MATERIAL DATA SHEET

EN AW-5019 cold-worked H18 fine wire after 180 degC/3 h (CC BY experimental)

Single-wire tensile properties for exact EN AW-5019 supplied cold-worked H18 and then exposed at 180 degC for 3 h.

Field	Value
Material ID	mdpi-en-aw-5019-h18-45um-after-180c-3h
Category	Metal
Condition	EN AW-5019 supplied cold-worked H18, after replacement heat treatment at 180 degC for 3 h | fine wire
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	Condition-specific base-material values from a CC BY 4.0 peer-reviewed article.
Citation	Julian Adam Till, Peter Wierach, and Pierre Mertiny, Multifunctional Hybrid Fiber Composites for Energy Transfer in Future Electric Vehicles, Materials 2022, 15, 6257, https://doi.org/10.3390/ma15186257.
Valid temperature	The single-wire test temperature is not reported.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	EN AW-5019 supplied cold-worked H18, after replacement heat treatment at 180 degC for 3 h
Uncertainty	Exact EN AW-5019 wire identity, as-supplied cold-worked H18 state and the subsequent 180 degC/3 h replacement thermal exposure are retained. Table 3 provides single tabulated results without replicate statistics or test temperature. The values are not delivery-state properties, generic temper values, product minima or design allowables. The paragraph identifies the cold-worked wire as H18 and 45 um diameter.
Last reviewed	2026-08-03
Reviewer	scripts/import_mdpi_open_aluminum_public.py
Review status	Checked

Field	Value
Review scope	Checked article CC BY notice, DOI and PDF hash, exact alloy/temper, source geometry, table values, and reported or measured rather than specified-minimum semantics.
Notes	Exact EN AW-5019 wire identity, as-supplied cold-worked H18 state and the subsequent 180 degC/3 h replacement thermal exposure are retained. Table 3 provides single tabulated results without replicate statistics or test temperature. The values are not delivery-state properties, generic temper values, product minima or design allowables. The paragraph identifies the cold-worked wire as H18 and 45 um diameter.
License ID	CC-BY-4.0
License URL	https://creativecommons.org/licenses/by/4.0/
Attribution	Julian Adam Till

Material Condition

Field	Value
Condition	EN AW-5019 supplied cold-worked H18, after replacement heat treatment at 180 degC for 3 h
Temper	H18 before the replacement heat treatment
Heat treatment	replacement exposure at 180 degC for 3 h before single-wire testing
Product form	fine wire
Thickness / diameter range	45 um diameter
Test direction	longitudinal wire direction
Processing route	commercial fine wire, replacement heat treatment, ASTM D3379-75 single-wire tension cardboard method
Temperature range	The single-wire test temperature is not reported.
Notes	Exact EN AW-5019 wire identity, as-supplied cold-worked H18 state and the subsequent 180 degC/3 h replacement thermal exposure are retained. Table 3 provides single tabulated results without replicate statistics or test temperature. The values are not delivery-state properties, generic temper values, product minima or design allowables. The paragraph identifies the cold-worked wire as H18 and 45 um diameter.

Properties

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength	511.0	MPa	Experimental Measured Screening	EN AW-5019 cold-worked H18 fine wire after replacement heat treatment at 180 degC for 3 h; 45 um diameter; single-wire tension cardboard method ASTM D3379-75
Elastic limit strain	0.62	%	Experimental Measured Screening	EN AW-5019 cold-worked H18 fine wire after replacement heat treatment at 180 degC for 3 h; 45 um diameter; single-wire tension cardboard method ASTM D3379-75
Failure strain	0.81	%	Experimental Measured Screening	EN AW-5019 cold-worked H18 fine wire after replacement heat treatment at 180 degC for 3 h; 45 um diameter; single-wire tension cardboard method ASTM D3379-75

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