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Designation: A 975 – 97 (Reapproved 2003)

Standard Specification for Double–Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic–Coated Steel Wire or Metallic-Coated Steel Wire With Poly(Vinyl Chloride) (PVC) Coating)[1]

This standard is issued under the fixed designation A 975; 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 gabions and revet mattresses produced from double-twisted metallic-coated wire mesh, and metallic-coated wire for lacing wire, stiffeners, and fasteners used for manufacturing, assembling, and installation of the product. This specification also covers gabions and revet mattresses in which the wire mesh, lacing wire, and stiffeners are poly(vinyl chloride) (PVC) coated after the metallic coating.

1.2 Double-twisted wire mesh for gabions and revet mattresses is produced in different styles, based on type of coating, as described in Section 4.

1.3 The values stated in SI units are to be regarded as the standard. The values given in brackets are for information only.

1.4 This specification references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of this specification.

1.5 The following safety hazards caveat pertains only to the test methods portion, Section 13, of this specification: *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 consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

A 90/A 90M Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coating[2]

A 313 Specification for Chromium-Nickel Stainless and Heat-Resisting Steel Spring Wire[3]

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products[3]

A 428 Test Method for Weight of Coating on Aluminum Coated Iron and Steel Articles[2]

A 641 Specification for Zinc Coated (Galvanized) Carbon Steel Wire[2]

A 764 Specification for Steel Wire, Carbon, Drawn Galvanized and Galvanized at Size for Mechanical Springs[3]

A 809 Specification for Aluminum-Coated (Aluminized) Carbon Steel Wire[2]

A 856/A 856M Specification for Zinc-5% Aluminum-Mischmetal Alloy-Coated Carbon Steel Wire[2]

A 902 Terminology Relating to Metallic Coated Steel Products[2]

B 117 Test Method of Salt Spray (Fog) Testing[4]

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension[5]

D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact[6]

D 792 Test Methods for Specific Gravity (Relative density) and Density of Plastics by Displacement[6]

D 1242 Test Methods for Resistance of Plastic Materials to Abrasion[6]

D 1499 Practice for Operating Light-and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics[6]

D 2240 Test Method for Rubber Property-Durometer Hardness[5]

G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials[7]

3. Terminology

3.1 *Definitions:*

3.1.1 Refer to Terminology A 902 for general terminology relating to metallic-coated steel products.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *gabion, n*—a double-twisted wire mesh container of variable sizes, uniformly partitioned into internal cells, interconnected with other similar units, and filled with stone at the

[1] This specification is under the jurisdiction of ASTM Committee A05 on Metallic Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.12 on Wire Specifications.

Current edition approved May 10, 2003. Published June 2003. Originally approved in 1997. Last previous edition approved in 1997 as A 975 - 97.

[2] *Annual Book of ASTM Standards*, Vol 01.06.

[3] *Annual Book of ASTM Standards*, Vol 01.03.

[4] *Annual Book of ASTM Standards*, Vol 03.02.

[5] *Annual Book of ASTM Standards*, Vol 09.01.

[6] *Annual Book of ASTM Standards*, Vol 08.01.

[7] *Annual Book of ASTM Standards*, Vol 14.02.

project site to form flexible, permeable, monolithic structures such as retaining walls, sea wall, channel linings, revetments, and weirs for erosion control projects (see Fig. 1 and Fig. 2).

3.2.2 *revet mattress, n*—a double-twisted wire mesh container uniformly partitioned into internal cells with relatively small height in relation to other dimensions, having smaller mesh openings than the mesh used for gabions; revet mattresses are generally used for riverbank protection and channel linings (see Fig. 3).

3.2.3 *double-twisted wire mesh, n*—a nonraveling mesh made by twisting continuous pairs of wires through three one-half turns (commonly called double-twisted) to form hexagonal-shaped openings which are then interconnected to adjacent wires to form hexagonal openings.

3.2.4 *selvedge wire, n*—a terminal wire used to edge the wire mesh perpendicular to the double twist by mechanically wrapping the mesh wires around it at least 2.5 times or by inserting it throughout the twists and folding one mesh length.

