vossloh
enabling green mobility

FOR OPTIMUM DAMPING

Vossloh *cellentic*

Our elastic rail pads and intermediate plates for rail fastening systems

Vossloh *cellentic:* Reduces wear and noise, increases **comfort and safety.**

Our contribution to maximum elasticity.

cellentic is a microcellular elastomer developed in-house by Vossloh. Its purpose is to provide the best possible cushioning for vibration of all kinds in the track system. *cellentic* is made of EPDM (ethylene propylene diene monomer), a synthetic rubber. This substance is extremely resistant to external influences, and can tolerate constant stresses for years with no loss of its elastic qualities.

Less vibration means lower costs

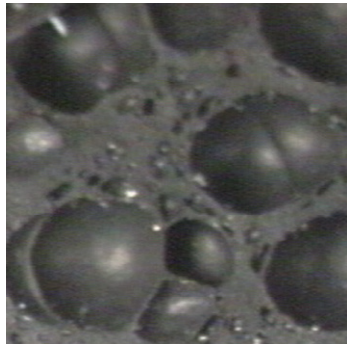
The combination of high speeds and heavy loads means huge forces on the rails and the entire track structure every time a train passes over them. To absorb these forces, our rail fastening systems make use of highly elastic rail pads and intermediate plates made of *cellentic.* These ensure the best possible load distribution under pressure, and cushion vibration caused by the unevenness of the track and the wheels. The entire superstructure is protected as a result. The required cost for track maintenance and repair is substantially reduced, along with overall lifecycle costs.

How you benefit from *cellentic:*

- Cushioning of wheel travel improves safety and comfort
- Less structure-borne noise thanks to ideal damping of vibration and minimised track vibration
- Reduced lifecycle costs thanks to elastic absorption of all forces and protection of the superstructure

Our recipe for success: **flexible elasticity**

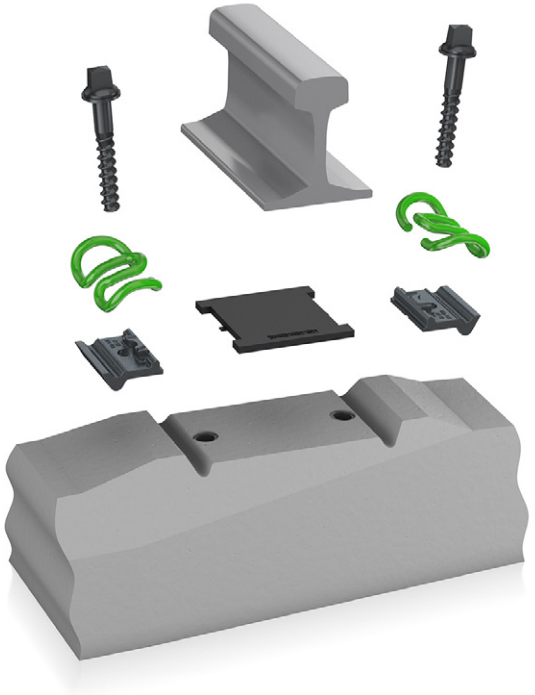
Thanks to its closed pores, *cellentic* is able to absorb loads into its own structure and thus exhibits very little deformation. The composition of the elastomer can be adjusted for every desired application until exactly the right elasticity and stiffness are achieved. The result is the ideal load distribution and maximum damping of vibration in every case.



closed-pored *cellentic* fine structure

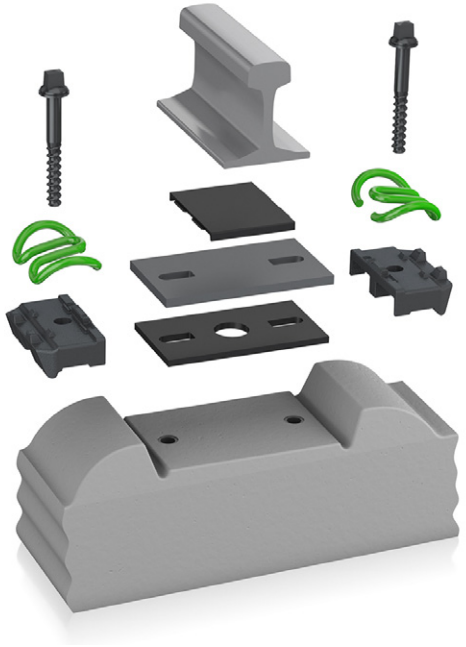
Engineering benefits of *cellentic*

- Resistant to chemical substances
- Superior temperature, ageing and weather characteristics
- High UV and ozone resistance
- High dimensional stability under continuous loads
- Low water absorption
- Low frequency dependence in the 1-40 Hz range
- Low dynamic loading on the subsurface
- Increased ride safety due to integrated track tilt protection
- High damping effect



