

A COMPARISON OF COMMON BONDED INJECTION TYPE ANCHORS

The graphs in this document provide an approximate comparison⁽¹⁾ of the characteristic bond resistance of various common bonded injection type anchors.

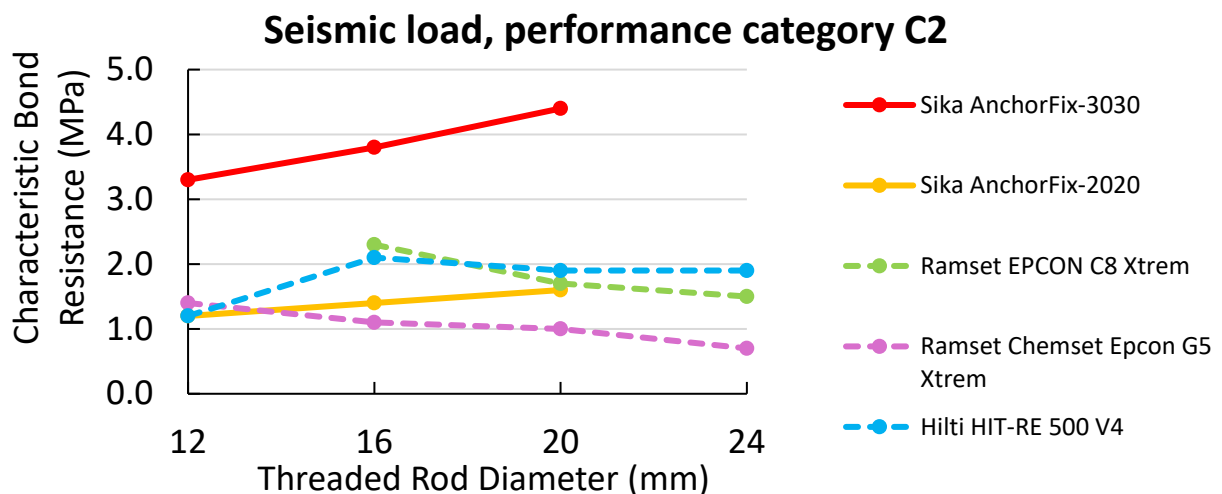
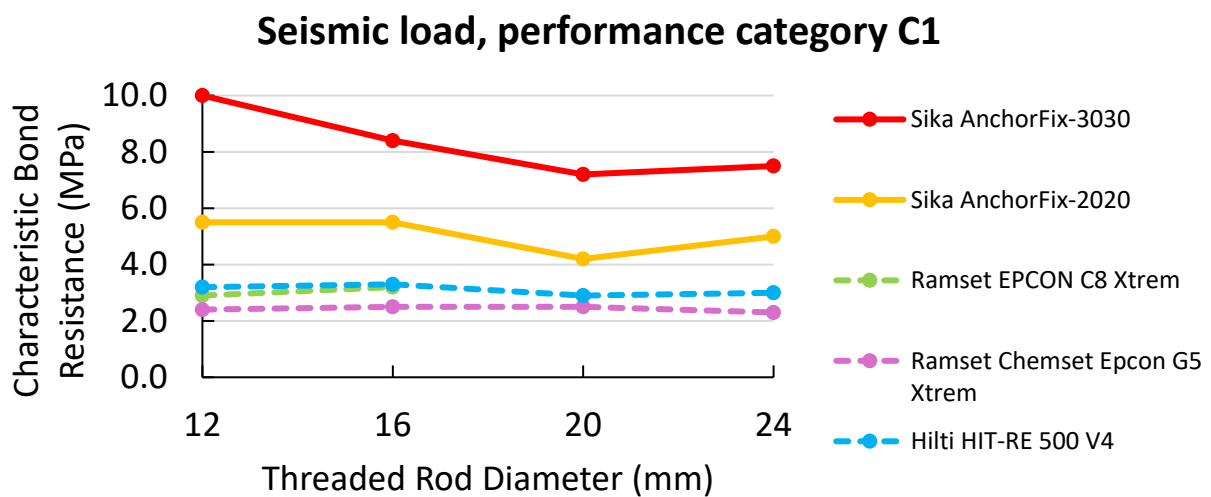
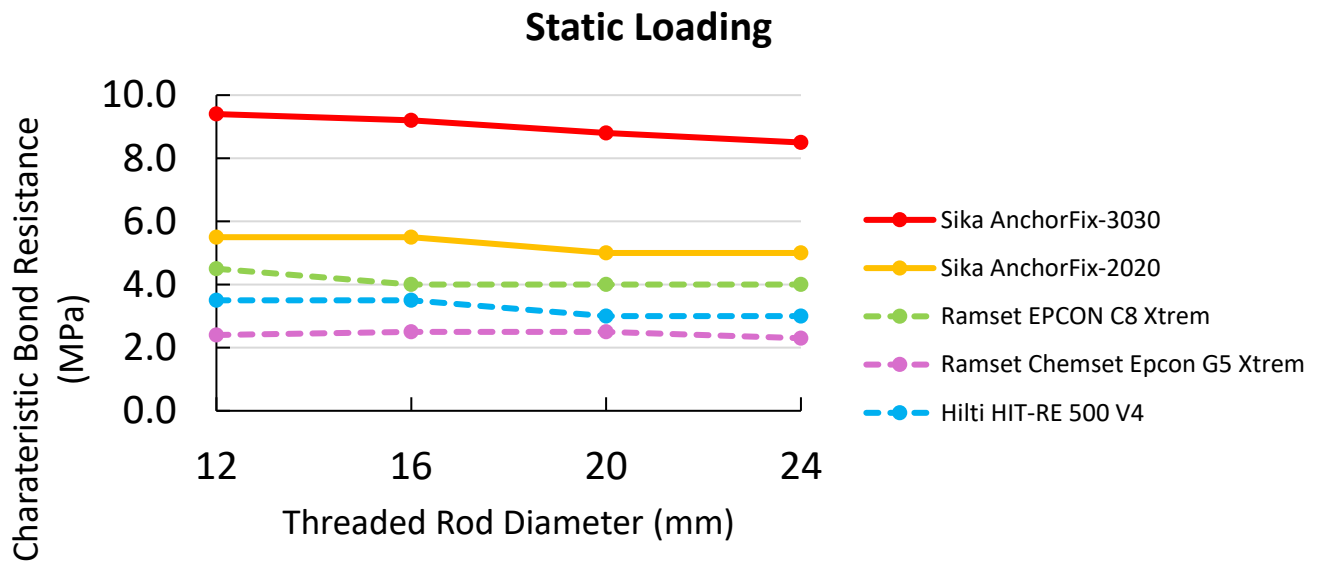
The graphs are based on the combined pullout and concrete cone failure of threaded rods in cracked concrete, assuming:

- The holes are hammer drilled.
- The concrete has a compressive strength of 20 MPa.
- The drilled holes are flooded⁽²⁾.
- The Working Life is 50 years.

The anchor testing has been carried out in accordance with ETAG 001 Metal Anchors for Use in Concrete or its successor document EAD 330499-00-601 Bonded Fasteners for Use in Concrete (including more recent revisions or variants).

Notes

1. *Due to slight differences in testing regimes, these graphs only provide an approximate comparison. The data for the graphs is provided on the final two pages.*
2. *All of the results shown are based on the holes being flooded, except for the seismic performance category C1 and C2 results for Hilti HIT-RE 500 V4 which are based on dry or wet concrete only.*
3. *Anchorage design is the responsibility of an engineer experienced in anchorages and concrete work. These graphs should not be used as a basis for substitution of one anchoring resin with another.*
4. *While every reasonable effort has been made to ensure the accuracy and completeness of the information presented, the data is derived from publicly available and/or third-party sources and may contain inaccuracies or omissions. No representation or warranty is made as to its accuracy, completeness, or suitability for any particular purpose. No responsibility or liability is accepted for any loss or damage arising from reliance on this information. This data is provided for informational and comparative purposes only and should be independently verified where appropriate.*



DATA FOR GRAPHS

The data for the graphs has been taken from the individual companies' published European Technical Assessments.

