



HIGH-ELASTICITY RAIL FASTENING

System 300

The all-rounder for conventional rail, heavy haul, high-speed, urban transportation systems, and turnouts



We are the 300!

More oversight, more clarity, one system!

The different versions of the familiar System 300 are being combined into a single system. In future, we'll only differentiate between fastening systems for concrete sleepers and direct fastening systems. What does this mean for you? There's nothing to memorise and no need to view multiple systems to find the version that's right for your needs. You can concentrate on the configuration you need, and we'll look after the rest.

For clarity, here is a breakdown of the systems you are familiar with, alongside the new structure:

	Old designation	New designation
Rail fastening for concrete sleepers, concrete plinths, and track supporting layers	System 300 NG	System 300 – Conventional rail, high-speed configuration
	System 300	System 300 – Conventional rail, high-speed configuration
	System 300 HH	System 300 – Heavy haul configuration
	System 300 W	System 300 – Turnout configuration
	System 300 UTS	System 300 – Urban transport configuration
Direct fastening for single support points	System DFF 300	System DFF 300 – Conventional rail, high-speed configuration
	System DFF 304	System DFF 300 – Conventional rail, urban transport configuration
	System DFF 300 UTS	System DFF 300 – Conventional rail, urban transport configuration
	System DFF 304 RS	System DFF 300 – Configuration for all segments

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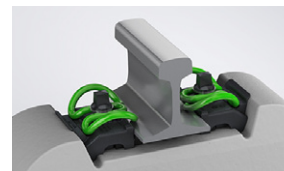
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System 300: Recipe for success for slab track

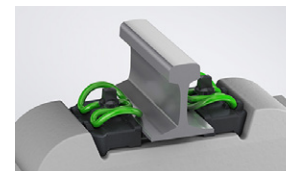
System 300 from Vossloh was designed more than 40 years ago, and since then it has been constantly refined, modernised, and optimised for special track properties. It is now in use worldwide and is one of the most commonly chosen fastening solutions for slab track. Whether you choose System 300 for concrete sleepers or System DFF 300 for single support points, – the applications cover all segments, from conventional rail, high-speed, and heavy haul services to urban transportation systems.



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



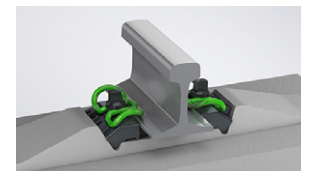
Conventional rail, high-speed



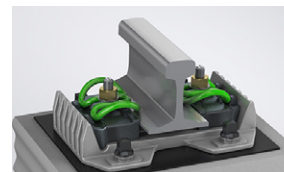
Heavy haul



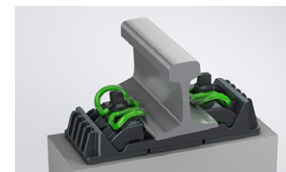
Turnouts



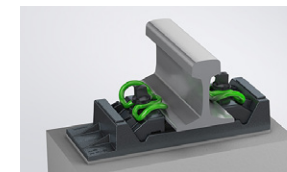
Urban transportation



Direct fastening for conventional rail, high-speed applications



Direct fastening for conventional rail, urban transport applications



Direct fastening for all segments



Versatile and cost-effective on every track


Slab track poses special challenges for rail fastening systems: The forces generated by rolling trains need to be deflected into the ground as smoothly as possible, with minimum impact on materials. System 300 from Vossloh offers a rail fastening system that provides the necessary elasticity – on all tracks and under the toughest environmental conditions.



One system, many different configuration options: That's the key to the global success of System 300.

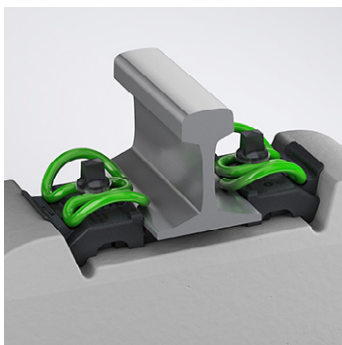
The system isn't just extremely versatile, it also excels in terms of cost-effectiveness: The components that fasten the system to concrete sleepers, concrete bases, and track supporting layers are preassembled in the factory if required. Direct fasteners can be flexibly used as single support points

and can be installed either top-down or bottom-up. That reduces overhead, makes replacement easier, and cuts maintenance costs. If the nature of the ground demands a special solution, the systems can be scaled, individually configured, and modified to suit requirements.



SYSTEM 300

Rail fastening for concrete sleepers, concrete plinths, and track supporting layers



Previous designation: System 300 NG

The special shape of the tension clamp in System 300 offers high rail creep resistance and therefore maximum safety. Another core element is an intermediate plate made of *cellentic* elastomer that ensures an ideal load distribution and compensates for vibrations to minimise their impact. The flexible use of height adjustment plates can also provide the maximum possible height adjustment as required. The result is a high level of ride comfort and low maintenance costs.

The current version for conventional rail and high-speed systems is a refinement of and improvement on the original System 300: The special design permits lower material overhead that goes easy on resources with no impact on functionality or stability. The familiar version also remains available.

System 300 also includes an elastic, configurable solution for turnouts.



Design of the future for conventional rail and high-speed systems

System 300 is highly elastic and flexible to protect the track from the forces acting on the rails in the conventional rail and high-speed ranges.

Extreme resilience in the heavy haul range

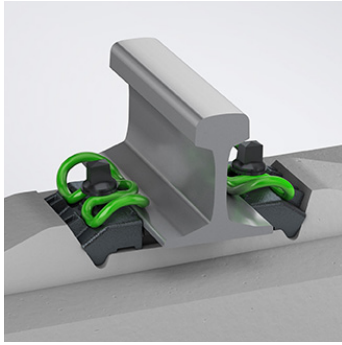
Axle loads in excess of 26 tonnes expose the track to extreme stress. System 300 protects the track with its smart design and components specifically designed for heavy loads.



Previous designation: System 300 HH

Tracks intended for heavy loads are normally combined with ballasted track. The benefit of slab track is revealed, however, on long stretches of track that are difficult to access: It requires less maintenance and has a longer lifecycle. In addition, thanks to its special configuration, System 300 for the heavy-load range helps minimise wear and tear and also improves track availability.

