover an entire kit for mechanically fastened roof waterproofing membranes.

The fasteners may be used for all types of flexible membranes. The supporting roof structure may consist of profiled steel decks, concrete, or a wood based constructions. FIXFAST SureFast Fastening System may be used with membranes installed on a thermal insulation material or directly to the supporting roof substrate

## 2. Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

Installation and design

*General*

The fasteners must be installed according to the manufacturer's instructions. It is the manufacturer's responsibility to provide correct information about the application of the products to the users.

Fasteners with plate washers may be used with stiff build-up materials, for example directly on wood-based roof substrates, concrete or with non-compressible insulation.

Steel washers used with screws having secondary threading to hold them in place beneath the head. Can be used together with thermal insulation. The insulation material should have a compressive strength ≥ 60 kPa at 10% deformation according to EN 826.

Care should be taken during design to ensure that bimetallic corrosion between metal parts, especially between substrate and screw, does not occur. Likewise, the use of insulation materials containing substances which can affect the performance of the fasteners must be avoided.

*Fastening in wood*

Minimum thickness for timber based substrate is 25 mm and for ply and OSB, 18 mm.

*Fastening in concrete*

Installing FIXFAST SureFast fasteners to different substrates, the manufacturer's technical documentation has to be followed. The drill hole diameter for fixing concrete screws must be normally 5 mm. The drill hole depth should be normally minimum 30 mm, unless special precautions are taken regarding installation control and inspection. Minimum anchorage depth shall be normally minimum 25 mm. Fixings in 40 mm thick concrete without penetration requires drilling with depth control. Concrete compression strength is normally minimum class C25 according to EN 206.

*Fastening in metal decks*

Load bearing decks made of profiled steel sheets shall have a minimum thickness of 0.7 mm. In particularly exposed areas the recommended minimum thickness is 0.8 mm for fixing roofing membranes to the steel decks.

## 3. Performance of the product and references to the methods used for its assessment

*Mechanical resistance and stability*

Not relevant.

*Safety in case of fire*

No performance determined. The reaction to fire of roof waterproofing kits is determined for the complete kits including the membrane.

*Hygiene, health and environment*

According to the manufacturer’s declaration, no corrosion protection used on any screws or washers contains chromium 6 compounds.

Consequently the products do not contain any dangerous which can affect substances according to the EU database. The leaching properties to soil and water is assessed not to be relevant. Likewise, the emission properties to indoor environment.

*Safety in use*

The fasteners have been tested for axial pull out performance from substrates, see Annex 2. The fasteners have also been tested for wind uplift according to EN-16002:2010 / ETA Guideline No. 006 edition March 2000, amended November 2012, and EAD 030351-00-0402. The wind uplift performance of roof waterproofing kits is mainly determined by the roofing membranes. Several full scale wind load tests with bituminous and polymeric membranes have been executed. The membranes are fixed with washers in combination with fixings to substrates of steel, wood and concrete. The complete test reports may be obtained from FIXFAST.

For the past 10 years the fasteners have been on the market, the manufacturer doesn't have any knowledge of any problems with unwinding of the screws mentioned in this document. The screws are therefore considered to be safe against unwinding.

*Protection against noise*

Not relevant

*Energy consumption and heat retention*

Not relevant

*Aspects of durability*

The screws have FIXFAST's coating for corrosion protection. All screws and steel washers in the FIXFAST SureFast flat roofing fastening system have corrosion resistance corresponding to the requirements of EAD 030351-00-0402 ch. A.2.4. Carbon steel screws have FIXFAST's coating for corrosion protection, and carbon steel washers are galvanised; these items are further tested for corrosion resistance. Test-procedure for these products is 15 exposure cycles (humid atmosphere 2 litres of sulphur dioxide). The complete test reports may be obtained from FIXFAST.

The SureFast tube washers, produced of polypropylene, satisfy the aspects of durability according to EAD 030351-00-0402 ch. A.2.3. The washers have a very acceptable resistance to brittleness according to EAD 030351-00-0402 ch. 2.2.3.3. The complete test reports may be obtained from FIXFAST.

*Identification*

The characteristic values of detailed product dimensions and respective tolerances are stated in the manufacturer's technical dossier and form a part of the control plan for the factory production control. All fasteners, tubewashers and steel washers are marked with either a "G" mark or a "SF" mark. The "G" or "SF" marking of the fasteners can be combined with the FIXFAST name or another brand name for products produced under private label. All packaging is to be marked with product type and batch number.

