



Designation: F1043 – 18 (Reapproved 2022)

Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework¹

This standard is issued under the fixed designation F1043; 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.

1. Scope

1.1 This specification covers the strength and protective coating requirements for industrial steel fence framework. The intended use is for all types of fence, including but not limited to, chain link, expanded metal, wire mesh both welded and woven, PVC, and wood. Consult fencing product manufacturer for post spacing requirements. Post spacings for chain link fence are not to exceed 10 ft. (For additional information, see CLFMI Guide WLG2445.)

1.1.1 *Caution Regarding Windload*—If additives to the fence, such as windscreen, inserts, or signage are required, it is advisable to use stronger framework and fittings, to reduce the on-center spacing of posts, or to add back bracing. Factors to consider when determining windload include the type of screening material to be used, area of fence to be covered, and local wind conditions.

1.2 Posts and rails may have any cross-sectional shape meeting the requirements herein. The shapes may be formed and welded, cold formed, hot rolled, or extruded.

1.3 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.

1.4 *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 establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This specification is under the jurisdiction of ASTM Committee F14 on Fences and is the direct responsibility of Subcommittee F14.40 on Chain Link Fence and Wire Accessories.

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2. Referenced Documents

2.1 *ASTM Standards*:²

A90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

B6 Specification for Zinc

D1499 Practice for Filtered Open-Flame Carbon-Arc Exposures of Plastics

D3359 Test Methods for Rating Adhesion by Tape Test

E8/E8M Test Methods for Tension Testing of Metallic Materials

E376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy Current (Electromagnetic) Testing Methods

F552 Terminology Relating to Chain Link Fencing

F934 Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials

F1083 Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

G155 Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials

2.2 *Other Documents*:³

WLG2445 CLFMI Guide for the Selection of Line Post Spacings

3. Terminology

3.1 *Definitions*:

3.1.1 *posts*—vertical members of the fence.

3.1.1.1 *Discussion*—End, corner, and pull posts are posts at which fencing material terminates. Gateposts are posts to which gates are either attached or latched. Line posts are posts that occur in a line of fence in which the fencing material passes and to which it is secured.

3.1.2 *rails*—horizontal members of the fence.

3.1.2.1 *Discussion*—May be top, bottom, intermediate, or brace rails.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Chain Link Fence Manufacturers Institute, 10015 Old Columbia Road, Suite B-215, Columbia, MD 21046, <http://www.chainlinkinfo.org>.

3.1.3 The dimensional terminology is shown in Fig. 1.

3.1.4 The relationship of measured dimension (used throughout) to trade and industry usage is shown in Table 1.

3.1.5 *open sections*—non-tubular framework sections (such as C-posts, and roll-formed top rail).

3.1.6 *polymer coatings*—examples of some polymer coatings are acrylic urethane, polyurethane, polyvinyl chloride (PVC), polyester, and polyolefin elastomer.

3.1.7 See Terminology F552 for definitions of other terms.

4. Ordering Information

4.1 Orders for steel fence framework purchased to this specification shall include the following information:

4.1.1 Number of posts and rails by size and length,

4.1.2 Type of outside and inside coating (Section 7) and class of material,

4.1.3 Color, if applicable, in accordance with Specification F934,

4.1.4 Material group (IA, IC, II, II-L, IV, IV-L) (Table 2),

4.1.5 Certification, if required, and

4.1.6 Exception(s) to this specification, or special requirements, if any.

NOTE 1—These details may be covered in whole or in any part by accompanying the orders with design drawings and notations thereon.

5. Strength Requirements

5.1 It is the intent of this specification to permit the continuance of historically proven practice in the installation of fence systems, and to provide strength requirements for alternative shapes and materials. Two categories are described. Heavy Industrial fence represents the most rigid and mechanically durable of the commonly installed framework. Light Industrial/Commercial fence, as provided herein, exhibits 80 % of the load bearing capability of heavy industrial fence. The

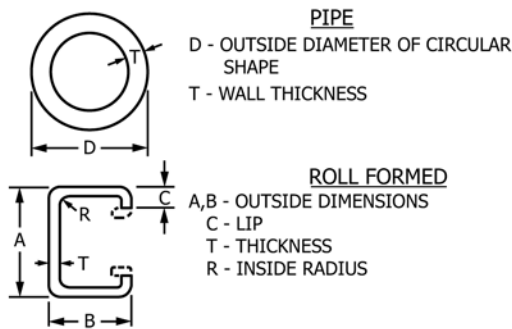


FIG. 1 Definitions of Dimensional Terms

TABLE 1 Pipe Diameter Terminology

Trade Size, in. (mm)	Actual Outside Diameter	
	in.	mm
1 $\frac{3}{8}$ (33.40)	1.315	33.40
1 $\frac{1}{2}$ (42.16)	1.660	42.16
1 $\frac{7}{8}$ (48.26)	1.900	48.26
2 $\frac{3}{8}$ (60.33)	2.375	60.33
2 $\frac{1}{2}$ (73.03)	2.875	73.03
3 $\frac{1}{2}$ (88.90)	3.500	88.90
4 (101.60)	4.000	101.60
4 $\frac{1}{2}$ (114.30)	4.500	114.30
5 $\frac{1}{16}$ (141.30)	5.563	141.3
6 $\frac{3}{8}$ (168.28)	6.625	168.28
8 $\frac{5}{8}$ (219.08)	8.625	219.08

TABLE 2 Definitions of Fence Framework Materials Design

Material	Description of Material
Group IA Round Steel Pipe	Steel pipe shall be produced to conform to Specification F1083, standard weight (Schedule 40). Weight shall not vary more than $\pm 10\%$ from that prescribed.
Group IC Round Steel Pipe Welded Pipe	Steel pipe shall be produced in accordance with commercial standards. Minimum yield strength shall be 50 000 psi (344 MPa). Such products shall include, without seeking to limit to, cold-formed and welded pipe. Weight shall not vary more than $\pm 10\%$ from that prescribed.
Group II/II-L Roll-Formed Steel Shapes (C-Sections)	Roll-formed steel shapes shall be produced to commercial standards. Minimum yield strength shall be 50 000 psi (344 MPa), and 60 000 psi (413 MPa) for the 3.25 in. $\times$ 2.50 in. line post sections. The formed lip shall be of the same thickness as the flat elements and shall project no less than $\frac{1}{8}$ the width of the flat element being stiffened. Group II products shall be designated such that the strong axis is perpendicular to the line of fence. Weight shall not vary more than $\pm 10\%$ from that prescribed.
Group IV/IV-L Alternate Design	Any suitable design can be delivered, provided it meets the strength and stiffness criteria of (Heavy Industrial) or (Light Industrial/Commercial) and the producer has supplied, in a form acceptable to the purchaser, data that demonstrates conformance with the specification. At the producer's option the methods in either Section 6 or 6.4 may be used.

summary requirements and options for Heavy Industrial fence and those of Light Industrial/Commercial Fence are given in Table 3.

5.2 *Historical Practice*—Experience has shown that galvanized steel performs satisfactorily as fence posts and rails if furnished to the standard weight (Schedule 40, Regular Grade, 30,000 psi) and nominal sizes listed in Specification F1083. Therefore, the minimum performance criteria is based on the historical strength of Specification F1083 Schedule 40, Regular Grade, 30,000 psi minimum yield.