ASTM INTERNATIONAL • COMMITTEE A01 · SUBCOMMITTEE A01.17 • STANDARD SPECIFICATION

A484/A484M – 10

General Requirements for Stainless Steel Bars, Billets, and Forgings

Master specification of **general delivery, chemistry, heat treatment, finish, dimensional, sampling, and inspection rules** *for 12 referenced wrought stainless steel product standards.*

EDITION

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01 Scope & Hierarchy

SECTIONS 1.1 – 1.7

This is a **general-requirements specification**, not a product specification of one grade. It bundles shared rules for bars, shapes, forgings, billets, and other wrought semi-finished material **(wire excluded)** produced to any of the 12 product specifications listed in Section 2.

12
Referenced specs
A276, A314, A458, A473, A477, A479/MA479, A564/MA564, A565/MA565, A582/MA582, A638/MA638, A705/MA705, A831/MA831

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Microstructure
Austenitic · Duplex · Ferritic · Martensitic

19
Tables + 2 Figs
Dimensional and shape tolerances

5
New-material rules
Annex A1 (mandatory)

Hierarchy of requirements

LEVEL 1	**Purchase Order** wins when it specifies **more stringent** requirements.
LEVEL 2	**Product Specification** wins over this General Specification when the two conflict.
LEVEL 3	**This General Spec (A484/A484M)** applies as default where no stricter rule exists.
HARD LIMIT	**PO shall never** waive or relax a test requirement mandated by the product spec or this spec.

Units

SI units and inch-pound units are **regarded as standard independently**; they are not exact equivalents and **shall not be mixed**. Unless an "M" designation is ordered, material is furnished to inch-pound units.

BOUNDARY

Flat-rolled stainless steel products other than bars fall under **A480/A480M**. Coiled wire and wire rods fall under **A555/A555M**. Always pair this spec with the applicable product spec.

02 Referenced Product Specifications

SECTION 2.1

The 12 product specs that A484/A484M covers. Where a spec is marked withdrawn, the historical last-approved version can be retrieved from ASTM website.

A276	**Stainless Steel Bars and Shapes**
A314	**Stainless Steel Billets and Bars for Forging**
A458	**Alloy Steel Bars for High Strength at Elevated Temperatures** hot-worked, hot-cold-worked, cold-worked WITHDRAWN
A473	**Stainless Steel Forgings**
A477	**Alloy Steel Forgings and Forging Billets for High Strength at Elevated Temperatures** WITHDRAWN
A479/MA479	**Stainless Steel Bars and Shapes for Boilers and Other Pressure Vessels**
A564/MA564	**Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes**
A565/MA565	**Martensitic Stainless Steel Bars for High-Temperature Service**
A582/MA582	**Free-Machining Stainless Steel Bars**
A638/MA638	**Precipitation Hardening Iron Base Superalloy Bars, Forgings, and Forging Stock for High-Temperature Service**
A705/MA705	**Age-Hardening Stainless Steel Forgings**
A831/MA831	**Austenitic and Martensitic Stainless Steel Bars, Billets, and Forgings for Liquid Metal Cooled Reactor Core Components** WITHDRAWN

Referenced test and general specs

ASTM test and companion specifications

SECTION 2.1

Designation	Purpose
A262	Detection of intergranular attack in austenitic stainless steels (Practice E: H_2SO_4–$CuSO_4$ test, cited repeatedly).
A370	Mechanical testing of steel products — tension, Brinell, Rockwell, Charpy V-notch impact.
A480/A480M	General requirements for flat-rolled plate, sheet, strip.
A555/A555M	General requirements for stainless steel wire and wire rods (wire is excluded from this spec).
A700	Packaging, marking, and loading methods for shipment (default for Section 19).
A751	Chemical analysis methods — basis for both heat and product analysis.
E112	Determination of average grain size.
E139	Creep, creep-rupture, and stress-rupture testing.

Federal Standards Fed. Std. No. 123 / 183, Military Standards MIL-STD-129 / MIL-STD-163, and AIAG Primary Metals Bar Code Standard are also referenced.

03 Terminology

SECTION 3

Classification is by **production path + size + shape**. Which term applies determines the table of dimensional tolerances and the rules for lotting and testing.