The shape of the tension clamp and the broader angle guide plates ensure safety on the track. To better absorb the higher loads that are generated, the version of System 300 for heavy-load transportation uses a *cellentic* intermediate plate with greater rigidity. Then there's the opportunity to use height adjustment plates to modify the rail fastener most appropriately for each section of track.



Previous designation: System 300 UTS

Frequent starting and stopping by trams and metro services in mass-transit systems causes major stress on the rails. That is where a smaller, more compact version of System 300 comes in, with components that are specifically designed for the requirements of mass-transit systems and metros in particular: A tension clamp optimised for the purpose ensures maximum safety and protection from excessive track tilt on tight curves.

A *cellentic* intermediate plate made of an EPDM elastomer prevents vibration and gives the rail fastening system the elasticity needed to ensure a high level of ride comfort. Height adjustment plates enable the system to be adapted to any track. The result is a fastening solution that reduces both noise and vibration and combines a high level of track availability with low maintenance overhead.



Protective adjustment for urban transport systems

The System 300 fastening system offers a configuration for urban commuter and mass-transit systems that can also manage sophisticated metro requirements.

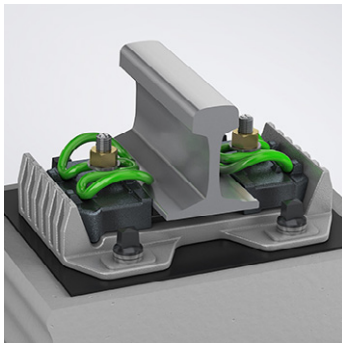
SYSTEM DFF 300

Direct fastening for single support points



Single support point with steel frame for conventional rail and high-speed systems

For tracks that require direct fastening, System DFF 300 offers a broad range of application-based configurations.



No change of name: System DFF 300

System DFF 300 has a steel frame and is a high-quality solution for the conventional rail and high-speed sectors, and it's also come to be known as an ideal repair solution. It is excellent for refurbishment projects thanks to its ease of installation – between two damaged ties or support points, for example. Maximum track safety also makes it the perfect choice for tunnel and bridge use.

A special benefit is offered by the tension clamp, which is used, for example, in a version with reduced rail creep resistance in bridge construction projects. A steel base plate safely deflects the powerful forces generated at high speeds into the substructure. An intermediate plate made of *cellentic* elastomer minimises vibration and structure-borne noise, which improves the lifecycle of the track components.

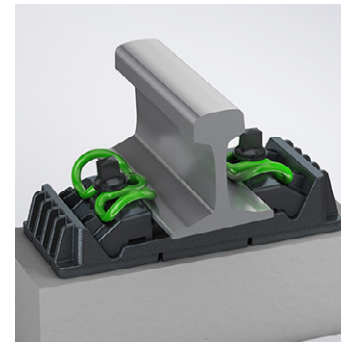


Single support point with plastic frame for all segments

A versatile configuration of System DFF 300 is used in the conventional rail, high-speed, heavy haul, and urban transport segments.

The geometry of the plastic base plate enables better conservation of resources in the material utilised in rail fasteners with a plastic frame. The result is a reduction in both weight and logistical costs. The tension clamp ensures safety on the track and prevents excessive track tilt on tight curves, among other things.

The special IVES design of the DFF 300 direct fastening system allows the combination of prefabricated components and local concrete base courses while ensuring maximum accuracy and rail stability, even under extreme conditions of assembly. These DFF configurations can be installed both top-down and bottom-up, so they're ideally suited to automated track-laying systems.



Previous designation: DFF 304 and
DFF 300 UTS



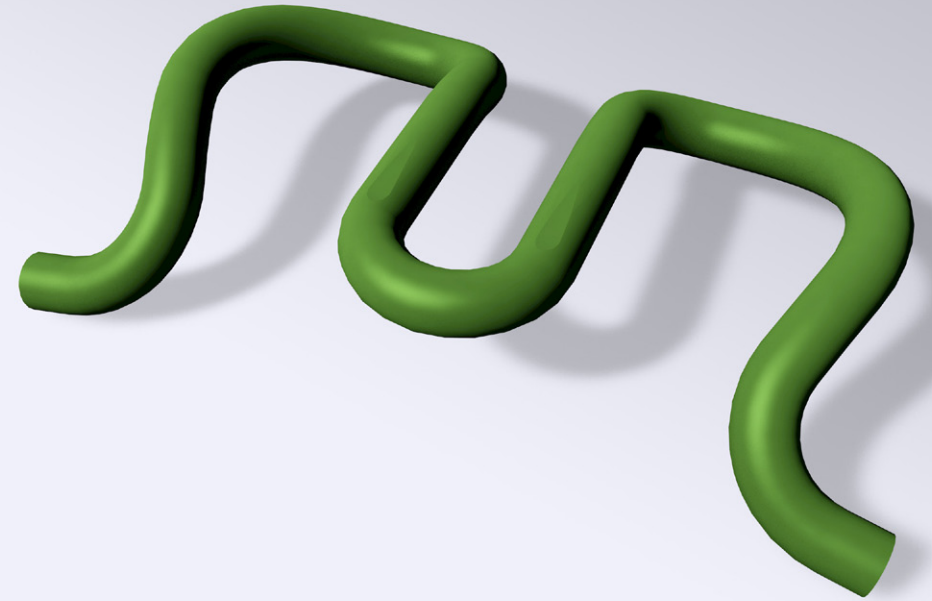
Previous designation: DFF 304 RS

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.