3.2.5 *edge wire, n*—a terminal wire used to edge the wire mesh parallel to the double twist by continuously weaving it into the wire mesh.

3.2.6 *lacing wire, n—for gabions and revet mattresses*, a metallic-coated steel wire or metallic-coated steel wire with PVC coating used to assemble and interconnect empty units, to close and secure stone-filled units, and for internal stiffeners.

3.2.7 *fastener, n*—an alternate method to lacing wire used for binding operations for gabions and revet mattresses.

3.2.8 *stiffener, n—for gabions*, a length of metallic-coated steel wire or metallic-coated steel wire with PVC coating used for support of facing by connecting the front panel to the back panel of a gabion (stiffener formed at the project site using wire having the same diameter as for the lacing wire (see Table 1) or across the corners of a gabion cell (preformed stiffener having a diameter as specified in Table 1).

3.3 *Abbreviations: Abbreviations:*

3.3.1 *PVC*—poly(vinyl chloride).

3.3.2 *Zn-5A1-MM*—zinc-5 % aluminum-mischmetal alloy.

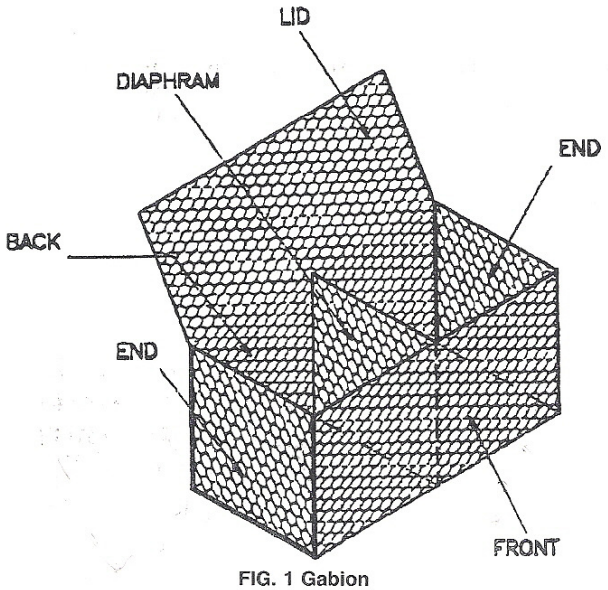

FIG. 1 Gabion

4. Classification

4.1 Double-twisted wire gabions and revet mattresses are classified according to coating, as follows:

4.1.1 *Style 1*, consists of double-twisted wire mesh made from wire which is zinc coated before being double-twisted into mesh. Fasteners, lacing wire, and stiffeners are produced from zinc-coated wire.

4.1.2 *Style 2*, consists of double-twisted wire mesh made from wire which is coated with Zn-5A1-MM before being double-twisted into mesh. Fasteners, lacing wire, and stiffeners are also produced from Zn-5A1-MM coated wire.

4.1.3 *Style 3*, consists of double-twisted mesh, lacing wire, and stiffeners as Style 1 and overcoated with PVC. Fasteners shall be of stainless steel wire.

4.1.4 *Style 4*, consists of double-twisted mesh made from wire which is aluminum-coated before being double-twisted into mesh. Fasteners, lacing wire, and stiffeners are also produced from aluminum-coated wire.

5. Ordering Information

5.1 Orders for material to this specification shall include the following information:

5.1.1 Quantity (number of units) as shown on plan,

5.1.2 Product type (gabions or revet mattresses),

5.1.3 Size (length by width by height),

5.1.4 Style of coating (Section 4), including the specific style to be furnished, or all acceptable styles,

5.1.5 ASTM designation and year of issue,

5.1.6 Any special requirements (see 8.2.5), and

5.1.7 Certification, if required (see Section 15).

NOTE 1—A typical ordering description is as follows: 100 gabions, 2 by 1 by 1 m or [6 by 3 by 3 ft], 100 revet mattresses 4 by 2 by 0.23 m or [12 by 6 by 0.75 ft] and 100 lids 4 by 2 m or [12 by 6 ft] as shown on plans; Style 1, 2, 3, or 4 with required fasteners or lacing wire and stiffeners; conforming to ASTM A-975.

