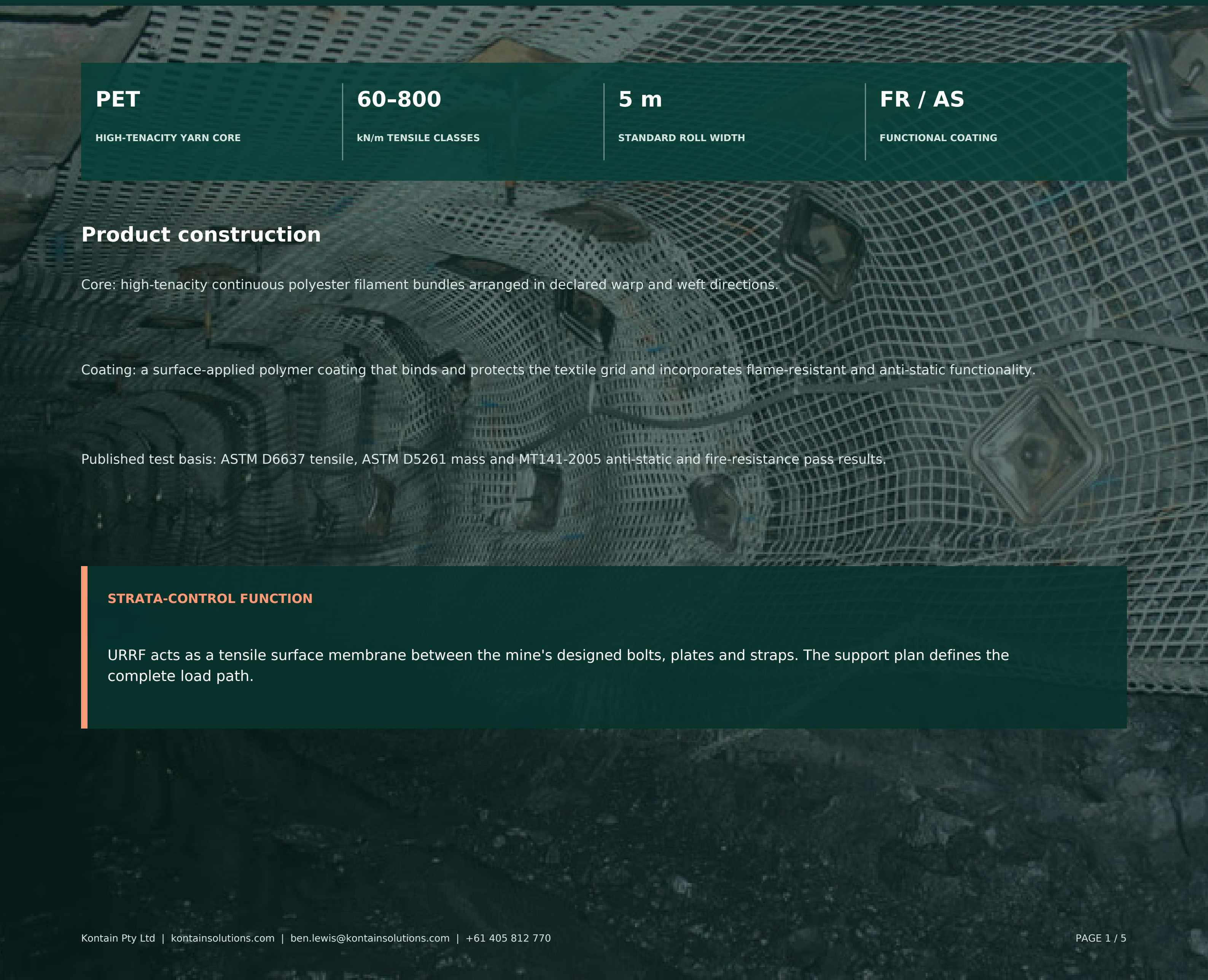
UNDERGROUND COAL · ROOF · RIB · LONGWALL RECOVERY

URRF

Underground Roof & Rib Reinforcement

Technical schedule | Coated high-strength PET support mesh

A six-grade textile reinforcement range for non-metallic roof and rib skin control, pillar wrapping and engineered longwall recovery.



PET	60–800	5 m	FR / AS
HIGH-TENACITY YARN CORE	kN/m TENSILE CLASSES	STANDARD ROLL WIDTH	FUNCTIONAL COATING

Product construction

Core: high-tenacity continuous polyester filament bundles arranged in declared warp and weft directions.

Coating: a surface-applied polymer coating that binds and protects the textile grid and incorporates flame-resistant and anti-static functionality.

Published test basis: ASTM D6637 tensile, ASTM D5261 mass and MT141-2005 anti-static and fire-resistance pass results.

STRATA-CONTROL FUNCTION

URRF acts as a tensile surface membrane between the mine's designed bolts, plates and straps. The support plan defines the complete load path.

01 / PUBLISHED GRADE RANGE

Six tensile fields from 60 to 800 kN/m

The first strength is warp; the second is weft. Directional grades align the stronger warp to the governing membrane axis.

Grade	Warp / weft kN/m	Junction N/pc	Aperture mm	Break strain	Mass g/m²	Roll m × m
URRF-60/60	60 / 60	701	60 × 60	13% ±3	727	5 × 104
URRF-100/80	100 / 80	1,077	50 × 50	13% ±3	959	5 × 104
URRF-200/200	200 / 200	1,200	55 × 33	13% ±3	1,869	5 × 104
URRF-400/400	400 / 400	1,523	49 × 45	13% ±3	2,970	5 × 52
URRF-600/400	600 / 400	2,008	48 × 40	13% ±3	3,550	5 × 52
URRF-800/800	800 / 800	2,700	44 × 25	13% ±3	4,700	5 × 52

What dictates grade selection

01 · GROUND

Failure mechanism

Ravelling, discrete slabs, block dimensions, weak bands, convergence, abutment and dynamic demand.

