

ChemSet™ Reo 502™ PLUS

CHEMICAL INJECTION - NON-CRACKED & CRACKED CONCRETE

AVAILABLE IN AUSTRALIA ONLY

(New Zealand refer to EPCON™ C6 PLUS range)

GENERAL INFORMATION

Performance Related	Installation Related
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Product

ChemSet™ Reo 502™ PLUS is a heavy duty pure Epoxy for anchoring threaded studs and reinforcing bar into cracked and uncracked concrete.

Compliance

Design according to AS5216:2021 Appendix D and AS3600-2018 clause 13.1.2.2 steel yield development length

- European Technical Assessment - tested to EAD 330087

Benefits, Advantages and Features

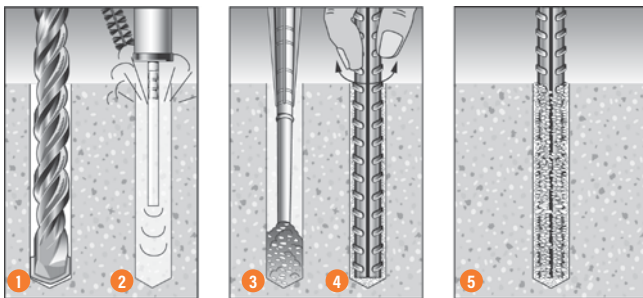
- 100 year working life
- Greater productivity:**
 - Anchors in dry, damp, wet or flooded holes
 - Easy dispensing even in cold weather
- Greater security:**
 - Strong bond
 - Rated for sustained loading
- Versatile:**
 - Anchors in carbide drilled and diamond drilled holes
 - Cold and temperate climates
- Greater safety:**
 - Low odour
 - VOC Compliant



Principal Applications

- Threaded Studs
- Starter Bars
- Threaded Inserts
- Over-head installation
- Steel Columns
- Hand Rails
- Road Stitching

Installation



- Drill recommended diameter and depth hole.
- Important:** Use **Ramset™** Dustless Drilling System to ensure holes are clean. Alternatively, clean dust and debris from hole with stiff wire or nylon brush and blower in the following sequence: blow x 2, brush x 2, blow x 2, brush x 2, blow x 2.
- Dispense adhesive to waste until colour is uniform light grey (2-3 trigger pulls). Insert mixing nozzle to bottom of hole. Fill hole to 3/4 the hole depth slowly, ensuring no air pockets form.
- Insert **Ramset™** ChemSet™ Anchor Stud/rebar to bottom of hole while turning.
- Allow ChemSet™ Reo 502™ PLUS to cure as per setting times.

Recommended Installation Temperatures

	Minimum	Maximum
Substrate	5°C	40°C
Adhesive	10°C	40°C

Service Temperature Limits

-40°C to 70°C

Setting Times Reo 502™ Plus

Temperature of base material	Cartridge Temperature	Gel Time	Curing time in dry and wet concrete
5°C	Minimum 10°C	300 min	24 h
10°C	10°C	150 min	18 h
15°C	15°C	40 min	12 h
20°C	20°C	25 min	8 h
25°C	25°C	18 min	6 h
30°C	30°C	12 min	4 h
40°C	40°C	6 min	2 h

Note: Cartridge temperature minimum +10°C

DESCRIPTION AND PART NUMBERS

Description	Cartridge Size	Part No.	Working Time at 20°C	Cure Time at 20°C
ChemSet Reo 502 PLUS	600 ml	RE0502P600	25 minutes	12 hours

ChemSet™ 801 Xtrem™ XC²

CHEMICAL INJECTION - NON-CRACKED & CRACKED CONCRETE

GENERAL INFORMATION

Performance Related	Installation Related

Product

ChemSet™ 801 Xtrem™ XC² is a heavy duty Vinylester for anchoring threaded studs and reinforcing bar into cracked and uncracked concrete.



