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Series 138

Série des 138

WITHDRAWAL

October 2017

Standards in series
Fencing products

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Octobre 2017

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CAN/CGSB-138.1-96

Fabric for Chain Link Fence (ICS 91.090)

CAN/CGSB-138.2-96

Steel Framework for Chain Link Fence (ICS 91.090)

CAN/CGSB-138.3-96

Installation of Chain Link Fence (ICS 91.090)

CAN/CGSB-138.4-96

Gates for Chain Link Fence (ICS 91.090)

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CAN/CGSB-138.1-96

Grillage métallique pour clôture (ICS 91.090)

CAN/CGSB-138.2-96

Monture en acier pour clôture grillagée (ICS 91.090)

CAN/CGSB-138.3-96

Installation des clôtures grillagées (ICS 91.090)

CAN/CGSB-138.4-96

Barrière pour clôture grillagée (ICS 91.090)

CORRIGENDUM

March 1996

CANADIAN GENERAL STANDARDS BOARD

FABRIC FOR CHAIN LINK FENCE

4. CLASSIFICATION

TABLE 1 — Classification of Fabric

In this Table, replace the word "Coating" with the word "Weaving" for the Type 1, Class B fabric.

RECTIFICATIF

Mars 1996

OFFICE DES NORMES GÉNÉRALES DU CANADA

GRILLAGE MÉTALLIQUE POUR CLÔTURE

CLASSIFICATION

TABLEAU 1 — Classification du grillage

Dans ce tableau, remplacer le mot «revêtement» par le mot «tissage» pour le grillage de type 1 et de catégorie B.

CGSB ONGC

Canadian
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CAN/CGSB-138.1-96

Supersedes CAN/CGSB-138.1-M80

Fabric for Chain Link Fence

National Standard of Canada

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NATIONAL STANDARD OF CANADA

CAN/CGSB-138.1-96

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FABRIC FOR CHAIN LINK FENCE

Prepared by the
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Approved by the
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Acknowledgment is made for the translation of this National Standard of Canada by the Translation Bureau of the Department of the Secretary of State.

CANADIAN GENERAL STANDARDS BOARD

FABRIC FOR CHAIN LINK FENCE

1. SCOPE

1.1 This standard gives the requirements for various properties of chain link fence fabric used in commercial and industrial applications.

1.2 The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any existing applicable regulatory requirements prior to its use.

2. REFERENCED PUBLICATIONS

2.1 The following publications are referenced in this standard:

2.1.1 Canadian Standards Association (CSA)

G162.1 — Methods of Determining Mass of Coating on Zinc-Coated (Galvanized) Steel Wire.

2.1.2 American Society for Testing and Materials (ASTM)

A 428 — Test Methods for Weight of Coating on Aluminum-Coated Iron or Steel Particles

B 6 — Specification for Zinc (Slab zinc)

B 211 — Specification for Aluminum and Aluminum Alloy Bar, Rod and Wire

D 412 — Test Methods for Rubber Properties in Tension

D 792 — Test Methods for Specific Gravity and Density of Plastics by Displacement

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

D 2240 — Standard Test Method for Rubber Property — Durometer Hardness

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

2.2 A reference to a regulation is always to the latest issue. A dated reference is to the issue specified. An undated reference is to the latest issue, unless otherwise specified by the authority applying this standard. The sources are given in the Notes section.

3. TERMINOLOGY

3.1 The following definitions apply in this standard:

Chain Link Fence Fabric (Grillage métallique)

A fencing material made from 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 twisting of the ends of the wires to form the selvage of the fabric.

Knuckling (Jointure)

The type of selvage obtained by interlocking adjacent wire ends, in pairs, and then bending the wire ends back into a closed loop.

Twisting (Torsade)

The type of selvage obtained by twisting adjacent wire ends together, in pairs, in a close helix of 1-1/2 machine turns, which is equivalent to 3 full twists. The wire ends beyond the twist shall be at least 6 mm long.

4. CLASSIFICATION

4.1 The fence fabric shall be supplied in the following types, classes, styles and grades as shown in Table 1 and shall be as specified (par. 9.1):

TABLE 1

Classification of Fabric

Type	Class	Style	Grade
1. Steel Fabric	A. Zinc-Coated Galvanized After Weaving	1. Heavy	1, 2 or 3
		2. Medium	
		3. Light	
	B. Zinc-Coated Galvanized Before Weaving	1. Heavy	1, 2 or 3
		2. Medium	
		3. Light	
	C. Aluminum-Coated	1. Heavy	1 or 2
		2. Medium	
		3. Light	
	D. Vinyl-Coated	1. Heavy	N/A
		2. Medium	
		3. Light	
2. Aluminum Alloy Fabric	N/A	1. Heavy	N/A
		2. Medium	
		3. Light	

5. GENERAL REQUIREMENTS

5.1 **Materials and Workmanship** — Materials used for the construction of chain link fence fabric shall be produced by methods recognized as good commercial practice. The fabric shall be of uniform quality and condition, and shall be free from any defects or imperfections that might adversely affect its serviceability and appearance. The base metal shall be of such quality and purity that when drawn to the size of wire specified, the finished fence fabric shall be uniform and have the properties and characteristics as detailed in this standard.

