Declaration of Performance

According to Annex III of the Regulation (EU) Nr.305/2011
(Construction Products Regulation).

Walraven Throughbolt Anchor WT1 SSt

DoP No. 21/0365-WT1-SST

1. **Unique identification code of the product-type:**
   Walraven Throughbolt Anchor WT1 SST, Item numbers: 608608075, 608610090, 608610135, 608612120, 608612150

2. **Intended use/es:**
   Metal anchors for use in concrete: for fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.

3. **Manufacturer:**
   J. van Walraven Holding B.V., Industrieweg 5, 3641 RK Mijdrecht, The Netherlands

4. **System/s of AVCP:**
   System 1

5. **European Assessment Document:** EAD 330232-01-0601 "Mechanical Fasteners for use in concrete ", December 2019.
   European Technical Assessment: ETA - 21/0365 (08/02/2024).
   Technical Assessment Body: Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc).
   Notified body: 1219.

6. **Declared performance/s:**

Essential Characteristic	Performance	Harmonized Technical Specification
Essential characteristics under static or quasi static loading	See Annex C1, C2, C4, C5, ETA-21/0365	EAD 330232-01-0601
Displacements under tension and shear loads	See Annex C6, ETA-21/0365	EAD 330232-01-0601
Essential characteristics under seismic loading categories C1 and C2	See Annex C8 and C10, ETA-21/0365	EAD 330232-01-0601
Resistance to fire	See Annex C12, ETA-21/0365	EOTA TRO20
Reaction to Fire	Anchors satisfy requirements for Class A1	EN 13501-1

7. **Appropriate Technical Documentation and/or Specific Technical Documentation:**
   N/A

8. **The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.**

Signed for and on behalf of the manufacturer by:

Frank Nijdam
CCO
J. van Walraven Holding B.V.

Signature

Date 21-10-2025
Place: Mijdrecht

Table C1: Installation parameters for WT1 ST, WT1 SH, WT1 anchors

Installation parameters			Performances					
			M8	M10	M12	M16	M20	M24
d_0	Nominal diameter of drill bit:	[mm]	8	10	12	16	20	24
d_f	Fixture clearance hole diameter:	[mm]	9	12	14	18	22	26
T_{inst}	Nominal installation torque:	[Nm]	20 / 15[1)]	40	60	100	200	250
L_{min}	Minimum total length of the bolt:	[mm]	68	82	98	119	140	175
h_1	Depth of drilled hole:	[mm]	60	75	85	105	125	155
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	55	68	80	97	114	143
h_{ef}	Effective anchorage depth:	[mm]	48	60	70	85	100	125
t_{fix}	Thickness of fixture for washer DIN 125 ≤ [2)]	[mm]	L - 66	L – 80	L – 96	L - 117	L - 138	L - 170
t_{fix}	Thickness of fixture for washers DIN 9021, DIN 440 ≤ [2)]	[mm]	L - 67	L – 81	L – 97	L - 118	L - 139	L - 171
s_{min}	Minimum allowable spacing: for edge distance c ≥	[mm] [mm]	40 55	40 70	60 75	65 95	95 105	125 125
c_{min}	Minimum allowable distance: for spacing s ≥	[mm] [mm]	45 55	45 90	55 110	70 115	95 105	125 125
h_{min}	Minimum thickness of concrete member: WT1 ST, WT1 SH	[mm]	100	120	140	170	200	250
h_{min}	Minimum thickness of concrete member: WT1	[mm]	80	90	105	130	150	--

[1)] Respective values for anchors WT1 ST / WT1 SH, WT1
[2)] L = total anchor length,