Compliance

Design according to AS5216:2021 Appendix D and AS3600-2018 clause 13.1.2.2 steel yield development length

- European Technical Assessment - tested to EAD 330087

Benefits, Advantages and Features

- 100 year working life
- Flooded Holes
- Fire rated
- Greater productivity:**
 - Easy dispensing even in cold weather
 - Apply torque in 2 hours @ 20°C
- Greater security:**
 - Strong bond
 - Rated for sustained loading
- Versatile:**
 - Earthquake, Fire & Flooded Conditions
 - Cold and temperate climates
- Greater safety:**
 - Low odour
 - VOC Compliant
 - Suitable for contact with drinking water

Made in Australia



Principal Applications

- Threaded Studs
- Starter Bars
- Threaded Inserts
- Over-head installation
- Steel Columns
- Hand Rails
- Road Stitching

Recommended Installation Temperatures

	Minimum	Maximum
Substrate	5°C	40°C
Adhesive	5°C	40°C

Service Temperature Limits

-40°C to 80°C

Setting Times 801 Xtrem™ XC²

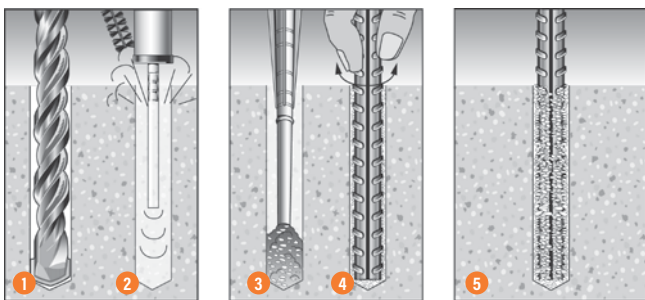
Temperature of base material	Gel Time	Curing time in dry concrete	Curing time in wet concrete
+5°C	60 min	240 min	480 min
6°C - 10°C	40 min	180 min	360 min
11°C - 20°C	15 min	120 min	240 min
21°C - 30°C	8 min	90 min	180 min
31°C - 40°C	4 min	60 min	120 min

Note: Cartridge temperature minimum +5°C

Note:

* Diamond Core drilling only applicable for 50 years working life.

Installation



1. Drill recommended diameter and depth hole.
2. **Important:** Use Ramset™ Dustless Drilling System to ensure holes are clean. Alternatively, clean dust and debris from hole with stiff wire or nylon brush and blower in the following sequence: blow x 2, brush x 2, blow x 2.
3. Dispense adhesive to waste until colour is uniform light grey (2-3 trigger pulls). Insert mixing nozzle to bottom of hole. Fill hole to 3/4 the hole depth slowly, ensuring no air pockets form.
4. Insert Ramset™ ChemSet™ Anchor Stud/rebar to bottom of hole while turning.
5. Allow ChemSet™ 801 Xtrem™ XC² to cure as per setting times.

EPCON™ C8 Xtrem™

CHEMICAL INJECTION - NON-CRACKED & CRACKED CONCRETE

Chemical Anchoring - Rebar to AS3600 & AS5216

GENERAL INFORMATION

Performance Related	Installation Related

Product

EPCON™ C8 Xtrem™ is a High Performance Pure Epoxy Anchoring adhesive for use in Cracked and Non-Cracked concrete. For structures subject to external exposure, permanently damp or aggressive conditions.



Compliance

Design according to AS5216:2021 Appendix D and AS3600-2018 clause 13.1.2.2 steel yield development length
 • European Technical Assessment - tested to EAD 330087



Benefits, Advantages and Features

- 100 year working life
- Approved for flooded holes
- Approved for floor, wall & overhead applications
- Data for 100 years sustained loading

Greater productivity:

- Anchors in dry, damp, wet or flooded holes
- No weather delays
- Fast, easy dispensing with high flow mixer

Greater security:

- Highest performance in cracked concrete

Versatile

- Anchors all stud & bar diameters in all directions
- Oversized holes
- Anchors in carbide drilled and diamond cored holes
- For tropical and cold weather conditions

Greater safety:

- Low odour

Fire Rated : Refer Fire rated anchoring section



Principal Applications

- Anchoring into cracked & non cracked concrete
- Road barrier hold down bolts
- Bridge refurbishment
- Road & Rail tunnel construction
- Reinforcing bar from 10 to 32mm
- Starter Bars
- Threaded Studs from M8 to M30
- Threaded Stud material: Zn, A4 316, HCR steels
- Threaded Stud material: 5.8, 8.8, 10.9 grade

Recommended Installation Temperatures

	Minimum	Maximum
Substrate	5°C	40°C
Adhesive	5°C	40°C

Load should not be applied to anchor until the chemical has sufficiently cured as specified.

Service Temperature Limits

-40°C to 80°C

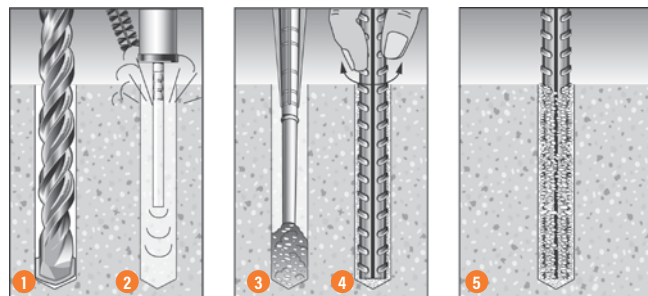
Setting Times EPCON™ C8 Xtrem™

Temperature of base material	Gel Time	Curing time in dry concrete	Curing time in wet concrete
5°C - 9°C	20 min	30 h	60 h
10°C - 19°C	14 min	23 h	46 h
20°C - 24°C	11 min	16 h	32 h
25°C - 29°C	8 min	12 h	24 h
30°C - 39°C	5 min	8 h	16 h
40°C	5 min	6 h	12 h

Note

*Performance of cored & oversized holes was not included in the ETAG test program and therefore is based on testing conducted at Ramset™ Product Engineering Laboratory.

Installation



1. Drill recommended diameter and depth hole.
2. **Important:** Use Ramset™ Dustless Drilling System to ensure holes are clean. Alternatively, clean dust and debris from hole with stiff wire or nylon brush and blower in the following sequence: blow x 2, brush x 2, blow x 2.
3. Dispense adhesive to waste until colour is uniform light grey (2-3 trigger pulls). Insert mixing nozzle to bottom of hole. Fill hole to 3/4 the hole depth slowly, ensuring no air pockets form.
4. Insert rebar to bottom of hole while turning.
5. Allow EPCON™ C8 Xtrem™ to cure as per setting times.

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Chemical Anchoring - Rebar to AS3600 & AS5216

Strength Limit State Design

Design Case 1 For Single Bar Remote from an Edge ($e > 4 d_b$)

For designs intended to comply with AS5216-2021 and AS3600-2018, refer to Design cases 2, 3 and 4

Concrete Splitting Factors

k_1	1.0
k_2	1.0
k_3	1.0

Table 1 Nominal steel yield development length $L_{sy,t(nom)}$ of Grade 500 reinforcing bar in tension post-installed in 32 MPa concrete with ChemSet™ Reo 502™ Plus, Chemset™ 801 Xtrem™ XC² or EPCON™ C8 Xtrem™

Rebar size	10*	12	16	20	24	25	28	32	36*	40*
Minimum Cover, e (mm)	40	48	64	80	96	100	112	128	144	160
Min. Clear Spacing, a (mm)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Adhesive reduced ultimate tensile bond capacity ϕN_{ub} (kN), $\phi_c = 0.6$	39.3	56.5	100.5	157.0	226.0	245.5	308.0	402.0	510.0	630.0
Nominal development length of bar in tension, $L_{sy,t(nom)}$	105	140	205	265	335	360	400	470	540	615
Effective length, L_{st} (mm)	Stress developed in steel, $\sigma_{st(nom)}$ (MPa)									
50	238									
60	286									
70	333	250								
80	381	286								
90	429	321								
100	476	357	244							
105	500	375	256							
120		429	293	226						
140		500	341	264	209					
160			390	302	239	222				
190			463	358	284	264	238			
205			500	387	306	285	256			
220				415	328	306	275	234		
230				434	343	319	288	245	213	
265				500	396	368	331	282	245	
300					448	417	375	319	278	
335					500	465	419	356	310	272
360						500	450	383	333	293
380							475	404	352	309
400							500	426	370	325
430								457	398	350
450								479	417	366
470								500	435	382
540									500	439
615										500

