

VT-HP® – High Performance Chemical Anchor

Material

Vinylester

Features & Benefits

- Suitable for use in cracked and non-cracked concrete M8 to M30 / rebar Ø8 to Ø32
- Qualified for use in seismic performance categories C1 and C2
- Low odour for safe use in confined spaces - VOC Compliant (A+ rating)
- Excellent for use in cold weather conditions or applications where fast cure is required
- Superior sustained load performance at elevated temperatures
- Can be used in dry and damp conditions, wet or flooded environments (not sea water)
- Fire rated to R120
- Fits 300ml standard caulking gun or DT300 by Simpson Strong-Tie, easy to dispense

Applications

- Structural Steel
- Steel Columns and Beams, Post Bases, Concrete Columns
- Balcony Extensions
- Post-installed rebar applications
- Threaded Rod Anchoring
- Facades, Safety Barriers
- Fences, Gates, Industrial Garage and Warehouse applications

Base Material

- Normal and Lightweight Concrete (cracked and non-cracked)
- Grout-filled and Hollow Concrete Block (when used with screen tubes)
- Certain un-reinforced masonry applications

Approvals

CE 1404 Simpson Strong-Tie Int. Ltd. 2022	CE 1404 Simpson Strong-Tie Int. Ltd. 2022
DoP: www.strongtie.eu	DoP: www.strongtie.eu
VT-HP ETA-19/0419 EAD 330499-00-0601 M8-M30 8mm - 32mm Seismic C2 M12,16,20 1404-CPR-3179	VT-HP ETA-19/0765 EAD 330076-00-0604 M8-M16 Masonry use category b,c,d 1404-CPR-3272



VT-HP Curing Schedule for Concrete and Masonry - Maximum working time and minimum curing time

Concrete Temperature	Gelling/Working Time	Minimum Curing Time in Dry Concrete	Minimum Curing Time in Wet Concrete
0°C to +4°C*	45 min	7 h	x2
+5°C to +9°C	25 min	2 h	x2
+10°C to +19°C	15 min	80 min	x2
+20°C to +29°C	6 min	45 min	x2
+30°C to +34°C	4 min	25 min	x2
+35°C to +40°C	2 min	20 min	x2
+40°C	1,5 min	15 min	x2

* Cartridge temperature must be between +5°C and +40°C

* In wet concrete the curing time must be doubled

Simpson Strong-Tie® Australia Pty Ltd
Call **1300 STRONGTIE (1300 787664)**
www.strongtie.com.au

Simpson Strong-Tie® (New Zealand) Ltd
Call **09 477 4440**
www.strongtie.co.nz

This flyer reflects information available as of September 16, 2024 and may be updated periodically.
Simpson Strong-Tie Limited Warranty: For the Limited Warranty that applies to Simpson Strong-Tie products, please consult www.strongtie.com.au/warranty or www.strongtie.co.nz/warranty. To obtain a copy of the Limited Warranty, contact us at info.au@strongtie.com or info.nz@strongtie.com, or at the number provided here. The Limited Warranty contains important disclaimers, limitations and exclusions, and applies only if the products have been properly specified, installed, maintained, and used in accordance with the design limits and the structural, technical, and environmental specifications in the Simpson Strong-Tie Documentation. All future purchases of Simpson Strong-Tie products are subject to the terms of the Limited Warranty in effect as of the purchase date.

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Specifications

Installation Data – Threaded Rod

Description	Symbol	Units	Threaded Rod Size (mm)							
			M8	M10	M12	M16	M20	M24	M27	M30
Nominal Insert Diameter	d	mm	8	10	12	16	20	24	27	30
Drill Hole Diameter	d _o		10	12	14	18	24	28	32	35
Minimum Embedment Depth	h _{ef,min}		60	60	70	80	90	96	108	120
Maximum Embedment Depth	h _{ef,max}		160	200	240	320	400	480	540	600
Clearance Hole Diameter in Fixture	d _f		9	12	14	18	22	26	30	33
Minimum Edge Distance	c _{min}		40	50	60	80	100	120	135	150
Minimum Spacing	s _{min}		40	50	60	80	100	120	135	150
Maximum torque moment	T _{inst, max}		Nm	10	20	40	80	120	160	180

Concrete Thickness, Critical Edge Distance and Spacing – Threaded Rod

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Embedment Depth h_{ef} = 8d										
Embedment Depth	h _{ef}	mm	64	80	96	128	160	192	216	240
Minimum Concrete Thickness	h _{min}		100	110	126	164	208	248	280	310
Critical Edge Distance	c _{cr,N}		96	120	144	192	240	288	324	360
Critical Spacing	s _{cr,N}		192	240	288	384	480	576	648	720
Embedment Depth h_{ef} = 12d										
Embedment Depth	h _{ef}	mm	96	120	144	192	240	288	324	360
Minimum Concrete Thickness	h _{min}		126	150	174	228	288	344	388	430
Critical Edge Distance	c _{cr,N}		144	180	216	288	360	432	486	540
Critical Spacing	s _{cr,N}		288	360	432	576	720	864	972	1060