Table C2: Installation parameters for WT1 SST anchor

Installation parameters			Performances				
			M8	M10	M12	M16	M20
d_0	Nominal diameter of drill bit:	[mm]	8	10	12	16	20
d_f	Fixture clearance hole diameter:	[mm]	9	12	14	18	22
T_{inst}	Nominal installation torque:	[Nm]	15	30	60	100	200
L_{min}	Minimum total length of the bolt:	[mm]	68	82	98	119	140
h_1	Depth of drilled hole:	[mm]	60	75	85	105	125
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	55	68	80	97	114
h_{ef}	Effective anchorage depth:	[mm]	48	60	70	85	100
t_{fix}	Thickness of fixture for washer DIN 125 ≤ [1)]	[mm]	L - 66	L – 80	L – 96	L - 117	L – 138
t_{fix}	Thickness of fixture for washers DIN 9021, DIN 440 ≤ [1)]	[mm]	L - 67	L – 81	L – 97	L - 118	L – 139
s_{min}	Minimum allowable spacing:	[mm]	42	47	57	75	100
c_{min}	Minimum allowable distance:	[mm]	47	52	62	75	90
h_{min}	Minimum thickness of concrete member:	[mm]	100	120	140	170	200

[1)] L = total anchor length

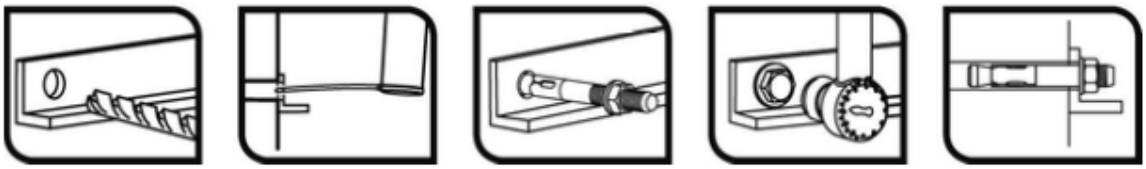
WT1 ST, WT1 SH, WT1, WT1 SST anchor

Performances

Installation parameters

Annex C1

Installation process



WT1 ST, WT1 SH, WT1, WT1 SST anchors	**Annex C2**
Performances Installation procedure	

Table C4: Essential characteristics under static or quasi-static tension loads according to design method A according to EN 1992-4 for WT1 SST anchor

Essential characteristics under static or quasi-static tension loads according to design method A				Performances				
				M8	M10	M12	M16	M20
Tension loads: steel failure								
$N_{Rk,s}$	Characteristic resistance:		[kN]	18.5	30.9	45.5	71.5	122.5
γ_{Ms}	Partial safety factor:		[-]	1.4	1.4	1.4	1.4	1.4
Tension loads: pull-out failure in concrete								
$N_{Rk,p,ucr}$	Characteristic resistance in C20/25 uncracked concrete:		[kN]	12	16	22	--[1)]	--[1)]
ψ_c	Increasing factor for $N^0_{Rk,p}$:	C30/37	[-]	1.22	1.22	1.22	1.22	1.09
		C40/50	[-]	1.41	1.41	1.41	1.41	1.16
		C50/60	[-]	1.58	1.58	1.58	1.58	1.22
$N_{Rk,p,cr}$	Characteristic resistance in C20/25 cracked concrete:		[kN]	8.5	14	19	--[1)]	--[1)]
ψ_c	Increasing factor for $N^0_{Rk,p}$:	C30/37	[-]	1.01	1.00	1.09	1.09	1.17
		C40/50	[-]	1.02	1.00	1.15	1.16	1.32
		C50/60	[-]	1.02	1.00	1.20	1.22	1.44
γ_{ins}	Installation safety factor:		[-]	1.0	1.0	1.2	1.2	1.2
Tension loads: concrete cone and splitting failure								
h_{ef}	Effective embedment depth:		[mm]	48	60	70	85	100
$k_{ucr,N}$	Factor for uncracked concrete:		[-]	11.0				
$k_{cr,N}$	Factor for cracked concrete:		[-]	7,7				
γ_{ins}	Installation safety factor:		[-]	1.0	1.0	1.2	1.2	1.2
$s_{cr,N}$	Concrete cone failure:		[mm]	$3 \times h_{ef}$				
$c_{cr,N}$			[mm]	$1.5 \times h_{ef}$				
$s_{cr,sp}$	Splitting failure:		[mm]	164	204	238	290	380
$c_{cr,sp}$			[mm]	82	102	119	145	190

1) Pull out failure is not decisive

WT1 SST anchor	**Annex C4**
Performances Essential characteristics under static or quasi-static tension loads	