Safety and track availability for all generations

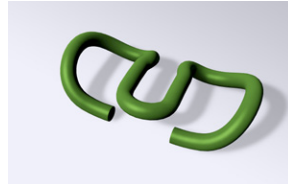
The factor linking all tension clamps is their force-deflecting design: On all stretches of track, including on tight curves, the track remains in position while the trains accelerate and brake. The track bed does not move, and noise and vibration are contained. As a result, the tension clamps ensure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

Old generation



Tension clamp Skl 15

- › Fatigue strength 3.0 mm
- › Spring deflection 20 mm through two spring arms
- › Toe load 9 kN
- › Frequency approx. 600 Hz

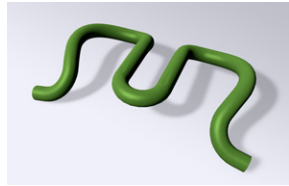


Tension clamp Skl 21

- › Fatigue strength 2.5 mm
- › Spring deflection 14.5 mm through two spring arms
- › Toe load 10 kN
- › Frequency approx. 650 Hz



New generation



Tension clamp M3

- › Fatigue strength 3.0 mm
- › Spring deflection > 26 mm through two spring arms
- › Toe load 9 kN
- › Frequency > 900 Hz



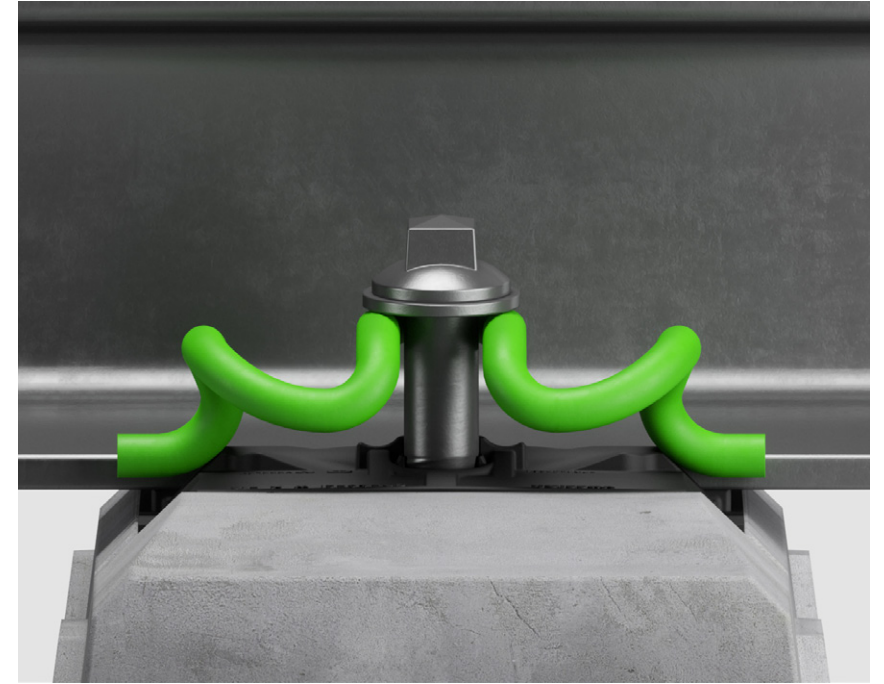
Tension clamp M7

- › 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 M3, 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 environmental impacts that will attack some components in rail fastening systems. That is why all tension clamps and sleeper screws and T-head bolts are coated with *Vossloh protect* for optimal protection. This innovative coating provides traditional barrier and cathodic corrosion protection that prevents damage from loose ballast, among other things. This is an important factor when it comes to reducing lifecycle costs. The coated components are also protected from aggressive industrial climates like acid rain, major temperature fluctuations, and other extreme conditions.



More information is available on our Web site:

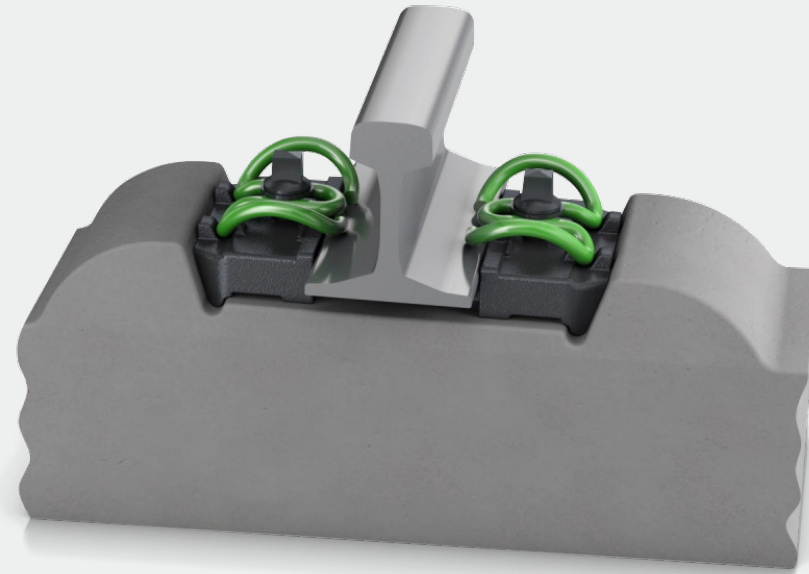


Extraordinary elasticity provided by *cellentic* intermediate plates

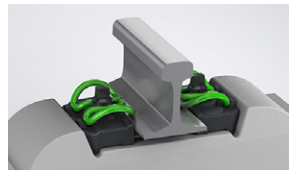
In these systems, *cellentic* intermediate plates help protect the tracks so they will require less frequent maintenance. The EPDM elastomer developed by Vossloh can provide optimal elasticity and rigidity in every application to ensure that loads are ideally distributed and vibration cushioned. It remains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

System 300

One system – many potential adaptations



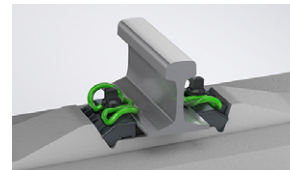
Conventional rail, high speed



Heavy haul



Turnouts



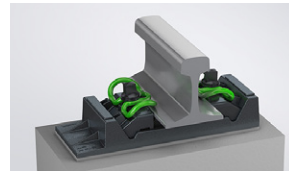
Urban transportation



Direct fastening for conventional rail, high-speed applications



Direct fastening for conventional rail, urban transport applications



Direct fastening for all segments

Click on the illustration to go directly to the system.





