

# **SPECIFICATION FOR HIGHER-STRENGTH MARTENSITIC STAINLESS STEEL PLATE, SHEET, AND STRIP**



**SA-1010/SA-1010M**

(Identical with ASTM Specification A1010/A1010M-01(2009) except for an editorial correction to a column heading in Table 2.)

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## 1. Scope

**1.1** This specification covers martensitic stainless steels for various structural, architectural, pressure vessel, and heat-resisting applications. The mechanical properties of these steels are customarily, but not necessarily, developed by a suitable heat treatment generally referred to as tempering.

**1.2** Steel products under this specification are available in two grades:

Grade	Yield Strength, min, ksi [MPa]
40 [275]	40 [275]
50 [350]	50 [350]

**1.3** The maximum thickness of plates is limited only by the capacity of the composition to meet the specified mechanical property requirements; however, current practice normally limits the maximum thickness of plates furnished under this specification to 1 in. [25 mm].

**1.4** The values stated in inch-pound or SI units are to be regarded separately as the standard. Within the text, SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. The inch-pound units shall apply unless the “M” designation of this specification is specified in the purchase order.

## 2. Referenced Documents

### 2.1 ASTM Standards:

A 480/A 480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

A 673/A 673M Specification for Sampling Procedure for Impact Testing of Structural Steel

E 527 Practice for Numbering Metals and Alloys (UNS)

### 2.2 Other Document:

SAE J 1086 Recommended Practice for Numbering Metals and Alloys

## 3. General Requirements

**3.1** The following requirements for orders for material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 480/A 480M.

- 3.1.1 Terminology,
- 3.1.2 Ordering Information,
- 3.1.3 Process,
- 3.1.4 Heat Analysis,
- 3.1.5 Product Analysis,
- 3.1.6 Finish for Sheet,
- 3.1.7 Finish for Strip,
- 3.1.8 Finish for Plates,
- 3.1.9 Test Specimens,
- 3.1.10 Number of Tests,
- 3.1.11 Test Methods,
- 3.1.12 Retests and Retreatment,
- 3.1.13 Dimensions and Permissible Variations,
- 3.1.14 Workmanship,
- 3.1.15 Packaging, Marking, and Loading,
- 3.1.16 Inspection,
- 3.1.17 Rejection and Rehearing, and
- 3.1.18 Material Test Report and Certification.

#### 4. Chemical Composition

4.1 The steel shall conform to the requirements as to chemical composition specified in Table 1, and shall conform to applicable requirements specified in the current edition of Specification A 480/A 480M.

#### 5. Heat Treatment

5.1 The material shall be heat-treated by tempering to meet the requirements of this specification. The tempering temperature shall not exceed 1400°F [760°C]. Prior to

tempering, the steel shall be in the as-rolled, normalized or quenched condition.

#### 6. Mechanical Properties

6.1 The material shall conform to the mechanical properties specified in Table 2.

#### 7. Keywords

7.1 architectural steel; martensitic; plate; stainless steel; steel; structural steel; tempered

TABLE 1  
CHEMICAL COMPOSITION REQUIREMENTS, %<sup>A</sup>

UNS Designation <sup>B</sup>	Type	Carbon	Manganese	Phosphorus	Sulfur	Silicon	Chromium	Nickel	Molybdenum	Nitrogen	Other Elements
S41003	...	0.030	1.50	0.040	0.030	1.00	10.5-12.5	1.50	...	0.030	...

<sup>A</sup> Maximum, unless range or minimum is indicated.

<sup>B</sup> Designation established in accordance with Practice E 527 and SAE J 1086.

TABLE 2  
MECHANICAL TEST REQUIREMENTS

Grade	Yield Strength, min, ksi [MPa]	Tensile Strength, min, ksi [MPa]	Elongation in 2 in. [50 mm], min %	Brinell Hardness, max	Cold Bend
40	40 [275]	66 [455]	18	223	not required
50	50 [350]	70 [485]	18	223	not required

## SUPPLEMENTARY REQUIREMENTS

Supplementary requirements shall not apply unless specified on the purchase order. Requirements other than those shown in this section may be specified subject to agreement between the supplier and the purchaser. The following supplementary requirements are suitable for use with this specification.

### **S1. Charpy V-Notch Impact Test**

**S1.1** Charpy V-notch impact tests shall be conducted in accordance with Specification A 673/A 673M.

**S1.2** The frequency of testing, the test temperature to be used, and the absorbed energy requirements shall be as specified on the order.

### **S2. Ultrasonic Examination**

**S2.1** The material shall be ultrasonically examined in accordance with the requirements specified on the order.