HUIJUE GROUP

Galvanized Steel, Stainless Steel or Aluminum for Telecom Cabinets?

Galvanized Steel, Stainless Steel and Aluminum Telecom Cabinets: Exposure, Coating, Fabrication, Weight and Supplier Evidence

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PRODUCT KNOWLEDGE

Galvanized Steel, Stainless Steel or Aluminum for Telecom Cabinets?

Compare cabinet metals as complete material systems: grade, coating, fabrication, interfaces, field exposure and the evidence needed to approve a supplier.

Updated August 14, 2026Material system comparisonApprox. 15 minute read

Contents

Normalize supplier bids Three cabinet quotations may all say “metal enclosure” while describing very different field risks. One may use zinc-coated sheet with a controlled pretreatment and powder topcoat. Another may specify stainless steel without naming the grade. A third may offer aluminum but leave its temper, fasteners and surface finish undefined.The right **outdoor enclosure material** is therefore not selected from the base-metal name alone. It is selected from the complete material system: metal grade or alloy, product form and thickness, surface preparation, coating or finish, cut-edge and weld treatment, hardware compatibility, fabrication control and the site’s actual exposure.

Procurement principle: approve a material schedule, not a marketing label. “Galvanized,” “stainless” and “aluminum” are starting points; none is a complete cabinet specification.

Which material is best for an outdoor telecom cabinet?

There is no universal winner. Galvanized and coated steel is often a practical baseline where stiffness, established fabrication and cost control matter; stainless steel can justify its premium in demanding corrosion environments when the correct grade and finish are used; aluminum can reduce shell mass and perform well in many atmospheres when strength, joints and dissimilar-metal interfaces are engineered.

The decision changes with the cabinet’s size, mounting method, populated mass, transport route, wind and impact loads, airborne salinity, industrial pollution, time of wetness, cleaning access, service life and repair capability. The metal must also work with the doors, roof, gland plates, hinges, locks, earthing points and cooling equipment rather than being assessed as an isolated sheet.

Use the outdoor telecom cabinet guide to define the cabinet type and installed equipment first. Material selection follows that system boundary. It cannot correct an undersized frame, a water trap, an incompatible fastener or an unsealed field cut.

What must a telecom cabinet material specification include?

A usable specification identifies the exact substrate and the processes applied before, during and after fabrication. It also states how the supplier will prove that the delivered cabinet matches the approved construction.

Record field	What to state	Why it changes the result
Base material	Steel, stainless steel or aluminum, including product form	Separates the structural substrate from a coating or trade name
Grade or alloy	Recognized designation, temper where relevant, and applicable material standard	“Stainless” and “aluminum” each cover families with different properties
Nominal thickness	Panel-by-panel gauge, tolerances and structural members	Door skin, frame, base and equipment rails do not necessarily need the same thickness
Pretreatment	Cleaning, conversion or preparation process before coating	Coating adhesion and under-film corrosion depend on the prepared surface
Coating or finish	System layers, colour, thickness range, cure or finish requirement	A topcoat name alone does not define corrosion performance or workmanship
Fabrication repair	Method for welds, cut edges, drilled holes and damaged areas	These locations can lose the protection present on untouched sheet
Interfaces	Fastener, hinge, lock, gland-plate, lug and isolation materials	Moisture at dissimilar-metal contacts can create localized problems
Acceptance evidence	Certificates, process records, inspection results and test reports tied to the active build	Prevents evidence for a coupon or another model from being treated as proof of the supplied cabinet

Huijue engineering references reviewed for this article list galvanized sheet, 201 or 304 stainless steel and 5052 aluminum sheet among project-dependent options for several outdoor cabinet families. Those references support configurability, not a claim that every metal, thickness or finish is available for every model. The approved drawing and bill of

materials must govern the order.

Galvanized and coated steel: define both the zinc and the topcoat

A **galvanized steel cabinet** can combine useful stiffness, mature sheet-metal fabrication and a cost-effective corrosion-control route. Its field durability still depends on what “galvanized” means, how the sheet was formed and joined, and whether exposed areas receive a compatible repair and topcoat.

Continuously zinc-coated sheet and a fabricated article that is hot-dip galvanized after fabrication are different products. ISO 14713-2:2019 provides design guidance for articles hot-dip galvanized after fabrication and explicitly excludes continuously galvanized sheet. A supplier certificate for one route should not be used as evidence for the other.

When a painted or powder-coated steel system is proposed, ask how the environment was classified and how the paint system was selected. ISO 12944-2:2017 classifies environments for steel structures, while ISO 12944-5:2019 describes protective paint-system selection. These standards can inform a coating discussion, but they do not automatically certify a telecom cabinet or replace the project’s enclosure requirements.