SYSTEM 300

Resource-efficient design for conventional rail and high-speed systems

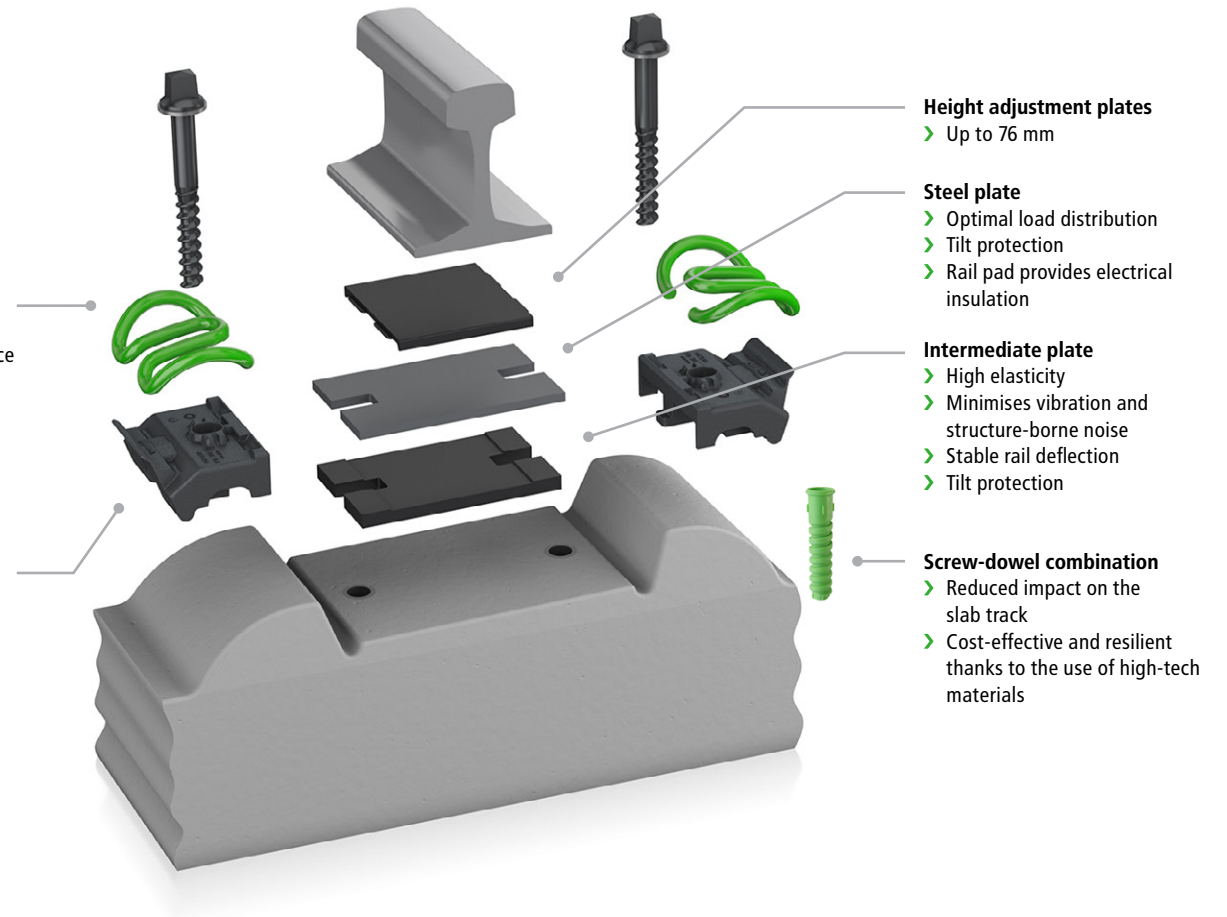
Less material with no
impact on quality:
The refined System 300

Skl 15

- › Maximum safety
- › Optimised rail creep resistance and tilt protection
- › Resistant to dynamic vertical movements
- › Maintenance-free system

Angle guide plates

- › No stresses from shearing or bending forces
- › Keep rails in the track
- › Tilt protection
- › Gauge adjustment possible



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SYSTEM 300

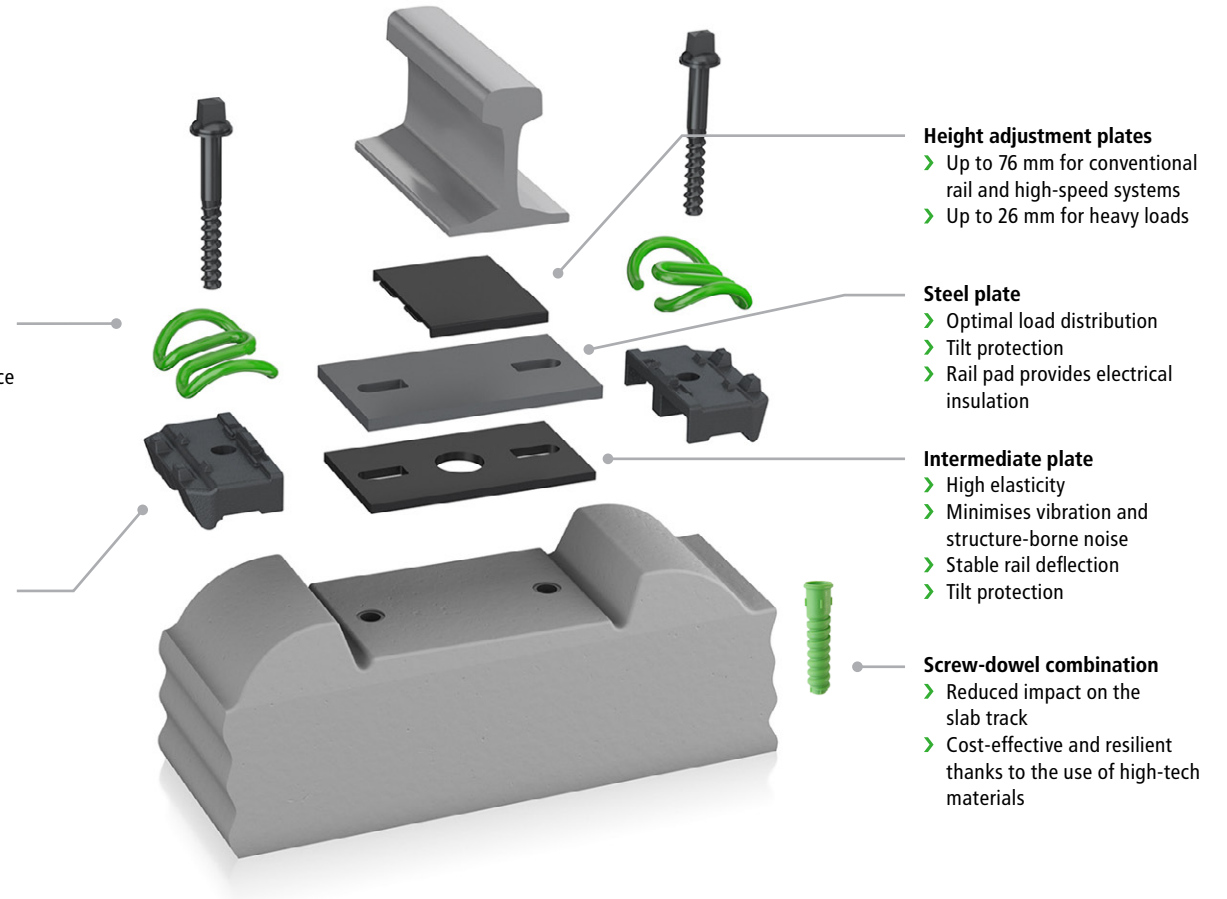
Proven quality for conventional rail, high-speed, and heavy-goods transportation