500 Denotes adhesive tensile bond stress at Grade 500 steel yield development length, $L_{sy,t}$. Interpolation permitted. Do not extrapolate.

*Note: 10, 36 & 40 mm Reinforcing bar diameter data only applies to ChemSet™ Reo 502™ Plus and EPCON™ C8 Xtrem™

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Checkpoint **1a**

Table 1a Concrete compressive strength effect on development length, tension, X_{nc}

f'_c (MPa)	20	25	32	40	50
X_{nc}	1.26	1.13	1.00	0.89	0.80

Design reinforcing bar steel development length, $L_{sy,t}$ (mm)

$$L_{sy,t} = L_{sy,t} (nom) * X_{nc}$$

If there is insufficient concrete depth to install bar to $L_{sy,t}$
go to Checkpoint 1b

Note: Effect of water in hole, multiply $L_{sy,t}$ by 1.4.

Checkpoint **1b**

Table 1b Concrete compressive strength effect on steel stress, tension, X_{nc}

f'_c (MPa)	20	25	32	40	50
X_{nc}	0.79	0.88	1.00	1.12	1.25

Design tensile steel stress, σ_{st} (MPa)

$$\sigma_{st} = \sigma_{st} (nom) * X_{nc}$$

Note: Effect of water in hole, multiply σ_{st} by 0.7.

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Chemical Anchoring - Rebar to AS3600 & AS5216

Strength Limit State Design

Design Case **2** Multiple Bars in Concrete Elements (Large clear anchor spacing)

Steel yield development length, L_{syt} (AS5216-2021 Appendix D and AS3600 - 2018, clause 13.1.2.2)

Table 2 Nominal steel yield development length $L_{syt(nom)}$ of Grade 500 reinforcing bar in tension post-installed in 32 MPa concrete with ChemSet™ Reo 502™ Plus, Chemset™ 801 Xtrem™ XC² or EPCON™ C8 Xtrem™

Rebar size	10*	12	16	20	24	25	28	32	36*	40*
Concrete Splitting Factor, k_1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Concrete Splitting Factor, k_2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.9
Concrete Splitting Factor, k_3	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Minimum Cover, e (mm)	40	40	45	60	75	75	95	110	130	150
Min. Clear Spacing, a (mm)	80	80	90	125	150	150	190	220	260	300
Adhesive reduced ultimate tensile bond capacity ϕN_{ub} , (kN), $\phi_c = 0.6$	39.3	56.5	100.5	157.0	226.0	245.5	308.0	402.0	510.0	630.0
Nominal development length of bar in tension, $L_{syt(nom)}$ **	290	350	465	580	700	725	835	990	1160	1345
Effective length, L_{st} (mm)	Stress developed in steel, $\sigma_{st(nom)}$ (MPa)									
140	241									
160	276									
180	310	257								
240	414	343								
290	500	414	312							
310		443	333							
330		471	355							
350		500	376	302						
370			398	319						
410			441	353						
465			500	401	332	321				
490				422	350	338	293			
540				466	386	372	323	273		
580				500	414	400	347	293	250	
615					439	424	368	311	265	
650					464	448	389	328	280	242
700					500	483	419	354	302	260
725						500	434	366	312	270
780							467	394	336	290
835							500	422	360	310
875								442	377	325
915								462	394	340
990								500	427	368
1160									500	431
1345										500

500 Denotes adhesive tensile bond stress at Grade 500 steel yield development length, L_{syt}
Interpolation permitted. Do not extrapolate.

