MACCAFERRI
SOUTHERN AFRICA

TECHNICAL DATA SHEET

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GREEN TERRAMESH™

Green Terramesh™

The Green Terramesh™ is an environmentally modular system used to strengthen soils in mechanically stabilised embankments. Green Terramesh™ units are manufactured from heavily zinc coated Class A and PVC coated steel wire according to SANS 675:1997 and SANS 1580:2005 respectively (Figure 1). The coated steel wire is woven into a double twist hexagonal Mesh Type 80 configuration as per SANS 1580:2005 (Table 1).

The properties for the mesh and wire are given in Table 1 and 2. Attached to the inside facing is a biodegradable erosion control blanket (ECB), a welded steel panel and two steel brackets, preformed to a 70° slope angle. The reinforcement, front face and return wrap tail all consist of a continuous panel of mesh.

The ECB protects the backfill soil and permits a vegetative cover to establish rapidly. It may consist of a permanent polymeric three dimensional geomat - MacMat™ (Water Type for hydraulic applications) or a biodegradable 100% coconut fibre biomat BioMac™ (Soil Type for dry applications).

The welded steel panel placed behind the ECB adds strength and provides support to the facing while holding the blanket in place during construction. The properties of the welded steel panel, ECB and MacMat™ are given respectively in Tables 3, 5 and 6. Standard sizes for Green Terramesh™ are shown in Table 4. When specifying Green Terramesh™ in the tender documents or bill of quantities, please refer to Table 7.

Filling and Lacing

The Green Terramesh™ units are unfolded, placed in position and connected to adjacent units. A 0,5m wedge of vegetative soil is placed behind the facing. Compaction of the vegetative soil should be done with a light hand held compactor. Thereafter the structural backfill is placed in approximately 0,2 m to 0,3 m lifts and compacted as per specifications. Heavy duty compaction equipment must not encroach to within 2 m of the front face. The process is repeated with the second lift of vegetative soil and structural backfill, before installation of the next row of Green Terramesh™ units. The top return portion of the mesh should be buried at least 0,3 m beneath the soil. To vegetate the front face rooted plugs can be planted and irrigated in drier climates or alternatively hydroseeding can be used. For further information on the installation, please refer to the Installation Guidelines for Green Terramesh™.

Wire

All tests on wire are performed prior to manufacturing the mesh.

1. Tensile strength: The wire used for the manufacture of the gabions has a tensile strength between 350-575 N/mm² according to SANS 675:1997.
2. Elongation: Elongation is not less than 10% in accordance with EN 10223-3. Tests are carried out on a sample at least 25 cm long.
3. Adhesion of zinc: The adhesion of the zinc coating to the wire is 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 rubbed with the bare fingers, in accordance with SANS 675:1997.
4. Ductility: The ductility of the zinc-coated wire is such that when the wire is wrapped at least eight times around a wire having the same diameter of the test specimen at a rate not exceeding 15 turns per minute and then unwrapped at the same rate, it does not show any sign of fracture of the underlying steel wire in accordance with SANS 675:1997.

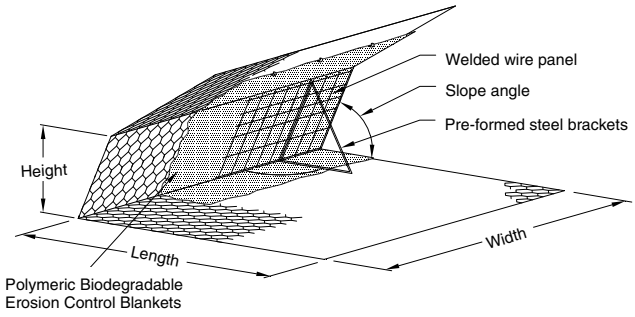
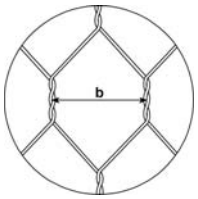


Figure 1

STANDARD MESH-WIRE			
Mesh Type 80	b	Tolerance (mm)	OD Wire Ø (mm)
Galvanised + PVC	80	-4 +10	2,7 / 3,7



MESH TOLERANCE
The tolerance on the opening of mesh "b" being the distance between the axis of two consecutive twists according to SANS 1580:2005.