6. Material and Manufacture

6.1 The wire used in the manufacture of double-twisted mesh for use in gabions and revet mattresses shall conform to the specifications shown in 6.1.1, 6.1.2, 6.1.3, or 6.1.4 as appropriate for the style ordered, except that the tensile strength shall conform to 7.1.

6.1.1 Style 1 double-twisted mesh shall be manufactured from zinc-coated steel wire conforming to Specification A 641, Class 3 coating, soft temper.

6.1.2 Style 2 double-twisted mesh shall be manufactured from Zn-5A1-MM-coated steel wire conforming to Specification A 856/A 856M, Class 3 coating, soft temper.

6.1.3 Style 3 double-twised mesh shall be manufactured from the same type of metallic-coated steel wire as Style 1 with an additional PVC coating extruded onto the metallic-coated steel wire. The PVC coating shall conform to the properties in 8.2.

6.1.3.1 Original or modified thermoplastic polymers along with their application methods can be permitted as a substitute for PVC coatings, as long as their performance is equivalent to the performance requirements of the PVC coating.

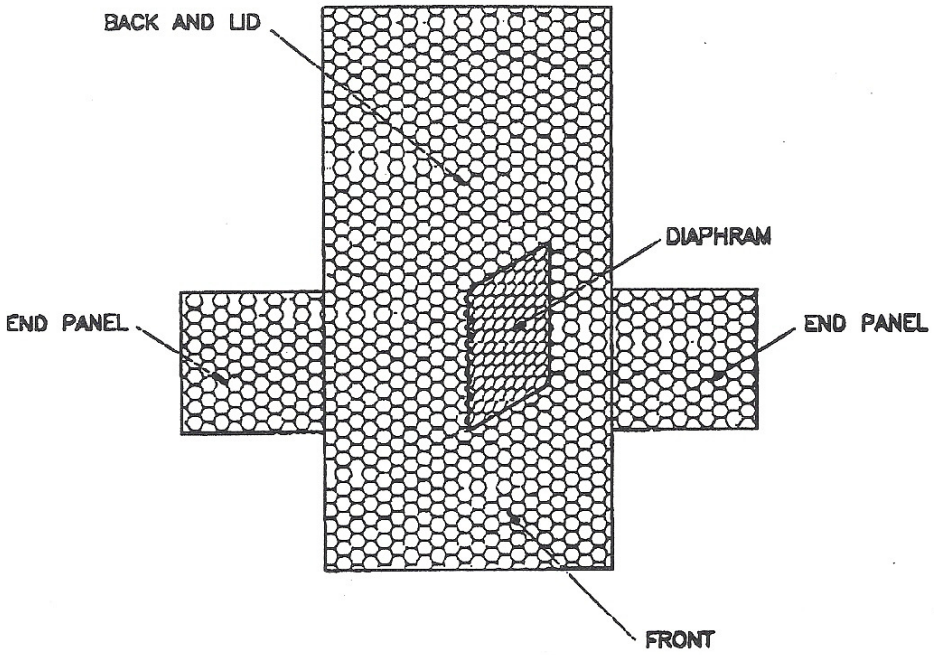

FIG. 2 Mechanically Manufactured Gabion

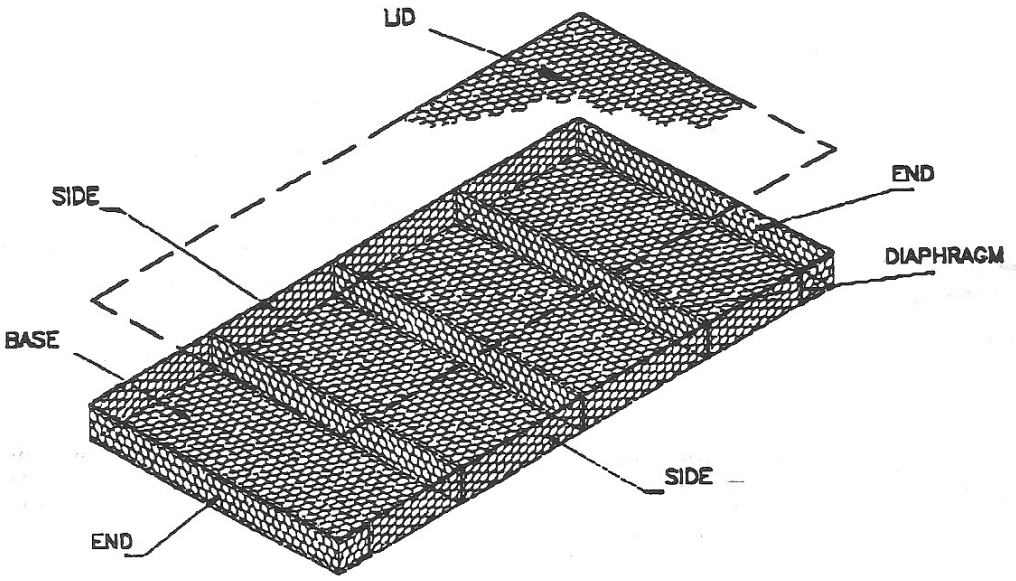

FIG. 3 Revet Mattress

6.1.4 Style 4 double-twisted mesh shall be manufactured from aluminum-coated steel wire conforming to Specification A 809, soft temper.

6.2 Lacing wire and stiffeners shall be made of wire having the same coating material as the double-twisted wire mesh furnished on the order and conforming to Specification A 641, A 856/A 856M, or A 809, with a tensile strength in accordance with 7.1

6.3 Fasteners made from zinc-coated steel wire, zinc-5 % aluminum mischmetal alloy-coated steel wire and aluminum-coated steel wire shall conform to Specification A 764, Type A, B, or C, Class 3, with a tensile strength in accordance with 7.2. Fasteners made from stainless steel wire shall conform to Specification A 313, Type 302, with a tensile strength in accordance with 7.2.

