

S1. ABAQUS model geometry

S1.1. Compression on the Y-axis

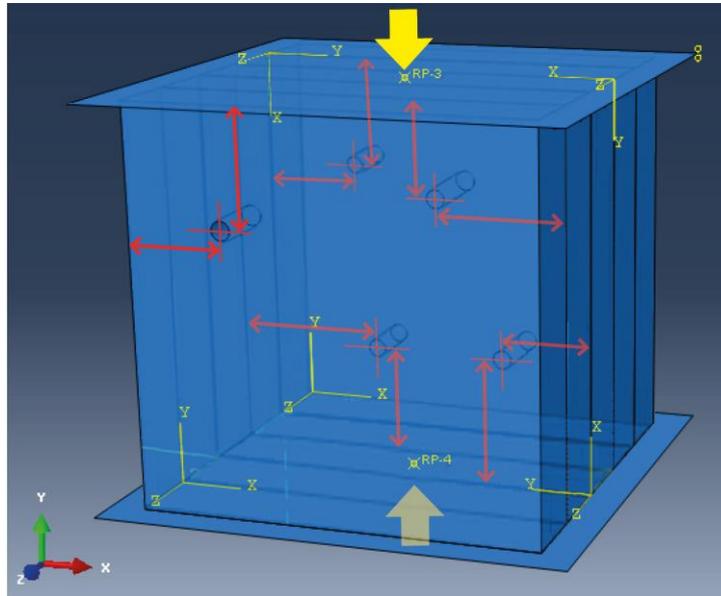


Figure S1. Compression specimen; lamella dimensions – Length = 85 mm; Width = 85 mm; Thickness = 17 mm; defect dimensions off sides (as Table 2 column 4) shown in red line, rotated 90° for each lamella to avoid their coincidence, i.e., are measured from the following sides: front lamella – LHS and top; second lamella – top and RHS; third lamella – RHS and bottom; fourth lamella – bottom and LHS; rear lamella – LHS and top.

S1.2. Out-of-plane Bending of the Panel's X-axis around the Y-axis

Run Q: Single large hole located at centre of span

Single large central hole in outer lamellae; hole properties – diameter = 15 mm centred at 410 mm and 25.5 mm from the outer edges.

Run R: Single large hole located off-centre of span

Single large shifted hole in both outer lamella; hole properties – diameter = 15 mm centred at 300 mm and 25.5 mm from the outer edges.

Run S: Miscellaneous spread out holes in all lamellae

Spread of holes as Table S1 and S2.

Table S1. Defect table: bottom lamella (all dimensions in mm).

| | | | | | | |
|-----------|--------|-----|-----|--------|-----|--------|
| Diameter | 4 | 10 | 2.8 | 6 | 11 | 4 |
| Thickness | HB, IF | T | T | HB, IF | T | HB, OF |
| X_centre | 40 | 250 | 400 | 440 | 620 | 670 |
| Y_centre | 21 | 25 | 30 | 31 | 11 | 21 |

X_centre, Y_centre from LHS edge

T=Through thickness of lamella; HB= half-blind (hole only going through half the lamella thickness)

IF=Inner Face (stuck to middle lamella) ; OF=Outer Face (external to whole assembly).

Table S2. Defect table: middle lamella (all dimensions in mm).

| | | | | | | |
|-----------|--------|-----|-----|--------|-----|--------|
| Diameter | 4 | 6 | 6 | 4 | 10 | 4 |
| Thickness | HB, BF | T | T | HB, FF | T | HB, FF |
| X_centre | 150 | 200 | 380 | 420 | 570 | 780 |
| Y_centre | 30 | 40 | 20 | 21 | 26 | 30 |

BF: Back face, FF: Front face.

Top lamella: same as bottom lamella but rotated around Y_axis by 180°.

Run T: Miscellaneous holes centrally clustered in all lamellae

Spread of holes as Table S3 and S4.

Table S3. Defect table: bottom lamella (all dimensions in mm).

| | | | | | | |
|-----------|--------|-----|-----|--------|--------|-----|
| Diameter | 4 | 6 | 10 | 4 | 4 | 6 |
| Thickness | HB, IF | T | T | HB, IF | HB, OF | T |
| X_centre | 300 | 350 | 370 | 400 | 420 | 440 |
| Y_centre | 21 | 11 | 30 | 25 | 21 | 31 |

X_centre, Y_centre from LHS edge.

T=Through thickness of lamella; HB= half-blind (hole only going through half the lamella thickness)

IF=Inner Face (stuck to middle lamella); OF=Outer Face (external to whole assembly).

Table S4. Middle lamella (all dimensions in mm).

| | | | | | | |
|-----------|-----|--------|-----|-----|--------|--------|
| Diameter | 6 | 4 | 6 | 10 | 4 | 4 |
| Thickness | T | HB, BF | T | T | HB, FF | HB, FF |
| X_centre | 300 | 350 | 380 | 410 | 450 | 500 |
| Y_centre | 40 | 30 | 20 | 26 | 20 | 30 |

BF: Back face, FF: Front face.

Top lamella: same as bottom lamella but rotated around Y_axis by 180°.