SKI 15

- Maximum safety
- Optimised rail creep resistance and tilt protection
- Resistant to dynamic vertical movements
- Maintenance-free system

Angle guide plates

- No stresses from shearing or bending forces
- Keep rails in the track
- Tilt protection
- Gauge adjustment possible
- Wider angle guide plates for heavy loads



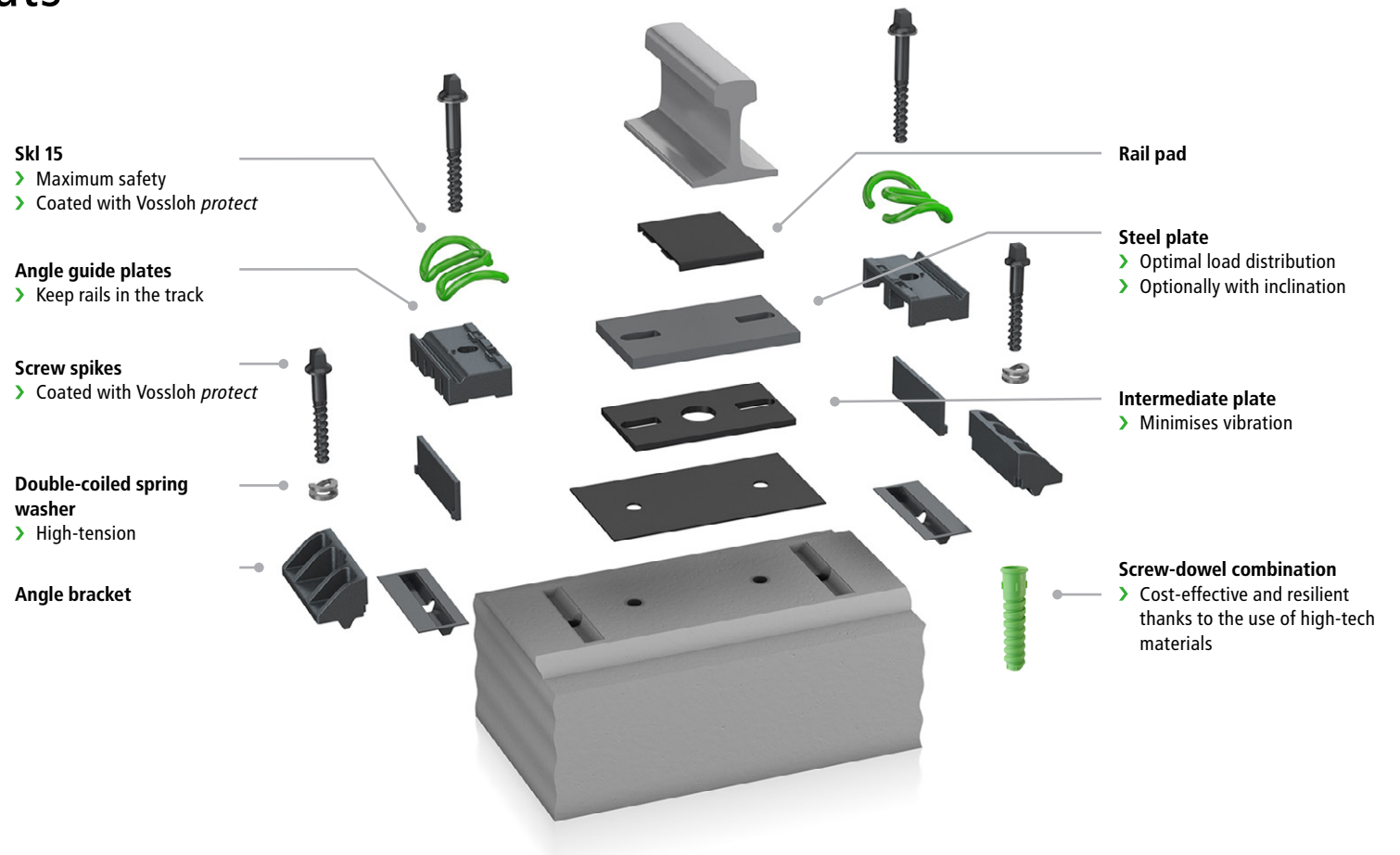
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SYSTEM 300