6.4 Gabions and revet mattresses shall be manufactured with all components mechanically connected at the production facility with the exception of the mattress lid which is produced separately from the base (see Fig. 1, Fig. 2, and Fig. 3). All gabions (Fig. 1 and Fig. 2) and revet mattresses (Fig. 3) shall be supplied in the collapsed form, either folded and bundled or rolled, for shipping.

TABLE 1 Mesh Characteristics[A]

Characteristics	Gabion		Revet Mattresses	
	Metallic Coated	PVC Coated	Metallic Coated	PVC Coated
Mesh Type	8 by 10		6 by 8	
Mesh Opening	83 by 114 mm [3.25 by 4.5 in.]	83 by 114 mm [3.25 by 4.5 in.]	64 by 83 mm [2.5 by 3.25 in.]	64 by 83 mm 2.5 by 3.25 in.]
Mesh wire	3.05 mm [0.120 in.]	2.7 mm [0.106 in.]	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]
Selvedge wire	3.8 mm [0.150 in.]	3.4 mm [0.134 in.]	2.7 mm [0.105 in.]	2.7 mm [0.105 in.]
Lacing wire	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]
Fasteners	3.0 mm [0.118 in.]	3.0 mm [0.118 in.]	3.0 mm [0.118 in.]	3.0 mm [0.118 in.]
Stiffeners:				
Using lacing wire	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]	2.2 mm [0.087 in.]
Preformed	3.8 mm [0.150 in.]	3.4 mm [0.134 in.]	N/A	N/A
PVC coating thickness:				
Nominal	N/A	0.50 mm [0.02 in.]	N/A	0.50 mm [0.02 in.]
Minimum	N/A	0.38 mm [0.015 in.]	N/A	0.38 mm [0.015 in.]

[A]All dimensions and wire diameters are minimum nominal values.

7. Mechanical Properties

7.1 *Tensile Strength*— The tensile strength of wire used for double-twisted mesh, lacing wire, and stiffener, when tested in accordance with Test Methods and Definitions A 370, shall be in accordance with the requirements of Specification A 641, A 809, and A 856/A 856M for soft temper wire.

