



Glue QC



CMS
BARREL MUON
DT CHAMBERS

Quality Control
Of
Gluing
- preliminary -

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020912

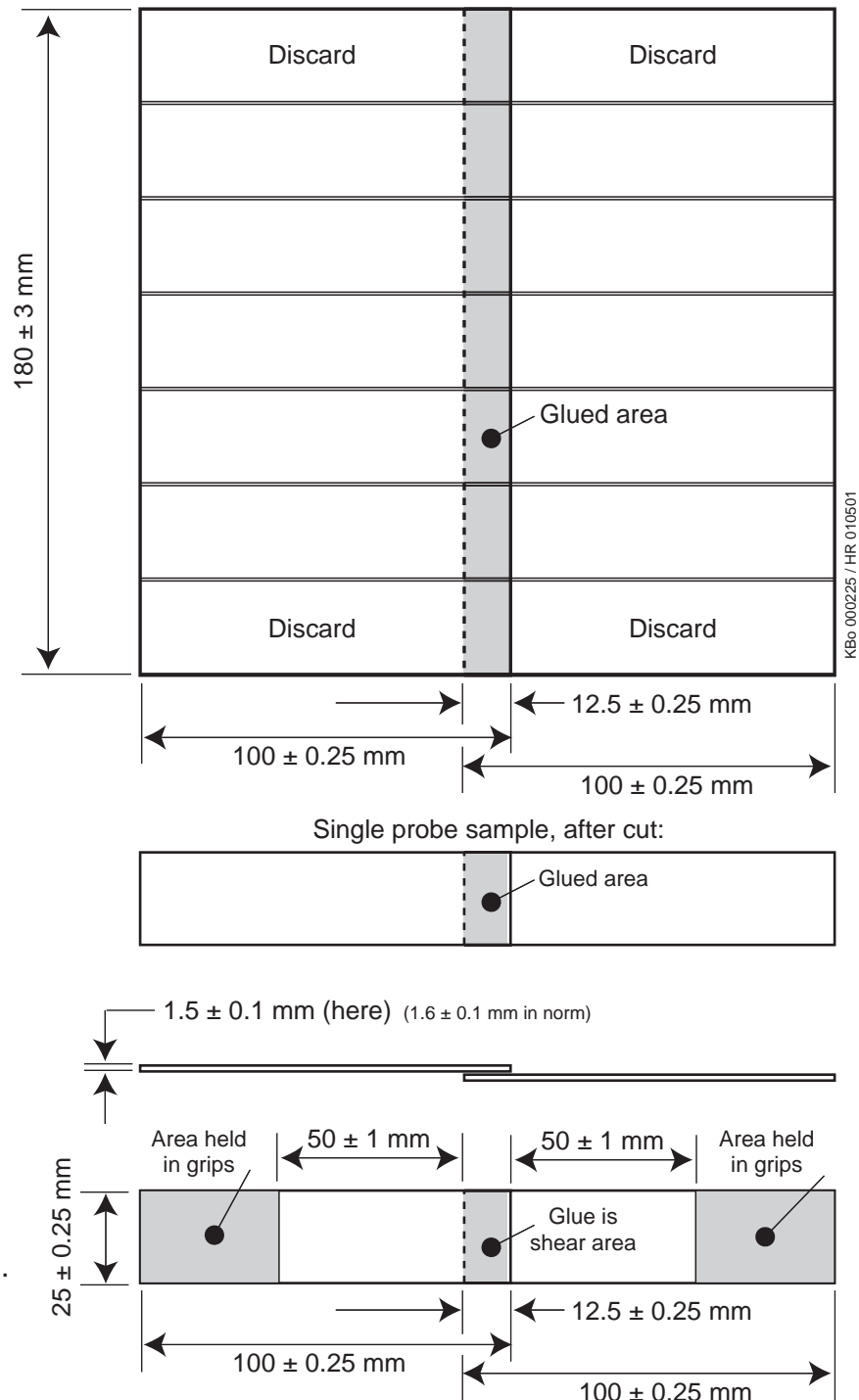
Method:

Glue the two rectangles 100 mm x 180 mm, with 12.5 mm overlap and 0.1 mm glue layer, set by wire or glass beads spacers, and holding the rectangles with a jig for precise alignment.
 For testing, first cut into 25 mm wide strips, discarding the two border strips, thus obtaining 5 samples. Prepare 3 plates, measure one plate (= 5 samples) within one month and store the others for later.