Evidence worth requesting for coated steel

- the sheet specification, zinc-coating designation and incoming material certificate;
- pretreatment chemistry and process-control records appropriate to the coating line;
- powder or paint product, layer sequence, colour and specified dry-film thickness range;
- coating-thickness measurements at agreed panel locations, including door returns and formed details;
- weld, cut-edge, hole and field-repair instructions;
- test specimens and acceptance criteria that represent the offered construction.

Steel is not disqualified by a corrosive site, but the protection system usually becomes more demanding. Conversely, an elaborate coating schedule may add little value if installers drill unprotected holes, allow water to stand at the base or substitute incompatible hardware.

Stainless steel: specify the grade, finish and fabrication

controls

A **stainless steel cabinet** should never be ordered with “stainless” as the complete material callout. Grade, surface finish, weld treatment, contamination control and cleaning exposure all affect the result, especially where chlorides can settle on sheltered surfaces or remain in crevices.

Stainless steel is corrosion resistant, not corrosion proof. Guidance collected by worldstainless shows that chloride resistance varies by grade and that coastal selection also depends on finish, exposure and washing. It follows that 201, 304 and higher-alloy grades are not interchangeable procurement descriptions.

Cabinet fabrication adds details that a flat material certificate does not cover. Grinding or forming tools contaminated with carbon steel can leave staining sites. Rough finishes and horizontal ledges retain deposits. Tight joints around handles, hinges, roof seams and labels can hold moisture. Specify how fabrication cleanliness, weld discoloration, passivation or other post-fabrication treatment will be controlled where the project requires it.

Stainless can be justified when coating damage is likely, washdown is expected or site exposure makes a coating-dependent maintenance plan unattractive. The choice still needs a grade-specific review. A lower stainless grade selected only because its initial price fits the budget may perform worse than a well-specified coated-steel system in the same location.

Aluminum: trade lower mass for tighter interface control

An **aluminum telecom cabinet** can reduce enclosure mass compared with a geometrically similar steel shell and can provide useful atmospheric corrosion resistance. The final design may need different gauges, bends, stiffeners or frame details, so material density alone does not establish cabinet weight or structural performance.

Specify the alloy and temper rather than “aluminum sheet.” Huijue references reviewed for this article include 5052 sheet as a configurable option, but the active temper, thickness, finish, joining method and structural verification remain project facts. Welding and heat-affected regions, formed corners, thread engagement and lifting points should be checked for the actual construction.

Dissimilar-metal contacts deserve deliberate treatment. The Aluminum Association’s structural design FAQ discusses moisture-exposed contact between aluminum and other metals and the use of protective separation in relevant cases. For a cabinet, review fasteners, hinges, copper grounding connections, mounting brackets, air-conditioner

frames and field-added hardware as interfaces, not afterthoughts.

Electrical continuity also needs its own design. A conductive metal enclosure does not eliminate the need for specified protective bonding across doors and removable panels, compatible lugs, prepared contact surfaces and corrosion-protected terminations. Confirm these details against the project’s electrical and earthing requirements.

How does the site environment change material selection?

Start with the exposure that reaches the cabinet, not the country name or a broad label such as “coastal.” Record humidity and wetting, airborne salinity, industrial pollutants, direct spray or washdown, dust that can retain moisture, solar exposure, sheltering, temperature cycling and the maintenance interval.

ISO 9223:2012 identifies the temperature-humidity complex, sulfur-dioxide pollution and airborne salinity as key atmospheric-corrosion factors. The standard provides a classification and estimation framework; it does not convert a nearby coastline or city name into a guaranteed cabinet service life.

Site clue	Likely design pressure	Procurement response
Sheltered, humid position with limited rain washing	Long wet periods and retained deposits on horizontal or recessed details	Review drainage, surface finish, crevices, cleaning access and hidden interfaces
Airborne salt or road-salt deposition	Chloride accumulation and localized attack at damaged coatings or unsuitable stainless grades	Quantify exposure where possible; confirm grade/coating evidence and a realistic washing plan
Industrial pollution	Atmospheric contaminants can alter the corrosivity category and coating demand	Use site or operator data rather than assuming a rural exposure class
Frequent handling, vandalism or tool contact	Scratches, impact and coating damage during the service life	Evaluate damage tolerance, repair method, panel stiffness and spare-part availability
Remote site with infrequent maintenance	Small defects can remain wet or damaged for long periods	Prioritize inspectable details, durable interfaces and a documented field-repair kit

The cabinet’s ingress rating remains a separate question. IP classification describes access, dust and water protection under the stated test arrangement; it does not rank metals or define corrosion life. Use the IP55 and IP65 telecom cabinet comparison for that boundary.

