TECHNICAL DATA SHEET

HY-XP — Extreme Performance Hybrid Mortar

Material
- Hybrid Mortar

Construction Types
- Commercial Construction
- Residential Construction

Features and Benefits
- Suitable for use in cracked and non-cracked concrete M8 to M30 / rebar Ø8 to Ø32
- Extreme Performance for structural applications with high loads, ideal for commercial use
- Qualified for use in seismic performance categories C1 and C2
- Fast cure formulation ideal for increased productivity
- Can be used in dry and damp conditions, wet or flooded environments (not sea water)
- 100 Years Working Life
- Fire rating R120
- VOC Compliant (A+ rating)
- Styrene Free
- NSF Certified (drinking water)
- LEED tested for sustainable construction

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

Base Material
- Cracked and non-cracked concrete, light-concrete, porous-concrete, solid masonry, hollow brick, natural stone

Approvals

ETA-25/0533 for use in Concrete

ETA-25/0356 for Rebar

100 Years Working Life

FLOODED HOLES

LEED tested

ÉMISSIONS DANS L'AIR INTÉRIEUR A+ A+ A B C

STYRENE FREE

NSF

FIRE RATED R120

Seismic Rated C1/C2

SCAN FOR MORE INFO

Australia

New Zealand

HY-XP Curing Schedule – Maximum working time and minimum curing time

Temperature of Concrete	Working Time	Curing Time*
-5°C to -1°C	50 min	5 h
0°C to +4°C	25 min	3.5 h
+5°C to +9°C	15 min	2 h
+10°C to +14°C	10 min	1 h
+15°C to +19°C	6 min	40 min
+20°C to +29°C	3 min	30 min
+30°C to +40°C	2 min	30 min
Cartridge Temperature	+5°C to +40°C	

*in wet concrete the curing times must be doubled

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Table 1: HY-XP Hybrid Mortar Installation Parameters - Gr 8.8 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	22	28	30	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	Prepositioned installation	d_f		9	12	14	18	22	26	30	33
	Push through installation			12	14	16	20	24	30	33	40
Installation Torque		$T_{inst,max}$	Nm	10	20	40[1)]	60	100	170	250	300
Minimum Concrete Thickness		h_{min}	mm	h_{ef} + 30mm (≥100mm)			h_{ef} + $2d_o$				
Minimum Edge Distance		c_{min}		35	40	45	50	60	65	75	80
Minimum Spacing		s_{min}		40	50	60	75	95	115	125	140

Table 2: HY-XP Hybrid Mortar - Design Resistance - Single Anchor, No Concrete Edge or Spacing Influence, 100 years working life

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Embedment Depth	h_{ef}	mm	70	80	110	140	180	220	300	450
Minimum Concrete Thickness	h_{min}		100	110	140	176	224	276	360	520
NON-CRACKED CONCRETE										
TENSION	N_{Rd}	kN	14.1	19.6	35.2	50.6	73.7	99.7	158.7	291.6
SHEAR	V_{Rd}		12	18.4	27.2	50.4	78.4	112.8	147.2	179.2
CRACKED CONCRETE										
TENSION	N_{Rd}	kN	5.8	9.4	18.4	35.1	51.6	64.5	98.9	164.9
SHEAR	V_{Rd}		12	18.4	27.2	50.4	78.4	112.8	147.2	179.2
SEISMIC C1 CATEGORY										
TENSION	N_{Rd}	kN	5.8	9.4	18.4	30.1	43.9	59.3	94.4	164.9
SHEAR	V_{Rd}		8.4	12.9	19	35.3	54.9	79	103	125.4
SEISMIC C2 CATEGORY										
TENSION	N_{Rd}	kN	-	-	8.2	13.6	20.7	21.2	-	-
SHEAR	V_{Rd}		-	-	16.9	27.9	42.3	43.2	-	-

1) Concrete strength is C20/25, $f_{ck,cube}$ = 25 N/mm² unreinforced, hollow hammer drilling (HDB), hole condition is "dry", temperature range 24°C long-term/40°C short-term.
2) Tabulated loads are valid at critical spacing and critical edge distance only.
3) N_{Rd} and V_{Rd} is based on use of a Grade 8.8 threaded insert. Verify capacity if using a different steel grade.
4) All design resistances are derived from the product's ETA (European Technical Assessment ETA-25/0533). For combined tension and shear loads or anchor groups, spacing and edge distance influence, a calculation per EAD 330499 shall be done. Simpson Strong-Tie® Anchor DesignerTM for Concrete Software used for analysis.
5) Tabulated loads for C1 category are for a working life of 50 years.
6) Factor for annular gap a = 1.0

Table 3: HY-XP Hybrid Mortar - Steel Design Resistance (Tension)

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Steel Grade 8.8[1)]	$N_{Rd,s}$	kN	19.3 (18.0)	30.7 (28.7)	44.7	83.3	130.7	188.0	245.3	299.3
Stainless Steel A2, A4 and HCR, Class 70			13.9	21.9	31.6	58.8	91.4	132.1	-	-

1) Values in brackets are valid for undersized threaded rods with smaller stress area As for hot-dip galvanised threaded rods according to EN ISO 10684:2004+AC:2009

