

BLOCK SHEAR STRENGTH OF METAL TO METAL ADHESIVES**Application**

This procedure is used to test the block shear strength of thermosetting adhesives used for bonding metal to metal.

Apparatus Required**Press**

An air driven press which will deliver a constant pressure to the test specimens during cure is required. The press is equipped with controlled electric heaters which heat the test specimens to required temperature during cure under pressure (see Drawing 1).

Mechanical Convection Oven

Capable of maintaining a temperature of 80 +/- 2 °C.

Tensile Tester

A tensile testing machine with a scale range of 0 - 100 KN and capable of a load at a uniform rate of 10 mm/minute is required. The tensile machine shall have an indicator for recording the shear strength of the adhesive in Newton at the moment of rupture.

Shear Strength Fixture

The fixture for holding the bonded test specimen during loading is shown in the attached Drawing 1. The fixture is equipped with an electrically controlled heater for determining shear strength at elevated temperatures.

Abrasive Paper or Sand Blast**(a) Abrasive Paper**

Type: KK 14; Size: 230 x 280 mm; Grit Size: 150

Used for polishing the mating surfaces of the test specimens or sand blast (depending on surface desired).

Source:

V.S.M Abrasive
Watford, England

or

Vereinigte Schmirgel and Maschinenfabriken AG
3 Hannover
Hainholz, Germany

Date	Action	Revisions
2000 11 13	Revised	Editorial – no technical change A. Cockman
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(b) Sand Blast

Sand or Grit Size

Retained on 20 Sieve - 12 % maximum

Retained on 50 Sieve - 1 % maximum

Operating Pressure

700 N/m²

Exposure Time

50 seconds per 10 cm²

Nozzle Distance to Specimen

75 mm

Nozzle Size

9.5 mm

Test Specimens

East test specimen assembly consists of one strip and one disc of BS 1474: 1969 HE 15 TB or DIN 1725 BL 1 AlCuMg 1F40 3.1325 aluminum. The strip is 28 mm by 111 mm by 6.0 mm and the disc is 28 mm in diameter by 6.0 mm thick, with a hole in the centre of the disc to give a firm fit over the pin in the press.

Tetrachloroethylene

To clean the test specimen.

Paper Masking Tape

Normal paint shop masking tape with dimensions 25 mm wide x 0.17 mm thick to build up the required layers.

Spring Paper Clips

"Bulldog" type or similar. Jaw width approximately 63 mm to fix the test sample assembly.

Surgical Scalpel

To scribe marks at positioning points.

Spatula

To spread and level the applied adhesive.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Prepare the mating surfaces of the aluminum strips and discs to give a uniform finish, by using abrasive paper or sand blast.
2. Wipe clean with a cloth wetted with tetrachloroethylene.
3. Lay the required number of prepared aluminum strips on a flat surface. Ensure that the long edges are touching and parallel.