7.2 *Fasteners*—The tensile strength of zinc-coated steel wire, zinc-5 % aluminum mischmetal alloy-coated steel wire and aluminum-coated steel wire used for fasteners shall be in accordance with the requirements of Specification A 764, Type A, B, or C, Table 2 or Table 3. The tensile strength of stainless steel wire used for fasteners shall be in accordance with the requirements of Specification A 313, Type 302, Table 2. Any fastener system shall give the number of fasteners required to comply with Table 2 in accordance with the pull-part resistance test (see 13.1.2). The manufacturer or supplier shall state the number of fasteners required for all vertical and horizontal connections for single- and multiple-basket joinings and shall include a description of a properly installed fastener including drawings or photographs.

TABLE 2 Minimum Strength Requirements of Mesh and Connections

Test Description	Gabions, Metallic Coated		Gabion, PVC Coated		Revet Mattress Metallic Coated and PVC Coated	
	kN/m	[lbf/ft]	kN/m	[lbf/ft]	kN/m	[lbf/ft]
Parallel to twist	51.1	[3500]	42.3	[2900]	33.6	[2300]
Perpendicular to twist	26.3	[1800]	20.4	[1400]	13.1	[900]
Connection to selvedges	20.4	[1400]	17.5	[1200]	10.2	[700]
Panel to panel connection using lacing wire or fasteners	20.4	[1400]	17.5	[1200]	10.2	[700]
	kN	[lbf]	kN	[lbf]	kN	[lbf]
Punch Test	26.7	[6000]	23.6	[5300]	17.8	[4000]

7.3 *Mesh and Panel to Panel Joint Strength*—The minimum strength requirements of the mesh, selvedge wire to mesh connection, panel to panel connection, and punch test, when tested in accordance with 13.1, shall be as shown in Table 2.

8. Physical Properties

8.1 *Metallic Coating*— The coating weights shall conform to the requirements of Specification A 641, Class 3, for zinc coating or Specification A 856/A 856M, Class 3, for Zn-5A1-MM coating, or Specification A 809 for aluminum coating.

8.2 *PVC for Coating*— The initial properties of PVC coating material shall have a demonstrated ability to conform to the following requirements:

8.2.1 *Specific Gravity*— In the range from 1.30 to 1.35 when tested in accordance with Test Method D 792.

8.2.2 *Tensile Strength*— Not less than 20.6 MPa [2985 psi] when tested in accordance with Test Methods D 412.

8.2.3 *Modulus of Elasticity*—Not less than 18.6 MPa [2700 psi] when tested in accordance with Test Methods D 412.

8.2.4 *Hardness*—Shore" D" between 50 and 60, when tested in accordance with Test Method D 2240.

8.2.5 *Brittleness Temperature*—Not higher than –9°C [15°F], or lower temperature when specified by the purchaser, when tested in accordance with Test Method D 746 (see Note 2).

NOTE 2—The maximum brittleness temperature should be at least 8°C [15°F] below the minimum temperature at which the gabions will be filled.

8.2.6 *Resistance to Abrasion*—The percentage of the weight loss shall be less than 12 %, when tested in accordance with Test Method D 1242.

8.2.7 *Salt Spray Exposure and Ultraviolet Light Exposure*:

8.2.7.1 The PVC shall show no effect after 3000 h of salt spray exposure in accordance with Test Method B 117.

8.2.7.2 The PVC shall show no effect of exposure to ultraviolet light with test exposure of 3000 h, using apparatus Type E and 63°C [145°F], when tested in accordance with Practice D 1499 and G 23.

8.2.7.3 *Evaluation of Coating After Salt Spray and Ultraviolet Exposure Test*—After the salt spray test and exposure to ultraviolet light as specified in 8.2.7.1 and 8.2.7.2, the PVC coating shall not show cracks nor noticeable change of color, or blisters or splits. In addition, the specific gravity, tensile strength, hardness, and resistance to abrasion shall not change more than 6 %, 25 %, 10 %, and 10 %, respectively, from their initial values.

