PANDROL

VIPA DOUBLE RESILIENT BASEPLATE SYSTEM (DRS)

PRODUCT INFORMATION
The PANDROL VIPA DRS baseplate system provides a highly resilient, low maintenance solution for non-ballasted tracks and areas where ground-borne noise and vibration reduction is required. The VIPA DRS e-clip baseplate is mounted on a studded, natural rubber pad that provides resilience. This system be tuned for various axle loads and stiffness requirements.

VIPA DRS is suitable for installation on non-ballasted tracks and areas where a reduction in ground-borne noise and vibration is required. Top-down and bottom-up construction techniques are supported.

Components:
1. Nylon side-post insulators
2. PANDROL brand e-clip
3. Studded rubber baseplate pad
4. Cast iron baseplate
5. Studded EVA rail pad
6. Conforming/construction shim (sub-assembly)
7. Anchors:
   • Specialised anchors can be supplied depending on the construction method
   • Assemblies may have two or four anchors depending on track conditions
   • Includes stud ‘nylock’ nut, coil spring, locating washer and eccentric bush

Rail fastening elements are non-threaded to provide low maintenance, with no need for greasing or re-tightening. The VIPA DRS system is built upon decades of worldwide rail fastening experience, and the unmatched knowledge of PANDROL technical engineers.
PANDROL has been installing VIPA DRS and its predecessors since the mid-1980s, on MRT and LRT systems in major cities such as Hong Kong, Singapore, Sao Paulo, Dubai and Istanbul. VIPA DRS systems are also installed on mainline slab applications and steel bridges with axle loads up to 22.5 tonnes.

**HIGHLY ADJUSTABLE**
VIPA DRS achieves typical lateral adjustment of ±3 mm, using an eccentric bush in 1 mm locked steps. PANDROL can provide additional lateral adjustment for specific requirements. Typical vertical adjustment of up to 20 mm can be achieved with custom shims.

**LOW MAINTENANCE**
All VIPA DRS parts and wear components are fully replaceable in situ. The system provides two independent levels of electrical insulation and uses PANDROL threadless fastening technology, delivering low maintenance operation throughout its lifespan.

**INSTALLATIONS OPTIONS**
VIPA DRS resilient baseplate assemblies can be installed using either top-down or bottom-up construction methods.

---

**UNITED ARAB EMIRATES**
PANDROL supplied 361,500 VIPA DRS baseplates for a major metro system in Dubai. The system was the first metro of its kind to be built in the Arabian Peninsula. It has been operational since 2009.

**TURKEY**
110,000 VIPA DRS baseplates were supplied by PANDROL for the construction of a 22 km metro rail line in Istanbul. The line has been operational since late 2012.

**INDIA**
The supply of 317,500 VIPA DRS baseplates has been awarded to PANDROL for the first phases of the Chennai Metro.
PANDROL TRACK SYSTEMS
63 Station Road
Addlestone, Surrey
KT15 2AR
England
Telephone: +44 (0)1932 834500
e-Mail: info@pandrol.com
Website: www.pandrol.com

NOTE:
PANDROL is a provider of innovative custom rail fastenings. Data in this document indicates typical performance. Actual performance is dependent on a range of external factors. Please contact us to discuss how PANDROL can tailor products to suit local operating conditions and specific requirements. Technical information in this document was correct at time of printing. Improvements may since have been introduced as a result of our continuous research and development programmes.

* For special applications consult PANDROL.

PANDROL TRACK SYSTEMS

PANDROL

VIPA DRS

• Designed for applications where a degree of vibration mitigation is required
• For use on concrete, non-ballasted tracks
• Suitable for all rail inclinations and rail types

Application data (standard products – special variants may be supplied for other applications)

<table>
<thead>
<tr>
<th>Application</th>
<th>At grade, bridges, tunnels and viaducts for metro/LRT and mainline slab tracks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clip type</td>
<td>PANDROL brand e-clip</td>
</tr>
<tr>
<td>Pad type</td>
<td>Typically studded EVA rail pad with studded rubber baseplate pad *</td>
</tr>
<tr>
<td>EN13481 Track category</td>
<td>Cat A, B, C, D</td>
</tr>
<tr>
<td>Maximum axle load</td>
<td>26 tonnes</td>
</tr>
</tbody>
</table>

* For special applications consult PANDROL.

Typical performance data

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Test method</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly static stiffness</td>
<td>Typically 20 kN/mm</td>
<td>EN13481-5:2012 cat B</td>
<td>Stiffness can be reduced to 15 kN/mm or increased to &gt;200 kN/mm through consultation with PANDROL</td>
</tr>
<tr>
<td>Assembly dynamic stiffness</td>
<td>Typically 22.5 kN/mm</td>
<td>EN13481-5:2012 cat C/D</td>
<td></td>
</tr>
<tr>
<td>Clamping force</td>
<td>&gt; 16 kN</td>
<td>EN13146-7:2012</td>
<td></td>
</tr>
<tr>
<td>Creep resistance</td>
<td>&gt; 7 kN</td>
<td>EN13146-1:2012</td>
<td>For special requirements and zero longitudinal restraint applications please contact PANDROL</td>
</tr>
<tr>
<td>Electrical insulation</td>
<td>&gt;10 kΩ</td>
<td>EN13146-5:2012</td>
<td>Two levels of insulation and long leakage path, suitable for traction return currents in DC systems</td>
</tr>
<tr>
<td>Vertical adjustment</td>
<td>+20mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral adjustment</td>
<td>+/-5mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPLIANCE WITH STANDARDS:
All PANDROL fastenings are tested against European CEN standards. (PANDROL VIPA DRS has been tested against the requirements of EN 13481-5:2012 ‘Fastening systems for slab tracks’.)