Bars Noun

Straight lengths produced by hot deformation — rolling, forging, or extrusion. Cross-sections include round, rectangular, and complex. **All shapes under 5 in. [125 mm]** classify as bars. Hot-rolled flats ≤10 in. [250 mm] wide and ≥0.125 in. [3.00 mm] thick are bars; flats cut from strip/plate classify as bars when their long direction is parallel to the final rolling direction.

Billets Noun

Semi-finished products (rolled, forged, or continuously cast) that require subsequent hot working. Typical cross-section area **≤ 36 in.² [230 cm²]**, square or rectangular, and width < 2× thickness. Rectangular sections with width ≥ 2× thickness classify as slabs or sheet bars.

Blooms Noun

Semi-finished products (rolled or continuously cast) that require subsequent hot rolling or forging. Typical cross-section area **> 36 in.² [230 cm²]**, same shape criteria as billets.

Forgings Noun

Parts — bars, billets, semi-finished, or complex shapes — produced by hot mechanical working using hammers, presses, or forging machines.

Shapes Noun

Bar stock with a cross-section **other than circular, rectangular, or hexagonal**.

Slabs / Sheet Bars Noun

Products typically produced by blooming, slabbing, sheet-bar mills, or continuous casting, shipped without further hot working to be processed into plate, sheet, or strip. Heat treating, cutting to shape, or surface conditioning is permitted.

NOTE 1 All cold-reduced flat material under **0.1875 in. [5.00 mm]** thick and **0.375 in. [9.50 mm]** wide or greater is classified as **strip**, not bar.

Length terms

Length categories

Term	Definition
Dead / Exact Lengths	Hot-sheared, hot-sawed, or machine-cut bars (after machine straightening) that meet the length tolerances listed in this spec.
Multiple Lengths	Ordered to a predetermined number of length units; conventionally **1/4 in. [6.5 mm] allowance per unit** for cutting to guarantee the required count.
Random Lengths	A range not less than **24 in. [1 m]**, e.g. 10–12 ft [3–4 m], 14–17 ft [4–5 m], 15–20 ft [5–6 m].

Condition vs Finish

Condition

Identification of the **final step(s) in thermomechanical processing** describing the metallurgical state as delivered — e.g. hot-worked; hot-worked and annealed; hot-worked, annealed, and cold-worked; hot-worked, quenched, and tempered.

Finish

Description of the **surface finish and applicable dimensional tolerance category**, identified by the process applied — e.g. blasting, pickling, rough turning, machine straightening, centerless grinding, polishing, or light cold drawing for surface quality only (not mechanical properties).

04 Ordering Information

SECTION 4.1

Purchaser is responsible for specifying all requirements. The 12 items below form the contract checklist; omitting any may invalidate acceptance.

Ordering Checklist
4.1.1 – 4.1.12

#	Item	Notes
1	**Quantity**	Weight or number of pieces.
2	**Dimensions**	Shape/form, diameter or width + thickness, length, prints/sketches as needed.
3	**Type or UNS designation**	e.g. Type 304 or S30400.
4	**ASTM spec number and year**	Year only when not the latest edition.
5	**Condition**	See Section 5 and Terminology 3.1.3.1.
6	**Finish**	See Section 8.
7	**Supplementary Requirements**	When invoked.
8	**Bar origin**	Rolled as bar vs. cut from strip or plate, where applicable.
9	**Preparation for delivery**	Packaging, protection, etc.
10	**Marking requirements**	See Section 18.
11	**Surface preparation for shapes**	Applicable to shapes only.
12	**Special requirements**	Any other agreed items.

TYPICAL ORDER DESCRIPTION

`5000 lb [2000 kg] — 1.000 in. [25 mm] round bar × 10 to 12 ft [3 to 4 m] — Type 304 or S30400 — Spec A479/A479M — annealed, centerless ground — plus optional requirements such as special marking instructions.`

05 Chemical Composition

SECTION 6

Two-tier regime: **heat analysis** verifies what the melt contained; **product analysis** verifies what was delivered. They are judged against different baselines — product analysis uses Table 1 tolerances relative to the product specification's compositional limits.

