<table>
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<tr>
<td>SA-283/SA-283M</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>03(R07)</td>
<td>88 through 03(R07)</td>
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<tr>
<td>SA-285/SA-285M</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>04(R07)</td>
<td>82(R07) through 12</td>
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<td>SA-299/SA-299M</td>
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<td>X</td>
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<td>04(R07)</td>
<td>82(R07) through 04</td>
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<tr>
<td>SA-302/SA-302M</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>04(R07)</td>
<td>82 through 12</td>
<td></td>
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</tr>
</tbody>
</table>

Identical except for the addition of Note 1 to Table 1. ASTM editions prior to 12 are acceptable provided that any accelerated cooling of plates as permitted in 5.3 is followed by tempering.

SA-307 | X | X | X | X | X | X | X | X | 07b | 00 through 07b | |

Identical except for the deletion of the term "private label distributor" from para. 13.1.1.

SA-311/SA-311M | X | X | X | X | X | X | X | X | 04(R10) | 90b through 04(R10) | |

Identical except for the deletion of 5.1.11, revision of Table 1 footnote A, and editorial change to 5.1.9, and 11.1 revised to make certification mandatory.

SA-312/SA-312M | X | X | X | X | X | X | X | X | 04a(R10) | 80 through 04a | |

Identical except for the deletion of 5.2, revision to 6.2 to add "H" Grade heat treatment requirements, and editorial differences in 7.1 and Table 1 and an editorial correction to the Cr and Ni percent chemical composition for UNS S31002 in Table 1.

SA-320/SA-320M | X | X | X | X | X | X | X | X | 07 | 01 through 07 | |

Identical except for editorial clarification of exemption of carbide solution treated austenitic material from impact test requirements in 6.2.1.1.

SA-325 | X | X | X | X | X | X | X | X | 07a | 06a through 07a | |

Identical except for the deletion of the term "private label distributor" in 15.1 and 15.5.

SA-333/SA-333M | X | X | X | X | X | X | X | X | 04a | 94 through 04a | |

Identical except for the deletion of 12.3 that conflicts with 15.

SA-334/SA-334M | X | X | X | X | X | X | X | X | 04(R10) | 80 through 04(R10) | |

Identical except for the addition of hardness requirements for P23 and P911 in 9.3 and 14.2.1, and the correction of UNS numbers for P9 and P91. For Grade P23, other acceptable ASTM editions are limited to 05a and later; for Grades P91, P92, P122 and P911, other acceptable ASTM editions are limited to 06.

SA-336/SA-336M | X | X | X | X | X | X | X | X | 07 | 05a through 07 | |

Identical except for the deletion of 6.12 and 14.1, revision to 14.2.5, and test reports have been made mandatory.

SA-351/SA-351M | X | X | X | X | X | X | X | X | 06 | 86 through 00 | |

Identical except for the deletion of the term "private label distributor" in 15.1 and 15.3.

SA-352/SA-352M | X | X | X | X | X | X | X | X | 06(R12) | 88 through 06(R12) | |

Identical except for the deletion of 12.3 that conflicts with 15.

SA-353/SA-353M | X | X | X | X | X | X | X | X | 09 | 87 through 09 | |

Identical except for the deletion of the term "private label distributor" in 15.1 and 15.3.

SA-354 | X | X | X | X | X | X | X | X | 07a | 86 through 07a | |

Identical except for the deletion of the term "private label distributor" in 15.1 and 15.3.

SA-358/SA-358M | X | X | X | X | X | X | X | X | 08 | 88 through 01 | |

Identical except for clarified heat treatment requirements in 6.3.1, the deletion of 6.3.2.2 for HT-O pipe and 6.3.2.3 for HT-0 pipe, an editorial difference in 1.2, and the following additional requirements apply as shown in the specification.

SA-369/SA-369M | X | X | X | X | X | X | X | X | 06 | 88 through 06 | |

Identical except for the deletion of the term "private label distributor" in 15.1 and 15.3.

SA-370 | - Mechanical Testing of Steel Products | X | X | X | X | X | X | X | 05 | 77 through 05 | |
SPECIFICATION FOR PRESSURE VESSEL PLATES, ALLOY STEEL, MANGANESE-MOLYBDENUM AND MANGANESE-MOLYBDENUM-NICKEL

SA-302/SA-302M

(Identical with ASTM Specification A302/A302M-12 except for the addition of Note 1 to Table 2.)
5. Heat Treatment

5.1 Plates 2 in. [50 mm] and under in thickness are normally supplied in the as-rolled condition. Plates may be ordered normalized or stress relieved, or both.

5.2 Plates over 2 in. [50 mm] in thickness shall be normalized.

5.3 When normalizing plates 4 in. [100 mm] or over in thickness, the cooling rate may be accelerated by air blast or liquid quenching followed by tempering in the temperature range from 1100 to 1300°F [595 to 705°C] to obtain mechanical properties comparable to those developed by normalizing plates in the lesser thicknesses.

5.4 If approved by the purchaser, for plates less than 4 in. [100 mm] in thickness, cooling rates faster than those obtained by cooling in air are permissible for improvement of toughness, provided the plates are subsequently tempered in the temperature range from 1100 to 1300°F [595 to 705°C].

6. Chemical Composition

6.1 The steel shall conform to the chemical requirements shown in Table 1 unless otherwise modified in accordance with Supplementary Requirement S17, Vacuum Carbon-Deoxidized Steel, in Specification A20/A20M.

7. Mechanical Properties

7.1 Tension Test Requirements—The plates, as represented by the tension test specimens, shall conform to the requirements given in Table 2.

7.1.1 For accelerated cooled plates with a nominal thickness of 3/4 in. [20 mm] or less, the 11/2-in. [40-mm] wide rectangular specimen may be used for the tension test, and the elongation may be determined in a 2-in. [50-mm] gage length that includes the fracture and that shows the greatest elongation.

8. Keywords

8.1 alloy steel plate; pressure containing parts; pressure vessel steels; steel plates; steel plates for pressure vessel applications

TABLE 1 Chemical Requirements

<table>
<thead>
<tr>
<th>Elements</th>
<th>Grade A</th>
<th>Grade B</th>
<th>Grade C</th>
<th>Grade D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon, max: *</td>
<td>0.20</td>
<td>0.20</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>Heat analysis</td>
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<td>1.15–1.50</td>
<td>1.15–1.50</td>
<td>1.15–1.50</td>
</tr>
<tr>
<td>Product analysis</td>
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<td>1.07–1.62</td>
<td>1.07–1.62</td>
<td>1.07–1.62</td>
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<tr>
<td>Phosphorus, max:</td>
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<td>0.025</td>
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<tr>
<td>Sulfur, max:</td>
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<tr>
<td>Silicon</td>
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<td>0.15–0.40</td>
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<tr>
<td>Molybdenum</td>
<td>0.15–0.45</td>
<td>0.15–0.45</td>
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<tr>
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<tr>
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<tr>
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<td>0.67–1.03</td>
<td>0.67–1.03</td>
<td>0.67–1.03</td>
</tr>
</tbody>
</table>

\* Applies to both heat and product analyses.

NOTE — Where “...” appears there is no requirement.