MATERIAL DATA SHEET

AA7003 high-Si water-quenched T7 extruded profile (CC BY experimental)

Air SSRT tensile values and electrical conductivity for exact high-Si AA7003 T7 extruded profile.

Field	Value
Material ID	mdpi-aa7003-high-si-wq-t7-extruded-profile
Category	Metal
Condition	AA7003 high-Si heat, water quenched and artificially aged to study condition T7 | solid rectangular extruded profile
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	Adrian Lervik et al., Stress Corrosion Cracking in an Extruded Cu-Free Al-Zn-Mg Alloy, Metals 2020, 10, 1194, https://doi.org/10.3390/met10091194.
Valid temperature	SSRT and conductivity test temperatures are not stated; air is the retained environment.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	AA7003 high-Si heat, water quenched and artificially aged to study condition T7
Uncertainty	Experimental values for one high-Si AA7003 heat and H-WQ-T7 profile condition. The air SSRT strength/ductility values are single-test results; conductivity is a five-measurement mean. The article designates the ageing condition as T7, but these are not EN extrusion minima.
Last reviewed	2026-08-03
Reviewer	scripts/import_mdpi_open_aluminum_public.py
Review status	Checked
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.

Field	Value
Notes	Experimental values for one high-Si AA7003 heat and H-WQ-T7 profile condition. The air SSRT strength/ductility values are single-test results; conductivity is a five-measurement mean. The article designates the ageing condition as T7, but these are not EN extrusion minima.
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Attribution	Adrian Lervik et al.

Material Condition

Field	Value
Condition	AA7003 high-Si heat, water quenched and artificially aged to study condition T7
Temper	T7 as designated by the article
Heat treatment	solution heat treatment at 480 degC for 30 min; water quench to room temperature; artificial ageing at 170 degC for 6 h
Product form	solid rectangular extruded profile
Thickness / diameter range	20 x 25 mm profile; SSRT geometry in article Figure 2
Test direction	SSRT specimen axis relative to extrusion direction is not explicitly stated
Processing route	cast and homogenized; preheated to 480 degC; extruded at about 11 mm/s; solution treated, water quenched and artificially aged
Temperature range	SSRT and conductivity test temperatures are not stated; air is the retained environment.
Notes	Experimental values for one high-Si AA7003 heat and H-WQ-T7 profile condition. The air SSRT strength/ductility values are single-test results; conductivity is a five-measurement mean. The article designates the ageing condition as T7, but these are not EN extrusion minima.

Properties

Physical

Property	Value	Unit	Type	Applies to
Electrical conductivity	27.15	MS/m	Experimental Measured Screening	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements

Mechanical

Property	Value	Unit	Type	Applies to
Tensile yield strength	322.0	MPa	Experimental Measured Screening	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements
Ultimate tensile strength	333.0	MPa	Experimental Measured Screening	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements
Elongation	15.9	%	Experimental Measured Screening	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements
Reduction in area	65.0	%	Experimental Measured Screening	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements

Composition

Property	Value	Unit	Type	Applies to
Silicon mass fraction	0.11	%	Experimental Measured Composition Reference	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements
Zinc mass fraction	5.56	%	Experimental Measured Composition Reference	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements
Magnesium mass fraction	0.68	%	Experimental Measured Composition Reference	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements
Zirconium mass fraction	0.17	%	Experimental Measured Composition Reference	AA7003 high-Si heat (Fe 0.20, Mg 0.68, Si 0.11, Zn 5.56, Cu 0.01, Zr 0.17, Ti 0.02 wt.%), 20 x 25 mm extruded profile; H-WQ-T7; one slow-strain-rate tensile test in air; initial rate reported as 1.2e-8 m/s; five electrical-conductivity measurements

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