Heat or cast analysis (6.1)

- Per heat, determined by **A751** from a sample taken **during pouring** or later in the manufacturing flow.
- Shall conform to the **product specification's** chemical range for each specified element.
- **Uns specified elements and residuals**: no practical need to limit them. Producer may analyze and report them. Their presence or report is **not a basis for rejection** unless they impair a property normally expected for that metal.
- Purchaser may **add a maximum limit for any unspecified element** in the PO — acknowledged requirements become specified elements.
- Purchaser may **tighten** requirements (raise minimums, lower maximums) but may **never relax** them.
- Limits shall be established for **specific elements**, not groups (all others, rare earths, balance) unless all members of the group have equivalent technical effect and are grouped in typical analysis methods.

Product analysis tolerances (Table 1 — selected elements)

Table 1 applies **only to product analysis**, not to heat analysis. Tolerances are relative to the product specification's compositional upper (or lower) limit.

TABLE 1 — Product Analysis Tolerances (selected)
FULL TABLE IN ASTM ORIGINAL · % COMPOSITION

Element	Specified range / maximum	Tolerance over max / under min
Carbon (C)	to 0.010 incl	0.002
	over 0.010 – 0.030 incl	0.005
	over 0.030 – 0.20 incl	0.01
	over 0.20 – 0.60 incl	0.02
	over 0.60 – 1.20 incl	0.03
	...	...
Manganese (Mn)	1.00 / 3.00 / 6.00 / 10.00 / 15.00 / 20.00	0.03 / 0.04 / 0.05 / 0.06 / 0.10 / 0.15
Chromium (Cr)	4–10 / 10–15 / 15–20 / 20–30	0.10 / 0.15 / 0.20 / 0.25
Nickel (Ni)	≤1 / 1–5 / 5–10 / 10–20 / 20–30 / 30–40 / >40	0.03 / 0.07 / 0.10 / 0.15 / 0.20 / 0.25 /
Molybdenum (Mo)	0.20–0.60 / 0.60–2.00 / 2.00–7.00 / 7.00–15.00 / 15.00–30.00	0.03 / 0.05 / 0.10 / 0.15 / 0.20
Nitrogen (N)	≤0.02 / 0.02–0.19 / 0.19–0.25 / 0.25–0.35 / 0.35–0.45 / >0.45	0.005 / 0.01 / 0.02 / 0.03 / 0.04 / 0.05
Phosphorus (P)	≤0.040 / 0.040–0.20	0.005 / 0.010
Sulfur (S)	≤0.040 / 0.040–0.20 / 0.20–0.50	0.005 / 0.010 / 0.020
Silicon (Si)	≤1.00 / 1.00–3.00 / 3.00–6.00	0.05 / 0.10 / 0.15
Aluminum (Al)	≤0.15	−0.005 / +0.01 (asymmetric)
Copper (Cu)	≤0.50 / 0.50–1.00 / 1.00–3.00 / 3.00–5.00 / 5.00–10.00	0.03 / 0.05 / 0.10 / 0.15 / 0.20
Titanium (Ti)	≤1.00 / 1.00–3.00 / >3.00	0.05 / 0.07 / 0.10
Tungsten (W)	≤1.00 / 1.00–2.00 / 2.00–5.00 / 5.00–10.00 / 10.00–20.00	0.03 / 0.05 / 0.07 / 0.10 / 0.15
Cobalt (Co)	0.05–0.50 / 0.50–2.00 / 2.00–5.00 / 5.00–10.00 / 10.00–15.00 / 15.00–22.00 / 22.00–30.00	0.01 / 0.02 / 0.05 / 0.10 / 0.15 / 0.20 /
Columbium + Tantalum	≤1.50 / 1.50–5.00 / >5.00	0.05 / 0.10 / 0.15

NOTE For Aluminum ≤ 0.15, the tolerance is **asymmetric**: −0.005 (below lower limit) and +0.01 (above upper limit). Tolerances for V, Se, and Ta also tabulated in the original.

Cross-grade rejection rule (6.3)

The steel shall not contain an unspecified element for the ordered grade to the extent that it would conform to the requirements of **another grade** — provided (a) the other grade is within the scope of the product spec and (b) that element has a specified minimum in that other grade. A guardrail against grade ambiguity.

06 Heat Treatment

SECTION 7

Microstructure-specific rules apply unless the product spec states otherwise. Table 2 (next page) is the execution reference for annealing temperatures.

