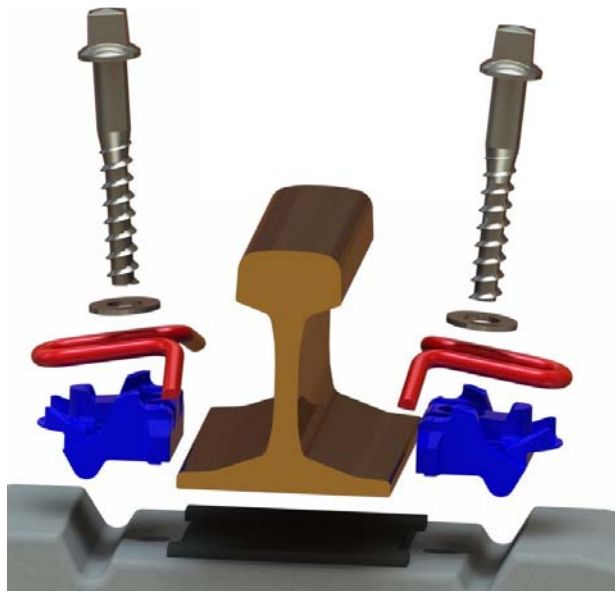


FOR BALLASTED AND SLAB TRACKS PANDROL PRESENTS:

SD FASTENERS FOR BALLASTED TRACKS



INSTALLATIONS



FRANCE



SPAIN



BULGARIA

INSTALLATION

SD fasteners have been developed for a wide combination of support types and construction methodologies:

- Direct installation on new concrete sleepers
- Retrofitting on existing concrete sleepers
- Installation on plastic base-plates mounted on concrete sleepers for 3 rails track sections
- Installation on plastic base-plates, for slab-tracks

FEATURES AND BENEFITS

SD systems have been developed by Pandrol Track Systems in order to offer a screwed solution optimising track construction costs and offering very high technical performances. SD means 'Safely Driven', referring to the controlled clip guidance from the parked- to the in-service-position. In addition to its ability of pre-assembly in the concrete sleeper manufacturing plant, SD systems have also been designed in order to offer high productivity with mechanised installation.

Tightening to refusal is the standard method used on SD systems. Together with this feature, the high elasticity of the SD clip ensures a regular clamping force and consequently a constant longitudinal restraint.

- **Multi-purpose fasteners, suitable to various types of concrete sleepers, both for new installation on specific sleeper design and retrofitting on existing sleepers**
- **Solution specially designed for easy implementation: pre-assembly in sleeper plant, compatibility to mechanised/automatic track installation**

TYPICAL PERFORMANCE RANGE

Clamping Force	20 kN per rail
Creep Resistance	N/A
Electrical Insulation	13.5 kΩ (ballasted track) EN 13146-5:2012 30 kΩ (non-ballasted track)

TYPE OF SYSTEM

Indirect Direct

SUITABLE FOR APPLICATION

Tram LRT Metro ML
 HS HH

ADJUSTMENT

	Typical	Maximum
Lateral	+/- 5 mm per rail	+/- 7.5 mm per rail
Vertical	+/- 2 mm	-4 /+2 mm

VIBRATION ISOLATION

Static Stiffness:

High speed applications	Conventional networks	Tram/ Metro Lines
>40 kN/m	>70 kN/m	>25 kN/m

RECOMMENDATIONS FOR BALLASTED TRACK

SD SYSTEMS		OPERATING CONDITIONS					GENERAL SUITABILITY				
CEN / CAT	Typical Operation	Typical Rad	Min Rad	Typical Axle	Max Axle	Max Speed	Rail Pad Resilience				
		(m)	(m)	(kn)	(kn)	(kph)	Very Stiff	Stiff	Med	Soft	Very Soft
A	Industrial / Light Urban / Tram	80	40	100	130	100			✓	✓	
B	Industrial / Light Urban / Metro	100	80	160	180	140			✓	✓	
C	Main Line Operation	400	150	225	260	250	✓	✓	✓	✓	
D	ML Large Curved (inc. High Speed)	800	400	180	260	250		✓	✓	✓	✓
E	Passenger & Heavy Freight	150	150	300	350	200	✓				
> E	Very Heavy Haul Freight	150	150	350	400	120	✓				

For guidance only. All applications differ. Please consult Pandrol for recommendations specific to your project.