**Tender specifications (long version) for PV mounting system MSP-FR-S**

Type of photovoltaic mounting system:

Mounting system for the attachment of nominally 10° elevated photovoltaic modules in south direction. Can be used from 0.5 m roof edge distance. All components made of aluminium, zinc magnesium coated steel and polyester fleece. Tested lightning current carrying capacity. Fulfils DIN (VDE 0100-712) requirements for potential equalisation of the holding frames (module frames) and the mounting system of the PV installation. TÜV certified. The mounting system is to be installed on the roof with as little additional ballast as possible and without penetrating the roof membrane, taking into account the maximum permissible ceiling load. Even after an extended period of time, the roof water drains must not be impeded by metal rails resting on the roof membrane or pulled through subsiding into the insulation material, regardless of the orientation. The configuration documentation of the mounting system manufacturer provides information about the surface load of the effectively occupied roof area and shows the maximum point load to be expected (including snow load). All components of the mounting system and all connecting materials must be made of rustproof material (aluminium, stainless steel or magnesium/nickel galvanised steel). The flat roof waterproofing must be protected by a protective layer of polyester fleece (min. 300 g/m²) against the horizontally acting shear forces and against any migration of plasticisers. The bearing pressure between the insulation material installed in the flat roof and the load caused by the additional load of the photovoltaic system plus the estimated snow load sk must be checked before the order is placed, and provided in writing by the mounting system manufacturer. It should be possible to adjust the bearing surface of the mounting system to the characteristics of the roof insulation material (min. permanent resistance to pressure at max. 2% compression). The modules are clamped to the mounting system by means of a universal end or middle clamp, which is suitable for all module frame heights of 28-45 mm. Irrespective of the modules, it must be possible for the mounting system to be mounted by one person. One-tool mounting (Torx 30). Additional drilling and cutting work on metal parts is not permitted on the construction site during the entire construction phase. Changes in roof coverage and associated changes to the ballast during the construction phase must be promptly tracked using configuration software and kept available for system documentation. The standards DIN EN 18195-1:2008-11 Building waterproofing - Part 2 - Materials, DIN VDE 0100-712 (VDE 0100-712), DIN EN 1990:2010-12, DIN EN 1991-1-1:2002-10, DIN EN 1991-1-3:2010-12, DIN EN 1991-1-4:2010-12, DIN EN 1999-1-1:2010-05 and the aerodynamic study according to WTG guidelines must be complied with.

**Consisting of**

* Support (low), SP-FR-S-SL
Or equivalent, supply and installation
* Support (high) MSP-FR-S-SH
Or equivalent, supply and installation
* Base profile MSP-FR-EW-BP (150 -1200)
BP150, BP300, BP450, BP600, BP900 or BP1200
Or equivalent, supply and installation
* Protection sheet fleece MSP-FR-EW-PSF (150 – 1200)
PSF150, PSF300, PSF450, PSF600, PSF900, PSF1200

Or equivalent, supply and installation

* Connection channel MSP-FR-EW-C, various lengths
Or equivalent, supply and installation
* Wind deflector MSP-FR-S-WD
Or equivalent, supply and installation
* Ballast tray holder MSP-FR-S-SB
Or equivalent, supply and installation
* Screws MSP-FR-S,
MSP-FR-TS 6.3x22 (for substructure capable of carrying lightning current)
and MSP-FR-GS
Or equivalent, supply and installation
* Cable holder with edge clip MSP-FR-CHE

Or equivalent, supply and installation

* Module clamps
Middle clamp MSP-PR-MC 28-45 mm, MSP-PR-MCG 28-45 mm (conductive)

Middle clamp MSP-PR-MCB 28-45 mm (black), MSP-PR-MCBG 28-45 mm (black, conductive)
and
End clamp MSP-PR-ECB 28-45 mm, MSP-PR-ECB 28-45 mm (black)

Or equivalent, supply and installation

**Tender specifications (short version) for PV mounting system MSP-FR-S**

Type of photovoltaic mounting system:

Elevation: nominal 10°

Module orientation: South and freely orientable

Roof edge clearance: minimum 0,5 m

Fixation: without roof penetration, only with additional load

Documentation of the manufacturer: structural strength verification for the stability of the entire system, ballasting plan, roof coverage plan, 3D total coverage overview, area load of effectively occupied area, max. point load incl. snow load, test of the bearing pressure

Materials: Aluminium, stainless steel, zinc magnesium coated steel and polyester fleece

System properties: Expandable bearing surface through selection of longer base plates, universal clamps 28-45 mm

Mounting characteristics (roof): Pre-installation without module is an option, installation by only one person possible, one-tool installation (Torx 30), no drilling or cutting work necessary, max. block size (thermal break): 14 m x 14 m, unimpeded roof drainage

Electrical properties: tested lightning current carrying capacity, earthing of module and frame possible with special earthing screw

Configuration flexibility: Fast reaction time with the help of configuration software (no Excel calculations!)

Standards/guidelines to be complied with: DIN EN 18195-1:2008-11 Water-proofing of buildings - Part 2: Materials, DIN VDE 0100-712 (VDE 0100-712), DIN EN 1990:2010-12, DIN EN 1991-1-1:2002-10, DIN EN 1991-1-3:2010-12, DIN EN 1991-1-4:2010-12, DIN EN 1999-1-1:2010-05 and the aerodynamic study according to WTG guidelines must be complied with.

Certificates: TÜV certified

**Consisting of**

* Support (low), MSP-FR-S-SL

Or equivalent, supply and installation

* Support (high), MSP-FR-S-SH

Or equivalent, supply and installation

* Base profile MSP-FR-EW-BP (150 -1200)
BP150, BP300, BP450, BP600, BP900 or BP1200
Or equivalent, supply and installation
* Protection sheet fleece MSP-FR-EW-PSF (150 – 1200)
PSF150, PSF300, PSF450, PSF600, PSF900, PSF1200

Or equivalent, supply and installation

* Connection channel MSP-FR-EW-C, various lengths
Or equivalent, supply and installation
* Screws
MSP-FR-S M6x16,
MSP-FR-TS 6.3x22 (for substructure capable of carrying lightning current)
and
MSP-FR-GS 6x60

Or equivalent, supply and installation

* Cable holder with edge clip MSP-FR-CHE

Or equivalent, supply and installation

* Module clamps
Middle clamp MSP-PR-MC 28-45 mm, MSP-PR-MCG 28-45 mm (conductive)

Middle clamp MSP-PR-MCB 28-45 mm (black), MSP-PR-MCBG 28-45 mm (black, conductive)
and
End clamp MSP-PR-ECB 28-45 mm, MSP-PR-ECB 28-45 mm (black)

Or equivalent, supply and installation