

TERRA AQUA GALFAN GABION

Scope:

This specification data sheet covers the use of Galfan or (Zinc 5%- Aluminum-Mischmetal Alloy-Coated) coated steel double twisted woven wire mesh gabion baskets filled with stone and used for various applications including but not limited to retaining walls, mechanically stabilized soil retaining structures, stream bank protection, slope paving, outfall structures, weirs, drop structures etc...

Definition:

- a) Gabions are defined as double twisted woven wire mesh box shaped baskets, of various sizes and dimensions.
- b) The selvedge of the gabion baskets are the thicker perimeter and edge wires to which the mesh is secured as to withstand sudden or gradual stress from any direction, which is unique to the double twisted mesh gabions only.
- c) Reinforcing wires are the thicker wires incorporated into the netting during fabrication.
- d) The internal diaphragms are the internal wire mesh partitions which divide the gabions into cells.
- e) Lacing or tie wire is used to assemble and join the gabion units.
- f) Connecting wires are the internal wire used to prevent the gabions from bulging.
- g) Alternative wire fasteners are ASTM approved wire fasteners used in lieu of lacing wire.

Fabrication:

Double Twisted Hexagonal steel wire mesh Galfan Gabions. Gabions shall be fabricated in such a manner that the sides, ends, lid and diaphragms can be assembled at the construction site into rectangular baskets of the sizes specified and shown in the drawings. Gabions shall be of single unit construction: the base, lid, ends, and sides shall be either woven into a single unit or edge of these members connected to the base section of the gabion in such a manner that the strength and flexibility at the connecting point does not compromise the engineered structural design of the gabion. Where the length of the gabion exceeds one and one half its horizontal width, the gabion shall be divided by diaphragms of the same mesh and gauge as the body of the gabion, into cells whose length does not exceed the horizontal width. The gabion shall be furnished with the necessary diaphragms secured in proper position on the base in such a manner that no additional tying is required at this juncture.

Mesh Formation:

The double twisted hexagonal wire mesh shall have deformability sufficient to permit minimum of mesh elongation equivalent to 10% of the unstretched length of the mesh test section without reducing the gauge or the tensile strength of the individual wire strands to values less than those for similar wire, one gauge smaller in diameter.

Non-Raveling:

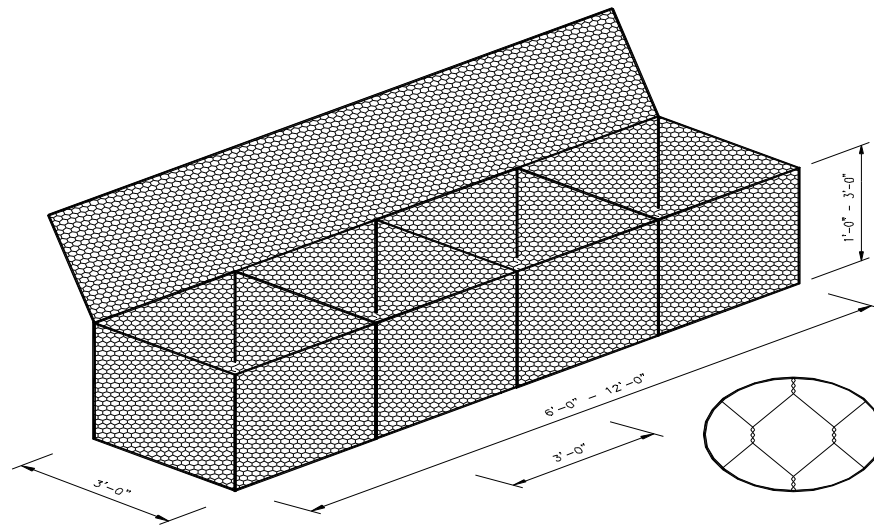
The double twisted hexagonal wire mesh is to be fabricated in such a manner as to be non raveling. This is defined as the ability to resist pulling apart at any of the twists or connections forming the mesh when a single wire strand in a section of mesh is cut or broken.

Gabion Fill:

The stone fill material used for filling the gabion units shall be clean, hard stone with pieces ranging from 4 – 8 inches on the greatest dimensions. Stone filling shall not exceed 24 inch vertical drop above the gabion basket. All effort shall be made to ensure that the stone fill material utilized in the design of the structure match the stone fill used in constructing the gabion structure.