Austenitic grades (7.2)

- Except strain-hardened (7.2.4), hot-rolled (7.2.5), and UNS N08020 (7.2.6), all austenitic stainless steels shall be furnished in the **solution annealed** condition per Table 2; light cold drawing for cold finishing and straightening is permitted afterward.
- Annealing may be by **separate annealing** (heat → hold → quench) or **process annealing** (complete hot working above the minimum temperature, then rapid cool) — at the manufacturer's option, unless Table 2 states otherwise.
- Solution-annealed austenitics shall be **capable** of passing **A262 Practice E**, but the test is **only required when the purchase order specifies it**.

> STABILIZED GRADES (321, 321H, 347, 347H, 348, 348H)
>
> Annealing temperatures **above 1950 °F [1065 °C]** may impair intergranular corrosion resistance after subsequent sensitizing exposures. If IGC is a concern, specify **A262 Practice E** on specimens given a sensitizing treatment. Temperatures **below 1800 °F [980 °C]** for stabilization annealing should be evaluated against the corrosive medium — they are not universally effective.

Duplex grades (7.3)

All duplex grades shall be furnished **solution annealed** per Table 2. Separate annealing consists of heating to the minimum temperature, holding to dissolve intermetallic phases, and rapid cooling to prevent their precipitation. Process annealing completes hot working above the minimum temperature and rapid-cools.

Ferritic grades (7.4)

Ferritic grades shall be annealed to meet their mechanical testing requirements, as specified in the applicable product specification. This spec does not prescribe annealing temperatures for ferritics — the performance outcome is the criterion.

Martensitic grades (7.5)

All martensitic grades shall be supplied in either the **annealed** or **tempered** condition as specified. Tempered material shall be normalized, or liquid-quenched from **1700 °F [925 °C] minimum**, then tempered per 7.5.2 / 7.5.3 / 7.5.4. Tempering hold time is **at least 1 h/in. (25.4 mm) of cross section**.

Martensitic tempering conditions

Grade / Condition	Tempering range
403, 410 — Condition 1	1250 °F [675 °C] min – 1400 °F [760 °C] max
403, 410 — Condition 2	1100 °F [595 °C] min – 1400 °F [760 °C] max
403, 410 — Condition 3	1050 °F [565 °C] min – 1400 °F [760 °C] max
XM-30, 414, 431	1100 °F [595 °C] min, 1400 °F [760 °C] max
S41500	Heat to min 1750 °F [955 °C], air-cool to 200 °F [95 °C] or lower, final temper **1050–1150 °F [565–620 °C]** only.

TABLE 2 — Annealing requirements

TABLE 2 — Annealing Requirements
MINIMUM TEMPERATURE, COOLING/TESTING, PERMITTED ANNEALING PROCEDURE

Designation / Type	Temperature [A]	Cooling / Test	Separate	Process
AUSTENITIC (CHROMIUM-NICKEL) · AUSTENITIC (CHROMIUM-NICKEL-MANGANESE)				
All austenitic grades except those listed below	1900 °F [1040 °C]	C	×	×[D]
All Cr-Ni-Mn grades; 302, S30215, S30452, S30600, S30615, 308, S30815, S30880, 309, 309S, 310, 310S, 314, 317, S31725, S31726, S32615, S38100	1900 °F [1040 °C]	E	×	×[D]
309Cb, 310Cb, 316Cb, 316Ti, 321, 347, 348	1900 °F [1040 °C]	E	×	—
304H, 309H, 310H, 316H	1900 °F [1040 °C]	E	×	—
321H, 347H, 348H — hot-worked	1925 °F [1050 °C]	E	×	—
321H, 347H, 348H — cold-worked	2000 °F [1095 °C]	E	×	—
S31254, S32050	2100 °F [1150 °C]	E	×	—
S31727, S32053	1975–2155 °F [1080–1180 °C]	E	×	—
S33228	2050–2140 °F [1120–1170 °C]	E	×	—

