

## ULTRA HIGH PERFORMANCE CROSSING (UHPC)

### Description

In the crossing of the turnout, there are unsteady wheel run-over conditions, because the wheel changes in a very short range from the wing rail to the point of the crossing.

This leads to a very high material load.

By using CrB1400 steels in the highly stressed areas of the crossing, wear can be halved compared to standard perlitic grades (R350HT).

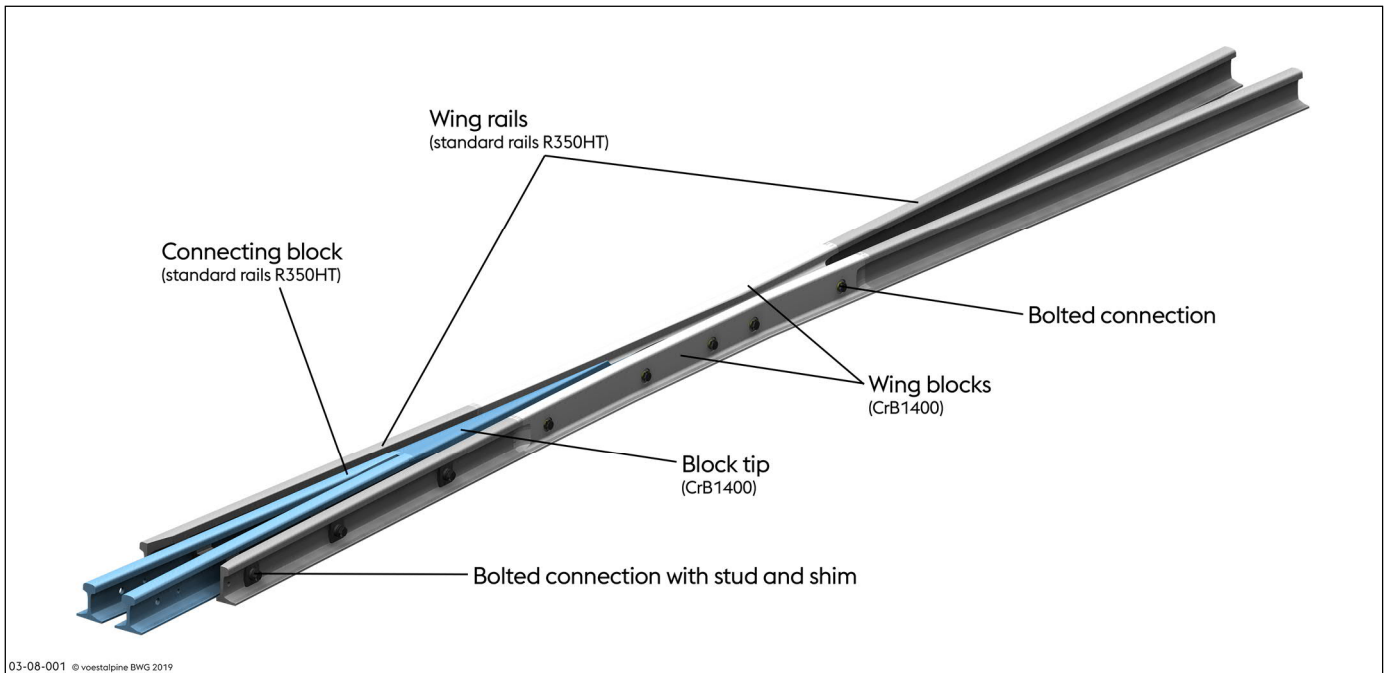
In wing rails made of rolled, bainitic standard rails, damaging residual stresses resulting from heat treatment and forming can cancel out the advantages of the choice of material.

The new Ultra High Performance Crossing therefore uses CrB1400 forging blocks in the run-over area, which are exclusively machined and then joined by means of flash butt welding with R350HT wing rails.

Combined with CrB1400 block tips, this creates crossings that withstand the highest loads permanently.