## 4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to Decision 98/143/EC by the European Commission, the system 2+ of assessment and verification of constancy of performance applies. See Annex V to Regulation (EU) No. 305/2011.

## 5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposit at SINTEF.

Issued in Trondheim on 2019-12-09

By

SINTEF

Hans Boye Skogstad

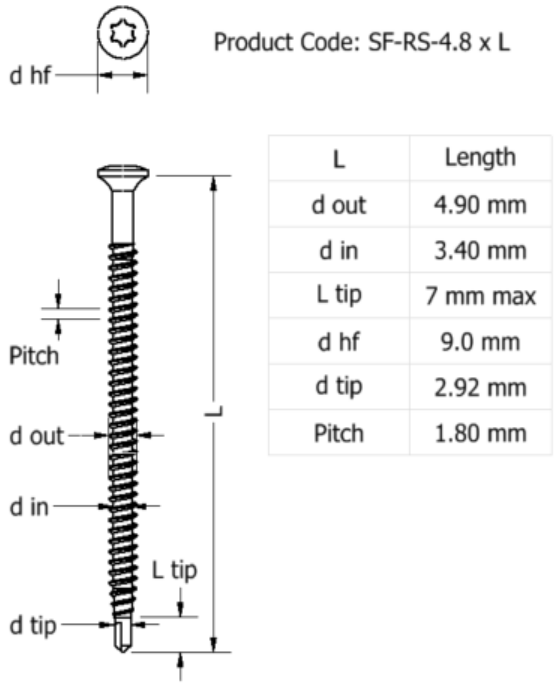
Approval Manager

# Annex 1

## Description of FIXFAST SureFast Fastening System

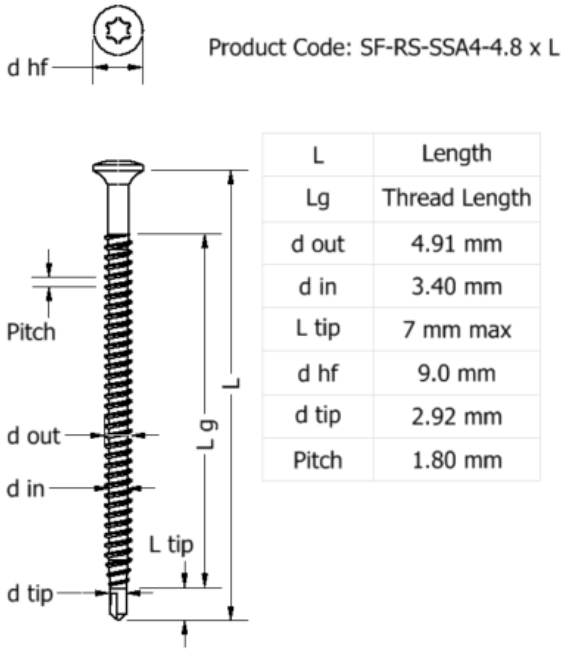
**Table 1**

| Fastener type | Fig. no. | Function | Material |
|---|---|---|---|
| SF-RS-4.8 | 1 | Steel- and wood screw | Coated carbon steel |
| SF-RS-SSA4-4.8 | 2 | Steel- and wood screw | Bi-metal 316 stainless steel |
| SF-RS-5.8 | 3 | Steel- and wood screw | Coated carbon steel |
| SF-RS-CL-5.2 | 4 | Steel and wood screw (for fixing insulation) | Coated carbon steel |
| SF-RS-HCR-5.8 | 5 | Aluminium or steel decks and wood substrates | 1.4529 grade stainless steel (High corrosion resistance) |
| SF-RS-6.1 | 6 | Concrete- and wood screw | Coated carbon steel |
| SF-RS-SSA4-6.1 | 7 | Concrete screw | Bi-metal 316 stainless steel |
| SF-P-8240-S | 8 | Steel washer | Galvanized steel |
| SF-P-8240-D | 9 | Steel washer | Galvanized steel |
| SF-P-70-D | 10 | Steel washer | Galvanized steel |
| SF-P-70-F | 11 | Steel washer | Galvanized steel |
| SF-P-40-F | 12 | Steel washer | Galvanized steel |
| SF-P-SSA4-40 | 13 | Steel washer | Stainless steel |
| SF-P-SS-70-D | 14 | Steel washer | Stainless steel |
| SF-T-50 | 15 | Tube washer | Polypropylene |
| SF-TB-50 | 16 | Tube washer | Polypropylene |
| SF-T-75 | 17 | Tube washer | Polypropylene |
| SF-T-LP-75 | 18 | Tube washer | Polypropylene |



