MATERIAL DATA SHEET

EN AW-7108A research alloy A1, extruded and solution-treated (CC BY)

Exact-grade instance composition and Al3Zr dispersoid measurements for research alloy A1.

Field	Value
Material ID	matchar-en-aw-7108a-a1-extruded-solution-treated
Category	Metal
Condition	source-identified EN AW-7108A research-alloy variant after solution treatment and water quench | vertically continuously cast billet extruded as a double hollow-chamber profile
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
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Source and Validity

Field	Value
Quality	Unknown
Design release allowed	No
Source family	peer_reviewed_open_article
Confidence	Reference-grade
License	Open
Source note	The article calls A1 and A2 variants of EN AW-7108A and reports their individual compositions, processing route and Al3Zr dispersoid measurements. It does not report density, elastic constants, tensile properties, hardness, a registered delivery temper, lot acceptance limits or product standards. The nominal 7108A row printed from a cited handbook is not imported. Values are research-instance microstructure data, not current EN composition limits, minimum mechanical properties, supplier guarantees or design allowables.
Citation	A. Arnoldt, P. Ortner, A. Schiffl, J. A. Oesterreicher, and H.-W. Hoeppel, Quantification of nanoscale Al3Zr-dispersoids in 7xxx aluminium alloys using low energy backscattered electron microscopy, Materials Characterization 229 (2025) 115505, Tables 1-2, doi:10.1016/j.matchar.2025.115505.
Valid temperature	Composition and post-process dispersoid measurements are not supplied as temperature-dependent properties.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	source-identified EN AW-7108A research-alloy variant after solution treatment and water quench

Field	Value
Uncertainty	The article calls A1 and A2 variants of EN AW-7108A and reports their individual compositions, processing route and Al3Zr dispersoid measurements. It does not report density, elastic constants, tensile properties, hardness, a registered delivery temper, lot acceptance limits or product standards. The nominal 7108A row printed from a cited handbook is not imported. Values are research-instance microstructure data, not current EN composition limits, minimum mechanical properties, supplier guarantees or design allowables.
Last reviewed	2026-08-03
Reviewer	scripts/import_exact_open_aluminum_public.py
Review status	Checked
Review scope	Checked the CC BY notice, article identity, exact alloy label, source table, units, product geometry and downloaded PDF hash.
Notes	The article calls A1 and A2 variants of EN AW-7108A and reports their individual compositions, processing route and Al3Zr dispersoid measurements. It does not report density, elastic constants, tensile properties, hardness, a registered delivery temper, lot acceptance limits or product standards. The nominal 7108A row printed from a cited handbook is not imported. Values are research-instance microstructure data, not current EN composition limits, minimum mechanical properties, supplier guarantees or design allowables.
License ID	CC-BY-4.0
License URL	https://creativecommons.org/licenses/by/4.0/
Attribution	Arnoldt, Ortner, Schiffl, Oesterreicher, and Hoeppel (2025), Materials Characterization 229, 115505

Material Condition

Field	Value
Condition	source-identified EN AW-7108A research-alloy variant after solution treatment and water quench
Temper	laboratory solution-treated and water-quenched state; no registered temper stated
Heat treatment	two-step homogenization: 450-490 degC for 3 h, then 490 degC for 9 h; solution anneal 480 degC for 30 min; water quench
Product form	vertically continuously cast billet extruded as a double hollow-chamber profile
Thickness / diameter range	source profile geometry shown in Figure 1; numerical wall dimensions not stated in text/table
Test direction	profile-top microstructure samples; mechanical direction not applicable
Processing route	vertical continuous casting; two-step homogenization; extrusion at 490 degC and 4 mm/s ram speed; solution anneal and water quench
Temperature range	Composition and post-process dispersoid measurements are not supplied as temperature-dependent properties.
Notes	The two cards preserve the article's A1 and A2 research-alloy identities and do not merge their measured populations.

Properties

Chemical

Property	Value	Unit	Type	Applies to
Silicon mass fraction	0.21	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Magnesium mass fraction	0.81	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Manganese mass fraction	0.05	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Iron mass fraction	0.26	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Copper mass fraction	0.05	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Titanium mass fraction	0.03	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Chromium mass fraction	0.04	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Zinc mass fraction	4.82	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Zirconium mass fraction	0.14	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route

Property	Value	Unit	Type	Applies to
Aluminum mass fraction	93.6	%	Source Reported Material Composition Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route

Microstructure

Property	Value	Unit	Type	Applies to
Al3Zr dispersoid 4-Q-BSE counted particles	154	count	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid 4-Q-BSE median diameter	25.1	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid 4-Q-BSE median 95% confidence interval	0.4	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid 4-Q-BSE mean diameter	27.7	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid 4-Q-BSE mean-diameter standard deviation	0.5	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid 4-Q-BSE minimum detected diameter	10.9	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid TEM counted particles	1595	count	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid TEM median diameter	16.8	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid TEM median 95% confidence interval	0.3	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route

Property	Value	Unit	Type	Applies to
Al3Zr dispersoid TEM mean diameter	19.2	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid TEM mean-diameter standard deviation	0.8	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid TEM minimum detected diameter	3.5	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid TEM foil thickness	213.7	nm	Source Reported Cbed Foil Thickness Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid LV-BSE counted particles	660	count	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid LV-BSE median diameter	17.5	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid LV-BSE median 95% confidence interval	0.4	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid LV-BSE mean diameter	19.9	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid LV-BSE mean-diameter standard deviation	0.5	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route
Al3Zr dispersoid LV-BSE minimum detected diameter	6.4	nm	Source Reported Dispersoid Measurement Screening	source-identified EN AW-7108A research alloy A1 after the article's extrusion, solution-anneal and water-quench route

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