

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.



Headshapes & Materials

Steel,
zinc-plated

Steel,
anti-corrosion
coated

Stainless steel
A4



Railing anchor
TSM BC SB 14-G



TOGE KORR



Composite mortar
and accessories

Application Examples



Fastening of railings and contact protection on structures of the Deutsche Bahn



Product Overview

Steel - anti-corrosion coated, TOGE KORR corrosiveness category C5 high



Item Nr.	Designation	Depth of drill hole h_o	Embedment depth of anchor h_{nom}	Max. thickness of fixture t_{fix}	Packing Unit
204 142 200	TSM BC SB 14x220 G M16 SW12	150 mm	140 mm	50 mm	20

Composite Mortar CF-T 300V

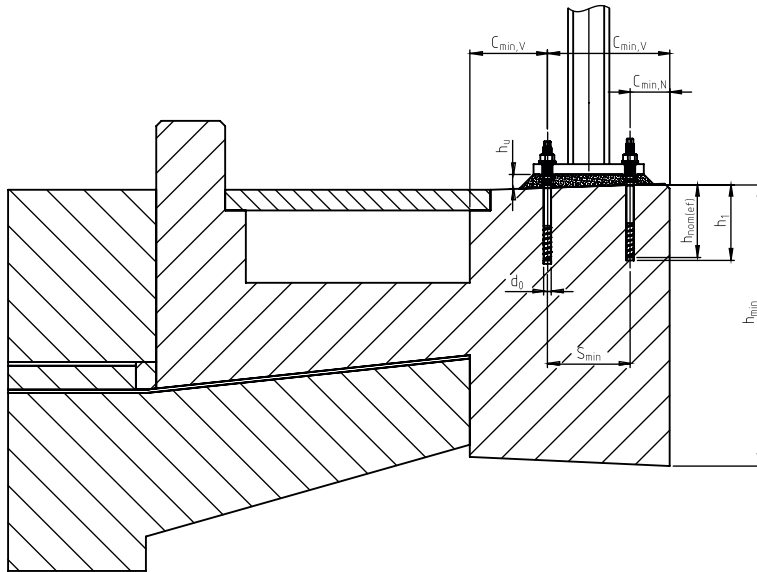
Chemical special mortar, vinyl ester styrene-free, suitable for concrete screws



Item Nr.	Designation	Packing Unit
222 222 003	Cartridge CF-T 300 V	1
222 223 001	Mixing nozzle for CF-T 300 V	1
222 222 004	Squeezing pistol for CF-T 300 V	1

Processing Instructions Composite Mortar

Temperature in ground	Processing time	Min. curing time in dry borehole	Min. curing time in wet borehole
$\geq -5^{\circ}\text{C}$	60 min	360 min	720 min
$\geq 0^{\circ}\text{C}$	60 min	180 min	360 min
$\geq 5^{\circ}\text{C}$	60 min	120 min	240 min
$\geq 10^{\circ}\text{C}$	45 min	80 min	160 min
$\geq 20^{\circ}\text{C}$	15 min	45 min	90 min
$\geq 30^{\circ}\text{C}$	5 min	25 min	50 min
$\geq 35^{\circ}\text{C}$	4 min	20 min	40 min