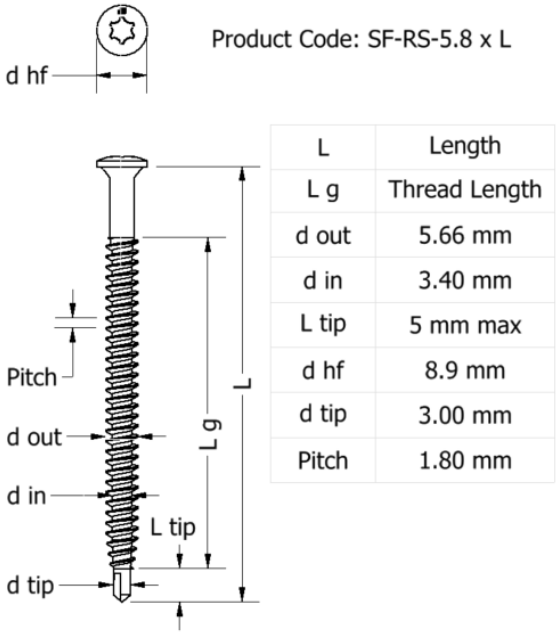

| L | Length |
|---|---|
| d out | 4.90 mm |
| d in | 3.40 mm |
| L tip | 7 mm max |
| d hf | 9.0 mm |
| d tip | 2.92 mm |
| Pitch | 1.80 mm |

Fig.1
SF-RS-4.8
Screw for fixing in steel and wood
(Figure: Fixfast)



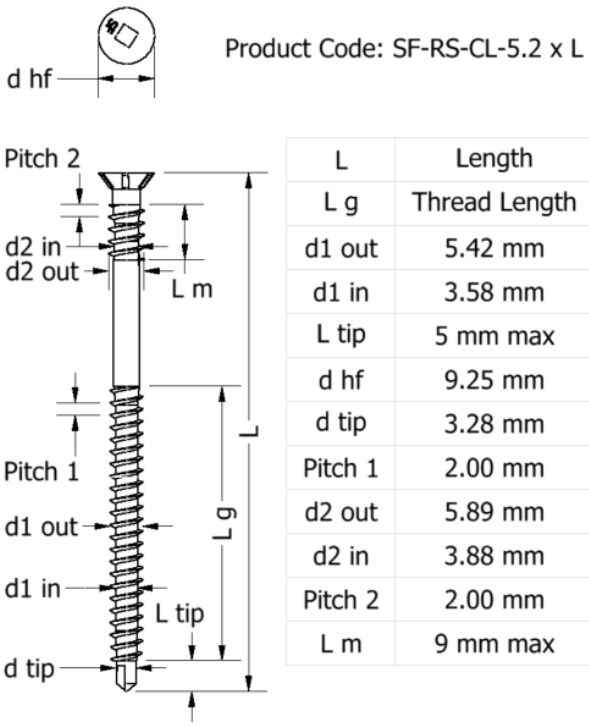

| L | Length |
|---|---|
| Lg | Thread Length |
| d out | 4.91 mm |
| d in | 3.40 mm |
| L tip | 7 mm max |
| d hf | 9.0 mm |
| d tip | 2.92 mm |
| Pitch | 1.80 mm |

Fig. 2
SF-RS-SSA4-4.8
Screw for fixing in steel and wood
(Figure: Fixfast)



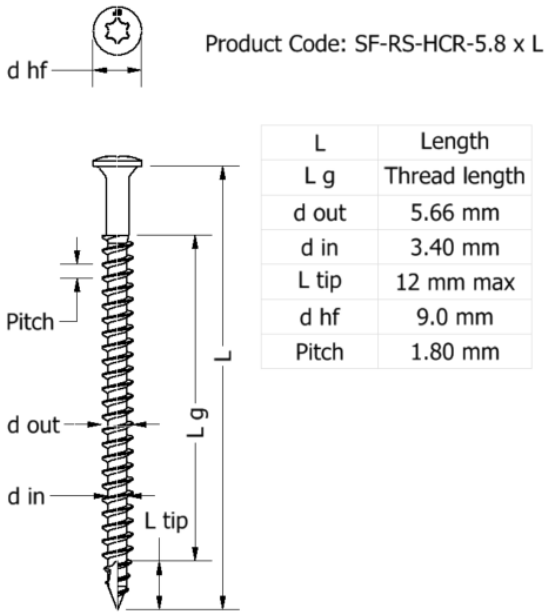

| L | Length |
|---|---|
| L g | Thread Length |
| d out | 5.66 mm |
| d in | 3.40 mm |
| L tip | 5 mm max |
| d hf | 8.9 mm |
| d tip | 3.00 mm |
| Pitch | 1.80 mm |

