

# ANCHOR FIX

## Polyester resin grouts

### Description

Dubond's Anchor Fix polyester resin grout are all pre-measured, two part, filled polyester resin grouts. After hardening the grout produces anchorages of consistent reproducible values.

The versions are:

Anchor fix L (large aggregate)

Anchor fix S (small aggregate)

Anchor fix P (pumpable grade)

Anchor fix L is used where hole diameter exceeds bar diameter by 25 to 50mm.

Anchor fix S is used where the difference between the hole diameter and bar diameter is < 25mm.

Anchor fix P is used in overhead or horizontal holes where bar / hole relationship conforms to Anchor Fix polyester resin grout S. The thixotropic nature of Anchor fix polyester resin grout P reduces flow of grout out of the hole.

### Uses

Anchor fix are used for high strength corrosion resistant anchoring of bolts and bars from 12 - 51mm diameter into concrete, rock, masonry or brickwork where high speed of installation and early application of load is required. Permanent installation of rein for cement starter bars, foundation bolts, base plates, balustrading, barriers and safety fences, railway tracks, tie-back anchors, reinforcement dowelling abutments, ground anchors for towers, cranes, dock sills.

### Advantages

- Rapid strength gain.
- Vibration resistant.
- Corrosion resistant.
- Non expansive.
- Can be placed under water.

### Standards & Specifications

Materials tested in accordance with...

- BS 4551
- BS 5080
- BS 2782

### Properties

#### Specific Gravity

- Anchor fix 'S' : 1.9 g/cc
- Anchor fix 'P' : 2.9 g/cc

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## ■ Technical Support

Dubond offers a comprehensive range of high performance, high quality concrete repair and construction products. In addition, Dubond offers technical support service to specifiers, end-users and contractors, as well as on-site technical assistance in locations all over the country.

## ■ Design Criteria

The version of Anchor fix grout to be used will depend upon ambient temperature and anchor conditions. The high strength of the cured resin permits strong anchors to be created. The ultimate bond strength developed depends upon Strength of host material.

Length of resin bond to bar.

Hole preparation and formation.

Type and dimension of bar.

The following formula may be used to determine the minimum depth of installation for Type I rebar bolts, to ensure the shear stress within the concrete is kept within the limits set out in BS8110.

$$\text{Minimum Hole} = 0.6Y Pd_1 = 10.15Yd_1^2$$

$$\text{Depth (mm)} = SPd^2 \quad 4 \quad Sd^2$$

Where Y is characteristic yield strength of steel (460 N/mm<sup>2</sup>)

S is permitted shear stress in concrete (N/mm<sup>2</sup>)

d<sub>1</sub> is bar diameter (mm)

d<sub>2</sub> is hole diameter (mm)

This formula is used typically as shown in Table I.

**Table I**

### Minimum hole depth

Characteristic concrete strength (N/mm<sup>2</sup>) : 20 25 30 > 40

Permitted concrete shear stress using Type One Bar (N/mm<sup>2</sup>) : 1.8 2.0 2.2 2.5

## ■ Technical Information

Bar Diameter (mm)	Yield Tonnes (mm)	Hole Diameter (mm)	Minimum Hole Depth (mm)			
			280	250	225	200
12	5.2	20	280	250	225	200
16	9.3	20	490	445	400	355
20	4.5	25	615	555	500	440
25	22.6	32	750	675	615	540
32	37.0	38	1035	930	845	745
40	57.8	45	1365	1225	1115	980

## ■ Technical Information

Gel Time temp (°C)	Gel Time (min)	Minimum time required before loading ( hours)
30	40	3
40	15	1

**Compressive Strength** : After the minimum time required before loading the grout typically attains a compressive strength in excess of  $20\text{N/mm}^2$  and an ultimate compressive strength of  $70\text{N/mm}^2$  in 7 days (50mm x 50mm x 50mm) when tested as per BS 6319 Part 2: 1983.

**Chemical Resistance** : The cured resin is resistant to fresh and salt water, petrol, oils, grease and most acids, alkalis and solvents.

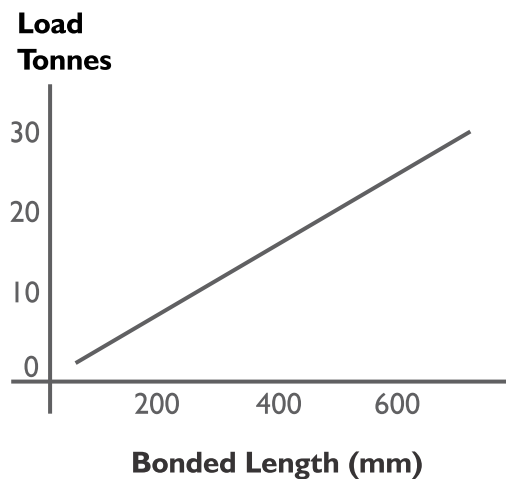
### ■ Application Instructions

**Selection of Grout version** : The version of Anchor Fix chosen will depend on anchor conditions.

**Parameters of Anchor design** : The high strength of the cured resin permits strong anchors to be created. Ultimate strength is determined by :

- Strength of host material
- Length of resin bond to bar
- Hole preparation and formation
- Type and dimension of bar

**Fig.1 Typical loads attained**



**Concrete** :  $20\text{N/mm}^2$  unreinforced

**Bar** : 25mm dia Deformed rebar to IS:1786 32mm dia hole: Air-flushed rotary percussive drilled

**Note** : The graph illustrates typical failure loads.

Minimum safety factors of 1.5 in non critical and of 2 in critical cases should be considered for design purposes.

