

# GABIONS

Gabions are a cost-effective solution to reduce or prevent erosion by slowing the velocity of concentrated runoff. Flexible and permeable, Gabion baskets & mattresses form monolithic structures such as retaining walls, channel walls, revetments, and weirs.

May 2023 <b>Gabions</b>			
Material Properties	Rev	ASTM	<div> <div>Metallic Coated</div> <div>PVC Coated</div> </div>
	Parallel to twist	A975	51.1 kN/m
	Perpendicular to twist	A975	26.3 kN/m
	Connection to selvages	A975	20.4 kN/m
	Panel to panel connection using lacing wire or fasteners	A975	20.4 kN/m
	Punch Test	A975	26.7 kN
	Mesh Type	A764	8 by 10
	Mesh Opening	A764	83 by 114 mm
	Mesh Wire	A764	3.05 mm
	Selvage Wire	A764	3.8 mm
	Lacing Wire	A764	2.2 mm
	Mesh Wire + Polymer	A764	N/A
	Selvage Wire + Polymer	A764	N/A
	Fasteners	A764	3.0 mm
	PVC Coating Thickness		
	Nominal		N/A
	Minimum		N/A

**Note:** Wire rings for fastening basket components together shall be in accordance with ASTM A975

Dimensions of a manufactured gabion shall not differ more than  $\pm 5\%$  from the ordered size prior to filling. The hexagonal, double-twisted wire mesh openings shall not exceed  $\pm 10\%$  of the nominal dimension (83mm).

May 2023 <b>Twisted Wire Gabion Size Chart - Galvanized or PVC Coated</b>								
Style	Length x Width x Height							
Size	2 x 1 x 0.3 m 6'6" x 3'3" x 1'	3 x 1 x 0.3 m 9'9" x 3'3" x 1'	2 x 1 x 0.5 m 6'6" x 3'3" x 1.6'	3 x 1 x 0.5 m 9'9" x 3'3" x 1.6'	4 x 1 x 0.5 m 13'1" x 3'3" x 1'6"	2 x 1 x 1 m 6'6" x 3'3" x 3'3"	3 x 1 x 1 m 9'9" x 3'3" x 3'3"	4 x 1 x 1 m 13'1" x 3'3" x 3'3"

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## QUALITY ASSURANCE

The Owner, Client, and/or Project Engineer reserves the right to test additional samples as required to verify the supplied product meets the specifications and properties of the sample received. For equivalent products, three randomly selected samples shall be collected 90 days prior to start of work so that wire, fasteners, and rings can be tested and verified to comply with the following properties in accordance with ASTM A975.

### These properties shall be:

- a) Wire thickness,
- b) Tensile strength,
- c) Coating thicknesses
- d) Ring fasteners pull apart strength.

### Double twisted wires used in the fabrication of gabion basket shall be of one of two styles as listed in ASTM A975:

- a) Style 1 - Mesh, fasteners, lacing wire, and stiffeners produced from wire that has been zinc coated in accordance with ASTM A641/A641M Class 3, soft or medium temper
- b) Style 2 - Mesh, lacing wire, and stiffeners as Style 1 and additionally coated with an extruded PVC (polyvinyl chloride) coating. Original or modified thermoplastic polymers along with their application methods may be permitted as a substitute for PVC coatings if their performance is equivalent to the performance requirements for the PVC coating. Fasteners shall be of stainless-steel conforming to ASTM A313/A313M, Type 302. Metallic coatings for all wire shall conform to their respective specifications referenced in the above Styles 1 and 2. Wire manufacturers shall provide certifications, such as mill test certificates (MTRs), for metallic coatings for each lot shipment.

### PVC coatings shall conform to Clause 8.2 of ASTM A975, specifically the following requirements shall be met:

- a) Specific gravity shall be in the range of 1.30 to 1.35 per Test Methods ASTM D792
- b) Tensile strength shall not be less than 20.6MPa per Test Methods ASTM D412
- c) Modulus of elasticity shall not be less than 18.6MPa per Test Methods ASTM D412
- d) Hardness shall be between 50 to 60 Shore D per Test Methods ASTM D2240
- e) Brittleness temperature shall not be higher than -9°C, unless a lower temperature is specified by the purchaser, per Test Methods ASTM D746. Additionally, the maximum brittleness temperature should be at least 9°C below the minimum temperature at which the gabion basket will be filled.
- f) Resistance to abrasion shall be sufficient that mass loss shall be less than 12% per Test Methods ASTM D1242
- g) No effects shall be observed after 3000 hours of salt spray exposure per Test Methods ASTM B117
- h) No effects shall be observed after 3000 hours of ultraviolet light exposure per Practices ASTM D1499 and G23 (superseded by ASTM G152) using apparatus Type E and 63°C
- i) After the salt spray and ultraviolet light exposure, the PVC coating shall not show cracks nor noticeable change of colour, or blisters or splits. 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.
- j) The PVC coatings shall not show cracks or breaks after the wires are twisted into the fabrication of the mesh.
- k) The fasteners, the selvage, or mesh wire confined by the fasteners shall show no rusty spots on any surfaces, excluding the cut ends, following the salt spray test.

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