Standard Guide for Metallic-Coated Steel Chain Link Fence & Fabric

1. Purpose

1.1 The purpose of this guide is to provide a nationally recognized standard of quality for metallic-coated steel chain link fence fabric and when combined with framework and accessory items, as listed in this publication, to provide a nationally recognized standard of quality for complete fence.

2. Scope

2.1 This guide gives the nomenclature, definition, and general requirements for metallic-coated steel chain link fence fabric and framework for industrial usage. See Section 5.8 for applicable documents.

2.2 The values stated in inch-pound units are to be regarded as the standard. The metric values given in parentheses are for information only.

3. Description of Terms

3.1 *Chain Link Fence Fabric*—A fencing material from steel wire helically wound and interwoven in such a manner as to provide a continuous mesh without knots or ties except in the form of knuckling or of twisting the ends of the wires to form the selvage of the fabric.

3.2 *Knuckling*—This term is used to describe the type of selvage obtained by interlocking adjacent pairs of wire ends and then bending the wire ends back into a closed loop.

3.3 *Twisting*—This term is used to describe the type of selvage obtained by twisting adjacent pairs of wire ends together in a closed helix of 1-1/2 machine turns, which is equivalent to three full twists, and cuffing the wire ends at a sharp angle to provide sharp points. The wire ends beyond the twist shall be at least 1/4 inch (6.4mm) long.

3.4 *Diamond Count*—A term used to designate the number of mesh openings in each height of fabric.

3.5 *Other Terminology*—See ASTM F552 for a listing of other terms specific to Chain Link Fence.

4. Requirements

4.1 *Materials*

4.1.1 *Base Metal*—The base metal of the fabric shall be a good commercial quality of steel wire of the gages specified in Table 1.

4.1.2 *Zinc Coating*—The zinc coating on the fabric may be ordered in two coating weight classes, as Class 1—the weight of zinc coating shall not be less than 1.20 oz./ft.^{2} (366 gm/m^2) of uncoated wire surface; or Class 2—the weight of zinc coating shall not be less than 2.0 oz./ft.^{2} (610 gm/m^2) of uncoated wire surface as determined from the average of results of two or more specimens, and not less than 1.8 oz./ft.^{2} (500 g/m^2) of uncoated wire surface for any individual specimen. Fabric galvanized after fabrication is normally not produced with a Class 2 coating on 11 ga.–0.120" (3.05mm)—or 11 1/2 ga.–0.113" (2.87mm) wire. The weight of the zinc coatings shall be determined in accordance with 5.5.2. The zinc used for the coating shall conform to the grades specified in ASTM Designation B6, Standard Specification for scab zinc.

4.1.3 *Aluminum Coating*—The wire shall be aluminum coated by the hot-dip process before weaving into the fabric. The weight of aluminum coating for 6 ga.–0.192" (4.88mm)—and9 ga–0.148" (3.76mm)—shall not be less than 0.40 oz./ft.^{2} (122 g/m^2) and for 11 ga.–0.120" (3.05mm)—shall not be less than 0.35 oz/ft.^{2} (107 g/m^2) of uncoated wire surface when tested in accordance with 5.5.3.

4.1.4 *Zinc*—5% aluminum mischmetal alloy coating—the metallic coating on the fabric may be ordered in two coating weight classes, as Class 1, the weight of metallic coating shall not be less than 0.60 oz./ft.^{2} (183 gm/m^2) or Class 2, the weight of metallic coating shall not be less than 1.00 oz./ft.^{2} (305 gm/m^2) of uncoated wire surface as determined from the average of results of two or more specimens, and not less than 0.90 oz./ft.^{2} (250 gm/m^2) of uncoated wire surface for any individual specimen. The weight of the metallic coatings shall be determined in accordance with 5.5.4. The zinc-5% aluminum mischmetal alloy used for the coating shall conform to the grades specified in ASTM designation B-750, Standard Specification for Zinc-5% Aluminum Mischmetal Alloy (UNSZ38510) in Ingot Form for Hot-Dip Coatings.

4.1.5 *Aluminum Alloy*—ASTM F1183—Chain link fabric woven from aluminum alloy, 9 ga.–0.148" (3.76mm)—or 6 ga.–0.192" (4.88mm) wire.

4.2 *Fabric Sizes*—The height, diamond count, size of mesh, and wire diameters of chain link fabric shall be as given in Table 1. The methods of measurement and tolerances are given in 4.2.1, 4.2.2. and 4.2.3.

4.2.1 *Height of Fabric*—The height of the fabric shall be the overall dimension from ends of twists or knuckles. The tolerance of the nominal height shall be plus or minus one inch (±25mm).

4.2.2 *Mesh Sizes*—The size of mesh shall conform to the requirements as shown in Table 1. The permissible variation from the specified size of mesh shall be ±1/8 in. (±3.2mm) for all mesh sizes over 1 in. (25mm) and ±1/16 in. (±1.6mm) for all mesh sizes 1 in. (25mm) and under.

4.2.3 *Wire Diameter*—The diameter of the coated wire shall be determined as the average of two readings measured to the nearest 0.001 inch (0.025mm) taken at right angles to each other on the straight portion of the parallel sides of the mesh. The tolerance in the diameter of the coated wire shall be plus or minus 0.005 inch (±0.13mm).

4.3 *Selvage*—Fabric with 2 inch (50mm) or 2 1/8 inch (54mm) mesh, in heights less than 72 inches (1830mm) shall be knuckled at both selvages. Fabric 72 inches (1830mm) high and over shall be knuckled at one selvage and twisted at the other. These are the standard selvages.

Other selvage combinations will be supplied only if specified by the purchaser.

Caution: Twisted selvages for fences under 72 inch (1830mm) in height are not recommended because of consumer safety considerations.

The selvages of fabrics with meshes of less than 2 inches (50mm) shall be knuckled on both edges.

5. Inspection and Testing

5.1 *General*—The tests given herein are intended primarily for use as production tests in conjunction with manufacturing processes, inspection methods and with other tests if needed, according to 5.2, so as to insure the conformity of the chain link fabric with the requirements of this guide.

5.2 *Production Inspection and Testing*—During the process of manufacture, the manufacturer shall make such inspections and tests as are needed to maintain the quality of the product so as to be consistently in conformity with this guide. The inspection and tests given herein (see 5.3 and 5.5) shall be made regularly during production for all chain link fabric furnished as being in conformity with this guide.

5.3 *Inspection*—The chain link fabric shall be visually inspected to determine its conformance with the workmanship, design and dimensional requirements of this standard.

5.4 *Sampling*—One roll from every 50 rolls or fraction thereof shall be selected at random for test purposes, but in no case shall less than 2 samples be selected from a shipment. The specimens for test purposes shall consist of individual pieces of wire taken from the outside end of the sample rolls.

5.5 *Test Procedures*

5.5.1 *Breaking Strength*—Table 2 & 3—The break strength of the wire used in the fabrication of the fabric shall be determined in accordance with the method described in ASTM A370, using one specimen from each sample roll. Specimens to establish conformance to this requirement shall constitute individual pickets from a section of the fence fabric of a sufficient length so as to be firmly gripped in the testing machine after straightening. The actual gage length (distance between jaws) of the specimen shall be limited to the undetermined length of wire between two adjacent straightened bends. If fracture takes place, other than between the jaw grips, the test shall be discarded.

