ARDEX RA 84

Ultra-Fast-Cure Acrylic Adhesive

Ultra-fast cure time - Full cure in 30 minutes

Versatile - Anchoring and dowelling adhesive and capping gel for ARDEX Crack Injection Systems

Moisture Insensitive - Allowing for installation and curing on damp substrates

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DESCRIPTION

ARDEX RA 84 is a two-component, non-sag, styrene-free, acrylic system used for anchoring and dowelling applications in uncracked concrete using threaded rod and rebar. Due to its ultra-fast cure time, it is an ideal capping gel for ARDEX Crack Injection applications. ARDEX RA 84 is moisture insensitive, allowing installation and curing in damp, water-saturated environments.

GENERAL USES & APPLICATIONS

- Adhering dowel bars and tie bars for full depth concrete repairs
- Short-term tensile anchoring and shear loading conditions in accordance with allowable stress design (ASD)
- Wide service temperature range between -40 °C to 80 °C
- Moisture insensitive allowing installation and curing in damp water-saturated environments
- Bonding agent for fresh concrete to hardened concrete and hardened to hardened concrete

ADVANTAGES & FEATURES

- Ultra-fast 30 minute full cure time at 25 °C in dry concrete
- High bond strength with fast cure times
- Easily dispensable even at low temperatures
- Styrene free
- Non-sag

INSTRUCTIONS

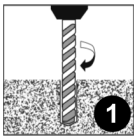
Before using ARDEX RA 84, make sure that the surfaces to be bonded are sound and clean so there is no dust, dirt, grease, wax, oil, or any other contaminant present. Smooth surfaces should be mechanically roughened with a wire brush or sand paper before application.

CARTRIDGE SET-UP

1. Unscrew the plastic cap and remove the plug.
2. Place cartridge into a heavy-duty caulking gun.
3. Dispense a small amount of product into a disposable container until both materials flow evenly from the cartridge.
4. Attach mixing nozzle to cartridge and dispense a small amount of material until a consistent colour with no streaks is obtained.

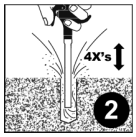
INSTALLATION INSTRUCTIONS

Drilling and Cleaning

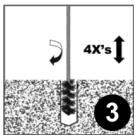


Using a rotary hammer drill, and a drill bit with the appropriate size for the anchor diameter to be installed, drill the hole to the specified embedment depth.

CAUTION: Always wear appropriate personal protection equipment (PPE) for eyes, ears & skin and avoid inhalation of dust during the drilling and cleaning process. Refer to the Safety Data Sheet (SDS) for details prior to proceeding.



NOTE: Remove any standing water from hole prior to beginning the cleaning process. Using oil free compressed air with a minimum pressure of 550kPa, insert the air wand to the bottom of the drilled hole and blow out the debris with an up/down motion for a minimum of 4 seconds each cycle (4X).



Select the correct wire brush size for the drilled hole diameter (see Table 2), making sure that the brush is long enough to reach the bottom of the drilled hole. Reaching the bottom of the hole, brush in an up/down and twisting motion for 4 cycles (4X). CAUTION: The brush should contact the walls of the hole. If it does not, the brush is either too worn or small and should be replaced with a new brush of the correct diameter.

Blow the hole out once more to remove brush debris using oil free compressed air with a minimum pressure of 550kPa. Insert the air wand to the bottom of the drilled hole and blow out the debris with an up/down motion for a minimum of 4 seconds/cycles (4X). Visually inspect the hole to confirm it is clean.

NOTE: If installation will be delayed for any reason, cover cleaned holes to prevent contamination.

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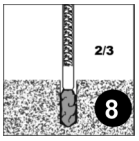
Cartridge Preparation

CAUTION: Check the expiration date on the cartridge to ensure it is not expired. Do not use expired product! Remove the protective cap from the adhesive cartridge and insert the cartridge into the recommended dispensing tool. Before attaching mixing nozzle, balance the cartridge by dispensing a small amount of material until both components are flowing evenly. For a cleaner environment, hand mix the two components and let cure prior to disposal in accordance with local regulations.

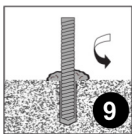
Only after the cartridge has been balanced, screw on the appropriate mixing nozzle to the cartridge (see Table 1). Do not modify mixing nozzle and confirm that internal mixing element is in place prior to dispensing adhesive. Take note of the air and base material temperatures and review the working/full cure time chart (see Table 4) prior to starting the injection process.

