MATERIAL DATA SHEET

EN AW-4006 disk, G.H.A.PLUS hard-anodized layer (CC BY experimental)

Measured thickness, microhardness and roughness for the G.H.A.PLUS anodic layer on exact EN AW-4006 disks.

Field	Value
Material ID	mdpi-en-aw-4006-gp-hard-anodized-disk
Category	Metal
Condition	G.H.A.PLUS hard-anodized and hydrothermally sealed EN AW-4006 disk | hard-anodized disk
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	Chiara Soffritti, Annalisa Fortini, Enrico Baroni, Mattia Merlin, and Gian Luca Garagnani, Hard-Anodized Aluminum Alloy: Wear Properties in Vegetable Oils, Lubricants 2024, 12, 383, https://doi.org/10.3390/lubricants12110383.
Valid temperature	The article does not state the temperature during layer thickness, hardness or roughness measurements.
Valid pressure	Pressure dependence is not represented.
Valid phase / condition	G.H.A.PLUS hard-anodized and hydrothermally sealed EN AW-4006 disk
Uncertainty	Exact EN AW-4006 substrate identity and measured anodic-layer statistics are retained. The article cites licensed UNI EN 573-3 for nominal substrate chemistry, so that chemistry is excluded. These surface-layer values do not describe untreated bulk-alloy hardness, tensile properties, EN minima or a design allowable; substrate temper and measurement temperature are not stated.
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-4006 substrate identity and measured anodic-layer statistics are retained. The article cites licensed UNI EN 573-3 for nominal substrate chemistry, so that chemistry is excluded. These surface-layer values do not describe untreated bulk-alloy hardness, tensile properties, EN minima or a design allowable; substrate temper and measurement temperature are not stated.
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Attribution	Chiara Soffritti

Material Condition

Field	Value
Condition	G.H.A.PLUS hard-anodized and hydrothermally sealed EN AW-4006 disk
Temper	substrate temper not stated; no wrought temper inferred
Heat treatment	G.H.A.PLUS hard anodizing; hot water at 96 degC for 2 min per micrometre of anodic-layer thickness
Product form	hard-anodized disk
Thickness / diameter range	75 mm disk diameter x 3 mm substrate thickness
Test direction	anodic-layer cross-section for thickness and microhardness; surface for roughness
Processing route	EN AW-4006 disk; silver-ion hard anodizing in sulfuric acid; condition-specific sealing
Temperature range	The article does not state the temperature during layer thickness, hardness or roughness measurements.
Notes	Exact EN AW-4006 substrate identity and measured anodic-layer statistics are retained. The article cites licensed UNI EN 573-3 for nominal substrate chemistry, so that chemistry is excluded. These surface-layer values do not describe untreated bulk-alloy hardness, tensile properties, EN minima or a design allowable; substrate temper and measurement temperature are not stated.

Properties

Surface

Property	Value	Unit	Type	Applies to
Anodic oxide layer thickness	53.0	um	Experimental Measured Surface Layer Screening	EN AW-4006 disk, 75 mm diameter x 3 mm thick, G.H.A.PLUS silver-ion hard anodizing in sulfuric acid at 1-10 A/dm^2 and 0-1 degC, followed by hot water at 96 degC for 2 min per micrometre of anodic-layer thickness
Vickers microhardness HV0.01	500.0	HV0.01	Experimental Measured Surface Layer Screening	EN AW-4006 disk, 75 mm diameter x 3 mm thick, G.H.A.PLUS silver-ion hard anodizing in sulfuric acid at 1-10 A/dm^2 and 0-1 degC, followed by hot water at 96 degC for 2 min per micrometre of anodic-layer thickness
Surface roughness Ra	0.48	um	Experimental Measured Surface Layer Screening	EN AW-4006 disk, 75 mm diameter x 3 mm thick, G.H.A.PLUS silver-ion hard anodizing in sulfuric acid at 1-10 A/dm^2 and 0-1 degC, followed by hot water at 96 degC for 2 min per micrometre of anodic-layer thickness
Surface roughness Rq	0.64	um	Experimental Measured Surface Layer Screening	EN AW-4006 disk, 75 mm diameter x 3 mm thick, G.H.A.PLUS silver-ion hard anodizing in sulfuric acid at 1-10 A/dm^2 and 0-1 degC, followed by hot water at 96 degC for 2 min per micrometre of anodic-layer thickness
Surface roughness Rz	4.1	um	Experimental Measured Surface Layer Screening	EN AW-4006 disk, 75 mm diameter x 3 mm thick, G.H.A.PLUS silver-ion hard anodizing in sulfuric acid at 1-10 A/dm^2 and 0-1 degC, followed by hot water at 96 degC for 2 min per micrometre of anodic-layer thickness

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