5.5.2 *Weight of Zinc Coating*—The weight of zinc coating on the fabric shall be determined in accordance with the method described in ASTM A90, using one piece of wire removed from the fabric of each sample roll.

5.5.3 *Weight of Aluminum Coating*—The weight of aluminum coating on the fabric shall be determined in accordance with the method described in ASTM A428, using one piece of wire removed from the fabric on each sample roll.

5.5.4 *Weight of Zinc—5% Aluminum Mischmetal Alloy*—The weight of metallic coating on the fabric shall be determined in accordance with the method described in ASTM A90, using one piece of wire removed from the fabric of each sample roll.

5.5.5 The specimen tested may be of any continuous length over 12 inches (305mm) but preferably should be about 24 inches (610mm) long.

5.6 *Packaging and Marking*—Each length of fabric shall be tightly rolled and firmly tied. Each shipment of fabric shall be identified as to the type and class of metallic coating, the size of mesh, the coated wire diameter, the height and length of fabric in each roll, and the name of the manufacturer. These requirements apply unless otherwise specified.

5.7 *Noncompliance*—If any specimen tested fails to meet the requirements of this guide, the roll represented by the specimen shall be rejected and two additional rolls shall be tested, both of which shall meet the requirements in every respect; otherwise the lot represented by the samples may be rejected.

5.8 *Applicable Documents*—The following documents form a part of this guide to the extent listed herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply. Chain link fabric specifications vary slightly in Canada. Consult the current Canadian specification CAN-2-138.1-H80.

American Society for Testing & Materials (ASTM) Standards:

A90/A90M— Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
A 121 — Zinc-Coated (Galvanized) Steel Barbed Wire
A 123 — Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A 370 — Mechanical Testing of Steel Products
A 392 — Zinc-Coated Steel Chain Link Fence Fabric
A 428 — Test Method for Weight of Coating on Aluminum-Coated Iron or Steel Articles
A 491 — Aluminum-Coated Steel Chain Link Fence Fabric
A 570 — Hot Rolled Sheet and Strip, Structural Quality
A 572 — High Strength Low-Alloy Columbium-Vanadium Steel of Structural Quality
A 585 — Aluminum-Coated Steel Barbed Wire
A 817 — Metallic-Coated Steel Wire for Chain Link Fence Fabric
A 824 — Metallic-Coated Steel Marcelled Tension Wire for Use with Chain Link Fabric
B 6 — Zinc (Slab Zinc)
B 750 — Zinc—5% Aluminum Mischmetal Alloy (UNSZ38510) in Ingot Form for Hot Dip Coatings
F 552 — Terminology Relating to Chain Link Fencing
F 567 — Installation of Chain Link Fence
F 626 — Fence Fittings
F 900 — Industrial and Commercial Swing Gates
F 934 — Standard Colors for Polymer Coated Chain Link Fence Materials
F 1043 — Specifications for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework
F 1083 — Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded for Fence Structures
F 1183 — Aluminum Alloy Chain Link Fence Fabric
F 1184 — Industrial and Commercial Horizontal Slide Gate
F 1345 — Zinc—5% Aluminum Mischmetal Alloy Coated Steel Chain Link Fence Fabric

Table 1—Fabric Size[A]

Recommended Usage	Height of Fabric	Size of Mesh	Gage,** Coated Wire	Nominal Diameter Coated Wire
Heavy Industrial	36" 42" 48" 60" 72" 84" 96" 120" 144" Diamond Count 10½ 12½ 13½ 17½ 20½ 24½ 27½ 34½ 41½	2" (50mm)	6	0.192" (4.88mm)
Standard Industrial Residential	36" 42" 48" 60" 72" 84" 96" 120" 144" Diamond Count 10½ 12½ 13½ 17½ 20½ 24½ 27½ 34½ 41½	2" (50mm)	9	0.148" (3.76mm)
Light Industrial Residential	36" 42" 48" 60" 72" 84" Diamond Count 10½ 12½ 14½ 17½ 20½ 24½	2" (50mm)	11	0.120" (3.05mm)
Heavy Industrial	36" 42" 48" 60" 72" 84" 96" 120" 144" Diamond Count 20 23 27 33 39 45 53 67 79	1" (25mm)	6	0.192" (4.88mm)
Standard Industrial Heavy Industrial	36" 42" 48" 60" 72" 84" 96" 120" 144" Diamond Count 20 23 27 33 39 45 53 67 79	1" (25mm)	9	0.148" (3.76mm)
Light Industrial Residential	36" 42" 48" 60" 72" 84" 96" 120" 144" Diamond Count 20 23 27 33 39 45 53 67 79	1" (25mm)	11	0.120" (3.05mm)
Light Residential	36" 42" 48" 60" 72" Diamond Count 9½ 11½ 13½ 16½ 19½	2⅛" (54mm)	11½	0.113" (2.87mm)
Tennis Court	Diamond Count 120 144" 39½ 47½	1¾" (44mm)	11	0.120" (3.05mm)
Security*	36" 42" 48" 60" 72" 84" 96" 120" 144" See Fig.1 for mesh Dimensions	⅜", ½", ⅝" (10mm), (13mm), (16mm)	11	0.120" (3.05mm)

[A] See Table 5 for supplementary metric equivalent information
* Small mesh ⅜" (10mm), ½" (13mm), ⅝" (16mm) only available in aluminum coated.
** Aluminum alloy fabric available only in 9 ga. —0.148 (3.76mm) and 6 ga. —0.192 (4.88mm)

Table 2 – Breaking Strength of Coated Steel Wire

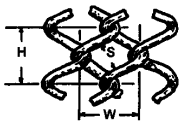
Diameter of Coated Wire Inches	(mm)	Minimum Breaking Strength Lbf	(N)
0.192	(4.88)	2170	(9650)
0.148	(3.76)	1290	(5740)
0.120	(3.05)	850	(3780)
0.113	(2.87)	750	(3340)

Table 3 – Breaking Strength of Aluminum Alloy Wire

Diameter of Wire Inches	(mm)	Minimum Breaking Strength Lbf	N
0.192	(4.88)	1560	(6939)
0.148	(3.76)	925	(4144)

Fig. 1 – Mesh Dimensions for 3/8 -in. (10mm), 1/2 -in. (13mm), and 5/8 -in. (16mm), Fabric

S	H	W
⅜ in. (10mm) MESH	¾ in. (19mm)	¾ in. (19mm)
½ in. (13mm)MESH	15/16 in. (24mm)	15/16 in. (24mm)
⅝ in. (16mm) MESH	1⅛ in. (29mm)	1⅛ in. (29mm)



1. MATERIALS—Posts, gate frames, braces, rails, stretcher bars, truss rods and tension wire shall be of steel. Gate hinges, post caps, barbed wire supporting arms, stretcher bar bands, and other parts shall be of steel, malleable iron, ductile iron or equal except that post tops, rail ends, ties and clips may be of aluminum.

Optional supplemental color coating, 10 mils (0.25mm) of polyvinyl chloride or 3 mils (0.08mm) of polyester can be obtained in conjunction with all coatings as indicated. Unless otherwise indicated, color of the coating shall be in accordance with ASTM F934, Green, Olive Green, Brown, and Black. Moveable and threaded fittings need not be coated but field coated per manufacturer's recommendations.

If this optional color coating is selected for the framework and accessories, the subsequent section of this guide pertaining to Polyvinyl Chloride (PVC) coated chain link fabric can be specified to achieve a total color coated chain link fence system.

