Product Specification
Tensar Structural Geogrid

- UX1000MSE Structural Geogrid
- UX1100MSE Structural Geogrid
- UX1400MSE Structural Geogrid
- UX1500MSE Structural Geogrid
- UX1600MSE Structural Geogrid
- UX1700MSE Structural Geogrid

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This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to June 1, 2007.
Product Specification - Structural Geogrid UX1000MSE

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Product Type: Integrally Formed Structural Geogrid
Polymer: High Density Polyethylene
Load Transfer Mechanism: Positive Mechanical Interlock
Recommended Applications: MESA System (Segmental Block Walls), SierraScape System (Welded Wire Walls)

Product Properties

<table>
<thead>
<tr>
<th>Index Properties</th>
<th>Units</th>
<th>MD Values(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength @ 5% Strain(^2)</td>
<td>kN/m (lb/ft)</td>
<td>23 (1,570)</td>
</tr>
<tr>
<td>Ultimate Tensile Strength(^2)</td>
<td>kN/m (lb/ft)</td>
<td>46 (3,150)</td>
</tr>
<tr>
<td>Junction Strength(^3)</td>
<td>kN/m (lb/ft)</td>
<td>43 (2,950)</td>
</tr>
<tr>
<td>Flexural Stiffness(^4)</td>
<td>mg-cm</td>
<td>400,000</td>
</tr>
</tbody>
</table>

Durability

- Resistance to Long Term Degradation\(^5\) % 100
- Resistance to UV Degradation\(^6\) % 95

Load Capacity

- Maximum Allowable (Design) Strength for 120-year Design Life\(^7\) kN/m (lb/ft) 16.8 (1,150)

Recommended Allowable Strength Reduction Factors\(^7\)

- Minimum Reduction Factor for Installation Damage (RF\(_{ID}\)) \(^8\) 1.05
- Reduction Factor for Creep for 120-year Design Life (RF\(_{CR}\)) \(^9\) 2.60
- Minimum Reduction Factor for Durability (RF\(_{D}\)) 1.00

Dimensions and Delivery

The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 1.33 meters (4.36 feet) in width and 76.2 meters (250.0 feet) in length. A typical truckload quantity is 432 rolls.

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637-01 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
3. Load transfer capability determined in accordance with GRI-GG2-05.
4. Resistance to bending force determined in accordance with ASTM D5732-01, using specimen dimensions of 864 millimeters in length by one aperture in width.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355-05.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T\(_{allow}\)) is determined by reducing the ultimate tensile strength (T\(_{ul}\)) by reduction factors for installation damage (RF\(_{ID}\)), creep (RF\(_{CR}\)) and chemical/biological durability (RF\(_{D}\)) per GRI-GG4-05 \([T_{allow} = T_{ul}(1/R_{ID}R_{CR}R_{D})]\). Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils. Coarser soils require increased RF\(_{ID}\) values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262-04. Actual design life of the completed structure may differ.

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Product Specification - Structural Geogrid UX1400MSE

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Product Type: Integrally Formed Structural Geogrid  
Polymer: High Density Polyethylene  
Load Transfer Mechanism: Positive Mechanical Interlock  
Recommended Applications: MESA System (Segmental Block Walls), ARES System (Panel Walls), SierraScape System (Welded Wire Walls)

Product Properties

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<th>MD Values¹</th>
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<tr>
<td>Tensile Strength @ 5% Strain²</td>
<td>kN/m (lb/ft)</td>
<td>31 (2,130)</td>
</tr>
<tr>
<td>Ultimate Tensile Strength²</td>
<td>kN/m (lb/ft)</td>
<td>70 (4,800)</td>
</tr>
<tr>
<td>Junction Strength³</td>
<td>kN/m (lb/ft)</td>
<td>66 (4,520)</td>
</tr>
<tr>
<td>Flexural Stiffness⁴</td>
<td>mg-cm</td>
<td>730,000</td>
</tr>
</tbody>
</table>

Durability

| Resistance to Long Term Degradation⁵    | %           | 100        |
| Resistance to UV Degradation⁶           | %           | 95         |

Load Capacity

| Maximum Allowable (Design) Strength for 120-year Design Life⁷ | kN/m (lb/ft) | 25.6 (1,760) |

Recommended Allowable Strength Reduction Factors⁷

| Minimum Reduction Factor for Installation Damage (RFID)⁸       | 1.05        |
| Reduction Factor for Creep for 120-year Design Life (RF_CR)⁹  | 2.60        |
| Minimum Reduction Factor for Durability (RF_D)                | 1.00        |

Dimensions and Delivery

The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 1.33 meters (4.36 feet) in width and 76.2 meters (250.0 feet) in length. A typical truckload quantity is 432 rolls.

