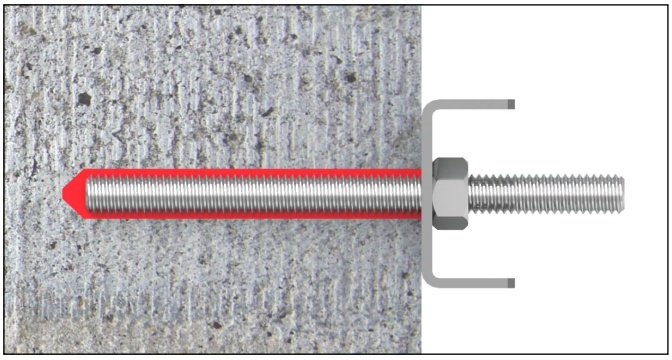
Fosroc® Lokfix E45T

constructive solutions

Styrene free vinylester resin based cartridge system, for anchoring reinforcement and fixings into a variety of substrates. Extended setting for hot climates.



Uses

For concrete (solid, porous and light), masonry and hollow bricks.

- Accredited* for use in dry, wet and flooded concrete substrates, internal and external exposure.
- Can be used with cracked concrete
- Fixing of post installed reinforcement and tension anchors
- Anchoring of threaded rod fixings
- Can be applied to a wide variety of fixing and rebar sizes
- For horizontal, vertical and overhead application
- Bonding and surface crack sealing applications prior to Fosroc Nitofill injection.
- C1 and C2 seismic resistance*

Advantages

- High bond strength
- Extended open time for working in high temperatures or on complex setting configurations.
- Rapid return to service
- Can use with a good quality skeleton gun (300ml size), No additional mixing equipment required
- Does not apply expansive force to the substrate
- Enables fixings closer to edges than mechanical anchors
- Low VOC
- Re-usable by replacing sealing cap product may be kept to the end of original shelf life.
- Waterproof, protecting the embedded fixing from corrosion and water penetration into the substrate.

Description

Lokfix E45T is a two component vinylester anchoring material, supplied in single component cartridges with a static mixer nozzle. When applied it sets and cures rapidly to firmly secure a variety of steel fixings into concrete and masonry substrates.

Two additional grades of Lokfix vinylester resin are available, selection is based upon substrate, installation temperature and compliance :

Lokfix E55S: Standard temperature grade, optimised for substrate installation temperatures between -10 to +30ºC.

Other grades of Lokfix are also available

Lokfix E77 Resin anchor cartridge system based on pure epoxy for heavy duty anchoring with 100 year service life.

Lokfix P, Lokfix S High strength polyester resin anchor grout for non critical fixings.

Lokfix TR High strength carbon steel and Stainless Steel threaded rods of various diameters in customized lengths.

Specification Clause

The anchor grout shall be Fosroc Lokfix E45T cartridge system. The Anchoring grout shall comply with EAD-33087 -00-0601, EAD 330499-01-0601 and EAD 330076-00-0604 .

Standards Compliance

Lokfix E45T complies with:

- European approval to EAD-33087-00-0601 for use in post-installed rebar connections (supersedes EOTA TR 023).
- European approval acc. to EAD 330499-01-0601 product area code: Metal Anchors for use in concrete pt.5 (supersedes ETAG 001)
- European approval acc. to EAD 330076-00-0604 Metal Injection Anchors for use in Masonry (supersedes ETAG TR029)
- Émissions dans l'air Intérieur : A+
- LEED compliant VOC Level
- Seismic C1 & C2 testing as part of EAD 330499-01-0601 for specific fastening sizes.

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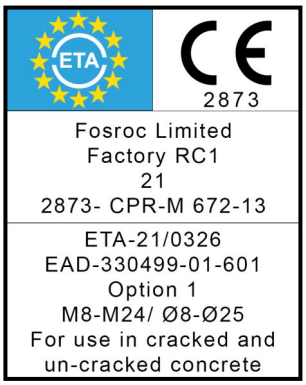