- *Note: 10, 36 & 40mm Reinforcing bar diameter data only applies to ChemSet™ Reo 502™ Plus and EPCON™ C8 Xtrem™
- **Note: 1. ChemSet™ Reo 502™ Plus and ChemSet™ 801 Xtrem™ XC² development length data is based on Diamond Core drilled holes.
2. EPCON™ C8 Xtrem™ development data is based on hammer drilled holes. For Diamond Core drilled holes refer to Development Length multiplication factors below.
3. When using 36 & 40mm Reinforcing bar diameter apply Development Length multiplication factors below.

Development Length Multiplication Factors on $L_{syt(nom)}$		
Chemical Anchor Type	Diamond Core Drill Factor	36mm and 40mm diameter factor
EPCON™ C8 Xtrem™	Multiply $L_{syt(nom)}$ x 1.2	Not required
ChemSet™ Reo 502™ Plus	Not required	Multiply $L_{syt(nom)}$ x 1.4

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Checkpoint **2a**

Table 2a Concrete compressive strength effect on development length, tension, X_{nc}

f_c (MPa)	20	25	32	40	50
X_{nc} - for 10-25 bar diam.	1.26	1.13	1.00	0.89	0.80
X_{nc} - for 28-32 bar diam.	1.26	1.13	1.00	1.00	1.00
X_{nc} - for 36-40 bar diam.	1.00	1.00	1.00	1.00	1.00

Design reinforcing bar steel development length, $L_{sy,t}$ (mm)

$$L_{sy,t} = L_{sy,t} \text{ (nom)} * X_{nc}$$

If there is insufficient concrete depth to install bar to $L_{sy,t}$
go to Checkpoint 2b

Note: Effect of water in hole, multiply $L_{sy,t}$ by 1.4.

Checkpoint **2b**

Table 2b Concrete compressive strength effect on steel stress, tension, X_{nc}

f_c (MPa)	20	25	32	40	50
X_{nc} - for 10-25 bar diam.	0.79	0.88	1.00	1.12	1.25
X_{nc} - for 28-32 bar diam.	0.79	0.88	1.00	1.00	1.00
X_{nc} - for 36-40 bar diam.	1.00	1.00	1.00	1.00	1.00

Design tensile steel stress, σ_{st} (MPa)

$$\sigma_{st} = \sigma_{st} \text{ (nom)} * X_{nc}$$

Note: Effect of water in hole, multiply σ_{st} by 0.7.

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Chemical Anchoring - Rebar to AS3600 & AS5216

Strength Limit State Design

Design Case **3** Multiple Bars in Concrete Elements (Medium clear anchor spacing)

Steel yield development length, $L_{sy,t}$ (AS5216-2021 Appendix D and AS3600 - 2018, clause 13.1.2.2)

Table 3 Nominal steel yield development length $L_{sy,t(nom)}$, of Grade 500 reinforcing bar in tension post-installed in 32 MPa concrete with ChemSet™ Reo 502™ Plus, Chemset™ 801 Xtrem™ XC² or EPCON™ C8 Xtrem™

Rebar size	10*	12	16	20	24	25	28	32	36*	40*
Concrete Splitting Factor, k_1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Concrete Splitting Factor, k_2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.9
Concrete Splitting Factor, k_3	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Minimum Cover, e (mm)	30	30	32	40	48	50	56	64	72	80
Min. Clear Spacing, a (mm)	60	60	70	80	100	100	120	130	150	150
Adhesive reduced ultimate tensile bond capacity ϕN_{ub} , (kN), $\phi_c = 0.6$	39.3	56.5	100.5	157.0	226.0	245.5	308.0	402.0	510.0	630.0
Nominal development length of bar in tension, $L_{sy,t(nom)**}$	290	350	520	675	835	880	1015	1205	1410	1670
Effective length, L_{st} (mm)	Stress developed in steel, $\sigma_{st(nom)}$ (MPa)									
120	207									
180	310									
200	345	286								
250	431	357								
290	500	414	279							
300		429	288							
330		471	317							
350		500	337	259						
400			385	296						
445			428	330						
520			500	385	311	295				
550				407	329	313	271			
595				441	356	338	293	247		
675				500	404	384	332	280	239	
700					419	398	345	290	248	
775					464	440	382	322	275	232
835					500	474	411	346	296	250
880						500	433	365	312	263
945							465	392	335	283
1015							500	421	360	304
1050								436	372	314
1120								465	397	335
1205								500	427	361
1410									500	422
1670										500

