MATERIAL DATA SHEET

EN AW-8011A cold-rolled foil, Technology B process chain (CC BY experimental)

Measured composition and process-stage cup-ear anisotropy for exact EN AW-8011A Technology B foil.

Field	Value
Material ID	mit-en-aw-8011a-technology-b-cold-rolling-chain
Category	Metal
Condition	EN AW-8011A industrial cold-rolled foil process chain, Technology B, from RFS through FBA/FCA | industrially hot-rolled sheet followed by cold-rolled 0.09 mm foil
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
Generated	2026-11-15 23:02

Source and Validity

Field	Value
Quality	Unknown
Design release allowed	No
Source family	peer_reviewed_open_article
Confidence	Reference-grade
License	Open
Source note	Exact-grade EN AW-8011A Technology B composition and anisotropy process-chain data from a CC BY 4.0 article.
Citation	Jakob Kraner, Kyung Il Kim, Bonghwan Kim, Shae K. Kim, and Irena Paulin, Relevance of cold-rolling technology for the texture and anisotropy of EN AW-8011A aluminum alloys, Materials and Technology 57(6) (2023) 631-638, https://doi.org/10.17222/mit.2023.993.
Valid temperature	Annealing temperatures are process parameters, not a service-temperature validity range.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	EN AW-8011A industrial cold-rolled foil process chain, Technology B, from RFS through FBA/FCA
Uncertainty	Exact EN AW-8011A industrial research material following the article's Technology B cold-rolling chain. Table 1 measured composition and Table 4 measured cup-ear/calculated texture anisotropy are transcribed directly. The article's Figure 5 strength and elongation curves are not digitized, and the reproduced STANDARD EN AW-8011A composition row is not imported. No registered temper, density, elastic constants, bulk hardness, product-standard minimum or design allowable is claimed.
Last reviewed	2026-08-03
Reviewer	scripts/import_peer_reviewed_open_aluminum_public.py

Field	Value
Review status	Checked
Review scope	Checked explicit article CC BY 4.0 grant, DOI/source integrity, exact alloy identity, condition and geometry limits, value location, and measured/reported rather than specified-minimum semantics.
Notes	Exact EN AW-8011A industrial research material following the article's Technology B cold-rolling chain. Table 1 measured composition and Table 4 measured cup-ear/calculated texture anisotropy are transcribed directly. The article's Figure 5 strength and elongation curves are not digitized, and the reproduced STANDARD EN AW-8011A composition row is not imported. No registered temper, density, elastic constants, bulk hardness, product-standard minimum or design allowable is claimed.
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Material Condition

Field	Value
Condition	EN AW-8011A industrial cold-rolled foil process chain, Technology B, from RFS through FBA/FCA
Temper	process states RFS, 1C, IA, 2C, FBA and FCA; no registered temper assigned
Heat treatment	intermediate anneal 400 +/- 10 degC for 4 h; final batch or continuous anneal within the source's 270-320 +/- 5 degC process window
Product form	industrially hot-rolled sheet followed by cold-rolled 0.09 mm foil
Thickness / diameter range	3.25 +/- 0.05 mm hot-rolled re-roll foil stock; 0.90 +/- 0.05 mm after 75 percent reduction; 0.09 +/- 0.05 mm after 85 percent reduction from the intermediate-annealed state
Test direction	composition not directional; tensile method was RD; cup-ear angles are relative to rolling direction
Processing route	Technology B: hot-rolled RFS; first cold roll; 400 +/- 10 degC/4 h intermediate anneal; second cold roll to 0.09 mm; final batch or continuous anneal
Temperature range	Annealing temperatures are process parameters, not a service-temperature validity range.
Notes	Exact EN AW-8011A industrial research material following the article's Technology B cold-rolling chain. Table 1 measured composition and Table 4 measured cup-ear/calculated texture anisotropy are transcribed directly. The article's Figure 5 strength and elongation curves are not digitized, and the reproduced STANDARD EN AW-8011A composition row is not imported. No registered temper, density, elastic constants, bulk hardness, product-standard minimum or design allowable is claimed.