Dispense 200mm - 300mm of material from the mixing nozzle into a disposable container according to local regulations and prior to initial injection into the drill hole. The product should be a uniform grey color with no streaks.
NOTE: The adhesive must be properly mixed in order to perform as published.
CAUTION: When changing cartridges, never re-use nozzles. A new nozzle shall be used with each new cartridge and steps 5 - 7 should be repeated accordingly.

Installation and Curing (Vertical Down and Horizontal)



NOTE: The engineering drawings must be followed. For any applications not covered by this document, or if there are any installation questions, please contact the ARDEX Technical Services Department.
Insert the mixing nozzle to the bottom of the hole and fill from the bottom to the top approximately two-thirds full, being careful not to withdraw the nozzle too quickly as this may trap air in the adhesive.
NOTE: When using a pneumatic dispensing tool, ensure that pressure is set at 60kPa maximum.



Prior to inserting the threaded rod or rebar into the hole, make sure it is clean and free of oil and dirt and that the necessary embedment depth is marked on the anchor element. Insert the anchor element into the hole while turning 1 - 2 rotations prior to the anchor reaching the bottom of the hole. Excess adhesive should be visible on all sides of the fully installed anchor. For horizontal installations, wedges should be used to center and support the anchor while the adhesive is curing.
CAUTION: Use extra care with deep embedment or high temperature installations to ensure that the working time has not elapsed prior to the anchor being fully installed.

Do not disturb, torque or apply any load to the installed anchor until the specified full cure time has passed. The amount of time needed to reach full cure is base material temperature and moisture dependent - refer to Table 4 for appropriate full cure time.

CURING

ARDEX RA 84 has a working time of 5 minutes at 23˚C and 50% relative humidity. Full cure on dry concrete within 30 minutes, twice as long on damp concrete.

TABLE A. Cure Schedule

BASE MATERIAL TEMPERATURE RANGE (°C)	WORKING TIME	FULL CURE TIME - DRY CONCRETE	FULL CURE TIME - DAMP CONCRETE
5	20 min	90 min	3 hr
15	9 min	60 min	2 hr
25	5 min	30 min	60 min
35	3 min	20 min	40 min

1. Working and full cure times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge/nozzle system performance.
2. Application Temperature: Substrate temperature should be from -9 - 35 °C.
3. When ambient or base material temperature falls below -5 °C, condition the adhesive above 20 °C prior to use.

APPLICATION TEMPERATURE

Substrate and ambient air temperature should be between 5°C and 35°C. When the work environment or substrate falls below 20°C, condition the product to 20°C – 25°C prior to use. Cold product may become too thick; product that is too warm will react faster than normal.

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CLEAN UP

Clean tools and equipment with white spirits, mineral turps or aerosol dewatering agent or lubricant. Do not allow adhesive to harden on equipment.

PACKAGING

ARDEX RA 84 is sold in a 300mL cartridge.

SHELF LIFE

ARDEX RA 84 has a shelf life of 18 months at 23°C and 50% relative humidity when stored in the original unopened packaging or if resealed for future use.

PLEASE PAY ATTENTION TO THE FOLLOWING

Not recommended for any application where there may be a sustained tensile load, including overhead applications.

SAFETY DATA

Causes eye and skin irritation and may cause serious eye damage. May cause an allergic skin reaction. May cause damage to organs through prolonged or repeated exposure. Do not release into the environment, harmful to aquatic life with long lasting effects. Wear protective gloves, clothing, eye and face protection Avoid inhaling dust/fumes/gas/mist/vapours/spray. Ensure adequate ventilation during mixing and application. In case of contact with the eyes rinse with running water until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Call the Poisons Information Centre on 131 126 (AUS) and 0800 764 766 (NZ) or call a doctor if you feel unwell or if swallowed. Do not induce vomiting. Check with your local Council regarding the disposal of contents and packaging. Keep out of the reach of children. Additional information is in the Safety Data Sheet (SDS) at www.ardexaustralia.com

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TECHNICAL DATA

TABLE B. ARDEX RA 84 Performance to ASTM C881-1412[1,2,3]

