# 3M™ Scotch-Weld™ EC-7256 B/A

## Two Part Structural Adhesive

## Product Description

3M™ Scotch-Weld™ EC-7256 B/A is a two part, epoxy based structural adhesive which combines high mechanical strength, excellent toughness and rapid cure at room temperature. It shows good adhesion to a wide variety of materials typically used in aircraft interior structures. Due to the fast strength build-up, it is an ideal adhesive to bond fasteners or brackets. 3M™ Scotch-Weld™ EC-7256 B/A is qualified to Airbus specifications AIMS 10-04-002, 10-04-003, and 10-04-011.

## Key Features

- General purpose adhesive for interior bonding
- Low-flow paste for vertical and overhead application
- Rapid cure at room temperature, can be accelerated by mild heat.
- Excellent shear and peel strength on a variety of substrates
- Good environmental and ageing resistance
- Available in cartridges for manual operations, e. g. bracket bonding


## Product Characterization

All technical data and information in this data sheet should be considered representative or typical only and should not be used for specification purposes.

| General Properties | Part B | Part A |
|---|---|---|
| Colour | Off-white | Off-white |
| Base | Modified epoxy | Modified amine |
| Consistency | Low sagging paste | Gel |
| Density | 1.13 g/cm³ | 1.10 g/cm³ |
| Mix ratio by volume (by weight) | 100 (100) | 50 (48) |
| Viscosity | 70 Pa·s | -- |
| Work life [a] at 23 ± 2 °C | 12 min | |
| Handling strength [b] | 70 – 80 min | |
| Available packaging | Cartridges | |

[a] time during which the adhesive can be applied properly; 10 g of mixed material
[b] time to reach 1 MPa overlap shear strength

## Product Performance

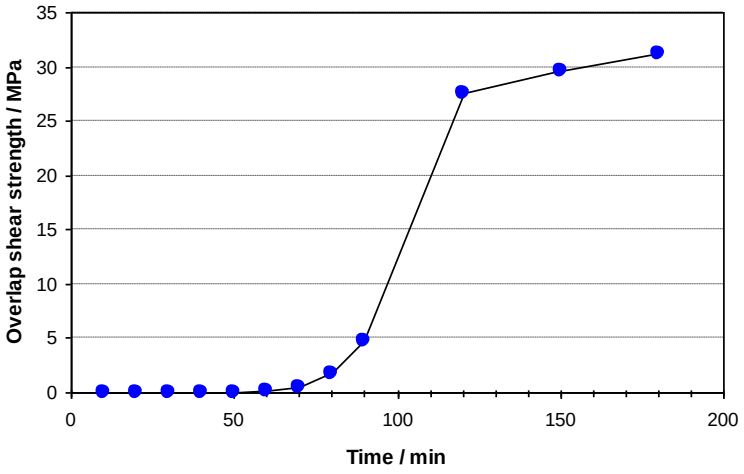
The following product performance data were obtained from specimens, which were cured 7 days at room temperature, unless otherwise stated. The surface preparation is described in the “Instructions for use” section on page 3. To control the bond line thickness, ca. 1 wt.% of glass beads, 90 – 150 µm diameter, was added to the adhesive.

| Mechanical properties | Test temperature | Result | Test method |
|---|---|---|---|
| **Overlap shear strength** [a] [b] | 23 °C | 35 MPa | ISO 4587 |
| | 23 °C | 32 MPa [c] | ISO 4587 |
| | -55 °C | 26 MPa | ISO 4587 |
| | 85 °C | 8 MPa | ISO 4587 |
| **Floating roller peel strength** [a] [b] | 23 °C | 216 N / 25 mm | ISO 4578 |
| | 23 °C | 192 N / 25 mm [c] | ISO 4578 |

[a] Test substrates: clad aluminium 2024 T3
[b] Surface preparation: Optimized FPL etching + primer (see “Instructions for use” on page 3)
[c] Specimens etched only, no primer; 48 h curing at room temperature

## Strength build-up

Overlap shear strength (OLS) after different curing times at room temperature are given in the following graph and table.




| Curing time | OLS at 23 °C |
|---|---|
| 10 min | 0.0 MPa |
| 30 min | 0.05 MPa |
| 50 min | 0.05 MPa |
| 60 min | 0.1 MPa |
| 70 min | 0.5 MPa |
| 80 min | 1.8 MPa |
| 90 min | 4.7 MPa |
| 120 min | 27.5 MPa |
| 150 min | 29.7 MPa |
| 180 min | 31.2 MPa |

## Ageing properties

Bonded specimens were exposed to different media and environments. After 72 h room temperature storage, overlap shear strength was measured to determine the ageing resistance of 3M™ Scotch-Weld™ EC-7256 B/A. The curing cycle for all specimens was 7 days at room temperature.

| Mechanical properties | Exposure time | Medium and temperature | Result |
|---|---|---|---|
| **Overlap shear strength after ageing** [a] [b] ISO 4587; test temperature 23 ± 2 °C | -- | (Initial) | 35 MPa |
| | 1000 h | Dry heat, 105 °C | 39 MPa |
| | 336 h | Hot wet: 85 % r. H., 70 °C | 27 MPa |
| | 1000 h | De-ionized water, 70 °C | 14 MPa |
| | 1000 h | Skydrol, 70 °C | 36 MPa |
| | 336 h | 50 % Skydol + 50 % de-ionized water, 70 °C | 14 MPa |
| | 1000 h | JP4 fuel, 40 °C | 36 MPa |
| | 1000 h | De-icing fluid S737, 60 °C | 24 MPa |
| | 24 h | Lubricating oil NATO O-142 (Royco© 363), 70 °C | 32 MPa |
| | 24 h | Lubricating oil NATO O-148 (Royco© 808), 70 °C | 31 MPa |
| | 24 h | Heat transfer fluid Coolanol 25R, 25 °C | 33 MPa |