High elasticity for turnouts



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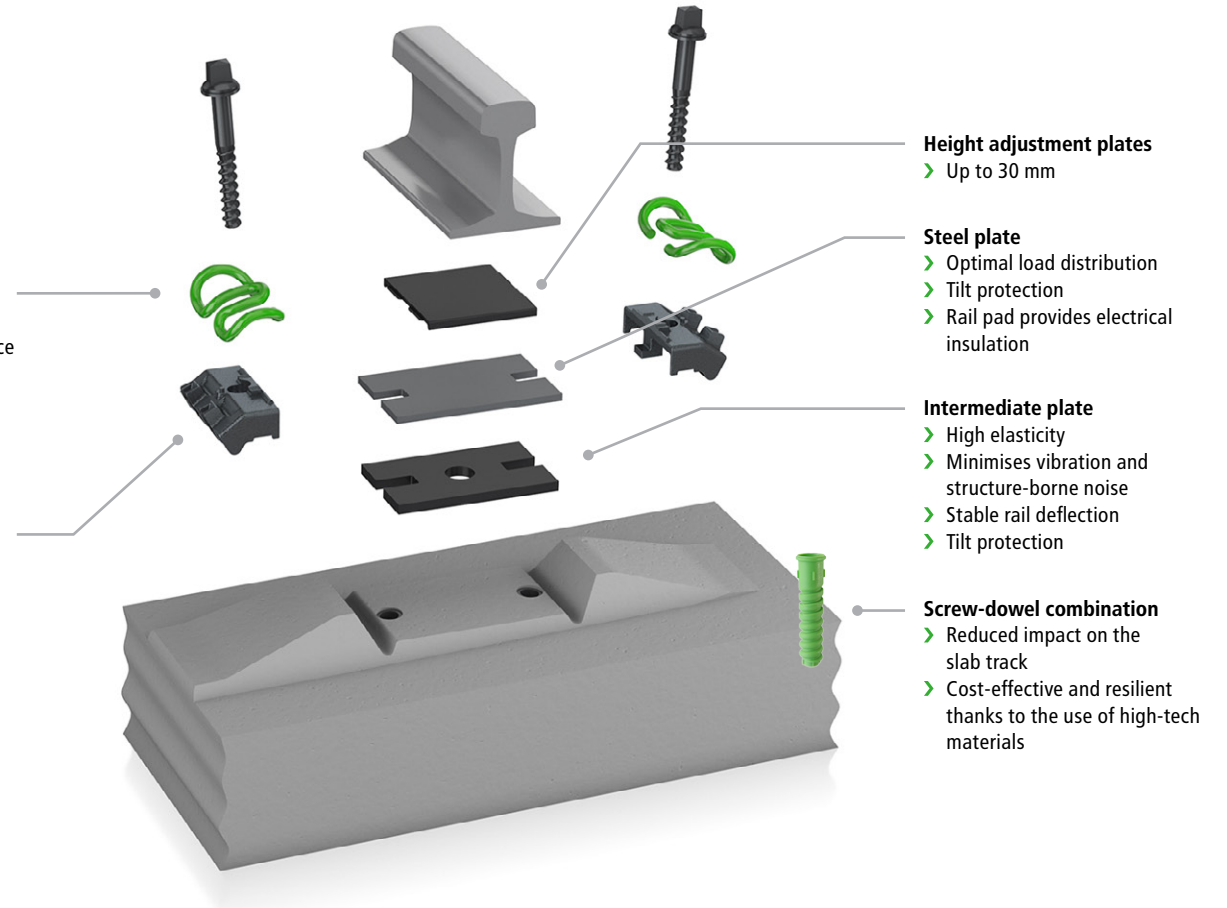


SYSTEM 300

Smooth mobility for mass transit

- Ski 21**
- › Maximum safety
 - › Optimised rail creep resistance and tilt protection
 - › Resistant to dynamic vertical movements
 - › Maintenance-free system

- Angle guide plates**
- › No stresses from shearing or bending forces Keep rails in the track
 - › Tilt protection
 - › Gauge adjustment possible



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SYSTEM DFF 300

Proven in repair situations, resilient for conventional rail and high-speed systems

Skl 15

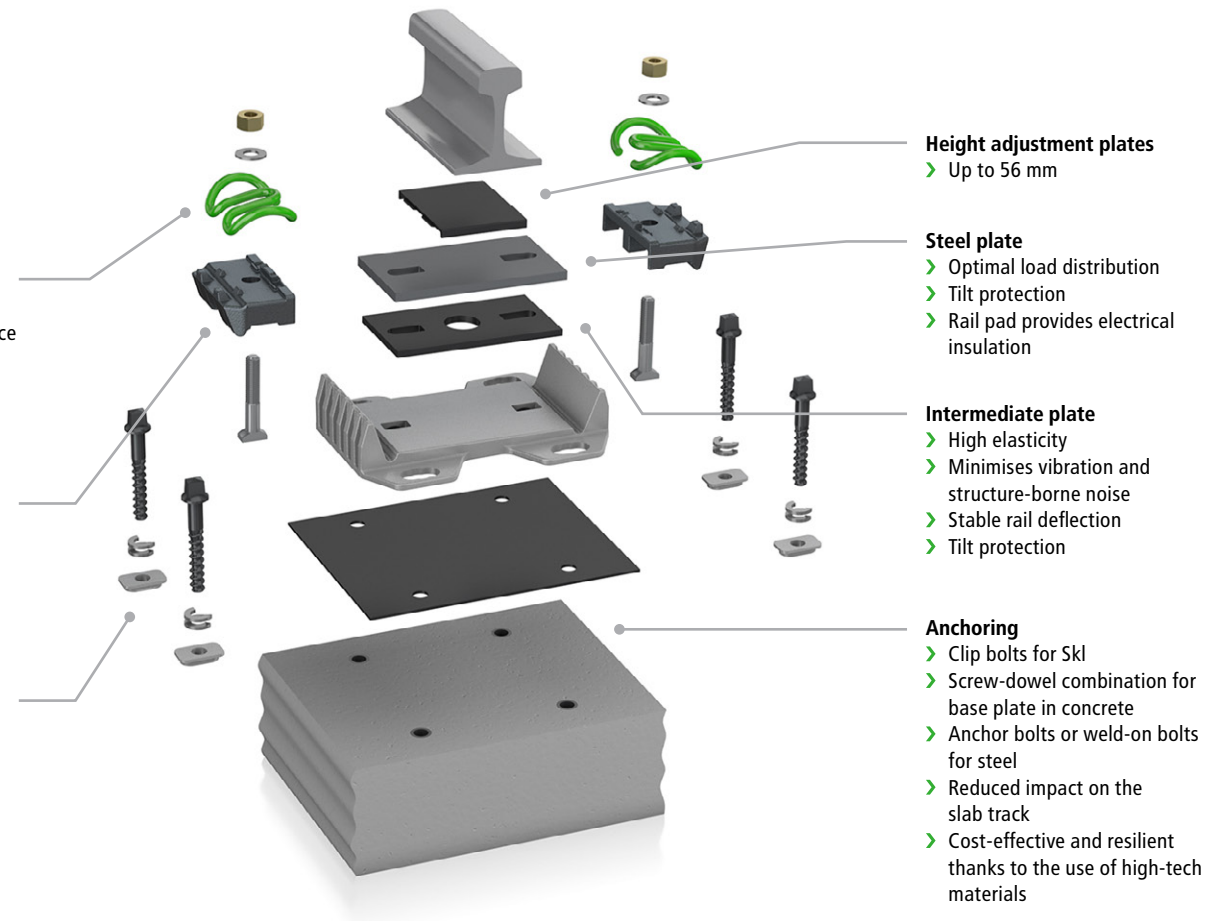
- › Maximum safety
- › Optimised rail creep resistance and tilt protection
- › Resistant to dynamic vertical movements
- › Maintenance-free system

