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Product Specification
Tensar Structural Geogrid

- **UX1100HS Structural Geogrid**
- **UX1400HS Structural Geogrid**
- **UX1500HS Structural Geogrid**
- **UX1600HS Structural Geogrid**
- **UX1700HS Structural Geogrid**
- **UX1800HS Structural Geogrid**

This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to November 1, 2011.

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Product Specification - Structural Geogrid UX1100HS

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Product Type: **Integrally Formed Structural Geogrid**
Polymer: **High Density Polyethylene**
Load Transfer Mechanism: **Positive Mechanical Interlock**
Recommended Applications: **Sierra System (Reinforced Slopes), Prism System (Embankments), Temporary Walls**

Product Properties

Index Properties	**Units**	**MD Values[1]**
▪ Tensile Strength @ 5% Strain[2]	kN/m (lb/ft)	27 (1,850)
▪ Ultimate Tensile Strength[2]	kN/m (lb/ft)	58 (3,970)
▪ Junction Strength[3]	kN/m (lb/ft)	54 (3,690)
▪ Flexural Stiffness[4]	mg-cm	500,000
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)	21.2 (1,450)
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_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. 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.
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 UX1400HS

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Product Type: **Integrally Formed Structural Geogrid**
Polymer: **High Density Polyethylene**
Load Transfer Mechanism: **Positive Mechanical Interlock**
Recommended Applications: **Sierra System (Reinforced Slopes), Prism System (Embankments), Temporary Walls**

Product Properties

Index Properties	**Units**	**MD Values[1]**
▪ Tensile Strength @ 5% Strain[2]	kN/m (lb/ft)	31 (2,130)
▪ Ultimate Tensile Strength[2]	kN/m (lb/ft)	70 (4,800)
▪ Junction Strength[3]	kN/m (lb/ft)	66 (4,520)
▪ Flexural Stiffness[4]	mg-cm	730,000
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)	25.6 (1,760)
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_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. 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.
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 UX1500HS

Tensar International Corporation reserves the right to change its product specifications 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.

Product Type: **Integrally Formed Structural Geogrid**
Polymer: **High Density Polyethylene**
Load Transfer Mechanism: **Positive Mechanical Interlock**
Recommended Applications: **Sierra System (Reinforced Slopes), Prism System (Embankments), Temporary Walls**

Product Properties

Index Properties	**Units**	**MD Values[1]**
▪ Tensile Strength @ 5% Strain[2]	kN/m (lb/ft)	52 (3,560)
▪ Ultimate Tensile Strength[2]	kN/m (lb/ft)	114 (7,810)
▪ Junction Strength[3]	kN/m (lb/ft)	105 (7,200)
▪ Flexural Stiffness[4]	mg-cm	5,100,000
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)	41.8 (2,860)
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 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. 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_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. 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.
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.

This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to November 1, 2011.

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Product Specification - Structural Geogrid UX1600HS

Tensar International Corporation reserves the right to change its product specifications 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.

Product Type: **Integrally Formed Structural Geogrid**
Polymer: **High Density Polyethylene**
Load Transfer Mechanism: **Positive Mechanical Interlock**
Recommended Applications: **Sierra System (Reinforced Slopes), Prism System (Embankments), Temporary 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 (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 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. 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_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. 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.
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

This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to November 1, 2011.

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Product Specification - Structural Geogrid UX1700HS

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Product Type: **Integrally Formed Structural Geogrid**
Polymer: **High Density Polyethylene**
Load Transfer Mechanism: **Positive Mechanical Interlock**
Recommended Applications: **Sierra System (Reinforced Slopes), Prism System (Embankments), Temporary Walls**

Product Properties

Index Properties	Units	MD Values[1]
▪ Tensile Strength @ 5% Strain[2]	kN/m (lb/ft)	75 (5,140)
▪ Ultimate Tensile Strength[2]	kN/m (lb/ft)	175 (11,990)
▪ Junction Strength[3]	kN/m (lb/ft)	160 (10,970)
▪ Flexural Stiffness[4]	mg-cm	9,075,000
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)	64.1 (4,390)
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 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. 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_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. 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.
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 UX1800HS

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Product Type: **Integrally Formed Structural Geogrid**
Polymer: **High Density Polyethylene**
Load Transfer Mechanism: **Positive Mechanical Interlock**
Recommended Applications: **Sierra System (Reinforced Slopes), Prism System (Embankments), Temporary Walls**

Product Properties

Index Properties	**Units**	**MD Values[1]**
▪ Tensile Strength @ 5% Strain[2]	kN/m (lb/ft)	95 (6,510)
▪ Ultimate Tensile Strength[2]	kN/m (lb/ft)	210.0 (14,390)
▪ Junction Strength[3]	kN/m (lb/ft)	180 (12,340)
▪ Flexural Stiffness[4]	mg-cm	9,500,000
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)	74.1 (5,080)
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]		2.7
▪ 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. 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_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. 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.
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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