Designation / Type	Temperature [A]	Cooling / Test	Separate	Process
S34565	2050–2140 °F [1120–1170 °C]	E	×	—
S35315	2010 °F [1100 °C]	E	×	—
N08367	2025 °F [1105 °C]	E	×	—
N08700	2000 °F [1095 °C]	E	×	—
N08020	1700–1850 °F [930–1010 °C]	E	×	—
N08904	2000 °F [1095 °C]	E	×	—
AUSTENITIC-FERRITIC (DUPLEX)				
S32100	1900 °F [1040 °C]	E	×	×[F]
S31260	1870–2010 °F [1020–1100 °C]	E	×	×[F]
S31803	1900 °F [1040 °C]	E	×	×[F]
S32101	1870 °F [1020 °C]	E	×	×[F]
S32202	1800–1975 °F [980–1080 °C]	E	×	×[F]
S32205	1900 °F [1040 °C]	G	×	×[F]
S32304	1800 °F [980 °C]	E	×	×[F]
S32506	1870–2050 °F [1020–1120 °C]	E	×	×[F]
S32550	1900 °F [1040 °C]	E	×	×[F]
S32750	1880–2060 °F [1025–1125 °C]	E	×	×[F]
S32760	2010 °F [1100 °C]	E	×	×[F]
S32900	1750 ± 25 °F [955 ± 15 °C]	E	×	×[F]
S32906	1830–2100 °F [1000–1150 °C]	E	×	×[F]
S32950	1850 ± 25 °F [1010 ± 15 °C]	E	×	×[F]

A Minimum annealing temperature unless otherwise specified.

C Quenched in water or rapidly cooled by other means at a rate sufficient to prevent carbide reprecipitation (capable of passing A262 Practice E — test not required unless PO specifies).

D Minimum finish temperature for hot rolling shall be 1750 °F [1010 °C].

E Quenched in water or rapidly cooled by other means.

F Minimum finish temperature for hot rolling shall be the minimum temperature for separate annealing.

G Quenched in water.

07 Finish

SECTION 8

Finish defines both the **surface state** and the **dimensional tolerance category**. Hot-finished bars use looser tolerances; cold-finished bars use tighter tolerances.

Six permitted finish categories

SECTION 8.1

Ref	Category	Key rule
8.1.1	**Hot-Finished Bars**	Surface resulting from hot processing, with optional additional operations — annealing / heat treatment, blasting, pickling, rough turning, machine straightening. Producer may also use centerless grinding or polishing for improved tolerances or surface condition. Tolerances **looser** than cold-finished.
8.1.2	**Bars Cut from Strip or Plate**	Two **pickled or descaled** surfaces + two cut surfaces. If the bar is heat treated after cutting, **all surfaces** shall be descaled or pickled.
8.1.3	**Cold-Finished Bars**	Further processed from hot-finished bars by light cold drawing, burnishing, centerless grinding, polishing — for closer tolerances and improved surface. Tolerances **tighter** than hot-finished.
8.1.4	**Reforging Stock (bars, billets, semi-finished)**	Shall be delivered **hot-finished**. Surface conditioning is permitted if it does not compromise the final forging.
8.1.5	**Shapes**	Descaled by machining, grinding, blasting, or pickling. Class A **or** Class C surface preparation as specified: A grinds hazardous imperfections (fins, tears, jagged edges); C grinds **all visible** surface imperfections. Both limited by (a) underweight tolerance and (b) max grind depth = **10 % of section thickness** at any point.
8.1.6	**Forgings**	Descaled by machining, blasting, or pickling. Method choice is producer's option unless PO specifies otherwise.

08

Dimensions & Tolerances

SECTION 9 · TABLES 3 – 19 · FIGS. 1 – 2

Tolerance family

Section 9 index

TABLES AND FIGURES TO APPLY BY PRODUCT FORM

Product	Applies to
Bars	Tables 3 – 12.
Shapes	Tables 13 – 19 and Figs. 1 – 2.
Forgings	As specified on the purchase order, or prints / sketches accompanying it.
Billets / reforging stock	Conform to purchaser-specified shape and dimensions within **± 5 %** permitted variation.