Fig.3
SF-RS-5.8
Screw for fixing in steel and wood
(Figure: Fixfast)



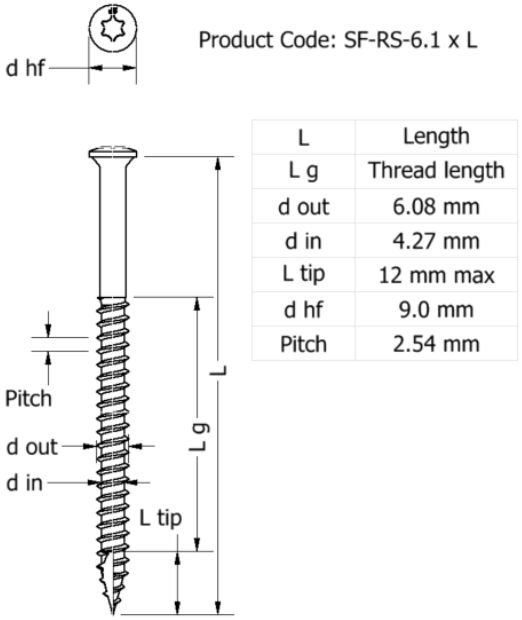

| L | Length |
|---|---|
| L g | Thread Length |
| d1 out | 5.42 mm |
| d1 in | 3.58 mm |
| L tip | 5 mm max |
| d hf | 9.25 mm |
| d tip | 3.28 mm |
| Pitch 1 | 2.00 mm |
| d2 out | 5.89 mm |
| d2 in | 3.88 mm |
| Pitch 2 | 2.00 mm |
| L m | 9 mm max |

Fig. 4
SF-RS-CL-5.2
Steel and wood screw (for fixing insulation and membrane)
(Figure: Fixfast)



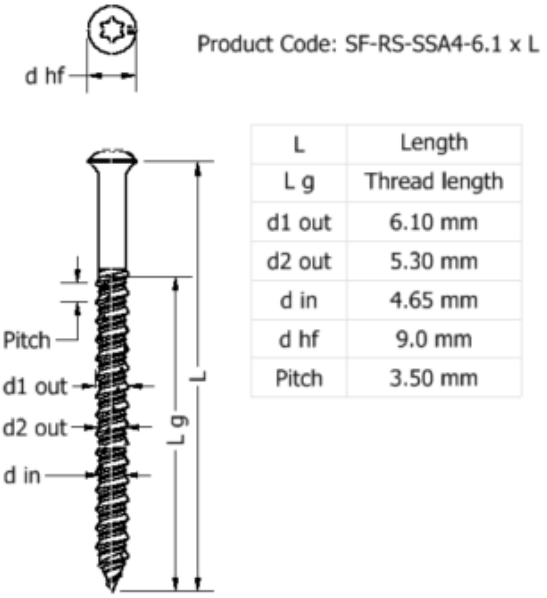

| L | Length |
|---|---|
| L g | Thread length |
| d out | 5.66 mm |
| d in | 3.40 mm |
| L tip | 12 mm max |
| d hf | 9.0 mm |
| Pitch | 1.80 mm |

Fig. 5
SF-RS-HCR-5.8
Screw for fixing in aluminium, steel and wood
(Figure: Fixfast)




| L | Length |
|---|---|
| L g | Thread length |
| d out | 6.08 mm |
| d in | 4.27 mm |
| L tip | 12 mm max |
| d hf | 9.0 mm |
| Pitch | 2.54 mm |

Fig. 6
SF-RS-6.1
Screw for fixing in concrete and wood
(Figure: Fixfast)




| L | Length |
|---|---|
| L g | Thread length |
| d1 out | 6.10 mm |
| d2 out | 5.30 mm |
| d in | 4.65 mm |
| d hf | 9.0 mm |
| Pitch | 3.50 mm |

Fig. 7
SF-RS-SSA4-6.1 Screw for fixing in concrete
(Figure: Fixfast)

