

MACMAT™ and MACMAT™ R

MACMAT™

MacMat™ is a three-dimensional geomat (Figure 1) consisting of entangled polypropylene monofilaments that are heat bonded at the contact points to provide a dimensionally stable matrix for soil erosion protection from wind, rainfall, run-off or flooding. It is a permanent erosion control product composed of UV stabilised, non-degradable synthetic fibres. MacMat™ provides permanent erosion protection on upland slopes, stream banks, wetland boundaries, and shorelines. The mats provide a stable medium to encourage natural colonisation and support healthy plant growth.

In certain instances MacMat™ may be used in conjunction with double twist wire mesh reinforcement. When combined with galvanised and PVC coated woven wire mesh, MacMat™ is used for long term root reinforcement, erosion control, revegetation and, when used with soil nails and shotcrete, for temporary slope stabilisation. This unique combination marries the excellent anti-erosion properties of the three-dimensional MacMat™ geomat and the well-known strength properties of double twist mesh.

Erosion Protection

MacMat™ can be used as an erosion control revegetation mat (ECRM) by placing directly over the ground surface. This surface may be pre-seeded, with vegetation establishment relying on natural sediment entrapment within the MacMat™. During this process, MacMat™ provides good initial erosion protection to the underlying soils.

Alternatively, MacMat™ may be filled with imported topsoil or sediment that has been either pre-seeded or seeded after filling of the mat. This technique is preferred as quick and controlled cover is readily established. It is also possible to hydro-seed or hydro-mulch into MacMat™, or over soil filled MacMat™.

Turf Reinforcement

MacMat™ N10 and N20 have been tested against variable hydraulic flow regimes and durations. Figure 2 indicates *the recommended design allowable shear stresses* resulting from the research. Safety factors were applied both in the unvegetated and vegetated condition. Tests were performed in a high velocity flume, with velocities ranging from 0,6 to 6 m/s, up to a maximum duration of 60 hours.

Once the vegetative root system is established, MacMat™ acts as a permanent turf reinforcement mat (TRM) by enabling the root system to withstand significantly higher shear stresses than unreinforced (natural) vegetation. Hence higher short and medium term flood velocities can be achieved.

Installation and Connections

Adjacent MacMat™ panels shall be overlapped by minimum 100 mm. MacMat™ R only require edge butting by lacing using a Spenax tool available from our offices together with stainless steel lacing rings having the following specifications:

- Diameter: 3mm;
- Tensile strength: 156-178 kg/mm².

MacMat shall be fastened to the ground using suitable pegs. (Figure 4). Please refer to the [Erosion Control Blanket Installation Guidelines](#) for peg spacing and density.

