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A36 steel

A36 steel is a common structural steel alloy used in the United States.[1] The A36 (UNS K02600) standard was established by the ASTM International. The standard was published in 1960 and has been updated several times since.[2] Prior to 1960, the dominant standards for structural steel in North America were A7 (until 1967[3]) and A9 (for buildings, until 1940[4]).[5] Note that SAE/AISI A7 and A9 tool steels are not the same as the obsolete ASTM A7 and A9 structural steels.

Chemical composition

Chemical composition (%, ≤) for shapes							
Standard	C	Si	Mn	P	S	Cu	Fe
ASTM A36/A36M	0.26	0.40	1.03	0.04	0.05	0.20	98.0

Note: For shapes with a flange thickness more than 3 in (76 mm), 0.85-1.35% manganese content and 0.15-0.40% silicon content are required.

Properties

As with most steels, A36 has a density of 0.28 pounds mass per cubic inch (7.8 grams per cubic centimeter). Young's modulus for A36 steel is 29,000 kilopounds per square inch (200 gigapascals).[6] A36 steel has a Poisson's ratio of 0.26 and a shear modulus of 11,500 ksi (79.3 GPa).[7]

A36 steel in plates, bars, and shapes with a thickness of less than 8 inches (203 millimeters) has a minimum yield strength of 36 ksi (250 MPa) and ultimate tensile strength of 58–80 ksi (400–550 MPa). Plates thicker than 8 inches have a 32 ksi (220 MPa) yield strength and the same ultimate tensile strength of 58–80 ksi (400–550 MPa).[1] The electrical resistance of A36 is 0.142 μΩm at 68 °F (20 °C). A36 bars and shapes maintain their ultimate strength up to 650 °F (343 °C). Above that temperature, the minimum strength drops off from 58 ksi (400 MPa): 54 ksi (370 MPa) at 700 °F (371 °C); 45 ksi (310 MPa) at 750 °F (399 °C); 37 ksi (260 MPa) at 800 °F (427 °C).

Fabricated forms

A36 is produced in a wide variety of forms, including:

- Plates
- Structural Shapes
- Bars
- Girders
- Angle iron

- T iron

Methods of joining

A36 is readily welded by all welding processes. As a result, the most common welding methods for A36 are the cheapest and easiest: shielded metal arc welding (*SMAW*, or *stick welding*), gas metal arc welding (*GMAW*, or *MIG welding*), and oxyacetylene welding. A36 steel is also commonly bolted and riveted in structural applications. High-strength bolts have largely replaced structural steel rivets. Indeed, the latest steel construction specifications published by AISC (the 15th Edition) no longer covers their installation.

See also

- Structural steel

References

1. *Steel Construction Manual*, 8th Edition, second revised edition, American Institute of Steel Construction, 1986, Ch. 1 pp. 1–5.
2. Kurt Gustafson ,Evaluation of Existing Structures (https://www.aisc.org/globalassets/modern-steel/archives/2007/02/2007v02_steelwise.pdf), Steelwise, American Institute of Steel Construction, February 2007.
3. ASTM A7 (https://www.astm.org/DATABASE.CART/WITHDRAWN/A7.htm) (dead link 27 April 2023)
4. ASTM A9 (https://www.astm.org/DATABASE.CART/WITHDRAWN/A9.htm) dead link 27 April 2023)
5. Historical Listing of Selected Structural Steels (http://dir.cisc-icca.ca/files/technical/techdocs/historical/historicalsteels.pdf), Canadian Institute of Steel Construction, retrieved Oct. 2021.
6. "MatWeb A36 steel bar" (http://www.matweb.com/search/DataSheet.aspx?MatGUID=d1844977c5c8440cb9a3a967f8909c3a&ckck=1). MatWeb. Retrieved 21 January 2012.
7. "A36 Steel Properties" (https://www.bushwickmetals.com/a36-steel-properties/). 15 May 2023.

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