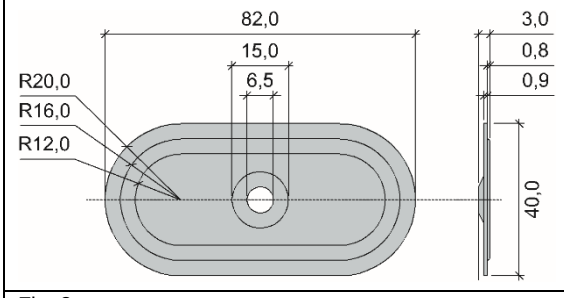



Fig. 8
SF-P-8240-S
Steel washer

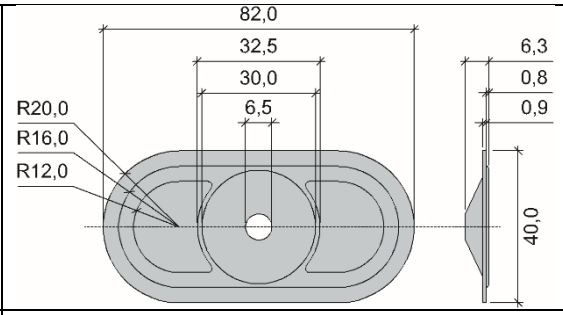



Fig. 9
SF-P-8240-D
Steel washer

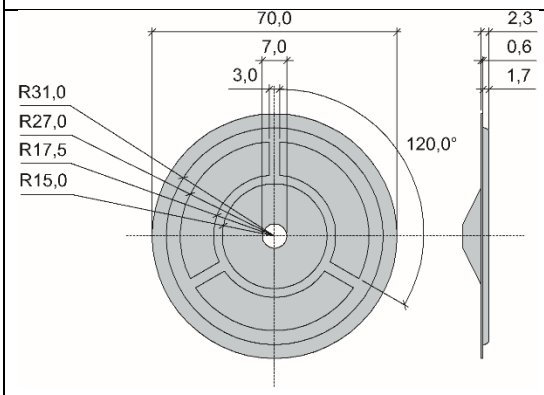



Fig. 10
SF-P-70-D
Steel washer

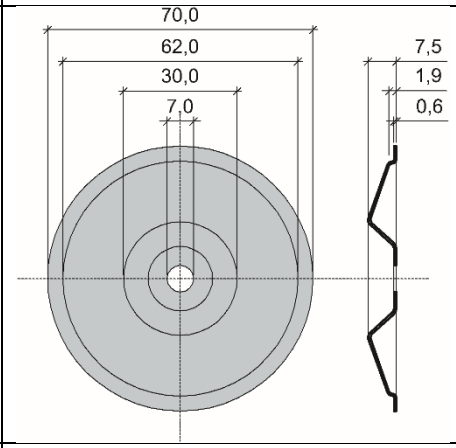



Fig. 11
SF-P-70-F
Steel washer

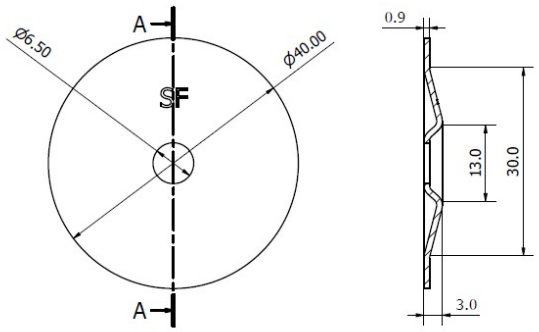



Figure 12
SF-P-40-F
Steel washer (galvanised steel)

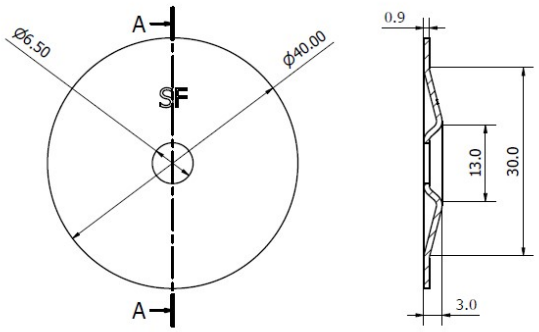



Figure 13
SF-P-SSA4-40
Steel washer (stainless steel closing bracket)

