ITW *Construction Products Canada*

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RE: New ITW Red Head A7+ adhesive substitutes A7 and S7 adhesives as anchoring solutions

To Whom It May Concern:

The new Red Head Epcon A7+ adhesive is now available as a direct replacement to Epcon A7 and S7 anchoring systems for concrete and masonry applications. A7 and S7 will begin their phase-out stage making way for A7+, our most versatile adhesive to date. A7+ is a high strength, quick cure, hybrid epoxy with comparable or higher performance than its predecessors. The following tables compare these three adhesives and are meant to serve as a reference when transitioning from A7 and/or S7 to our newer technology, A7+.

Table 1 – Adhesive's general information

RED HEAD	A7+	S7	A7
	Hybrid Epoxy (10:1)		Acrylic (10:1)
Base material temperature range (^{o}C)	-10 to 43	-18 to 43	-18 to 38
Shelf life	18 months	12 months	18 months
Setting time @ 21^{o}C (mins)	10	4	6.5
Cure time @ 21^{o}C (mins)	45	30	30-35
Minimum edge distance/spacing (1/2" threaded rod)	1-1/2" / 1-1/2"	1-1/2" / 1-1/2"	1-1/2" / 1-1/2"
Installation conditions	All weather conditions (incl. submerged)	All weather conditions (incl. submerged)	All weather conditions (incl. submerged)
Masonry approved	✓	✗	✓
Cracked concrete approved	✓	✓	✗
All seismic zones approved	✓	✓	✗
NSF 61	✓	✓	✓
Overhead	✓	Partially (3/8" and 1/2")	✗

Table 2 - Bond strength information of A7+ and S7 for threaded rod

			Nominal threaded rod diameter					
	S7 Adhesive	**Unit**	**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**
Temperature range A	**Characteristic bond strength for uncracked concrete**	psi	1611	1611	1611	1611	1611	1611
		(Mpa)	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)	(11.1)
	Characteristic bond strength for cracked concrete	psi	652	726	726	785	785	785
		(Mpa)	(4.5)	(5.0)	(5.0)	(5.4)	(5.4)	(5.4)

			Nominal threaded rod diameter					
	A7+ Adhesive	**Unit**	**3/8**	**1/2**	**5/8**	**3/4**	**7/8**	**1**
Temperature range A	**Characteristic bond strength for uncracked concrete**	psi	1770	1770	1770	1770	1490	1490
		(Mpa)	(12.2)	(12.2)	(12.2)	(12.2)	(10.3)	(10.3)
	Characteristic bond strength for cracked concrete	psi	1060	790	860	890	695	655
		(Mpa)	(7.3)	(5.4)	(5.9)	(6.1)	(4.8)	(4.5)

Table 3 - Bond strength information of A7+ and S7 for reinforcing bar

			Nominal rebar diameter					
	S7 Adhesive	**Unit**	**#3**	**#4**	**#5**	**#6**	**#7**	**#8**
Temperature range A	**Characteristic bond strength for uncracked concrete**	psi	1100	1100	1100	1100	1100	1100
		(Mpa)	(7.6)	(7.6)	(7.6)	(7.6)	(7.6)	(7.6)
	Characteristic bond strength for cracked concrete	psi	506	552	563	608	608	608
		(Mpa)	(3.5)	(3.8)	(3.9)	(4.2)	(4.2)	(4.2)

			Nominal rebar diameter					
	A7+ Adhesive	**Unit**	**#3**	**#4**	**#5**	**#6**	**#7**	**#8**
Temperature range A	**Characteristic bond strength for uncracked concrete**	psi	1675	1935	1900	1700	1635	1615
		(Mpa)	(11.5)	(13.3)	(13.1)	(11.7)	(11.3)	(11.1)
	Characteristic bond strength for cracked concrete	psi	755	755	755	585	585	585
		(Mpa)	(5.2)	(5.2)	(5.2)	(4.0)	(4.0)	(4.0)

Bond strength values correspond to concrete compressive strengths ranging from 2,500 psi (17.2 MPa) to 8,000 psi (55.2 MPa).
Temperature range A: Maximum short term temperature of 130°F (54°C) and maximum long term temperature of 110°F (43°C).
For structures assigned to IBC Seismic Design Category C, D, E, or F, bond strength values must be multiplied by $\alpha_{N,seis}$
Bond strength values are limited to the anchor's minimum and maximum embedment depths.
A7 was not included in the bond strength comparison with A7+ since its performance is below that of S7.

Characteristic bond strength, for A7+ and S7 adhesives, was extracted from their respective ICC-ES reports, 3903 and 2308. For additional technical information or general inquiries, please refer to our technical guides or contact us at (905) 471-7403.

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