

Fastener Corrosion Protection — Electro-Zinc, Hot-Dip Galvanised, Sendzimir and A4 Stainless Compared

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What each fastener finish actually survives: electro-zinc for dry interiors, hot-dip galvanising outdoors, Sendzimir strip coatings on brackets, acid-resistant A4 stainless for marine and washdown — plus galvanic pairing rules and the stocked examples of each class.

The protection ladder

Finish/material | Typical zinc/protection | Belongs in | Stocked examples |

Electro-zinc (FZB/FZV) | ~5–12 µm zinc | Dry interiors | M6 expansion bolt, zinc rod |

Sendzimir (strip-galv.) | ~20 µm, coated before forming | Indoor brackets/rails, mild environments | pendant bracket 200 mm |

Hot-dip galvanised (HDG) | ~45–85 µm | Outdoors, splash zones | M8 × 75 HDG bolt, M8 × 90 HDG |

A4 / acid-resistant stainless | Alloy, not coating | Marine air, washdown, chemical | A4 rod M8, (grooved steel for contrast), acid-resistant lever ZC2JY313 |

Polymer (nylon) | Immune, weak | Isolation, light chemical duty | nylon rod |

Life scales roughly with zinc thickness divided by the environment's corrosion rate (the ISO 9223 C-classes): electro-zinc that lasts decades in a C1 office measures its life in months in C5 coastal spray. HDG's thick layer plus sacrificial protection of cut edges is why outdoor structural fixings specify it; A4 sidesteps the whole consumption model — and adds chloride pitting resistance that plain A2 stainless lacks, which is why washdown and marine specs say A4/"syrefast".

Galvanic pairing rules

Fastener "e noble than the joined parts: a stainless bolt in a galvanised bracket is fine (small cathode, big anode); a zinc screw in a stainless assembly dissolves on schedule.

Keep chemistry consistent through a drop: one zinc washer in an A4 suspension is the cell that streaks the ceiling (the washer table in the rod guide exists in both classes).

Aluminium + stainless tolerate each other dry; add isolation (washers/paste) where wet.

HDG + fresh concrete: fine after cure; zinc reacts in wet alkaline concrete — anchors are plated accordingly (anchor guide).

Stainless-on-stainless galling: A4 nuts on A4 rod seize under power driving — thread lubricant/anti-seize and hand-torque finishing.

Choosing in practice

Decide by the worst micro-environment on the path, not the room label: the 'indoor' plant room with a washdown hose is C4; the roof under a cooling-tower plume is coastal-equivalent; inside insulation on a cold line is permanently condensing (which is why insulated clamps with dry inserts matter — clamp guide). Where inspection access is poor, step one class up — the cost delta between zinc and HDG, or HDG and A4, is trivial against re-doing a suspended run. And record the class on drawings: 'M10 rod' is an incomplete specification in any environment above C2.

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