TABLE 3 — Hot-finished round, turned, and square bars

TABLE 3 — Permitted Variations in Size

HOT-FINISHED ROUND, TURNED [A], AND SQUARE BARS · IN. [MM]

Specified Size	Over	Under	Out-of-Round [B] / Out-of-Square [C]
5/16 – 7/16 [8.00 – 11.00], incl [D]	0.006 [0.15]	0.006 [0.15]	0.009 [0.23]
Over 7/16 – 5/8 [11.00 – 15.50], incl [D]	0.007 [0.18]	0.007 [0.18]	0.010 [0.26]
Over 5/8 – 7/8 [15.50 – 22.00], incl	0.008 [0.20]	0.008 [0.20]	0.012 [0.30]
Over 7/8 – 1 [22.00 – 25.00], incl	0.009 [0.23]	0.009 [0.23]	0.013 [0.34]
Over 1 – 1 1/8 [25.00 – 28.00], incl	0.010 [0.25]	0.010 [0.25]	0.015 [0.38]
Over 1 1/8 – 1 1/4 [28.00 – 31.50], incl	0.011 [0.28]	0.011 [0.28]	0.016 [0.42]
Over 1 1/4 – 1 3/8 [31.50 – 34.50], incl	0.012 [0.30]	0.012 [0.30]	0.018 [0.46]
Over 1 3/8 – 1 1/2 [34.50 – 38.00], incl	0.014 [0.35]	0.014 [0.35]	0.021 [0.53]
Over 1 1/2 – 2 [38.00 – 50.00], incl	1/64 [0.40]	1/64 [0.40]	0.023 [0.60]
Over 2 – 2 1/2 [50.00 – 63.00], incl	1/32 [0.80]	0	0.023 [0.60]
Over 2 1/2 – 3 1/2 [63.00 – 90.00], incl	3/64 [1.20]	0	0.035 [0.90]
Over 3 1/2 – 4 1/2 [90.00 – 115.00], incl	1/16 [1.60]	0	0.046 [1.20]
Over 4 1/2 – 5 1/2 [115.00 – 140.00], incl	5/64 [2.00]	0	0.058 [1.50]
Over 5 1/2 – 6 1/2 [140.00 – 165.00], incl	1/8 [3.00]	0	0.070 [1.80]
Over 6 1/2 – 8 [165.00 – 200.00], incl	5/32 [4.00]	0	0.085 [2.20]
Over 8 – 12 [200.00 – 300.00], incl [A]	3/16 [4.80]	0	3/32 [2.40]
Over 12 – 15 [300.00 – 400.00], incl [A]	7/32 [5.50]	0	7/64 [2.80]
Over 15 – 25 [400.00 – 625.00], incl [A]	1/4 [6.50]	0	1/8 [3.20]

A Turned bars are available from 2 to 25 in. [50 to 625 mm] diameter. **Over 8 in. [200 mm], only turned bars**.

B Out-of-round = difference between max and min diameter at the same cross-section.

C Out-of-square = difference between the two face-to-face dimensions at the same cross-section.

D Size tolerances not evolved for coils of 5/16 in. [8.00 mm] to approximately 5/8 in. [15.5 mm] diameter produced on rod mills.

Figure 1 — Hot-finished round bar tolerances by size EXTRACTED FROM TABLE 3

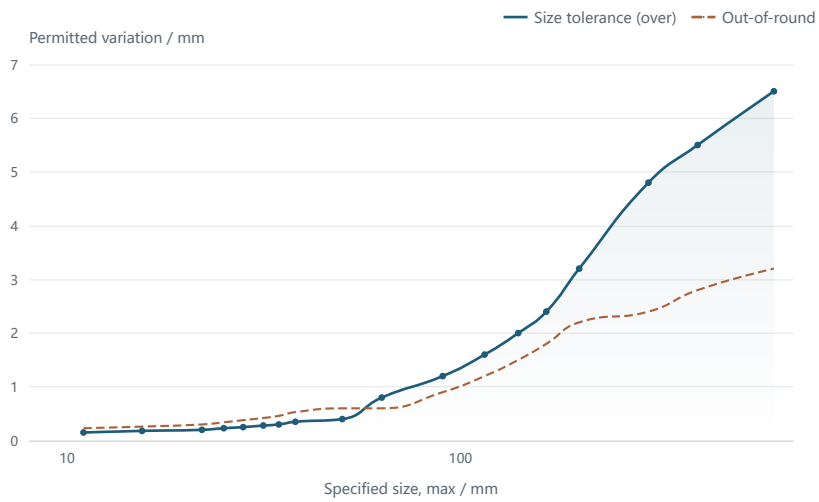

TABLE 7 — Cold-finished round bars

TABLE 7 — Permitted Variations in Size of Cold-Finished Round Bars
IN. [MM]