Table C5: Essential characteristics under static or quasi-static shear loads of design method A according to EN 1992-4 for WT1 ST, WT1 SH, WT1 anchors

Essential characteristics under static or quasi-static shear loads according to design method A			Performances					
			M8	M10	M12	M16	M20	M24
Shear loads: steel failure without lever arm								
$V_{Rk,s}$	Characteristic resistance:	[kN]	11.0	17.4	25.3	47.1	73.1	84.7
k_7	Ductility factor:	[-]	1.00					
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25	1.25
Shear loads: steel failure with lever arm								
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	22.5	44.8	78.6	199.8	389.4	673.5
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25	1.25
Shear loads: concrete pryout failure								
k_8	Pryout factor:	[-]	1	2	2	2	2	2
γ_{ins}	Installation safety factor:	[-]	1.00					
Shear loads: concrete edge failure								
ℓ_f	Effective length of anchor under shear loads:	[mm]	48	60	70	85	100	125
d_{nom}	Outside anchor diameter:	[mm]	8	10	12	16	20	24
γ_{ins}	Installation safety factor:	[-]	1.00					

Table C6 Essential characteristics under static or quasi-static shear loads of design method A according to EN 1992-4 for WT1 SST anchor

Essential characteristics under static or quasi-static shear loads according to design method A			Performances				
			M8	M10	M12	M16	M20
Shear loads: steel failure without lever arm							
$V_{Rk,s}$	Characteristic resistance:	[kN]	11.9	18.9	27.4	55.0	85.9
k_7	Ductility factor:	[-]	1.00				
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25
Shear loads: steel failure with lever arm							
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	26.2	52.3	91.7	233.1	454.3
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25
Shear loads: concrete pryout failure							
k_8	Pryout factor:	[-]	1	2	2	2	2
γ_{ins}	Installation safety factor:	[-]	1.00				
Shear loads: concrete edge failure							
ℓ_f	Effective length of anchor under shear loads:	[mm]	48	60	70	85	100
d_{nom}	Outside anchor diameter:	[mm]	8	10	12	16	20
γ_{ins}	Installation safety factor:	[-]	1.00				

WT1 ST, WT1 SH, WT1, WT1 SST anchors	
Performances Essential characteristics under static or quasi-static shear loads	**Annex C5**

Table C7: Displacements under tension loads for WT1 ST, WT1 SH, WT1, WT1 SST anchors

Displacements under tension loads			Performances					
			M8	M10	M12	M16	M20	M24
WT1 ST anchor								
N	Service tension load:	[kN]	2.5	4.3	6.3	10.4	13.9	18.0
δ_{N0}	Short term displacement:	[mm]	1.1	0.7	1.0	0.4	1.6	0.4
$\delta_{N\infty}$	Long term displacement:	[mm]	1.9	1.9	1.9	1.9	1.9	2.0
WT1 SH anchor								
N	Service tension load:	[kN]	2.5	4.3	6.3	10.4	13.9	--
δ_{N0}	Short term displacement:	[mm]	1.0	1.1	0.9	1.5	1.2	--
$\delta_{N\infty}$	Long term displacement:	[mm]	1.9	1.9	1.9	1.9	1.9	--
WT1 anchor								
N	Service tension load:	[kN]	2.5	4.3	7.6	11.9	14.3	--
δ_{N0}	Short term displacement:	[mm]	1.0	1.1	0.9	1.5	1.3	--
$\delta_{N\infty}$	Long term displacement:	[mm]	1.6	1.6	1.6	1.6	1.6	--
WT1 SST anchor								
N	Service tension load in non cracked concrete:	[kN]	5.7	7.6	8.7	15.3	19.5	--
δ_{N0}	Short term displacement:	[mm]	1.4	1.4	1.4	1.8	1.8	--
$\delta_{N\infty}$	Long term displacement:	[mm]	1.9	1.9	1.9	1.9	1.9	--
WT1 SST anchor								
N	Service tension load in cracked cocnrete:	[kN]	4.0	6.7	7.5	10.7	13.7	--
δ_{N0}	Short term displacement:	[mm]	1.2	1.3	1.3	1.3	1.3	--
$\delta_{N\infty}$	Long term displacement:	[mm]	1.7	1.7	1.7	1.7	1.7	--

