ARC TECHNICAL INFORMATION

AMBEX®
CONCRETE REPAIR SOLUTIONS

AMBEX ANCHORING CAPSULES ARC

Ultra Fast Cementitious Anchoring Capsule for Rebars and Dowels

DESCRIPTION

Ambex Anchoring Capsules ARC are a cementitious non-shrink grout specially designed for the anchoring of rebar or dowels in concrete, masonry or rock. This dry pre-mixed cementitious grout is encapsulated in a water permeable wrapping and once the grout capsule is saturated in water it becomes an ultra fast setting thixotropic grout and is easily inserted in the anchoring hole. Ambex Anchoring Capsules ARC contain a mix of fast setting proprietary cements, fine graduated sand and selected additives.

USES

Can be used for civil engineering, architectural, mining or geological projects with plain, threaded or deformed rebars or dowels.

- Structural repairs
- Highway and airports slabs
- Retaining or building walls
- Dams and tunnels
- Concrete formwork anchors
- Mining anchors
- Bridges **
- Reservoirs and water structures **
- Wharves and canal structures **

** Ambex AAC are recommended in underwater and cold weather applications.

ADVANTAGES

- Simple and economical
- Easy to install
- Easy handling and storage
- Reduces installation time and cost
- No product mixing on site
- No special tools and equipment required
- High early strengths
- Thixotropic mix
- Stable water /cement ratio
- No toxic emanation or fumes
- Environmental friendly

SIZES

1. Capsule ARC-13: 13mm (1/2") diameter
   200mm (8") long
2. Capsule ARC-19: 19mm (3/4") diameter
   300mm (12") long
3. Capsule ARC-25: 25mm (1") diameter
   300mm (12") long

- Additional sizes available on special order.
- Capsule placer available for ARC-25.

TECHNICAL INFORMATION

Tests performed by independent laboratories.

		Metric	Imperial
Net weight dry:	ARC-25	± 240g	± 0.5 lbs.
	ARC-19	±145g	± 0.3 lbs.
	ARC-13	±50g	± 0.1 lbs.
Density (dry)		1.5-1.7 g/cm^3	93.6-106.1lbs./ft^3
Compressive strength (ASTM C-109–28 days)		52.6 MPa	7629 psi
Water/Cement Ratio		0.36–0.39	0.36–0.39

Soaking time	1 to 2 min.
Working time 20°C (68°F)	10 min.
Initial setting time (ASTM C-191 Vicat needle)	32 min.
Final setting time (ASTM C-191 Vicat needle)	37 min.
Expansion (ASTM C-1090)	0.03%
Freeze-thaw resistance (ASTM 666-300 cycles,)	100%

PACKAGING

	ARC-13	ARC-19	ARC-25
Capsules per bag	160	45	42
Weight per 1bag	8kg (17.5lbs)	6.8kg (15lbs)	10.3kg (22.7lbs)
Bags per skid	132	180	132

GENERAL INFORMATION

- Consult an engineer for structural design and capacity.
- Engineer must evaluate substrate and anchoring conditions.
- Contact Ambex representative if hole sizes and depths differ from chart.
- Underwater: Strength may be reduced by 30% depending on application.
- Cold weather applications may have slower initial setting time.

SAFETY DIRECTIVES

This product contains cement and will react with water. It can inflame eyes and skin. In the case of direct contact with eyes, rinse several times with water, do not rub eyes and see a doctor. Wearing rubber gloves, dust-mask and safety glasses is highly recommended. Keep away from children. The Material Safety Data Sheet (MSDS) is available on request.

STORAGE

Cementitious material is sensitive to humidity. Store in a dry area where there is no humidity or freezing. Shelf life up to 2 years if well protected.

WARRANTY

Ambex Concrete Technologies Inc. warrants that this product will perform as presented when used as described herein. Ambex does not give any other implicit or explicit warranty. Ambex's liability is limited to the replacement of the product proven defective.