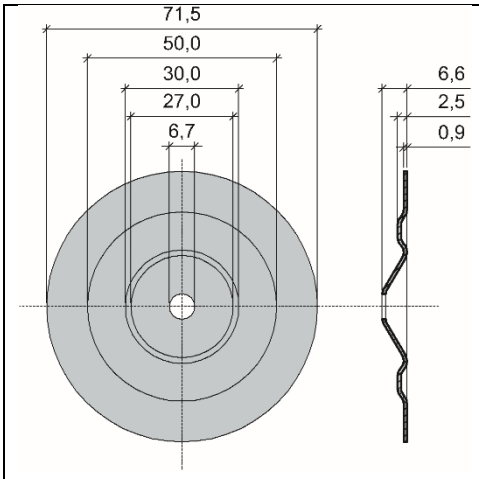



Fig. 14
SF-P-SS-70-D
Steel washer

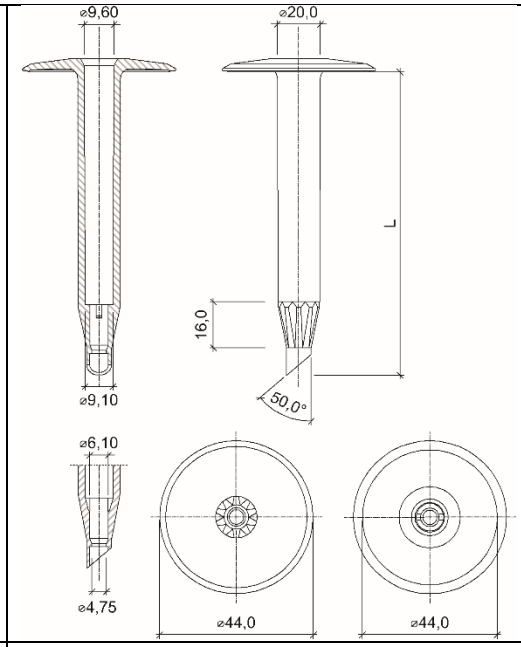



Fig. 15
SF-T-50
Tube washer

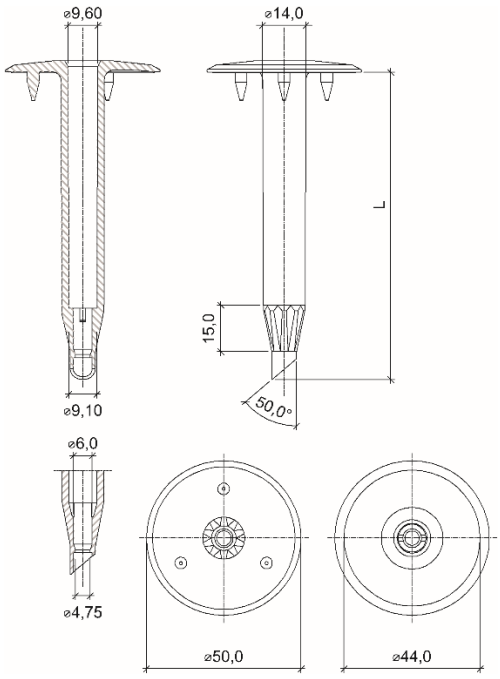



Fig. 16
SF-TB-50
Tube washer

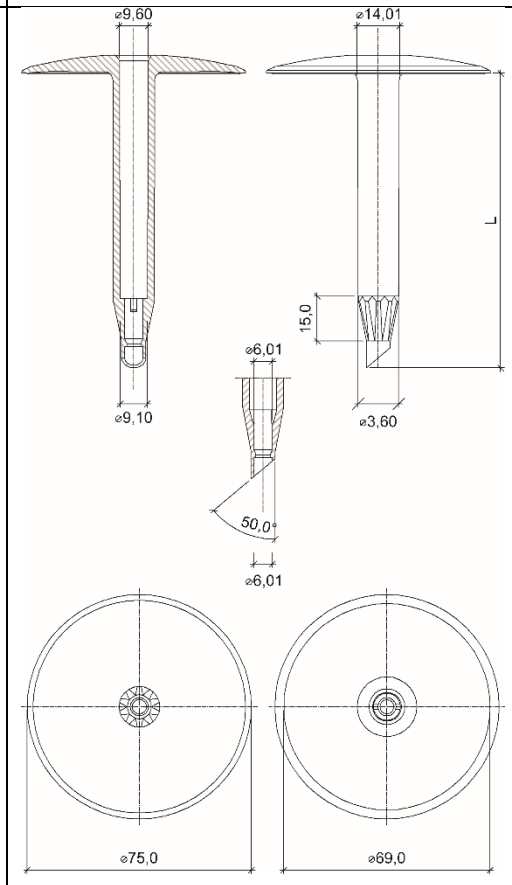



Fig. 17
SF-T-75
Tube washer

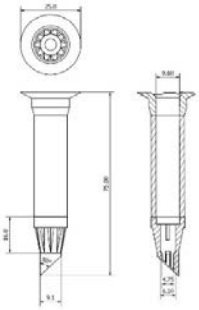


Fig. 18
SF-T-LP-75
Tube washer

# Annex 2

# Performance of FIXFAST SureFast Fastening system on different substrates

Characteristic values are calculated from the following formula:

$$\alpha\left(x_m - k \cdot s\right)$$

where: $\alpha$ = Corr. factor for tested substrate spec. compared with nominal substrate spec.