500 Denotes adhesive tensile bond stress at Grade 500 steel yield development length, $L_{sy,t}$. Interpolation permitted. Do not extrapolate.

*Note: 10, 36 & 40mm Reinforcing bar diameter data only applies to ChemSet™ Reo 502™ Plus and EPCON™ C8 Xtrem™

- **Note:
1. ChemSet™ Reo 502™ Plus and ChemSet™ 801 Xtrem™ XC² development length data is based on Diamond Core drilled holes.
 2. EPCON™ C8 Xtrem™ development data is based on hammer drilled holes. For Diamond Core drilled holes refer to Development Length multiplication factors below.
 3. When using 36 & 40mm Reinforcing bar diameter apply Development Length multiplication factors below.

Development Length Multiplication Factors on $L_{sy,t(nom)}$		
Chemical Anchor Type	Diamond Core Drill Factor	36mm and 40mm diameter factor
EPCON™ C8 Xtrem™	Multiply $L_{sy,t(nom)}$ x 1.2	Not required
ChemSet™ Reo 502™ Plus	Not required	Multiply $L_{sy,t(nom)}$ x 1.4

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Checkpoint **3a**

Table 3a Concrete compressive strength effect on development length, tension, X_{nc}

f_c (MPa)	20	25	32	40	50
X_{nc} - for 10-25 bar diam.	1.26	1.13	1.00	0.89	0.80
X_{nc} - for 28-32 bar diam.	1.26	1.13	1.00	1.00	1.00
X_{nc} - for 36-40 bar diam.	1.00	1.00	1.00	1.00	1.00

Design reinforcing bar steel development length, $L_{sy,t}$ (mm)

$$L_{sy,t} = L_{sy,t} (nom) * X_{nc}$$

If there is insufficient concrete depth to install bar to $L_{sy,t}$
go to Checkpoint 3b

Note: Effect of water in hole, multiply $L_{sy,t}$ by 1.4.

Checkpoint **3b**

Table 3b Concrete compressive strength effect on steel stress, tension, X_{nc}

f_c (MPa)	20	25	32	40	50
X_{nc} - for 10-25 bar diam.	0.79	0.88	1.00	1.12	1.25
X_{nc} - for 28-32 bar diam.	0.79	0.88	1.00	1.00	1.00
X_{nc} - for 36-40 bar diam.	1.00	1.00	1.00	1.00	1.00

Design tensile steel stress, σ_{st} (MPa)

$$\sigma_{st} = \sigma_{st} (nom) * X_{nc}$$

Note: Effect of water in hole, multiply σ_{st} by 0.7.

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Chemical Anchoring - Rebar to AS3600 & AS5216

Strength Limit State Design

Design Case **4** Multiple Bars in Concrete Elements (Minimum clear anchor spacing)

Steel yield development length, $L_{sy,t}$ (AS5216-2021 Appendix D and AS3600 - 2018, clause 13.1.2.2)

Table 4 Nominal steel yield development length $L_{sy,t(nom)}$ of Grade 500 reinforcing bar in tension post-installed in 32 MPa concrete with ChemSet™ Reo 502™ Plus, Chemset™ 801 Xtrem™ XC² or EPCON™ C8 Xtrem™