1.1 *Intermediate posts* shall be Type I or Type II pound pipe or "C" roll formed sections conforming to the dimensions and weights shown in Table 4.

1.1.1 *Type I round post* shall be hot dipped galvanized with a minimum average zinc coating of 1.8 oz./ft.^{2} (0.55 kg/m^2) meeting ASTM F-1083 for standard weight (Schedule 40) galvanized pipe.

1.1.2 *Type II round post* shall be steel pipe cold-formed and welded per ASTM F1043, Group IC, having a minimum yield strength of 50,000 psi (344mPa). The external zinc coating shall be Type B, zinc with polymer film, 0.90 oz./ft.^{2} (275g/m^2) minimum zinc coating with a chromate conversion and a verifiable polymer film. The internal coating shall be Type B, zinc 0.90 oz./ft.^{2} (275g/m^2) minimum or type D, zinc pigmented, 81% nominal coating with 0.30 mils (0.008mm) minimum thickness.

1.1.3 *Roll formed "C" Section* steel shapes shall be produced from steel having a minimum yield strength of 45,000 psi (310mPa) and meet the strength and protective coating requirements of ASTM F-1043.

1.2 *Terminal posts, braces and rails* shall be round or square Type I as shown in 1.1.1 or round Type II as shown in 1.1.2 and shall conform to dimensions and weights as shown in Table 4.

2. ZINC COATING—All Type I and Type II steel framework and other iron parts shall be zinc coated by the hot-dipped method, using zinc Grade E. The weight of zinc coat on Type I rail, post and brace shall have not less than 1.8 oz./ft.^{2} (0.55Kg/m^2) coating as listed in 1.1.1. Type II steel rails, posts and braces shall have an average weight of not less than 0.90 oz./ft.^{2} (275 g/m^2) as listed in 1.1.2. Zinc weight shall be determined in accordance with ASTM A-90.

3. POST BRACES shall be provided for each gate, comer, pull, and end post for use when top rail is omitted or with fabric 6 feet (1.80m) or more in height, and shall consist of a round tubular brace extending to each adjacent line post at approximately midheight of the fabric, and a truss consisting of a rod not less than 5/16 inch (7.90mm) nominal diameter from the line post back to the gate, comer, pull, or end post, with a turnbuckle or other equivalent provision for adjustment. Truss rods may be eliminated in any line of fence where there is a continuous center rail.

4. POST TOPS shall consist of ornamental tops or combination tops with barbed wire supporting arms, as required. When so required, or when a top rail is to be provided, the top shall be provided with a hole suitable for the through passage of the top rail. The post tops shall fit over the outside of posts and shall exclude moisture from posts.

5. BARBED WIRE SUPPORTING ARMS, when required to be furnished, shall be at an angle of approximately 45° or vertical, as required, and shall be fitted with clips or other means for attaching three strands of barbed wire. With 45° arms the top wire shall be approximately twelve inches horizontally from the fence line and the other wires spaced uniformly between the top of the fence fabric and the outside strand. Barbed wire arm shall be of sufficient strength to withstand a weight of 250 pounds (113.3 kg) applied at the outer strand of barbed wire. Six line barbed wire 'V' arm may be used, if desired.

6. TOP RAILS shall be in lengths not less than 18 feet (5.5m), and shall be fitted with couplings or swedged for connecting the lengths into a continuous run. The couplings shall be not less than 6 inches (152.4mm) long, with 0.070 inches (1.75mm) minimum wall thickness, and shall allow for expansion and contraction of the rail. Open seam outside sleeves shall be permitted only with a minimum wall thickness of 0.100 inches (2.50mm). Suitable ties or clips shall be provided in sufficient number for attaching the fabric securely to the top rail at intervals not exceeding 24 inches (610mm). Means shall be provided for attaching the top rail to each gate, corner, pull and end post. Tension wire is required at top of fence if top rail is omitted. See paragraph 10.

7. TENSION BARS shall not be less than 3/16 inch (4.76mm) by 3/4 inch (19.05mm) and not less than 2 inches (50mm) shorter than the normal height of the fabric with which they are to be used. One tension bar shall be provided for each end and gate post, and two for each comer and pull post.

8. TIES OR CLIPS of adequate strength shall be provided in sufficient number for attaching the fabric to all line posts at intervals not exceeding 15 inches (380mm); and not exceeding 24 inches (610mm) when attaching fabric to top rail or tension wire.

9. BANDS OR CLIPS of galvanized steel or aluminum alloy per ASTM F-626 shall be provided in sufficient number for attaching the fabric and stretcher bars to all terminal posts at intervals not exceeding 15 inches (380mm). Tension bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.078 inch (1.98mm); and minimum width of 3/4 inch (19.05mm) for posts 4" O.D. (101.60mm). or less and 0.108 inch

(2.74mm) thickness by 7/8 inch (22.23mm) for posts larger than 4" O.D. (101.60mm). Brace bands shall be formed from flat or beveled steel and shall have a minimum thickness of 0.108 inch (2.74mm) after galvanizing; and minimum width of 3/4 inch (19.05mm) for post 4" O.D. (101.60mm). Standard mill tolerances of ± 0.005 inch (±0.127mm) on thickness and 0.010 inch (0.25mm) on width shall apply—attachment bolts shall be 5/16 (7.94mm) x 1-1/4 inch (31.76mm) galvanized carriage bolts with nuts.

10. TENSION WIRE shall be Marcelled (spiralled or crimped) #7 gage, 0.177 inches (4.50mm) ± 0.005 inches (±0.127mm) in diameter, conforming to ASTM A-824.

10.1 *Tension Wire Coating* shall conform to ASTM A-824 Type I, Aluminum-coated, 0.40 oz/ft^2 (122g/m^2) or Type II Zinc-coated Class 2, 1.20 oz/ft.^{2} (366g/m^2)

11. BARBED WIRE shall consist of two strands of twisted wire with 4 point barbs on 5 inch (127mm) spacing. The following listed barbed wires are recommended for use with chain link fencing:

Line Wire Gage	Line Wire Coating Weight	Barb Gage	Barb Coating Weight
12½	ZN 0.80 oz/ft.^{2} (245g/m^2)	14	ZN 0.65 oz/ft.^{2} (200g/m^2)
12½	AL 0.30 oz/ft.^{2} (90g/m^2)	14	Aluminum Alloy, or Aluminum Coated AL 0.25 oz/ft.^{2} (75g/m^2)
12½	Aluminum Alloy	14	Aluminum Alloy

Zinc-coated barbed wire shall conform to ASTM A-121, Chain link fence grade. Aluminum-coated barbed wire shall conform to ASTM A-585, Type I, 5 inch (127mm)or Type ll, 3 inch (76mm) barb spacing.

12. SWING GATES shall conform to ASTM F 900 (for complete specification, see ASTM 900).

12.1 *Materials*—The base materials of the gate frame shall be round or rectangular tubular members, welded at all corners or assembled with corner fittings. Gates assembled with corner fittings shall have adjustable truss rods 5/16 in. (7.9mm) minimum diameter on panels 5 ft. (1.5m) wide or wider. Truss rods shall be the same base metal and finish as the gate frames.

12.1.1 *The interior bracing*, when needed shall be the same metal and shape tubular material and finish as the gate frame, but need not be the same size. Gate leaves shall have vertical interior bracing at maximum intervals of 8 feet (2.4m) and shall have a horizontal interior member if the fabric height is 8 feet (2.4m) or more.