02 · SPAN

Support geometry

Bolt rows, bolt spacing, plates, straps and clear membrane span govern load and sag between supports.

03 · DIRECTION

Warp / weft alignment

Use balanced grades where load direction can change; align directional warp to the established governing axis.

04 · RETENTION

Block and aperture

The effective opening must retain the target fragment. Strength cannot compensate for material passing through.

05 · SERVICE

Allowable movement

Acceptable sag, convergence, egress and equipment clearance set the usable tensile response.

06 · METHOD

Installation system

Roll mass, dispenser, miner-bolter or longwall equipment, joints and edge capture influence the practical grade.

PRODUCT CLASS SCREEN

URRF-60/60 and 100/80 are entry skin-control classes; 200/200 is the balanced high-duty step. URRF-400/400, 600/400 and 800/800 address severe convergence and engineered recovery demand.

02 / CONSTRUCTION COMPARISON

Coated PET yarn grid versus extruded PP grid

The two product types are not interchangeable. Textile PET provides the higher tensile envelope and conformability; extruded polypropylene provides high flexural stiffness and integral junctions.

Design issue	Coated PET yarn grid	Integrally formed extruded PP grid
Manufacture	High-tenacity yarn bundles arranged in warp and weft, then functionally coated.	Polypropylene sheet is punched and drawn into stiff ribs with integral junctions.
Tensile class	URRF: 60 to 800 kN/m, balanced and directional.	Representative published biaxial roof-support grid: 21.9 kN/m in each direction.
Response	Flexible and conformable across roof, shoulders, ribs and recovery canopies.	High flexural stiffness assists flat presentation and controlled miner-bolter feeding.
Load transfer	Yarn bundles carry tensile load; plates, straps, junctions, overlaps and orientation form the system.	Stiff ribs and integral junctions provide consistent local geometry and plate interaction.
Best fit	Higher retained load, severe deformation, wide continuous coverage and longwall recovery.	Routine skin control where stiffness and mechanised deployment are primary.

Why the woven system is the higher-capacity pathway

- Tensile capacity scales through high-tenacity filament bundles rather than a thicker moulded rib.
- Balanced grades reach 800/800 kN/m; directional grades place additional capacity in the known principal axis.
- Textile flexibility allows continuous roof-to-rib coverage and controlled drape over longwall shields.
- Five-metre-wide rolls reduce panel joints and provide a continuous membrane field.

WARP AND WEFT YARN CONSTRUCTION

COMPARISON BASIS

Strength values are product index classes. Installed system response is confirmed with the mine's bolt, plate or strap geometry and deformation criterion.

03 / LONGWALL RECOVERY

Longwall recovery grid: purpose and design boundary

A longwall extracts a wide coal panel along one continuous face. The shearer cuts coal, the armoured face conveyor removes it, and hydraulic shields support the active work zone. As the face retreats, the roof is allowed to cave into the goaf behind the shields.

Where the recovery grid fits

01 · ACTIVE FACE	The shield canopies carry immediate roof load while the shearer and conveyor operate beneath the supported zone.
02 · RECOVERY APPROACH	Near the planned finish, the grid is introduced across the full face and carried over the shield canopies as advance continues.
03 · EQUIPMENT RECOVERY	The installed grid forms a continuous reinforced roof screen that retains immediate roof and broken material as shields and face equipment are withdrawn.

Recovery detail to be engineered

01 · FACE PLAN

Start and finish chainage

Define installation start, stopping line, advance rate, roll sequence and the planned equipment recovery sequence.

02 · SUPPORT

Grid and shield interaction

Set grade, orientation, layers, attachment, overlap, edge anchorage and canopy handling within the recovery support design.

03 · MONITOR

Ground and equipment response

Track roof condition, convergence, shield load, mesh damage, gas, ventilation and the mine's defined trigger-action response plan.

DESIGN OWNERSHIP

The mine's geotechnical, strata-control and longwall engineering teams set the recovery detail and integrate it with the approved support plan, shield system, ventilation and recovery sequence. Kontain provides grade data, roll configuration and product-system evidence for that design.

04 / SUPPORT DESIGN

Who designs the bolts, plates and spacing?

The mine operator owns the support system. The geotechnical or strata-control engineer develops the design from the geotechnical model, roadway duty and monitored ground response.

Role	Primary responsibility
Mine geotechnical / strata-control engineer	Ground model; failure mechanisms; bolt and cable type, length and pattern; plates and straps; grid grade and orientation; secondary support; monitoring and TARP.
Technical services manager	Support-plan compilation, hazard plans, design review, monitoring frequency and technical coordination.
Underground mine / production management	Resources, approved procedures, installation to the mine support plan and operational change control.
Supervisors and installation crews	Verify support is installed to plan, record conditions and act on abnormal ground or support response.
Kontain / manufacturer	Product properties, coating and test evidence, roll planning, identification, installation input and system-test coordination.

Project technical schedule

Design input	Record / project value	Design input	Record / project value
Mine, seam, district		Application / chainage	
Roadway width / height		Ground failure model	
Retained block / density		Bolt rows and spacing	
Plate / strap system		Allowable sag / movement	
URRF grade / warp		Overlap / edge detail	
Installation equipment		Monitoring / TARP	

Reference basis

NSW Resources Regulator, Code of Practice: Strata control in underground coal mines (2015); NSW TRG 3608, Non-metallic materials for underground coal mines (2022); NIOSH, Evaluation of Support and Ground Response as Longwall Face Advances into and Widens Recovery Room; Tensar BX3326 Product Specification; supplied URRF six-grade technical data schedule.