8.2.8 The PVC coating shall not show cracks or breaks after the wires are twisted in the fabrication of the mesh.

8.3 *Salt Spray Resistance for Fastener*—After testing in accordance with 13.1.3, the fasteners, the selvedge, or mesh wire confined by the fasteners shall show no rusty spots on any part of the surface excluding the cut ends.

9. Dimensions and Tolerances

9.1 The diameter of metallic coated wire shall conform to Table 1 plus or minus the tolerances shown in Specifications A 641, A 856/A 856 M, and A 809, as applicable.

9.2 The diameter of metallic-coated wire and stainless steel wire used in the fabrication of fasteners shall conform to Table 7 plus or minus the tolerances shown in Specification A 764.

9.3 The minimum and nominal thickness of PVC coating uniformly applied in a quality workmanlike manner shall be as shown in Table 1.

9.4 Gabions shall be manufactured with an 8 by 10-mesh type having a nominal mesh opening of 83 by 114 mm [3.25 by 4.5 in.]. Dimensions are measured at right angles to the center axis of the opening (D = 83 mm, see Fig. 4) and parallel to the twist along the same axis.

9.5 Revet mattresses shall be manufactured with a 6 by 8-mesh type having a nominal mesh opening of 64 by 83 mm [2.5 by 3.25 in.]. Dimensions are measured at right angles to the center axis of the opening (D = 64 mm, see Fig. 4) and parallel to the twist along the same axis.

9.6 The width, height, and length of the gabion as manufactured shall not differ more than ±5 % from the ordered size prior to filling. (Typical gabion sizes are shown in Tables 3 and 4).

9.7 The width and length of the revet mattress as manufactured shall not differ more than ±5 %, and the height shall not differ more than ±10 % from the ordered size prior to filling. (Typical revet mattress sizes are shown in Tables 5 and 6).

9.8 *Mesh Opening Tolerances*—Tolerances on the hexagonal, double-twisted wire mesh opening shall not exceed ±10 % on the nominal dimension D values, as follows (see Fig. 4):

Mesh Type	Nominal Dimension D Values
6 by 8	64 mm [2.50 in.]
8 by 10	83 mm [3.25 in.]

10. Workmanship

10.1 Wire of proper grade and quality, when fabricated in the manner herein required, shall result in a strong, serviceable mesh-type product having substantially uniform openings. It shall be fabricated and finished in a workmanlike manner, as determined by visual inspection, and shall conform to this specification.

11. Sampling

11.1 Samples for determining the mechanical and physical properties of double-twisted wire mesh shall be in accordance with the samples, dimensions, and requirements described in Section 13.

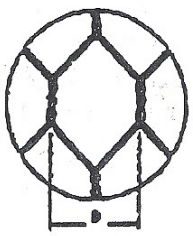

FIG. 4 Wire Mesh Opening Nominal Dimension D

TABLE 3 Typical Gabion Sizes (SI Units)

Length, m	Width, m	Height, m	Number of Cells, each	Volume, m^3
2.0	1.0	1.0	2.0	2.0
3.0	1.0	1.0	3.0	3.0
4.0	1.0	1.0	4.0	4.0
2.0	1.0	0.5	2.0	1.0
3.0	1.0	0.5	3.0	1.5
4.0	1.0	0.5	4.0	2.0
2.0	1.0	0.3	2.0	0.6
3.0	1.0	0.3	3.0	0.9
4.0	1.0	0.3	4.0	1.2

TABLE 4 Typical Gabion Sizes (Inch-Pound Units)

Length, ft	Width, ft	Height, ft	Number of Cells, Each	Volume, yd^3
6.0	3.0	3.0	2.0	2.0
9.0	3.0	3.0	3.0	3.0
12.0	3.0	3.0	4.0	4.0
6.0	3.0	1.5	2.0	1.0
9.0	3.0	1.5	3.0	1.5
12.0	3.0	1.5	4.0	2.0
6.0	3.0	1.5	2.0	0.67
9.0	3.0	1.0	3.0	1.0
12.0	3.0	1.0	4.0	1.33