12.1.2 *Manufacture*—Gate frames shall be fabricated and coated where necessary, as described in 12.1.3 through 12.1.5

12.1.3 *Zinc-Coated Steel Frames* shall be in accordance with ASTM Specifications F 1043 of F 1083, or a combination thereof, and shall match that selected for any adjoining fence framework. Welded joints shall be coated in accordance with Practice A780, employing a zinc-rich paint.

12.1.4 *Aluminum Alloy Gate Frames* shall be in accordance with Specification F 1043.

12.1.5 *Polymer-Coated Steel or Polymer-Coated Aluminum Frames* shall be in accordance to paragraphs 12.1.3 and 12.1.4. Welded joints shall be top-coated to match the frame color.

12.1.6 *Gate Fabric* shall be the same type as used in fence construction. The fabric shall be attached securely to the gate frame at intervals not exceeding 15 in. (357mm).

12.1.7 *Barbed Wire Top*—When specified, shall have the end members of the gate frame extended in height to accommodate three strands of barbed wire.

12.2 *Dimensions, Mass, and permissible Variations*

12.2.1 Size of the gate opening shall be measured from the inside face to inside face of gate posts.

12.2.2 *Dimensions and weights* of gate frame members and posts shall be in accordance with Tables 6 and 7.

12.2.3 Gate frame shall be designed for the width and built so that the outer members shall not sag in excess of the lesser of 1% of the gate leaf width of 2 in. (50.8mm).

12.3 *Gate Accessories*—All gate accessories shall be of the materials as specified for the fence.

12.3.1 *Gate Hinges*—Hinges shall be structurally capable of supporting the gate leaf and allow the gate to open and close without binding. The hinges shall be so designed to permit the gate to swing a full 180°.

12.3.2 *Single Gate Latch*—Gate latch shall be capable of retaining the gate in a closed position and shall have provision for a padlock.

12.3.3 *Double Gate Latch*—Gate latch shall be a drop rod or plunger bar arranged to engage the gate stop. Locking devices shall be constructed so that the center drop rod or plunger bar cannot be raised when the gate is locked. The latching devices shall have provision for a padlock.

12.3.4 *Gate Stops*—Gate stops shall be provided for all double gates.

12.3.5 *Keepers* shall be provided for each gate leaf over 5 ft. (1.5m wide).

13. SLIDING GATES—Sliding gates shall comply with ASTM F 1184 which provides for overhead slide gates which are horizontal slide gates supported only from above and cantilever slide gates which are horizontal slide gates spanning an opening without a top or bottom support within that opening. Cantilever slide gates shall be supplied with steel or aluminum frames using external or internal rollers. Note: Safety guide posts and roller guards are required for cantilever slide gates using external rollers. See ASTM F 1184 for complete specifications.

14. INSTALLATION of fencing and gates shall meet the requirements of ASTM F 567 which are not intended to preclude any practice that has a proven performance equal to or better under varying conditions nor do they purport to address all of the safety problems involved. It is the responsibility of the user of this guideline to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

14.1 *Site Preparation* shall involve the location of fence lines, gates, terminal posts, underground utility locations, USC&G benchmarks, property monuments and underground structures by the purchaser who shall also provide for site cleaning and grading with adequate clearance on both sides of the fence line.

14.2 *Post Location* shall be as required spaced equidistant at intervals not exceeding 10 ft. (3.05m). Measure the interval parallel to the grade of the proposed fence and in the line of the fence from center to center of the posts.

14.3 *Terminal Posts* (end corner and gate posts) shall be set at the beginning and end and end of each continuous length of fence and at abrupt changes in vertical and horizontal alignments.

14.4 *Post Foundations* shall be concrete with hole diameters dug or drilled a minimum of four times the largest cross section of the post and a minimum depth of 24 in. (609.6mm) plus an additional 3 in. (76.2mm) for each 1 ft. (305mm) increase in the fence height over 4 ft. (1.22m).

14.5 *Set Posts* in a vertical position, plumb and align while concrete 2500 psi (17.2 mPa), is backfilled into the excavation and extended 2 in. (50mm) above grade and crowned to shed water or to 2 in. (50mm) below grade if a cover of sod, blacktop, or other material is provided.

14.6 *Mechanical Devices* can be used in place of concrete for the setting of fence posts provided the device strength in the ground is equal or superior to the strength developed by the concrete footing.

14.7 *Solid Rock or Concrete* can be encountered where an overburden of soil is not present. In this case set posts in the solid rock or concrete to a depth three times the largest cross section of the posts. The diameter of the hole shall be 1/2 in. (13mm) greater than the largest cross section of the post.

14.8 *Sleeves* can be used in order to leave voids in new concrete construction. Half-fill the void with nonshrinkable hydraulic cement and force the post to the bottom of the hole and plumb. Thoroughly work additional grout into the hole so as to leave no voids. Crown the grout to shed water.

14.9 *Drive Posts* are to be driven by mechanical means to a minimum depth of 36 in. (914.4mm) or 6 in. (152.4mm) greater than what is required for posts set in concrete for a given fence height except where soil conditions are unstable or rock or concrete is encountered. In the case of the latter, the depth should be in keeping with standard fence construction practices for the local area or utilize the solid rock or concrete requirements previously outlined. When driving posts the tops must be protected to prevent distortion of the exposed end. The use of a drive cap is recommended.

14.10 *Gate Posts* shall be set in concrete footings. Swing gate posts shall be set in footings as listed in Table 8. Cantilever slide gate post footings shall have a minimum diameter of 12 in. (304mm) and a minimum depth of 42 in. (1066mm). Overhead slide gate posts shall be set in a 12 in. (304mm) diameter hole with a depth of 38 in. (1.2m) for gate openings up to 24 ft. (7.3m). For openings 24 ft. (7.3m) to 40 ft. (12.19m), a 4 in. (101.6mm) outside diameter double post shall be set in a 24 in. (610mm) by 16 in. (406.4mm) sized hole, with a depth of 48 in. (1.2m).

14.11 *Terminal Post* bracing is required on all fabric over 6 ft. (1.83m) and on fabric over 12 ft. (3.66m) in height a center rail is required. All fences installed without a top rail shall have braces on all terminals. Securely fasten diagonal braces to the terminal post and the adjacent line post or its footing or a footing of equal size. There should be no more than a 50° angle between the brace and the ground. Securely fasten horizontal braces (if used in place of diagonal braces) with truss rods from the bottom of the terminal post to the adjacent line post where the brace rail terminates. When top rail is used attach the brace at the halfway point of the terminal post above grade and, when the top rail is omitted, at the two-thirds point above grade.

14.12 *Top Rail* must be supported at each post so that a continuous brace from end to end of each stretch of fence is formed. Securely fasten the top rail to the terminal posts and join with sleeves or coupling to allow for expansion and contraction.

14.13 *Tension Wire* should be stretched from end to end of each stretch of fence when the top rail is omitted and positioned at a height that will enable it to be fastened to the fabric within the top 1 ft. (305mm) of the chain-link fabric. If specified, bottom tension wire should be fastened within the bottom 6 in. (150mm) of the fabric. The tension wire should be taut and free of sag.