Design Resistance – Single Anchor, No Concrete Edge or Spacing Influence – Threaded Rod

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Uncracked Concrete - h_{ef} = 8d										
TENSION	N _{Rd}	kN	11.1	17.4	25.1	44.6	69	90.8	105.8	117.6
SHEAR	V _{Rd}		7.2	12	16.8	31.2	48.8	70.4	92	112
Cracked Concrete - h_{ef} = 8d										
TENSION	N _{Rd}	kN	4.5	7.3	11.5	20.4	31.9	46	68.8	84.9
SHEAR	V _{Rd}		7.2	12	16.8	31.2	48.8	70.4	92	112
Uncracked Concrete - h_{ef} = 12d										
TENSION	N _{Rd}	kN	12	19.3	28	52	81.3	117.3	153.3	176.3
SHEAR	V _{Rd}		7.2	12	16.8	31.2	48.8	70.4	92	112
Cracked Concrete - h_{ef} = 12d										
TENSION	N _{Rd}	kN	6.7	10.9	17.2	30.7	47.9	69	103.2	127.4
SHEAR	V _{Rd}		7.2	12	16.8	31.2	48.8	70.4	92	112

- Concrete strength is 30 MPa (cylinder) unreinforced, hole condition is "dry", and temperature range 24°C long-term/43°C short-term.
- Tabulated loads are valid at critical spacing and critical edge distance only. For spacing and edge distance influence, use Simpson's Anchor Designer™ Software for analysis.
- N_{Rd} and V_{Rd} is based on use of a Grade 5.8 threaded insert. Verify capacity if using a different steel grade.
- All design resistances are derived from the product's ETA (European Technical Assessment).

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Design Resistance – Single Anchor, No Concrete Edge or Spacing Influence – Threaded Rod

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Category C1 - $h_{ef} = 8d$										
TENSION	N_{Rd}	kN	2.7	4.3	7.4	13.2	20.7	30.5	45.8	56.5
SHEAR	V_{Rd}		2.3	4.2	5.9	10.9	17.1	24.6	32.2	39.2
Category C2 - $h_{ef} = 8d$										
TENSION	N_{Rd}	kN	-	-	4	7.1	11.2	-	-	-
SHEAR	V_{Rd}		-	-	4.1	7.3	11.4	-	-	-
Category C1 - $h_{ef} = 12d$										
TENSION	N_{Rd}	kN	4	6.5	11.2	19.8	31	45.8	68.7	84.8
SHEAR	V_{Rd}		2.5	4.2	5.9	10.9	17.1	24.6	32.2	39.2
Category C2 - $h_{ef} = 12d$										
TENSION	N_{Rd}	kN	-	-	6	10.7	16.7	-	-	-
SHEAR	V_{Rd}		-	-	5	10.9	17.1	-	-	-

- Concrete strength is 20 MPa (cylinder) unreinforced, hole condition is "dry", and temperature range 24°C long-term/43°C short-term.
- Tabulated loads are valid at critical spacing and critical edge distance only. For spacing and edge distance influence, use Simpson's Anchor Designer™ Software for analysis.
- N_{Rd} and V_{Rd} is based on use of a Grade 5.8 threaded insert. Verify capacity if using a different steel grade.
- All design resistances are derived from the product's ETA (European Technical Assessment).

Steel Design Resistance (Tension) – Threaded Rod

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Steel Grade 5.8	$N_{Rd,s}$	kN	12.2	19.3	28	52.7	82	118	153	187
Stainless Steel A4			13.7	21.7	31.6	58.8	92	132	80.2	98.1

Steel Design Resistance (Shear) – Threaded Rod

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Steel Grade 5.8	$N_{Rd,s}$	kN	7.4	11.6	16.8	31.2	48.8	70.4	92	112
Stainless Steel A4			8.2	13	19.2	35.3	55.1	79.5	48.3	58.9

Installation Data – Rebar

Description	Symbol	Units	Rebar Size (mm)								
			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Nominal Insert Diameter	d	mm	8	10	12	14	16	20	25	28	32
Drill Hole Diameter	d_o		12	14	16	18	20	24	32	35	40
Minimum Embedment Depth	$h_{ef,min}$		60	60	70	75	80	90	100	112	128
Maximum Embedment Depth	$h_{ef,max}$		160	200	240	280	320	400	500	580	640
Minimum Edge Distance	c_{min}		40	50	60	70	80	100	125	140	160
Minimum Spacing	s_{min}		40	50	60	70	80	100	125	140	160

