TOGE TSM BC SB G

Composite anchor screw for fastening railings and contact protection for dynamic loads

Approval

Approval of the Federal Railway Authority for alternating fatigue loading up to 5 million load cycles as defined in DB Ril 804.

Approved for outdoor use with a service life of 50 years.

Small edge distances

Small edge distances allow railings and contact protection to be anchored on narrow components while simultaneously absorbing high forces.

Load Transmission

Transfer of fatigue-relevant actions even with installation-related inclination of the anchors up to 3°.

Transmission of shear load even with lever arm.

Transmission of forces in the existing concrete by the undercutting technique in combination with composite mortar.

Installation

Fast and secure installation.

Approvals

Approvals

General design type approval / General technical approval Z-21.1-1799.

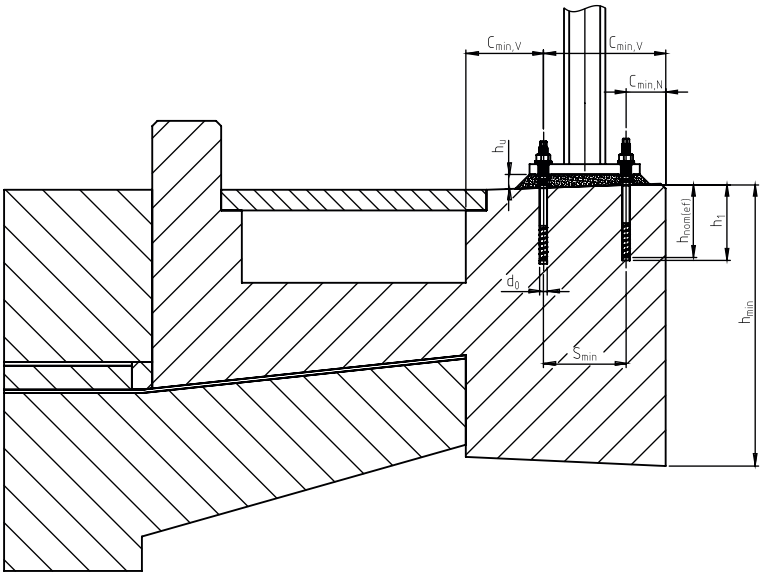
Federal Railway Authority approval 213.3-213izbia/005-2101#009

Federal Railway Authority approval 213.3-213izbia/005-2101#011

Base Materials

Application in cracked and non-cracked concrete of strength classes from C20/25 to C50/60.