14.14 *Chain-Link Fabric* shall be placed on the outside of the area enclosed or as directed by the purchaser. Place the fabric by securing one end, applying sufficient tension to remove all slack before making attachments elsewhere. Tighten the fabric to provide a smooth uniform appearance free from sag. The fabric can be cut by untwisting a picket and attaching each span independently at all terminal posts. Use stretcher bars with tension bands or other suitable devices at 15 in. (380mm) maximum intervals. The fence fabric should be installed 2 in. (50mm) above ground level. Measure clearance at the post with a tolerance of ± 3 in. (±76mm). Fasten the fabric to the line posts at intervals not exceeding 15 in. (380mm). Fasten the fabric to the rail or tension wire at intervals not exceeding 24 in. (610mm). Rolls of wire fabric can be joined by weaving a single picket into the ends of the rolls to form a continuous mesh.

14.15 *Barbed Wire*, if required, shall be pulled taut to remove all sag. Firmly install in the slots of extension arms, and secure it to a terminal post utilizing terminal post band arms or brace bands or other suitable devices.

14.16 *Proper Gate Operation* and design requires consideration of opening direction, grade clearance, and possible obstructions.

14.17 *Work areas* shall be left neat and free of any debris caused by the erection of the fence. All work shall be performed in a safe and orderly fashion in accordance with the Williams-Steiger Occupational Safety and Health Act of 1970.

Table 4 – Dimensions and Weights

Use and Section	Nominal Outside Diameter Inches	(Millimeters)	Nominal Weight Per Foot (± 10% Tolerance) Type I Lbs/Ft	(kg/m)	Type II Lbs/Ft	(kg/m)
End, corner and pull posts fabric height 6'0" (1.83m)and less:round	2.375	(60.0)	3.65	(5.43)	3.12	(4.64)
square	2.00	(50.8)	2.60	(3.87)		
Over 6'0" (1.83 m): round	2.875	(73.0)	5.79	(8.62)	4.64	(6.90)
square	2.50	(63.5)	5.10	(7.60)		
Rails and post braces	1.66	(42.0)	2.27	(3.38)	1.83	(2.72)

Intermediate Posts For Fabric Heights		Nominal Weight Per Foot (± 10% Tolerance) Type I Lbs/Ft	(kg/m)	Type II Lbs/Ft	(kg/m)	C Sections Lbs/Ft	(kg/m)
6'0" (1.83 m) and less: round	1.90 (48.3)	2.72	(4.05)	2.28	(3.39)		
C Section	1.875" (47.6mm) x 1.625"(41.3mm)					2.28	(3.39)
Over 6'0" (1.83 m): round	2.375 (60.0)						
C Section	2.25" (57.1 mm) x 1.70"(43.2mm)	3.65	(5.43)	3.12	(4.64)		
						2.64	(3.93)

Note: Fencing utilizing fabric mesh sizes smaller than 1" (25mm) trade size, wind screen fencing and chain link fence with privacy inserts are subject to wind and ice loads and should be designed to accommodate these additional forces.

Table 5 — (Nonmandatory Information) Approximate Metric Equivalents for Table 1

Height of Fence Fabric					
Inches	(mm)	Inches	(mm)	Inches	(mm)
36	(910)	72	(1830)	108	(2740)
42	(1070)	84	(2130)	120	(3050)
48	(1220)	96	(2440)	144	(3660)
60	(1520)				

Table 6 — Gate Frame Members, Dimensions, and Weights

Gate Fabric Height	Outside Dimensions in. (mm)	Minimum Weight lb/ft (kg/m)
6 ft. (1.8 m) or Less:		
Round tubular (steel)	1.66 (42.2)	1.83 (2.72)
Rectangular tubular (steel)	1.50 (38.1)	1.84 (2.74)
Round tubular (aluminum)	1.90 (48.3)	0.91 (1.35)
Rectangular tubular (aluminum)	2.00 (50.8)	0.91 (1.35)
Over 6 ft. (1.8 m):		
Round tubular (steel)	1.90 (48.3)	2.28 (3.39)
Rectangular tubular (steel)	2.00 (50.8)	2.52 (3.75)
Round tubular (aluminum)	1.90 (48.3)	0.91 (1.35)
Rectangular tubular (aluminum)	2.00 (50.8)	0.91 (1.35)
Interior Bracing:		
Round pipe (steel)	1.66 (42.2)	1.83 (3.39)
Rectangular pipe (steel)	1.50 (38.1)	1.84 (2.74)
Round tubular (aluminum)	1.90 (48.3)	0.91 (1.35)
Rectangular tubular (aluminum)	2.00 (50.8)	0.91 (1.35)

Note: Gate leaf shall have vertical interior bracing at maximum intervals of 8 ft. and shall have a horizontal interior member if fabric height is 8 ft. or more. Additional horizontal, vertical or diagonal member or diagonal truss rods may be needed to comply with requirements of 12.2.3.

Table 7 — Dimensions and Weight of Gate Posts

Gate Leaf Width		Outside Diameter of Pipe, in. (mm)	Minimum Weight, lb/ft (kg/m)
For Gate Fabric Height of 6 ft. (1.8 m) or less:			
Up to and including 4 ft. (1.2 m)	Steel	2.375 (60.3)	3.11 (4.63)
	Aluminum	2.375 (60.3)	1.22 (1.81)
Over 4 to 10 ft (1.2 to 3.7 m)	Steel	2.875 (73.0)	4.64 (6.91)
	Aluminum	2.875 (73.0)	1.94 (2.89)
Over 10 to 18 ft (3.7 to 5.5 m)	Steel	4.000 (101.6)	8.65 (12.88)
	Aluminum	4.000 (101.6)	2.99 (4.45)
For Gate Fabric Height over 6 ft. (1.8 m):			
Up to and including 6 ft. (1.8 m)	Steel	2.875 (73.0)	4.64 (7.04)
	Aluminum	2.875 (73.0)	1.94 (2.89)
Over 6 to 12 ft (1.8 to 3.7 m)	Steel	4.000 (101.6)	8.65 (12.88)
	Aluminum	4.000 (101.6)	2.99 (4.45)
Over 12 to 18 ft (3.7 to 5.5 m)	Steel	6.625 (168.3)	18.02 (26.82)
Over 18 to 24 ft (5..5 to 7.3 m)	Steel	8.625 (219.1)	27.12 (40.36)

Note: All gate posts shall be of sufficient strength so that the total deflection of the gate frame and the gate post at the end of the gate leaf shall not exceed the lesser of 2% of the gate leaf width or 4 in. When necessary to meet this requirement due to the total weight of the gate leaf the next larger size post listed in Table 7 shall be used.