All data has been based on:

- Working Life = 50 years
- Concrete compressive strength = 20 MPa
- Drilling method = Hammer drilling

There are variations in the temperature ranges used for the testing, and these differences mean that the graphs only provide an approximate comparison of the different products.

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Characteristic bond resistance under static loading for threaded rods in cracked concrete

	Document	Table	Temperature range	Hole condition	Characteristic bond resistance (MPa)							
					M8	M10	M12	M16	M20	M24	M27	M30
Sika AnchorFix-3030	ETA 17/0694 of 09/09/2025	Table C4	55°C/75°C	Flooded hole	9.4	9.4	9.4	9.2	8.8	8.5	6.0	5.9
Sika AnchorFix-2020	ETA 22/0893 of 07/01/2023	Table C1	50°C/80°C	Flooded hole		5.5	5.5	5.5	5.0	5.0		
Ramset EPCON C8 Xtrem	ETA-10/0309 of 01/10/2015	Table C2	50°C/80°C	Flooded hole	4.5	4.5	4.5	4.0	4.0	4.0		3.5
Ramset Chemset Epcon G5 Xtrem	ETA-25/0648 of 03/03/2026	Table C1	45°C/75°C	Flooded hole		1.7	2.4	2.5	2.5	2.3	2.2	2.1
Hilti HIT-RE 500 V4	ETA-20/0541 of 10/09/2025	Table C1	55°C/75°C	Water-filled drill holes	4.0	3.5	3.5	3.5	3.0	3.0	3.0	3.0

Characteristic tension resistance under seismic load, performance category C1, for threaded rods

	Document	Table	Temperature range	Hole condition	Characteristic bond resistance (MPa)							
					M8	M10	M12	M16	M20	M24	M27	M30
Sika AnchorFix-3030	ETA 17/0694 of 09/09/2025	Table C17	55°C/75°C	Flooded hole	9.1	8.2	10.0	8.4	7.2	7.5	5.5	4.7
Sika AnchorFix-2020	ETA 22/0893 of 07/01/2023	Table C9	50°C/80°C	Flooded hole		5.5	5.5	5.5	4.2	5.0		
Ramset EPCON C8 Xtrem	FTA-19/0003 of 08/02/2019, which is a supplement to ETA-10/0309 of 01/10/2015	Table C13	50°C/80°C	Flooded hole		2.9	2.9	3.2				
Ramset Chemset Epcon G5 Xtrem	ETA-25/0648 of 03/03/2026	Table C7	45°C/75°C	Flooded hole		1.7	2.4	2.5	2.5	2.3		1.9
Hilti HIT-RE 500 V4	ETA-20/0541 of 10/09/2025	Table C23	55°C/75°C	Dry or wet concrete (not in water-filled drill holes)	3.6	3.2	3.2	3.3	2.9	3.0	3.0	3.0

Characteristic tension resistance under seismic load, performance category C2, for threaded rods

	Document	Table	Temperature range	Hole condition	Characteristic bond resistance (MPa)					
					M12	M16	M20	M24	M27	M30
Sika AnchorFix-3030	ETA 17/0694 of 09/09/2025	Table C19	55°C/75°C	Flooded hole	3.3	3.8	4.4			
Sika AnchorFix-2020	ETA 22/0893 of 07/01/2023	Table C10	50°C/80°C	Flooded hole	1.2	1.4	1.6			
Ramset EPCON C8 Xtrem	FTA-19/0003 of 08/02/2019, which is a supplement to ETA-10/0309 of 01/10/2015	-	50°C/80°C	Flooded hole		2.3	1.7	1.5		
Ramset Chemset Epcon G5 Xtrem	ETA-25/0648 of 03/03/2026	Table C9	45°C/75°C	Flooded hole	1.4	1.1	1.0	0.7		1.1
Hilti HIT-RE 500 V4	ETA-20/0541 of 10/09/2025	Table C35	55°C/75°C	Dry or wet concrete (not in water-filled drill holes)	1.2	2.1	1.9	1.9	1.6	1.7