



HP350 by British Steel is a premium high-strength rail designed for use in tightly curved or heavy haul track where wear, plastic deformation and rolling contact fatigue are the main degradation mechanisms.

Building on the success of our award-winning HP335 rail, we have developed HP350, a high-strength grade with wear-resistance properties equivalent to those usually only found in heat-treated rail.

Working in partnership to meet customer needs

British Steel works in partnership with customers to understand the needs of the rail sector and develop innovative and value-adding products to directly address those needs.

The success of the development and testing of our HP335 grade with Network Rail has allowed us to enhance the HP range with a high-strength grade, responding to the industry's needs for improved rail life with reduced maintenance requirements.

Meeting the requirements of demanding environments

HP350 is suitable for use on heavy axle freight lines, tight curves or steep gradients in conventional track.

This new grade was developed to provide networks with a microstructurally engineered alternative to thermally hardened rails.

HP350 has a running surface hardness between 350HB and 390HB across the entire section of the rail. This uniformity, combined with a residual stress level equivalent to that of a standard grade R260 rail, results in a more homogeneous rail with high wear-resistance.

Manufactured to the highest quality

Meeting all the quality, production and dimensional requirements set out in the EN, UIC and AREMA standards, HP350 meets the most demanding requirements, including those of the Class A straightness and Class X profile.

Available in our full profile range and produced from blooms from our integrated steelmaking plant in Scunthorpe, you can be assured of the highest product and service quality, with full traceability.

Weldability

HP350 is readily weldable and can be both aluminothermically and flash butt welded.

As its properties are not achieved through heat treatment, there is no need for a post-weld heat treatment process. The resulting flash butt weld critical heat-affected zone is harder and stronger than the parent rail and is therefore resistant to weld cupping, allowing a longer grinding interval and reduced maintenance.

Our technical team can provide support on all types of track welding. Please contact us for more information.

Technical support

Our technical experts are available to provide advice and support, helping you to optimise your rail selections. Rail products and grades can be matched precisely to track conditions, track types, environmental conditions and a host of other variables to ensure that every rail we deliver provides optimum performance throughout its service life.

HP350 steel grade

The tables below indicate the standard mechanical properties and chemical analysis for British Steel's HP350 steel grade.

Mechanical properties

Grade	Rm (MPa)	Elongation (%)	HBW running surface
HP350	≥ 1,175	≥ 8	350 - 390

Chemical composition

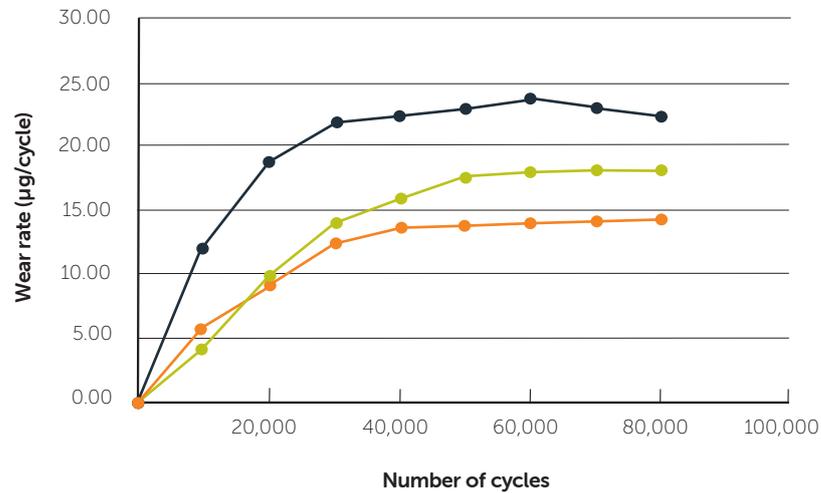
Grade	C	Si	Mn	P	S	Cr	Al	V	H2 (ppm)
HP350	0.87-0.97	0.75-1.00	0.75-1.00	≤ 0.020	0.008-0.020	≤ 0.10	≤ 0.004	0.09-0.13	≤ 2.5

Comparison to other rail grades

Key

- R260
- HP350
- R350 HT

Graph shows that compared to R260 and R350 HT, our HP350 has the highest resistance to wear



Notes: Independent twin disc testing performed under identical dry conditions by University of Sheffield - mean data shown in graph.
Source: A. Wilby et al., Wear, Volumes 530-531, 2023, 205004

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