

VALJI

COMPOUND CAST WORK ROLLS FOR HOT STRIP, PLATE AND STECKEL MILLS

Cast for the hot strip mill.

Rolls that make your steel shine.

Štore, Slovenia. Since 1900.

VALJI D.O.O.

High quality for over 100 years.

Our rolls are the result of many years of development, knowledge, hard work of all our employees and the experience we have collected around the world in all types of steel and rubber industries. With technologically highly sophisticated equipment and our entire internal production process, we are able to guarantee the highest standards and quality of our rolls.



1900	1,300 mm	8,000 mm	32 t	6,000 t
Cast iron rolls from Slovenia since	Maximum barrel diameter	Maximum overall roll length	Maximum finished roll weight	Approx. rolls shipped in 2025

Contents

01 **Product overview** p. 6–11
Production, application map, anatomy of a roll

02 **Shell** p. 12–13
Material specification of all material groups

03 **Core** p. 14
Material specification of cores and necks

04 **Company** p. 15
Quality



TRADITION SINCE 1900

More than a century of rolls from Slovenia.



1900

First cast iron rolls for the ironworks in Štore and Ravne.

1950

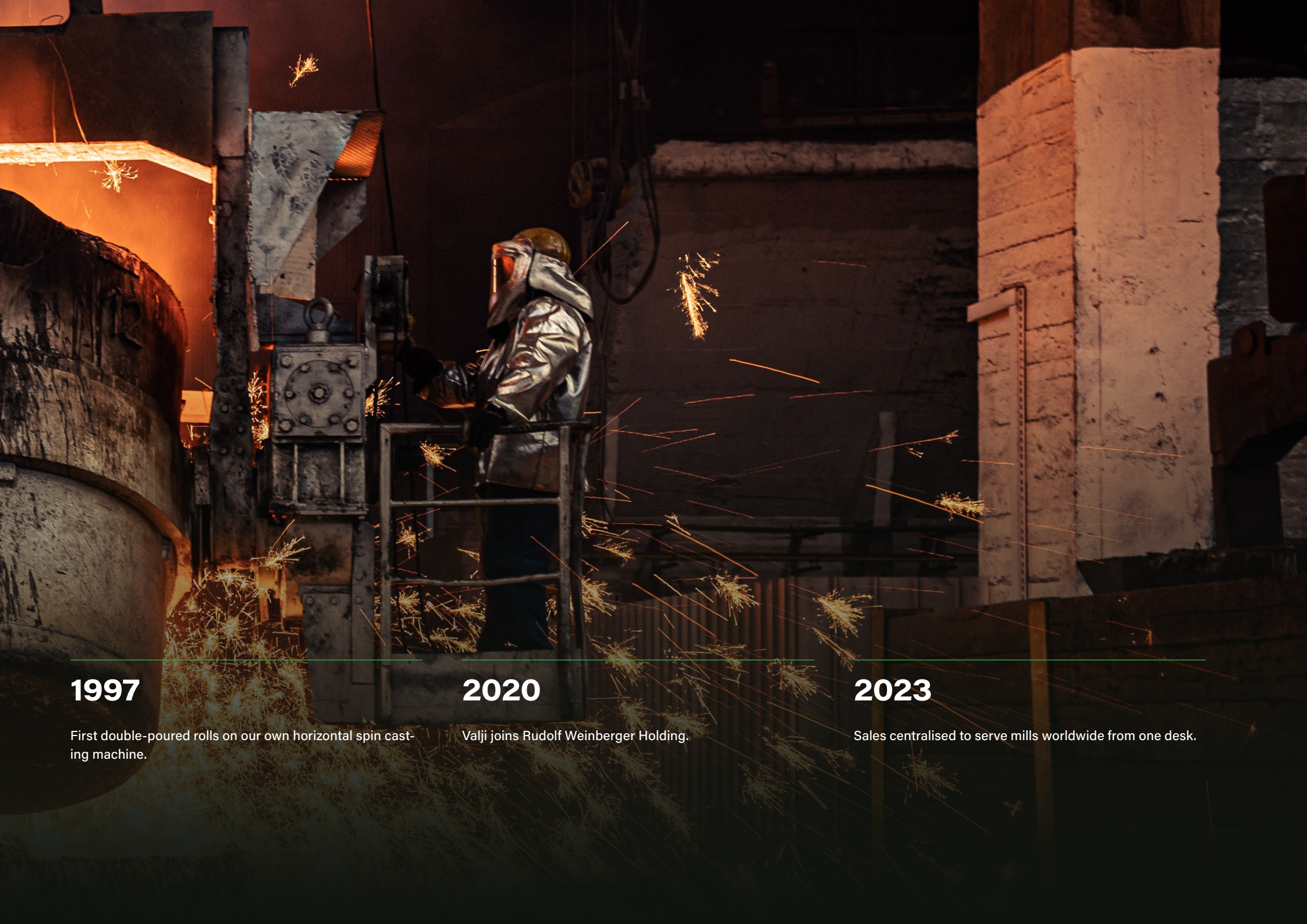
Technology, equipment and staff of the Jesenice foundry move to Štore.