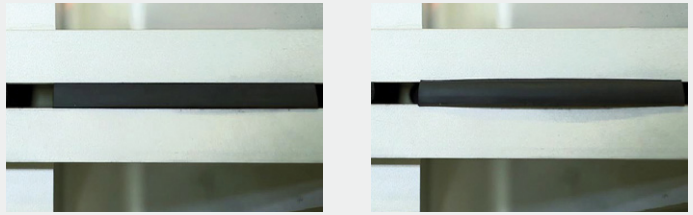
cellentic for ballasted track

cellentic rail pads damp vibration and optimise the elasticity of the ballast layer. This preserves the superstructure and reduces wear on all track components including the ballast. A configuration with variable stiffness of between 20 and 200 kN/mm allows *cellentic* rail pads to be used in almost all applications worldwide (conventional rail, urban transport and high-speed rail).



cellentic on slab track

The high elasticity of *cellentic* components enables them to meet the special requirements of slab track. Their variable design ensures the required elasticity for all load profiles (conventional rail, urban rail, high-speed rail and heavy haul). This involves the use of intermediate plates with elasticities ≥ 8 kN/mm in particular.



Evidence from endurance testing:

The *cellentic* rail pad (left) absorbs loads into its own structure and hardly deforms, whereas the solid rubber rail pad stretches both longitudinally and laterally, and is exposed to destructive wear.

H-shape design (e.g. Zw 900a)

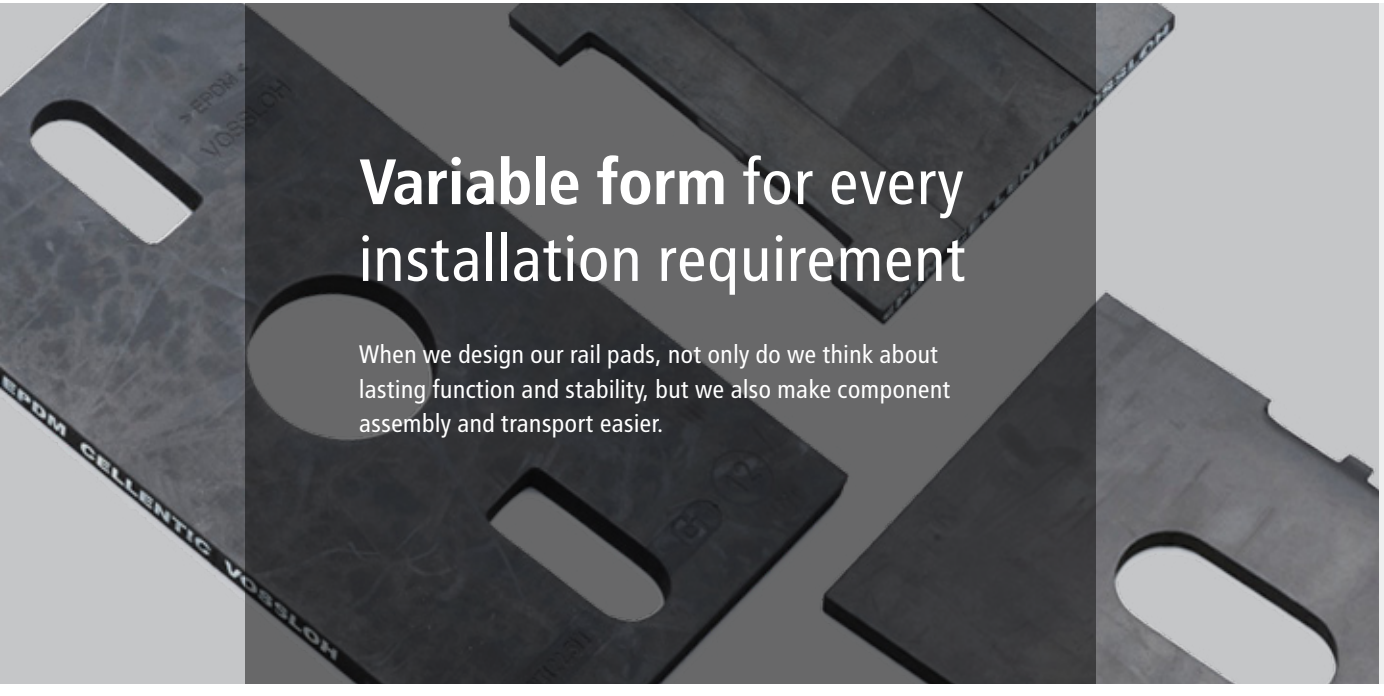
During (pre-)assembly, the H shape ensures that the rail pad is correctly placed on the rail seats and between the angle guide plates.

