AAC™ TECHNICAL INFORMATION

AMBEX®
CONCRETE REPAIR SOLUTIONS

CEMENTITIOUS ANCHORING CAPSULE FOR REBARS AND DOWELS AAC™

DESCRIPTION

AMBEX AAC™ anchoring capsules are a cementitious non-shrink grout designed for the anchoring of rebars or dowels in concrete, masonry or rock. This dry pre-mixed cement grout is encapsulated in a water permeable wrapping and once the grout capsule is saturated in water it becomes a fast setting thixotropic grout and is easily inserted in the anchoring hole. **AMBEX AAC™** contain a mix of calcium aluminate cement, screened 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
- Dams and tunnels
- Bridges
- Highway and airport slabs
- Wharves and canal structures
- Reservoirs and water structures
- Retaining or building walls
- Concrete formwork anchors
- Mining anchors
- Mining - grout plugs for exploratory holes

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
- Can be installed in cold weather at -17°C (0° F)
- Thixotropic mix
- Stable water/cement ratio
- No toxic emanation or fumes
- Environmentally friendly
- Does not contain calcium chloride
- Can be used underwater

SIZES

1. **AMBEX AAC™– 13:** 13 mm (1/2") diameter
   200 mm (8") long
2. **AMBEX AAC™– 19:** 19 mm (3/4") diameter
   300 mm (12") long
3. **AMBEX AAC™– 25:** 25mm (1") diameter
   300 mm (12") long

- Additional sizes available on special order
- Capsule placer available for AAC-25

TECHNICAL INFORMATION

Tests performed by independent laboratories.

		METRIC	IMPERIAL
Water/Cement Ratio		0.32	0.32
Net Weight (Dry)	*AMBEX AAC™– 25:*	±240 g	± 0.5 lbs
	AMBEX AAC™– 19:	±145 g	± 0.3 lbs
	AMBEX AAC™– 13:	±50 g	± 0.1 lbs
Density (Dry)		1.5-1.7 g/cm³	93.6-106.1 lbs/ft³
Compressive Strength (ASTM C-109)	*28 days:*	48.2 MPa	6990 psi
Creep Test (ASTM E-1512)		Exceeds Requirements	
Soaking time		1 to 2 min	
Working time 20° C (68° F)		10 min	
Initial setting time (ASTM C-191)		6 min	
Final setting time (ASTM C-191)		26 min	
Expansion (ASTM C-1090)		0.05%	
Freeze-thaw resistance (ASTM C- 666) (C-666, 312 cycles)		100%	

PACKAGING

	AAC-13	AAC-19	AAC-25
Capsules per bag	160	45	42
Weight per bag	8 kg/ 17.5 lbs	6.8 kg/15 lbs	10.3 kg/22.7 lbs
Bags per skid	132	180	132

GENERAL INFORMATION

- Consult an engineer for structural design and capacity.
- Engineer must evaluate substrate and anchoring conditions.
- Contact an 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 PRECAUTIONS

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.

GUARANTEE

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.

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AMBEX ANCHORING CAPSULES – AAC™

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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)	17.8	4001	0.45	146 (5-3/4)	40 (8990)
			125 (5)	28.9	6497	0.72		
			150 (6)	42.0	9442	1.05		
12M (#4)	19 (3/4)	13 (1/2)	100 (4)	21.5	4833	0.41	165 (6-1/2)	53 (11914)
			150 (6)	39.8	8947	0.75		
			200 (8)	83.8	18838	1.58		
15M (#5)	19 (3/4)	13 (1/2)	100 (4)	41.7	9374	0.52	184 (7-3/8)	80 (17984)
			150 (6)	64.0	14387	0.80		
			200 (8)	87.5	19670	1.09		
15M (#5)	22 (7/8)	19 (3/4)	100 (4)	48.4	10880	0.60	180 (7)	80 (17984)
			150 (6)	63.0	14255	0.79		
			200 (8)	91.3	20529	1.14		
20M (#6)	22 (7/8)	19 (3/4)	150 (6)	82.4	18524	0.69	190 (7-1/2)	120 (26977)
			200 (8)	131.6	29584	1.10		
			300 (12)	161.3	36260	1.34		
25M (#8)	28 (1-1/8)	25 (1)	200 (8)	215.6	48467	1.07	200 (8)	200 (44961)
			300 (12)	268.1	60269	1.34		
30M (#9)	38 (1-1/2)	25 (1)	300 (12)	364.0	81827	1.30	250 (10)	280 (62946)
			400 (16)	382.0	85874	1.36		
35M (#11)	42 (1-5/8)	25 (1)	300 (12)	398.4	89560	1.00	300 (12)	400 (89924)
			400 (16)	400**	89924**	1.00		

- 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)
**Hydraulic jack capacity: 400 KN (89923.58 lbs)
Tests made by Independant laboratory:
Qualitas, Montreal, Quebec, Canada

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= 21,225 mm³ (1.3 in³) for **AMBEX AAC™** – 13
V= 72,600 mm³ (4.4 in³) for **AMBEX AAC™** – 19
V= 125,600 mm³ (7.7 in³) for **AMBEX AAC™** – 25

N: Minimum number of capsules required (estimate)

RECOMMENDED INSTALLATION PROCEDURE

1. DRILL ANCHORING HOLES: Drill holes as per recommended minimum dimensions in above table. ***Use rotary percussion hammer with carbide bits. Do not use diamond core bits.*** For faster and easier installation, increase hole diameter up to 6 mm (1/4") greater than the bar diameter for bars up to 25M (#8). Contact an AMBEX representative for different hole sizes and lengths.

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 **AMBEX AAC™**.

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 the wrapping of the grout capsule. 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. ***CAUTION: Volume of grout required to fill hole may vary due to diameter and length of hole, cavities, fissures and nature of substrate. User must ensure that grout completely fills hole and encapsulates bar at surface after insertion of bar.***

5. INSERT BAR IN THE ANCHORING HOLE: Insert bar without rotating it through the capsule that is already in the hole. Use a hammer or percussion hammer/drill if required. Do not touch or move bar before final setting time. ***Do not rotate rebar.***

TECHNICAL SERVICE

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