MACCAFERRI

TECHNICAL DATA SHEET

Rev. 01 Date 15/02/2015

GABIONS
GALMAC & POLYMER COATED

Gabions are baskets made of 8x10 double twisted steel woven wire mesh, as per EN 10223-3:2013 (Figs. 1, 2). Gabions are filled with stones at the project site to form flexible, permeable, monolithic structures such as retaining walls, channel linings, and weirs for erosion control projects. The steel wire used in the manufacture of the gabion is Galfan coated (Zn-5%Al). A PVC coating is then applied to provide added protection for use in polluted environments where soils or water are acidic: in salt or fresh water, or wherever the risk of corrosion is present. The PVC coating has a nominal thickness of 0.50 mm. The standard specifications of mesh-wire are shown in Table 2. The gabion is divided into cells by means of diaphragms positioned at approximately 1m centers (Fig.1). In order to reinforce the structure, all mesh panel edges are selvedged with a wire having a greater diameter (Table 3). Dimensions and sizes of PVC coated gabions are shown in Table 1. The material is supplied from an ISO 9001 certified factory.

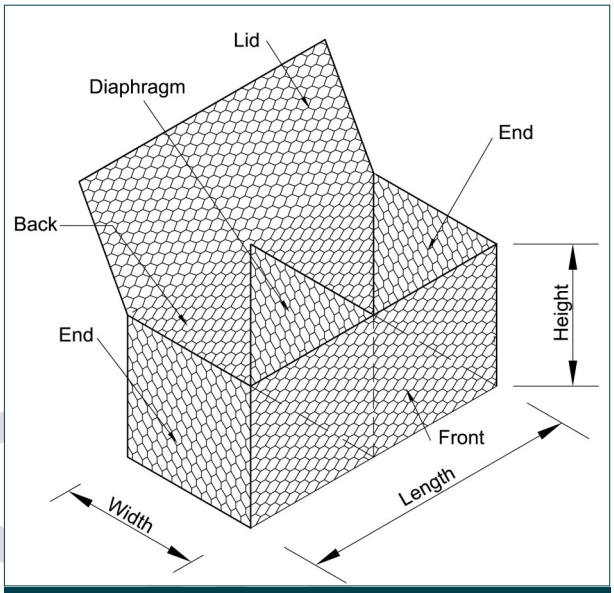

Figure 1

Steel wire mesh
The nominal tensile strength of the wire mesh shall be as per Table 2 (EN 10223-3:2013). The punch strength of the wire mesh shall be as per table 2 (UNI 11437.)

Wire
All tests on wire must be performed prior to manufacturing the mesh.

1. **Tensile strength:** the wire used for the manufacture of gabions shall have a tensile strength between 350-550 N/mm^2 as per EN 10223-3:2013. Wire tolerances (Table 4) are in accordance with EN 10218 (Class T1).
2. **Elongation:** Elongation at fracture shall not be less than 8%, on a gauge length of 250 mm as per EN 10223-3: 2013.
3. **Galmac coating:** minimum quantities of Galmac (Table 4) meet the requirements of EN 10244-2 (Table 2 - Class A).
4. **Adhesion of Galmac:** the adhesion of the Galmac coating to the wire shall be such that, when the wire is wrapped six turns around a mandrel having four times the diameter of the wire, it does not flake or crack when rubbing it with the bare fingers, according to EN 10244.
5. **Outwearing accelerated aging test:** when subjected to test in sulphur dioxide environment (EN ISO 6988) after 28 cycles of discontinuous test the mesh shall not show more than 5% of DBR (Dark Brown Rust).

The tolerance on the mesh size 'M' being the distance between the axis of two consecutive twists, is according to EN 10223-3: 2013

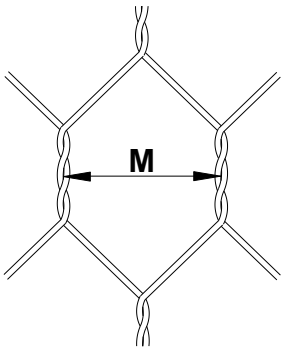

Figure 2

P.V.C. (Polyvinyl Chloride) Coating
The technical characteristics and the resistance of the PVC to ageing meet the relevant standards. The main values for the PVC material are as follows:

Specific gravity: 1.30-1.35 kg/dm$_3$ in accordance with ASTM D792 Table 1;
Hardness: between 50 and 60 Shore D, according to ASTM D 2240 –91;
Tensile strength: not less than 20.6 MPa, according to ASTM D412-92;
Modulus of elasticity: not less than 18.6 MPa, in accordance with ASTM D412-92;
Abrasion resistance: the percentage of the weight loss shall be less than 12%, according to ASTM D1242-92.
Creeping corrosion: max. penetration of corrosion of the wire from a square cut end shall be 1 in. (25 mm) when the specimen has been immersed for 2,000 hours in a 5% solution HCl (hydrochloric acid 12 Be).

The accelerated ageing tests are:
Salt spray test: test period 3,000 hours, test method ASTM B117-94;
Exposure to UV rays: test period 3,000 hours at 145°F (63°C), test method ASTM D1499-92a and ASTM G23-93 apparatus Type E;
Brittleness temperature: no higher than 15°F (- 9°C), or lower temperature when specified by the purchaser, when tested in accordance with ASTM D746.

