

# Adhesive Anchors

## ET-HP® High-Performance Epoxy Adhesive

ET-HP is a high performance epoxy based anchoring adhesive for use as a non-shrink anchor grouting material.

### Features

- Economical
- High performance
- Non-shrink
- Suitable for cracked and uncracked concrete
- Seismically rated per ACI 355.4
- Long-term loading (creep) applications

### Applications

- Rebar Dowelling
- Tension Zones
- Dry And Wet Concrete
- Threaded Rod Anchoring
- General Purpose Anchoring
- Structural Steel

### Base Material

- Cracked and Uncracked Concrete
  - Grout-filled and Hollow\* Concrete Block
  - Solid and Hollow\* Brick
- \*When used in conjunction with screen tubes

### Approvals

- Seismic testing per ACI 355.4
- ICC-ES ESR-3372 (Concrete)
- ICC-ES ESR-3638 (URM)
- IAPMO UES ER-241 (Masonry)
- BRANZ Appraisal 983 (2018) for applications related to bottom plate fixings and holdown applications per NZS 3604 using ET-HP.

### Installation

Refer to page 46 for installation procedures.

Refer to page 49 for cartridge usage estimation guide.

### Shelf Life

24 months from date of manufacture in unopened cartridge.

### Storage Conditions

For best results, store between 7–32°C. To store partially used cartridges, leave hardened nozzle in place. To re-use, attach new nozzle.

### Colour

Resin — white, hardener — black. When properly mixed, ET-HP adhesive will be a uniform medium grey colour.

### Chemical Resistance

Refer to page 14 for chemical resistance of adhesive anchors.



**ET-HP650-AU**  
(Includes 2 mixing nozzle EMN22)



Scan this QR code to download the BRANZ Appraisal  
<http://www.strongtie.co.nz/pdf/codes/BRANZ-APPROVAL-983.pdf>



ET-HP® is an economical high-performance general purpose anchoring adhesive.

# Adhesive Anchors

## ET-HP® High-Performance Epoxy Adhesive

### Working and Curing Time Schedule

Internal Concrete Temperature	Working Time	Curing Time (Dry Concrete)	Curing Time (Wet Concrete)
T <sub>anchorage base</sub>	t <sub>gel</sub>	t <sub>cure,dry</sub>	t <sub>cure,wet</sub>
≥ +10°C	45 min	72 h	144 h
≥ +16°C	30 min	24 h	48 h
≥ +27°C	20 min	24 h	48 h
≥ +38°C	15 min	24 h	48 h




\*Let anchor fully cure without disturbing.

### In-Service Temperature\*

Temperature Range	
Maximum <b>Long</b> Term Temperature	Maximum <b>Short</b> Term Temperature
+43°C	+65°C

\*See "Elevated In-Service Temperature" on page 13 for more information

### Cartridge Size and Accessories

Cartridge	Size	Box Qty	Model No.
	650 ml	10	ET-HP650-AU
Dispensing Tools	Description	Model No.	
	Manual dispensing tool	EDT22S	
Mixing Nozzles			
	Mixing nozzle Pack of 5	EMN22i-RP5 (NZ)	
	Mixing nozzle Pack of 10	EMN22i-RP10 (AU)	



## ET-HP® High-Performance Epoxy Adhesive — Gr 8.8 Threaded Rod

### Installation Data

Description	Symbol	Units	Threaded Rod Size (mm)						
			M10	M12	M16	M20	M24	M27	M30
Nominal Insert Diameter	d		10	12	16	20	24	27	30
Drill Hole Diameter	$d_o$		12	14	18	24	28	30	35
Minimum Embedment Depth	$h_{ef,min}$	mm	60	70	80	90	100	110	120
Maximum Embedment Depth	$h_{ef,max}$		120	144	192	240	288	324	360
Clearance Hole Diameter in Fixture	$d_f$		12	14	18	22	26	30	32
Installation Torque	$T_{inst,max}$	Nm	25	35	50	75	100	120	200

### Concrete Thickness, Edge Distance and Spacing

Description	Symbol	Units	M10	M12	M16	M20	M24	M27	M30
Minimum Concrete Thickness	$h_{min}$	mm	$h_{ef} + 5d_o$						
Minimum Edge Distance	$c_{min}$		45						
Minimum Spacing	$s_{min}$		76						
Critical Edge Distance	$c_{cr,N}$		$1.5 \times h_{ef}$						
Critical Spacing	$s_{cr,N}$		$3 \times h_{ef}$						

### Design Resistance — Single Anchor, No Concrete Edge or Spacing Influence

Description	Symbol	Units	M10	M12	M16	M20	M24	M27	M30
Embedment Depth	$h_{ef}$	mm	80	110	140	180	220	240	260
Minimum Concrete Thickness			130	170	220	280	340	375	410
<b>Uncracked Concrete</b>									
<b>TENSION</b>	$N_{Rd}$	kN	<b>12.4</b>	<b>20.5</b>	<b>34.8</b>	<b>55.9</b>	<b>81.9</b>	<b>101</b>	<b>121</b>
<b>SHEAR</b>	$V_{Rd}$		<b>13.8</b>	<b>24.3</b>	<b>45.3</b>	<b>70.5</b>	<b>102</b>	<b>132</b>	<b>162</b>
<b>Cracked Concrete</b>									
<b>TENSION</b>	$N_{Rd}$	kN	<b>3.1</b>	<b>7.6</b>	<b>12.8</b>	<b>33.8</b>	<b>51.8</b>	<b>54.3</b>	<b>55.7</b>
<b>SHEAR</b>	$V_{Rd}$		<b>6.7</b>	<b>16.3</b>	<b>27.6</b>	<b>70.5</b>	<b>102</b>	<b>117</b>	<b>120</b>

