SMITT TECHNOLOGY

INNOVATIVE FUTURE

TOWER

FB SERIES TOWER

General

Octagonal metal towers for supporting Telecommunication antennas.
These towers have the following main features:
- No welding: no weak parts or defects;
- "Panels"-formed modular structure: installation without using special cranes or large trucks;
- Easy transportation: it can fit very limited spaces as the panels can be stacked;
- Assembling: four technicians employed, without cranes, for about 12 hours working.

Features of the materials

Nominal yield point "fy" and ultimate tensile strength "fu" for structural steels according to EN 10025 (t ≥ 40 mm):

Steel	**S235**	f_y = 235 MPa	f_u = 360 MPa
	S275	f_y = 275 MPa	f_u = 430 MPa
	S355	f_y = 355 MPa	f_u = 510 MPa

Nominal yield point "fyb" and ultimate tensile strength "fub" for bolts:

Bolts	*class 8.8*	f_{yb} = 640 MPa	f_{ub} = 800 MPa
Nuts	*class 6 S*		

Coefficients calculated for the material:

- modulus of elasticity	*E = 210000 N/mm²*
- modulus of tangential elasticity	*G = E / (2_(1+n)) @ 81000 N/mm²*
- poisson coefficient	*n = 0.3*
- coefficient of thermal expansion	*a = 12 _ 10-6 per °C*
- density	*r = 7850 kg/m³*

Maximum stress is obtained by a linear elastic analysis of the structure, according to the construction theory method; safety is verified by using the ultimate limit state method.

Dimensions

The tower can be from 15 to 36 mt tall and is comprised of eight 2.900 mm modules.
The tower octagonal cross section is generated by the combination of 8 shaped plates, 6 and 8 mm thick, bolted together. The tower is fixed to the base through a plate and anchor bolts embedded into a reinforced concrete foundation. When the tests are performed, the loads on the structure are combined to give the most unfavorable state of stress for each module.

STANDARD HEIGHT MODELS

NAME	HEIGHT
FB15	15 m
FB18	18 m
FB20	20 m
FB24	24 m
FB26	26 m
FB30	30 m
FB36	36 m

Wind on the tower

The horizontal action of the wind is considered with the reference kinetic pressure, which is equal to (see wind load analysis § 6.1.) q_{vref} = 455.6 N/m².

Wind load analysis

Reference speed:	v_{ref} = 27.0 m/s		
Reference kinetic pressure:	q_{ref} = 455.6 N/m²		
Ground roughness category:	k_r = 0.19;	z_0 = 0.05 m;	z_{min} = 4 m
Topography coefficient:	c_t = 1.0 (flat ground)		
Shape coefficient for towers:	c_p = 1.2		
Dynamic coefficient:	c_d = 1.0		
Curve p *lotting:*	$_z = q_{ref} \times c_e$		

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