APPLICATIONS & BENEFITS

Improvement of Track Quality
- Reduction of stresses on all track components and substructure due to a better load distribution over the track and its components both longitudinally and transversely
- Improvement of the initial track geometry = less settlement & corrugation

Economic Impact: Reduction of Life Cycle Costs (LCC)
- Increased longevity of the track and all the components
- Reduction of rail corrugation, especially in tight radius curves = extending the grinding interval by at least a factor 2
- Possibility of reducing the ballast bed thickness (up to 10cm)
- Minimising maintenance efforts: Levelling, Lining and Tamping (LLT) period extended by a minimum factor of 2
- Payback period is approximately 3-4 years

Transition Zones Design and Control
- Less differential settlement
- Controlled stiffness differential (where conventional ballasted track becomes slab-track or goes over a bridge, embankment, tunnel etc.)

Noise & Vibration Control
- Vibration Insulation up to 15 dB(v)
- Decreases noise (about 1 dBA) when compared to new track
- Better in-time evolution of recorded airborne noise levels

Sand Ingress
- Mitigation of detrimental effects and ballast stiffening due to wind blown sand

INSTALLATION
- Attached during sleeper production by means of CDM-MFF® technology
- Can be attached to sleeper post-production by means of glue
- Compatible with all in-track sleeper installation methods

CDM-MFF®
- CDM-MFF® is the registered trade mark for the Micro-Filament Fastening bonding technique
- Designed to fix CDM-USP onto fresh concrete during sleeper production
- Compatible with all production processes and concrete types

SPECIFICATION

<table>
<thead>
<tr>
<th>Track application category</th>
<th>LRT, metros, main and high speed lines</th>
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<tbody>
<tr>
<td>Bonding method</td>
<td>Fixed on fresh concrete through CDM-MFF® technology Glued post sleeper production</td>
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<tr>
<td>Materials</td>
<td>Resin-bonded rubber (RR family)</td>
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<td>Thickness range</td>
<td>For the elastomer part: 6.5 – 20 mm For the CDM-MFF® layer: 0.7 mm</td>
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<td>Geometry</td>
<td>Flat or wavy (CDM-Locksoft® technology)</td>
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<td>Sleeper compatibility</td>
<td>Suitable for all monoblock or bi-block concrete and timber sleepers. All possible geometries</td>
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<tr>
<td>Density range</td>
<td>710 - 1200 kg/m³</td>
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<td>Static bedding modules range</td>
<td>0,07 – 0,04 N/mm² according to DIN 45673-6</td>
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<tr>
<td>Dynamic bedding modules range (10Hz)</td>
<td>0,08 – 0,81 N/mm² according to DIN 45673-6</td>
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<tr>
<td>Pull-out strength</td>
<td>&gt;0.5MPa according to DIN45673-6</td>
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BELGIUM

Under Sleeper Pads are tailor-made resilient systems designed to reduce track maintenance, increase the quality of the track and provide vibration mitigation by fixing elastic elements to the bottom surface of the sleepers.

Visit Pandrolcdmtrack.com for more information about the USP system