

SINTEF Building and Infrastructure confirms that

Milletech Fastening System

meets the provisions regarding product documentation given in Norwegian building regulations, with properties, fields of application and conditions as stated in this document

1. Holder of the approval

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2. Manufacturer

Milles Teknikplast AB.
 Subcontractors according to the control description.

3. Product description

Milletech fastening system is a roofing membrane fastener system, and consists of plastic fastening plugs with corresponding screws. The fastening plugs are made of injection moulded modified polypropylene and are supplied in two types:

- Milletech Quadro T with studs, see fig.1.
- Milletech Quadro without studs, see fig.2.

The fastening plugs with studs are preferably used together with polymeric roofing membranes, whereas plugs without studs are used together with bitumenous roofing membranes.

The plugs are fixated to the underlay of steel sheets with Milletech Itech 4.8 mm plate screws, see fig.3. The screws are treated with zinc coating (galvanized), phosphating and Ruspert corrosion protection.

4. Fields of application

Milletech fastening system is used for mechanical fastening of bitumenous and polymeric roofing membranes on flat, compact roofs with a supporting construction of steel sheets.

5. Properties

Fastening capacity

Design capacities for fastening in various roofing membranes are given in table 1. Table 2 gives the design capacity for the pullout of screws in profiled steel sheets.

Corrosion protection

The screws in Milletech fastening system have corrosion resistance corresponding to user group KLA as specified in Building Research Design Sheet 544.206, and has acceptable low risk for galvanic corrosion in combination with washers of aluminium or stainless steel.

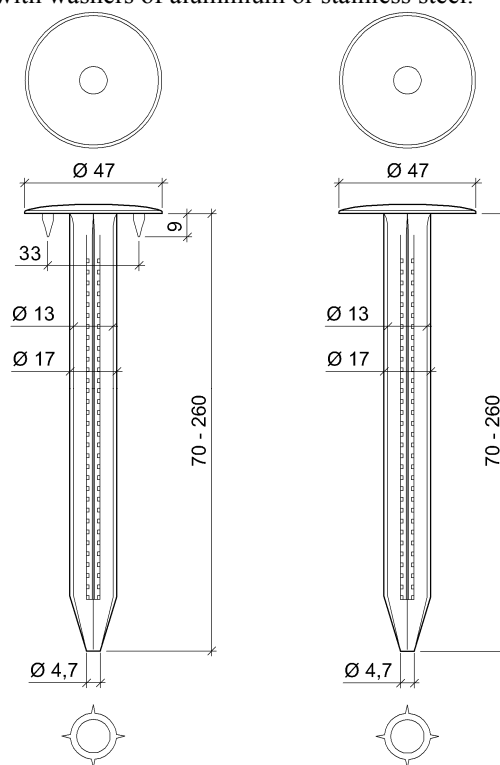


Fig. 1
 Quadro T fastening plug
 with studs.

Fig. 2
 Quadro fastening plug
 without studs.

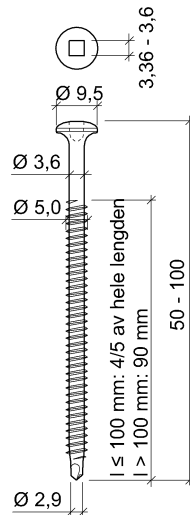


Fig. 3
Milletech Itech 4.8 mm plate screw.

Table 1
Design pull through capacity for fastening in various roofing membranes

Roofing	Capacity in N per fixing *	
	Fastening plug	
	Quadro	Quadro T
Icopal MonoPC bitumenous roofing membrane	900	-
Protan SE polymeric roofing membrane	-	750

* The capacities shall not exceed the dimensioning extraction values for fastening to the foundation.

Table 2
Design pullout capacity for Milletech Itech 4.8 mm plate screw in profiled steel sheets.

Steel thickness	Design capacity N per fixing
0.65 mm	850
0.70 mm	1000
0.80 mm	1250
0.90 mm	1550
1.00 mm	1850

6. Environmental aspects

Environmental declaration

No environmental declaration according to ISO 21930 has been worked out for Milletech fastening system.

Substances hazardous to health and environment

The products contain no hazardous substances with priority. Chemicals with priority include substances on the list of Priority Substances (SFT) and CMR, PBT or vPvB compounds.

Effect on soil, surface water and ground water

Leaching from the products is judged not to affect soil and groundwater negatively

Waste treatment/recycling

The fasteners, Milletech Quadro, may be recycled as plastic materials, or sent to an ordinary public waste deposit site after ending its working life.

The plate screws, Milletech Itech 4,8 mm, may be recycled as metal materials, or sent to an ordinary public waste deposit site after ending its working life.

7. 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 Informer nr. 5" (TPF Informs no. 5), based on the design capacities in Table 1 and 2. The capacity values are valid for Norwegian conditions. 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.

8. Factory production control

Milletech fastening system is subjected to surveillance control according to contract for SINTEF Technical Approval. *Eventuelt legges det til tekst om at produksjonsbedriften har et kvalitetssystem som sertifisert i henhold til ISO 9001.*

9. Basis for the approval

Fastening capacity in roofing membrane

The fastening capacities in the roofings are based on test results from wind load tests according to the method described in ETAG No. 006, section 5.1.4.1 from EOTA. The test results are documented in report O 20040-B from the Norwegian Building Research Institute dated 24.06.2005.

Fastening capacity in steel sheets

Fixing strength to steel plates has been measured according to method NBI 129/83 (NT Build 306). The test results are documented in report O 20040 from the Norwegian Building Research Institute dated 19.12.2004.

Durability

The corrosion protection for washers and screws has been tested in Kesternichkammer with 2.0 dm³ SO₂ according to DIN 50018. The test results are documented in report P 402519 from the Swedish National Testing and Research Institute, Borås, dated 01.11.2004.

Quadro fastening plug has been tested with respect to durability in use together with bitumenous roofing membrane and polymeric roofing membrane, and is documented in report O 20040-D from the Norwegian Building Research Institute dated 19.12.2005.

10. Marking

Fastening plugs in the fastening system shall be marked with approval holder's product name. All packages are marked with product designation and time of manufacture. SINTEF's approval mark for SINTEF Technical Approval No. 2439 may also be used.



Approval mark

11. 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.

12. Technical management

Project manager for this approval is Noralf Bakken, SINTEF Building and Infrastructure, Dept. of Materials and Construction - Trondheim.

for SINTEF Building and Infrastructure

Tore Henrik Erichsen
Approval Manager