### Added value

- » Excellent performance in highly stressed run-over area (forged CrB1400 for wing block and block tip)
- » Precise run-over contour by machining with tolerances typical of mechanical engineering
- » Internal stresses due to bending and kinking and the necessary heat input are avoided
- » Force-locking and form-fit connection of the wing block with the block tip
- » Elimination of the screw connections with angle compensation elements in the wing block area to ensure the necessary prestressing force
- » Compatible with existing constructions of voestalpine BWG and DB AG
- » Standard installation including thermite welding by using R350HT rails



## MORE THAN DOUBLE LIFE

### Properties

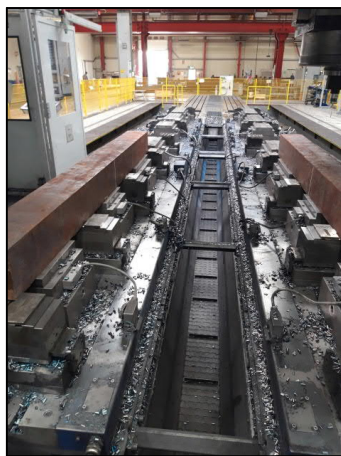
- » Tensile strength in the run-over area of the crossing:  
1350-1600 N/mm<sup>2</sup>
- » Weldability due to the low carbon content of <0.4% has been proven for all common joining and surfacing welds
- » The high elongation at break of 12-16% allows a plastic deformation on the running surface of the crossing in the running-in phase
- » Resistance to fatigue damage (rolling contact fatigue)



and to assembled and customer-installed crossing.



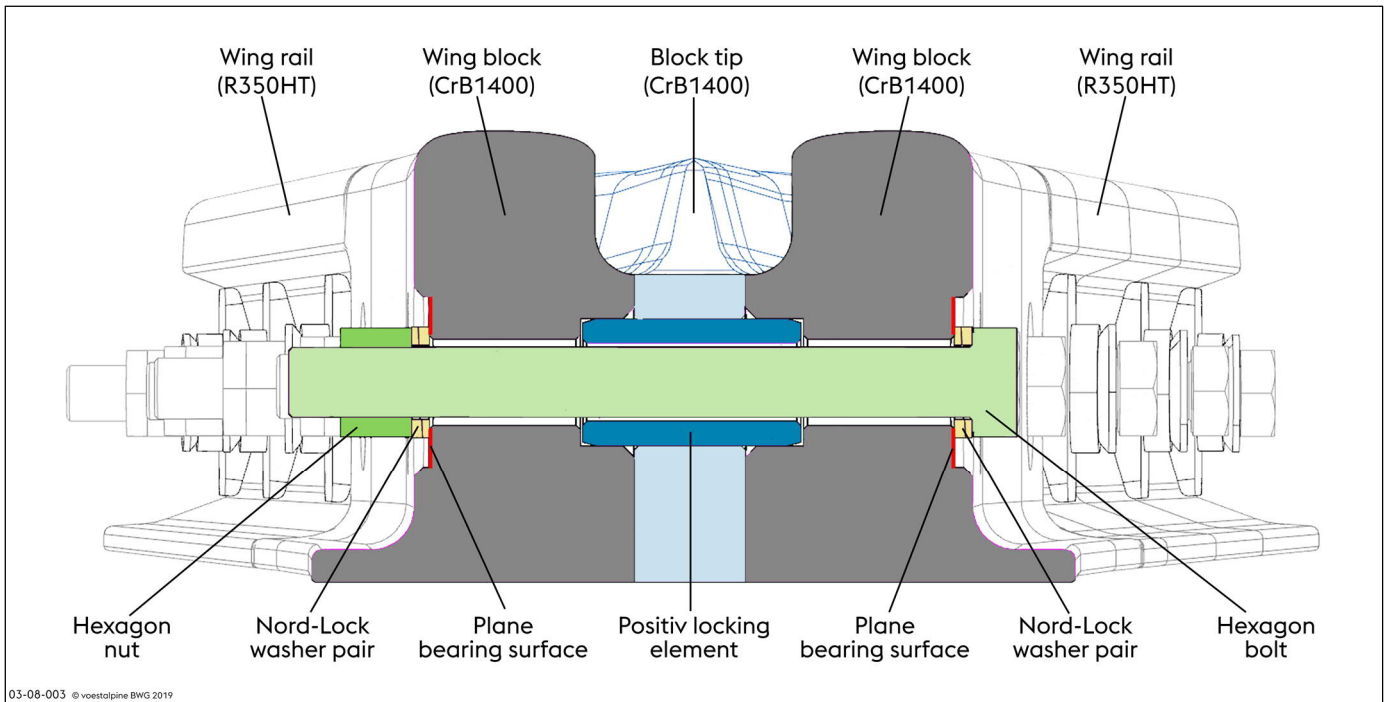
From the forged ingot ...



