

SINTEF confirms that

Milletech Fastening System

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

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www.milletech.se

2. Product description

Milletech Fastening System is designed as mechanical fastening system of roofing membranes and thermal insulation in roof constructions. Milletech Fastening System consists of the following components, see fig. 1-13:

- Tube washers made of injection moulded modified polypropylene and are produced both with and without studs, fig. 1 and 2
- Steel washer of coated steel, fig 3 – 6
- Screws for fixing in profiled steel sheets, fig. 7 - 9
- Concrete screw, fig 10
- Screw for fixing in light weight concrete, fig. 11
- Screws for fixing in wood, fig. 12 and 13.

3. Fields of application

Milletech Fastening System is used for mechanical fastening of bituminous and synthetic roofing membranes on flat, compact roofs with a supporting construction of profiled steel sheets, concrete, light weight concrete or wood.

4. Properties

Fastening capacity

Design capacities for fastening in various roofing membranes are given in table 1. Table 2 and 3 show the design capacity for the screws fixed in different substrates.

Corrosion protection

The fasteners in Milletech fastening system is treated with Ruspert corrosion protection and have corrosion resistance corresponding to user group KLA as specified in Building Research Design Guide 544.206 and ETAG 006 Annex D, 3.1.1 (15 cycles in accordance with DIN:50018:1997/ISO 6988:1995).

Safety against self-unwinding

Milletech Itech screws, for fixing in steel sheets, have been tested for safety against self-unwinding, and are considered safe.

Application properties

Milletech Fastening System has been evaluated to be satisfactory for use under the following conditions:

- Installation at temperatures down to -20°C .
- Oblique loading when fastened at the edge of membrane sheets or at flaps.
- Strength against loads caused by dynamic wind loads.
- Torch welding of bitumen roofing membranes.
- Ageing together with PVC roofing membranes and bituminous roof coverings.

5. Environmental aspects

Substances hazardous to health and environment

The product contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Waste treatment/recycling

The products shall be sorted as metal waste or residual waste on the building/demolition site. The products shall be delivered to an authorized waste treatment plant for material recovery (metal parts) and energy recovery (non-metal parts).

Environmental declaration

No environmental declaration according to EN 15804 has been worked out for Milletech Fastening System.