$x_m$ = mean axial pullout load for 10 specimens

$k$ = 1.92 (according to Table D1 in EN-1990:2002)

$s$ = standard deviation

**Table 2: Profiled metal decking substrate**

| Fastener type | Substrate | Characteristic values of the mechanical resistance, $R_k$ (kN) | Failure mode |
|---|---|---|---|
| SF-RS-4.8 | Steel 0.7 mm [1)] | 1.17 | Pull out from substrate |
| SF-RS-4.8 | Steel 0.9 mm [1)] | 1.89 | Pull out from substrate |
| SF-RS-4.8 | Steel 1.2 mm [1)] | 2.42 | Pull out from substrate |
| SF-RS-5.8 | Steel 0.7 mm [1)] | 1.43 | Pull out from substrate |
| SF-RS-5.8 | Steel 0.9 mm [1)] | 1.93 | Pull out from substrate |
| SF-RS-5.8 | Steel 1.2 mm [1)] | 2.87 | Pull out from substrate |
| SF-RS-CL-5.2 | Steel 0.7 mm [1)] | 0.94 | Pull out from substrate |
| SF-RS-HCR-5.8 | Aluminium 0.9 mm [2)] | 1.07 | Pull out from substrate |
| SF-RS-HCR-5.8 | Aluminium 1.5 mm [2)] | 2.06 | Pull out from substrate |
| SF-RS-CL-5.2 | Steel 0.9 mm [1)] | 1.47 | Pull out from substrate |
| SF-RS-CL-5.2 | Steel 1.2 mm [1)] | 2.05 | Pull out from substrate |
| SF-RS-SSA4-4.8 | Steel 0.7 mm [1)] | 1.08 | Pull out from substrate |
| SF-RS-SSA4-4.8 | Steel 0.9 mm [1)] | 1.45 | Pull out from substrate |
| SF-RS-SSA4-4.8 | Steel 1.2 mm [1)] | 2.24 | Pull out from substrate |
| SF-RS-6.1 | Steel 0.7 mm [1)] | 1.16 | Pull out from substrate |

*[1)] Steel sheets. galvanized. Grade S280 and S350 according to EN 10346 have to be used*
*[2)] Tensile strength for aluminium ($R_m$): 241 MPa*

## Table 3: Concrete substrate

| Fastener type | Substrate | Characteristic values of the mechanical resistance, $R_k$ (kN) | Failure mode |
|---|---|---|---|
| SF-RS-6.1 | Concrete C25/30 [1)] | 2.24 | Pullover between steel washer SF-P-8240-F and screw |
| SF-RS-SSA4-6.1 | Concrete C25/30 [1)2)] | 2.66 | Pullover between steel washer SF-P-70-F and screw |
| SF-RS-SSA4-6.1 | Concrete C25/30[1)2)] | 3.61 | Pull out from substrate. No steel washer was used in the test |

[1)] *Nominal characteristic values based on concrete strength. Concrete qualities C32/40, C25/30:*

- *α is determined according to ETAG 001 chapter 6.0 as follows:*
- *$\alpha = (f_c/f_{c,test})^{0.5} \leq 1.0$ $f_c$ = nominal compression strength of the concrete $f_{c,test}$ = compression strength of the concrete used for the test. $f_c$ = C32 $f_{c,test}$ = C32*
- *$\alpha = (f_c/f_{c,test})^{0.5} \leq 1.0$ $f_c$ = nominal compression strength of the concrete $f_{c,test}$ = compression strength of the concrete used for the test. $f_c$ = C32 $f_{c,test}$ = C32*

*Nominal characteristic value (C32/40): 3613 N / α = $(32/32)^{0.5}$=1.0*
*Nominal characteristic value (C25/30): 3194 N / α = $(25/32)^{0.5}$=0.884*

[2)] *The lowest value of the pull out and pullover should be used as the characteristic value for the application.*

