



**Ramset™**

**Concrete Results™**



**Ramset™**  
Chemset Injection System  
Heavy Duty Epoxy Adhesive

**EPCON**  
**A7**

**Fast Dispensing**  
**Fast Curing Acrylic**

- 35 Minute Cure Time at 60°F
- Fast Dispensing at All Temperatures
- Fully Cures Below 0°F
- Multi-Patented Formula

ICBO Evaluation Report #5560



ITW Red Hood  
Wood Dale, IL 60191

Contents: 28 fl. oz. (825 ml)

**EPCON A7**  
Chemical Anchoring System

# EPCON A7

## Chemical Anchoring System

### Fast Dispensing, Fast Curing Acrylic Adhesive

A7 is a cost effective solution to anchoring jobs close to edges where there is a need to avoid bursting stress on the surrounding substrate and is suitable for normal loads in benign environments.

The acrylic resin and hardening agent are completely mixed as they are simultaneously dispensed from the dual cartridge through a static mixing nozzle, directly into the anchor hole.

A7 can be used to fix starter bars, wall ties, threaded studs, bolts and large screws into concrete, brickwork, masonry and stone. Fixtures can be installed into hollow block work using A7 in conjunction with the appropriate sleeve or sieve.

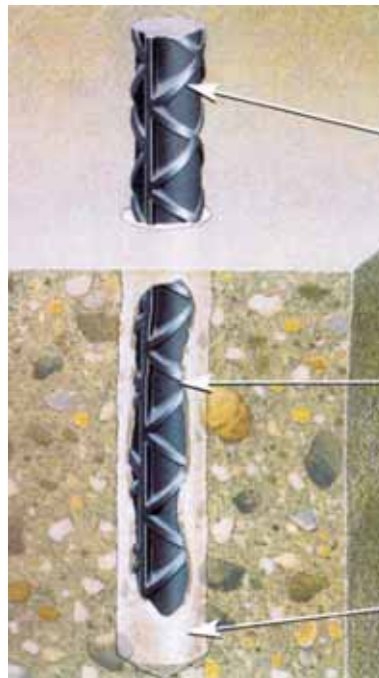
### Features



Threaded stud (Carbon or Stainless Steel) supplied by contractor; Stud does not need to be chisel pointed.

EPCON A7 chemical completely fills area between stud and hole creating a stress-free, high load anchorage.

Pre-drilled hole in concrete; see performance tables for suggested hole sizes.



Rebar (shown) supplied by contractor.

EPCON A7 chemical completely fills area between stud and hole creating a stress-free, high load anchorage.

Pre-drilled hole in concrete; see performance tables for suggested hole sizes.

### Suggested Specifications

#### Acrylic Chemical:


- Two component methyl methacrylate adhesive, non-sag paste, moisture insensitive when cured, dark gray in colour
- Meets ASTM C881-90, Type IV, Grade 3, Class A, B and C with the exception of gel time and epoxy content
- Shrinkage during cure per ASTM D2566: .002in./in
- Heat deflection temperature, ASTM D648: 60°C minimum
- Shelf life: Best if used within 18 months (store below 27°C)
- Pumpable at negative 17°C without preheating

#### Packaging:

- Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio.
- Acrylic components dispensed through a static mixing nozzle that thoroughly mixes the material and places the material at the base of the pre-drilled hole.
- Cartridge markings: Include manufacturer's name, batch number and best-used-by date, mix ratio by volume, ANSI hazard classification, and appropriate ANSI handling precautions.

## Advantages

- **Cost Saving**
  - Incredibly fast dispensing and rod installation times
  - Significantly faster curing times
  - Easy to use (no-heating) even at freezing cold temperatures
  - Requires less chemical - can be used in 1/16" oversized or 1/8" oversized holes
- **Water Insensitivity**
  - Works in damp holes and underwater applications
- **Easy Handling & Installation**
  - No drip, no sag, easy clean up
  - Fast & easy dispensing, even 825ml cartridge can be hand dispensed
  - Rods are easier to inset into the hole with A7 compared with other adhesives
  - Not mix ratio sensitive
- **One Formula**
  - For both hollow and solid base materials
- **NSF Approval for Portable Drinking Water**
- **Fast Curing Time**



Base Material Temperature (F°/C°)	Working Time	Full Cure Time
100°/38°	5 minutes	25 minutes
80°/27°	5.5 minutes	30 minutes
60°/16°	7 minutes	35 minutes
40°/4°	15 minutes	75 minutes
20°/-7°	35 minutes	6 hours
0°/-18°	4 hours	24 hours

## Approvals / Listings

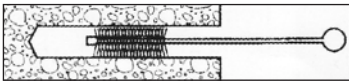
- ASTM C881, Type IV, Grade 3, Class A, B, C  
(exceptions - A7 gels faster than ASTM requirements and does not contain any epoxy)
- ICC Evaluation Service, INC. - #ER-5560 (formerly ICBO)
- Metro-Dade County - #01-0501.01
- City of Los Angeles - RR#25379
- DOT Approvals
- Florida Building Code
- NSF Standard 61 Certified for Drinking Water Components
- HDB Prefabrication Technology Centre (ETAG)

## Installation Method - Solid Base Material

### Preparation



- Drill a hole according to the selected diameter (tables of dimensions of anchoring). The hole may be drilled with a diamond bit, but rebar location must be determined in order to avoid cutting them.