1522 Blvd. des Laurentides | Laval, Quebec | Canada H7M 2N7 | Tel 450.662.9147 | Toll Free 1.888.351.7585 | Fax 450.662.9013

AMBEX ANCHORING CAPSULES - ARC

Nominal rebar size	Recommended hole diameter mm (inch)	Capsule size mm (inch)	Embedment Depth mm (inch)	Fy Ultimate pullout strength KN	Fy Ultimate pullout strength lbs	Fy/F'y	Minimum embedment to develop yield strength of steel mm (inch)	F'y Yield strength of steel KN (lbs)
10M (#3)	16 (5/8)	13 (1 /2)	100 (4)	36.7	8250	0.92	132 (5 1/4)	40 (8990)
			150 (6)	59.0	13342	1.48		
15M (#5)	19 (3/4)	13 (1 /2)	100 (4)	55.2	12416	0.69	147 (5 3/4)	80 (17984)
			150 (6)	82.0	18434	1.03		
			200 (8)	116.7	26077	1.45		
20M (#6)	23 (7/8)	19 (3/4)	150 (6)	97.3	21907	0.81	160 (6 3/8)	120 (26977)
			200 (8)	138.7	31157	1.16		
			300 (12)	186.0	41813	1.55		
25M (#8)	28 (1 1/8)	25 (1)	200 (8)	160.7	34147	0.76	237 (9 3/8)	200 (44961)
			250 (10)	264.0	59347	1.32		
			300 (12)	282.3	63394	1.41		
30M (#9)	38 (1 1/2)	25 (1)	300 (12)	378.0	84974	1.35	245 (9 5/8)	280 (62946)
			400 (16)	over 400 **	over 89924 **			
35M (#11)	42 (1 5/8)	25 (1)	300 (12)	over 400 **	over 89924 **		300 (12)	400 (89924)
			400 (16)	over 400 **	over 89924 **			

* The hole and rebar diameter may vary. Use the smallest hole diameter that allows easy insert of capsule and rebar.
* Tests made at 28 days and 20°C (68°F).
* Concrete compressive strength > 35 MPa (5080 psi).
* Steel 400 MPa. (58000 psi).
* Tests made by Independant laboratory, Qualitas, Montreal, Qc, Canada.
**Hydraulic jack capacity: 400 KN (89923.58 lbs.).

ESTIMATE OF THE NUMBER OF CAPSULES REQUIRED FOR YOUR PROJECT

CALCULATION FORMULA FOR ESTIMATE :

$N = \{3{,}142 * L ((D/2)^2 - (R/2)^2) \} \div V$

R: Rebar diameter in mm (inch)
D: Hole diameter in mm (inch)
L: Hole depth in mm (inch)
V: V= 12.0mm^3 (0.7 in^3) for capsule ARC-13
V= 66.0mm^3 (4.0 in^3) for capsule ARC-19
V= 110mm^3 (6.7 in^3) for capsule ARC-25
N: Minimum number of capsules required (estimate only)

RECOMMENDED INSTALLATION PROCEDURE

1. DRILL ANCHORING HOLES: Drill holes as per recommended minimum dimensions in table above. For faster and easier installation, increase hole diameter up to 6mm (1/4") greater than the bar diameter for bars up to 25M (#8). For different hole sizes and lengths contact Ambex representative.

2. CLEAN ANCHORING HOLES: The hole must be clean before inserting the grout capsule. Clean with water pressure or air pressure to eliminate all dust and contaminants. Clean holes from bottom out. Residual water must be removed. Anchoring holes must be clean prior to inserting the grout capsule.

3. SOAK THE GROUT CAPSULES IN WATER: Soak the grout capsules in clean water for 1 to 2 minutes or until bubbles cease coming out of the capsules. Water temperature can be between 2°C (36°F) and 25°C (77°F). In cold weather conditions, water and capsules can be warmed up to 25°C (77°F) to accelerate the setting time of the capsule.

4. INSERT THE GROUT CAPSULE IN THE ANCHORING HOLE: Working time of the grout capsule is about 10 minutes at 20°C (68°F). Twist off end with staple and insert open end in hole. Do not remove wrapping of the capsule. Insert the grout capsule in hole. A capsule can be cut to required length when an anchoring hole does not require a full capsule. The remaining part can be used for another anchoring hole.

5. INSERT BAR IN THE ANCHORING HOLE: Insert bar without rotating it through the capsule that is already in the hole. Use a hammer if required. Do not touch or move bar before final setting time. DO NOT ROTATE REBAR

TECHNICAL SERVICE

AMBEX CONCRETE TECHNOLOGIES INC.
1522 Blvd. des Laurentides,
Laval, Quebec, Canada H7M 2N7
Tel. 450.662.9147 Toll free 1.888.351.7585
Fax 450.662.9013 www.ambexcorp.com
Questions? E-mail us at ambexinfo@ambexcorp.com