MATERIAL DATA SHEET

AA5005-H32 rod, 10 mm (CC BY reference)

Reported mechanical and thermal base-material properties for exact AA5005-H32 used in a 10 mm rod.

Field	Value
Material ID	mdpi-aa5005-h32-rod-10mm-reference
Category	Metal
Condition	AA5005-H32 base material used as the aluminum rotating rod in a Ti Grade 2/AA5005 friction-welding study | rod
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	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	Piotr Lacki, Janina Adamus, Wojciech Wieckowski, and Maciej Motyka, A New Method of Predicting the Parameters of the Rotational Friction Welding Process Based on the Determination of the Frictional Heat Transfer in Ti Grade 2/AA 5005 Joints, Materials 2023, 16, 4787, https://doi.org/10.3390/ma16134787.
Valid temperature	Mechanical-table temperature is not stated; thermal conductivity is marked as room-temperature.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	AA5005-H32 base material used as the aluminum rotating rod in a Ti Grade 2/AA5005 friction-welding study
Uncertainty	Reported reference values for exact AA5005-H32 base material used in the article's 10 mm rod; source direction, sampling and value statistics are not stated. Values are not EN product 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	Reported reference values for exact AA5005-H32 base material used in the article's 10 mm rod; source direction, sampling and value statistics are not stated. Values are not EN product minima.
License ID	CC-BY-4.0
License URL	https://creativecommons.org/licenses/by/4.0/
Attribution	Piotr Lacki

Material Condition

Field	Value
Condition	AA5005-H32 base material used as the aluminum rotating rod in a Ti Grade 2/AA5005 friction-welding study
Temper	H32
Heat treatment	strain hardened and stabilized to H32; detailed supplier route not stated
Product form	rod
Thickness / diameter range	10 mm diameter; model component length 20 mm
Test direction	not stated for the reported reference values
Processing route	commercial H32 rod; detailed prior processing not stated
Temperature range	Mechanical-table temperature is not stated; thermal conductivity is marked as room-temperature.
Notes	Reported reference values for exact AA5005-H32 base material used in the article's 10 mm rod; source direction, sampling and value statistics are not stated. Values are not EN product minima.

Properties

Physical

Property	Value	Unit	Type	Applies to
Density	2700.0	kg/m^3	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated

Thermal

Property	Value	Unit	Type	Applies to
Thermal conductivity	200.0	W/m/K	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Specific heat capacity	900.0	J/kg/K	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Solidus temperature	632.0	degC	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Liquidus temperature	654.0	degC	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Linear thermal expansion coefficient	2.19e-05	1/K	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated

Mechanical

Property	Value	Unit	Type	Applies to
Tensile yield strength	117.0	MPa	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Ultimate tensile strength	138.0	MPa	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Elongation	11.0	%	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Young's modulus	68.9	GPa	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Poisson's ratio	0.33	-	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Shear modulus	25.9	GPa	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Shear strength	96.5	MPa	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated
Brinell hardness	36.0	HB	Reported Reference Screening	AA5005-H32 base material used as a 10 mm diameter, 20 mm long rotating rod in the friction-welding model; direction and value statistics not stated

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