



# E'GRID®

## Rigid Biaxial Geogrid

E'GRID® is a rigid biaxial geogrid commonly used for subgrade reinforcement, rock stabilisation and erosion control.

### E'GRID® provides the following benefits:

- ✓ Distribution of loads and therefore reduction in stress concentration over the soil.
- ✓ The geogrids structural junctions, rigid ribs and thick walls help lock aggregate, increasing its shear resistance.
- ✓ As a result when a vertical load is applied the aggregate is restrained by the ribs reducing deformation. (Lateral Restraint)
- ✓ Decrease in long term deformation (creep).
- ✓ Increase in load distribution. (Bearing Capacity Increase)
- ✓ Controls differential settlement.

Grade	Mass kg/m <sup>2</sup>	Tensile Strength (kN/m)		Tensile Load (kN/m)				Radial Secant Stiffness			P <sub>md</sub>	P <sub>td</sub>	W <sub>md</sub>	W <sub>td</sub>	T <sub>j</sub>	T <sub>md</sub>	T <sub>td</sub>	Roll Size
				2% strain		5% strain		0.5% Strain	1.0% Strain	Ratio								W x L (m x m)
		MD	XD	MD	XD	MD	XD											
E'GRID®2020	0.2	20.0	20.0	7.4	7.4	14.8	14.8	>380	380	0.80	40	40	2.0	2.4	4.1	1.0	0.8	3.9 x 51.3
E'GRID® 2020L	0.2	20.0	20.0	7.4	7.4	14.8	14.8	-	-	-	66	66	3.3	4.0	4.3	1.0	0.9	3.9 x 51.3
E'GRID® 3030	0.3	30.0	30.0	10.8	10.8	21.6	21.6	>550	550	0.80	40	40	2.2	2.7	4.3	2.0	1.4	3.9 x 51.3
E'GRID® 3030L	0.3	30.0	30.0	12.0	12.5	24.0	25.0	-	-	-	66	66	3.3	4.0	5.0	1.5	1.4	3.9 x 51.3
E'GRID® 4040	0.5	40.0	40.0	14.0	14.0	28.0	28.0	>725	725	0.80	33	33	2.3	2.6	5.5	2.3	2.0	3.9 x 30.8
E'GRID® 4040L	0.5	40.0	40.0	14.0	14.0	28.0	28.0	-	-	-	54	34	3.5	4.5	7.0	1.8	1.6	3.9 x 30.8
Junction Efficiency <sup>4</sup>	95% (GRI-GG2-05)																	
Flexural Rigidity	4,300,000mg-cm (ASTM D7748)																	
Aperture Stability <sup>5</sup>	7.3 cm-kg/deg = 0.72 m-N/deg (US COE)																	
UV Resistance <sup>1,7,9</sup>	100% (ASTM D4355/D6637)																	
Carbon Black <sup>3</sup>	2% (ASTM D1603)																	
Chemical Resistance <sup>1,8,9</sup>	100% (EPA 9090A)																	

- Note:
1. Nominal Value(s)
  2. All mechanical properties are based on the manufacturer's laboratory test results at 21±1°C
  3. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02
  4. Expressed as a comparison of GRI-GG2 strength to GRI-GG1 strength of the same sample
  5. Resistance to in-plane rotational moment of 20 kg-cm
  6. At 2% strain under 3600 radial loading, determined from tests in accordance with ASTM D6637
  7. 500 hour exposure
  8. 120 day emersion testing
  9. Expressed as a percentage of Ultimate Tensile Strength

Consult Polyfabrics Australasia or a certified Engineer for site specific installation instructions.

Polyfabrics Australasia reserves the right to change its product specification at any time. It is the responsibility of the specifier and purchaser to ensure that product specifications used for design and procurement purposes are current and consistent with the products used in each instance.

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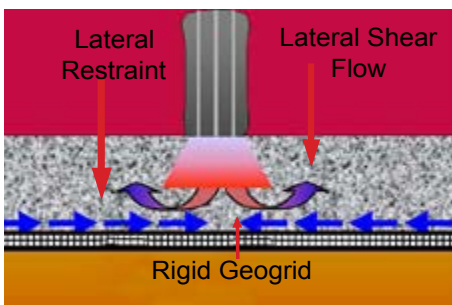
### CHEMICAL AND BIOLOGICAL RESISTANCE

E'GRID® is a biaxial Geogrid manufactured from polypropylene which is unaffected by all chemicals, including acids, alkalis and salts, normally found in soils. Also it is not a nutrient, therefore it is not affected by micro-organisms in soil.

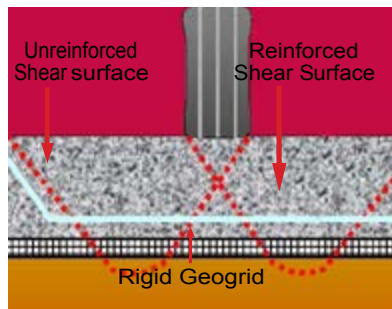
### THEORY

Rigid geogrids behave differently to geotextiles even those with similar or greater tensile strengths. Geotextiles transmit stresses to the soil through friction. They do not interlock with the aggregate the same way as a rigid geogrid with thick ribs. For a geotextile to provide reinforcement it must go into tension (Tension Membrane Effect) and for this to occur it requires large deformation and fixed wheel paths. This is difficult to control and design, as a result the only function it achieves is separation. The transmission of stress between soil and geogrid is obtainable only if the geogrid is rigid with integral junction. A woven geogrid constructed of high tensile polymer strands, can hardly develop this function, as the structure is not integral and the transversal ribs can move along the longitudinal ribs without developing any interlocking effect. A properly chosen geogrid with angular rock is able to change the boundary conditions through three main mechanisms:

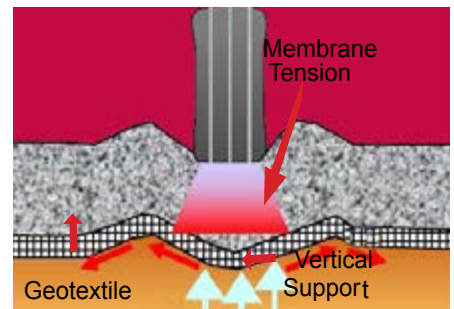
(a) Confinement Effect (or Lateral Restraint); (b) Load Distribution and (c) Tension Membrane Effect.



(a) Confinement Effect (Lateral restraint)

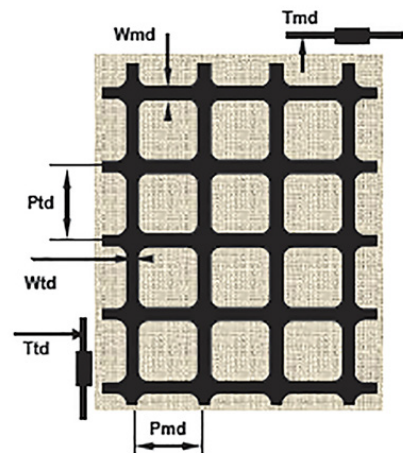


(b) Load Distribution Effect (Bearing Capacity Increase)



(c) Tensioned membrane Effect (Support)

Sieve Size (mm)	Grading Range (%)
63	100
31.5	75 - 99
16	50 - 90
8	30 - 75
4	15 - 60
1	0 - 35



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## Rigid Biaxial Geogrid

### INSTALLATION

The following information is offered in good faith to assist end users with installation of E'GRID® geogrids. As installation damage is one of the key factors that effects the integrity of the installed product it is recommended that the following guidelines be adhered to as closely as possible:

**SUBGRADE PREPARATION:** It is possible to lay the geogrid directly on undisturbed vegetation e.g. grasses and reeds should levels so permit. Any woody plant vegetation such as bushes or shrubs, as well as large rocks or other similar obstacles must first be removed. On very soft ground it can be advantageous to cut vegetation flush with the ground to leave the root-zone and soil crust undisturbed. All voids, wheel ruts or other deep depressions require to be either filled or levelled to provide a smooth surface.

**PRODUCT INSTALLATION:** E'GRID® is placed at the interface of the low CBR sub-base layer and the platform. If this interface is below the water table, a filtration geotextile is placed first followed by the E'GRID®. A granular fill is then followed. The geogrid should be rolled out and allowed to follow the contours of the ground. Placed on the subgrade either parallel to a road centre line or at right angles to it.

All geogrids should be tensioned by hand to remove slack and to ensure that any mechanical joints are taught. Small deposits of fill material will generally be required on top of the geogrid at this time to hold it in position until the main fill placement commences. No construction traffic may be allowed to travel directly on the geogrid prior to fill placement.

**GEOTEXTILE/GEOGRID COMBINATIONS:** Should the joint use of a geotextile separator and geogrid be specified over very soft ground then the geogrid should always be placed on top of the geotextile.

**PRODUCT CONTINUITY:** For Biaxial geogrids the simplest and quickest method of ensuring product continuity is to overlap adjacent layers. Roll edges and ends should have a minimum overlap of 300mm. Over soft or uneven soils these overlaps may require to be increased up to as much as 900mm.

Typically for CBR>4.0 overlap 300mm at 4.0>CBR>2.0 overlap 450 and 2>CBR<0.5 overlap 900mm.

Overlaps should be shingled in the direction of fill placement. Care should be taken to ensure that the overlaps are maintained during fill placement.

The use of plastic zip-lock ties at 0.5-1m spacing can help to hold overlaps in place during fill placement. Should a mechanical joint be required then please consult the manufacturer for further details.

**CUTTING TO SIZE:** Product may be cut to length or width using either snips or a disc cutter.

**Placement of Cover Fill:** Fill material should be end tipped at either the starting edge of the geogrid or on top of already placed fill before being spread to the required depth using a tracked machine. A minimum fill layer thickness over the geogrid of 150mm is recommended prior to any trafficking or compaction. During spreading the bulldozer blade should be angled back to lift fill rather than push it.

**FILL SELECTION:** A selection of fill types may be used with E'GRID® geogrids. Ideally the use of a graded aggregate is recommended. (Refer to table on Pg 2 Sieve size)

For immediate results the granular fill is substituted with rock to suit the aperture of the grid (30mm - 40mm) without fines, forcing the geogrid to lay flat. The more angular rock, the better the locking, the greater the shear strength and bearing capacity. The rock layer thickness can be 100mm to 500mm and placed uncompacted. The surface can then be blinded with finer material and compacted or a geotextile used followed by a finer soil.

**FILL COMPACTION:** Compaction of the material should follow in accordance with the appropriate clause of the project specification.

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