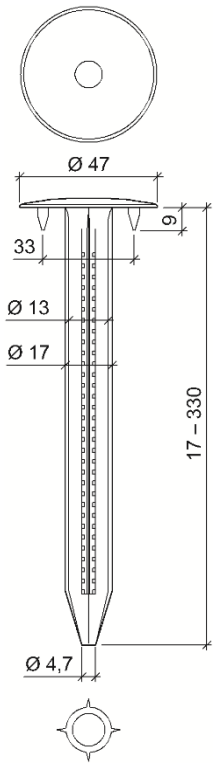


Fig. 1
Quadro – T fastening plug with studs

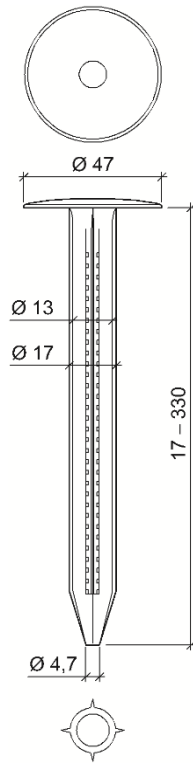


Fig. 2
Quadro fastening plug without studs

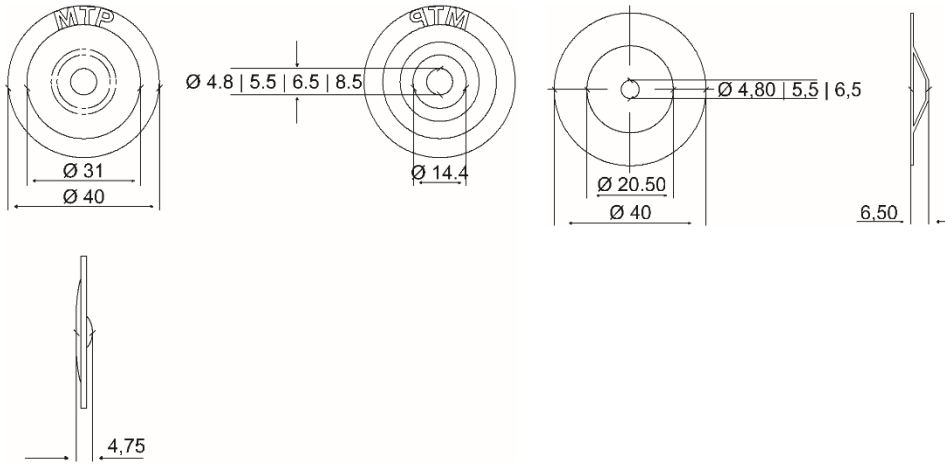


Fig. 3
Milletech Itech 40 steel washer

Fig. 4
Milletech Itech 40 countersunk steel washer

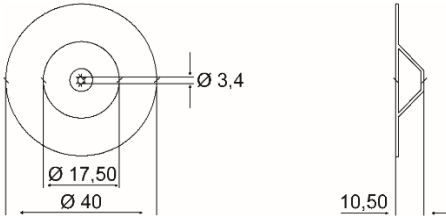
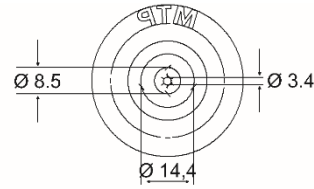
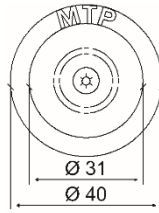


Fig. 5
Milletech Itech 40 countersunk steel washer for use together with wood screws

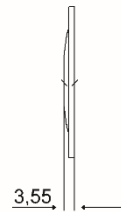


Fig. 6
Milletech Itech 40 steel washer for use together with wood screws

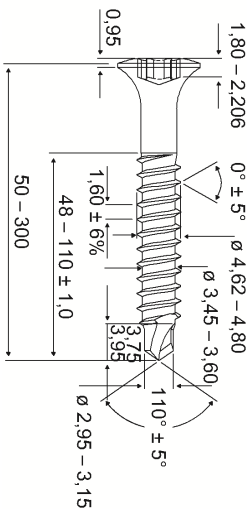
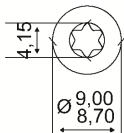


Fig. 7
Milletech Itech 4,8 T25 for fixing in steel sheets

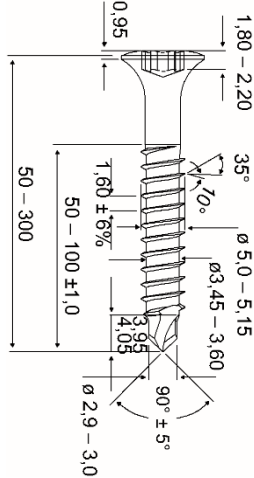
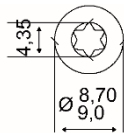