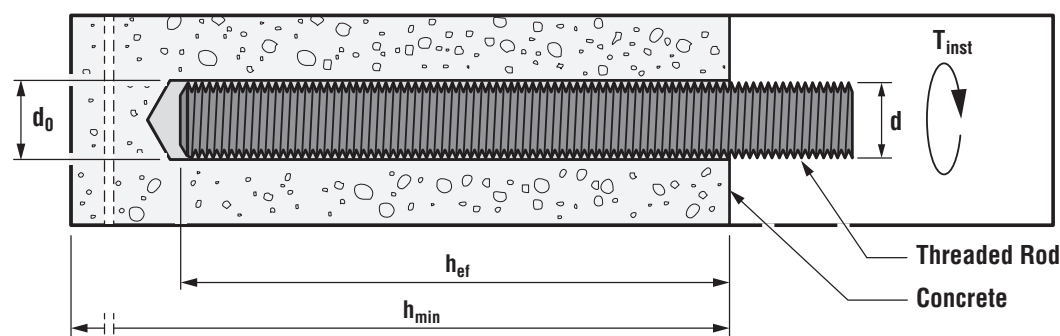
- Concrete strength is 31 MPa (cylinder) unreinforced, hole condition is "dry", and temperature range 24°C long-term/43°C short-term.
- Tabulated loads are valid at critical spacing and critical edge distance only.
- For spacing and edge distance influence, use Simpson's Anchor Designer™ Software for analysis.**
- $N_{Rd}$  and  $V_{Rd}$  is based on use of a Grade 8.8 threaded insert. Verify capacity if using a different steel grade.
- All design resistances are derived from the product's ICC ESR (ACI 355.4 testing, ACI 318 Design).

### Steel Design Resistance (Tension)

Description	Symbol	Units	M10	M12	M16	M20	M24	M27	M30
Steel Grade 5.8	$N_{Rd,s}$	kN	18.9	27.3	51.0	79.6	115	149	183
Steel Grade 8.8			30.2	43.9	81.6	127	184	239	292
Stainless Steel A4			26.4	38.4	71.4	111	160	119	145

### Steel Design Resistance (Shear)

Description	Symbol	Units	M10	M12	M16	M20	M24	M27	M30
Steel Grade 5.8	$V_{Rd,s}$	kN	8.7	15.3	28.2	44.1	63.6	82.5	101
Steel Grade 8.8			13.8	24.3	45.3	70.5	102	132	162
Stainless Steel A4			12.2	21.2	39.5	61.7	89.0	65.9	80.6



## ET-HP® High-Performance Epoxy Adhesive — Rebar Grade B500 (DIN 488-2)

### Installation Data

Description	Symbol	Units	Rebar Size (mm)						
			10	12	16	20	25	28	32
Drill Hole Diameter	$d_o$	mm	14	16	20	25	32	35	40
Minimum Embedment Depth	$h_{ef,min}$		60	70	80	90	100	115	130
Maximum Embedment Depth	$h_{ef,max}$		200	240	320	400	500	560	640

### Concrete Thickness, Edge Distance and Spacing

Description	Symbol	Units	10	12	16	20	25	28	32
Minimum Concrete Thickness	$h_{min}$	mm	$h_{ef} + 5d_o$						
Minimum Edge Distance	$c_{min}$		45						70
Minimum Spacing	$s_{min}$		76						152
Critical Edge Distance	$c_{cr,N}$		$1.5 \times h_{ef}$						
Critical Spacing	$s_{cr,N}$		$3 \times h_{ef}$						

### Design Resistance — Single Rebar, No Concrete Edge or Spacing Influence

Description	Symbol	Units	10	12	16	20	25	28	32
Embedment Depth	$h_{ef}$	mm	80	110	140	180	220	240	260
Minimum Concrete Thickness			130	170	220	280	345	380	420
<b>Uncracked Concrete</b>									
<b>TENSION</b>	$N_{Rd}$	kN	<b>10.6</b>	<b>17.6</b>	<b>29.8</b>	<b>47.9</b>	<b>73.2</b>	<b>89.4</b>	<b>111</b>
<b>SHEAR</b>	$V_{Rd}$		<b>15.6</b>	<b>22.5</b>	<b>39.9</b>	<b>61.8</b>	<b>97.2</b>	<b>122</b>	<b>159</b>

### Rebar Strength Tension

Description	Symbol	Units	10	12	16	20	25	28	32
Design Resistance	$N_{Rd,s}$	kN	28.0	40.3	71.8	112	176	220	288
Nominal Yield Strength	$f_{yk}$		38.8	55.8	99.5	156	243	305	398
Nominal Tensile Strength	$f_{uk}$		43.0	62.0	110	173	270	339	443

### Rebar Strength Shear

Description	Symbol	Units	10	12	16	20	25	28	32
Design Resistance	$V_{Rd,s}$	kN	15.6	22.5	39.9	61.8	97.2	122	159

- Concrete strength is 31 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 ICC ESR (ACI 355.4 testing, ACI 318 Design).
- Nominal yield strength ( $f_{yk}$ ) for Gr 500B Rebar is determined by the equation:  $f_{yk} = 500 \text{ MPa} \times A_{nom}$   
Nominal tensile strength ( $f_{uk}$ ) for Gr 500B Rebar is determined by the equation:  $f_{uk} = 550 \text{ MPa} \times A_{nom}$

