

HIGH-ELASTICITY RAIL FASTENING System W 14 .0 The classic for conventional rail, heavy-haul

The classic for conventional rail, heavy-h and high-speed systems

System W 14 – the most popular solution for ballasted track



See the following pages to discover the application and configuration options, as well as interesting details on construction and materials!



Conventional rail, high speed



Heavy haul

	Old designation	
Rail fastening for	System W 14	
concrete sleepers	System W 14 HH	

New designation

System W 14 – Conventional rail, high-speed configuration System W 14 – Heavy-haul configuration



Successful worldwide thanks to **optimised flexibility**

Ballasted track is the most widely used track system worldwide. Thanks to its flexible ballast layer, it can spread the forces generated by trains evenly across the substructure. The W 14 rail fastening system takes this feature to a new level with components coordinated with the track in question, increasing both travelling comfort and track lifecycle. The system protects the track bed, and special components ensure ideal elasticity.



If you took all the System W 14 fastening points that have been installed to date and laid them end to end, the resulting track would circle the earth twice. System W 14 is an important element in ensuring cost-effectiveness, not only on account of its longer lifecycle. Its components can be preassembled on the sleepers in the concrete plant, which makes installation on the track faster, easier and therefore more cost-effective. Particular demands created by the subsurface are met by customised adaptations, which also contribute to the long life of the system and the track. SYSTEM W 14

Rail fastening for concrete sleepers



Successful product: System W 14

When the Skl 14 tension clamp was first developed more than 30 years ago, it added a component to the fastening system that achieves the ultimate in minimising noise and vibration. It also minimises rail breaks caused by trains accelerating and braking frequently. This is also where the *cellentic* rail pad comes in: It allows rail deflection, increases the elasticity of the track and makes a critical contribution toward improved safety, increased travelling comfort and a longer lifecycle. Maximum quality with minimum maintenance overhead – the economic appeal of System W 14 has been unbroken for decades, and it is a winner with track builders worldwide.

Maximum elasticity for conventional rail and high-speed systems

System W 14 maximises the existing, dominant flexibility offered by the ballasted track and optimises it not only for conventional rail but also for high-speed trains up to a speed of 320 km/h.

Smart materials for heavy-haul transport

Trains with axle loads of up to 35 tonnes place enormous loads on the track. In its heavy-haul configuration, System W 14 eases the load on the rail, and its smart components help to protect the track bed.



Previous designation: System W 14 HH

An optimised tension clamp plays a key part in helping System W 14 to offset heavy loads: Its excellent tensional force ensures the necessary rail creep resistance, allowing the rail to withstand significant vertical motion and providing the required tilt protection.

Further components increase the elasticity of the fastening system: A rail pad made of TPU was specially developed for the requirements of heavyhaul traffic, enabling the rails to deflect as much as necessary in order to absorb the loads. For especially sandy substructures, a rail pad was developed that prevents material from penetrating between the sleeper and the TPU rail pad. This is a feature that is highly appreciated in sandy areas of the US in particular, where tests in accordance with AREMA Chapter 30 prove the excellent quality of System W 14.

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System components and specifications

Tension clamps: Generational change for improved resistance

Climate-friendly passenger transportation, reliable goods transportation, efficient logistics: Rail traffic is becoming increasingly important, and this places new demands on the rail network. The new generation of clamps was specifically developed to respond to the growing burden on rails and fasteners. The new M generation of Vossloh tension clamps is more robust and therefore guarantees safety on the track into the future, regardless of growing demands and higher loads. The tension clamps are manufactured using state-of-the-art processes at the new production facility in Werdohl. That is also where its more compact and lighter design was created, which both reduces logistical costs and saves resources.



Test track tension clamp M7

Test track tension clamp M9



Safety and track availability for all generations

The factor linking all tension clamps is their force-deflecting design: On all stretches of track, including on tight curves, the track remains in position while the trains accelerate and brake. The track bed does not move, while noise and vibration are contained. As a result, the tension clamps ensure maximum safety and track availability.



Tension clamp M7

- > Fatigue strength > 2.5 mm
- > Spring deflection > 16 mm through two spring arms
- > Toe load > 10 kN
- > Frequency > 1,000 Hz



Tension clamp M9

- > Fatigue strength up to 3.2 mm
- > Spring deflection > 20 mm through two spring arms
- Toe load > 11.5 kN
- > Frequency > 1,000 Hz



Tension clamps M7, and M9 can replace the previous generation of tension clamps and are optimised for a number of requirements. The M9 clamp is especially well suited for narrow curve radii, for example.

The new M generation clamps are currently in the development stage. The values shown here are based on laboratory results, and the assessment following the initial operational trials is positive.

Comprehensive protection with **Vossloh** protect

High humidity levels and high salt content in the ambient air are just two examples of





Extraordinary elasticity provided by *cellentic* rail pads

In these systems, *cellentic* rail pads help protect the tracks so they will require less frequent maintenance. The EPDM elastomer developed by Vossloh can provide optimal elasticity and rigidity in every application to ensure that loads are ideally distributed and vibration cushioned. It remains resistant to chemical substances, temperature fluctuations, and weathering even under challenging environmental conditions.

is available on our



System W 14

One system – many potential adaptations





Conventional rail, high-speed



Heavy haul



SYSTEM W 14

Proven quality for conventional rail and high-speed transportation





SYSTEM W 14

Resistance for heavy-haul transportation



Skl 14

- and tilt protection
- movements

Angle guide plates

- > No stresses from shearing or bending forces
- > Tilt protection
- > Gauge adjustment possible
- to handle strong lateral forces



System W 14: **Specifications** at a glance



		System W 14		
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Field of application	Conventional rail	High-speed trains	Heavy haul	
Axle load	≤ 26 t	≤ 26 t	≤ 35 t	
Speed	≤ 250 km/h	≥ 250 km/h	≤ 160 km/h	
Curve radius	≥ 150 m	≥ 400 m	≥ 400 m	
Height adjustment	optional	optional	optional	
Gauge adjustment	± 10 mm	± 10 mm	± 10 mm	

Note: Content, figures, and specifications in this brochure reflect the performance of the fastening system under ideal conditions, but this will always depend on external factors and influences. Contact us so we can work with you to develop a solution tailored to your project and your requirements. The information in this document represents the state of technical development at the time of publication; the product may have been updated since as a result of ongoing research and development work at Vossloh.



On the move worldwide

Almost three hundred million fastening points on more than 87,000 km of track – a proud achievement for System W 14. High speed, conventional rail or heavy haul – the system carries trains on a total track length that that would circle the equator twice. In Germany alone, W 14 has been fitted to more than 10,000 km of track. And next door, in France, this proven rail fastening system has long been the trusted solution for ballasted track. As long ago as 2001, the system was fitted to 10 km of the HSL Méditerranée high-speed line. Romania has also used the W 14 since 2001, and has fitted it to more than 1,100 km of track. The list of rail systems is a long one, currently covering more than 60 countries worldwide.

Want to know more about our references? Drop us a line:





The German rail network

The dominant fastening system in Europe's largest rail network

About 16 million sleeper sets currently fitted to about 10,000 km of track



France

Fast connection: Tours – Bordeaux

Sud-Europe Atlantique high-speed line (SEA HSL)

More than one million W 14 rail fastening systems

Total track length: 340 km, speed: more than 300 km/h

Travel time has been reduced by one-third

15 References



Interested in more products in the Vossloh portfolio for your rail infrastructure?

Take a look at our Product Finder, where you'll quickly find the solution that's right for you!



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