Fig. 8
Milletech Itech 5,1 T25 for fixing in steel sheets

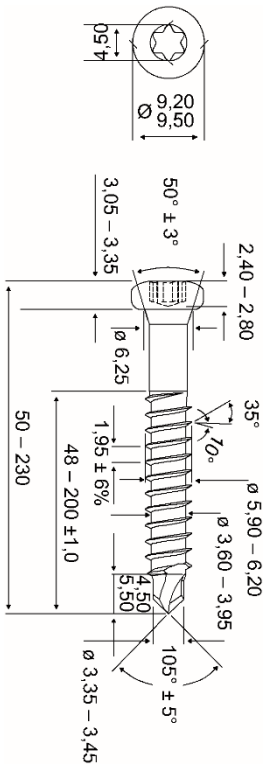


Fig. 9
Milletech Itech 6,1 T25 for fixing in steel sheets

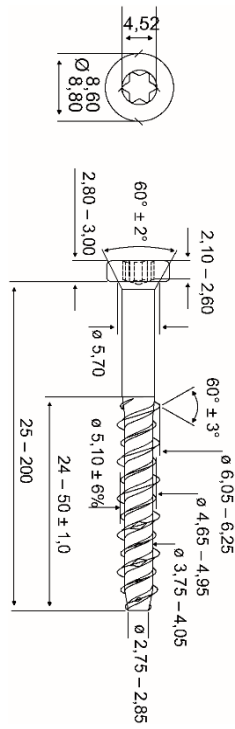


Fig. 10
Milletech Itech 6,1 T25 for fixing in concrete

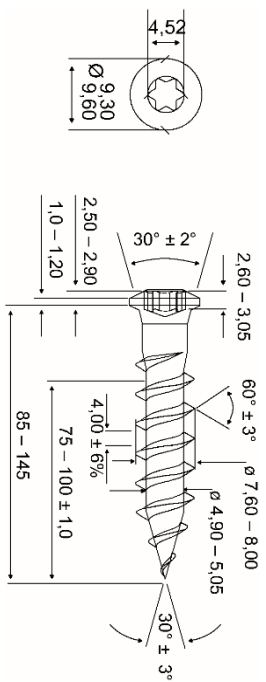


Fig. 11
Milletech Itech 8,0 T25 for fixing in light weight concrete

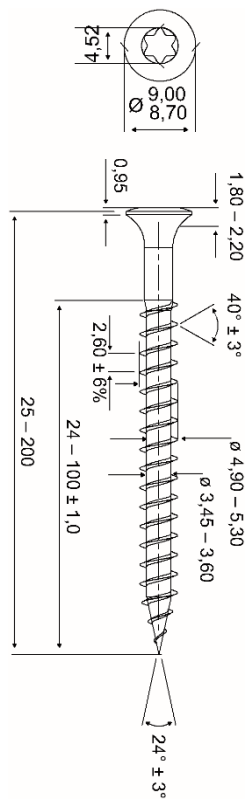


Fig. 12
Milletech Itech 5,2 T25 mm for fixing in wood

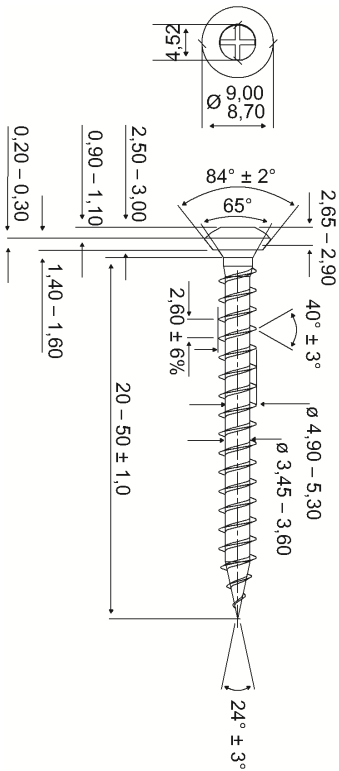


Fig. 13
Milletech Itech 5,2 PH2 for fixing in wood

Table 1

Design capacities in ultimate limit states for Milletech Fastening system washers, fixing various roofing membranes. The values to be used must not exceed the design fastening capacities of the substrate fastening shown in table 2 and 3

Roofing material	Design capacity in N/fastener ¹⁾		
	Plastic washers		Steel washers
	Quadro	Quadro T	Milletech Itech 40
PVC membrane fastened along membrane edge			
Alkorplan F 35076 1,2 mm		900	
Fatrafol 810/V 1,2 mm		900	
Icopal Monarplan FM EM 1,2 mm	600		
Protan SE takfolie 1,2 mm		900	
Protan SE takfolie 1,2 mm	700		
Sikaplan 12 VGWT		850	
Icopal Monarplan FM 1,2		750	
Single layer bituminous membrane			
Icopal Mono PM	750		
Icopal Mono PM	750		
Icopal Mono PR	750		
Icopal Mono PR			800
Isola Isotekk SET 5500	850		
Isola Isotekk SEP 5500			1000
Mataki Unotech FR	700		
Mataki Unotech FR			700
Mataki Power	750		
Mataki Power FR			750
Soprema Sopralene MF 5500	750		
Trebolit Elastolit R01	700		
Trebolit Elastolit R01			700
Trebolit Elastolit E-lit TM	750		
Trebolit Elastolit E-lit TM			750

¹⁾ Design capacities are given for use in Norway and include a safety factor (γ_m) of 1,3

Table 2

Design capacities at ultimate limit state for fixings with Milletech Fastening System to steel sheets substructures

Fastener	Substructure ¹⁾	Design capacity in N/fastener
Milletech Itech 4,8 mm steel sheet	Steel sheet 0,65 mm	700
Milletech Itech 4,8 mm steel sheet	Steel sheet 0,70 mm	850
Milletech Itech 4,8 mm steel sheet	Steel sheet 0,80 mm	1100
Milletech Itech 4,8 mm steel sheet	Steel sheet 0,90 mm	1400
Milletech Itech 4,8 mm steel sheet	Steel sheet 1,00 mm	1700
Milletech Itech 5,1 mm steel sheet	Steel sheet 0,70 mm	1050
Milletech Itech 6,1 mm steel sheet	Steel sheet 0,70 mm	1100

¹⁾ Steel quality S-280

Table 3

Design capacities at ultimate limit state for fixings with Milletech Fastening System to substructures of concrete, light weight concrete and wood

Fastener	Substructure ¹⁾	Design capacity in N/fastener
Milletech Itech 5,2 T25 mm for fixing in wood	18 mm plywood	1800
Milletech Itech 5,2 T25 mm for fixing in wood	20 mm wooden sheathing	1400
Milletech Itech 6,1 T25	Concrete C25/C30	1150
Milletech Itech lettbetongskruer 8,0 T25	Light weight concrete 450 kg/m ³	900

6. Special conditions for use and installation

Fastening to metal sheets

Calculation of fastening point numbers shall be carried out as shown in Building Research Design Sheet 544.206 or in "TPF Informerer nr. 5" (TPF Informs no. 5), based on the design capacities in table 1, 2 and 3. The capacity values are valid for use in Norway and include a safety factor of 1,3.