Further comments:

- 1- Typical glue thickness is 0.2 mm, but 0.1 here; measure and record it.
- 2- The excess of adhesive squeezed out during the formation of the joint shall be removed immediately after assembling.
- 3- Major axis of the specimens shall be the rolling direction of the Al plate.
- 4- Measure dimensions to within ± 0.1 mm.
- 5- Grips are self aligning.
- 6- May use shim, to apply force in plane of the adhesive bond.
- 7- Operate test machine at a constant test speed so that the average joint will be broken in a period of $65 \text{ s} \pm 20 \text{ s}$.
- 8- If working at constant rate of loading, apply the load at the rate of 8.3 MPa to 9.7 MPa.
- 9- Measure the applied force to within 1%.

Standard glue test panel following ISO 4587:1995(E)



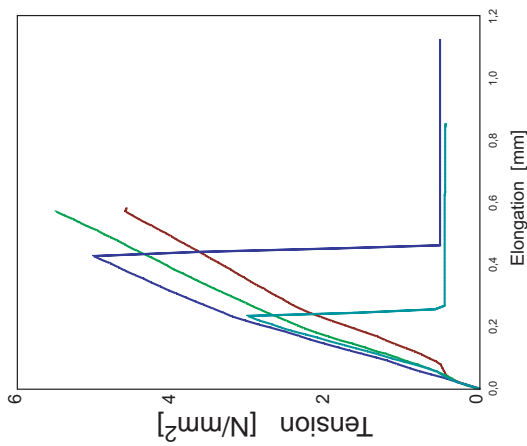
The final glue probes, according to the norm ISO 4587:1995(E)

Reminder, from the QC Book.

If sample preparation and rupture tests not done so far, please do it urgently!

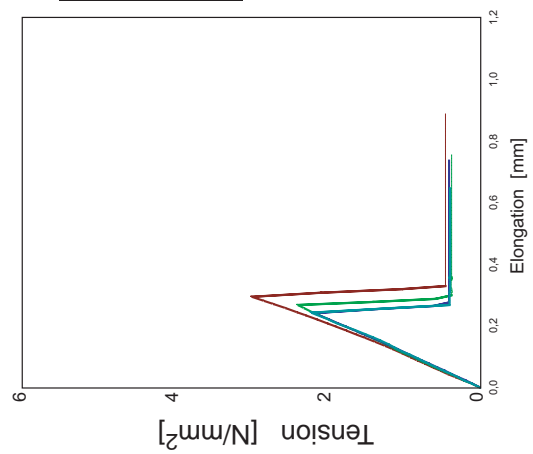
Proben 1, 2, 3, 4 Klebschichtdicke 0,1 mm

Probennummer	Probenbezeichnung		Überlappungslänge [mm]	Probenbreite [mm]
1	Blech 1	Probe 2	13,8	25,5
2	Blech 1	Probe 3	13,6	25,0
3	Blech 2	Probe 2	12,9	25,0
4	Blech 2	Probe 3	13,2	25,2



Proben 1, 2, 3, 4 Klebschichtdicke 2 mm

Probennummer	Probenbezeichnung		Überlappungslänge [mm]	Probenbreite [mm]
1	Blech 3	Probe 2	12,3	25,0
2	Blech 3	Probe 3	12,4	25,0
3	Blech 4	Probe 2	12,4	24,9
4	Blech 4	Probe 3	12,3	24,9



Rupture tests of 8 samples, for two glue layer thicknesses, as done by a firm.

- 1- QC glue tests to be done everywhere and compared.
- 2- Concern that probe(s) may have been damaged while cutting apart. Have done next samples watching this; are awaiting results.
- 3- Ensure use of original plate material, use same surface treatment as for chamber assembly.
- 4- Rupture limit observed is lower than rated max. strength of glue. Is expected fact, since surface treatment at SL assembly can only be far from ideal one.

Attempt to understand, nevertheless, whether it is due mainly to Al surface or to glue and whether ratio is reasonable; await more statistics.
- 5- Rupture limit observed for 2 mm glue layer agrees with expected 40%-60% of strength for 0.1 mm layer, as stated by producer.