Properties

Composition

Property	Value	Unit	Type	Applies to
Silicon mass fraction	0.72	%	Experimental Measured Composition Reference	measured composition of the 0.09 mm EN AW-8011A Technology B foil
Iron mass fraction	0.72	%	Experimental Measured Composition Reference	measured composition of the 0.09 mm EN AW-8011A Technology B foil
Manganese mass fraction	0.089	%	Experimental Measured Composition Reference	measured composition of the 0.09 mm EN AW-8011A Technology B foil
Magnesium mass fraction	0.034	%	Experimental Measured Composition Reference	measured composition of the 0.09 mm EN AW-8011A Technology B foil
Copper mass fraction	0.01	%	Experimental Measured Composition Reference	measured composition of the 0.09 mm EN AW-8011A Technology B foil
Titanium mass fraction	0.026	%	Experimental Measured Composition Reference	measured composition of the 0.09 mm EN AW-8011A Technology B foil

Forming

Property	Value	Unit	Type	Applies to
Earing on cups, RFS	1.79	%	Experimental Measured Forming Anisotropy Screening	Technology B, RFS: as-hot-rolled re-roll foil stock
Earing angle, RFS	90.0	deg	Experimental Measured Forming Direction Screening	Technology B, RFS: as-hot-rolled re-roll foil stock
Calculated material anisotropy, RFS	22.0	-	Calculated Ebsd Texture Anisotropy Screening	Technology B, RFS: as-hot-rolled re-roll foil stock
Earing on cups, 1C	2.2	%	Experimental Measured Forming Anisotropy Screening	Technology B, 1C: first cold-rolled state
Earing angle, 1C	45.0	deg	Experimental Measured Forming Direction Screening	Technology B, 1C: first cold-rolled state
Calculated material anisotropy, 1C	-50.9	-	Calculated Ebsd Texture Anisotropy Screening	Technology B, 1C: first cold-rolled state
Earing on cups, IA	1.52	%	Experimental Measured Forming Anisotropy Screening	Technology B, IA: intermediate annealed at 400 +/- 10 degC for 4 h
Earing angle, IA	90.0	deg	Experimental Measured Forming Direction Screening	Technology B, IA: intermediate annealed at 400 +/- 10 degC for 4 h
Calculated material anisotropy, IA	12.3	-	Calculated Ebsd Texture Anisotropy Screening	Technology B, IA: intermediate annealed at 400 +/- 10 degC for 4 h
Earing on cups, 2C	6.12	%	Experimental Measured Forming Anisotropy Screening	Technology B, 2C: second cold-rolled 0.09 mm foil state

Property	Value	Unit	Type	Applies to
Earing angle, 2C	45.0	deg	Experimental Measured Forming Direction Screening	Technology B, 2C: second cold-rolled 0.09 mm foil state
Calculated material anisotropy, 2C	-74.7	-	Calculated Ebsd Texture Anisotropy Screening	Technology B, 2C: second cold-rolled 0.09 mm foil state
Earing on cups, FBA	1.09	%	Experimental Measured Forming Anisotropy Screening	Technology B, FBA: final batch-annealed state; 270-320 +/- 5 degC process window, 1 h
Earing angle, FBA	45.0	deg	Experimental Measured Forming Direction Screening	Technology B, FBA: final batch-annealed state; 270-320 +/- 5 degC process window, 1 h
Calculated material anisotropy, FBA	-32.5	-	Calculated Ebsd Texture Anisotropy Screening	Technology B, FBA: final batch-annealed state; 270-320 +/- 5 degC process window, 1 h
Earing on cups, FCA	1.67	%	Experimental Measured Forming Anisotropy Screening	Technology B, FCA: final continuous-annealed state; 270-320 +/- 5 degC process window, 2-4 min
Earing angle, FCA	90.0	deg	Experimental Measured Forming Direction Screening	Technology B, FCA: final continuous-annealed state; 270-320 +/- 5 degC process window, 2-4 min
Calculated material anisotropy, FCA	21.8	-	Calculated Ebsd Texture Anisotropy Screening	Technology B, FCA: final continuous-annealed state; 270-320 +/- 5 degC process window, 2-4 min

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