



Designation: A314 – 23

Standard Specification for Stainless Steel Billets and Bars for Forging¹

This standard is issued under the fixed designation A314; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers stainless steel billets and bars intended only for forging.

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

A484/A484M Specification for General Requirements for Stainless Steel Bars, Billets, Shapes, and Forgings

A751 Test Methods and Practices for Chemical Analysis of Steel Products

E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

2.2 *Other Document:*

SAE J1086 Recommended Practice for Numbering Metals and Alloys³

3. Ordering Information

3.1 It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Such requirements may include but are not limited to the following:

- 3.1.1 Quantity (weight or number of pieces),
- 3.1.2 Name of material: type or UNS designation (Table 1),
- 3.1.3 Condition,

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.17 on Flat-Rolled and Wrought Stainless Steel.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

3.1.4 Cross section (round, round-cornered square, and so forth),

3.1.5 Form: bar or forging billet,

3.1.6 Applicable dimensions, including size, thickness, width, and length,

3.1.7 ASTM designation and date of issue,

3.1.8 Preparation for delivery (see Specification A484/A484M),

3.1.9 Marking (see Specification A484/A484M), and

3.1.10 Exceptions to the specification or special requirements.

3.2 If possible, the intended use of the item should be given on the purchase order especially when the item is ordered for a specific end use or uses.

NOTE 1—A typical ordering description is as follows: 10 000 lb, Type 420, annealed, round-cornered square billets, ASTM A314 dated _____ for valve parts.

4. Manufacture

4.1 *Annealing*—Blooms and billets of the 400 series of stainless steel types which are highly hardenable, such as Types 414, 420, 431, 440A, 440B, and 440C, are commonly annealed prior to shipment and so specified in order to avoid the possibility of thermal cracking. Those grades are not normally furnished in the as-rolled or as-forged condition. Other hardenable grades, such as Types 403, 410, 416, and 416 Se, which may also require annealing, depending on their composition and size, are furnished suitable for cold cutting when so specified on the purchase order.

4.2 *Conditioning*—Material may be conditioned by chipping or grinding to remove injurious surface defects provided the depth of conditioning does not exceed that which will affect the surface condition or dimensions of the article to be forged from the bar or billet.

5. Chemical Composition

5.1 The steel shall conform to the chemical composition prescribed in Table 1 for the respective grades.

5.2 Methods and practices relating to chemical analysis required by this specification shall be in accordance with Test Methods, Practices, and Terminology A751.