Specified Size	Permitted Variation [A,B]
1/16 – 5/16 [1.50 – 8.00], excl	0.001 [0.03]
5/16 – 1/2 [8.00 – 13.00], excl	0.0015 [0.04]
1/2 – 1 [13.00 – 25.00], excl	0.002 [0.05]
1 – 1 1/2 [25.00 – 38.00], excl	0.0025 [0.06]
1 1/2 – 3 1/4 [38.00 – 83.00], incl [C]	0.003 [0.08]
3 1/4 – 4 [83.00 – 100], incl [C]	0.005 [0.13]

A Symmetric over/under by default. May be reallocated (all over, all under, or mixed) as long as the **total spread is not less** than shown.

B Double these tolerances if heat treating (or heat treating + pickling) is necessary after cold finishing.

C Cold-finished bars over 4 in. [100 mm] diameter are produced but tolerances are not included in this spec.

Straightness (Table 12)

- **Hot-finished**: 1/8 in. [3.00 mm] in any 5 ft [1.50 m]; total = 1/8 in. × (length ft / 5) [m / 1.50].
- **Cold-finished**: 1/16 in. [1.5 mm] in any 5 ft [1.5 m]; total = 1/16 in. × (length ft / 5) [m / 1.50].
- Sizes < 1/2 in. [6.50 mm] — no straightness tolerances established.

09 Sampling & Lot Definition

SECTION 11

Three-tier definition of "lot"
SECTION 11.1 – 11.2.3

Purpose / Case	Lot definition
Product analysis	All bars, shapes, or forgings from the same heat.
Mechanical / corrosion tests	All bars of the same size, or forgings < 1000 lb [500 kg] each, from the same heat and **same processing conditions**. Austenitic, ferritic, duplex, free-machining, martensitic annealed to Condition A, and precipitation/age-hardening grades in solution-treated condition **may be heat treated in one or several furnaces under controlled conditions** (see Appendix X1). When martensitic steels are heat treated to Condition T or H, and when precipitation-hardening grades are age hardened, the lot is **same size, same heat, same heat-treat charge** — or same conditions in a continuous furnace.
Forgings 1000 – 5000 lb	One size classification per heat per heat-treat charge (continuous furnace: per 8 h or less).
Forgings 5000 – 7000 lb	Each piece = one lot.
Forgings > 7000 lb	Each piece = **double lot**. Two tension tests required — one from each end. For ring forgings, specimens from two locations on the periphery approximately 180° apart and from opposite ends where practicable.

10 Tests & Retests

SECTIONS 12 – 14

- Per heat: **one chemical analysis sample**.
- Per lot of bars/shapes and per lot of forgings: **one mechanical test sample**. Bars/shapes are tension-tested in the longitudinal direction (except bars cut from strip/plate — conform to the strip/plate product spec and A480/A480M). Hardness tests on bars are conducted **midway between center and surface**.
- Intergranular corrosion test (when required) and grain size test (when required): **one per lot**.
- If any specimen shows defective machining or flaws, discard and substitute.
- If a test fails, retest **two new specimens**. Failure of one retest specimen rejects the lot.
- If failure is attributable to inadequate heat treatment, producer may **reheat treat and resubmit** (Section 13).

Test methods (Section 14)

Properties and test method designations

Property / Item	Method
Chemical analysis	A751
Tension	A370
Stress rupture	E139
Brinell / Rockwell hardness	A370
Intergranular corrosion	A262 Practice E
Grain size	E112
Charpy V-notch impact	A370

11 Inspection to Packaging

SECTIONS 15 – 19

Inspection (15)

Civilian procurement: by agreement between purchaser and supplier as part of the purchase contract.

Government procurement: unless contract specifies otherwise — (a) seller is responsible for all inspection and test requirements; (b) seller may use own or other suitable facilities; (c) purchaser has the right to perform any of the inspections and tests set forth, and the manufacturer shall afford all reasonable facilities.

Rejection & rehearing (16)

Purchaser may reject non-conforming material and shall notify the producer or supplier promptly, preferably in writing. If dissatisfied with the results, producer or supplier may claim a rehearing.

