



MINING

UNDERGROUND AND SURFACE SYSTEMS

Tensor® Uniaxial (UX) 3326 Roof Mats for Mines and Tunnels

Underground Heavy-Duty Roof and Rib Control Offers Safety and Security

Primary roof and rib control of underground openings is traditionally accomplished by metallic supports that may have a variety of configurations. Perhaps the most common are steel roof and rib bolts, which are generally spaced on a regular pattern within the roof, and sometimes ribs of the entry. These primary support devices are intended to prevent catastrophic failure of the openings. They are generally not suited



The easy-to-install, white, reflective Tensor® Roof Mat is corrosion-resistant and flame retardant.

to prevent spalling between their isolated locations. Tensor International Corporation (Tensor) offers a heavy-duty polymer geogrid to provide supplemental roof and rib skin control.

TENSAR® UX3326 ROOF MATS

Designed to replace 8-gauge, welded wire, 4 in. by 4 in. roof mats for secondary control of roof strata between roof bolts, Tensor UX3326 Roof Mats are an integrally formed structural geogrid for underground mine and tunnel applications, that provide greater skin coverage for less fall through by small rocks. They are easy-to-handle and safe to work with since they are lightweight and lack sharp edges. The result is increased production efficiency and decreased injury downtime.

The flame-retardant additive is injected during the batching stage of production and complies with the Mine Safety and Health Administration (MSHA) CFR30, Part 7, for permanent installations. Further, the polymer grid structure will not corrode in a damp environment and is totally impervious to acidic conditions.

Other unique properties of UX3326 Geogrid include:

- ▶ Inby-outby stiffness for production installation from miner/bolters
- ▶ Rib-rib flexibility allowing continuous roof-to-rib reinforcement for securing entry corners
- ▶ Strength equivalent to 8-gauge, welded wire modules, but 1/7 the weight
- ▶ White, reflective color for increased entry brightness

EXTENSIVE RESEARCH AND TESTING

The National Institute for Occupational Safety and Health (NIOSH) Mining Pittsburgh Research Laboratory (PRL) in Pennsylvania is dedicated to testing products and facilities to eliminate mining



NIOSH tested Tensor UX3326-45 Geogrid against 8-gauge, welded wire mesh.

Tensar® UX3326 Roof Mat Physical Properties			
Property	Test Method	Type	Typical Value
Product Type	-	Integrally Formed Structural Geogrid	4.5 ft (1.4 m) w x 300 ft (91.5 m) l
Polymer	ASTM D4101	Flame-Retardant Polypropylene	Group 1/Class 1/Grade 2
Tensile Strength	ASTM D6637-01	lbs/ft (kN/m)	5,480 (80.0)
Junction Efficiency	GRI-GG2-05	Percent	90%
Flexural Stiffness	ASTM D5732-01	mg-cm	4,500,000
Max. Flame Prop.	30 SFR, Part 7	ft (m)	4.0 (1.2)
Avg. Burn Duration	30 SFR, Part 7	Minute	1.0 (max) Test Set
Max. Burn Duration	30 SFR, Part 7	Minute	2.0 Single Test

fatalities, injuries and illnesses. They have been conducting research and prevention activities since 1910.

In July 2007, NIOSH PRL conducted load displacement tests on Tensar® UX3326-45 Geogrid in simulated loading conditions related to the performance of screen and mesh when used for surface control in underground coal mines. They reported the UX3326 Geogrid's strength to be 86% compared to 8-gauge, steel wire using 6 in. by 6 in. plates on a 4 ft by 4 ft pattern.

It should be noted that a 20% increase in strength was witnessed when 8 in. by 8 in. plates were utilized at the corners and a 100% increase in strength was observed when mild, steel "bacon strips" were used in the rib-rib direction.

EXPERIENCE YOU CAN RELY ON

Tensar, the leader in geosynthetic soil reinforcement, offers a variety of solutions for underground and surface projects. Our products and technologies, backed by the most thorough quality assurance practices, are at the forefront of the industry. Our support services include site evaluation, design consulting and site construction assistance.

For innovative solutions to your engineering challenges, rely on the experience, resources and expertise that have set the industry standard for more than two decades.

For more information on the Mining Systems or other Tensar Systems, call **800-TENSAR-1**, visit **www.tensarcorp.com**, or e-mail **info@tensarcorp.com**.



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