5.2 **Manufacturing Progress Characteristics**

5.2.1 ***Type 1, Class A*** — Fabric that is zinc-coated after weaving shall be hot-dip galvanized. The zinc coating shall be applied in a continuous process and shall not be applied to the fabric in roll form.

5.2.2 ***Type 1, Class B*** — Fabric that is zinc-coated before weaving may be made from either electrolytically or hot-dip galvanized wire.

5.2.3 ***Type 1, Class C*** — Fabric that is aluminum-coated before weaving shall be hot dip coated.

5.2.4 ***Type 1, Class D*** — Fabric that is vinyl-coated shall be made from galvanized or aluminum-coated steel wire that meets the requirements of this standard. The fabric shall be vinyl-coated before weaving by a thermal extrusion or fusion process.

5.2.5 ***Style of Fabric*** — The style of fabric is designated according to the diameter of the coated wire.

6. DETAILED REQUIREMENTS

6.1 Type 1, Classes A, B and C — Zinc- and Aluminum-Coated Steel Fabric

6.1.1 ***Zinc*** — The slab zinc used for coating shall conform to ASTM B 6.

6.1.2 ***Grade of Coating*** — The grade (mass per unit area of the zinc or aluminum coating) shall be as determined in par. 8.2.1.

6.1.2.1 *Type 1, Class A* — The grade for zinc-coated fabric after weaving shall be as follows:

a. Grade 1 — The average mass per unit area of zinc coating shall not be less than 366 g/m^2 of uncoated wire surface, as determined from the average results of two or more specimens, and not less than 330 g/m^2 of uncoated wire surface for any individual specimen.

b. Grade 2 — The average mass per unit area of zinc coating shall not be less than 490 g/m^2 of uncoated wire surface, as determined from the average results of two or more specimens, and not less than 440 g/m^2 of uncoated wire surface for any individual specimen.

c. Grade 3 — The average mass per unit area of zinc coating shall be not less than 610 g/m^2 of uncoated wire surface, as determined from the average results of two or more specimens, and not less than 550 g/m^2 of uncoated wire surface for any individual specimen.

6.1.2.2 *Type 1, Class B* — The grade for zinc-coated fabric before weaving shall be as follows:

a. Grade 1 — The average mass per unit area of zinc coating shall not be less than 366 g/m^2 of uncoated wire surface, as determined from the average results of two or more specimens, and not less than 330 g/m^2 of uncoated wire surface for any individual specimen.

b. Grade 2 — The average mass per unit area of zinc coating shall not be less than 490 g/m^2 of uncoated wire surface, as determined from the average results of two or more specimens, and not less than 440 g/m^2 of uncoated wire surface for any individual specimens.

c. Grade 3 — The average mass per unit area of zinc coating shall not be less than 610 g/m^2 of uncoated wire surface, as determined from the average results of two or more specimens, and not less than 550 g/m^2 of uncoated wire surface for any individual specimens[1].

6.1.2.3 *Type 1, Class C* — The grade for aluminum-coated fabric shall be as follows:

a. Grade 1 — The average mass per unit area of aluminum coating shall not be less than 107 g/m^2 of uncoated wire surface.

b. Grade 2 — The average mass per unit area of aluminum coating shall not be less than 122 g/m^2 of uncoated wire surface.

6.1.3 ***Adhesion*** — The zinc or aluminum coating shall adhere to the wire without flaking or being removed by rubbing with bare fingers when tested according to par. 8.2.2[2].

6.2 Type 1, Class D — Vinyl-Coated Fabric

6.2.1 ***Zinc*** — The slab zinc used for coating of the steel core wire shall conform to ASTM B 6.

6.2.2 ***Mass Per Unit Area of Core Wire Coating*** — The mass per unit area of zinc or aluminum coating shall be as determined in par. 8.2.1 and as specified (par. 9.1).

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[1] *Only ailable as electrolytically zinc-coated.*

[2] *Loosening or detachment during the adhesion test of superficial, small particules of zinc formed by mechanical polishing of the surface of zinc-coated wire shall not be considered cause for rejection.*

6.2.2.1 The mass per unit area of zinc or aluminum coating shall not be less than 90 g/m² of uncoated wire surface, as determined from the average of results of two or more specimens, and not less than 80 g/m² of uncoated wire surface for any individual specimen.