Table 4: HY-XP Hybrid Mortar - Steel Design Resistance (Shear without lever arm)

Description	Symbol	Units	M8	M10	M12	M16	M20	M24	M27	M30
Steel Grade 8.8[1)]	$N_{Rd,s}$	kN	12.0 (10.4)	18.4 (16.8)	27.2	50.4	78.4	112.8	147.2	179.2
Stainless Steel A2, A4 and HCR, Class 70			8.3	12.8	19.2	35.3	55.1	79.5	-	-

1) Values in brackets are valid for undersized threaded rods with smaller stress area As for hot-dip galvanised threaded rods according to EN ISO 10684:2004+AC:2009

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Table 5: HY-XP Hybrid Mortar Installation Parameters - Rebar

Description	Symbol	Units	Rebar Size									
			Ø8[1)]	Ø10[1)]	Ø12[1)]	Ø14	Ø16	Ø20	Ø24[1)]	Ø25[1)]	Ø28	Ø32
Drill Hole Diameter	d_o	mm	10 / 12	12 / 14	14 / 16	18	20	25	30 / 32	30 / 32	35	40
Minimum Embedment Depth	$h_{ef,min}$		60	60	70	75	80	90	96	100	112	128
Maximum Embedment Depth	$h_{ef,max}$		160	200	240	280	320	400	480	500	560	640
Minimum Concrete Thickness	h_{min}		hef + 30mm (≥100mm)			h_{ef} + 2d_o						
Minimum Edge Distance	c_{min}		35	40	45	50	50	60	70	70	75	85
Minimum Spacing	s_{min}		40	50	60	70	75	95	120	120	130	150

1) Both nominal drill hole diameters can be used

Table 6: HY-XP Hybrid Mortar - Design Resistance - Single Anchor, No Concrete Edge or Spacing Influence, 100 years working life

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø24	Ø25	Ø28	Ø32
Embedment Depth	h_{ef}	mm	80	90	110	130	160	180	200	220	300	450
Minimum Concrete Thickness	h_{min}		110	120	140	166	200	230	260	280	370	530
NON-CRACKED CONCRETE												
TENSION	N_{Rd}	kN	14	20.8	32.2	44.4	58	73.7	86.4	99.7	158.7	291.6
SHEAR	V_{Rd}		9.2	14.4	20.7	28.2	36.9	57.6	82.9	90	112.9	147.4
CRACKED CONCRETE												
TENSION	N_{Rd}	kN	5.5	8.2	13.8	20.6	29	40.8	54.4	67.2	102.6	175.9
SHEAR	V_{Rd}		9.2	14.4	20.7	28.2	36.9	57.6	82.9	90	112.9	147.4
SEISMIC C1 CATEGORY												
TENSION	N_{Rd}	kN	5.5	8.2	13.8	20.6	29	40.8	51.4	59.3	94.4	173.5
SHEAR	V_{Rd}		6.5	10.1	14.5	19.8	25.8	40.3	58.1	63	79	103.2

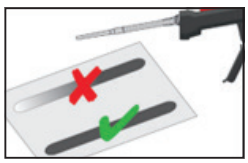
1) Concrete strength is C20/25, fck,cube = 25 N/mm² unreinforced, hollow hammer drilling (HDB), hole condition is “dry”, temperature range 24°C long-term/40°C short-term.
2) Tabulated loads are valid at critical spacing and critical edge distance only.
3) Nominal tensile strength (fuk) is determined by the equation: fuk = 550 MPa x Anom
4) All design resistances are derived from the product’s ETA (European Technical Assessment ETA-25/0533). For combined tension and shear loads or anchor groups, spacing and edge distance influence, a calculation per EAD 330499 shall be done. Simpson Strong-Tie® Anchor DesignerTM for Concrete Software used for analysis.
5) Tabulated loads for C1 category are for a working life of 50 years.
6) Factor for annular gap a = 1.0

Table 7: EP-XP Hybrid Mortar - Rebar Design Resistance

Description	Symbol	Units	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø24	Ø25	Ø28	Ø32
Design Resistance - TENSION	$N_{Rd,s}$	kN	19.7	30.9	44.4	60.5	79.0	123.4	177.7	192.8	241.9	316.0
Design Resistance - SHEAR	$V_{Rd,s}$		9.2	14.4	20.7	28.2	36.9	57.6	82.9	90.0	112.9	147.4

Installation

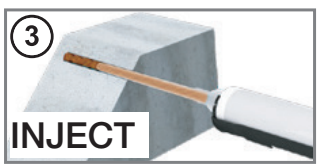
Note: Refer to ETA for additional information



IMPORTANT: Prior to dispensing into the anchor hole, purge a minimum of three full strokes until it shows a consistent colour.

Drill hole to specified diameter and depth.

Minimum of 2x blow / 2x brush / 2x blow (min. 6 bar)



From the bottom of the hole, fill to approx. two thirds, slowly withdrawing the nozzle to avoid air pockets.

Insert clean, oil free anchor, turning slowly until reaching the required embedment depth.

Do not disturb anchor until fully cured (see curing table).

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