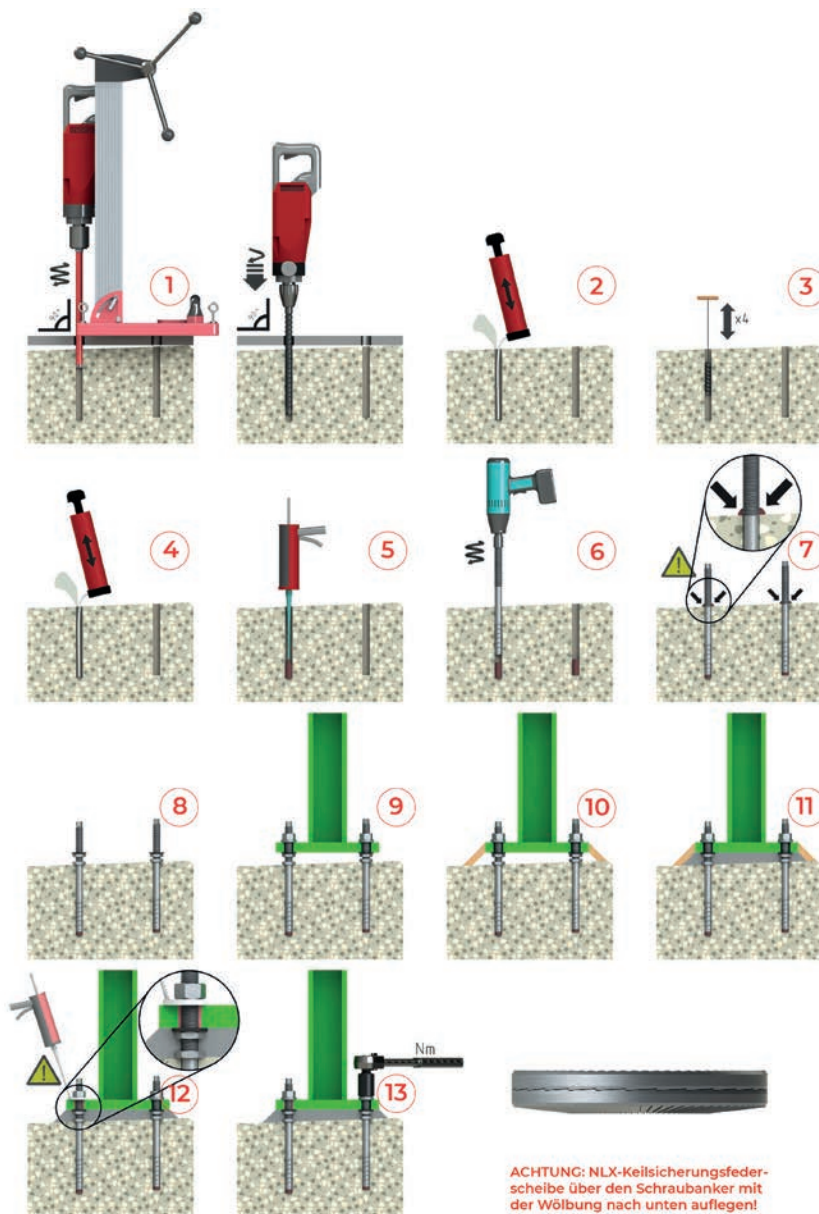
Installation parameters and load values for design according to EN 1992-4 Railing anchor TSM BC SB G for dynamic loads

Anchor size			TSM BC SB 14
Screw length	L	[mm]	220
Nominal diameter of drill bit	d_0	[mm]	14
Depth of drill hole	$h_0 \geq$	[mm]	100
Effective embedment depth of anchor	$h_{nom} = h_{ef} \geq$	[mm]	100
Clearance hole in the base plate	$d_f \leq$	[mm]	22
Diameter metric connection thread	d_{Gew}	[mm]	16
Length metric connection thread	L_{Gew}	[mm]	85
Grouting height	$h_u \leq$	[mm]	40
Installation torque	T_{inst}	[Nm]	80
Minimum edge distance	$C_{min} \geq$	[mm]	60
Minimum spacing	$S_{min} \geq$	[mm]	60
Minimum base material thickness	$h_{min,alt} \geq$	[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)}	$N_{Rd,c} \geq$	[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⁾	$\Delta\sigma_{SMlo}$	[N/mm ²]	52,17
Design value of the amplitude of the shear stress resulting from the shear load ²⁾	$\Delta\tau_{SMlo}$	[N/mm ²]	26,1
Design value of the amplitude of the flexural stress resulting from normal tension load and shear load with lever arm ²⁾	$\Delta\sigma_{SMlo}$	[N/mm ²]	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 distances.

³⁾ The specified values apply only under the following conditions: $\alpha_u = 2,0$; $h_u = 40$ mm; $t_{fix} = 15$ mm; $a_3 = 0$.



- 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.

ACHTUNG: NLX-Keilsicherungsfeder-scheibe über den Schraubanker mit der Wölbung nach unten auflegen!