Angle guide plates

- › No stresses from shearing or bending forces
- › Keep rails in the track
- › Tilt protection
- › Gauge adjustment possible

Adjusting plates

- › Gauge adjustment possible



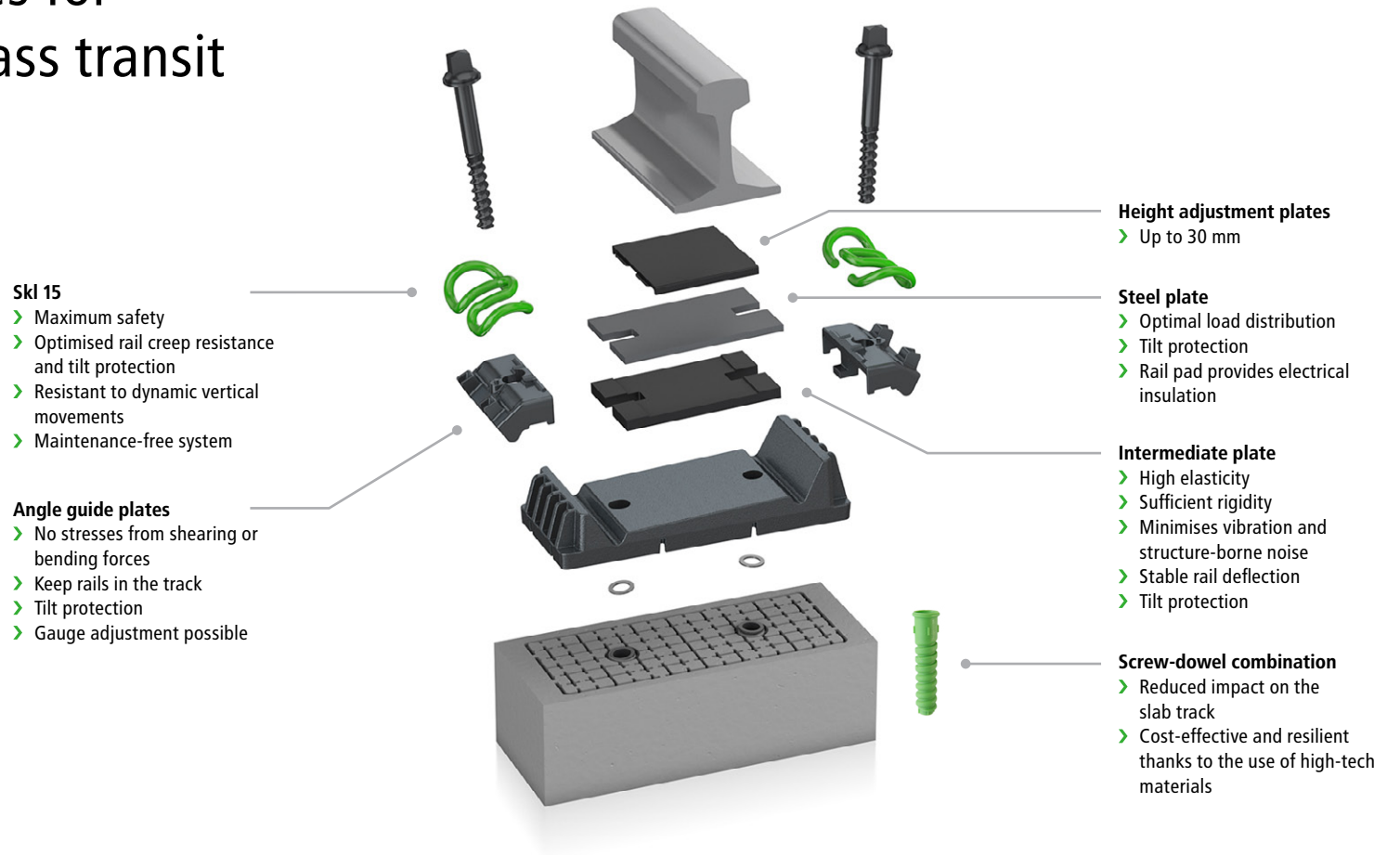
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SYSTEM DFF 300