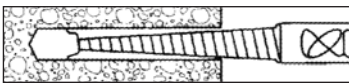


- Carefully brush the surface of the hole with a metal brush.

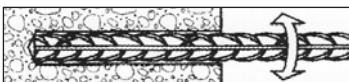


- Blow the dust out of the hole.  
**NB: The hole may also be cleaned with a jet of water.**

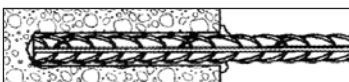
### Injection



- When starting new cartridge or new nozzle, dispense and discard enough chemical until uniform grey colour is achieved. Inject from the bottom of the hole, gradually filling in until 50% full.



- Insert the selected rod slowly by hand with a twisting motion until the end of the hole is reached. The rod must be clean and free from oil and grease. Check that the hole is well filled (no air bubbles). A slight excess should emerge.

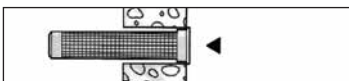


- Wait for the resin to harden before applying the load / tighten fixture into place. See A7 Cure Time Chart for set-up time.

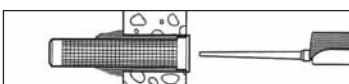
## Installation Method - Hollow Block Material



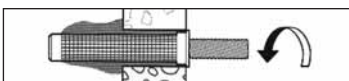
- Drill a hole according to selected diameter.



- Insert selected sleeve.



- Inset mixer nozzle into sleeve and slowly inject A7 to form a solid body of mortar behind block.

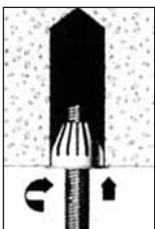


- Push stud into sleeve with a twisting motion. Allow time to cure before applying the load. See A7 Cure Time Chart for set-up time.

## Installation Method - Overhead

**Preparation** - same as *solid base material*

### Injection



- Slowly inject resin, insert retaining collar and push stud bolt to bottom of hole. Allow resin to cure before applying load. See A7 Cure Time Chart for set-up time.

# EPCON A7

## Chemical Anchoring System

### Performance Tables - Threaded Stud Fixings

Anchor Size	Installation					Minimum Dimensions			Design Load					
	Hole Dia. (mm)	Embedment Depth (mm)	Fixture Clearance (mm)	Fixture Thickness (mm)	Tightening Torque (Nm)	Edge Distance (mm)	Anchor Spacing (mm)	Substrate Thickness (mm)	Hollow Concrete Block 20 MPa		Solid Red Brick		Concrete Block 30 MPa	
									Tensile (kN)	Shear (kN)	Tensile (kN)	Shear (kN)	Tensile (kN)	Shear (kN)
M8	10	80	10	15	10	35	50	120	0.6	0.6	2.0	1.6	12.0	8.6
M10	12	90	12	20	20	40	60	130	0.6	0.6	2.3	6.2	16.2	11.7
M12	14	110	14	25	30	50	75	160	0.6	0.6	3.2	5.6	22.9	16.5
M16	18	125	18	35	60	65	95	175	-	-	-	-	28.1	20.2
M20	25	170	25	65	120	80	120	220	-	-	-	-	48.3	34.8
M24	28	210	28	63	200	95	145	270	-	-	-	-	69.4	50.0
M30	35	280	35	70	400	120	180	340	-	-	-	-	111.5	80.3

Design Tensile Load for 30MPa Concrete Block (Factor of Safety = 2.16); Design Shear Load (Factor of Safety = 1.8)

Design Tensile Load for Solid Red Brick (Factor of Safety = 3.0)

Note: Please seek ITW Asia's Technical Engineer for more detailed technical information.

### Performance Tables - Rebar Fixings

Concrete Strength: 30/Nmm<sup>2</sup>

Characteristic Rebar Strength: FE 460

Rebar Size (mm)	Hole Dia. (mm)	Rebar Yield (kN)	Characteristic Tensile Bond Capacity (kN)																						
			36.5	40.5	48.6	55.8	60.4	74.4	83.2	103.9	129.9	126.4	158.0	176.9	189.6	251.7	275.3	291.1	314.7	327.3	353.9	371.6	439.4	553.7	
10	13	36.1																							
13	16	61.1																							
16	20	92.5																							
20	25	144.5																							
25	30	225.8																							
28	35	283.2																							
32	40	370.0																							
40	50	578.1																							
Embedment Depth (mm)			90	100	120	130	160	200	250	280	300	320	350	370	400	420	500	630							

