



IVG 30

Insulated Rail Joint for almost
any Common Rail Profile

General Description



At high electric resistance, the glued insulated rail joint IVG 30, developed by voestalpine BWG, is subject to considerable mechanic and dynamic stress.

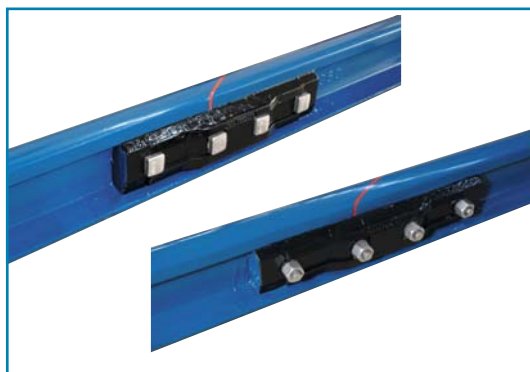
Rails serve as conductors in DC track circuits for track-release. The electric circuits of the rails are formed with the help of insulated rail joints. They create an area that is closed in itself – the block. When passing, the train closes the circuit and triggers a disabling signal. In this way, a second train cannot use the block in this phase. When the train leaves the block at the next insulated rail joint, the area is deblocked for the following train. This ensures the safe use of the track because there is always a distance of one block between the trains. Rear-end collisions are avoided.

Design and Function of the Insulated Rail Joint

The main characteristic of IVG 30 is a 30° scarf joint in the area of the running table of the rail head. This type of contact area makes it possible for the wheel to pass smoothly without abrupt interruptions in the insulated rail joint. Compared to the 90° insulated rail joint, this is more resistant to wear and has a lower noise level as far as the wheel transfer area is concerned. To reduce wear even further a fine pearlitic hardening of the wheel transfer area or the use of HSH rails is recommended. Due to the fact that a scarf joint can take up only few longitudinal forces, it is only to be found in the rail head. In the subjacent area, including the rail base, the construction is such that the longitudinal forces are transmitted by a 90° joint.

For a clean transition from scarf joint to perpendicular joint, both rail segments end in the neutral area of the rail in a drilling. The insulating intermediate layer is shaped accordingly. For reasons of dynamics, the insulated joints are located at distances of 1.50 to 6.00 m to the welded joints depending on the speed.

Depending on axle load and dynamics, fishplates or reinforced fishplates can be used as connecting elements. The reinforcement increases the section modulus and thereby decreases the deflection of the insulated rail joint. The insulated steel fishplates secure the joint via a high-strength bolted connection.



Insulated rail joint with four bolts



Insulated rail joint with six bolts

Technical Information

Testing Sample:

- First installed for DB AG in 1988
- 320 Mio. tons of weight without significant maintenance
- Approved by Eisenbahn Bundesamt (Federal Railway Office) since 1999
- Standard of DB (German National Railway) since 2006

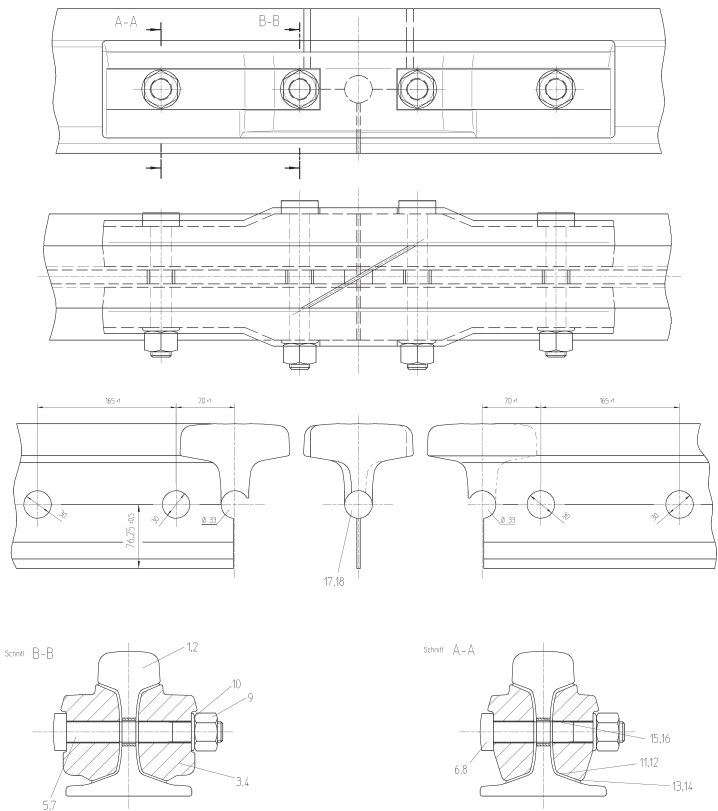
Serial Installation:

- High-speed track Madrid – Seville without maintenance since 1992 – 450 pieces
- High-speed track Madrid – Barcelona since 2001 – 240 pieces
- Norwegian State Railway since 1996 – 350 pieces
- Subway Sao Paulo and Subway Brasilia since 1998 – 100 pieces

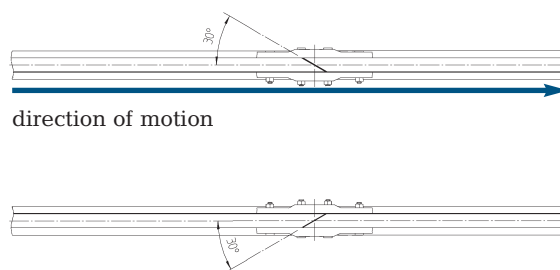
Technological Advantages:

Thanks to the 30° sloped connection in the rail head, the dynamics of the joint are distinctly reduced. Consequently, wear and the development of noise are cut down in the area of the insulated rail joint. To take up the longitudinal forces, the rail base is designed as a 90° joint half way up the height of the rails. The reinforced connection fishplate has a higher section modulus than standard fishplates and so deflection of the rail in the joint area is decreased. The wheel transfer area is fine-pearlitically hardened. The tensile strength in the rail head is approximately 1,250 N/mm² [368 HB]. Alternatively, HSH rails can be used.

Design drawing of IVG 30



Location of IVG 30 in the track

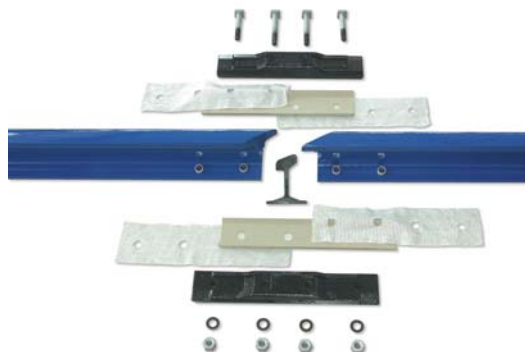


Application of IVG 30

In high-speed traffic and heavy haul traffic, in industrial railways and standard gauge railways, the reinforced IVG 30 joint is used, in light railway traffic the standard IVG 30 joint is used.

Highlights

- Reduced joint dynamics thanks to a 30° slope in the running table
- Deflection in the joint area comparable to continuous rails
- Less wear
- Low noise level
- Increased travel comfort
- Low maintenance
- High availability
- Fast payback



Conclusion

The design of IVG 30 by voestalpine BWG ensures a low-wear and low-noise wheel passage and a high level of travel comfort.

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ONE STEP AHEAD.