TABLE 5 Typical Revet Mattress Sizes (SI Units)

Length, m	Width, m	Height, m	Number of Cells, Each	Area, m^2
3.0	2.0	0.17	3.0	6.0
4.0	2.0	0.17	4.0	8.0
3.0	2.0	0.23	3.0	6.0
4.0	2.0	0.23	4.0	8.0
3.0	2.0	0.3	3.0	6.0
4.0	2.0	0.3	4.0	8.0

TABLE 6 Typical Revet Mattress Sizes (Inch-Pound Units)

Length, ft	Width, ft	Height, ft	Number of Cells, Each	Area, yd^2
9.0	6.0	0.5	3.0	6.0
12.0	6.0	0.5	4.0	8.0
9.0	6.0	0.75	3.0	6.0
12.0	6.0	0.75	4.0	8.0
9.0	6.0	1.0	3.0	6.0
12.0	6.0	1.0	4.0	8.0

11.2 Samples for determining the mechanical and physical properties of coated steel wire used for mesh, lacing wire, and stiffeners shall be selected at random from wire coils used for manufacturing.

12. Number of Tests

12.1 A minimum of three tests each for conformance to strength of metallic-coated steel wire mesh parallel to twist, perpendicular to twists, connection of metallic-coated steel wire mesh to selvedge, and punch test shall be performed. A retest for conformance with the aforementioned strength and connection tests shall be required when changes of the physical characteristics of the mesh products occur. For metallic-coated steel wire with PVC coating, follow the same requirements as for the metallic-coated steel wire mesh. The results of all three tests must meet the requirements of Table 2.

12.2 The tensile strength, metallic coating weight, and PVC coating thickness of the metallic steel wire used in the fabrication of mesh, lacing wire, stiffeners, and fasteners must be certified by the steel wire producers for conformance to the requirements of Sections 6 and 7 and Table 1 for each lot shipment to the gabion manufacturer's facility.

13. Test Methods

13.1 *Mechanical Property Tests*:

13.1.1 *Tensile Strength Test*—The wire mesh specimens shall be representative of proper field construction as to materials, mesh geometry, and workmanship, and shall be as large as practical to minimize the effect of variations. The width of a specimen shall not be less than seven repetitions of a mesh pattern, nor shall the length be less than fourteen repetitions. The tests shall be run with the load applied parallel to the axis of twist and repeated on a separate test specimen with the load applied perpendicular to the axis of twist.

13.1.1.1 The apparatus shall grip the wire in such a manner as to allow the wire failures to occur at least one mesh pattern away from the gripping points. If a failure occurs in a wire leading directly to a gripping point that specimen shall be rejected, and not included among the tests reported.

13.1.1.2 Insert the wire into the machine grips and the axially free sliding adjustable spreader system attachment points such that the gripped wires will be maintained in the mesh geometry characteristic of field use and attached in such a manner as to eliminate failure at the grips. The grips may be left loose until the preload is applied to allow the wires to seat. The load is then applied at a uniform rate not to exceed 50 nor 3 % of the mesh ultimate strength per second (see Table 2). The load shall initially be taken to a preload of 20 % of the specified minimum strength and the machine head travel stopped. The mesh gage dimensions shall be recorded at this time and taken as the initial dimensions of the specimen where such dimensions are required. Loading shall then continue uniformly in increments of 10 % of the specified minimum strength until first fracture or unwrapping of an individual wire in the system occurs. The machine head travel at each load increment or sequential incident of wire failure may be stopped for recording pertinent information such as load, fracture type, resulting mesh geometry and elongation, and resulting reduction in wire gage. The distortion of the mesh or changes in gage length shall be measured to an accuracy consistent with reporting the percent elongation to the nearest 0.5 %. The results of the tests shall be in accordance with the requirements shown in Table 2.