Notes:
1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637-01 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
3. Resistance to bending force determined in accordance with ASTM D5732-01, using specimen dimensions of 864 millimeters in length by one aperture in width.
4. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
5. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_allow) is determined by dividing the ultimate tensile strength (T_u) by reduction factors for installation damage (RFID), creep (RF_CR) and chemical/biological durability (RF_D = RFID * RF_CR * RF_BD) per GRI-GG4-05 [T_allow = T_u / (RFID * RF_CR * RF_BD)]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
7. Minimum value is based on 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355-05.
8. Reduction factors are computed to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_allow) is determined by dividing the ultimate tensile strength (T_u) by reduction factors for installation damage (RFID), creep (RF_CR) and chemical/biological durability (RF_D = RFID * RF_CR * RF_BD) per GRI-GG4-05 [T_allow = T_u / (RFID * RF_CR * RF_BD)]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
10. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262-04. Actual design life of the completed structure may differ.

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Product Specification - Structural Geogrid UX1500MSE

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Product Type: Integrally Formed Structural Geogrid
Polymer: High Density Polyethylene
Load Transfer Mechanism: Positive Mechanical Interlock
Recommended Applications: MESA System (Segmental Block Walls), ARES System (Panel Walls), SierraScape System (Welded Wire Walls)

Product Properties

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<tr>
<td>Tensile Strength @ 5% Strain²</td>
<td>kN/m (lb/ft)</td>
<td>52 (3,560)</td>
</tr>
<tr>
<td>Ultimate Tensile Strength²</td>
<td>kN/m (lb/ft)</td>
<td>114 (7,810)</td>
</tr>
<tr>
<td>Junction Strength³</td>
<td>kN/m (lb/ft)</td>
<td>105 (7,200)</td>
</tr>
<tr>
<td>Flexural Stiffness⁴</td>
<td>mg-cm</td>
<td>5,100,000</td>
</tr>
</tbody>
</table>

Durability

- Resistance to Long Term Degradation⁵ % 100
- Resistance to UV Degradation⁶ % 95

Load Capacity

- Maximum Allowable (Design) Strength for 120-year Design Life⁷ kN/m (lb/ft) 41.8 (2,860)

Recommended Allowable Strength Reduction Factors⁷

- Minimum Reduction Factor for Installation Damage (RFID)⁸ 1.05
- Reduction Factor for Creep for 120-year Design Life (RFCR)⁹ 2.60
- Minimum Reduction Factor for Durability (RFD) 1.00

Dimensions and Delivery

The structural geogrid shall be delivered to the job site in roll form with each roll individually identified and nominally measuring 1.33 meters (4.36 feet) in width and 61.0 meters (200.0 feet) in length. A typical truckload quantity is 324 rolls.

Notes:
1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637-01 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
3. Load transfer capability determined in accordance with GRI-GG2-05.
4. Load transfer capability determined in accordance with GRI-GG2-05.
5. Resistance to resistance to load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to resist bending force determined in accordance with ASTM D5732-01, using specimen dimensions of 864 millimeters in length by one aperture in width.
7. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355-05.
8. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (Tallow) is determined by reducing the ultimate tensile strength (Tult) by reduction factors for installation damage (RFID), creep (RFCR) and chemical/biological durability (RFD) per GRI-GG4-05 [Tallow = Tult/(RFID ⋅ RFCR ⋅ RDF)]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.