6.2.3 ***Adhesion*** — The zinc or aluminum coating shall adhere to the steel wire when tested in accordance with par. 8.2.2.

6.2.4 ***Vinyl Coating*** — Vinyl-coated wire used for the manufacture of fence fabric shall be coated before weaving by thermally extruding or fusing vinyl over the zinc- or aluminum-coated core wire. The minimum thickness applicable to coatings on the core wire shall be in accordance with Table 2.

6.2.5 ***Density*** — The density of vinyl shall be a maximum of 1.30 g/cm³, when tested in accordance with ASTM D 792.

6.2.6 ***Hardness*** — The durometer hardness of extruded vinyl shall be Type A - 93 ± 3 when tested in accordance with ASTM D 2240.

6.2.7 ***Tensile Strength and Elongation*** — The tensile strength of extruded vinyl shall be 18 MPa ± 5%, and elongation shall be 275% minimum when tested in accordance with ASTM D 412.

TABLE 2

Minimum Vinyl Coating Thickness

Style	Nominal Diameter* of Vinyl-Coated Finished Wire mm	Nominal Diameter of Coated Core Wire mm	Vinyl Coating Thickness mm
1	4.26	3.5	0.380
2	3.76	3.0	0.380
3	2.96	2.2	0.380

** Diameter includes vinyl coating. To determine diameter of metallic-coated core wire, subtract twice the thickness of the vinyl coating.*

6.2.8 ***Accelerated Aging*** — The vinyl-coated wire shall not crack, craze, or become loose when tested in accordance with par. 8.2.3.

6.3 **Type 2 — Aluminum Alloy Fabric**

6.3.1 ***Material*** — The fence fabric of aluminum alloy wire shall conform to the requirements of ASTM B 211 in the H18 temper, or of any alloy having equivalent or greater strength and corrosion resistance.

6.4 **Types 1 and 2 — Fabric Properties**

6.4.1 ***Weave and Size*** — 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 par. 6.4.3. The size of mesh and the height of chain link fence fabric shall be as shown in Tables 3, 4 and 5 and as specified in par. 9.1. Measurements of diameter, size and height shall be made in accordance with par. 8.2.4, 8.2.5 and 8.2.6.

6.4.2 ***Breaking Strength*** — The wire shall meet the minimum breaking strength requirements shown in Tables 3, 4 and 5 when tested in accordance with par. 8.2.7.

TABLE 3

Type 1 Classes A, B and C — Zinc-Coated and Aluminum Steel Fabric — Size and Breaking Strength

Style	Nominal Diameter of Zinc- or Aluminum-Coated Wire mm	Permissible Variations in Diameter of Coated Wire ±mm	Size of Mesh (±3 mm) mm	Height of Fence Fabric (±25 mm) m	Minimum Breaking Strength N
1	5.0	0.1	50	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	10 000
2	3.5	0.1	40	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	5 000
			50		
3	3.0	0.1	40	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	3 600
			50	1.0, 1.2, 1.5, 1.8	

TABLE 4

Type 1, Class D — Vinyl-Coated Steel Fabric — Size and Breaking Strength

Style	Nominal Diameter of Vinyl-Coated Finished Wire mm	Permissible Variations in Diameter of Coated Wire ±mm	Size of Mesh (±3 mm) mm	Height of Fence Fabric (±25 mm) m	Minimum Breaking Strength* N
1	4.26	0.1	40	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	4 000
			50		
2	3.76	0.1	40	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	2 900
			50		
3	2.96	0.1	40	1.0, 1.2, 1.5, 1.8	
			50		

** Breaking strengths are calculated on core wire equivalent tensile strength of 60 000 psi (min).*

TABLE 5

Type 2 — Aluminum Alloy Fabric — Size and Breaking Strength

Style	Nominal Diameter of Aluminum Alloy Wire mm	Permissible Variations in Diameter of Wire ±mm	Size of Mesh (±3 mm) mm	Height of Fence Fabric (±25 mm) m	Minimum Breaking Strength N
1	5.0	0.1	50	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	5 000
2	3.5	0.1	50	1.0, 1.2, 1.5, 1.8, 2.1, 2.4, 3.0, 3.6	2 500
3	3.0	0.1	40	1.0, 1.2, 1.5, 1.8 2.1, 2.4, 3.0, 3.6	1 900
			50	1.0, 1.2, 1.5, 1.8	

6.4.3 ***Selvage*** — Heavy and medium fabric 1.5 m high and under shall be furnished with knuckling at each selvage. Fabric over 1.5 m high shall be furnished with twisting on one selvage and knuckling on the other.

6.4.4 ***Standard Length of Rolls*** — The standard length of roll shall be 15 m ± 1% except as otherwise agreed upon at the time of purchase (par. 9.1). The length of roll shall be determined as described in par. 8.2.8.