H-shape design with pre-assembly lips (e.g. Zw 900b)

The pre-assembly lips are important for transportation, especially for pre-assembled sleepers: they help the angle guide plates to hold the rail pad in place so nothing is lost.

H-shape design with anti-tilt protection (AT)

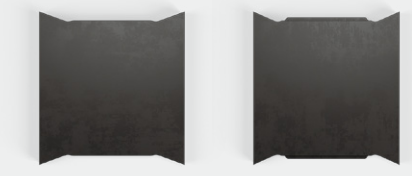
The reinforced edge areas stabilise the rail position, e.g. in narrow curves. In combination with angle guide plates, anti-tilt protection optimises rail behaviour, reduces wear and therefore extends the service life of the whole rail track. The AT version is also available with pre-assembly lips.



Variable form for every installation requirement

When we design our rail pads, not only do we think about lasting function and stability, but we also make component assembly and transport easier.

The innovative *fin* design is also available for rail pads with pre-assembly lips.

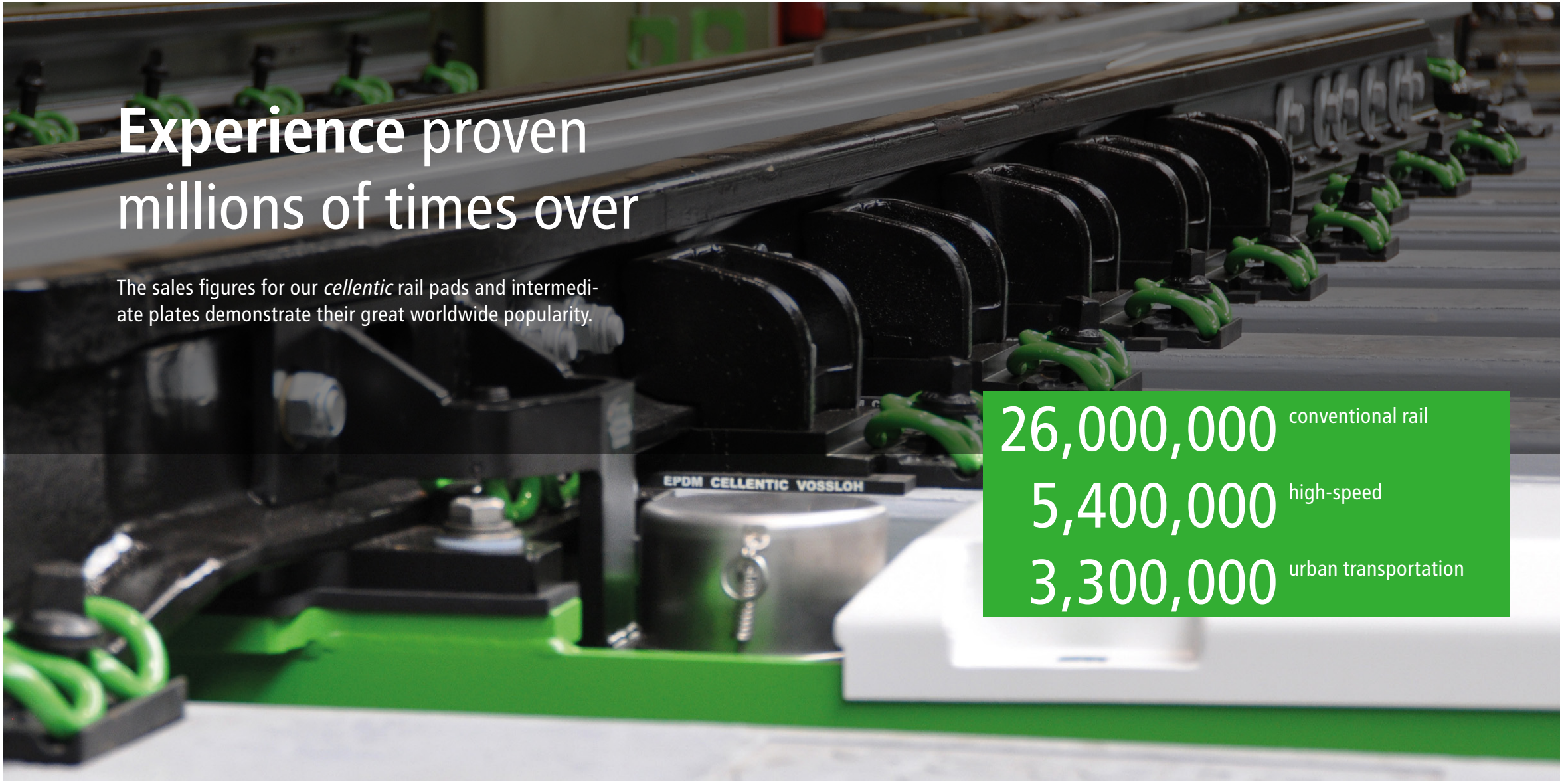


All rail pads can be delivered with the innovative *fin* design

The *fin* design was developed to optimise the properties of the H shape, for applications where the rail is subject to strong longitudinal movements, e.g. due to high temperature fluctuations. This is also available for rail pads with pre-assembly lips.

Experience proven millions of times over

The sales figures for our *cellentic* rail pads and intermediate plates demonstrate their great worldwide popularity.



26,000,000	conventional rail
5,400,000	high-speed
3,300,000	urban transportation

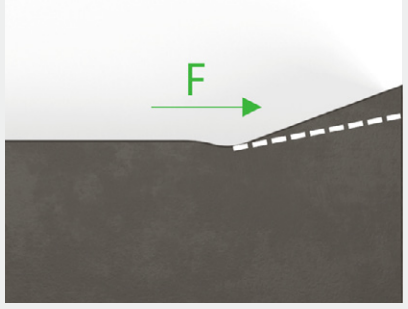
Evolutionary progress
in the form of a dorsal fin

The streamlined *fin* design offers considerably improved flexibility during track installation. The rail pad perfectly absorbs the forces applied.

