MATERIAL DATA SHEET

EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall), tensile population (CC BY experimental)

Observed static-tensile averages and extremes for one exact EN AW-3103 thin-wall tube size.

Field	Value
Material ID	iop-en-aw-3103-thin-wall-tube-9p5-12mm-tensile
Category	Metal
Condition	EN AW-3103 tube as tested; static-table temper and shaped/raw state not identified | extruded round thin-wall tube
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
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Source and Validity

Field	Value
Quality	Experimental screening
Design release allowed	No
Source family	Experimental screening dataset
Confidence	Reference-grade
License	Open
Source note	Exact-grade condition-specific values from a CC-BY-3.0 peer-reviewed article.
Citation	R. S. Maruta, R. Nagy, and K. Menyhardt, Thin Wall AW3103 Pipe - Dynamic Load Concerns, IOP Conference Series: Materials Science and Engineering 416, 012068 (2018), https://doi.org/10.1088/1757-899X/416/1/012068.
Valid temperature	The static tensile-test temperature is not reported.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	EN AW-3103 tube as tested; static-table temper and shaped/raw state not identified
Uncertainty	Exact EN AW-3103 tube geometry and the article's static-tensile averages and observed extremes are retained. Temper, test temperature and exact per-size sample count are not stated, and the authors describe the results as inconsistent and sparse. The fatigue-stress ordinate was withheld under NDA and is not imported. Values are observations, not standard minima or design allowables.
Last reviewed	2026-08-03
Reviewer	scripts/import_plos_iop_open_aluminum_public.py
Review status	Checked

Field	Value
Review scope	Checked the explicit article CC BY grant, DOI and PDF hash, exact alloy identity, condition/form/geometry limits, tabulated or stated value location, and experimental semantics.
Notes	Exact EN AW-3103 tube geometry and the article's static-tensile averages and observed extremes are retained. Temper, test temperature and exact per-size sample count are not stated, and the authors describe the results as inconsistent and sparse. The fatigue-stress ordinate was withheld under NDA and is not imported. Values are observations, not standard minima or design allowables.
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License URL	https://creativecommons.org/licenses/by/3.0/
Attribution	R. S. Maruta et al.

Material Condition

Field	Value
Condition	EN AW-3103 tube as tested; static-table temper and shaped/raw state not identified
Temper	not stated; do not infer O or an H temper
Heat treatment	not stated
Product form	extruded round thin-wall tube
Thickness / diameter range	9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall)
Test direction	longitudinal tube tension
Processing route	commercial tube; manufacturing and any specimen shaping/tempering assignment are not stated for Table 1
Temperature range	The static tensile-test temperature is not reported.
Notes	Exact EN AW-3103 tube geometry and the article's static-tensile averages and observed extremes are retained. Temper, test temperature and exact per-size sample count are not stated, and the authors describe the results as inconsistent and sparse. The fatigue-stress ordinate was withheld under NDA and is not imported. Values are observations, not standard minima or design allowables.

Properties

Mechanical

Property	Value	Unit	Type	Applies to
Young's modulus	65.132	GPa	Experimental Measured Screening	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed minimum young's modulus	38.375	GPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed maximum young's modulus	67.575	GPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Maximum tensile force Fm	5.0	kN	Experimental Specimen Response Screening	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed minimum maximum tensile force fm	0.73	kN	Experimental Specimen Response Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row

Property	Value	Unit	Type	Applies to
Observed maximum maximum tensile force fm	5.21	kN	Experimental Specimen Response Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
0.1% proof strength Rp0.1	99.0	MPa	Experimental Measured Screening	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed minimum 0.1% proof strength rp0.1	11.96	MPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed maximum 0.1% proof strength rp0.1	104.66	MPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Tensile yield strength	104.0	MPa	Experimental Measured Screening	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row

Property	Value	Unit	Type	Applies to
Observed minimum tensile yield strength	12.61	MPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed maximum tensile yield strength	109.93	MPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Ultimate tensile strength	114.0	MPa	Experimental Measured Screening	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed minimum ultimate tensile strength	17.02	MPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row
Observed maximum ultimate tensile strength	121.31	MPa	Experimental Measured Screening Observed Extreme	EN AW-3103 thin-wall tube, 9.5 mm inside diameter x 12 mm outside diameter (1.25 mm nominal wall); controlled tensile loading to failure; 18-24 specimens are reported for the static campaign overall, not per size row

Engineering note: seed solid-material values are reference values only. Verify against the project material specification or supplier data sheet before release.