1965

First indefinite chill quality produced.

1991

Železarna Štore splits into independent companies, Valji among them.



1997

First double-poured rolls on our own horizontal spin casting machine.

2020

Valji joins Rudolf Weinberger Holding.

2023

Sales centralised to serve mills worldwide from one desk.

From scrap to superfinish, under one roof.

Every roll passes through our own furnaces, casting pits, heat treatment and machine shop before it leaves Štore.



01

Melting

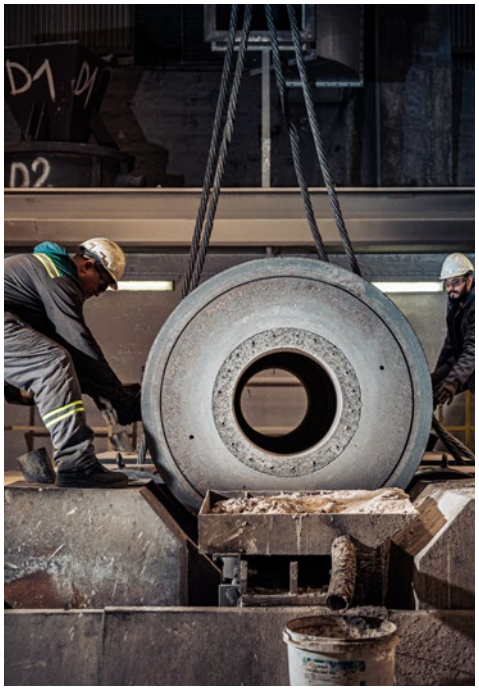
Furnaces of 4, 10, 2 × 20 and 30 t melt separate heats for shell, intermediate layer and core.



02

Centrifugal casting

Two horizontal spin casting machines. Melt temperatures are tracked over time during the whole pour.



03

Cleaning and first analysis

Rolls cool in casting pits 3 to 6 m deep, are cleaned of sand and sampled for metallography.



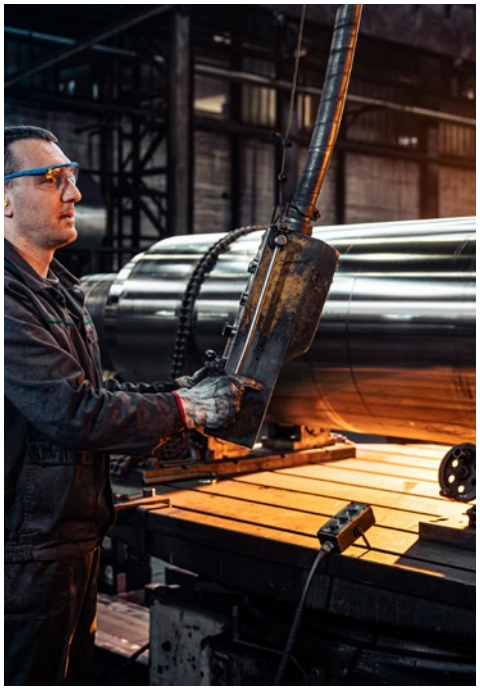
04

Heat treatment

Ten computer-controlled furnaces of 60 to 120 t run a multistage cycle for each grade.