Table 8 — Minimum Requirements for Setting Industrial and Commercial Swing Gate Posts

Gate Leaf Width	Height	Post Size	Size of Hole			
			Diameter		Depth	
		Specification F 900	Dirt	Solid Rock or Concrete	Dirt	Solid Rock or Concrete
4 ft. or less (1.2 m)	6 ft. or less (1.8m)	Steel 2.375 (60.3 mm) Aluminum 2.375 (60.3 mm)	10 in. (254 mm)	Post O.D. + 1/2 in. (+13 mm)	30 in. (762 mm)	Post O.D. x 3
Over 4 ft. to 10 ft. (1.2 m to 3.7 m)	6 ft. or less (1.8m)	Steel 2.875 (73.0 mm) Aluminum 2.875 (73.0 mm)	12 in. (304 mm)	Post O.D. + 1/2 in. (+13 mm)	36 in. (914.5 mm)	Post O.D. x 3
Over 10 ft. to 18 ft. (3.7 m to 5.5 m)	6 ft. or less (1.8m)	Steel 4.0 (101.6 mm) Aluminum 4.0 (101.6 mm)	14 in. (356.4 mm)	Post O.D. + 1/2 in. (+13 mm)	36 in. (914.5 mm)	Post O.D. x 3
6 ft. or less (1.8 m)	Over 6 ft. (1.8m)	Steel 2.875 (73.0 mm) Aluminum 2.875 (73.0 mm)	10 in. (254 mm)	Post O.D. + 1/2 in. (+13 mm)	36 in. (914.5 mm)	Post O.D. x 3
Over 6 ft. to 12 ft. (1.8 m to 3.7 m)	Over 6 ft. (1.8m)	Steel 4.0 (101.6 mm) Aluminum 4.0 (101.6 mm)	12 in. (304 mm)	Post O.D. + 1/2 in. (+13 mm)	36 in. (914.5 mm)	Post O.D. x 3
Over 12 ft. to 18 ft. (3.7 m to 5.5 m)	Over 6 ft. (1.8m)	Steel 6.625 (168.3 mm)	16 in. (406.4 mm)	Post O.D. + 1/2 in. (+13 mm)	42 in. (1066 mm)	Post O.D. x 3
Over 18 ft. to 24 ft. (5.5 m to 7.3 m)	Over 6 ft. (1.8m)	Steel 8.625 (219.1 mm)	18 in. (457.2 mm)	Post O.D. + 1/2 in. (+13 mm)	48 in. (1.2 m)	Post O.D. x 3

Standard Guide for Polyvinyl Chloride (PVC) — Coated Steel Chain Link Fence Fabric

1. Scope

1.1 This guide covers Polyvinyl Chloride coated steel chain link fabric, Polyvinyl Chloride coated before weaving. Polyvinyl Chloride hereinafter will be designated PVC. Except for Barbed Wire and Tension Wire the preceeding Industrial Steel Guide for Fence Rails, Posts, Gates and Accessories also applies for PVC coated Steel Chain Link fabric and if the supplemental color coating for these items is elected as described in paragraph 1 of that section, a total color coated fence system can be achieved.

1.2 Fabric produced from three classes of wire are covered.

1.2.1 Class 1 consists of PVC coating extruded over metallic-coated steel wire.

1.2.2 Class 2a consists of PVC coating extruded over and adhered to metallic-coated steel wire.

1.2.3 Class 2b consists of PVC coating fused and adhered to metallic-coated steel wire.

Note 1—The values stated in inch-pound units are regarded as the standard. The metric values given in parentheses are provided for information only.

2. Applicable Documents

2.1 *ASTM Standards*:

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

A 370 — Mechanical Testing of Steel Products

D 1499 — Practice for Operating Light–and Water–Exposure Apparatus (Carbon-Arc-Type) for Exposure of Plastics

D 1729 — Visual Evaluation of Color Differences of Opaque Materials

F 552 — Terminology Relating to Chain Link Fencing

F 668 — Polyvinyl Chloride (PVC)-Coated Steel Chain Link Fence Fabric

F 934 — Standard Colors for Polymer Coated Chain Link Fence Materials

F 1043 — Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework

F 1664 — Standard Specification for Polyvinyl Chloride (PVC)- Coated Steel Tension Wire Used with Chain Link-Fence

F 1665 — Standard Specification for Polyvinyl Chloride (PVC)- Coated Steel Barbed Wire Used with Chain Link-Fence

G 23 — Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials.

G 26 — Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials.

3. Ordering Information

3.1 Orders for chain link fence fabric purchased to this guide shall include the following information:

3.1.1 Quantity

3.1.2 Class of PVC coating

3.1.3 Color of coating

3.1.4 Size of mesh

3.1.5 Diameter of core wire and/or minimum wire breaking strength

3.1.6 Height of fabric

3.1.7 Type of selvage, if nonstandard

3.1.8 Diamond count (see Section 9), if nonstandard

3.1.9 Certification, if required

3.2 Any tests required other than those specifically covered in this guide must be stipulated by the purchaser in the order or contract.

3.3 All rolls of fabric accepted by the purchaser shall be billed to him on the basis of the original footage of the rolls before sampling, unless changed by contractual agreement.

4. Definitions of Terms

4.1 Definitions of terms, such as chain link fence fabric, selvage, knuckle, twist and diamond count may be found on page 2 paragraph 3 of this manual. See ASTM F552 for additional listings of terminology specific to chain link fence.

5. Materials

5.1 *Base Metal*—The base metal shall be steel of such quality and purity that, when drawn to the size of wire required and coated with PVC, the finished fencing shall be of uniform quality and have properties and characteristics as prescribed in the specification.

5.2 *PVC-Coated Wire*—Wire used for the manufacture of fabric shall meet the requirements of this guide and shall be capable of being woven into fabric without the PVC coating cracking or peeling. PVC shall be plasticized

and thoroughly compounded so that there is full dispersement of pigments, stabilizer and other components.

6. Manufacture

6.1 Class 1 PVC-coated wire shall have the PVC coating extruded onto wire that is zinc-coated or zinc-5% aluminum alloy coated by the hot-dip method, zinc coated by the electrolytic process or aluminum-coated by the hot-dip method.

6.2 Class 2a PVC-coated wire shall have the PVC coating extruded and adhered to wire that is zinc-coated or zinc-5% aluminum alloy coated by the hot-dip method, zinc coated by the electrolytic process or aluminum-coated by the hot-dip method.

6.3 Class 2b PVC-coated wire shall have the PVC coating fused and adhered to a primer that is thermally cured onto wire that is zinc-coated or zinc-5% aluminum alloy coated by the hot-dip method, zinc-coated by the electrolytic process, or aluminum-coated by the hot-dip method.

6.4 The type of metallic coating on the steel wire substrate shall be the choice of the producer unless otherwise specified.

7. Weave

7.1 The wire shall be woven throughout in the form of approximately uniform square mesh, having parallel sides and horizontal and vertical diagonals of approximately uniform dimensions. The top and bottom of the fabric shall be knuckled or twisted as specified in Section 12.

8. Size of Mesh

The size of mesh shall conform to the requirements as shown in Table 1.

The permissible variation from the specified size of mesh shall be ± 1/8 in. (3.2mm) for all mesh sizes over 1 in. (25mm) and ± 1/16 in. (1.6mm) for all mesh sizes 1 in. (25mm) and under.

9. Diamond Count

9.1 Typical diamond count for each standard height is shown in Table 1. Other diamond counts are permissible, provided that they are consistent within a lot. The purchaser has the option to specify the typical diamond count under Ordering Information, Section 3.1.8.

10. Size of Wire

10.1 Chain link fabric shall be fabricated from wire diameters as necessary to meet the requirements of Table 1. The diameter shall be determined as the average of two readings taken at right angles to each other on the straight portion of the parallel sides of the mesh and measured to the nearest 0.001 inches (0.03mm).

10.2 The permissible variation from the specified diameter of core wire shall be ± 0.005 inch (0.13mm) for a core wire diameter over 0.105 in. (2.67mm) and ±0.004 in. (0.10mm) for a core wire diameter of 0.105 in. (2.67mm) or less.

11. Height of Fabric

11.1 Chain link fabric, unless otherwise required by the purchaser, shall be furnished in the standard heights shown in Table 1. The height of fabric shall be the overall dimensions from ends of twists or knuckles. Permissible variation from the specified height shall be ± 1 inch (25mm) for standard selvage on fabric with mesh sizes 1 in. (25mm) and over and ± 1/2 in. (13mm) for all fabric with mesh sizes less than 1 inch (25mm).