PROPERTY	CURE TIME	ASTM STANDARD	UNITS	SAMPLE CONDITIONING TEMPERATURE		
				CLASS A	CLASS B	CLASS C
				-10 °C	10 °C	35 °C
Gel Time - 60 Gram Mass[4]		C881	min	50	10	4
Compressive Yield Strength	7 day	D695	MPa	41	39	24
Compressive Modulus			MPa	2,400	1,900	1,900
Bond Strength Hardened to Hardened Concrete	2 day	C882	MPa	21	21	17
Bond Strength Fresh Concrete to Hardened Concrete	14 day		MPa	22	21	21
			MPa	15		
Consistency or Viscosity		C881		Non-sag		
Heat Deflection Temperature	7 day	D648	°C	63		
Water Absorption	14 day	D570	%	0.42		
Linear Coefficient of Shrinkage	48 hr	D2566	%	0.014		

1. Results based on testing conducted on a representative lot(s) of product. Average results will vary according to the tolerances of the given property.
2. Full cure time is listed above to obtain the given properties for each product characteristic.
3. Results may vary due to environmental factors such as temperature, moisture and type of substrate.
4. Gel time may be lower than the minimum required for ASTM C881.

TABLE C. TENSION & SHEAR LOADS FOR THREADED ROD in normal-weight concrete[1,2]

EMBEDMENT DEPTH mm	TENSION LOAD BASED ON BOND STRENGTH/ CONCRETE CAPACITY		ALLOWABLE LOADS BASED ON STEEL STRENGTH[3]					
	f'c = 27.5 MPa (4,000 psi)		Tension			Shear		
	Ultimate kN	Allowable kN	ASTM F1554 Grade 36 kN	ASTM A193 Grade B7 kN	ASTM F593 304/316 SS kN	ASTM F1554 Grade 36 kN	ASTM A193 Grade B7 kN	ASTM F593 304/316 SS kN
85	32	8	9	20	16	5	10	8
115	59	15	17	36	29	9	19	15
140	75	19	26	56	45	14	29	23
170	99	25	38	81	55	19	42	28
200	143	36	52	110	75	26	57	39
230	185	46	67	144	98	34	74	51

1. Allowable bond strength/concrete capacity calculated using a safety factor of 4.0.
2. The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.
3. Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = 0.33*Fu*Anom., Shear = 0.17*Fu*Anom
4. Values for bond strength of 22mm. threaded rod were linearly interpolated from 19mm & 25mm in. data.

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TABLE D. TENSION & SHEAR LOADS FOR REBAR in normal-weight concrete[1,2]

REBAR SIZE	EMBEDMENT DEPTH mm	TENSION LOAD BASED ON BOND STRENGTH/CONCRETE CAPACITY		ALLOWABLE LOADS BASED ON STEEL STRENGTH[3]			
		f'c = 27.5 MPa (4,000 psi)		Tension		Shear	
		Ultimate kN	Allowable kN	ASTM A615 Grade 60 kN	ASTM A615 Grade 75 kN	ASTM A615 Grade 60 kN	ASTM A615 Grade 75 kN
No. 10	85	43	11	12	15	8	8
No. 13	115	66	17	21	27	14	15
No. 16	140	88	22	33	41	21	23
No. 19	170	128	32	47	59	30	33
No. 22	200	150	37	64	80	41	45
No. 25	230	176	44	84	105	54	60

1. Allowable bond strength/concrete capacity was calculated using a safety factor of 4.0.
2. The lower value of either the adjusted allowable bond strength/concrete capacity or steel strength should be used as the allowable tension or shear value for design.
3. Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = (Fy*Anom)/2.5, Shear = 0.17*Fu*Anom
4. Values for bond strength of #No. 22 rebar were linearly interpolated from No. 19 & No. 25 data.

TABLE E. ARDEX RA 84 reduction factors for EDGE DISTANCE in TENSION[1,2]

DIAMETER	mm	10	13	16	19	22	25
EMBEDMENT DEPTH	mm	85	115	140	170	200	230
CRITICAL EDGE DISTANCE	mm	114	149	187	225	260	298
MIN. EDGE DISTANCE	mm	57	73	92	108	127	149
EDGE DISTANCE mm		ALLOWABLE LOAD CAPACITY REDUCTION FACTOR					
57		0.63					
73		0.73	0.63				
92		0.86	0.72	0.63			
102		0.92	0.77	0.67			
108		0.96	0.80	0.69	0.63		
114		1.00	0.83	0.72	0.65		
127			0.89	0.77	0.69	0.63	
150			1.00	0.85	0.76	0.69	0.63
165				0.91	0.81	0.74	0.67
187				1.00	0.88	0.80	0.72
197					0.91	0.82	0.75
210					0.95	0.86	0.78
225					1.00	0.90	0.82
235						0.93	0.84
248						0.96	0.87
260						1.00	0.91
273							0.94
286							0.97
299							1

1. Minimum slab thickness equals 1.5 x embedment depth.
2. Linear interpolation may be used for intermediate edge distances.