The properties after ageing tests shall be as follows:
Appearance of coated mesh: no cracking, stripping or air bubbles, and no appreciable variation in color;
Specific Gravity: variations shall not exceed 6%;
Hardness: variations shall not exceed 10%;
Tensile strength: variations shall not exceed 25%;
Modulus of elasticity: variations shall not exceed 25%;
Abrasion resistance: variations shall not exceed 10%;
Brittleness temperature: shall not exceed + 64°F (+18°C).

Table 1: Sizes of gabions			
Length (m)	Width (m)	Height (m)	# of cells
2	1	0.5	2
1.5	1	1	1
2	1	1	2

All sizes and dimensions are nominal.
Tolerances of ± 5% of the width, height and length of the gabions shall be permitted (EN 10223-3:2013).

Quantity Request

When requesting a quotation, please specify:

- size of units (length x width x height, see Table 1)
- type of mesh
- type of coating and diaphragms

EXAMPLE: No. 100 gabions 2x1x1m - Mesh type 8x10 - Wire diam. 2.70 mm - Galmac & polymer coated - with diaphragms.

Lacing Operations

Lacing operations can be made by using the tools shown in Fig.5. Stainless steel rings having the following specification can be used instead of lacing wire (Figs. 3, 4):

- diameter: 3.00 mm
- tensile strength: >1700 - 1900N
- Pull–apart strength > 2.0 kN

Spacing of the rings must not exceed 200 mm (Fig.3)

Table 2: Standard Mesh-Wire					
Type	M (mm)	Tolerance (mm)	Wire Diameter int/ext (mm)	Mesh Tensile Strength (kN/m)	Punch Strength (kN)
8x10	80	-0/+10	2.7/3.7	50	67

Table 3: Standard wire diameters					
		Mesh Wire	Selvedge Wire	Lacing Wire	Bracing Wire
8x10 Mesh Type	ø mm	2.7/3.7	3.4/4.4	2.2/3.2	3.4/4.4

Table 4: Wire tolerances and coatings				
Wire diameter	mm	2.20	2.70	3.40
Wire diameter tolerance	(±) mm	0.06	0.06	0.07
Min. Galmac quantity	g/m^2	230	245	265

Internal Bracing

Lacing wire or specially pre-formed bracing wire shown in Fig. 5. having wire diameters to those listed in Table 3 shall be used in accordance with the Maccaferri Installation Guidelines to prevent distortion of the gabion units during filling.

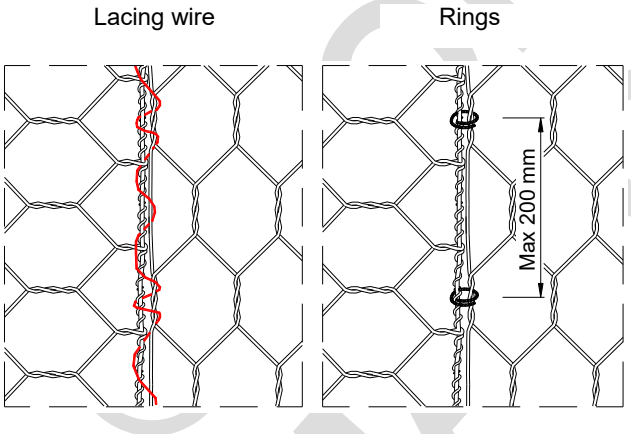

Figure 3

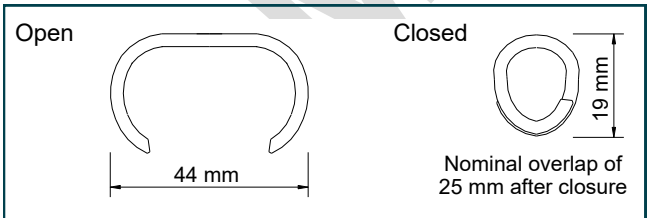

Figure 4

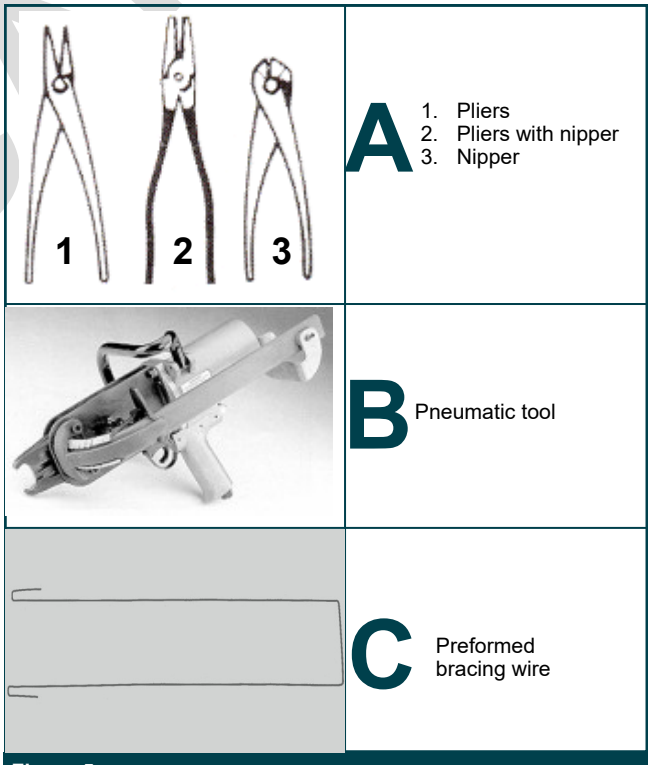

Figure 5

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