12. Selvage

12.1 Fabric with 2 inch (50.8mm) or 2-1/8 inch (54.0mm) mesh, in heights less than 72 inches (1829mm) shall be knuckled at both selvages. Fabric 72 inches (1829mm) high and over shall be knuckled at one selvage and twisted at the other. These are the standard selvages. Other selvage combinations will be supplied only if specified by the purchaser.

Caution: Twisted selvages for fences under 72 inches (1829mm) in height are not recommended because of consumer safety considerations.

12.2 The selvages of fabrics with meshes of less than 2 inches (50.8mm) shall be knuckled on both edges.

13. Breaking Strength

13.1 Wire constituting the fabric shall meet the minimum breaking strength shown in Table 3, as determined according to A 370.

13.2 Specimens to establish conformance to this requirement shall comprise individual pickets from a section of the fence fabric. The specimens shall be of sufficient length so as to be firmly gripped in the testing machine after straightening. PVC coating may be removed from the sample by chemical or mechanical means before testing. The actual gage length (distance between jaws) of the specimen shall be limited to the underformed length of wire between the two adjacent bends.

Note 1 — Unless otherwise stipulated by the purchaser, tests for breaking strength (Section 13) weight of zinc coating (Section 14) thickness of PVC coating (Section 15) and properties of PVC-coated wire (Section 16) made on the wire prior to weaving may be substituted for tests made on the wire from the finished fabric.

14. Weight of Metallic Coating

14.1 For Class 1 or Class 2 fabric, the weight of metallic coating shall conform to Table 4.

14.2 The weight of coating shall be determined on an individual piece of wire removed from the fabric. This specimen may be any length of wire over 12 inches (305mm) and shall include both bends and straight sections, but shall not include either twists or knuckles.

14.3 The weight of zinc, or zinc-5% aluminum alloy coating shall be determined by the method contained in Test Method A90/A90M after stripping the PVC coating as outlined in section 15.

14.4 The weight of aluminum coating shall be determined by the method contained in Test Method A 428, after stripping the PVC coating as outlined in Section 15.

15. Thickness of PVC Coating

15.1 The thickness of the PVC coating shall be in accordance with Table 5.

15.2 The thickness of PVC coating shall be determined on an individual piece of wire removed from the fabric. This specimen may be any length of wire over 12 inches (305mm) and shall include both bends and straight sections, but shall not include either twists or knuckles.

15.3 For Class 1 and Class 2a material, mechanically strip the PVC coating from the wire and measure the minimum and maximum thickness of the PVC coating with a suitable micrometer.

For Class 2b material, strip the PVC coating by chemical means and determine the diameter of the bare wire. Scrape the coating from one side of the wire and measure the reduced diameter with a micrometer. The thickness of coating at this point is the difference between the measurement thus obtained and the measured diameter of the bare wire. In a similar manner, determine the thickness of coating at right angles to the first determination.

When removing PVC coating by scraping, care should be exercised not to remove any of the metallic surface.

16. Properties of PVC-Coated Wire

16.1 The PVC coated wire from which the fabric is woven shall have a demonstrated ability to conform to the following requirements.

16.2 *Adhesion Tests*

16.2.1 Class 2a must conform to the requirements of paragraph 16.2.2. Class 2b must conform to the requirements of paragraph 16.2.3.

16.2.2 Three specimens from each lot shall be tested. Measure a distance of 3/4 inch (19mm) from the end of the specimen. With a regular hand grip wire stripper exert maximum hand pull parallel to the axis of the wire. Attempt to remove the measured portion of the vinyl sleeve from the core wire. The lot shall be acceptable if the vinyl sleeve is not capable of being removed from the core wire on all three samples.

16.2.3 Three specimens from each lot shall be tested. Make two cuts parallel to the axis of the wire through the coating, approximately 1/16 inch (1.6mm) apart, at least 1/2 inch (12.7mm) long. With a knife, peel back a section of the coating between 1/8 inch (3.2mm) and 1/4 inch (6.4mm) long, to produce a tab. Attempt to remove the 1/16 inch (1.6mm) strip of coating by pulling the tab. The lot shall be acceptable if the coating breaks rather than separates from the core wire on all three specimens.

16.3 *Accelerated Aging*

16.3.1 PVC-coated wire from which the fabric is woven shall withstand exposure for 1000 hours without failure at a black panel temperature of 145°F (63°C) when tested in accordance with ASTM D 1499. Type D, E or F apparatus described in ASTM G 23 or Type BH apparatus described in ASTM G 26 shall be used for the test.

The product shall be construed to have failed the test if:

(a) The wire fails to withstand the mandrel bend test described in 16.4

(b) Shrinkage of the PVC coating is greater than 1/16 inch per ft. (5.2mm/m) of wire

(c) There is a significant change in color or gloss of the PVC surface as determined by visual inspection.

16.4 *Mandrel Bend*

16.4.1 PVC-coated wire when subjected to a single bend at -20°F (-29°C) around a mandrel no larger than ten times the diameter of the wire shall not exhibit breaks or cracks in the PVC coating.

16.4.2 The mandrel bend test shall be performed on an individual piece of wire removed from the fabric. This specimen may be any length of wire over 12 inches (305mm) and shall include both bends and straight sections, but shall not include either twists or knuckles.

16.5 *Color*

16.5.1 Unless otherwise stipulated by the purchaser, the color of the PVC in Class 1, 2a and 2b fabric shall be in accordance with the standard colors contained in Table 2 and ASTM F934.

16.5.2 Compliance with this requirement shall be determined by comparison of specimens of the PVC coated wire to standard flat specimens of fused film of approximately the thickness specified for the PVC coating to be applied to the wire, and measuring at least 1-1/2 x 1-1/2 inch (38mm x 38mm).

Standard flat specimens for the evaluation of color of Class 1 and Class 2a coatings shall be prepared by milling, calendering, or compression molding PVC pellets, using temperatures approximating those to be used in the extrusion process.

Standard flat specimens for the evaluation of Class 2b coatings shall be prepared by thermally fusing PVC powder onto a suitable base, using temperatures approximating those to be used in the powder coating process.

16.5.3 The color of the standard flat specimens shall be determined in accordance with ASTM D 2244 and D 1729. The color of the specimens shall not vary more than 6 Delta E when exposed to 500,000 Langleys accelerated weathering operated in accordance with Practice G 90 with both day and night spray cycles.

17. PVC-Coated Wire Accessories

17.1 *PVC-Coated Tension Wire* shall be manufactured in accordance with ASTM 1664 which requires either a (1) heavy duty 7 gage, 0.177 in. (4.50 mm) metallic coated core wire having a breaking strength of 1950 lbf (8670 N) or a (2) light duty 9 gage 0.148 in. (3.76 mm) metallic coated core wire having a breaking strength of 1290 lbf (5740 N). The PVC coating shall be class 1 extruded, class 2a extruded and adhered or class 2b fused and adhered.

17.2 *PVC-Coated Barb Wire* shall be manufactured in accordance with ASTM F 1665 which requires two strands of 14 gage, 0.080 in. (2.03 mm) metallic-coated core wire with four-point 14 gage, 0.080 in. (2.03 mm) zinc-coated or aluminum alloy barbs. The PVC coating shall be class 1 extruded, class 2a extruded and adhered or class 2b fused and adhered. The spacing of the barbs shall be Type I, 5 in. (125 mm) on center or Type II, high security 3 in. (75 mm) on center.