Concrete Thickness, Critical Edge Distance and Spacing – Rebar

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Embedment Depth $h_{ef} = 8d$											
Embedment Depth	h_{ef}	mm	64	80	96	112	128	160	200	224	256
Minimum Concrete Thickness	h_{min}		100	110	128	148	168	208	264	294	336
Critical Edge Distance	$c_{cr,N}$		96	120	144	168	192	240	300	335	384
Critical Spacing	$s_{cr,N}$		192	240	288	336	384	480	600	672	768
Embedment Depth $h_{ef} = 12d$											
Embedment Depth	h_{ef}	mm	96	120	144	168	192	240	300	336	384
Minimum Concrete Thickness	h_{min}		126	150	176	204	232	288	364	406	464
Critical Edge Distance	$c_{cr,N}$		144	180	216	252	288	360	450	504	576
Critical Spacing	$s_{cr,N}$		288	360	432	504	576	720	900	1008	1152

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Design Resistance – Single Anchor, No Concrete Edge or Spacing Influence – Rebar

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Uncracked Concrete - $h_{ef} = 8d$											
TENSION	N_{Rd}	kN	11.1	17.4	25.1	34.1	44.6	69	96.5	113.8	126.3
SHEAR	V_{Rd}		9.3	14.7	20.7	28	36	56.7	88.7	110.7	144.7
Cracked Concrete - $h_{ef} = 8d$											
TENSION	N_{Rd}	kN	4.5	7.3	11.5	15.6	20.4	31.9	49.9	74	96.6
SHEAR	V_{Rd}		8.9	14.7	20.7	28	36	56.7	88.7	110.7	144.7
Uncracked Concrete - $h_{ef} = 12d$											
TENSION	N_{Rd}	kN	16.7	26.1	37.6	51.2	66.9	104.5	149.7	170.7	189.5
SHEAR	V_{Rd}		9.3	14.7	20.7	28	36	56.7	88.7	110.7	144.7
Cracked Concrete - $h_{ef} = 12d$											
TENSION	N_{Rd}	kN	6.7	10.9	17.2	23.5	30.7	47.9	74.8	110.9	144.9
SHEAR	V_{Rd}		9.3	14.7	20.7	28	36	56.7	88.7	110.7	144.7

- Concrete strength is 30 MPa (cylinder) unreinforced, hole condition is "dry", and temperature range 24°C long-term/43°C short-term.
- Tabulated loads are valid at critical spacing and critical edge distance only. For spacing and edge distance influence, use Simpson's Anchor Designer™ Software for analysis.
- All design resistances are derived from the product's ETA (European Technical Assessment).

Design Resistance – Single Anchor, No Concrete Edge or Spacing Influence – Seismic Performance C1 – Rebar

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
$h_{ef} = 8d$											
TENSION	N_{Rd}	kN	2.7	4.3	7.4	10.1	13.2	20.7	33.1	49.2	64.3
SHEAR	V_{Rd}		4.6	8.8	14.2	19.4	25.3	39.6	61.9	77.6	101.3
$h_{ef} = 12d$											
TENSION	N_{Rd}	kN	4	6.5	11.2	15.2	19.8	31	49.7	73.9	96.5
SHEAR	V_{Rd}		6.3	10	14.2	19.4	25.3	39.6	61.9	77.6	101.3

- Concrete strength is 20 MPa (cylinder) unreinforced, hole condition is "dry", and temperature range 24°C long-term/43°C short-term.
- Tabulated loads are valid at critical spacing and critical edge distance only. For spacing and edge distance influence, use Simpson's Anchor Designer™ Software for analysis.
- All design resistances are derived from the product's ETA (European Technical Assessment).

Rebar Strength – Tension

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Design Resistance	$N_{Rd,s}$	kN	19.3	30.5	43.6	59.4	77.5	121.1	189.4	237.6	310.1

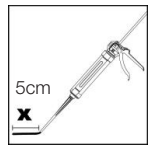
Rebar Strength – Shear

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Design Resistance	$N_{Rd,s}$	kN	9	14.2	20.3	27.7	36.2	56.5	88.4	110.9	144.7

INSTALLATION



Cartridge Preparation: Open cartridge, pull bag firmly upwards and cut. Attach supplied Simpson Strong-Tie nozzle to cartridge (Do not modify or use alternative nozzles), and insert cartridge into Simpson Strong-Tie dispensing tool. Dispense and discard the first 5cm of mixed product until uniform colour appear.

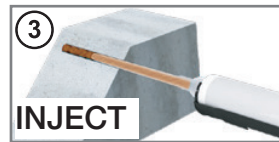


Using a hammer drill, drill hole to specified diameter and depth.



Clean hole by brushing and blowing alternately:

- Manual Air Cleaning: 4x blow /4x brush / 4x blow for $d_0 \leq 20$ mm & $h_{ef} \leq 10d$
- Compressed Air Cleaning: 4x blow /4x brush /4x blow for all drill hole diameters and depths (min. 6 bar compressed air).



Inject resin using a Simpson Strong-Tie[®] dispensing tool. Fill hole two-thirds full, starting from bottom of hole, withdraw the nozzle after each trigger to prevent air pockets.



Insert clean, oil-free threaded rod/rebar, turning slowly until anchor/threaded rod reaches bottom of hole. The anchor can be loaded after the required curing time. Applied torque shall not exceed the values T_{max} .