The weakest interface can control cabinet life

Good **cabinet corrosion protection** often fails at a small detail rather than across the centre of a panel. Conduct the review as a water-and-service walkdown: follow rain,

condensate, dust and tools from the roof to the base and note every transition where material or protection changes.

1. **Roof and door returns:** look for unsealed seams, horizontal shelves and folded pockets that can retain water.
2. **Hinges, locks and stays:** confirm hardware materials, fasteners, isolating washers where required and replaceability.
3. **Welds and cut edges:** state the restoration process and how repaired areas will be inspected.
4. **Gland and cooling cut-outs:** verify coating continuity, edge sealing, drainage and the materials of attached frames.
5. **Bonding points:** define compatible lugs, surface preparation, joint protection and inspection access.
6. **Base and foundation:** prevent trapped water, soil contact and damage from grouting, lifting or anchoring.
7. **Field modifications:** provide approved drilling, touch-up, swarf removal and sealing instructions.

This walkdown also separates material selection from wall construction. A double skin can change exposure and access to hidden cavities, but it does not make the base metal irrelevant. Compare those thermal and moisture boundaries in the single-wall versus double-wall cabinet guide .

Is a salt-spray result enough to select a cabinet material?

No. A salt-spray report can compare specified specimens under a controlled test, but its hours should not be converted directly into years of outdoor service or treated as stand-alone proof for a complete cabinet.

ASTM B117-26 defines the salt-fog apparatus and operating practice. Its significance statement says stand-alone salt-spray results have seldom correlated with natural-environment performance, and that extrapolation is not always predictable. The practice also does not prescribe the specimen, exposure period or interpretation for a particular product.

Read a report by asking what was tested. Was it a flat unscribed coupon, a scribed coated panel, a formed door corner, a welded assembly or a populated cabinet? Did it use the same substrate, pretreatment, coating thickness, cure and repair method as the offered bill of materials? What counted as failure: red rust, white corrosion, blistering, loss of adhesion, pitting or operation of the enclosure?

A defensible acceptance plan states the standard and revision, specimen construction, conditioning, exposure, replicates, inspection method, acceptance criteria and link to the

production process. Salt spray may be one part of that plan alongside material certificates, coating measurements, adhesion checks, workmanship inspection and project-specific environmental tests.

Normalize supplier bids with a material evidence schedule

Put each bidder on the same evidence sheet before comparing price. If one bid names only “powder-coated steel” and another includes substrate grade, zinc designation, pretreatment, coating system, thickness limits, hardware materials and repair instructions, the two offers are not technically equivalent.

- **Site basis:** installation location, exposure classification or measured data, sheltering, cleaning and service interval.
- **Material schedule:** every panel, frame, base, rail, door, roof, gland plate and external hardware item.
- **Process route:** forming, joining, surface preparation, coating or finishing, curing and post-fabrication treatment.
- **Interface register:** dissimilar metals, isolation method, bonding points, cooling-unit cut-outs and foundation contact.
- **Verification:** certificates, inspection plan, coating readings, test reports, nonconformity limits and traceability to the active model.
- **Lifecycle response:** cleaning, inspection, touch-up materials, spare panels and field-modification procedure.

At receipt and installation, verify the delivered material markings or certificates, coating condition, repaired edges, hardware substitutions, swarf removal, drainage, seals and bonding. Photograph agreed inspection points and preserve the records with the cabinet serial or project identifier. The outdoor telecom cabinet RFQ checklist places this material schedule inside the wider load, cooling, battery, transport and acceptance package.

Standards and technical references

- IEC 61969-3:2023 — environmental requirements, tests and safety aspects for outdoor enclosures.
- ISO 9223:2012 — atmospheric-corrosivity classification, determination and estimation.
- ISO 14713-2:2019 — design guidance for articles hot-dip galvanized after fabrication.
- ISO 12944-2:2017 and ISO 12944-5:2019 — environments and paint-system selection for steel structures.
- ASTM B117-26 — controlled salt-fog test practice and its interpretation limits.
- worldstainless corrosion resources — grade, finish, chloride and cleaning

considerations for stainless steels.

Standards define methods and decision inputs; they do not establish that a particular Huijue cabinet complies. Confirm the active model, project environment, accepted standard editions, laboratory scope and complete evidence package before contract award.

Build a cabinet material schedule for your site

Send Huijue the cabinet dimensions, installed equipment, mounting arrangement, site exposure, service interval and operator requirements. Our engineering team can compare available material and finishing routes and identify the model-specific evidence still required.

Request a cabinet material review

Related engineering resources

Outdoor Telecom Cabinet Guide
Single-Wall vs Double-Wall Cabinets
IP55 vs IP65 Telecom Cabinets
Outdoor Telecom Cabinet RFQ Checklist

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