TABLE F. ARDEX RA 84 reduction factors for EDGE DISTANCE in SHEAR[1,2]

DIAMETER	mm	10	13	16	19	22	25
EMBEDMENT DEPTH	mm	85	115	140	170	200	230
CRITICAL EDGE DISTANCE	mm	95	127	159	191	222	254
MIN. EDGE DISTANCE	mm	51	64	83	95	111	127
EDGE DISTANCE mm		ALLOWABLE LOAD CAPACITY REDUCTION FACTOR					
51		0.25					
64		0.46	0.25				
70		0.57	0.33				
83		0.79	0.48	0.25			
89		0.89	0.55	0.31			
95		1.00	0.63	0.38	0.25		
102			0.70	0.44	0.30		
111			0.81	0.53	0.38	0.25	
121			0.93	0.63	0.45	0.31	
127			1.00	0.69	0.50	0.36	0.25
140				0.81	0.60	0.44	0.33
152				0.94	0.70	0.53	0.40
159				1.00	0.75	0.57	0.44
178					0.90	0.70	0.55
191					1.00	0.79	0.63
203						0.87	0.70
222						1.00	0.81
235							0.89
254							1.00

1. Minimum slab thickness equals 1.5 x embedment depth.
2. Linear interpolation may be used for intermediate edge distances.

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TABLE G. ARDEX RA 84 reduction factors for SPACING in TENSION[1,2]

DIAMETER	mm	10	13	16	19	22	25
EMBEDMENT DEPTH	mm	85	115	140	170	200	230
CRITICAL SPACING DISTANCE	mm	225	298	371	448	521	597
MIN. SPACING DISTANCE	mm	57	76	92	111	130	146
SPACING DISTANCE mm		ALLOWABLE LOAD CAPACITY REDUCTION FACTOR					
57		0.63					
76		0.67	0.63				
83		0.69	0.64				
92		0.71	0.66	0.63			
102		0.73	0.67	0.64			
111		0.75	0.69	0.66	0.63		
130		0.79	0.72	0.68	0.65	0.63	
146		0.83	0.75	0.70	0.67	0.65	0.63
172		0.88	0.79	0.74	0.70	0.67	0.65
197		0.94	0.83	0.77	0.72	0.69	0.67
225		1.00	0.88	0.81	0.76	0.72	0.70
260			0.94	0.85	0.79	0.75	0.72
299			1.00	0.90	0.84	0.79	0.76
330				0.95	0.87	0.82	0.78
372				1.00	0.92	0.86	0.82
413					0.96	0.90	0.85
448					1.00	0.93	0.88
483						0.96	0.91
521						1.00	0.94
559							0.97
597							1.00

1. Minimum slab thickness equals 1.5 x embedment depth.
2. Linear interpolation may be used for intermediate edge distances.

GUARANTEE

ARDEX Australia Pty Ltd ("we" or "us") guarantees this product ("our goods") is free from manufacturing defects and will perform to any applicable specification published by us for 10 years from the date of purchase. Our liability under this guarantee is limited at our option to replacement of the product, repair of any damage to the immediate surface or area of application of the product, or compensation, in each case if we are satisfied loss or damage was due to a breach of this guarantee. This guarantee does not apply if damage or loss is due to failure to follow published instructions or any act or circumstance beyond our control, including shade variations and efflorescence. If you wish to make a claim under this guarantee you must notify us (ARDEX Australia Pty Ltd, 20 Powers Road Seven Hills NSW 2147; Toll Free: 1800 224 070; Email: technicalservices@ ardexaustralia.com) and provide evidence of your purchase of the product within 30 days of any alleged loss or damage occurring. We reserve the right to ask you for satisfactory evidence of any alleged loss or damage. Any claim under this guarantee is at your cost. This guarantee is in addition to any rights or remedies you may have as a "consumer" under the Australian Consumer Law and to that extent you need to be aware that: "Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss of damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure".

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standards. Our instructions and recommendations are only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program. Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may affect specific installation recommendations. The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

This datasheet was issued in December 2019 and is valid for 3 years, in some instances a newer version may be published. Always refer to www.ardexaustralia.com for the latest technical data from ARDEX Australia Pty Ltd.