Certification (17)

- A certified report of test results shall be furnished at shipment, including ASTM spec designation and year/revision.
- Documents printed from an electronic data interchange (EDI) transmission **have the same validity** as the certified counterpart — the transmitting organization remains responsible for content.

Product marking (18)

Marking requirements by category

Object / Procurement	Marking
Bars & shapes · civilian	Name of manufacturer; purchaser's name and order number; ASTM spec designation; heat number; grade or type; condition; finish; where appropriate, size, length, weight. Method at manufacturer's option: hot stamp, cold stamp, paint, or tags on bundles/lifts/boxes.
Forgings · civilian	Legibly **die-stamped** with manufacturer's symbol or name, material spec designation, grade/type, and heat ID. Where die stamping is not permitted, electric pencil or electro-etching.
Government procurement	When specified, in addition to contract requirements — MIL-STD-129 (military) or Fed. Std. No. 123 (civil). For Defense Supply Agency procurement, bars and shapes shall be continuously marked per Fed. Std. No. 183.

Packaging & package marking (19)

Unless otherwise specified, packaged and loaded per **A700**. For government procurement when Level A is specified, preservation, packaging, and packing shall conform to Level A of **MIL-STD-163**.

12 Annexes & Changes

ANNEX A1 · APPENDIXES X1, X2 · SUMMARY OF CHANGES

Annex A1 (mandatory) — New materials introduction

To add a new material to a referencing specification, the application must:

1. Be submitted to the chairman of the subcommittee with jurisdiction.
2. Be accompanied by a statement from **at least one user** confirming a need for the new grade.
3. Include test data required by the applicable specification, from **at least three test lots**, each from a **different heat**.
4. Provide recommendations for **all** requirements appearing in the applicable specification.
5. State whether the new grade is covered by patent.

Appendix X1 (nonmandatory) — Lot definition rationale

A lot is "produced under the same processing conditions," i.e. same manufacturing order number, same size, same heat, same heat-treating procedure, same subsequent processing. **Single samples may represent the whole lot**, with **at least one sample per 20,000 lb of material**. Multiple furnace loads may constitute one lot when:

- Set point temperatures and process tolerances match (X1.2.1);
- Time at temperature for all thermal treatments is within **10 %** (X1.2.2);
- All furnaces used are similar in size and meet uniformity requirements of a documented furnace quality assurance program (X1.2.3);
- Quench systems are the same in volume, quenchant type, and circulation rate (X1.2.4);
- Assembled loads are handled within a relatively short time and hardness testing is performed on **at least one sample per charge** (X1.2.5).

Old "same size, heat, and heat-treat charge in a batch furnace" definition assumed heat treating is the only property-affecting process and ignored pre/post-heat-treatment processing. Sampling for mechanical properties is **not a statistical sampling plan** — uniformity assurance relies on producer's process control.

Appendix X2 (nonmandatory) — Bar coding

Committee A01 does not specifically address bar coding for steel identification but **endorses the AIAG Primary Metals Bar Code Standard** as a possible auxiliary identification method.

Summary of Changes — A484/A484M − 10 vs − 09

APPROVED MAY 1, 2010

(1) Added annealing requirements for **UNS N08904** to Table 2. The super-austenitic 904L-like grade is furnished solution annealed at **2000 °F [1095 °C]**, cooled/tested per condition E, separate annealing only.

Maintenance note

This standard is subject to revision at any time by the responsible technical committee and shall be reviewed **every five years**. If not revised, it shall be either reapproved or withdrawn.

Keywords

`general delivery requirements` `stainless steel bars` `stainless steel billets` `stainless steel forgings` `stainless steel shapes`

BOUNDARY

This digest is a structured condensation of ASTM A484/A484M − 10 for rapid understanding. It is **not** a substitute for the official ASTM publication. For contract acceptance, dispute resolution, or regulatory conformity, consult the latest ASTM standard, the applicable product specifications, and the purchase order. All table values are condensed; the full 19-table set appears in the ASTM original.

SOURCE DOCUMENT

ASTM A484/A484M − 10, Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings.

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Jurisdiction: ASTM Committee A01 (Steel, Stainless Steel and Related Alloys), Subcommittee A01.17 (Flat-Rolled and Wrought Stainless Steel). Approved for use by U.S. DoD agencies. For ASME Boiler and Pressure Vessel Code applications see SA-484/SA-484M, Section II.

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