WESSEX
RESINS+ADHESIVES

# Wessex 4701

## (UW 47)

## UNDERWATER ADHESIVE

Technical Data Sheet

### DESCRIPTION

Wessex 4701 (UW 47 adhesive) is a two component epoxide based adhesive capable of curing at temperatures as low as 3°C and is more tolerant of oil and water than most epoxide adhesives. The material may be used to make adhesive bonds to substrates totally immersed in fresh or in salt water.

### MIXING

| Method | **Resin : Hardener** |
|---|---|
| | Part A : Part B |
| by Weight | 1 : 1 |
| by Volume | 1 : 1 |

Part “A”, the epoxy resin component, is a buff colour and mixed in equal proportions by weight with Part “B” the hardener component, which is black in colour.

Equal weights of the resin and hardener are blended thoroughly together until all signs of streakiness have disappeared and the epoxy composition is of uniform colour.

Small quantities of up to 500 g can be mixed by hand, but for larger quantities the use of a suitable mechanical mixer is strongly recommended. Those employing a planetary action have been found to be satisfactory, along with correctly set automated mix dispense equipment. In general a minimum mixing time of 5 minutes is required to ensure complete mixing and if using a static mixer, the first 6 inches should be ejected and discarded to ensure the correct ratio.

### STORAGE

Wessex 4701 Parts A and B should be stored in a warm dry environment where a temperature of between 10°C and 30°C can be maintained. After use ensure that the lids are replaced and are tightly secured. This should ensure that there is no contamination of the two components. Keep containers closed when not in use to avoid contamination.

### USEABLE LIFE

When the resin and hardener are mixed the gel time of a 500 g batch of Wessex 4701 is approximately 100 minutes at 20°C which will allow ample working time for most purposes. For larger quantities the gel time is shorter and, for example, a 2 kg batch of material will gel in approximately 45 minutes at 20°C and must be used immediately after mixing. Higher ambient temperatures will result in a shorter

ISO9001:2015 Certified

**REV 1 / Apr 2018**

©2018 Wessex Resins & Adhesives

**Wessex Resins & Adhesives,** Cupernham House, Cupernham Lane, Romsey, Hampshire, SO51 7LF, UK
wessex-resins.com +44(0)1794 521111

useable life, a rough guide being that a rise in ambient temperature of 10°C will reduce useable life by half.

## SURFACE PREPARATION

Although Wessex 4701 adhesive is tolerant of some contamination, best results are obtained on well prepared surfaces. Ideally, surfaces should be mechanically abraded to provide the maximum mechanical key and be free from grease, moisture and dust particles and a solvent wipe with a clean lint free cloth will remove any oily contamination.

If glass fibre laminate forms part of a primary or otherwise important structure which is in contact with water, such as a hull or a dome, preparation should be confined to abrasion of the resin and the glass should not be exposed.

When the adhesive is used to make a temporary or emergency repair and it is not possible to make ideal surface preparations, the effectiveness and/or durability of the bond may be impaired. Decisions regarding surface preparation must be taken on site dependent upon the situation in hand, but advice can always be obtained from Wessex Resins & Adhesives Limited.

## APPLICATION

1. Apply freshly mixed adhesive (using a spatula, trowel, stiff brush or roller) and work thoroughly into both mating surfaces prior to making the joint.

2. Spread a thin coating as evenly as possible with the minimum entrapment of air. On average, 1 kg of adhesive will bond an area of approximately 0.4 $m^2$.

3. Care must be taken to ensure that both surfaces are ‘wetted’ and this can be ascertained by pressing the flat part of a spatula or trowel onto the applied adhesive and then drawing it away quickly. If the adhesive becomes detached from the applied surface then it must be reworked into the surface and retested. If ‘wetting’ cannot be satisfactorily achieved to the substrate the adhesive should be removed and the surface preparation process repeated

4. Hold the bonded surfaces together using a retention device capable of applying an even pressure of 0.26 bar ± 0.05 bar across the entire surface. Care must be taken to ensure that the holding pressure is applied well before the useable life (pot life) of the adhesive has expired.

5. Do not remove the holding device or stress the joint until the adhesive has been allowed to cure for the recommended period of time for the working temperature as in the table below.

| Temperature (°C) | Time (hrs) |
|---|---|
| 7 - 14 | 24 |
| 15 - 20 | 16 |
| > 20 | 12 |

©2018 Wessex Resins & Adhesives

# Wessex 4701

## UNDERWATER ADHESIVE

### TECHNICAL DATA WESSEX 4701 UNDERWATER ADHESIVE

#### Handling Characteristics

| Property | Standard | Units | 22°C |
|---|---|---|---|
| Pot Life (500g) | ASTM D2471 | min | 100 |
| Pot Life (2kg) | ASTM D2471 | min | 45 |
| Viscosity (Resin – Part A) | ASTM D2196 | | Paste |
| Viscosity (Hardener– Part B) | ASTM D2196 | | Paste |
| Viscosity (Mixed) | ASTM D2196 | | Paste |
| Density - Resin – Part A | | $gcm^{-3}$ | 1.5 |
| Density - Hardener – Part B | | $gcm^{-3}$ | 1.5 |
| Density - Cured | | $gcm^{-3}$ | 1.5 |

#### Mechanical Properties

| Property | Standard | Units | 22°C |
|---|---|---|---|
| Hardness | ASTM D2240 | Shore D | 84 |
| Tensile Strength | ASTM D638 | MPa | 31.3 |
| Tensile Modulus | ASTM D638 | GPa | 3.7 |
| Tensile Elongation | ASTM D638 | % | 1.9 |
| Flexural Strength | ASTM D790 | MPa | 52 |
| Flexural Modulus | ASTM D790 | GPa | 2.2 |

#### Adhesion Properties

| Property | Standard | Units | |
|---|---|---|---|
| Lap Shear (Mild Steel) | ASTM D1002 | MPa | 16.2 |
| Tensile Adhesion (Mild Steel) | ASTM D4541 | MPa | 39.8 |

#### Thermal Properties

| Property | Standard | Units | 22°C |
|---|---|---|---|
| Tg DMA Peak Tan Delta | ASTM 1640 | °C | 61 |
| Tg DSC 1st Heat | ASTM E1356 | °C | 56.8 |
| Tg DSC Ultimate | ASTM E1356 | °C | 66 |

These are typical properties and cannot be construed as a specification. The end users should test the products to ensure the products are suitable for the intended application. Any information, data, advice or recommendation published by Wessex Resins or obtained from Wessex Resins by other means and whether relating to Wessex Resins' materials or other materials, is given in good faith and believed to be reliable.

©2018 Wessex Resins
& Adhesives