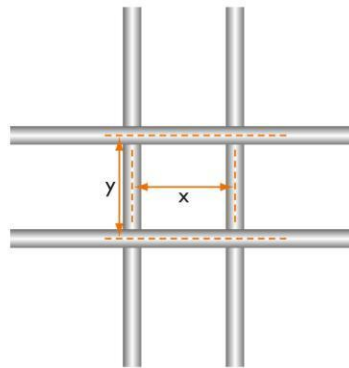


## Gabion Design Specification : Bi-Axial Welded Mesh

### GABION ENV333



#### SPECIFIED MESH BI-AXIAL WELDED

Nominal dimensions (x) and (y) : Gabions, 75mm Mattresses, 75mm

Gabions supplied by Devoran Garden Gabions are manufactured by:

Enviromesh, Garner Street Business Park, Etruria, Stoke-on-Trent, Staffordshire, ST4 7BH.

The certification, materials, manufacture, assembly and installation of the above-mentioned product shall comply with all of the following criteria:

#### Certification

1. All gabion products are manufactured in accordance with the requirements of BS EN 10223-8:2013 where the gabions are considered to have a life expectancy of **up to 50 years** in a 'low aggressive C2 environment' (ref. EN ISO 9223:2012 Table 1).
2. Evidence of relevant certificates of conformity with respect to wire strength, weld strength and coating weights used in the manufacture of the mesh fabric and wire products are to be issued upon request.

#### Materials

The wire used in the manufacture of the gabions and installation accessories shall comply with the following:

##### Mesh Fabric

The mesh fabric shall be formed by electrically welding at each and every intersection, hard drawn steel line and cross wires into a dimensionally stable bi-axial square metric mesh of size **75mm x 75mm**.

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# Bi-axial Welded Mesh

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The weld strength shall be **75%** of the minimum ultimate tensile strength of the wire.

The nominal wire diameter for the mesh fabric shall be **3.00mm** for the base, front, rear, end, diaphragm panels and lid, all within the tolerances specified in BS EN 10218-2:2012 and shall have a tensile strength that falls within a range of **540-770 N/mm<sup>2</sup>**.

Tensile strengths of less than **540 N/mm<sup>2</sup>** may result in increased deformation of the filled units and a reduction in weld strength shall not be permitted.

## **Lacing Wire**

The lacing wire used for site assembly shall be of a nominal **2.2mm** wire diameter in accordance with BS EN 10218-2:2012 and shall have a tensile strength that falls within a range of **350 to 550 N/mm<sup>2</sup>**.

## **Helical Binders** *(where specified, not supplied as standard)*

Full height helical binders for the vertical joints for gabion installation and assembly shall be of a nominal **3.00mm** wire diameter in accordance with BS EN 10218-2:2012 and shall have a minimum tensile strength **350 N/mm<sup>2</sup>**.

## **Preformed Corner Bracing Ties** *(where specified, not supplied as standard)*

Preformed corner bracing ties are to be formed from a nominal **3.00mm** wire diameter in accordance with BS EN 10218-2:2012 and shall have a minimum tensile strength of **350 N/mm<sup>2</sup>**.

## **Corrosion Resistance**

All wire used in the mesh fabric or accessories shall be Galfan coated (95% Zinc / 5% Al) in accordance with BS EN 10244-2:2009 (Class A).

## **Manufacture**

### **Unit Formation**

The gabion is to be formed from mesh panels such that the front, rear, ends and diaphragm panels are connected to the base panel with either **Stainless Steel CL35 clips** or **Galfan coated CL50 'C' rings** at a maximum spacing of 225mm for all joints. This process must be undertaken in a factory-controlled environment. The lid may be supplied loose or fixed in the same manner to the rear or face panel. Diaphragm (partitioning panels) spacings should not exceed 1.050m on units oriented as stretchers and 1.65m oriented as headers.

Should units be required to be prefilled and lifted as opposed to filling in situ, additional clips, rings and mesh panels may be required. In such circumstances the manufacturer must be consulted prior to supply to ensure product is suitable for application.

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## Gabion Sizes

It should be noted that it is industry standard for gabions to be quoted as overall nominal sizes. The actual gabion sizing is dependant upon the physical mesh configuration.

Clarification should always be sought from the manufacturer in relation to gabion sizing.

Designation of sizes **length x width x height**

Gabion standard unit lengths: 975mm or 2025mm

Gabion standard unit widths: 450mm, 675mm, 975mm, 1350mm, 1500mm or 1650mm

Gabion standard unit heights: 450mm and 975mm

Non-standard sizes available in multiples of 75mm on request.

## Assembly and Installation

**Note** Please also refer to manufacturer's installation instructions, which are available upon request in either electronic or hard copy format.

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### Jointing

Gabions are supplied with lacing wire as standard for horizontal and vertical jointing of adjacent units whilst empty. Lacing is to be continuous along all joints using alternate single and double loops at a maximum spacing of 100mm ensuring that it forms a tight joint. Start or termination of lacing is formed by three turns ensuring the free end is turned into the unit.

Where helical binders are requested for use on verticals joints, the top and bottom helical turn should be rotated through 90 degrees to prevent movement. All horizontal joints are to be laced as described above unless specially requested.

If CL50 'C' rings are to be used for final jointing as an alternative to lacing then these must be installed at every other mesh opening to achieve the required joint strength.

### Internal Bracing

Internal bracing is formed by creating a continuous windlass tie between the face and rear of the exposed cells within the structure.

For 1m high units, two internal windlass bracings are required at third widths and at each third height of the gabion.

In all cases the windlass tie is to span two or three mesh openings on the front and rear cells to spread the load. The exposed end gabions to the wall should also be braced in both directions to prevent end face deformation.

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## **Geotextile Separators**

Where a geotextile separator between the rear of the gabion and backfill is to be used, refer to the engineer's design proposal and specification.

## **Foundations**

Reference to the engineer's design proposal must be made with respect to foundation requirement, wall inclination, face configuration (stepped, flush or combination thereof), drainage and backfilling requirements. Any soft areas in the sub grade should be excavated and replaced with a granular material to the engineer's requirements.

## **Filling**

Units are to be filled with a hard, durable, non-frost susceptible rock, stone or clean crushed concrete as specified by design. The grading of the fill is to be 100 to 150mm or 100 to 200mm (6G). Where dual fills of the same grading are specified a separation panel is optional. Where the secondary fill grading is less than the mesh aperture size, it is necessary for the fills to be separated using pre-cut correx panels or geo-textile that is inserted into the gabion on site. If this is the case then this will require the fitting of an additional longitudinal diaphragm set back from the face. In such instances it is important to refer to the engineer's design proposal with respect to additional drainage that may be required. It is also important to note that cohesive fills are not to be used as a secondary fill within gabions.

The units shall be filled in layers not exceeding 340mm, if large voids are present then the stone must be re-orientated to minimise voids. Where specified the gabions are to have a hand placed front face.

The units shall be filled such that the mesh lid bears down onto the gabion filling material. It may be beneficial to blind the top of the filled unit with a 20 to 50mm aggregate.

Filling should be staged so that no adjacent cells have more than a half difference in the level of filling for units of greater height than 500mm.

To assist in maintaining face alignment and reduce deformation, the use of external formwork i.e. timber or scaffold tubes can be tied onto the external face of the structure at third heights and then removed upon completion.

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