IHZ
Tramway Crossings
with Wear-Resistant Insert
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The crossings in turnouts are extremely wear-intensive components. Given their design, particularly deep-grooved crossings exhibit interrupted and intermittent contact areas between wheel and rail and due to the configuration in the wheel, the contact area between the crossing nose and the wing rail kink. This is where small wheel contact areas with high surface pressure develops during pass-over of the vehicle wheel. Depending on the turnout configuration, the load on the crossing nose and the wing rail kink may thus increase sharply. Therefore, it is necessary to protect the contact surface against wear.

Design and Function of IHZ

The design of the tramway crossing with wear-resistant insert consists of the following basic elements:

- Continuous wing rails of thick-web profiles with toothed receptacles for crossing insertion
- Wear-resistant insert
- Support fish plates
- High-strength connecting elements

The wing rails are bent so that their shape conforms to the crossing divided in its longitudinal axis. The crossing insert may consist of austenitic manganese steel, but also of other wear-resistant steels of natural hardness or subjected to heat treatment. Wing rails and crossing insert are machined for a positive and frictional connection. In the insert area, support fish plates on the wing rails reinforce the pre-tension forces introduced. For street-flush mounting of the crossing, covers made of bulb plate are installed.

1. Wing rails
2. Crossing insert
3. Support fish plates
4. High-strength connecting elements
Application of IHZ

When a wheel runs over a rail, for design reasons the deformation energy grows so much that the tension introduced exceeds the yield strength and the tensile strength of the normal rail steel, and the wheel contact area is severely deformed. This is the reason why other materials should be used here, materials which have a higher wear-resistance to rolling/sliding wear and above all to shock loads. Normal rail steels cannot resist this load permanently. Even with great effort, wear-resistant rail steels can barely be welded with other materials.

To use wear-resistant material in an economical way, voestalpine BWG developed the crossing insert IHZ that includes a wear-resistant insert of austenitic manganese steel or other wear-resistant materials in the contact area. The connecting rails consist of weldable rail steels that can be welded to the track rails by common welding procedures.
Highlights

• Application of wear-resistant rail steels in the contact area
• Rounded inclined joints in the wheel contact area
• Positive and frictional clamping
• No welding joints between different materials
• Low-maintenance
• High availability
• Fast payback

Conclusion

The modern crossing technology of voestalpine BWG in conjunction with highest production quality ensures an optimum application. It guarantees long service lives, enormous reduction of maintenance expenditures, and better reliability and availability of the turnout.

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