

PERFORMANCE ON TRACK®

400 UHC® HSH® RAILS FOR METRO APPLICATION

Rails for best track performance.



400 UHC® HSH® RAILS

FOR METRO APPLICATION

The last few decades have seen a high growth in population in booming metropolises around the world, resulting in an inherent rise in public transport demand. Modern Metro Systems play the key role for public transport in these cities.

The demands on modern Metro Systems reflect their importance for public transportation and consequently have changed over time. Many operators have to master new challenges such as:

- » 24/7 operation
- » More noise-sensitive public
- » Economic efficiency programs

To deal with these new demands voestalpine has developed the rail steel 400 UHC® HSH® which offers

- » Longest possible service lives
- » Lowest rail maintenance demands
- » Highest profile stability

The rail steel 400 UHC® HSH® has proven to be the best performing rail steel for Metro Application in various Metro Systems and is recommended to be used in curves.

Customer benefits

- » Reduction of LCC by up to 70 %
- » Longest operational rail service life time
- » Reduction of working hours for rail maintenance by up to 80 %
- » Reducing noise and vibrations through slowest corrugation development.
- » Ideal solution for systems with small maintenance time slots.

400 UHC® HSH® – BEST PERFORMANCE IN METRO TRACKS

Developed under the decade-long experience at heavy haul and mixed traffic conditions, the rail steel 400 UHC® has now become a standard rail steel for Metro curves.

Various track experiences in worldwide Metro networks show that the propagation of rail wear, corrugation and Head Checks are reduced significantly compared to standard rails R260 and R350HT.

Thus, the 400 UHC® HSH® represents the optimum steel grade for customers who

- » want to avoid noise emissions from corrugation and related grinding,
- » are aiming for longest possible maintenance intervals
- » assure longest service lives and highest economic efficiency (LCC)

It's outstanding profile stability can also be used to keep up good wheel-rail-contact conditions and thus significantly prolong the wheel service lives.

