

High Speed Steel Scrap Specification — M-Series and T-Series Tooling Arisings

Material category: High speed steel (HSS) scrap

High speed steel scrap: worn and reground tooling, broken tools, blanks, bar ends and turnings from molybdenum-series and tungsten-series HSS families, evaluated lot by lot after identification and any agreed analysis.

High speed steel is bought for the tungsten, molybdenum, vanadium and cobalt it carries, which is why it is graded and priced quite differently from ordinary steel scrap. This specification covers the accepted forms, the alloy families, and above all the separation discipline between HSS and cemented carbide that governs the commercial outcome for both streams.

Material description

High speed steel is a highly alloyed tool steel that retains hardness at cutting temperature. Its value in the secondary market comes from the alloying elements rather than the iron: tungsten and molybdenum principally, with vanadium, chromium and in the higher grades cobalt. Recovery routes are typically remelt into new tool steel or use as an alloy addition, and both care about which family the material belongs to.

The material arrives from machine shops, tool rooms, regrinding services, saw and broach manufacturers, and from the tool cribs of any plant that consumes drills, taps, reamers, milling cutters and blades. Most collections are aggregated over months, which means a single drum can span many tool types and several families.

Typical material forms

- Worn and end-of-life drills, taps, reamers, milling cutters, broaches and hobs
- Saw blades and blade segments, including bi-metal blades described as such
- Broken tool bodies, shanks and flute sections
- Unused and reject blanks, bar ends and forged tool blanks from manufacture
- Regrind rejects and quality-control rejects from tool production
- HSS turnings, chips and grinding solids, drained and packed as their own fraction

Specification table (typical characteristics)

Material category	High speed steel (HSS) tooling scrap (secondary raw material)
Accepted forms	Drills, taps, reamers, milling cutters, broaches, hobs, saw blades, blanks, bar ends, regrind rejects, turnings
Typical alloy families	M-series (molybdenum-based) and T-series (tungsten-based) HSS, with cobalt-bearing variants inside both; PM grades identified by marking where available
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.
Primary sorting requirement	Separation of HSS from cemented carbide by weight, file test, spark test and XRF screening before packing
Identification	Spark and file testing in the workshop; XRF on a clean surface for family placement. Carbon is not read usefully by handheld XRF

Common contamination	Carbide tooling and tips, bi-metal blades, holders and collets, plastics and packaging, oil, coolant and grinding sludge
Exclusions	Fire-damaged or unidentified mixed metal fractions, sealed assemblies, tooling contaminated with hazardous process residue
Preparation	Holders and non-tool hardware removed where practical; fractions separated and labelled; free liquid drained
Typical packaging	Closed steel drums, boxes or bins filled by weight, palletised and labelled by fraction
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

- Cemented carbide tooling mixed into the HSS fraction, and vice versa
- Carbide-tipped tools where the body is steel and the tip is a different material
- Bi-metal blades presented as solid HSS rather than as their own fraction
- Steel tool holders, collets, sleeves, adaptors, chucks and arbors
- Plastic tool cases, sleeves, caps, cardboard packaging and wooden pallet debris
- Cutting oil, coolant and free water in drums, and grinding sludge mixed into solids
- Heavily rusted or fire-damaged tooling where condition affects the recovery route

Inspection and analysis

Screening in this stream does two jobs: it keeps carbide out of the HSS fraction, and it separates tungsten-based from molybdenum-based families where that distinction affects the destination. Both are performed on prepared surfaces across a sample of pieces rather than on a single tool.

Because handheld instruments do not read carbon usefully, grade-level designation cannot be confirmed by screening alone. Where a designation matters contractually, laboratory analysis with an agreed sampling plan is the only basis on which a figure should be relied on.

- 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 high speed steel tooling scrap 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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