Table 1

PROPERTIES OF WIRE				
Use	Units	Lacing	Mesh	Selvedge
Wire** Galvanised + PVC	Ø mm	2,2 / 3,2	2,7 / 3,7	3,4 / 4,4
Wire Tolerance*	Ø mm	±0,08	±0,08	±0,1
Quantity of zinc*	g/m²	245	275	275
Tensile strength*	N/mm²	350-575		

* According to SANS 675:1997
** According to SANS 1580:2005 and SANS 675:1997

Table 2

Figure 2

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Maccaferri SA (Pty) Ltd reserves the right to amend product specifications without notice and specifiers are requested to check as to the validity of the specifications they are using.

PVC Coating Characteristics

The properties of the PVC material adheres to the following:
Colour: Grey RAL 7037 according to ASTM D1482-57T;
Specific gravity: 1,30-1,38 kg/dm³ in accordance with ASTM D792 Table 1;
Hardness: between 55 and 65 Shore D, according to ASTM D2240;
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 is less than 12%, according to ASTM D1242-92;
Creeping corrosion: max. penetration of corrosion of the wire from a square cut end is 25 mm when the specimen has been immersed for 2,000 hrs in a 5% solution HCl (hydrochloric acid 12 Be).

The accelerated aging 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 63°C, test method ASTM D1499-92a and ASTM G23-93 apparatus Type E;
Brittleness temperature: no higher than -9°C, or lower temperature when specified by the purchaser, when tested in accordance with ASTM D746.

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

PROPERTIES OF WELDED STEEL PANEL	
Wire description	Hot Drawn Black Mildsteel
Rod diameter (mm)	8
Aperture size (mm)	160 x 200

Table 3

STANDARD GREEN TERRAMESH™ SIZES			
Length L(m)	Width W(m)	Height H(m)	Units/Bundle
2,0	2,0	0,6	20
3,0	2,0	0,6	20
4,0	2,0	0,6	20
5,0	2,0	0,6	20
6,0	2,0	0,6	20

Tolerances : Length, Width, Height : ±5%
All sizes and dimensions are nominal.

Table 4

PROPERTIES OF BIOMAC™ (ECB)	
Mass (g/m²)	450
Matt matrix	Untreated 100% coconut fibres
Netting	UV Stabilised polypropylene

Table 5

PROPERTIES OF MACMAT™		
Physical properties		
Thickness (mm)	10	ASTM D5199
Mass per unit area (g/m²)	520	ASTM D5261
Void space (%)	>90	
Filament thickness (mm)	0,65	
Colour	Black	
Polymer	Polypropylene	
Polymer unit weight (g/m³)	905	ASTM D792
Polymer melting point (°C)	150	ASTM D1505
Polymer UV resistance	Stabilised	ASTM D4355
Mechanical properties		
Longitudinal tensile strength (kN/m)	3,0	ASTM D4595
Elongation at break (%)	64	ASTM D4595
Transversal tensile strength (kN/m)	1,2	ASTM D4595
Elongation of break (%)	57	ASTM D4595

Table 6

BILL OF QUANTITIES

Item No.	Description	Unit	Quantity	Rate	Amount (R)
1	GREEN TERRAMESH™ (Double twist hexagonal wire mesh to SANS 1580:2005). (Including material and delivery).				
1.1	Green Terramesh™ units of Mesh Type 80 with 2,7/3,7mm Class A Galvanised and PVC coated wire. Length x Width x Height	No.			
2	Surface preparation for bedding of Green Terramesh™ units.	m²			
3	Excavation against embankment cuts behind Green Terramesh™ retaining wall.	m³			
4	Installation of Green Terramesh™ units (Including folding, placing and lacing).	m²			
5	Selected structural backfill (Including loading, hauling, placement and compaction).	m³			
6	Vegetative soil behind the front face (Including placing and light hand compaction).	m³			
7	Hydroseeding front face.	m²			
8	Vegetating front face.	m²			

Table 7

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