

## TT-G HDG THROUGH BOLT

### Features:

- Through fixing
- Approved for non-cracked concrete
- 2 Embedment depths
- Hot Dipped Galvanised Min 4um
- Fire Rated

#### Load Data

- Concrete C20/25 ( $f_{ck,cube} = 25 \text{ N/mm}^2$ )
- No Edge and Spacing reductions
- Minimum base material thickness
- Correct installation

### Benefits:

- Quick and simple installation
- One anchor for concrete from C20/25 to C50/60
- Internal and external applications
- Long thread for stand off installation



Concrete Ranges: C20/C25 according to EN 206:2013+A1:2016

Certification: European technical assessment 22/0225

### Product Range

Product Code	Thread Diameter	Anchor Length	Drill Hole Diameter	Standard Embedment		Reduced Embedment		Fixture Clearance Hole	Thread Length
				Drill Hole Depth	Maximum Fixture Thickness	Drill Hole Depth	Maximum Fixture Thickness		
	d	L	d <sub>o</sub>	h <sub>nom,std</sub>	t <sub>fix,std</sub>	h <sub>nom,red</sub>	t <sub>fix,red</sub>	df	g
	mm	mm	mm	mm	mm	mm	mm	mm	mm
TT08050G*	8	50	8	60	-	35	-	9	22
TT08060G		65			-		5		30
TT08080G		80			15		25		40
TT08090G		90			25		35		50
TT08115G		115			50		60		60
TT10065G	10	65	10	65	-	40	5	12	30
TT10090G		90			20		30		50
TT10105G		105			35		45		55
TT10120G		120			50		60		60
TT10140G		140			70		80		80
TT12080G	12	80	12	90	-	50	5	14	35
TT12100G		100			5		25		50
TT12120G		120			25		45		70
TT12140G		140			45		65		90
TT12180G		180			85		105		100
TT16105G	16	105	16	110	-	65	5	18	55
TT16115G		115			-		15		55
TT16125G		125			5		25		65
TT16150G		150			30		50		85

## Installation Data

Anchor Diameter			M8	M10	M12	M16
Effective Anchorage Depth, Standard	$h_{ef, std}$	[mm]	45	50	70	85
Spacing, Standard Embedment Depth	$s_{cr, N, std}$	[mm]	40	125	200	200
Edge Distance, Tensile Standard Embedment Depth	$c_{cr, N, std}$	[mm]	55	70	105	115
Edge Distance, Shear, Standard Embedment Depth	$c_{cr, V, std}$	[mm]	70	90	115	195
Minimum Concrete Thickness, Standard	$h_{min}$	[mm]	100	100	140	170
Effectice Anchorage Depth, Reduced	$h_{ef, red}$	[mm]	35	40	50	65
Spacing, Reduced Embedment Depth	$s_{cr, N, red}$	[mm]	95	115	115	170
Edge Distance, Tensile, Red. Embedment Depth	$c_{cr, N, red}$	[mm]	50	60	60	90
Edge Distance, Shear, Red. Embedment Depth	$c_{cr, V, red}$	[mm]	70	85	120	205
Minimum Concrete Thickness, Reduced	$h_{min, red}$	[mm]	100	100	100	130
Minimum Spacing	$s_{min}$	[mm]	35	40	50	65
Minimum Edge Distance	$c_{min}$	[mm]	35	40	50	65
Installation Torque	$T_{inst}$	[Nm]	25	34	60	120

For reductions in Spacing and Edge Distance refer to DesignFix for calculations

## Load Data

### Standard Embedment

Characteristic Resistance (Non-Cracked concrete)

Anchor Diameter			M8	M10	M12	M16
$N_{Rk}$		[kN]	9.5	16.0	28.0	28.0
$V_{Rk}$		[kN]	7.3	11.6	16.9	31.4

### Design Resistance

Anchor Diameter			M8	M10	M12	M16
$N_{Rd}$		[kN]	6.3	10.6	18.6	18.6
$V_{Rd}$		[kN]	5.8	9.2	13.5	25.1

### Recommended Resistance

Anchor Diameter			M8	M10	M12	M16
$N_{rec}$		[kN]	4.5	7.6	13.3	13.3
$V_{rec}$		[kN]	4.1	6.6	9.6	17.9

Includes Partial Safety Factor  $\gamma = 1.4$  in the absence of national regulations and type of loading Data is for Static and Quasi Static Loads for a single anchor

## Reduced Embedment Characteristics Resistance

(Non-Cracked concrete)

Anchor Diameter			M8	M10	M12	M16
$N_{Rk}$		[kN]	9.5	12.0	12.0	24.0
$V_{Rk}$		[kN]	7.3	12.4	16.9	31.4

## Design Resistance

Anchor Diameter			M8	M10	M12	M16
$N_{Rd}$		[kN]	6.3	8.0	8.0	16.0
$V_{Rd}$		[kN]	5.8	8.3	13.5	25.1

## Recommended Resistance

Anchor Diameter			M8	M10	M12	M16
$N_{rec}$		[kN]	4.5	5.7	5.7	11.4
$V_{rec}$		[kN]	4.1	5.9	9.6	17.9

*Includes Partial Safety Factor  $\gamma = 1.4$  in the absence of national regulations and type of loading Data is for Static and Quasi Static Loads for a single anchor*

## Steel Limits

Anchor Diameter			M8	M10	M12	M16
$\Psi_c$ C30/37		[-]	1.00			
$\Psi_c$ C40/50		[-]	1.00			
$\Psi_c$ C50/60		[-]	1.00			

*When using increasing factors care must be taken not to exceed steel limits*

## Fire Loads

Anchor Diameter			M8	M10	M12	M16	
Characteristic Tensile Resistance	R30	$N_{Rk,s,fi}$	[kN]	0.4	0.9	1.7	3.1
	R60	$N_{Rk,s,fi}$	[kN]	0.3	0.8	1.3	2.4
	R90	$N_{Rk,s,fi}$	[kN]	0.3	0.6	1.1	2.0
	R120	$N_{Rk,s,fi}$	[kN]	0.2	0.5	0.8	1.6
Characteristic Shear Resistance	R30	$V_{Rk,s,fi}$	[kN]	0.4	0.9	1.7	3.1
	R60	$V_{Rk,s,fi}$	[kN]	0.3	0.8	1.3	2.4
	R90	$V_{Rk,s,fi}$	[kN]	0.3	0.6	1.1	2.0
	R120	$V_{Rk,s,fi}$	[kN]	0.2	0.5	0.8	1.6
Characteristic Bending Resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	0.6	1.7	3.9	9.3
	R60	$M^0_{Rk,s,fi}$	[Nm]	0.5	1.4	2.9	7.0
	R90	$M^0_{Rk,s,fi}$	[Nm]	0.4	1.1	2.5	6.0
	R120	$M^0_{Rk,s,fi}$	[Nm]	0.3	0.9	1.9	4.6

Minimum Edge Distance  $2 \times h_{ef}$

In case of fire attack from more than one side Minimum Edge Distance shall be  $\geq 300\text{mm}$  Minimum Spacing  $4 \times h_{ef}$

## Anchor Materials

Designation	Material	
Bolt	C1008 Cold formed steel	Hot Dipped Galvanised $\geq 4\mu\text{m}$ EN ISO 1461
Expansion Sleeve	$f_{uk} \geq 400 \text{ MPa}$ $F_{yk} \geq 320 \text{ MPa}$ Stainless Steel 304	
Washer	DIN 125 or EN ISO 7089	
Hexagon Nut	EN ISO 898-2 carbon steel class 8 / DIN 934 ? AISI 1008	