7. PREPARATION FOR DELIVERY

7.1 **Packaging** — Each length of fabric shall be tightly rolled and firmly tied to prevent loosening during shipment and handling.

7.2 **Marking** — Unless otherwise specified (par. 9.1), each roll of fabric shall be marked to show:

Type, class, style and grade of coating

Nominal size

Nominal length and height of fabric in each roll

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Name of the manufacturer.

8. INSPECTION

8.1 **Sampling** — Unless otherwise specified (par. 9.1), one roll from every 50 rolls or fraction thereof shall be taken at random as a sample for test purposes, and in no case shall less than 2 samples be tested.

8.1.1 To determine compliance with the requirements of this standard, test specimens for each of the tests specified shall be taken from the outside end of the sample rolls representing the lot.

8.1.2 If any specimen tested fails to meet the requirements of this standard, the roll represented by the specimen shall be rejected and 2 additional rolls shall be tested, both of which shall meet all the requirements.

8.1.3 Unless otherwise stipulated by the authority applying this standard, alternative tests for mass per unit area of coating when galvanized prior to weaving and for breaking strength made on the wire prior to weaving may be substituted for tests made on the wire from the finished fabric.

8.2 **Testing**

8.2.1 ***Mass per Unit Area of Zinc or Aluminum Coating (Grade)***

8.2.1.1 Determine the mass per unit area of the zinc or aluminum coating on an individual piece of wire removed from the fabric. This specimen may be of any length over 300 mm and shall include both bends and straight sections, but shall not include knuckles.

8.2.1.2 Determine the mass per unit area of zinc coating in accordance with CSA G162.1.

8.2.1.3 Determine the mass per unit area of the aluminum coating in accordance with ASTM Method A 428.

8.2.2 ***Adhesion of Zinc or Aluminum Coating*** — Determine the adhesion of the zinc or the aluminum coating on the wire as follows: Wrap a sample of the wire at least twice in a close helix around a cylindrical mandrel having a diameter 4 times the nominal wire diameter. (Wrapping speed shall not exceed 15 turns per minute). Then examine, the adherence of the zinc or aluminum coating to the wire to determine compliance with the stated requirement.

8.2.3 ***Accelerated Aging of Vinyl-Coated Wire*** — The vinyl used for coating wires shall have a demonstrated ability to withstand exposure for 1000 h without failure at a black panel temperature of 63°C when tested in accordance with ASTM D 1499. Type D, E or H apparatus described in ASTM G 23 shall be used for the test. The product shall be construed to have failed the test if:

a. The wire fails to withstand a mandrel bend test when subjected to a single bend at –29°C around a mandrel no larger than ten times the diameter of the wire and exhibits breaks or cracks in the vinyl coating. The mandrel and wire shall be conditioned at –29°C for at least 1 h.

b. The shrinkage of the vinyl coating is greater than 5 mm/m of wire.

c. There is a significant change in the colour or the gloss of the vinyl surface as determined by visual inspection.

8.2.4 ***Diameter of Wire*** — Determine the diameter of the coated wire 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 measure to the nearest 0.03 mm.

8.2.5 ***Size of Mesh*** — Determine the size of the mesh by measuring the minimum clear distance between the wires forming the parallel sides of the mesh.

8.2.6 ***Height of Fabric*** — Determine the height of the fabric using the overall dimension from the ends of the knuckles or from the knuckle and the twist.

8.2.7 ***Breaking Strength*** — Determine the conformance to the breaking strength requirement using 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. Limit the actual gauge length (distance between jaws) of the specimen to the undeformed length of wire between the two adjacent straightened bends.

8.2.8 ***Length of a Roll*** — Determine the length of a roll by first 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 5 mm/m of height or by more than 13 mm, whichever is less.

9. NOTES

9.1 **Options** — The following options must be specified in the application of this standard:

a. Type, class, style and grade of fabric (par. 4.1)

b. Mass per unit area of core wire coating (par. 6.2.2).

c. Size of mesh and height of fabric (par. 6.4.1)

d. Standard length of roll if other than 15 m (par. 6.4.4)

e. Marking details, if other than as specified (par. 7.2)

f. Sampling, if other than as specified (par. 8.1).

9.2 **Basis of Purchase** — Unless otherwise stated in the purchase documents, all samples shall be included in the contract quantity.

9.3 **Sources of Referenced Publications**

9.3.1 The publication referred to in par. 2.1.1 may be obtained from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Etobicoke, Ontario M9W 1R3.

9.3.2 The publications referred to in par. 2.1.2 may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, U.S.A. or from the Standards Council of Canada, Standards Sales Branch, 45 O'Connor Street, Suite 1200, Ottawa, Ontario K1P 6N7.