



# Under Sleeper Pad

Sustainable Resilient Systems

## Adding Value

Across all ballasted track scenarios, designed to improve track quality, give better load distribution and provide vibration reduction, constructed from high-quality materials and resistant to any prevailing conditions.



Pandrol Under Sleeper Pad (USP) solutions reduce maintenance requirements, increase track quality and provide vibration attenuation to Ballasted Track. The systems are easy to install, maintenance free and compatible with all types of track design; with their use also proven to reduce the life-cycle cost of the railway.

When USPs are installed, the stress within each sleeper is reduced due to a more even distribution of axle load.

Contact area between the ballast and sleeper is also increased, resulting in a more homogeneous track quality.

USPs are made from high-quality resin-bonded rubbers. Depending on the project, the design parameters can be adjusted to achieve a vibration attenuation target whilst also ensuring track quality.

## → TECHNICAL FEATURES

### Designed for fast and simple installation

Under Sleeper Pads can either be installed onto fresh concrete during sleeper production using MFF® technology, or glued onto existing sleepers.

### Extended lifespan

Designed to last, Pandrol USPs have tested long-term stable properties and continued performance. They are highly resistant to changing atmospheric conditions, chemical exposure and mechanical fatigue.

### Vibration attenuation

Available in a wide range of stiffnesses, Pandrol USPs provide a tuneable approach to vibration isolation that can be modified to meet exact requirements.

### Tailor-made solutions

Pandrol USPs are individually designed for the required sleeper profile, meaning that a perfect fit is always achieved.

### High resilience

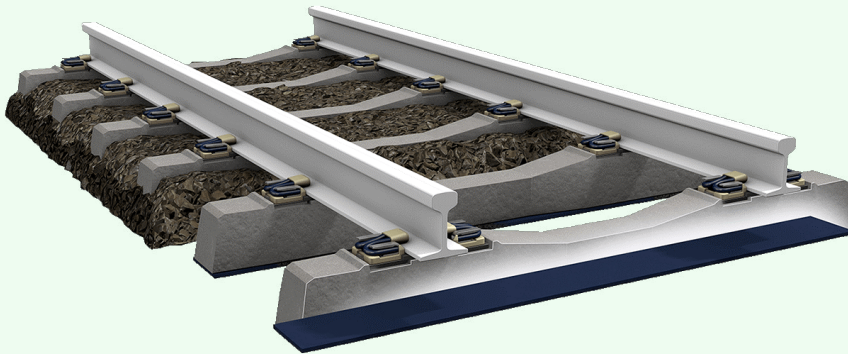
The Resin-Bonded-Rubber used in Pandrol USPs is highly resilient and returns to its original form even after large localised indentation; such as when stacking Sleepers with USPs on thin wooden blocks.

### Sustainability

Pandrol USPs are made from over 90% recycled materials and are 100% recyclable.

→ ADVANTAGES /

- Installation of Under Sleeper Pads can extend the interval between essential track maintenance, such as LLT, by a minimum factor two.
- The thickness of the ballast layer can be reduced by up to 10cm with the addition of USPs to normalise track stiffness.
- Including USPs within a transition between sub-structures offers a controlled difference in track stiffness and settlement, resulting in a much smoother transition.
- The use of USPs can combat the effect of sand ingress, which stiffens the ballast matrix.
- USPs can greatly reduce rail corrugation in tight curves, increasing grinding intervals and therefore reducing maintenance costs.
- USPs have a low environmental impact and increase the sustainability of the track.



→ COMPONENTS /

Resilient Layer:  
Made from High-Quality Resin  
Bonded Rubber

Bonding Element:  
Either patented MFF® Technology for  
the fixation to fresh concrete, or special  
adhesive for pre-existing sleepers.

→ SPECIFICATIONS /

Technical specifications	
Bonding method	Fixed on fresh concrete through MFF technology. Glued post-sleeper production.
Materials	Resin-bonded rubber
Thickness range	Elastic element: 5.5 to 20 mm MFF® bonding layer: 0.7 mm
Geometry	Flat
Sleeper compatibility	Suitable for Concrete, Steel or Timber sleepers of all possible geometries.
Density range	710 to 1100 kg/m <sup>3</sup>
Pull-out strength	> 0.5 MPa when tested according to EN 16730

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