

Nickel Alloy Scrap Specification — Superalloy, Corrosion-Resistant and High-Nickel Arisings

Material category: Nickel and nickel alloy scrap

Nickel and nickel alloy scrap: solids, plate and pipe offcuts, process equipment, fabrication arisings and turnings from nickel-base corrosion-resistant and high-temperature alloy families, segregated by grade where possible and evaluated lot by lot.

Nickel alloy scrap is the most grade-sensitive stream in the specialty group: the same physical piece can be worth very different things depending on which alloy family it belongs to. This specification describes the accepted forms, why segregation dominates value, and what has to be verified rather than assumed.

Material description

Nickel-base alloys are specified where steel and stainless steel fail: strongly corrosive process chemistry, sour service, sea water, high-temperature oxidation and creep. That service history is what produces the scrap. Typical sources are decommissioned chemical and petrochemical process equipment, heat exchangers and reactor internals, aerospace and gas-turbine manufacturing arisings, fabrication offcuts from specialist workshops, and machining turnings from companies working nickel-base bar and plate.

Unlike commodity stainless, nickel alloys are traded close to grade. A corrosion-resistant nickel-molybdenum alloy, a nickel-chromium-iron heat-resisting alloy and a precipitation-hardening aerospace superalloy look broadly similar in a skip and have very different destinations. Segregation, documentation and identification are therefore the substance of this specification rather than an appendix to it.

Typical material forms

- Plate, sheet and strip offcuts from fabrication, in identified grade lots where possible
- Pipe, tube, fittings, flanges and heat-exchanger tube bundles
- Bar ends, forged blanks, rings and machined component rejects
- Process equipment: vessel sections, agitators, internals and pump and valve bodies
- Turnings and chips from machining, drained and packed separately from solids
- Wire, mesh, gauze and welding-consumable arisings in clean, identified condition

Specification table (typical characteristics)

Material category	Nickel and nickel alloy scrap (secondary raw material)
Accepted forms	Plate, sheet, pipe, tube, fittings, bar ends, process equipment, fabrication offcuts, turnings
Typical alloy families	Ni-Cu, Ni-Cr and Ni-Cr-Fe, Ni-Mo and Ni-Cr-Mo, precipitation-hardening superalloys, commercially pure nickel
Composition	Chemistry is grade-dependent. This page does not state a guaranteed composition: alloy family, element ranges and any deleterious-element limits must be confirmed for the specific lot by material identification, XRF or OES analysis, mill certificates where available, or an agreed inspection before shipment.
Grade segregation	Segregation by grade at source materially affects evaluation; unidentified material is packed and labelled as unidentified
Identification	XRF or OES screening on prepared surfaces, supported by mill certificates, heat numbers and piece marking where they survive

Common contamination	Steel and stainless attachments, insulation and refractory, gaskets, coatings, process residue, free liquid in turnings
Exclusions	Sealed or pressurised assemblies, radioactive or chemically hazardous equipment, uncleaned process vessels, clad plate offered as solid alloy
Preparation	Steel and insulation removed where practical; oversized equipment cut to agreed size; turnings drained and packed separately
Typical packaging	Strapped bundles, boxes or bins for solids; closed drums or agreed bulk packaging for turnings; labelled by grade where known
Inspection	Third-party inspection can be arranged at the loading location; scope and appointment agreed in the sales contract
Documentation	Commercial invoice, packing list and transport documents; mill certificates or analysis where they exist and have been agreed; waste-shipment and customs documentation as required by the specific trade lane

Common contamination and deduction factors

- Carbon steel and stainless steel fittings, flanges, supports and frames attached to nickel alloy components
- Insulation, refractory lining, gasket material, ceramic packing and internal catalyst residue
- Paint, plating, cladding and weld overlay where the base metal is a different material
- Process residue inside pipework and vessels; equipment must be cleaned and drained before shipment
- Free liquid, cutting fluid and grinding sludge in turnings drums
- Sealed, pressurised, radioactive or chemically hazardous equipment, which is excluded from this stream
- Clad plate, where a thin nickel alloy layer sits on a steel backing and the piece is mostly steel by weight

Inspection and analysis

Identification of nickel alloys is instrument work, not visual work. Screening on a ground clean surface separates the principal families and detects steel and stainless carry-over; it is the routine sorting tool for this stream and is used before packing rather than after arrival.

Contractual chemistry is different in kind. Melt-based or drilled-sample laboratory analysis with an agreed sampling plan is what establishes a figure that can be relied on, particularly for lots containing clad, welded or overlaid material where a surface reading describes the surface and not the piece.

- Handheld XRF reads a small surface area of the piece it is pointed at; scale, paint, plating, coatings, oxide and machining residue all bias that reading.
- Handheld instruments read alloying elements well but are weak or blind on light elements — carbon in particular — so they cannot separate grades that differ mainly by carbon content.
- A reading on one piece is not a lot average. Mixed-grade lots require representative sampling across packages, layers and size fractions before a figure is treated as commercially meaningful.
- Screening results are used to sort and to open a price discussion. Contractual figures require the sampling protocol, laboratory method and acceptance criteria the parties have agreed in writing.

Customs classification

Customs classification for nickel-bearing secondary material depends on the actual composition and physical form of the goods, on whether the material is solid scrap, turnings, powder or residue, on the destination country and on how the competent authority in that jurisdiction interprets the material description.

Mixed-grade and mixed-family lots can create additional classification complexity, because the description of the goods on the invoice and packing list must reflect what is actually shipped rather than the best fraction in the load.

Nautica does not assign a definitive tariff code in advance for this stream. Buyers and importers should confirm the

applicable classification, duty treatment and any import licensing or waste-shipment obligation with their own customs broker or the competent customs authority for the destination before contracting.

Documentation

Commercial invoice, packing list, transport documents and any customs, waste-shipment or licensing documentation required for the specific trade lane. Documentary requirements are confirmed per shipment and per destination.

Commercial and specification disclaimer

This document describes typical characteristics of a secondary raw material stream. Scrap of this type is heterogeneous by nature: composition, alloy or binder content, contamination and recoverable content vary between lots and within a single lot.

Nothing on this page constitutes a guaranteed specification, a warranty of composition, a declaration of purity or an offer capable of acceptance. Guaranteed specifications, tolerances, sampling protocol, analysis method, acceptance criteria, deduction mechanics and rejection rights exist only where they are written into the signed sales contract between buyer and seller for a specific lot.

Where a buyer requires assured values, those values must be defined contractually and verified by an agreed inspection or analysis procedure before shipment.

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