



Designation: A 690/A 690M – 00a

Standard Specification for High-Strength Low-Alloy Steel H-Piles and Sheet Piling for Use in Marine Environments¹

This standard is issued under the fixed designation A 690/A 690M; 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 high-strength low-alloy steel H-piles and sheet piling of structural quality for use in the construction of dock walls, sea walls, bulkheads, excavations, and like applications in marine environments.

1.2 The steel has approximately two to three times greater resistance to seawater “Splash Zone” corrosion than ordinary carbon steel (Specifications A 36/A 36M and A 328/A 328M) where exposed to the washing action of rain and the drying action of the wind or sun, or both. Where the steel is not boldly exposed, the usual provisions for the protection of ordinary carbon steel should be considered.

1.3 When the steel is to be welded, it is presupposed that a welding procedure suitable for the grade of steel and intended use or service will be utilized. See Appendix X 3 of Specification A 6/A 6M for information on weldability.

1.4 The values stated in either inch-pound units or SI units are to be regarded as standard. Within the text, the 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.

2. Referenced Documents

2.1 ASTM Standards:

A 6/A6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling²

A 36/A36M Specification for Carbon Structural Steel²

A 325 Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength³

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 A01.02 on Structural Steel for Bridges, Buildings, Rolling Stock, and Ships.

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² Annual Book of ASTM Standards, Vol 01.04.

³ Annual Book of ASTM Standards, Vol 15.08.

A 325M Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength [Metric]³
A 328/A328M Specification for Steel Sheet Piling²
A 588/A588M Specification for High-Strength Low-Alloy Structural Steel with 50 ksi [345 MPa] Minimum Yield Point to 4 in. [100 mm] Thick²

3. General Requirements for Delivery

3.1 Material furnished under this specification shall conform to the requirements of the current edition of Specification A 6/A 6M, for the ordered material, unless a conflict exists in which case this specification shall prevail.

4. Appurtenant Materials

4.1 When components of a steel structure are identified with this ASTM designation but the product form is not listed in the scope of this specification, the material shall conform to one of the standards listed in Table 3 unless otherwise specified by the purchaser. Table 3 does not provide any specification requirements to a manufacturer or processor. Orders to a manufacturer or processor should describe the required ASTM designation for product forms not listed in the scope of this specification.

5. Chemical Composition

5.1 The heat analysis shall conform to the requirements prescribed in Table 4.

5.2 The steel shall conform on product analysis to the requirements prescribed in Table 4, subject to the product analysis tolerances in Specification A 6/A 6M.

6. Tension Test

6.1 The material, as represented by the test specimens, shall conform to the requirements as to tensile properties prescribed in Table 5.

7. Keywords

7.1 bulkheads; corrosion resistance; dock walls; excavations; high-strength; H-piles; low-alloy; marine environments; sea walls; sheet piling; steel; structural steel



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TABLE 3 Appurtenant Material Specifications

NOTE 1— The specifier should be satisfied of the suitability of these materials for the intended application. Composition and/or mechanical properties may be different than specified in A 690/A 690M.

Commodity	ASTM Specification of Material to be Furnished with Steel H-piles or Sheet Piling
Plates, bars, structural shapes	A 588/A 588M
Bolts, nuts, washers	A 325 [A 325M], Type 3
Rivets	^A

^AAs negotiated with the fabricator, in general rivets made of Specification A 588/A 588M stock will provide compatible corrosion resistance when used with this grade steel.

TABLE 4 Chemical Requirements

Element	Composition, % Heat Analysis
Carbon, max	0.22
Manganese	0.60–0.90
Phosphorus	0.08–0.15
Sulfur, max	0.04
Silicon, max	0.40
Copper, min	0.50
Nickel	0.40–0.75

TABLE 5 Tensile Requirements

Tensile strength, min, ksi [MPa]	70 [485]
Yield point, min, ksi [MPa]	50 [345]
Elongation in 8 in. [200 mm], min, %	18 ^A
Elongation in 2 in. [50 mm], min, %	21

^ASee elongation requirement adjustments under the Tension Tests section of Specification A 6/A 6M. See specimen orientation under the tension tests section of Specification A 6/A 6M.

SUPPLEMENTARY REQUIREMENTS

Supplementary requirements shall not apply unless specified in the purchase order or contract. Standardized supplementary requirements for use at the option of the purchaser are listed in Specification A 6/A 6M. In addition, the following supplementary requirement is also suitable for use with this specification.

S99. The minimum strength of the interlocked joint required for certain services may be specified for certain sheet piling sections subject to specific agreement between the material purchaser and the manufacturer.

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