by pairwise machining ...



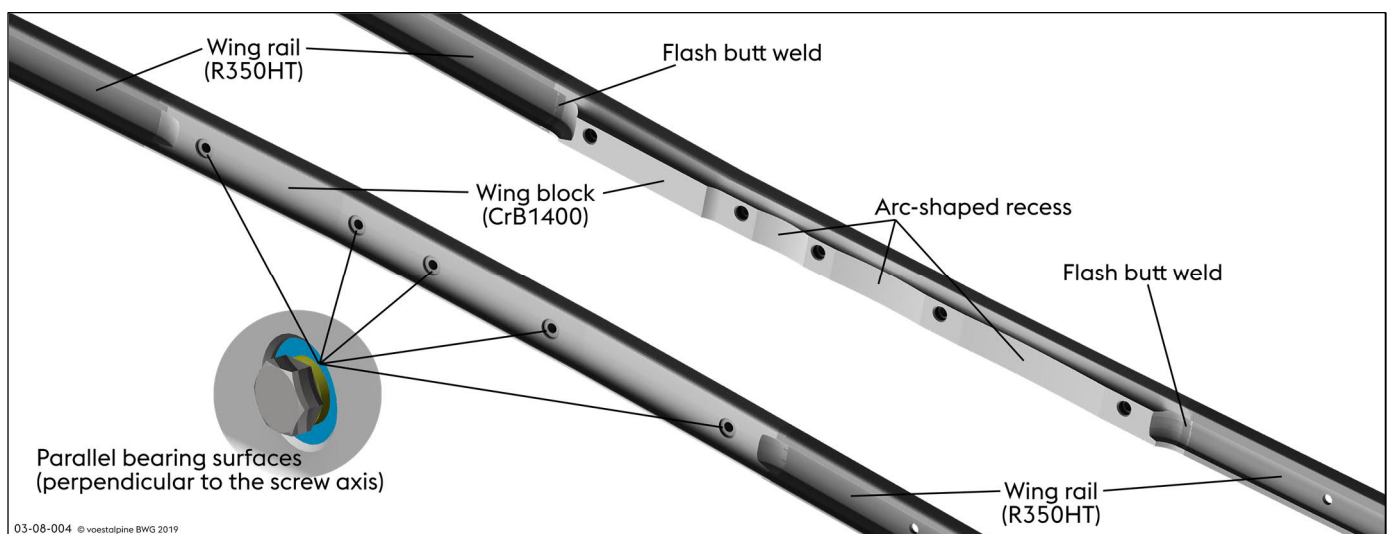
to finished part



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Section through the crossing in the area of a screw connection of the wing blocks

## DESIGN CHARACTERISTICS

- » The Ultra High Performance Crossing can be manufactured for all common turnout geometries and rail profiles.
- » The rigidity of the overall construction is further increased by additional positive locking elements.
- » Parallel bearing surfaces, perpendicular to the tensile axis of the expansion screws, allow screw connections of the wing blocks without angle compensation elements.
- » Arc-shaped recesses avoid sudden momentary jumps in the cross section of the run-over area.



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Design features of the Ultra High Performance Crossing

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