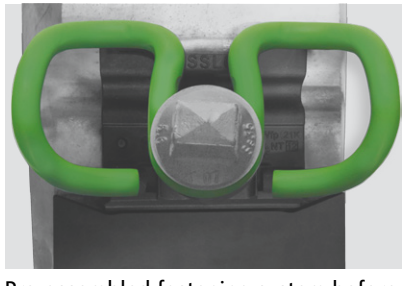
When the load becomes too heavy because of extraordinary longitudinal rail movements, the special shape reduces resistance at the "fin" by retracting it.

The special design enables the rail pad to follow the longitudinal movements of the rail without resistance. It is essentially pulled out of the support point by the rail.

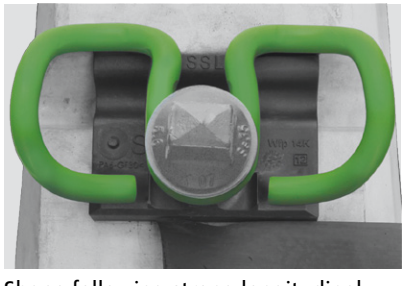
Since the rail pad returns to its original shape after relaxing, it can be repositioned easily.



Optimised distribution of forces:
The "fin" retracts.


Pre-assembled fastening system before ...

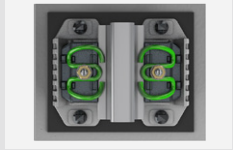
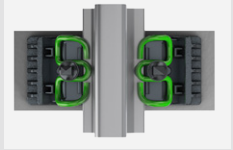
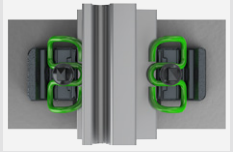
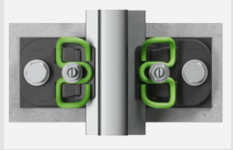

... and after positioning of the rail


Shape following strong longitudinal rail movements.

Vossloh fastenings with *cellentic* – **specifications** at a glance

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

Rail fasteners for slab track with single support point

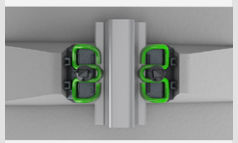
Fastening system	DFF 300 with steel frame	DFF 300 with plastic frame	DFF 200	DFF 200	336 (all configurations)	DFF 300 with plastic frame
						
Field of application	**Conventional rail, high-speed**	**Conventional rail**	**Conventional rail**	**Urban transportation**	**Urban transportation**	**Urban transportation**
cellentic components	Intermediate plate	Intermediate plate	Rail pad	Rail pad	Intermediate plate	Intermediate plate
Material stiffness	≥ 17 kN/mm	≥ 22.5 kN/mm	≥ 30 kN/mm	≥ 30 kN/mm	≥ 8 kN/mm	≥ 16 kN/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.

