MATERIAL DATA SHEET

EN AW-2030 annealed square bar, Hollomon parameters (CC BY experimental)

Tensile-derived Hollomon strength coefficient and strain-hardening exponent for exact annealed EN AW-2030 bar.

Field	Value
Material ID	plos-en-aw-2030-annealed-bar-hollomon
Category	Metal
Condition	EN AW-2030 square bar after the article's controlled annealing cycle | square-section wrought bar
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-4.0 peer-reviewed article.
Citation	Carolina Bermudo, Francisco Martin, Maria Jesus Martin, and Lorenzo Sevilla, Experimental Validation of the New Modular Application of the Upper Bound Theorem in Indentation, PLOS ONE 10(3), e0122790 (2015), https://doi.org/10.1371/journal.pone.0122790.
Valid temperature	The tensile-test temperature used to identify the hardening constants is not stated.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	EN AW-2030 square bar after the article's controlled annealing cycle
Uncertainty	The exact alloy, bar section, annealing cycle and fitted Hollomon parameter semantics are retained. The article does not state the initial temper, tensile direction, test temperature, replicate count, fit interval or fit uncertainty. No tensile/yield strength, elongation, standard minimum or design allowable is inferred from the plotted curve.
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	The exact alloy, bar section, annealing cycle and fitted Hollomon parameter semantics are retained. The article does not state the initial temper, tensile direction, test temperature, replicate count, fit interval or fit uncertainty. No tensile/yield strength, elongation, standard minimum or design allowable is inferred from the plotted curve.
License ID	CC-BY-4.0
License URL	https://creativecommons.org/licenses/by/4.0/
Attribution	Carolina Bermudo et al.

Material Condition

Field	Value
Condition	EN AW-2030 square bar after the article's controlled annealing cycle
Temper	article-described annealed condition; no registered O temper claimed
Heat treatment	heat from room temperature to 420 degC over 1 h; hold 420 degC for 1 h; cool to 250 degC over 1 h; hold 250 degC for 1 h; stop oven and cool to room temperature
Product form	square-section wrought bar
Thickness / diameter range	50 x 50 mm source-bar section; tensile geometry per article Table 1
Test direction	tensile direction relative to bar processing direction not stated
Processing route	commercial wrought bar, machined tensile specimens, controlled annealing
Temperature range	The tensile-test temperature used to identify the hardening constants is not stated.
Notes	The exact alloy, bar section, annealing cycle and fitted Hollomon parameter semantics are retained. The article does not state the initial temper, tensile direction, test temperature, replicate count, fit interval or fit uncertainty. No tensile/yield strength, elongation, standard minimum or design allowable is inferred from the plotted curve.

Properties

Mechanical

Property	Value	Unit	Type	Applies to
Hollomon strength coefficient, K	404.66	MPa	Experimental Fitted Constitutive Parameter Screening	EN AW-2030 square-section wrought bar, initially 50 x 50 x 2000 mm; tensile samples and 50 x 50 x 30 mm indentation workpieces received the article's full controlled annealing cycle
Hollomon strain-hardening exponent, n	0.26	-	Experimental Fitted Constitutive Parameter Screening	EN AW-2030 square-section wrought bar, initially 50 x 50 x 2000 mm; tensile samples and 50 x 50 x 30 mm indentation workpieces received the article's full controlled annealing cycle

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