Standard Specification for
Ni-Fe-Cr-Mo-Cu Alloy (UNS N08825, UNS N08221, and
UNS N06845) Plate, Sheet, and Strip

This standard is issued under the fixed designation B424; 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 Department of Defense.

1. Scope

1.1 This specification covers rolled nickel-iron-chromium-
molybdenum-copper alloy (UNS N08825, UNS N08221, and
UNS N06845) plate, sheet, and strip.

1.2 The values stated in inch-pound units are to be regarded
as standard. The values given in parentheses are mathematical
conversions to SI units that are provided for information only
and are not considered standard.

1.3 This standard does not purport to address all of the
safety concerns, if any, associated with its use. It is the
responsibility of the user of this standard to become familiar
with all hazards including those identified in the appropriate
Material Safety Data Sheet (MSDS) for this product/material
as provided by the manufacturer; to establish appropriate
safety and health practices, and determine the applicability of
regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

B425 Specification for Ni-Fe-Cr-Mo-Cu Alloy (UNS
N08825, UNS N08221, and UNS N06845) Rod and Bar
B906 Specification for General Requirements for Flat-
Rolled Nickel and Nickel Alloys Plate, Sheet, and Strip

3. Terminology

3.1 Descriptions of Terms Specific to This Standard—The
terms given in Table 1 shall apply.

4. General Requirements

4.1 Material furnished under this specification shall con-
form to the applicable requirements of Specification B906.

5. Ordering Information

5.1 It is the responsibility of the purchaser to specify all
requirements that are necessary for the safe and satisfactory
performance of material ordered under this specification.
Examples of such requirements include, but are not limited to,
the following:

5.1.1 ASTM designation and year of issue.
5.1.2 Alloy name or UNS number.
5.1.3 Condition—Table 2 and Appendix X1.
5.1.4 Finish—Appendix X1.
5.1.5 Dimensions—Thickness, width, and length.
5.1.6 Quantity.
5.1.7 Optional Requirements:
5.1.7.1 Sheet and Strip—Whether to be furnished in coil, in
cut straight lengths, or in random straight lengths.
5.1.7.2 Strip—Whether to be furnished with commercial slit
edge, square edge, or round edge.
5.1.7.3 Plate—Whether to be furnished specially flattened
(see 8.7); also how plate is to be cut (Table 3).
5.1.8 Certification—State if certification is required (Speci-
fication B906, section on Material Test Report and Certifica-
tion).
5.1.9 Samples for Product (Check) Analysis—Whether
samples for product (check) analysis should be furnished (see
Specification B906, section on Sampling).
5.1.10 Purchaser Inspection—If the purchaser wishes to
witness tests or inspection of material at the place of
manufacture, the purchase order must so state, indicating
which tests or inspections are to be witnessed (Specification
B906, section on Inspection).

6. Chemical Composition

6.1 The material shall conform to the composition limits
specified in Table 4.

6.2 If a product (check) analysis is performed by the
purchaser, the material shall conform to the product (check)
analysis per Specification B906.

*A Summary of Changes section appears at the end of this standard
TABLE 1 Product Description

<table>
<thead>
<tr>
<th>Product</th>
<th>Thickness, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot-rolled plate*</td>
<td>≥ ¾ (4.76) and over</td>
</tr>
<tr>
<td>Cold-rolled plate*</td>
<td>≥ ¼ to ⅛ (4.8 to 9.5), incl</td>
</tr>
<tr>
<td>Hot-rolled sheet*</td>
<td>0.018 to 0.250 (0.46 to 6.4), incl</td>
</tr>
<tr>
<td>Cold-rolled sheet*</td>
<td>0.018 to 0.250 (0.46 to 6.4), incl</td>
</tr>
<tr>
<td>Cold-rolled strip*</td>
<td>0.005 to 0.250 (0.13 to 6.4), incl</td>
</tr>
</tbody>
</table>

* Material ⅛ to ⅛ in. (4.8 to 6.4 mm), incl, in thickness may be furnished as sheet or plate provided the material meets the specification requirements for the condition ordered.

8.3 Length:
8.3.1 Sheet and strip of all sizes may be ordered to cut lengths, in which case a variation of ¼ in. (3.2 mm) over the specified length shall be permitted.