Where the values in table 2 are lower than the corresponding ones in table 1, the lowest values must be used.

Roofing membranes should normally be fastened to steel sheets with minimum 0.7 mm thickness. For locations with particularly severe weather conditions it is recommended to apply minimum 0.8 mm steel sheets.

7. Factory production control

The product is produced by " Milles Teknikplast AB, Bergsjödalen 55, S-415 23, Göteborg, Sweden.

The holder of the approval is responsible for the factory production control in order to ensure that the product is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

8. Basis for the approval

The approval is based on verification of several properties documented in the following reports:

- SINTEF (Norges Byggeforskningsinstitutt) report O-20040-B, dated 24.06.2005 (design capacity)
- SINTEF (Norges Byggeforskningsinstitutt) report O-20040, dated 19.12.2004 (design capacity)
- SP report P 402519 dated 01.11.2004 (durability)
- SINTEF report O-20040-C, dated 21.09.2005 (durability)

- SINTEF report O-20040-D, dated 19.12.2005 (durability)
- SINTEF report 102012380, dated 31.01.2018 (design capacity fixed in steel sheets, self-unwinding)
- Constructech report 20161010-124-1, dated 27.10.2016 (characteristic capacity)
- Constructech report 20161010-124-2, dated 28.10.2016 (pull-over)
- Constructech report 20160616-112-1, dated 21.06.2016 (wind uplift)
- Constructech report 20160616-112-2, dated 21.06.2016 (wind uplift)
- Constructech report 20160616-112-3, dated 21.06.2016 (wind uplift)
- Constructech report 20160616-112-4, dated 28.06.2016 (wind uplift)
- Constructech report 20160616-112-5, dated 28.06.2016 (wind uplift)
- Constructech report 20160616-112-6, dated 12.07.2016 (wind uplift)
- Constructech report 20160616-112-7, dated 21.07.2016 (wind uplift)
- Constructech report 20160616-112-8, dated 21.07.2016 (wind uplift)
- Constructech report 20160616-112-9, dated 21.07.2016 (wind uplift)
- Constructech report 20160616-112-10, dated 13.10.2016 (wind uplift)
- Constructech report 20160616-112-61, dated 12.07.2016 (wind uplift)
- Constructech report 20160616-112-91, dated 21.07.2016 (wind uplift)
- Constructech report 20161208-128-1, dated 11.12.2016 (wind uplift)
- Constructech report 20161208-128-2, dated 11.12.2016 (wind uplift)
- Constructech report 20160616-112-61, dated 12.07.2016 (wind uplift)
- Constructech report 20170314-138-1 dated 16.03.2017 (wind load)

- Constructech report 20170314-138-2 dated 24.03.2017 (wind uplift)
- Constructech report 20170314-138-3 dated 25.03.2017 (wind uplift)
- Constructech report 20170313-157 dated 17.08.2017 (wind uplift)
- Constructech report 20171019-168-1 dated 20.10.2017 (wind uplift)
- Constructech report 20171019-168-1 dated 23.10.2017 (wind uplift)
- Constructech report 20171019-168-11 dated 20.10.2017 (wind uplift)
- Constructech report 20171019-168-21 dated 23.10.2017 (wind uplift)
- Constructech report 20160516-110-1, dated 07.06.2016 (korrosjon)
- Constructech report 20160516-110-2, dated 01.06.2016 (korrosjon)
- Constructech report 20160516-110-3, dated 05.09.2016 (korrosjon)
- Constructech report 20180525-192, dated 25.05.2018 (characteristic capacity)
- SINTEF report 102012380, dated 31.01.2018 (design capacity and self-unwinding)

9. Marking

The tube washers shall be marked with manufacturers product name. All packaging shall be marked with product names and production dates.

The fastening system is CE-marked according to ETA 12-0056.

The approval mark for SINTEF Technical Approval No. 2439 may also be used.



Approval mark

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402

for SINTEF

Hans Boye Skogstad
Approval Manager