13.1.2 *Pull-Apart Resistance Test*—A set of the jointed panels, which are prepared by the same method as specified in the salt spray test but without being subject to the 48-h salt spray test, shall be mounted on a loading machine with grips or clamps such that the panels are uniformly secured along the full width. The grips or clamps shall be designed to only transmit tension forces. The load will then be applied at a uniform rate not to exceed 220 N/s [50 lb/s] until failure occurs. The failure is defined as when the maximum load is reached and a drop of strength is observed with subsequent loading or alternately the opening between any two closest selvedge wires, applicable to a fastener confining either two or four selvedge wires, becomes greater than 50 mm [2 in.] at any place along the panel width. The strength requirements of the jointed panels at failure shall be as shown in Table 2.

13.1.3 *Salt Spray Test*— A set of two identical rectangular gabion panels, each with a width about 10½ mesh openings along a selvedge wire, shall be jointed by properly installed wire fasteners along the two selvedge wires so that each fastener confines two selvedge and two mesh wires. If the fasteners are also to be used to join two individual empty gabion baskets, two additional selvedge wires that are each mechanically wrapped with mesh wires shall be included so that each fastener confines four selvedge and four mesh wires. A properly installed fastener shall meet the following requirements:

13.1.3.1 Each interlocking fastener type shall be in a locked and closed position. Each overlapping fastener type shall be closed and the free ends of the fastener shall overlap a minimum of 1 in. The set of the jointed panels shall be subject to Salt Spray Test of Test Method B 117 for a period of not less than 48 ± 1 h cycle length.

13.1.4 *Punch Test*—An uncut section of 1.82 m [6 ft] in length (unselvedged) and not less than 0.91 m [3 ft] in width (selvedged), including all selvedge bindings, shall have the ends securely clamped for 0.91 m along the width of the sample. When the width of the section under test exceeds 0.91 m, the clamps shall be centered along the width and the excess width will be allowed to fall free on each side of the clamped section. The sample shall then be subjected to tension sufficient to cause 10 % elongation of the sample section between the clamps. After elongation and while clamped as described above (and otherwise unsupported), the section shall be subjected to a load applied to a 1-ft^2 area applied to an area of 900 cm^2 [1 ft^2] in the approximate center of the sample section between the clamps and in a direction perpendicular to the direction of the tension force. The sample shall withstand, without rupture of any strand or opening of any mesh fastening, an actual load applied by means of a circular ram at a rate as indicated in 13.1.2 equaling or exceeding the values shown in Table 2. The ram head used in the test shall be circular with a 305-mm [12-in.] diameter and have its edges beveled or rounded to prevent cutting of the wire strands.

13.2 *Metallic Coating Weight*—Perform coating weight tests as prescribed in Test Methods A 90/A 90M or A 428 as applicable.

13.3 *PVC Coating Thickness*:

13.3.1 The thickness of the PVC coating shall be determined on a randomly chosen individual piece of wire removed from the mesh.

13.3.2 Measure with a micrometer the diameter of the metallic coated steel wire with PVC coating. Determine the thickness of the PVC coating by stripping the PVC coating from the wire and measure the reduced diameter with a micrometer. The thickness of the coating is the difference between the diameter of the metallic-coated steel wire with PVC coating and the measured diameter of the metallic-coated wire divided by two. This value shall be in accordance with Table 1. When removing the PVC coating by stripping, take care not to remove any of the metallic surface.

14. Inspection

14.1 Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements of this specification. The producer shall use his own or any other suitable facilities for the performance of the inspection and test requirements, at his option, unless disapproved by the purchaser at the time the order is placed. The purchaser at their own expense shall have the right to perform any of the inspections and tests set forth in this specification when such tests are deemed necessary to ensure that the material conforms to the prescribed requirements.

15. Certification

15.1 When specified in the purchase order or contract, a producer's or supplier's certification that the material meets the contract specifications shall be furnished to the purchaser.

16. Keywords

16.1 double-twisted wire mesh; fasteners; gabions; lacing wire; metallic-coated mesh; metallic-coated steel wire; metallic-coated steel wire with PVC coating; preformed stiffeners; revet mattresses; selvedge edge wire; stiffeners