8.3.2 Permissible variations in length of rectangular plate shall be as prescribed in Specification B906, Permissible Variations in Length of Sheared, Plasma, Torch-Cut, and Abrasive-Cut Rectangular Plate Table.

8.4 Straightness:
8.4.1 The edgewise curvature (depth of chord) of flat sheet, strip, and plate shall not exceed 0.05 in. (1.27 mm) multiplied by the length in feet (0.04 mm multiplied by the length in centimetres).

8.4.2 Straightness for coiled material is subject to agreement between the manufacturer and the purchaser.

8.5 Edges:
8.5.1 When finished edges of strip are specified in the contract or order, the following descriptions shall apply:

8.5.1.1 Square-edge strip shall be supplied with finished edges, with sharp, square corners, without bevel or rounding.

8.5.1.2 Round-edge strip shall be supplied with finished edges, semicircular in form, the diameter of the circle forming the edge being equal to the strip thickness.

8.5.1.3 When no description of any required form of strip edge is given, it shall be understood that edges such as those resulting from slitting or shearing will be acceptable.

8.5.1.4 Sheet shall have sheared or slit edges.

8.5.1.5 Plate shall have sheared or cut (machined, abrasive cut, powder cut, or inert arc cut) edges, as specified.

8.6 Squareness (Sheet)—For sheets of all thicknesses, the angle between adjacent sides shall be 90° ± 0.15° (⅛ in. in 24 in.) (1.6 mm in 610 mm).

8.7 Flatness—Standard flatness tolerances for plate shall conform to the requirements of Table 3, “Specifically-flattened” plate, when so specified, shall have permissible variations in flatness as agreed upon between the manufacturer and the purchaser.

9. Product Marking
9.1 Each bundle or shipping container shall be marked with the name of the material or UNS number; condition; this specification number; the size; gross, tare, and net weight; consignor and consignee address; contract or order number; or such other information as may be defined in the contract or order.

10. Keywords
10.1 N08825; N08221; N06845; plate; sheet; strip
### TABLE 2 Mechanical Properties for Plate, Sheet, and Strip
(All Thicknesses and Sizes Unless Otherwise Indicated)

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Condition</th>
<th>Tensile Strength, min, ksi (MPa)</th>
<th>Yield Strength, A, (0.2 % Offset), min, ksi (MPa)</th>
<th>Elongation in 2 in. or 50 mm (or 4 D, min, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot-Rolled Plate:</td>
<td>UNS N08825</td>
<td>annealed</td>
<td>85 (586)</td>
<td>35 (241)</td>
</tr>
<tr>
<td></td>
<td>UNS N08221</td>
<td>annealed</td>
<td>79 (544)</td>
<td>34 (235)</td>
</tr>
<tr>
<td></td>
<td>UNS N06845</td>
<td>annealed</td>
<td>100 (690)</td>
<td>40 (276)</td>
</tr>
<tr>
<td>Cold-Rolled Plate:</td>
<td>UNS N08825</td>
<td>annealed</td>
<td>85 (586)</td>
<td>35 (241)</td>
</tr>
<tr>
<td></td>
<td>UNS N08221</td>
<td>annealed</td>
<td>79 (544)</td>
<td>34 (235)</td>
</tr>
<tr>
<td></td>
<td>UNS N06845</td>
<td>annealed</td>
<td>100 (690)</td>
<td>40 (276)</td>
</tr>
<tr>
<td>Hot-Rolled Sheet:</td>
<td>UNS N08825</td>
<td>annealed</td>
<td>85 (586)</td>
<td>35 (241)</td>
</tr>
<tr>
<td></td>
<td>UNS N08221</td>
<td>annealed</td>
<td>79 (544)</td>
<td>34 (235)</td>
</tr>
<tr>
<td></td>
<td>UNS N06845</td>
<td>annealed</td>
<td>100 (690)</td>
<td>40 (276)</td>
</tr>
<tr>
<td>Cold-Rolled Sheet:</td>
<td>UNS N08825</td>
<td>annealed</td>
<td>85 (586)</td>
<td>35 (241)</td>
</tr>
<tr>
<td></td>
<td>UNS N08221</td>
<td>annealed</td>
<td>79 (544)</td>
<td>34 (235)</td>
</tr>
<tr>
<td></td>
<td>UNS N06845</td>
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<td>100 (690)</td>
<td>40 (276)</td>
</tr>
<tr>
<td>Cold-Rolled Strip:</td>
<td>UNS N08825</td>
<td>annealed</td>
<td>85 (586)</td>
<td>35 (241)</td>
</tr>
<tr>
<td></td>
<td>UNS N08221</td>
<td>annealed</td>
<td>79 (544)</td>
<td>34 (235)</td>
</tr>
<tr>
<td></td>
<td>UNS N06845</td>
<td>annealed</td>
<td>100 (690)</td>
<td>40 (276)</td>
</tr>
</tbody>
</table>

A. Yield strength requirements do not apply to material under 0.020 in. (0.51 mm) in thickness.
B. Not applicable for thickness under 0.010 in. (0.25 mm).