[a] Test substrates: clad aluminium 2024 T3

[b] Surface preparation: Optimized FPL + primer (see “Instructions for use” on page 3)

### Overlap shear strength on different substrates

Specimens were cleaned with an organic solvent, some were abraded prior to bonding. Cure cycle was 24 hours at room temperature followed by 2 hours at 70 °C.

| Mechanical properties | Substrates | Result |
|---|---|---|
| **Overlap shear strength** ISO 4587; test temperature 23 ± 2 °C | Clad aluminium 2024 T3 [a] | 22 MPa |
| | Cold rolled steel [a] | 17 MPa |
| | Stainless steel [a] | 19 MPa |
| | Brass [a] | 16 MPa |
| | Polystyrene [a] | 3 MPa |
| | ABS | 4 MPa |
| | PVC | 3 MPa |
| | Polyamide 6.6 | 2 MPa |
| | Glass fibre reinforced polyester [a] | 9 MPa [b] |
| | Glass fibre reinforced phenolics | 22 MPa [b] |
| | Carbon fibre reinforced epoxy | 33 MPa |

[a] Abraded with Scotch-Brite 7447
[b] Substrate failure

# Handling, Application, Storage

### Precautionary Information

Refer to product label and Material Safety Data Sheet (MSDS) for health and safety information before using this product. For MSDS visit our website www.3M.com/msds.

### Instructions for use

| Process step | Instruction |
|---|---|
| Surface preparation | The strength and durability of a bonded joint depend on proper treatment of the surface to be bonded. Optimum processing temperature for substrates and adhesive is around room temperature (23 °C). A thoroughly cleaned, dry, grease-free surface is essential for maximum performance. Cleaning methods which will produce a continuous water film on metal surfaces are generally satisfactory.<br>At the very least, joint surfaces should be cleaned with a good proprietary degreasing agent and mechanically abraded, e. g. with 3M Scotch-Brite™ 7447. Abrading should be followed by a second degreasing treatment, e.g. with 3M 08984 Adhesive Cleaner. The results given in this data sheet were determined using an optimized FPL etching process:<br>1) Degrease with methyl ethyl ketone.<br>2) Immerse 10 to 20 minutes in alkaline degreasing 8 % Oakite 164 solution at 85 ± 5 °C.<br>3) Rinse in tap water.<br>4) Sulfochromic immersion (10 minutes) at 70 ± 2 °C: 27.5 wt.% of $H_2SO_4$; 7.5 wt.% of $Na_2Cr_2O_7 \cdot 2\ H_2O$; 65 wt.% of demineralised water; 0.5 g/l aluminium; 1.5 g/l $CuSO_4 \cdot 5\ H_2O$.<br>5) Rinse in tap water.<br>6) Dry 15 minutes at 23 ± 2 °C.<br>7) Dry 10 minutes at 70 ± 2 °C.<br>**Caution:** *Use adequate respiratory, eye and skin protection when using etch solutions.*<br>Best results were obtained, when a structural bonding primer, was applied on the etched surfaces. |

| Process step | Instruction |
|---|---|
| Application | This product consists of two parts. Unless cartridges or other mixing devices with static mixers are used, mix part B and part A in a separate container just prior to application in the specified proportions. **Note:** Mix ratio deviations above ± 5 % can have significant influence on material performance. Mix both components thoroughly until a uniform colour is obtained. **Important:** Be careful when mixing larger quantities, because exothermic reaction may occur. Dual cartridge applications provide maximum accuracy and easy handling. **Note:** When using a new static mixer, purge the first milliliters until a uniform colour is obtained. Apply adhesive to substrates before end of work life. **Note:** Work life depends to some extent on mixed quantity and the shape of the container. In order to obtain optimum mechanical performance, the substrates should be assembled as soon as the adhesive has been applied and before end of the open time. A fixation of the joint and a uniform contact pressure throughout the bond area during cure will ensure optimum performance. Maximum shear strength is obtained with 0.10 – 0.20 mm bond line thickness. Close the containers after use to protect the material against humidity. |
| Curing | Once mixed, Scotch-Weld™ EC-7256 B/A will gel in 10 – 15 minutes and build up handling strength in 70 – 80 min. The following cure cycles will result in a full cure:<br>▪ 7 days at 23 ± 2 °C<br>▪ 2 hours at 65 ± 2 °C<br>**Note:** Curing can be accelerated by mild heat. Lower temperatures will slow down the reaction rate. The curing temperature may have influence on the final product performance. |
| Cleaning | Excess uncured adhesive can be cleaned with ketone type solvents. After cure the adhesive can be removed mechanically. **Note**: When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and instructions for use. |
| Storage and handling | Store the product at room temperature. Shelf life is minimum 12 months from date of shipment in the original unopened containers. The specific expiry date is mentioned on the product label. |



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