Table C8: Displacements under shear load for WT1 ST, WT1 SH, WT1, WT1 SST anchors

Displacements under shear loads			Performances					
			M8	M10	M12	M16	M20	M24
WT1 ST anchor								
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6	33.6
δ_{V0}	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1	1.4
$\delta_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7	2.1
WT1 SH anchor								
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6	-
δ_{V0}	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1	--
$\delta_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7	--
WT1 anchor								
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6	--
δ_{V0}	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1	--
$\delta_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7	--
WT1 SST anchor								
V	Service shear load:	[kN]	6.8	10.8	15.7	31.4	46.9	--
δ_{V0}	Short term displacement:	[mm]	1.9	1.6	1.6	2.2	2.2	--
$\delta_{V\infty}$	Long term displacement:	[mm]	2.4	2.4	2.4	3.3	3.3	--

WT1 ST, WT1 SH, WT1, WT1 SST anchors	**Annex C6**
Performances Displacements under static or quasi-static tension and shear loads	

Table C10: Essential characteristics for seismic performance category C1 WT1 SST anchors

Essential characteristics for seismic performance category C1			Performances				
			M8	M10	M12	M16	M20
Steel tension failure							
$N_{Rk,s,C1}$	Characteristic tension steel failure:	[kN]	--	30.9	45.5	71.5	122.5
$\gamma_{Ms,N}$	Partial safety factor:	[-]	--	1.4	1.4	1.4	1.4
Steel shear failure							
$V_{Rk,s,C1}$	Characteristic shear steel failure:	[kN]	--	10.6	19.2	40.2	45.5
α_{gap}	Factor for annular gap:	[-]	--	0.5			
$\gamma_{Ms,V}$	Partial safety factor:	[-]	--	1.25	1.25	1.25	1.25
Pull out failure							
$N_{Rk,p,C1}$	Characteristic pull out failure:	[kN]	--	6.4	11.8	17.5	20.6
γ_{ins}	Installation safety factor:	[-]	--	1.0	1.2	1.2	1.2
Concrete cone failure							
h_{ef}	Effective embedment depth:	[mm]	--	60	70	85	100
$s_{cr,N}$	Spacing:	[mm]	--	3 x hef			
$c_{cr,N}$	Edge distance:	[mm]	--	1.5 x h_{ef}			
γ_{ins}	Installation safety factor:	[-]	--	1.0	1.2	1.2	1.2
Concrete pryout failure							
k_8	Pryout factor:	[-]	--	2	2	2	2
Concrete edge failure							
l_f	Effective length of anchor:	[mm]	--	60	70	85	100
d_{nom}	Outside anchor diameter:	[-]	--	10	12	16	20

WT1 SST anchors	**Annex C8**
Performances Essential characteristics for seismic performance category C1	

Table C12: Essential characteristics for seismic performance category C2 WT1 SST anchors

Essential characteristics for seismic performance category C2			Performances				
			M8	M10	M12	M16	M20
Steel tension and shear failure							
$N_{Rk,s,C2}$	Characteristic tension steel failure:	[kN]	--	30.9	45.5	71.5	122.5
$\gamma_{Ms,N}$	Partial safety factor:	[-]	--	1.4	1.4	1.4	1.4
$V_{Rk,s,C2}$	Characteristic shear steel failure:	[kN]	--	10.6	19.2	40.2	45.5
α_{gap}	Factor for annular gap	[-]	--	0.5	0.5	0.5	0.5
$\gamma_{Ms,V}$	Partial safety factor:	[-]	--	1.25	1.25	1.25	1.25
Pull out failure							
$N_{Rk,p,C2}$	Characteristic pull out failure:	[kN]	--	3.0	4.0	15.8	15.7
γ_{ins}	Installation safety factor:	[-]	--	1.0	1.2	1.2	1.2
Concrete cone failure							
h_{ef}	Effective embedment depth:	[mm]	--	60	70	85	100
$s_{cr,N}$	Spacing:	[mm]	--	$3 \times h_{ef}$			
$c_{cr,N}$	Edge distance:	[mm]	--	$1.5 \times h_{ef}$			
γ_{ins}	Installation safety factor:	[-]	--	1.0	1.2	1.2	1.2
Concrete pryout failure							
k_8	Pryout factor:	[-]	--	2	2	2	2
Concrete edge failure							
l_f	Effective length of anchor:	[mm]	--	60	70	85	100
d_{nom}	Outside anchor diameter:	[-]	--	10	12	16	20
Displacements							
$\delta_{N,C2\ (DLS)}$	Displacement Damage Limitation State:[1) 2)]	[mm]	--	2.6	4.9	5.2	5.5
$\delta_{V\ C2\ (DLS)}$		[mm]	--	4.5	4.5	5.2	5.6
$\delta_{N,C2\ (ULS)}$	Displacement Ultimate Limit State:[1)]	[mm]	--	9.3	15.2	13.2	15.7
$\delta_{V,C2\ (ULS)}$		[mm]	--	6.9	7.2	8.3	7.9