Assembling and Placing:

- a) Each gabion unit shall be assembled by tying or fastening all connecting seams. The binding wire shall be tightly looped around every other mesh opening along the seams in such a manner that single and double loops are alternated. An alternative wire fasteners may be used in lieu of lacing wire. The alternative wire fasteners shall be applied at approximately 4" – 6" intervals on all vertical and horizontal seams. No less than 3 fasteners per one foot on any given seam.
- b) A line of empty gabions, shall be placed into position according to the contract drawings. Binding wire or alternative wire fasteners shall be used to secure each unit to the adjoining one along the vertical reinforced edges and the top selvages. An approved corner closure tool shall be used to adjoin adjacent gabions to insure a tight, neat seam and minimize gabion wired or fastened to the latter at front and back. The lid shall be secured with an approved closure tool to insure proper closure without excessive mesh deformation.
- c) To achieve optimum alignment and finish for retaining walls, a minimum amount of stretching may be required.
- d) Connecting wire shall be inserted during the filling operation as follows: The connecting wires shall be installed according to manufacturers instructions every 1' vertical lift of the gabion unit.



Terra Aqua Gabion Unit Standard Sizes: Custom Jumbo Sizes Available

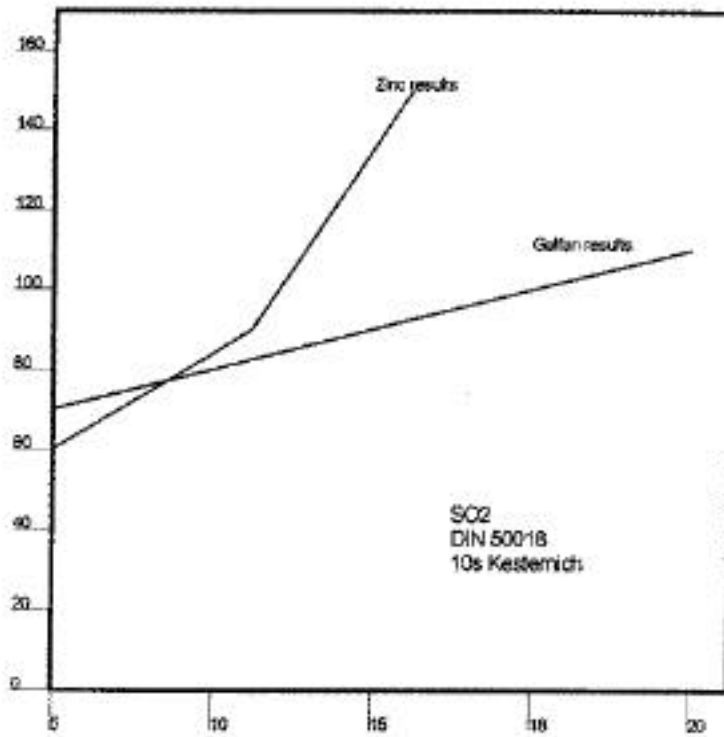
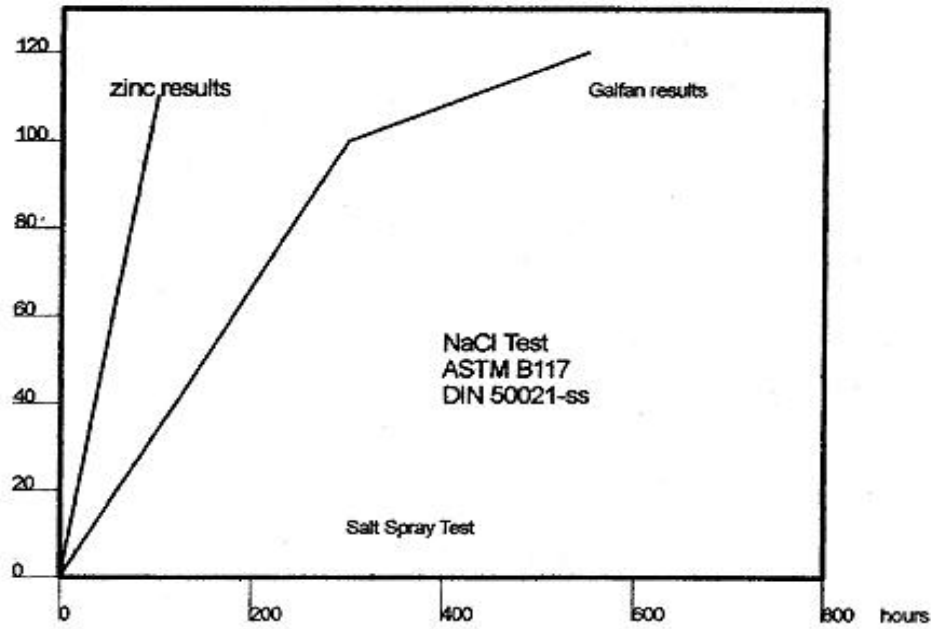
<i>Gabion unit size</i>	<i>Capacity Cubic Yards</i>	<i>No. of Internal Cells</i>
6x3x3	2	2
9x3x3	3	3
12x3x3	4	4
6x3x1.5	1	2
9x3x1.5	1.5	3
12x3x1.5	2	4
6x3x1	.666	2
9x3x1	1	3
12x3x1	1.33	4

TOLERANCES: All gabion dimensions shall be within a tolerance limit of plus or minus 5% of the manufacturers stated dimensions.