Vossloh fastenings with *cellentic* – **specifications** at a glance

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

Rail fasteners for slab track with profile

				
Fastening system	**300 (configuration: turnout)**	**300**	**300**	**300**
Field of application	**Conventional rail, high-speed**	**Conventional rail, high-speed**	**Heavy haul**	**Urban transportation**
cellentic components	Intermediate plate	Intermediate plate	Intermediate plate	Intermediate plate
Material stiffness	≥ 17 kN/mm	≥ 17 kN/mm	≥ 37.5 kN/mm	≥ 16 kN/mm

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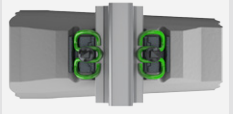
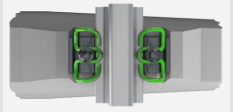
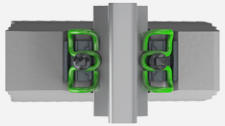
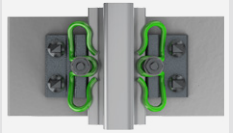
Vossloh fastenings with *cellentic* – **specifications** at a glance

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

	Rail fasteners for ballast track with concrete sleeper				KS track
					
Fastening system	**W 14**	**W 21**	**W 25**	**W 30**	**KS 24**
Field of application	**Conventional rail, high-speed**	**Conventional rail, high-speed**	**Urban transportation**	**Conventional rail**	**Conventional rail**
cellentic components	Rail pad	Rail pad	Rail pad	Rail pad	Rail pad
Material stiffness	≥ 60 kN/mm	≥ 30 kN/mm	≥ 60 kN/mm	≥ 50 kN/mm	≥ 40 kN/mm

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cellentic ensures more comfort, more safety and less wear **worldwide**

Elastic rail pads and intermediate pads made of *cellentic* have made a name for themselves as a calming element in rail fastening systems thanks to their noise-reducing properties. Because they are also easy to fit retrospectively, even "problem tracks" can be transformed into textbook examples of rail traffic systems.

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

China

Olympic Route Beijing–Tianjin

On China's very first high-speed rail line, a total of 750,000 *cellentic* intermediate plates were installed on the slab track over a track length of 230 km

While the track is designed for 300 km/h, the route will also support speeds up to 350 km/h

China

Noise reduction for Suzhou Metro

The city's metro trains were causing serious noise and vibration issues. Local systems were replaced with 850 fully compatible Vossloh support points offering excellent damping performance

Noise emissions were reduced by up to 8 decibels

Germany

Nuremberg–Ingolstadt high-speed line

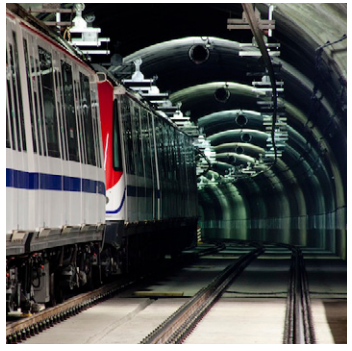
Tunnels make up almost a third of the route, which was designed for 300 km/h travel

cellentic intermediate plates installed on 154 km of track minimise travel noise and provide a comfortable ride

Thailand

Bangkok BTS Sky Train – Extension to Sukhumvit line

Around 45,000 *cellentic* intermediate plates were installed along the entire 10.4 km elevated track, which offers travel speeds of up to 80 km/h



Dominican Republic

Santo Domingo Metro Line 2

This route is completely located underground and was equipped with *cellentic* intermediate plates along a track length of 22 km

The trains run at 3-minute intervals and carry up to 200,000 passengers every day

India

Bangalore Metro

Almost the entire Metro line, which runs both below ground and on viaducts, is equipped with rail fastening systems from Vossloh

240,000 *cellentic* intermediate plates were installed along 80 km of track

Maximum speed: 80 km/h

Taiwan

TTY–Airport Line

The fact this area is prone to earthquakes and the route has extreme grades, with 40 km of track installed on viaducts, meant this project presented demanding engineering problems

Approx. 330,000 *cellentic* intermediate plates were installed on 102 km of track, providing a safe and comfortable ride for more than 140,000 passengers daily at speeds of up to 100 km/h

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

vossloh
enabling green mobility

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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Vossloh Fastening Systems GmbH

Vosslohstraße 4
D-58791 Werdohl

Phone +49 (0) 23 92 / 52-0
Fax +49 (0) 23 92 / 52-448

info.corecomponents@vossloh.com
vossloh.com

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