



## Description

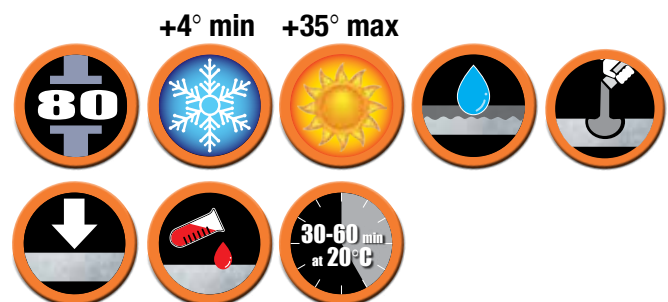
Liquid eS is a two part pourable epoxy resin based grout formulated for grouting & levelling applications. It offers high strength adhesion to concrete and most other building materials with strong resistance to physical wear and chemical attack.

## Typical Uses

- Base plate grouting & machine grouting
- Crane rail grouting
- Vertical starter bars
- Repairing concrete floor control joints
- Repairing chipped & spalled concrete floors
- General purpose high performance pourable grout

## Features & Benefits:

- Superb adhesive & cohesive strength
- High early strength
- Non shrink
- Vibration resistant
- Moisture tolerant
- Good chemical resistance for long-term protection
- Excellent adhesion to concrete, metal and most porous surfaces





## Surface Preparation

Concrete must have a minimum of 7 days cure. Surface must be clean, sound, dry and free from any loose coatings/particles or surface contaminants such as grease, oil, chemicals, paint, rust or curing membranes unless otherwise stated in the data sheets.

We suggest captive shot blast, diamond grind or scabble to expose clean sound surface. In harsh environments any exposed reinforcing may require a pre treatment i.e. UltraBond e132

Clean holes for drilled starter bars by air blasting with oil free compressed air. Brush the hole to remove and loose debris then re-blast with compressed air.

## Mixing

For best results, ensure the components are between +5°C and +29°C prior to mixing. Premix both components separately to a homogeneous consistency. Place the correct proportion of Component A and Component B into a clean container with flat wall and bottom.

**It is recommended where possible to always use whole units. If part units are required then accurately measure by weight.**

Mix thoroughly for a minimum of 3 minutes using a low speed drill (450-600 rpm) and a mixing paddle. Keep the paddle below the surface material to avoid entrapment of air. After 3 minutes, carefully scrape the sides and bottom to ensure thorough mixing, then continue to mix for a further 2 minutes until a uniformly mixed, even consistency is achieved.

Thorough mixing of both components is important to obtain optimum results. Mix only the amount of material that can be placed immediately.

## Application

Place the mixed grout immediately after mixing, any delay will reduce the ability of the product to flow. Pour from one side only at a uniform rate until the grout has flowed into position; ensure there is adequate pressure/head to maintain a continuous flow.

Care must be taken to prevent voids or trapped air, if necessary use air holes or breather pipes in formwork to prevent entrapment, rodding under base plates is also recommended to remove air. Discard the product once it has become difficult to apply. Support starter bars to prevent movement while curing.

To avoid potential shrinkage caused by exotherm the maximum layer thickness per application is 40mm. Thicknesses above 40mm may require the addition of a suitable heat sink refer Ramset for advice.

## Limitations

Will change colour with long term exposure to sunlight. Do not finish using solvent. Do not apply below 4°C or above 35°C. Avoid skin contact.

## Theoretical Coverage

2m<sup>2</sup> /L at 0.5mm thickness.

Actual coverage will depend on wastage and surface profile.

## Clean Up

Clean uncured material from equipment using xylene solvent. Cured material can only be removed by mechanical means.

## Colour

Medium Grey

## Storage/Shelf Life

Keep in tightly sealed original containers in a cool place. Do not store near boilers or other sources of heat. Do not store in direct sunlight. Tightly sealed containers will store in excess of one year. Use older material first.