Reduced use of resources for conventional rail and mass transit



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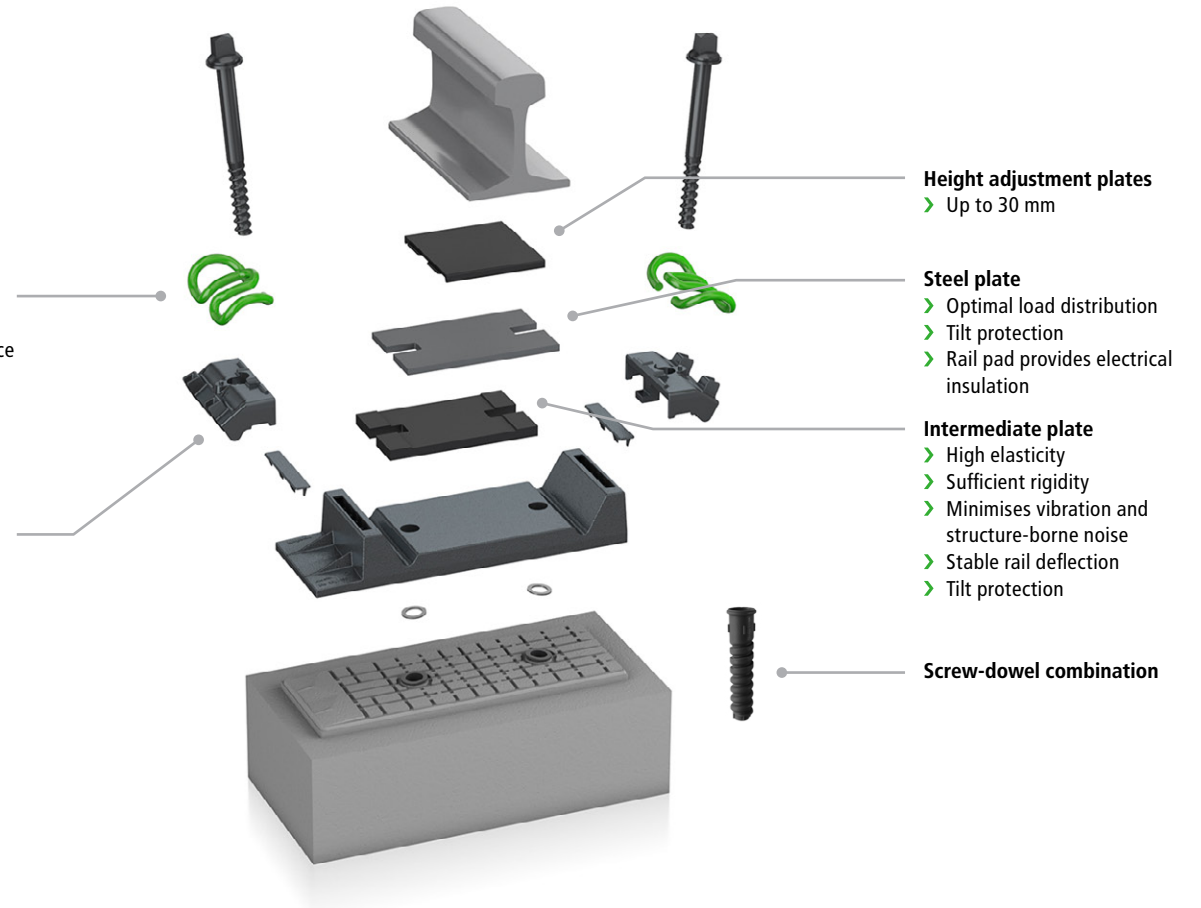


SYSTEM DFF 300

IVES design for all segments

- Skl 15**
- › Maximum safety
 - › Optimised rail creep resistance and tilt protection
 - › Resistant to dynamic vertical movements
 - › Maintenance-free system

- Angle guide plates**
- › No stresses from shearing or bending forces
 - › Keep rails in the track
 - › Tilt protection
 - › Gauge adjustment possible



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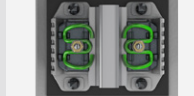



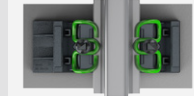
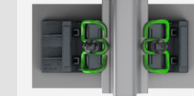




System 300: Specifications at a glance

You can also use our Product Finder on our Web site:



	System 300			System DFF 300 with steel frame	System DFF 300 with plastic frame		System DFF 300 with plastic frame design IVES		
									
Field of application	Conventional rail High-speed trains	Heavy haul	Urban transportation system	Conventional rail High-speed trains	Conventional rail	Urban transportation system	Conventional rail High-speed trains	Heavy haul	Urban transportation system
Axle load	≤ 26 t	≤ 35 t	≤ 18 t	≤ 26 t	≤ 26 t	≤ 18 t	≤ 26 t	≤ 35 t	≤ 18 t
Speed	CR: ≤ 250 km/h HS: ≥ 250 km/h	≤ 160 km/h	≤ 140 km/h	CR: ≤ 250 km/h HS: ≥ 250 km/h	≤ 250 km/h	≤ 140 km/h	CR: ≤ 250 km/h HS: ≥ 250 km/h	≤ 160 km/h	≤ 140 km/h
Curve radius	CR: ≥ 150 m HS: ≥ 400 m	≥ 300 m	≥ 80 m	CR: ≥ 150 m HS: ≥ 400 m	≥ 150 m	≥ 80 m	CR: ≥ 150 m HS: ≥ 400 m	≥ 150 m	≥ 80 m
Height adjustment	- 4 mm/+ 76 mm	- 4 mm/+ 26 mm	+ 30 mm	- 4 mm/+ 56 mm	+ 30 mm	+ 30 mm	+ 30 mm	partially possible	+ 30 mm
Gauge adjustment	± 16 mm	± 16 mm	± 10 mm	± 46 mm	± 10 mm	± 10 mm	± 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 publishing; the product may have been subsequently updated as a result of ongoing research and development work at Vossloh.



International success model

To date, the System 300 has been installed on almost 20,000 kilometres of track worldwide. Since the 1970s, it's been one of the systems most widely used by Deutsche Bahn. In Taiwan, System 300 has proved a winner on a 52-km stretch of the THSRC involving speeds of up to 300 km/h. Its low design height makes it ideal for use in tunnel construction projects: for example, in Switzerland, Turkey, the Indian region of Kashmir, and also in Italy where the highest speed in a tunnel (362 km/h) was recorded. Additional adjustment options allows the System 300 to be used in all countries and under extreme conditions.

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



Germany

Track types: Passenger transportation, high speed

Challenge: Safety, comfort

System 300 on 1,300 km of DB rail network

Max. speed: 300 km/h

Along the A3 autobahn: The world's steepest high-speed line

Nuremberg-Berlin: "German Unity Transport Project", 500 km of new and extended track



China

Track types: Passenger transportation, high speed

Challenge: Mountainous terrain, high bridges, tunnels

Shanghai–Beijing: World's longest high-speed track: 1,318 km; max. speed: 350 km/h, track record: 486 km/h

Chengdu–Guiyang: Mountainous region, 85 per cent of track on high bridges or through tunnels

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!

Click here to directly
access the Product Finder



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