

Tunnel Bolt

TSM B 10x165 M12

TSM B 14x165 M16



Product Application Guide

Description

Self threading concrete screw with metric connection thread and hexagon drive.

Material

Zinc flake-coated steel (available in A4 stainless steel or HCR upon request).

Substrates

- Approved for cracked and non-cracked concrete C20/25 - C50/60.
- Suitable for natural stone/brick with dense microstructure.

Approvals



¹⁾ETA option 1 governs the use of single-point fixings in cracked and non-cracked concrete.

Installation



1. Drill hole using a concrete drill bit (EN10204 or comparable national standard) and a hammer drill.
2. Blow out dust and debris from the bottom of the hole using a mechanical blow pump or air line
3. The screw anchors can be installed by hand. In this case some pressure is required initially to allow the thread to grip and begin cutting the thread. The use of an impact wrench is recommended. Be aware of the recommended torque for each screwbolt and set the impact

Removal

Remove either by hand or with impact wrench.



Usage/Purpose

The TSM B is a high performance concrete screw that self taps into the tunnel segments to provide “form locking” action into the substrate.

Rapid installation and complete removal is possible with an impact wrench.

Key Benefits

- High load capacity in cracked and non-cracked concrete
- Fast and safe installation
- Load transmission via undercut
- Can be removed without leaving residue
- Can be loaded immediately
- Cost effective
- Temporary and permanent works capability
- System can be either stud projecting or through fixing
- Torque wrench not required for safe setting of anchor

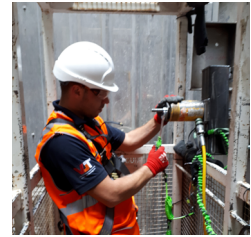
Technical Information

Description	Drill hole depth	Anchor embedment depth	Maximum fixture thickness	VJT Product Code
TSM B 10x120 M12x20 SW9	95mm	85mm	10mm	02800260
TSM B14x165 M16x35 SW12	135mm	125mm	15mm	02800290

Technical characteristics without fire exposure for single fastening of zinc flake-coated steel

		TSM B	
		10	14
drill bit diameter	d_o [mm]	10	14
drill hole depth	h_1 [mm]	95	135
embedment depth of anchor	h_{nom} [mm]	85	125
effective anchorage depth	h_{ef} [mm]	68	100
minimum thickness of member	h_{min} [mm]	130	200
minimum edge distance	c_{min} [mm]	70	100
minimum spacing	s_{min} [mm]	70	100
characteristic edge distance	$c_{cr,N}$ [mm]	102	150
characteristic spacing	$s_{cr,N}$ [mm]	204	300
installation torque	T_{inst} [Nm]	40	80
design value of tension load in cracked concrete C20/25 ¹⁾³⁾	N_{Rd} [kN]	10.8	24.1
design value of tension load in non-cracked concrete C20/25 ¹⁾³⁾	N_{Rd} [kN]	18.8	33.6
design value of shear load in cracked and non-cracked concrete C20/25 to C50/60 ¹⁾³⁾	V_{Rd} [kN]	22.7	42.7
recommended tension load in cracked concrete C20/25 ²⁾³⁾	N_{rec} [kN]	7.7	17.1
recommended tension load in non-cracked concrete C20/25 ²⁾³⁾	N_{rec} [kN]	13.4	24.0
recommended shear load in cracked and non-cracked concrete C20/25 to C50/60 ²⁾³⁾	V_{rec} [kN]	16.2	30.5

- ¹⁾ The partial safety factor from the approval $\gamma_M = 1.5$ was considered for determining the design value.
²⁾ The partial safety factor for material resistance from the approval $\gamma_M = 1.5$ as well as a partial safety factor for load actions $\gamma_F = 1.4$ were considered for determining the load.
³⁾ These values apply without influence of the spacings and edge distances.



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