[1)] The listed displacements represent mean values

[2)] A small displacement may be required in the design in the case of displacements sensitive fastening of "rigid" supports. The characteristics resistance associated with such small displacements may be determined by linear interpolation or proportional reduction.

WT1 SST anchors	
Performances Essential characteristics for seismic performance category C2	**Annex C10**

Table C14: Essential characteristics under fire exposure WT1 SST anchor

Essential characteristics under fire exposure					Performances				
					M8	M10	M12	M16	M20
Steel failure									
$N_{Rk,s,fi}$	Characteristic tension resistance:		R30	[kN]	0,7	1,5	2,5	4,7	7,4
			R60	[kN]	0,6	1,2	2,1	3,9	6,1
			R90	[kN]	0,4	0,9	1,7	3,1	4,9
			R120	[kN]	0,4	0,8	1,3	2,5	3,9
$V_{Rk,s,fi}$	Characteristic shear resistance:		R30	[kN]	0,7	1,5	2,5	4,7	7,4
			R60	[kN]	0,6	1,2	2,1	3,9	6,1
			R90	[kN]	0,4	0,9	1,7	3,1	4,9
			R120	[kN]	0,4	0,8	1,3	2,5	3,9
$M^0_{Rk,s,fi}$	Characteristic bending resistance:		R30	[Nm]	0,7	1,9	3,9	10,0	19,5
			R60	[Nm]	0,6	1,5	3,3	8,3	16,2
			R90	[Nm]	0,4	1,2	2,6	6,7	13,0
			R120	[Nm]	0,4	1,0	2,1	5,3	10,4
Pull out failure									
$N_{Rk,p,fi}$	Characteristic resistance:		R30 R60 R90	[kN]	2,1	3,5	4,8	--[1]	--[1]
			R120	[kN]	1,7	2,8	3,8	--[1]	--[1]
Concrete cone failure [2]									
$N_{Rk,c,fi}$	Characteristic resistance:		R30 R60 R90	[kN]	2.7	4,8	7,1	11,5	17,2
			R120	[kN]	2,2	43,8	5,6	9,2	13,8
$s_{cr,N,fi}$	Critical spacing:	R30 to R120		[mm]	4 x h_{ef}				
$s_{min,fi}$	Minimum spacing:	R30 to R120		[mm]	42	47	57	75	100
$c_{cr,N,fi}$	Critical edge distance:	R30 to R120		[mm]	2 x h_{ef}				
$c_{min,fi}$	Minimum edge distance:	R30 to R120		[mm]	c_{min} = 2 x h_{ef}; if fire attack comes from more than one side, the edge distance of the anchor has to be ≥ 300 mm and ≥ 2 x h_{ef}				
Concrete pry out failure									
k_8	Pryout factor:	R30 to R120		[-]	1	2	2	2	2

[1] Pull out failure is not decisive
[2] As a rule, splitting failure can be neglected since cracked concrete and reinforcement is assumed.
In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{m,fi}$ = 1,0 is recommended

WT1 SST anchors	
Performances Essential characteristics under fire exposure	**Annex C12**