

Bar Tonala - Top Module (study)

STATIC STRESS REPORT

RELEASABLE TO CUSTOMER

Every criterion in this study is met. This document may be issued.

0 1

Verdict

ACCEPTABLE

0.000 % of the material yields. The most loaded part, **Interior Vertical Frame**, works at 9 MPa at its 99.9th percentile against 215 MPa: SF 23.09. The model's highest stress (10 MPa, at x=-1,522 y=1,116 z=1,054 mm) is at the **Top Module L Inside Wall ↔ Upper Horizontal Frame** joint, where the two parts are welded. The weld decides: a 1.3 mm fillet (the 3.0 mm specified fillet is limited to 1.3 mm: the tube wall) carries 7 N/mm against 257 N/mm, **SF 34.63** — meets the 2.0 target.

Frame sag at mid-span is 0.14 mm over 2,634 mm, i.e. span/19,140 (within a typical span/360 serviceability limit). The model-wide maximum (0.15 mm) is NOT frame sag: it is local dish of a thin surface, which scatters between meshes with one element through the wall and must be checked separately as a plate.

The peak on the CAD's sharp edge is not used: the real joint carries the weld, and the weld is what is checked (weld table).

0 2

Key results

MINIMUM SAFETY FACTOR	PEAK VON MISES STRESS	MAX DEFLECTION	TOTAL APPLIED LOAD
20.67	10 MPa	0.14 mm	272 kg
Target 2.0	Yield strength 215 MPa	span/19,140	+ 122 kg self weight

0 3

How much material is actually stressed

VOLUME FRACTION	%	STRESS PERCENTILES	MPa	FS
Below SF 1.0 — yielding	0.000 %	Median	0.0 MPa	8775.5
Below SF 1.5	0.000 %	95th percentile	1.2 MPa	178.3
Below SF 2.0	0.000 %	99th percentile	2.9 MPa	72.9
Below SF 3.0	0.000 %	99.9th percentile	7.1 MPa	30.3

0 4