Rebar size	10*	12	16	20	24	25	28	32	36*	40*
Concrete Splitting Factor, k_1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Concrete Splitting Factor, k_2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.9
Concrete Splitting Factor, k_3	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Minimum Cover, e (mm)	30	30	32	40	48	50	56	64	72	80
Min. Clear Spacing, a (mm)	30	36	48	60	72	75	84	96	108	120
Adhesive reduced ultimate tensile bond capacity ϕN_{ub} , (kN), $\phi_c = 0.6$	39.3	56.5	100.5	157.0	226.0	245.5	308.0	402.0	510.0	630.0
Nominal development length of bar in tension, $L_{sy,t(nom)}$ **	335	410	565	730	910	965	1105	1310	1535	1780
Effective length, L_{st} (mm)	Stress developed in steel, σ_{st} (nom) (MPa)									
150	224									
200	299									
250	373	305								
290	433	354								
335	500	409	296							
350		427	310	$\sigma_{st} < f_{sy}$						
390		476	345							
410		500	363	281						
450			398	308						
480			425	329						
565			500	387	310	293				
600				411	330	311	272			
650				445	357	337	294	248		
730				500	401	378	330	279	238	
780					428	404	353	298	254	
850					467	440	385	324	277	239
910					500	472	412	347	297	256
965						500	437	368	314	271
1030							466	393	336	289
1105							500	422	360	310
1200								458	391	337
1250								477	407	351
1310								500	427	368
1535									500	431
1780										500

500 Denotes adhesive tensile bond stress at Grade 500 steel yield development length, $L_{sy,t}$
Interpolation permitted. Do not extrapolate.

*Note: 10, 36 & 40mm Reinforcing bar diameter data only applies to ChemSet™ Reo 502™ Plus and EPCON™ C8 Xtrem™

- **Note:
1. ChemSet™ Reo 502™ Plus and ChemSet™ 801 Xtrem™ XC² development length data is based on Diamond Core drilled holes.
 2. EPCON™ C8 Xtrem™ development data is based on hammer drilled holes. For Diamond Core drilled holes refer to Development Length multiplication factors below.
 3. When using 36 & 40mm Reinforcing bar diameter apply Development Length multiplication factors below.

Development Length Multiplication Factors on $L_{sy,t(nom)}$		
Chemical Anchor Type	Diamond Core Drill Factor	36mm and 40mm diameter factor
EPCON™ C8 Xtrem™	Multiply $L_{sy,t(nom)}$ x 1.2	Not required
ChemSet™ Reo 502™ Plus	Not required	Multiply $L_{sy,t(nom)}$ x 1.4

Chemset Reo 502™ Plus, Chemset 801 Xtrem™ XC² or EPCON™ C8 Xtrem™ STRENGTH LIMIT STATE DESIGN

Checkpoint **4a**

Table 4a Concrete compressive strength effect on development length, tension, X_{nc}

f_c (MPa)	20	25	32	40	50
X_{nc} - for 10-25 bar diam.	1.26	1.13	1.00	0.89	0.80
X_{nc} - for 28-32 bar diam.	1.26	1.13	1.00	1.00	1.00
X_{nc} - for 36-40 bar diam.	1.00	1.00	1.00	1.00	1.00

Design reinforcing bar steel development length, $L_{sy,t}$ (mm)

$$L_{sy,t} = L_{sy,t} \text{ (nom)} * X_{nc}$$

If there is insufficient concrete depth to install bar to $L_{sy,t}$
go to Checkpoint 4b

Note: Effect of water in hole, multiply $L_{sy,t}$ by 1.4.

Checkpoint **4b**

Table 4b Concrete compressive strength effect on steel stress, tension, X_{nc}

f_c (MPa)	20	25	32	40	50
X_{nc} - for 10-25 bar diam.	0.79	0.88	1.00	1.12	1.25
X_{nc} - for 28-32 bar diam.	0.79	0.88	1.00	1.00	1.00
X_{nc} - for 36-40 bar diam.	1.00	1.00	1.00	1.00	1.00

Design tensile steel stress, σ_{st} (MPa)

$$\sigma_{st} = \sigma_{st} \text{ (nom)} * X_{nc}$$

Note: Effect of water in hole, multiply σ_{st} by 0.7.