400 UHC® HSH® – FACTS



Innovative UHC® steel design



400BHN hardness for highest material resistance



Joint and repair weldable with commercially available welding materials



20 years of experience in other railway applications

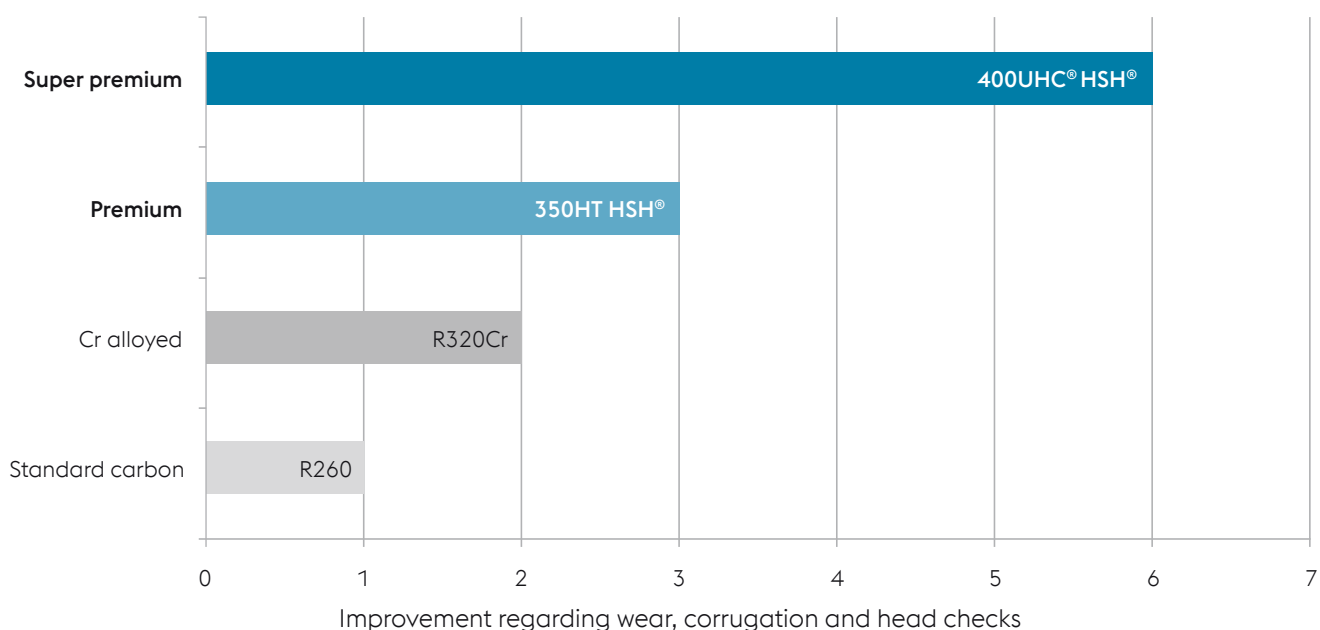


Standardized in EN13674-1:2017 as R400HT



Lowest Life Cycle Costs

Rail grade performance





CHOICE OF RAIL STEEL – METRO

As most Metros Systems aim to provide highest availability of their transport system, maintenance time slots are usually in a range of 4 hours ranging from midnight to the early morning hours. A time of the day, where noise pollution e.g. from rail maintenance is a potential source of public discomfort.

Due to the extraordinary performance with regards to the most relevant degradation mechanisms for rail maintenance, 400 UHC® HSH® rails do not only prolong the service life of rails in curves but furthermore also stretch the maintenance interval leading to:

- » Highest track availability
- » Lowest maintenance expenditures
- » Fast product amortization

Subsequent KPIs demonstrate, the benefits in terms of RAMS and LCC that can be achieved by using 400UHC® HSH® a tight Metro Curve:



-70%

Annual savings
(Equivalent Annual
Cost Reduction)



-80%

Rail maintenance
efforts per km and year

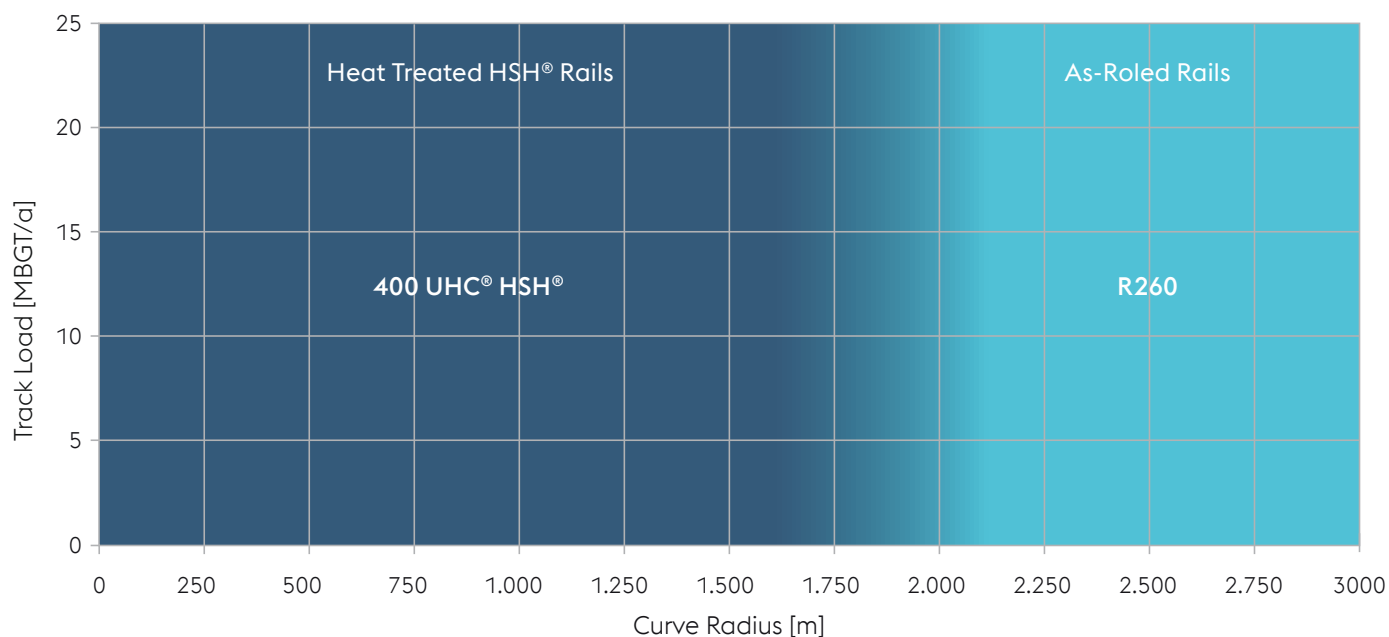


0.7 years

Pay-back-time

Economic potential of 400 UHC® HSH® in comparison to a standard R260 in a tight Metro curve