18. Workmanship

18.1 Chain link fence fabric shall be produced by methods recognized as good commercial practices. The PVC coating shall be without voids. The PVC-coated wire shall be woven into fabric without tears or cuts which reveal the substrate.

19. Standard Length of Rolls

19.1 The standard length of roll shall be 50 ft. (15.24m) ± 1% except as otherwise agreed upon at the time of purchase.

19.2 The length of roll shall be determined by unrolling a roll of fabric on a flat surface and exerting tension by appropriate means to remove all slack. The tension applied shall not reduce the actual height of the fabric by more than 1/16 inch/ft. (5.2mm/m) of height or by more than 1/2 inch (12.7mm), whichever is less.

20. Field Sampling and Number of Tests

20.1 The purchaser may select at random one roll from every 50 rolls or fraction thereof for test purposes, except in no case shall fewer than two rolls be sampled.

120.2 Sample rolls thus selected shall be checked for weave (Section 7), size of mesh (Section 8), diamond count (Section 9), wire size (Section 10), height of fabric (Section 11), selvage (Section 12), and length (Section 18).

20.3 Test specimens taken from the outside end of the sample rolls shall be tested for breaking strength (Section 13), weight of metallic coating for Class 1 or Class 2 core wire (Section 14) and thickness of PVC coating (Section 15).

20.4 If any specimen tested fails to conform to the specified requirements, the roll represented by the specimen shall be rejected and two additional rolls shall be tested, both of which shall meet the requirements in every respect; otherwise the lot represented by the samples may be rejected.

21. Packaging and Marking

21.1 Each length of fabric shall be tightly rolled and firmly tied. Each shipment of fabric shall be identified as to the class of PVC coating, the color, the size of mesh, the core size of the wire, the height and length of fabric in each roll, ASTM Designation F668, and the name or mark of the manufacturer. The requirements apply unless otherwise specified.

22. Inspection

22.1 The seller is responsible for the performance of all inspection and test requirements as listed herein. The seller may use his own or other suitable facilities for inspection and testing unless the purchaser does not approve at the time the order is placed. Purchaser has the right to make any of the inspection and tests outlined where such are deemed necessary.

23. Certification and Reports

23.1 Upon the request of the purchaser in the contract or order, a manufacturer's certification that the material was produced in accordance with this guide shall be furnished.

Table 1— Standard Sizes of PVC-Coated Fabric[A]

Nominal Height of Fabric Diamond Count										Size of Mesh Inches	Specified Dia. of Core Wire Inches
Inches	36"	42"	48"	60"	72"	84"	96"	120"	144"	2" (50mm)	0.192" (4.88mm)
Diamond Count	10½	12½	13½	17½	20½	24½	27½	34½	41½		
Inches	36"	42"	48"	60"	72"	84"	96"	120"	144"	2" (50mm)	0.148" (3.76mm)
Diamond Count	10½	12½	13½	17½	20½	24½	27½	34½	41½		
Inches	36"	42"	48"	60"	72"	84"				2" (50mm)	0.120" (3.05mm)
Diamond Count	10½	12½	14½	17½	20½	24½					
Inches	36"	42"	48"	60"	72"					2⅛" (54mm)	0.120" (3.05mm)
Diamond Count	9½	11½	13½	16½	19½						
Inches								120"	144"	1¾" (44mm)	0.120" (3.05mm)
Diamond Count								39½	47½		
Inches								120"	144"	1¾" (44mm)	0.148" (3.76mm)
Diamond Count								39½	47½		
Inches	36"	42"	48"	60"	72"	84"	96"	120"	144"	1" (25mm)	0.148" (3.76mm)
Diamond Count	20	23	27	33	39	45	53	67	79		
Inches	36"	42"	48"	60"	72"	84"	96"	120"	144"	1" (25mm)	0.120" (3.05mm)
Diamond Count	20	23	27	33	39	45	53	67	79		
Inches	36"	42"	48"	60"	72"	84"	96"	120"	144"	—	—
Mesh Dimensions	S	H	W							⅜", ½", ⅝" (10mm), (13mm), (16mm)	0.120" (3.05mm))
	⅜ in. (10mm) MESH	¾ in. (19mm)	¾ in. (19mm)							⅜", ½", ⅝" (10mm), (13mm), (16mm)	0.105" (2.67mm))
	½ in. (13mm)MESH	15/16 in. (24mm)	15/16 in. (24mm)								
	⅝ in. (16mm) MESH	1⅛ in. (29mm)	1⅛ in. (29mm)							⅜", ½", ⅝" (10mm), (13mm), (16mm)	0.080" (2.03mm))

[A] See Table 6 for supplementary metric equivalent information
* These wire sizes should only be used with ⅜" (10mm), ½" (13mm), & ⅜" (16mm) mesh fabrics

Table 2 – Standard Polymer Colors (ASTM F934) Hunter System

	Green	Olive Green	Brown	Black
L	28.61	32.10	27.76	22.30
A	-12.59	-6.14	3.37	-0.09
B	1.95	3.00	4.28	-0.85
Delta/E	3.0	3.0	3.0	6.0

Test Method ASTM D 2244
Practice ASTM D 1729

Table 3 – Breaking Strength of PVC-Coated Core Wire

Diameter of Core Wire Inches	(mm)	Minimum Breaking Strength Class 1 and 2 lb.	(N)
0.192	(4.88)	2170	(9650)
0.148	(3.76)	1290	(5740)
0.120	(3.05)	850	(3780)
0.105	(2.67)	650	(2890)
0.080	(2.03)	380	(1690)

Table 4 – Weight of Metallic Coatings

Specified Diameter of Core Wire Inches	(mm)	Minimum Weight of Zinc or Zinc-5% Aluminum Alloy Coating oz./ft²	(g/m²)	Minimum Weight of Aluminum Coating oz./ft²	(g/m²)
0.192	(4.88)	0.40	(122)	0.20	(61)
0.148	(3.76)	0.30	(92)	0.20	(61)
0.120	(3.05)	0.30	(92)	0.20	(61)
0.105	(2.76)	0.30	(92)	0.20	(61)
0.080	(2.03)	0.25	(76)	0.20	(61)

Table 5 – Thickness of PVC Coating

	Class 1, Class 2a		Class 2b	
	Inches	(mm)	Inches	(mm)
Minimum Thickness at Any Point	0.015	(0.38)	0.006	(0.15)
Maximum Thickness at Any Point	0.025	(0.64)	0.010	(0.25)

Note 4 — Thickness of zinc coat can be estimated, using 1 ounce of zinc per square foot (305 g/m^2) equivalent to a coating thickness of 0.0017 inch (0.043mm).

Table 6 — (Nonmandatory Information) Approximate Metric Equivalents for Table 1

Height of Fence Fabric	
Inches	(mm)
36	(910)
42	(1070)
48	(1220)
60	(1520)
72	(1830)
84	(2130)
96	(2440)
108	(2740)
120	(3050)
144	(3660)

SPECIAL SAFETY CONSIDERATIONS

1) If the project includes an automatic gate operating system, safety devices appropriate to the application are required.
2) There are various state, local and federal codes, ordinances, and/or specifications for swimming pool enclosures (for information published by the U.S. Consumer Product Safety Commission contact Pool Barriers, Office of the Secretary, Washington, D.C. 20207). Please investigate accordingly.

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