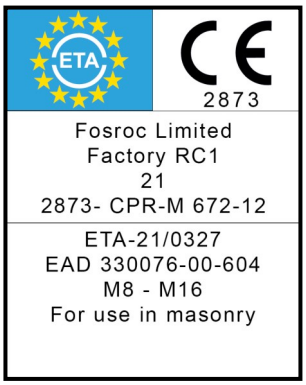

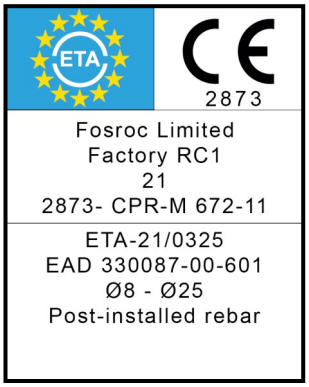

Table 1—Material Properties

Compressive Strength (EN196-1)	100 MPa
Flexural Strength (EN196)	15 MPa
E Modulus (ISO 527-2)	14,000 MPa
Shore D Hardness	90
Density	1.77kg/L
Permanent Service Temperature	-40 to +50°C
Temporary Service Temperature	-40 to +80°C
Electrical resistance (IEC93)	3.6 x10^9 Ωm
Thermal Conductivity (IEC 600093)	0.65W/m.K

Chemical resistance

Lokfix E45T has resistance to a wide variety of chemicals. **Consult Fosroc technical department for specific data.*

Table 2 - Lokfix E45T Gel & *Dry Curing Times

For optimal use the cartridge temperature should be between +15 to +30ºC. Note general storage conditions.

Substrate Temp.	Gel Time (mins)	*Dry Curing Time (mins)
+10 ºC	30	300
+20 ºC	15	145
+30 ºC	10	80
+35ºC	6	45
+40°C	4	25
+45°C	2	20

* In wet/damp conditions, the setting times will double.

Note, the substrate temperature can vary significantly from the ambient temperature.

Design Criteria

Assistance and qualification

Design of fixings and reinforcement must be undertaken by suitably qualified personnel with understanding of the construction and use of the structure, the use of the fixing, as well as being in compliance with local legislation.

In applications where fixings or rebar must be designed and applied in compliance with the requirements of the ETA, designers should consult the relevant Fosroc accreditation documents.

Fosroc provides software which may be used to aid design, available at www.lokfix.com or through your local technical office.

Setting Parameters

Note tables 3 and 4 are for dry un-cracked concrete only. For all other conditions including fixings into solid and hollow masonry types, fixings into cracked concrete, fixings subject to seismic conditions and post installation of reinforcement refer to the relevant method statement, EAD document or use the design software www.lokfix.com, also available through your local technical office.

Table 3 - Setting Parameters – details below

Rebar in un-cracked Concrete Anchor Size				Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25
Characteristic Edge Distance		$C_{cr,N}$	mm	120	135	165	175	185	255	315
Min. Edge Distance	5 x d	C_{min}		50	55	65	70	80	100	130
Characteristic Spacing		$S_{cr,N}$		240	270	330	345	375	510	630
Min. Spacing	5 x d	S_{min}		50	55	65	70	80	100	130
Max. Embedment Depth		$h_{ef,max}$		160	200	240	280	320	400	500
Min. Embedment Depth		$h_{ef,min}$		60	60	70	75	80	90	100
Min Part Thickness		h_{min}		h_{ef} +30mm ≥100mm		h_{ef} +2d_0				
Drill Diameter		d_o		12	14	16	18	20	25	32

Table 4 - Setting Parameters – details below

Threaded Rod in un-cracked Concrete Anchor Size				M8	M10	M12	M16	M20	M24
Characteristic Edge Distance		$C_{cr,N}$	mm	120	135	165	190	255	315
Min. Edge Distance	5 x d	C_{min}		40	50	60	80	100	120
Characteristic Spacing		$S_{cr,N}$		240	270	330	375	510	630
Min. Spacing	5 x d	S_{min}		40	50	60	80	100	120
Max. Embedment Depth		$H_{ef,max}$		160	200	240	320	400	480
Min. Embedment Depth		$H_{ef,min}$		60	60	70	80	90	96
Min Part Thickness		h_{min}		h_{ef} +30mm ≥100mm			h_{ef} +2d_0		
Drill Diameter		d_o		10	12	14	18	24	28
Max. Installation Torque		T_{inst}≤	Nm	10	20	40	80	120	160

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Product Installation

Full details are available in the application method statement, a copy of which may be obtained from your local Fosroc technical department.

The following methodology is for installation into solid substrates such as reinforced concrete. For hollow substrates please request a separate method statement.

Hole Formation and Preparation

Drill hole with percussive drill ensuring sides of the concrete are rough.

If rebar is encountered, immediately stop drilling and seek the advice of the designing engineer.