Wherever relevant, the local code of practice or standard must also be considered in relation to anchorage length.

### ■ Hole preparation and formation

Optimum performance of Anchor fix requires rough sided, dust free holes. Uses of rotary percussive drills with air or water flushing is recommended.

Diamond drilled holes should be under-reamed unless necessary safety factors are incorporated.

Cast holes should preferably be inverse dovetail configuration. If parallel sides holes are cast they should be rough to provide adequate keying.

### ■ Bar Preparation

All bars should preferably be degreased and all flaky rust removed.

## Mixing

A complete pack of resin and catalysed filler should be mixed in one operation. Mixing may be carried out mechanically. When a smooth, even consistency is achieved the grout is ready for use and should be placed well within the gel time of the grout (See properties).

Packs have been designed to produce practical and economic volumes of grout.

Do not attempt to mix partial pack components.

## Installation

### Anchor fix polyester resin grout S & L

Using the calculated volume of grout based on Table I, the grout should be poured steadily into the prepared holes. The anchor bar is then pressed into the hole to the required depth. Slight agitation of the bar will assist in achieving a complete bond. The bar should then be left undisturbed in the required position until the resin is set.

### Anchor fix polyester resin grout P

The grout should be injected to the rear of the hole to avoid air entrapment. The thixotropic nature of Anchor fix P will prevent significant flow of resin out of the hole.

### Cleaning

Any mixing drums, pumps, etc. should be cleaned within the pot life of the grout.

Table I

Quantity estimating guide

Table indicates volume of Anchor fix polyester resin grout in cm<sup>3</sup> / 100mm bond

Hole Diameter (mm)	Bolt Diameter (mm)							
	12	16	20	25	32	40		
20	25							
25	50	40	25					
32	80	70	60	40				
38		100	100	75	45			
45			150	130	100	45		
50				180	150	90		
62					280	225		

These figures allow for a 25% wastage factor.

If the anchor is in very old concrete, masonry or brickwork the wastage factor should be increased.

No of bolts / 200 mm deep hole which can be fixed using a 2.5 litre pack of Anchor fix

Hole Diameter (mm)	Bolt Size (mm)							
	12	16	20	25	32	40		
20	25							
25	25	31	50					
32	15	17	21	31				
38		12	12	16	27			
45			8	9	12	27		
50			6	8	9	13		
62			4	4	5	5		

## ■ Packaging

Anchor Fix S/P	:	0.5 and 2.5 L
Anchor Fix L	:	18 L
Poly Sol.	:	5 ltr. and 20 ltr.

## ■ Storage

The product should be stored away from high temperature. 6 months shelf life when stored below 25°C in original unopened containers.

## ■ Precautions

At operating temperatures above 40°C, the creep of Anchor fix polyester resin grout resin under load may become significant. Resin anchors should not be used where structural load bearing performance has to be maintained in anchors subjected to fire conditions.

## ■ Health & Safety Instructions

Confined areas must be well ventilated and no naked flames allowed. Contact with the skin should be avoided as certain sensitive skins may be affected by contact with the polyester resin. In such cases if contact with the resin occurs, the skin should be washed immediately with soap and water - not solvent. Gloves and barrier creams should be used when handling these products. Eye contamination must be immediately washed with plenty of water and medical treatment sought.

## ■ Fire

Anchor Fix polyester resin grout resin is flammable. Confined areas must be well ventilated and no naked flames allowed. Do not smoke during use.

## ■ Flash Point

Anchor Fix S,L,P	:	29°C
Poly Sol.	:	33°C

## ■ Additional Information

The Dubond range of associated products includes high strength cementitious grouts, epoxy grouts. Also available a range of products for use in construction; viz., admixtures, curing compounds, release agents, flooring systems and repair mortars

**DISCLAIMER** The product information & application details given by the company & its agents has been provided in good faith & meant to serve only as a general guideline during usage. Users are advised to carry out tests & take trials to ensure on the suitability of products meeting their requirement prior to full scale usage of our products. Since the correct identification of the problems, quality of other materials used and the on-site workmanship are factors beyond our control, there are no expressed or implied guarantee / warranty as to the results obtained. The company does not assume any liability or consequential damage for unsatisfactory results, arising from the use of our products.

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