## Table 4: Wood substrate

| Fastener type | Substrate | Characteristic values of the mechanical resistance, $R_k$ (kN) | Failure mode |
|---|---|---|---|
| SF-RS-4.8 | 18 mm plywood [1)] | 2.40 | Pull out from substrate |
| SF-RS-4.8 | 18 mm OSB [2)] | 1.03 | Pull out from substrate |
| SF-RS-4.8 | 38 mm timber [3)] | 2.88 | Pullover between steel washer SF-P-70 F and screw |
| SF-RS-4.8 | 38 mm timber | 4.05 [7)] | Pull out from substrate. No steel washer was used in the test |
| SF-RS-5.8 | 18 mm plywood [1)] | 2.10 | Pull out from substrate |
| SF-RS-5.8 | 18 mm OSB [2)] | 1.58 | Pull out from substrate |
| SF-RS-5.8 | 38 mm timber [3)] | 4.06 [4)] | Pull out from substrate. No steel washer was used in the test |
| SF-RS-CL-5.2 | 18 mm plywood [1)] | 2.01 | Pull out from substrate |
| SF-RS-CL-5.2 | 18 mm OSB [2)] | 1.52 | Pull out from substrate |
| SF-RS-CL-5.2 | 38 mm timber [3)] | 4.23 [5)] | Pull out from substrate. Two steel washers were used in the test |
| SF-RS-HCR-5.8 | 18 mm plywood [1)] | 2.46 | Pull out from substrate |
| SF-RS-HCR-5.8 | 38 mm timber [3)] | 2.76 | Pullover between steel washer SF-P-70 F and screw |
| SF-RS-HCR-5.8 | 38 mm timber [3)] | 4.72 [7)] | Pull out from substrate. No steel washer was used in the test |
| SF-RS-SSA4-4.8 | 18 mm plywood [1)] | 1.77 | Pull out from substrate |
| SF-RS-SSA4-4.8 | 18 mm OSB [2)] | 1.37 | Pull out from substrate |
| SF-RS-SSA4-4.8 | 38 mm timber | 3.89 [6)] | Pull out from substrate. Two steel washers were used in the test |
| SF-RS-6.1 | 18 mm plywood [1)] | 2.07 | Pull out from substrate |

*[1)] Plywood to be in accordance with minimum specifications of EN 636:2012+A1:2015 (t ≥ 19 mm exterior grade, minimum density 500 kg/m³)*

*[2)] Roofing grade OSB/3 should be manufactured to EN 300 (minimum density 600 kg/m³)*

*[3)] Softwood quality C-24 (mean density 420 kg/m³)*

*[4)] To determine the characteristic value for the kit, compare the values given in table 5 (pullover) between SF-RS-5.8 and washer SF-P-8240-D. The lowest value of the pull out and pull over should be used as the characteristic value for the application.*

*[5)] To determine the characteristic value for the kit, compare the values given in table 5 (pullover) between SF-RS-CL-5.2 and washer SF-P-8240-F. The lowest value of the pull out and pull over should be used as the characteristic value for the application.*

*[6)] To determine the characteristic value for the kit, compare the values given in table 5 (pullover) between SF-RS-SSA4-4.8and washer SF-P-8240-D. The lowest value of the pull out and pull over should be used as the characteristic value for the application.*

*[7)] The lowest value of the pull out and pullover should be used as the characteristic value for the application.*

## Table 5: Pullover test and durability for the washers

| Fastener type | Washer | Characteristic values of the mechanical resistance, $R_k$ (kN) | Durability |
|---|---|---|---|
| SF-RS-SSA4-4.8 | SF P-SS-70-D | 5.50 | Approved |
| SF-RS-5.8 | SF P-SS-70-D | 5.50 | Approved |
| SF-RS-6.1 | SF P-SS-70-D | 5.50 | Approved |
| SF-RS-SSA4-4.8 | SF-SP-8240-D | 3.06 | Approved |
| SF-RS-CL-5.2 | SF-P-8240-F | 4.28 | Approved |
| SF-RS-5.8 | SF-SP-8240-D | 3.06 | Approved |
| SF-RS-6.1 | SF-SP-8240-D | 3.06 | Approved |
| SF-RS-5.8 | SF-T-50 | 1.55 | Approved |
| SF-RS-SSA4-4.8<br>SF-RS-SSA4-4.8<br>SF-RS-6.1 | SF-P-40-F | 3.33 | Approved |
| SF-RS-SSA4-4.8<br>SF-RS-SSA4-4.8<br>SF-RS-6.1 | SF-P-SSA4-40 | 3.33 | Approved |

*Obtained values from the axial load test in different substrates (table 2 - 4) and the pullover test (table 5) of washers/sleeves have to be compared and the lowest of the two gives the characteristic value for the fastener / sleeve, washer combination of the application.*