Clean holes immediately prior to installation of fixings to avoid them becoming re-contaminated.

Standing water in the hole shall be removed prior to preparation.

Using a hand pump or compressed air insert the nozzle to the back of the hole and blow out 4 times.

Insert a wire cleaning brush to the bottom of the hole and brush out 4 times. Cleaning brush should be at least 0.5mm wider than diameter of drill hole.

Using a hand pump or compressed air insert the nozzle to the back of the hole and blow out an additional 4 times.

If dust is still present, repeat the process until no further dust is visible.

Ensure the drill bit and the cleaning brush are of suitable diameter for the fixing used consulting tables 3 or 4. If using non-standard fixings less than 16 mm, the following setting should be observed.

Threaded rod:
Drill bit Ø = rod diameter +2mm
Wire brush Ø = Drill bit diameter +2mm

Reinforcement:
Drill bit Ø = rod diameter +4mm
Wire brush Ø = Drill bit diameter +2mm

Fixings Preparation

Fixings shall be free from rust, paint, grease and contaminants which will interfere with the bond.

Mark the required depth on the fixing.

Installation

Unscrew the fixing cap. Pull the plastic within the tube slightly upwards so that the steel collar is exposed, cut the plastic tube competently removing the metal clip and discard.

Screw the static mixer nozzle onto the cartridge. Place the cartridge into the application gun.

Pull the trigger to extrude the Lokfix E45T.

Important: Extrude the initial material until the colour becomes grey and consistent. This typically takes two or three full squeezes. Discard material that is streaky in colour.

Insert the nozzle to the back of the hole and pump the Lokfix material gently pulling back until the hole is ⅔ to ¾ full. Ensure there are no voids in the resin. If the hole is too deep for the nozzle to reach the back, use an extension nozzle.

In wide/overhead holes a piston plug will help reduce slump and ensure a void-free application.

Observing the product gel time, insert the fixing into the hole using a gentle twisting motion. Ensure the fixing is inserted to the required depth and is held straight until the resin sets. There should be some extrusion of the Lokfix material from the hole which indicates that there is full embedment.

Do not load or apply tension to the fixing until the product fixing time has been observed, see table 2.

Do not over-tighten fixings. Observe maximum installation torque as stated in tables 3 & 4 for un-cracked concrete.

If the cartridge is to be re-used, remove the mixing nozzle and re-apply the cap. When using again, a new mixing nozzle will be required, ensure product is pre-extruded and of consistent colour before use.

Cleaning

Wet resin should be removed from tools and equipment using Nitoflor SOL immediately after use.

Estimating

Supply

Lokfix E45T is supplied in boxes of 12 no. 300ml cartridges, each supplied with a single mixer nozzle.

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Fosroc may also supply:

- Steel cleaning brushes, in various diameter to clean the hole.
- Dust blower pump, one size, hand held to clean the hole.
- Hollow block sleeves, in a variety of diameters and embedded lengths for hollow bricks and blocks, can be used for solid brick.
- Extension nozzle, essential where the embedment depth is greater than 190mm in various lengths.
- Piston plugs, required where the hole diameter is >20mm or where embedment depth is >240mm. Must be used with an extension nozzle.
- Application guns, hand held for cartridge application.
- Spare mixer nozzles, required if a cartridge is to be re-used.

Yield

Standard yield estimation is provided in tables 3 and 4 based on the hole diameter, fixing size and embedded length.

For non-standard consumption the following calculation of theoretical consumption may be used. Factors such as over-drilling, extrusion from bolt hole, initial gun extrusion and some wastage should also be considered.

Theoretical Consumption:

(π radius cm hole^2 - π radius cm bolt^2) x hole length cm = consumption ml.

Practical Consumption:

π radius cm hole^2 x hole length cm x 0.67= consumption ml.

Limitations

Load calculations should always be undertaken by a qualified engineer.

When embedding into hollow masonry it is normally necessary to use hollow block sleeves. Consult separate method statement.

For applications into natural or decorative stone staining may occur. Check suitability before use.

Storage

300ml cartridges have a maximum shelf life of 12 months when kept in a dry warehouse at between +5 to +25ºC.

Further Information

Further product information is available including, EAD certification, SDS, Method Statements and calculation software. This can be found at www.lokfix.com or by contacting your local Fosroc office.

Precautions

Health & Safety

Observe the information provided on the relevant SDS.

**Consult Fosroc technical department for specific data.*

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