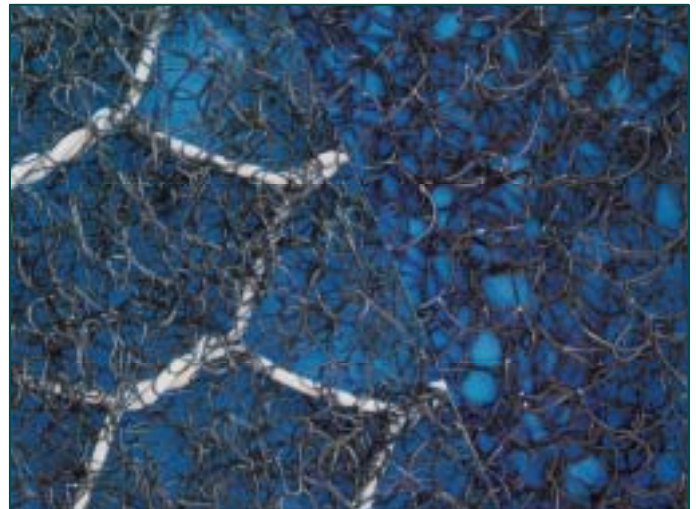


Figure 1 - MacMat™ R and MacMat

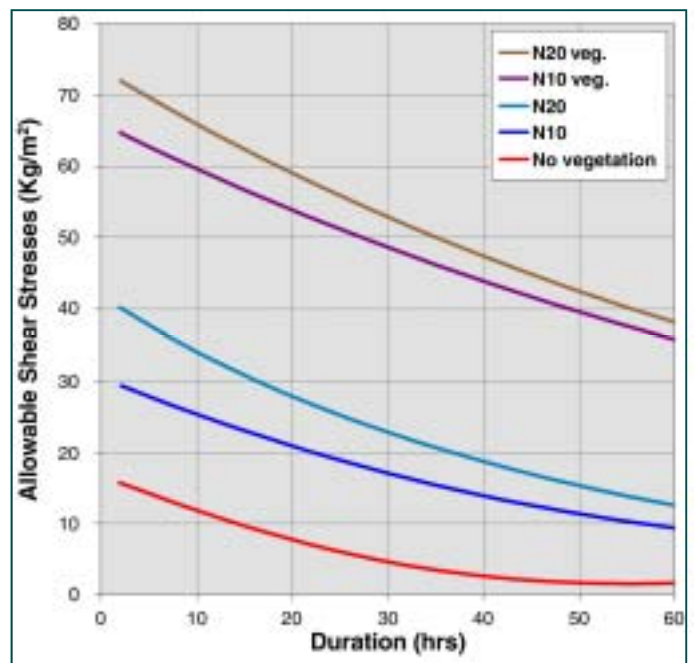


Figure 2 - Shear stress vs flood duration



Figure 3 - MacMat channel (Inset : Immediately after construction)

PHYSICAL PROPERTIES (MACMAT™ N10)		
Thickness (mm)	10	ASTM D5199
Mass per unit area (g/m ²)	520	ASTM D5261
Void space (%)	>90	
Filament thickness (mm)	0,65	
Colour	Black	
Polymer	Polypropylene	
Polymer unit weight (g/m ³)	905	ASTM D792
Polymer melting point (°C)	150	ASTM D1505
Polymer UV resistance	Stabilised	ASTM D4355
MECHANICAL PROPERTIES (MACMAT™ N10)		
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
MECHANICAL PROPERTIES (MACMAT™ R)		
Longitudinal tensile strength (machine direction)		
Mesh Type 60 (kN/m)	35	ASTM A975

Table 1

MACMAT™ & MACMAT™ R SIZES			
	MacMat™	MacMat™ R	
		Type 60 Zn	Type 60 Zn/PVC
Roll Length	50 m	25 m	25 m
Roll Width	2 m	2 m	2 m
Roll Diameter	0,65	0,60	0,63
Roll Mass	55 kg	82 kg	93 kg
Binding/Fixing pegs sold separately. MacMat™ and MacMat™ R sold in full rolls only.			

Table 2

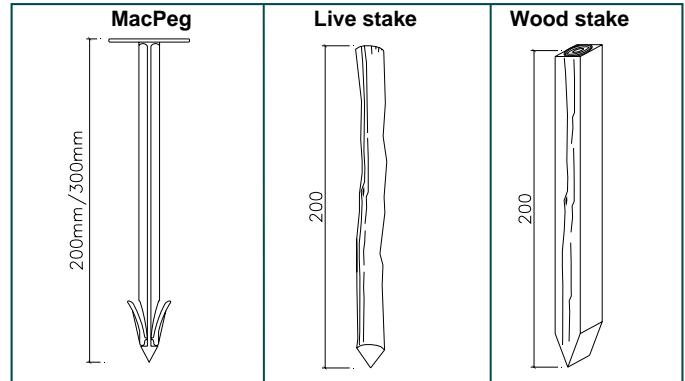


Figure 4 - Peg types

BILL OF QUANTITIES					
Item No	Description	Unit	Quantity	Rate	Amount (R)
	EROSION CONTROL BLANKETS.				
1	MACMAT™ - Three-dimensional mat manufactured from entangled polypropylene monofilaments.				
2	Scarifying for loosening topsoil.	m ²			
3	DOUBLE TWIST WIRE MESH REINFORCEMENT (As per Rockfall Netting specifications) (Including material and delivery).				
3.1 (a)	Mesh Type 60 with 2,2 mm Class A Galvanised wire. Length x Width	m ²			
(b)	Mesh Type 60 with 2,2/3,2 mm Class A Galvanised and PVC coated wire. Length x Width	m ²			
4	Vegetative topsoil below and above erosion control blanket.	m ³			
5	VEGETATION:				
5.1	Cuttings.	m ²			
5.2	Sodding.	m ²			
5.3	Hydroseeding.	m ²			
5.4	Handsowing (Specify plant species).	m ²			
6 (a)	Installation of MacMat™ (Including unrolling and fixing).	m ²			
(b)	Installation of Double Twist Wire Mesh Reinforcement (Including unrolling, fixing and lacing).	m ²			
7	Steel pegs for erosion control blanket.	No.			

Table 3