*A Summary of Changes section appears at the end of this standard

TABLE 1 Chemical Requirements

UNS Designation ^A	Type Number ^F	Chemical Composition, % ^B									
		Carbon	Manganese	Phosphorus	Sulfur	Silicon	Chromium	Nickel	Molybdenum	Nitrogen	Other Elements ^F
Austenitic Grades											
N08020	Alloy 20	0.07	2.00	0.045	0.035	1.00	19.0–21.0	32.0–38.0	2.00–3.00	...	Cu 3.0–4.0 Nb 8 × C min, 1.00 max
N08367	...	0.030	2.00	0.040	0.030	1.00	20.0–22.0	23.5–25.5	6.0–7.0	0.18–0.25	Cu 0.75
N08800	800	0.10	1.50	0.045	0.015	1.00	19.0–23.0	30.0–35.0	...	...	Fe ^G 39.5 min Cu 0.75 Al 0.15–0.60 Ti 0.15–0.60
N08810	800H	0.05–0.10	1.50	0.045	0.015	1.00	19.0–23.0	30.0–35.0	...	...	Fe ^G 39.5 min Cu 0.75 Al 0.15–0.60 Ti 0.15–0.60
N08811	...	0.06–0.10	1.50	0.045	0.015	1.00	19.0–23.0	30.0–35.0	...	...	Fe ^G 39.5 min Cu 0.75 Al ^H 0.25–0.60 Ti ^H 0.25–0.60
N08700	...	0.040	2.00	0.040	0.030	1.00	19.0–23.0	24.0–26.0	4.3–5.0	...	Cu 0.50 Nb 8 × C min, 0.40 max
N08904	904L	0.020	2.00	0.045	0.035	1.00	19.0–23.0	23.0–28.0	4.0–5.0	0.10	Cu 1.0–2.0
N08925	...	0.020	1.00	0.045	0.030	0.50	9.0–21.0	24.0–26.0	6.0–7.0	0.10–0.20	Cu 0.80–1.50
N08926	...	0.020	2.00	0.030	0.010	0.50	9.0–21.0	24.0–26.0	6.0–7.0	0.15–0.25	Cu 0.50–1.50
S20161	...	0.15	4.00–6.00	0.040	0.040	3.00–4.00	15.00–18.00	4.00–6.00	...	0.08–0.20	...
S20200	202	0.15	7.50–10.00	0.060	0.030	1.00	17.00–19.00	4.00–6.00	...	0.25	...
S20910	XM-19	0.06	4.00–6.00	0.040	0.030	1.00	20.50–23.50	11.50–13.50	1.50–3.00	0.20–0.40	Nb 0.10–0.30 V 0.10–0.30
S21800	...	0.10	7.00–9.00	0.060	0.030	3.50–4.50	16.00–18.00	8.00–9.00	...	0.08–0.18	...
S21900	XM-10	0.08	8.00–10.00	0.060	0.030	1.00	19.00–21.50	5.50–7.50	...	0.15–0.40	...
S21904	XM-11	0.04	8.00–10.00	0.060	0.030	1.00	19.00–21.50	5.50–7.50	...	0.15–0.40	...
S24000	XM-29	0.08	11.50–14.50	0.060	0.030	1.00	17.00–19.00	2.25–3.75	...	0.20–0.40	...
S24100	XM-28	0.15	11.00–14.00	0.060	0.030	1.00	16.50–19.00	0.50–2.25	...	0.20–0.45	...
S28200	...	0.15	17.00–19.00	0.045	0.030	1.00	17.00–19.00	...	0.75–1.25	0.40–0.60	...
S30200	302	0.15	2.00	0.045	0.030	1.00	17.00–19.00	8.00–10.00	...	0.10	...
S30215	302B	0.15	2.00	0.045	0.030	2.00–3.00	17.00–19.00	8.00–10.00	...	...	...
S30300	303	0.15	2.00	0.20	0.15 min	1.00	17.00–19.00	8.00–10.00	...	...	...
S30323	303Se	0.15	2.00	0.20	0.06	1.00	17.00–19.00	8.00–10.00	...	...	Se 0.15 min
S30400	304	0.08	2.00	0.045	0.030	1.00	18.00–20.00	8.00–10.50	...	0.10	...
S30403	304L	0.030	2.00	0.045	0.030	1.00	18.00–20.00	8.00–12.00	...	0.10	...
S30500	305	0.12	2.00	0.045	0.030	1.00	17.00–19.00	10.50–13.00	...	...	...
S30800	308	0.08	2.00	0.045	0.030	1.00	19.00–21.00	10.00–12.00	...	...	...
S30900	309	0.20	2.00	0.045	0.030	1.00	22.00–24.00	12.00–15.00	...	...	...
S30908	309S	0.08	2.00	0.045	0.030	1.00	22.00–24.00	12.00–15.00	...	...	...
S30940	309Cb	0.08	2.00	0.045	0.030	1.00	22.00–24.00	12.00–16.00	...	...	Nb 10 × C min, 1.10 max
S31000	310	0.25	2.00	0.045	0.030	1.50	24.00–26.00	19.00–22.00	...	...	...
S31008	310S	0.08	2.00	0.045	0.030	1.50	24.00–26.00	19.00–22.00	...	...	...
S31266	...	0.030	2.00–4.00	0.035	0.020	1.00	23.0–25.0	21.0–24.0	5.2–6.2	0.35–0.60	Cu 1.00–2.50 W 1.50–2.50
S31400	314	0.25	2.00	0.045	0.030	1.50–3.00	23.00–26.00	19.00–22.00	...	...	...
S31600	316	0.08	2.00	0.045	0.030	1.00	16.00–18.00	10.00–14.00	2.00–3.00	0.10	...
S31603	316L	0.030	2.00	0.045	0.030	1.00	16.00–18.00	10.00–14.00	2.00–3.00	0.10	...
S31635	316Ti	0.08	2.00	0.045	0.030	1.00	16.00–18.00	10.00–14.00	2.00–3.00	...	Ti 5 × (C+N) min, 0.70 max
S31640	316Cb	0.08	2.00	0.045	0.030	1.00	16.00–18.00	10.00–14.00	2.00–3.00	...	Nb 10 × C min; 1.10 max
S31700	317	0.08	2.00	0.045	0.030	1.00	18.00–20.00	11.00–15.00	3.00–4.00	0.10	...
S32100	321	0.08	2.00	0.045	0.030	1.00	17.00–19.00	9.00–12.00	...	...	Ti 5 × (C + N) min, 0.70 max ^I
S33228	...	0.04–0.08	1.00	0.020	0.015	0.030	26.00–28.00	31.00–33.00	...	...	Nb 0.6–1.0 Ce 0.05–0.10 Al 0.025
S34700	347	0.08	2.00	0.045	0.030	1.00	17.00–19.00	9.00–13.00	...	...	Nb × C min, 1.10 max
S34800	348	0.08	2.00	0.045	0.030	1.00	17.00–19.00	9.00–13.00	...	...	Nb 10 × C min, 1.10 max, Ta 0.10 Co 0.20
S38031	...	0.015	2.0	0.020	0.010	0.3	26.0–28.0	30.0–32.0	6.0–7.0	0.15–0.25	Cu 1.0–1.5
S38926	...	0.020	2.00	0.03	0.01	0.5	19.00–21.00	24.00–26.00	6.0–7.0	0.15–0.25	Cu 0.5–1.5
Austenitic-Ferritic Grades											
S31803	...	0.030	2.00	0.030	0.020	1.00	21.0–23.0	4.5–6.5	2.5–3.5	0.008–0.20	...
S32003	...	0.030	2.00	0.030	0.020	1.00	19.5–22.5	3.0–4.0	1.50–2.00	0.14–0.20	...