### TABLE 3 Permissible Variations From Flatness of Rectangular, Circular, and Sketch Plates

**Note 1**—Permissible variations apply to plates up to 12 ft (3.66 m) in length, or to any 12 ft (3.66 m) of longer plates. If the longer dimension is under 36 in. (914 mm), the permissible variation is not greater than 1⁄4 in. (6.4 mm).

**Note 2**—The shorter dimension specified is considered the width, and the permissible variation in flatness across the width does not exceed the tabular amount of that dimension.^

**Note 3**—The maximum deviation from a flat surface does not customarily exceed the tabular tolerance for the longer dimension specified.

<table>
<thead>
<tr>
<th>Specified Thickness</th>
<th>Permissible Variations from a Flat Surface for Thickness and Widths Given, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To 48</td>
<td>48 to 60</td>
</tr>
<tr>
<td>(1220, excl)</td>
<td>(1220 to 1520, excl)</td>
</tr>
<tr>
<td>Inches</td>
<td>Miles</td>
</tr>
<tr>
<td>3⁄16 to 1⁄4, excl</td>
<td>3⁄16 to 1⁄4, excl</td>
</tr>
<tr>
<td>1⁄4 to 3⁄8, excl</td>
<td>1⁄4 to 3⁄8, excl</td>
</tr>
<tr>
<td>3⁄8 to 1⁄2, excl</td>
<td>3⁄8 to 1⁄2, excl</td>
</tr>
<tr>
<td>1 to 2, excl</td>
<td>1 to 2, excl</td>
</tr>
<tr>
<td>2 to 4, incl</td>
<td>2 to 4, incl</td>
</tr>
<tr>
<td>4.8 to 6.4, excl</td>
<td>4.8 to 6.4, excl</td>
</tr>
<tr>
<td>6.4 to 9.5, excl</td>
<td>6.4 to 9.5, excl</td>
</tr>
<tr>
<td>9.5 to 12.7, excl</td>
<td>9.5 to 12.7, excl</td>
</tr>
<tr>
<td>12.7 to 19.0, excl</td>
<td>12.7 to 19.0, excl</td>
</tr>
<tr>
<td>19.0 to 25.4, excl</td>
<td>19.0 to 25.4, excl</td>
</tr>
<tr>
<td>25.4 to 50.8, excl</td>
<td>25.4 to 50.8, excl</td>
</tr>
<tr>
<td>50.8 to 101.6, incl</td>
<td>50.8 to 101.6, incl</td>
</tr>
</tbody>
</table>

A. Editorially corrected.
X1. CONDITIONS AND FINISHES NORMALLY SUPPLIED

X1.1 Scope

X1.1.1 This appendix lists the conditions and finishes in which plate, sheet, and strip are normally supplied. These are subject to change, and the manufacturer should be consulted for the latest information available.

X1.2 Plate

X1.2.1 Hot-rolled, annealed, and descaled.

X1.2.2 Cold-rolled, annealed, and descaled.

X1.3 Sheet

X1.3.1 Hot-rolled, annealed, and descaled.

X1.3.2 Cold-rolled, annealed, and descaled or bright annealed.

X1.4 Strip

X1.4.1 Cold-rolled, annealed, descaled, or bright annealed.

SUMMARY OF CHANGES

Committee B02 has identified the location of selected changes to this standard since the last issue (B424 - 05 (2009)) that may impact the use of this standard. (Approved October 1, 2011.)

(1) Revised Title, subsection 1.1, Section 10, Table 4, and Table 2 to add UNS N06845.

(2) Corrected UNS number of N08221 in Section 10.

(3) Revised Table 4 to add new footnote A, renumber old footnote A to B, and to add footnote B to the iron content for N08221.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

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