KingGrout® PE5

Polyester resin cartridge system for anchoring.

DESCRIPTION

KingGrout PE5 is a high strength, fast cure, polyester resin anchoring grout supplied in a pre-packed cartridge system.

APPLICATIONS

KingGrout PE5 is ideally designed for use in the following applications:

- Permanent installation of reinforcement starter bars and dowel bars.
- Permanent installation of hand rails, safety fence, wall ties, railway tracks and ground anchors.

ADVANTAGES

- Easy to apply using skeleton gun.
- Exceptional rapid strength development.
- Resistant to dynamic loading.
- Damp tolerant. The product will cure under damp conditions and is resistant to immersion underwater.
- Exceptional high compressive, flexural and tensile strengths.
- Extremely dense.
- Exceptional bond to concrete and steel surfaces.
- Good chemical resistance.
- High ultimate and early strengths.

*Except for gel time.

METHOD OF USE

Substrate preparation

Substrate should be sound, clean and free from grease or any contamination. Bars should be free from any loose rust deposits. Holes are best Made using rotary percussive drill to provide rough sides followed by air or water flushing. If hole is cast, it should be of inverse dovetail configuration or mechanically roughened to provide a key. Deformed or ribbed bars will give a higher performance than smooth or other bar types. After drilling, holes should be brushed and blown out twice, to remove all drilling debris.

TECHNICAL PROPERTIES

Compressive strength: BS6319, Part 2 : 1983	≥ 40 MPa @ 1 hr. ≥ 70 MPa @ 7 days
Bond Strength:	When applied properly, failure in pull will be in the concrete or steel, and not at the bond interface.
Working life:	60 mins. @ 30°C

APPLICATION

Unscrew the protective cap, remove the insert plug and attach the static mixing nozzle. Insert the cartridge into the cartridge gun and dispense sufficient material until an even color is achieved. Usually 10 ml of extruded material should be adequate. Insert the nozzle into the base of the hole, apply pressure to the gun and slowly withdraw the nozzle as the hole fills. Normally it is enough to fill the hole approximately half to two thirds full.

Insert the stud/ steel bar into the hole with a twisting action, ensuring that is fully embedded. Allow the resin to cure fully before loading.

When filling holes overhead or in porous block work, the use of plastic sleeves is recommended.

Partly used cartridge are reusable, Remove the static mixer and surplus base and catalyst components from the cartridge nozzle, insert the plug and screw on the protective cap.

KingGrout® PE5

Polyester resin cartridge system for anchoring.

TABLE I					
FY (N/ mm2)	FC (N/ mm2)	ΦB (mm)	ΦH (mm)	Calculated Pullout Force F(KN) in tension with 40% safety margin at a certain hole depth (HD)	Ultimate Pullout Force in tension
For Steel Bar	For Concrete	Bar Diameter	Hole Diameter	100	120
420	2.5	8	12	16	19
420	2.5	10	14	18	22
420	2.5	12	16	21	25
420	2.5	14	18	24	28
420	2.5	16	20	26	31
420	2.5	18	22	29	35
420	2.5	20	24	31	38
420	2.5	22	26	34	41
420	2.5	25	30	39	47
420	2.5	32	36	47	56

C)Table II shown below shows the Ultimate Pullout Force that each steel reinforcement bar grade 60 can take:

TABLE II			
Dar Diameter ΦB mm	Bar Area mm	FY N/ mm2	Ultimate Pullout Force (F) KN
8	50.24	420	21
10	78.5	420	33
12	113.04	420	47
14	153.86	420	65
16	200.96	420	84
18	254.34	420	107
20	314	420	132
22	379.94	420	160
25	490.625	420	206
32	803.84	420	338

D)To calculate volume of KingGrout PE5 required in ML:
Volume (ML) = π . (ΦH² – ΦB²) . HD 4000

TABLE III												
Volume of KINGGROUT REQUIRED (ML) Hole Depth (mm)												
Bar Dia mm			Hole Dia mm	100	140	160	200	250	300	350	400
180	200	250	12	8	9	10	13	16	19	22	25
10			14	8	11	12	15	19	23	26	30
12		134	16	9	12	14	18	22	26	31	35
16	37		20	11	16	18	23	28	34	40	45
20	42	52	25	18	25	28	35	44	53	62	71
25	47	59	32	31	44	50	63	78	94	110	125
32	52	65	40	45	63	72	90	113	136	158	181
40	58	72	50	71	99	113	141	177	212	247	283
50	63	78	94	110	420	132					
54	68	85	102	119	469	160					
64	78	96	128	130	525	206					
80	94	118	141	165	717	338					

Table III shows an estimate of materials required for each bar for a given hole depth and diameter.

DESIGN CONSIDERATION

A)Minimum Hole Depth HD

As per BS8110, minimum Hole Depth HD (or length of embedment) is shown below, allowing for 40% factor of safety

$HD = 0.6\ FY\ .\ \pi\ \Phi B^2$

FC π ΦH 4

$HD = 0.6\ .\ FY\ .\ \Phi B^2$

4 FC ΦH

Noting that:

FY: Yield strength of the steel (N/mm²)

FC: Concrete bond stress (N/ mm²)

ΦB: Bar Diameter (mm)

ΦH: Hole Diameter (mm)

HD: Minimum Hole Depth (length of Embedment) (mm)

π: 3.14

B)Calculation of the Pullout Force (F) in tension using the minimum hole depth (HD) shown in A is as follows:

$HD = 0.6\ .\ FY\ .\ \Phi B^2$

4 FC ΦH

FC π ΦH HD = 0.6 FY . π ΦB2

KingGrout® PE5

Polyester resin cartridge system for anchoring.

4

The Pullout Force (F) is equal to FY * Steel Bar Area. The Steel Bar Area is equal to:

π ΦB2

4

then:

FC π ΦH HD = 0.6 F

F (N) = π . FC . ΦH . HD

0.6

F (KN) = (5.23 . FC . ΦH . HD¹) ÷ 1000

Table I is a summary of the forces (F) that each steel reinforcement bar can take for a certain hole depth (HD).

Calculations are based on steel grade 60 and 25 N/ mm² concrete compressive strength with FC at 2.5 N/ mm².

ESTIMATING

The required quantity of grout needed is dependent on hole diameter, bar diameter and hole depth. This can be estimated by using the following formula:

Volume (ML) = π . (ΦH² – ΦB²) . HD

4000

Where:

ΦH is hole diameter in mm. ΦB is bar diameter in mm.

H is hole depth in mm.

CLEANING

All tools should be cleaned immediately after finishing by KINGKRETE Solvent. Hardened materials can be cleaned mechanically.

PACKAGING

KingGrout PE5 is available in 280 ml cartridge system.

STORAGE

Shelf life is 1 year when stored under cover, out of direct sunlight and protected from extremes of temperature.

Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice consult KingKrete's Technical Services Department.

HEALTH AND SAFETY

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs. Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Reseal containers after use. Use in well ventilated areas and avoid inhalation.

NOTE

Field service, where provided, does not constitute supervisory responsibility. For additional information contact your local KingKrete representative. KingKrete Inc. reserves the right to have the true cause of any difficulty determined by accepted test methods.

QUALITY AND CARE

All products originating from KingKrete's Middle East facility are manufactured under a management system independently certified to conform to the requirements of the quality standards ISO 9001, ISO 14001 and ISO 45001.

* Properties listed are based on laboratory-controlled tests.
® = Registered trademark of the KingKrete-Group in many countries.

Ref: KK-04018-MEA-R01 | Issue: 01.2026

KingKrete Middle East
Qatar – Syria
www.kingkrete.com