Product Specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to June 1, 2007.
Product Specification - Structural Geogrid UX1600MSE

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Product Type: Integrally Formed Structural Geogrid
Polymer: High Density Polyethylene
Load Transfer Mechanism: Positive Mechanical Interlock
Recommended Applications: MESA System (Segmental Block Walls), ARES System (Panel Walls), SierraScape System (Welded Wire Walls)

Product Properties

Index Properties | Units | MD Values 1
--- | --- | ---
- Tensile Strength @ 5% Strain 2 | kN/m (lb/ft) | 58 (3,980)
- Ultimate Tensile Strength 2 | kN/m (lb/ft) | 144 (9,870)
- Junction Strength 3 | kN/m (lb/ft) | 135 (9,250)
- Flexural Stiffness 4 | mg-cm | 6,000,000

Durability

- Resistance to Long Term Degradation 5 | % | 100
- Resistance to UV Degradation 6 | % | 95

Load Capacity

- Maximum Allowable (Design) Strength for 120-year Design Life 7 | kN/m (lb/ft) | 52.7 (3,620)

Recommended Allowable Strength Reduction Factors 7

- Minimum Reduction Factor for Installation Damage (RFID) 8 |  | 1.05
- Reduction Factor for Creep for 120-year Design Life (RFCR) 9 |  | 2.60
- Minimum Reduction Factor for Durability (RFD) |  | 1.00

Dimensions and Delivery

The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 1.33 meters (4.36 feet) in width and 61.0 meters (200.0 feet) in length. A typical truckload quantity is 216 rolls.

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637-01 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
3. Load transfer capability determined in accordance with GRI-GG2-05.
4. Load transfer capability determined in accordance with GRI-GG2-05.
5. Resistance to bending force determined in accordance with ASTM D5732-01, using specimen dimensions of 864 millimeters in length by one aperture in width.
6. Resistance to bending force determined in accordance with ASTM D5732-01, using specimen dimensions of 864 millimeters in length by one aperture in width.
7. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
8. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262-04. Actual design life of the completed structure may differ.

This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to June 1, 2007
Product Specification - Structural Geogrid UX1700MSE

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Product Type: Integrally Formed Structural Geogrid  
Polymer: High Density Polyethylene  
Load Transfer Mechanism: Positive Mechanical Interlock  
Recommended Applications: MESA System (Segmental Block Walls), ARES System (Panel Walls), SierraScape System (Welded Wire Walls)

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<td>kN/m (lb/ft)</td>
<td>75 (5,140)</td>
</tr>
<tr>
<td>Ultimate Tensile Strength²</td>
<td>kN/m (lb/ft)</td>
<td>175 (11,990)</td>
</tr>
<tr>
<td>Junction Strength³</td>
<td>kN/m (lb/ft)</td>
<td>160 (10,970)</td>
</tr>
<tr>
<td>Flexural Stiffness⁴</td>
<td>mg-cm</td>
<td>9,075,000</td>
</tr>
</tbody>
</table>

Durability

| Resistance to Long Term Degradation⁵ | % | 100 |
| Resistance to UV Degradation⁶       | % | 95  |

Load Capacity

| Maximum Allowable (Design) Strength for 120-year Design Life⁷ | kN/m (lb/ft) | 64.1 (4,390) |

Recommended Allowable Strength Reduction Factors⁷

| Minimum Reduction Factor for Installation Damage (RF_ID)⁸ | 1.05 |
| Reduction Factor for Creep for 120-year Design Life (RF_CR)⁹ | 2.60 |
| Minimum Reduction Factor for Durability (RF_D) | 1.00 |

Dimensions and Delivery

The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 1.33 meters (4.36 feet) in width and 61.0 meters (200.0 feet) in length. A typical truckload quantity is 144 rolls.

Notes:
1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637-01 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
3. Load transfer capability determined in accordance with GRI-GG2-05.
4. Load transfer capability determined in accordance with ASTM D5732-01, using specimen dimensions of 864 millimeters in length by one aperture in width.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Load transfer capability determined in accordance with GRI-GG4-05 [Tallow = Tult/(RF_ID ⋅ RFCR ⋅ RF_D)]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
7. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils. Coarser soils require increased RFID values.
8. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262-04. Actual design life of the completed structure may differ.

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