#### Reduction Factor For Rebar-Rebar Spacing

Rebar Size	T10	T13	T16	T20	T25	T28	T32	T40
50	0.64							
60	0.67							
65	0.68	0.64						
70	0.69	0.65						
80	0.72	0.67						
90	0.75	0.69	0.64					
100	0.78	0.71	0.66					
110	0.81	0.73	0.67	0.64				
120	0.83	0.75	0.69	0.65				
140	0.89	0.79	0.72	0.68	0.64			
160	0.94	0.83	0.75	0.70	0.66	0.64		
180	1.00	0.88	0.78	0.73	0.68	0.66		
200		0.92	0.81	0.75	0.70	0.68	0.64	
220		0.96	0.84	0.78	0.72	0.70	0.65	
240		1.00	0.88	0.80	0.74	0.71	0.66	
260			0.91	0.83	0.76	0.73	0.68	
280			0.94	0.85	0.78	0.75	0.69	
300			0.97	0.88	0.80	0.77	0.70	
320			1.00	0.90	0.82	0.79	0.72	0.64
340				0.93	0.84	0.80	0.73	0.65
380				0.98	0.88	0.84	0.76	0.67
400				1.00	0.90	0.86	0.77	0.68
450					0.95	0.90	0.80	0.70
500					1.00	0.95	0.84	0.73
560						1.00	0.88	0.75
600							0.91	0.77
700							0.97	0.82
740							1.00	0.83
800								0.86
900								0.91
1000								0.95
1110								1.00

#### Reduction Factor For Rebar-Edge Distance

Rebar Size	T10	T13	T16	T20	T25	T28	T32	T40
65	0.64							
70	0.66							
75	0.69							
80	0.71							
85	0.74	0.63						
90	0.77	0.65						
100	0.82	0.69						
110	0.87	0.73						
115	0.90	0.75	0.64					
120	0.92	0.77	0.65					
130	0.97	0.81	0.68					
135	1.00	0.83	0.69					
140		0.84	0.71	0.63				
160		0.92	0.77	0.67				
180		1.00	0.83	0.72	0.64			
200			0.88	0.77	0.67	0.63		
220			0.94	0.81	0.71	0.67		
240			1.00	0.86	0.75	0.70		
260				0.91	0.79	0.73	0.63	
280				0.95	0.82	0.77	0.65	
300				1.00	0.86	0.80	0.68	
340					0.93	0.87	0.73	
360					0.97	0.90	0.75	
375					1.00	0.93	0.77	
400						0.97	0.80	0.64
420						1.00	0.83	0.65
440							0.85	0.67
480							0.91	0.70
500							0.93	0.72
555							1.00	0.77
600								0.80
700								0.89
835								1.00

Note: Please seek ITW Asia's Technical Engineer for more detailed technical information.

## Estimated Consumption Tables

Epon A7 Acrylic Chemical		Number of Anchoring per 825ml Cartridge for Rebar Fixings							
Rebar Size (mm)	Hole Diameter $d_o$ (mm)	Embedment Depth $h_{ef}$ (mm)							
		115	160	190	240	310	335	380	475
10	12	126.8	91.2	76.8	60.8	47.1	43.5	38.4	30.7
13	16	71.4	51.3	43.2	34.2	26.5	24.5	21.6	17.3
16	20	45.7	32.8	27.6	21.9	16.9	15.7	13.8	11.1
20	25	29.2	21.0	17.7	14.0	10.8	10.0	8.8	7.1
25	30	20.3	14.6	12.3	9.7	7.5	7.0	6.1	4.9
28	35	14.9	10.7	9.0	7.1	5.5	5.1	4.5	3.6
32	40	11.4	8.2	6.9	5.5	4.2	3.9	3.5	2.8
40	50	7.3	5.3	4.4	3.5	2.7	2.5	2.2	1.8

Epon A7 Acrylic Chemical		Number of Anchoring per 825ml Cartridge for Threaded Stud Fixings							
Anchor Size	Hole Diameter $d_o$ (mm)	Embedment Depth $h_{ef}$ (mm)							
		80	90	110	125	170	210	280	
M8	10	262.6	233.4	191.0	168.0	123.6	100.0	75.0	
M10	12	182.3	162.1	132.6	116.7	85.8	69.5	52.1	
M12	14	134.0	119.1	97.4	85.7	63.0	51.0	38.3	
M16	18	81.0	72.0	58.9	51.9	38.1	30.9	23.2	
M20	25	42.0	37.3	30.6	26.9	19.8	16.0	12.0	
M24	28	33.5	29.8	24.4	21.4	15.8	12.8	9.6	
M30	35	21.4	19.1	15.6	13.7	10.1	8.2	6.1	

Note: The estimated number of fixings (for both rebar and threaded stud) is based on the calculation of hole volume and recommended injection volume per fixing (50% embedment depth). These estimates do not account for chemical wastage.

## Applications



Starter bars anchored to slab prior to pour of adjoining floor slab, shallow depth and close to edge with A7 Injection.



Close anchor spacing for structural steel.



No expansion force - perfect for hollow block and brick.



Anchoring starter bars for attachment of reinforcing for shower hob.



Permanent anchoring of steel columns to concrete floor slab.



Anchoring of starter bars to join vertical and horizontal elements.

## Available Chemical Anchor Systems



### Epon G5

High strength epoxy with extended working time and fast curing time.



### Epon C6

Fast curing epoxy for all conditions.

### Epon A7

Fast dispensing, fast curing acrylic adhesive.



### Maxima 7

Spin-in acrylic glass capsule for easy handling.



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