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SiwinnTag™ Industrial Asset Identification Solutions

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ENGINEERING SPECIFICATION MATRIX

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SiwinnTag™ Industrial Metal Asset Tag Material Selection Guide

Cross-comparison engineering matrix across 4 primary alloy grades for offshore, industrial plant, IT datacenter & heritage asset tagging.

4 Core Alloys | C5-M to Light-Duty | ISO/IEC 15415 | ISO 9001:2015

1. COMPREHENSIVE MATERIAL COMPARISON & ENGINEERING PARAMETER MATRIX

Evaluation Criteria	SUS 316L Stainless ST-TDS-316L-OFFSHORE	SUS 304 Stainless ST-TDS-304-INDUSTRIAL	Anodised Aluminium ST-TDS-AL-ANODISED	Commercial Brass ST-TDS-BRASS-PREMIUM
Material Grade & Standard	**SUS 316L** (UNS S31603 / EN 1.4404) ASTM A240 / ASME SA240	**SUS 304** (UNS S30400 / EN 1.4301) ASTM A240 / ASME SA240	**Alloy 5052-H32 / 6061-T6** MIL-A-8625F Type II Anodised	**Cartridge Brass H62 / C26000** ASTM B36 / EN CW508L
Chemical / Physical Key	Cr 16-18%, Ni 10-14%, **Mo 2-3%** **C ≤ 0.03%** (Ultra-Low Carbon)	Cr 18-20%, Ni 8-10.5% C ≤ 0.07% (General Austenitic)	10–25 µm Sealed Hard Oxide Surface Hardness > 300 HV	Cu 60.5–63.5%, Zn Remainder **100% Non-Sparking Alloy**
Operating Temp. Range	**-40°C to +300°C** (-40°F to +572°F)	**-40°C to +400°C** (-40°F to +752°F)	**-40°C to +150°C** (-40°F to +302°F)	**-40°C to +250°C** (-40°F to +482°F)
Corrosion & Environment	**Extreme Marine (C5-M / CX)** Seawater splash, tidal salt fog, H_2S	**Industrial Atmospheric (C3/C4)** Steam, washdown, CIP detergents	**Controlled & Mild (C1/C2)** Humidity, indoor dust, light solvent	**Architectural & Freshwater** Anti-algae, freshwater & indoor
Weight & Density	High Density (~8.0 g/cm³) Heavy-duty structural rigidity	High Density (~7.9 g/cm³) High mechanical impact strength	**Ultra-Lightweight (~2.7 g/cm³)** 1/3 weight of steel (Zero load)	High Density (~8.5 g/cm³) Heavy classic aesthetic weight
Marking Process & Optics	Fiber Laser Dark Annealing (0 µm) ISO/IEC 15415 **Grade A/B**	Fiber Laser Dark Annealing (0 µm) ISO/IEC 15415 **Grade A/B**	High-Speed Laser Ablation (1000 DPI) **Grade A** (Max Contrast >85%)	Laser Dark Anneal or Deep Rotary Engrave with Black Enamel Fill
Core Engineering Merit	No sensitization; immune to marine pitting & crevice corrosion.	Highest temperature limit & excellent mechanical rigidity.	High-density micro QR codes; non-conductive & non-magnetic.	ATEX spark-free safety; natural antimicrobial bio-fouling proof.
Fastening Systems	SUS 316 Wire Keyring / 316 Tie	SUS 304 Wire Keyring / 304 Tie / 3M	Blind Rivets / 3M 468MP Thin Tape	Brass Ball Chain / Brass Screws
Design Service Lifespan	**20+ Years** (Offshore Marine)	**15–20 Years** (Factory Plant)	**10–15 Years** (Indoor IT / Cabinet)	**25+ Years** (Indoor Heritage)

2. TARGET APPLICATION SCENARIOS & ENGINEERING SELECTION GUIDE

MARINE & PETROCHEM

SUS 316L Stainless

- Offshore oil & gas platforms & FPSO
- Subsea ROV & survey instruments
- Refinery pipelines & chemical skids
- Coastal marine splash & tidal zones

Best Choice: Maximum offshore corrosion durability

INDUSTRIAL & PLANT

SUS 304 Stainless

- Automated warehouse racks & AGV
- Food, dairy & beverage machinery
- Pharmaceutical cleanroom assets
- Industrial motors, pumps & HVAC

Best Choice: High-rigidity manufacturing asset tracking

IT, TELECOM & FLEET

Anodised Aluminium

- Enterprise IT server racks & datacenters
- Electrical switchgear & control panels
- Micro-QR assets (5×5 mm high-density)
- Aviation ground rigs & fleet trailers

Best Choice: High-speed barcode scan & lightweight

HERITAGE & SAFETY

Commercial Brass

- ATEX hazardous non-sparking zones
- Luxury hotels & executive facilities
- Heritage architectural restorations
- Vintage boilers & freshwater pumps

Best Choice: Non-sparking safety & luxury aesthetics

Pre-Production Engineering & Digital Asset Workflow: All SiwinnTag™ products support variable serialization (sequential numbers, dynamic QR payloads, prefix/suffix text) seamlessly imported from customer Excel (.xlsx) / CSV databases. Prior to volume production release, 100% vectorized 2D CAD engineering layout proofs are submitted for customer QA sign-off. Precision CNC laser cutting provides custom geometries, custom hole patterns (single, dual, 4-corner or slotted), and deburred safety radiused corners.

3. QUALITY ASSURANCE, COMPLIANCE & TRACEABILITY DELIVERABLES

ISO 9001:2015
Certified QMS (IAF & CNAS Accredited)
Design & Supply of Metal Tags

EN 10204 Type 3.1
Official Mill Test Certificate (MTC 3.1)
Heat No. & Chemistry Traceability

EU RoHS 2.0
Directive 2011/65/EU & 2015/863
Hazardous Substances Compliant

100% Optical DPM QA
Full FAI Dimensional Inspection &
100% Pre-Shipment QR Optical Scan