Recommendation for the use of rail steels based on LCC-considerations:



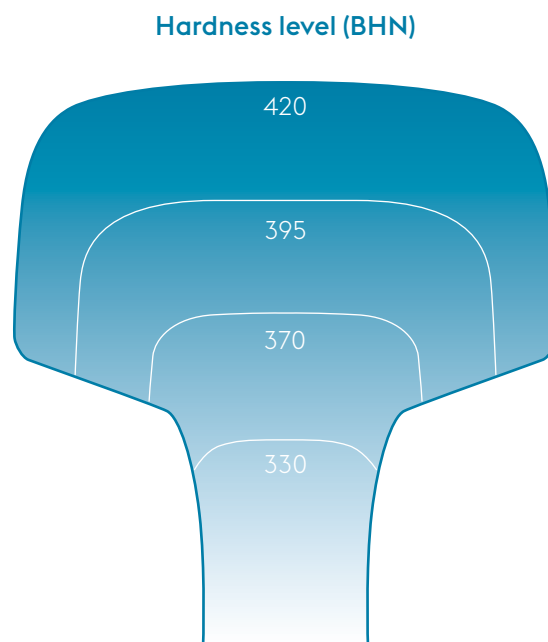
Based on long-year measurement experiences and LCC-calculations, 400 UHC® HSH® is the optimum solution for Metro curves and is paying off wherever rail wear, corrugation or Head Checking are the maintenance driving factors. The border radius for the use of this rail steel depends thus to a variety of factors, but can generally be seen at approximately 1,500 m.



PRODUCT DESCRIPTION

The R400HT rail grade is a fine-pearlitic heat treated rail grade in accordance with EN 13674-1, with a minimum hardness of 400 BHN. voestalpine Schienen manufactures this high performance steel grade through its self-developed and worldwide leading HSH® process under the brand 400 UHC® HSH® following a special metallurgic approach. This rail grade shows its technical and economic excellence especially under challenging conditions of Metro systems.

The 400 UHC® HSH® rail grade is available in all profiles in accordance with EN, AREMA as well as other common standards and various customer specifications and, of course, in up to 120 m in weld-free lengths. The rails are characterised by the tightest tolerances of profile, straightness and flatness (e.g. EN 13674-1; tolerance classes A & X) and the best surface quality.



Mechanical Properties

Product name	Description	Hardness of running surface [HBW]	Tensile strength R _m [MPa]	Elongation A ₅ [%]	Branding
R400HT (400 UHC® HSH®)	<ul style="list-style-type: none"> » Super Premium Rail Steel » HSH® Technology » Deep Head Hardened 	400-440	≥ 1280	≥ 9	

Chemical composition

Product name	C [%]	Si [%]	Mn [%]	Cr [%]	P [%]	S [%]	H [ppm]
R400HT (400 UHC® HSH®)	0.90-1.05	0.20-0.60	1.00-1.30	max. 0.30	max. 0.020	max. 0.020	max. 1.5

Detailed information such as rail steel data sheets, rail profile drawings and technical descriptions are available upon request. The experts of Product Management and Technical Customer Service will be happy to assist.

Contact – Productmanagement: product_management@voestalpine.com

voestalpine PREMIUM SERVICES

voestalpine offers a unique portfolio of additional customer services including



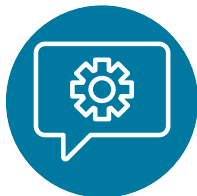
LOGISTICS

- » Our logistics team guarantees smooth rail delivery to its destination by optimization of the entire logistics chain. Our specialties are just-in-time deliveries to any construction site in Europe, as well as oversea deliveries.



WELDING

- » Our experts from voestalpine Competence Center Welding (CCW) are constantly working jointly with renowned welding material suppliers to develop and improve rail welding technology.
- » Beside trainings in our plant as well as on site, CCW offers also welding inspection to ensure high initial quality of rail welds



TECHNICAL SUPPORT TEAM

Our customer service team assists you in questions of:

- In-track performance evaluation
- Whole track system optimization
- Wheel – Rail interface optimization
- RAMS & LCC consulting



ISO 9001 Quality



ISO 14001 Environment
in accordance with EMAS II



ISO 45001 Safety



ISO 50001 Energy



AT-000183
Verified Environmental
Management