Technical Characteristics

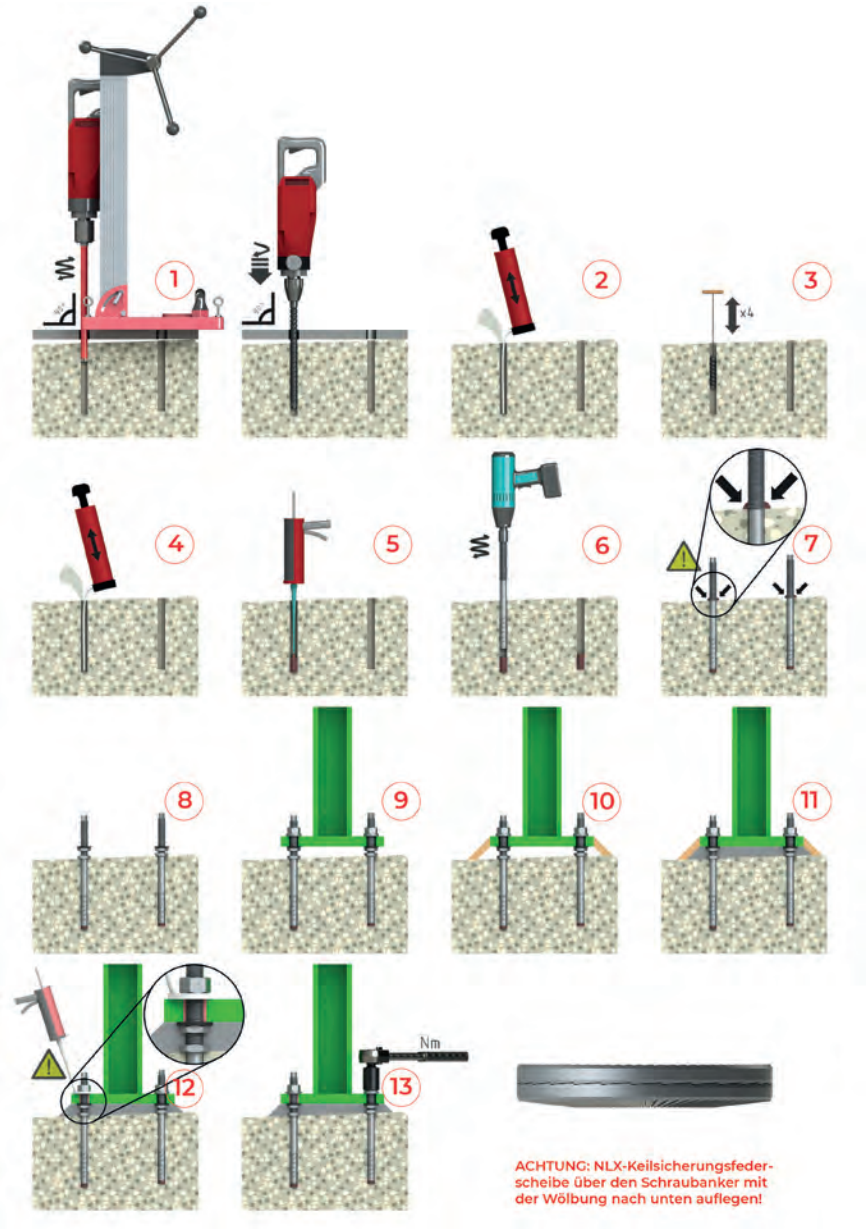


Installation parameters and load values for design according to EN 1992-4
Railing anchor TSM BC SB G for dynamic loads

Anchor size			**TSM BC SB 14**
Screw length	**L**	**[mm]**	**220**
Nominal diameter of drill bit	d_0	[mm]	14
Depth of drill hole	h_0 ≥	[mm]	100
Effective embedment depth of anchor	$h_{nom} = h_{ef}$ ≥	[mm]	100
Clearance hole in the base plate	d_f ≤	[mm]	22
Diameter metric connection thread	d_{Gew}	[mm]	16
Length metric connection thread	L_{Gew}	[mm]	85
Grouting height	h_u ≤	[mm]	40
Installation torque	T_{inst}	[mm]	80
Minimum egde distance	C_{min} ≥	[mm]	60
Minimum spacing	S_{min} ≥	[mm]	60
Minimum base material thickness	$h_{min,alt}$ ≥	[mm]	h_{ef} + 70
Hexagonal drive for installation of the screws	SW	[mm]	12
Design value of tension load in cracked concrete C20/25 [1) 2)]	$N_{Rd,c}$ ≥	[kN]	21,2
Design value of shear force for steel failure without lever arm [1) 2)]	$V_{Rd,s}$	[kN]	51,2
Design value of shear load for steel failure with lever arm [1) 2) 3)]	$V_{Rd,s,M}$	[kN]	4,8
Nominal torque of tangential screwdriver		[Nm]	≤ 650
Fatigue verification per individual anchor			
Design value of the amplitude of the normal stress resulting from the tension load [2)]	$\Delta\sigma_{5Mio}$	[N/mm²]	52,17
Design value of the amplitude of the shear stress resulting from the shear load. [2)]	$\Delta\tau_{5Mio}$	[N/mm²]	26,1
Design value of the amplitude of the flexural stress resulting from normal tension load and shear load with lever arm [2)]	$\Delta\sigma B_{5Mio}$	[N/mm]	113,04

[1)] For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.
[2)] These values apply without the influence of the spacing and edge dstances.
[3)] The specified values apply only under the following conditions: α_M = 2,0 ; h_u = 40 mm ; t_{fix} = 15 mm ; a_3 = 0.

Installation Instructions



1) Drill a hole at right angles to the base plate.
2) Thoroughly blow out the drill hole.
3) Brush the drill hole 4x.
4) Thoroughly clean the drill hole again.
5) Discard three full strokes of composite mortar – then inject composite mortar.
6) Screw in concrete screw.
7) After reaching the screw-in depth, the composite mortar must extrude at the concrete surface.
8) Hand-tighten the tensioning nut against the concrete. Screw on adjusting nut and place elastomer washer.
9) Position the post.
10) Build formwork.
11) Line base plate with suitable mortar (max. lining height 40mm).
12) Fill the annular gap between the screw anchor and the drill hole in the base plate.
13) Place the NLX wedge-lock washer with the curvature facing downwards and apply torque.