## Health & Safety

Wash hands thoroughly after handling.

Wear eye/face protection.

Contaminated work clothing should not be allowed out of the workplace.

Wear protective gloves.

Do not breathe vapours.

Wash hands thoroughly after handling.

Do not eat, drink or smoke when using this product.

Avoid release to the environment.

Collect spillage.

**IF IN EYES:** Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Apply continuous irrigation with water for at least 15 minutes holding eyelids apart. If eye irritation persists: Get medical attention.

**IF ON SKIN:** Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical attention. Wash contaminated clothing before reuse. IF exposed or concerned: Get medical attention.

## Packaging

Liquid eS	1.2kg	EPLES-1.2KG
Liquid eS	5kg	EPLES-5KG
Liquid eS	30kg	EPLES-30KG

## General Properties

Shelf Life	1 year
Appearance of Hardener	Dark grey/green colour liquid
Appearance of Resin	Cream coloured paste
Mixing proportions by weight	1 Hardener to 2 Resin
Solids content	100%
Tensile strength	15 MPa
Compressive strength	80 MPa*
Flexural strength	22 MPa**
Work Time	30-60 @20°C
Application Temperature	+4°C to +35°C
Cure Time	7 days
Density	1.8kg/L

\*Tested to NZS 3112 Part 2:1986; section 4, 6 (ASTM C39/C39M-09)

\*\*Tested to NZS 3112 Part 2:1986; section 7 (ASTM C39/C78-09)

**For Single Bar Remote from an Edge ( $e \geq 4 d_b$ ) in 32MPa Concrete**

Stress in Steel,  $\sigma_{st}$  at selected effective length,  $L_{st}$

Rebar Size	10	12	16	20	25	32	40
Drilled Hole Dia, $d_h$ (mm)	14	16	20	25	30	40	50
Minimum Cover, $e$ (mm)	40	48	64	80	100	128	160
Minimum Clear Spacing, $a$ (mm)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Reduced Ultimate Tensile Adhesive Bond Capacity, $\Phi N_{ub}$ , (kN), $\Phi_c = 0.6$	39.3	56.5	100.5	157	245.5	402	630
Nominal development length of bar in tension, $L_{sv,t}$ (nom) (mm)	210	280	410	560	740	940	1230
Effective Length, $L_{st}$ (mm)	Stress Developed in Steel, $\sigma_{st(nom)}$ (MPa)						
100	238						
<b>130 (10mm 300E Bar Capacity)</b>	<b>300</b>						
140	333	250					
<b>170 (12mm 300E Bar Capacity)</b>	381	<b>300</b>					
190	452	339					
<b>210 (10mm 500E Bar Capacity)</b>	<b>500</b>	375					
230	500	411	280				
<b>250 (16mm 300E Bar Capacity)</b>		464	<b>300</b>				
<b>280 (12mm 500E Bar Capacity)</b>		<b>500</b>	341	264			
<b>320 (20mm 300E Bar Capacity)</b>		500	390	<b>300</b>			
370			451	349			
<b>410 (16mm 500E Bar Capacity)</b>			<b>500</b>	387	281		
<b>440 (25mm 300E Bar Capacity)</b>			500	425	<b>300</b>		
490				462	336	261	
<b>560 (32mm 300E Bar Capacity)</b>				<b>500</b>	363	<b>300</b>	
<b>560 (20mm 500E Bar Capacity)</b>				<b>500</b>	363	<b>300</b>	
600					411	319	
670					459	356	272
<b>740 (40mm 300E Bar Capacity)</b>					<b>500</b>	388	<b>300</b>
<b>740 (25mm 500E Bar Capacity)</b>					<b>500</b>	388	<b>300</b>
800						426	325
870						463	354
<b>940 (32mm 500E Bar Capacity)</b>						<b>500</b>	382
1040						500	423
1140							463
<b>1230 (40mm 500E Bar Capacity)</b>							<b>500</b>
1320							500