Minimum Strength requirements of Terra Aqua Double Twisted Mesh Gabions

<i>Test Description</i>	<i>Galvanized/Galfan Gabion</i>	<i>Pvc Coated Gabion</i>
Tensile strength of wire mesh parallel to twist	3500 lbs/ft	2900 lbs/ft
Tensile strength of wire mesh perpendicular to twist	1800 lbs/ft	1400 lbs/ft
Connection to selvages	1400 lbs/ft	1200 lbs/ft
Panel to Panel	1400 lbs/ft	1200 lbs/ft
Punch strength of mesh	6000 lbs/ft	5300 lbs/ft

Tests have been carried out to compare side-by-side the performance of Galfan to Galvanized coating for steel wire. The results are illustrated below.



Galfan:

Extensive research into the improved corrosion protection offered by Galfan coating in Rural, Industrial and Marine environments has been undertaken both by the International Lead Zinc Research Organization, and by Bekaert Corporation, the findings listed above show that the Galfan offers much better corrosion resistance than does standard galvanized zinc. To appreciate the improved corrosion resistance, the corrosion mechanism should be understood. Galfan solidifies into lamellar microstructure consisting of alternating very thin plates. In this type of structure the more active zinc will corrode first leaving an aluminum enrichment which continues with exposure to elements. Therefore the longer the exposure the more corrosion resistance the coating becomes. The result is that the loss of coating weight is not linear as with galvanized zinc but parabolic.

Advantages Of Galfan Gabions Over Galvanized Gabions:

Galfan offers a more homogenous, ductile and smoother coating than does galvanized zinc. The result is that the galfan is less affected by abrasion.

Galfan coating offers up to 3 times better corrosion protection than standard zinc coating in salt spray test, and up to 2 times better corrosion protection than standard zinc coating in the SO₂ Atmosphere test.

Galfan offers better sacrificial protection of the steel wire than standard galvanized zinc.

Galfan gabions use the same wire diameters as the galvanized gabions. This is an advantage in corrosive environments over PVC coated gabions that have a reduced steel wire diameter as compared to the galvanized gabions. The result is a better corrosion protection coating than the galvanized zinc or the PVC coated gabions.

Because the corrosive resistance of the gabion wire is directly related to the longevity of the gabion wire and therefore the confinement ability of the gabion basket it is recommended that Galfan Coating be utilized when corrosion is the predominant factor for determining the expected life span of a gabion structure.

Any questions or requests for additional information concerning the Galfan product may be directed to the Technical Sales Department at Terra Aqua Gabions, Inc.

Material data:

(Galfan) ASTM A975-97, Designation A856/A 856M-97

Zinc 5% Aluminum-Mischmetal Alloy Coated Carbon Steel Wire Mesh Gabions:

- mesh opening 3 1/4 by 4 1/2 inches or 8cm x 10cm.
- diameter of mesh wire: 0.120 inches
- diameter of selvedge wire: 0.153 inches
- diameter of lacing wire: 0.091 inches
- coating of wire zinc 5% Aluminum-Mischmetal Alloy Coated Carbon Steel Wire
- tensile of wire: soft temper in accordance with ASTM A-641-92
- weight of zinc/Aluminum coating shall be determined by ASTM A90, or class 80, Table 1, for Zinc 5% Aluminum-Mischmetal Alloy Coated Carbon Steel Wire
- wire diameter of 0.120 inches shall have a weight of coating: 0.80 oz/sf galfan
- wire diameter of 0.153 inches shall have a weight of coating: 0.80 oz/sf galfan
- wire diameter of 0.091 inches shall have a weight of coating: 0.80 oz/sf galfan
- grade of zinc coating of wire shall be high grade or special high grade in accordance with ASTM B-6, Table 1
- uniformity of coating shall be determined by ASTM A239
- elongation: not less than 12% in accordance with ASTM A370-92

All of the above wire diameters are subject to a tolerance limit of 0.004 in accordance with ASTM A-641.

All Terra Aqua gabion material is manufactured according to ASTM A975-97 guidelines for Double Twisted Hexagonal Mesh Gabions.

ASTM A975-97

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