500–1,300 mm	1,300–3,500 mm	4,500–8,000 mm	32 t
Diameter	Barrel length	Overall length	Maximum finished roll weight

Not in our programme: forged rolls, edger rolls, statically cast rolls and rolls outside these limits.



05

Turning, milling, boring

Twelve heavy-duty roll lathes, milling up to 7,000 × 3,000 mm and deep drilling up to 7,000 mm.



06

Grinding

Rolls up to 8,000 mm long and 32 t. Superfinish for the finest roughness, hot grinding above 180 °C.



07

Final inspection

Every roll is UT and eddy current tested. Hardness is checked with an Equotip 550 in ShC, LD and HB.

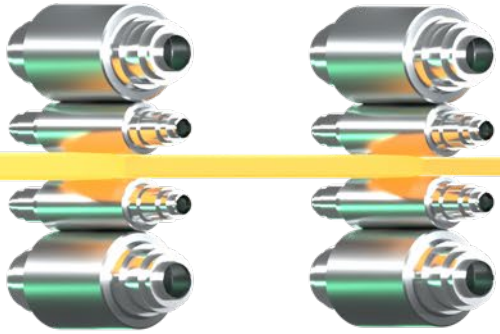


08

Packaging and dispatch

Corrosion protection that needs no solvents at installation. Shipped on wooden or steel bases, or crated.

The right shell for every stand.



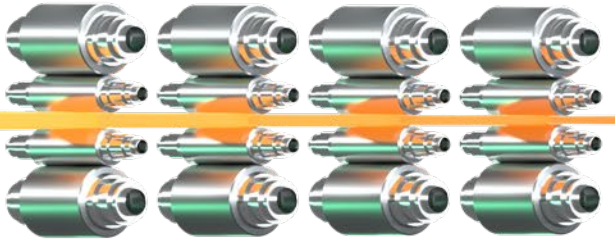
R1 R2

Roughing stands

HICR STEEL 72 / 77 — 70–80 ShC

High chromium steel

10 to 13 % Cr. For continuous and reversing roughing stands, medium and heavy plate mills.



F1 F2 F3 F4

Early finishing stands

HSS 72 / 77 — 70–80 ShC

High-speed steel

MC, M_2C and M_6C carbides. Longer campaigns, better wear profile and a smoother strip surface.

HICR IRON 72 / 77 — 70–80 ShC

High chromium iron

16 to 18 % Cr. Tolerant of demanding mill conditions. Also for plate and skin-pass mills.

Scale: Shore C, 60 to 90

Each grade is cast to a defined hardness class. The position in your mill decides the shell.



F5 F6 F7 Coiler

Last finishing stands

ICDP 77 / 82 75–85 ShC

Indefinite chill double poured

Cementite with dispersed graphite flakes. Proven anti-sticking and thermal shock resistance.

Hardness classes

Class	ShC	LD	HRC
72	70–75	737–764	51–55
77	75–80	764–793	55–58
82	80–85	793–820	58–62

Also in your mill

Plate mills: high chromium steel for roughing, high chromium iron for finishing. CSP and ESP lines and pinch rolls: indefinite chill double poured. Final choice with your Valji contact.

Send us your stand

Send stand position, roll dimensions and current grade to sales@valji.si. Our sales team replies with a recommendation.

INSIDE A VALJI ROLL

Two metals, cast into one roll.



1 **Working layer**

High-speed steel, high chromium or indefinite chill. Hard carbides in a tempered matrix resist wear, fire cracks and oxidation.

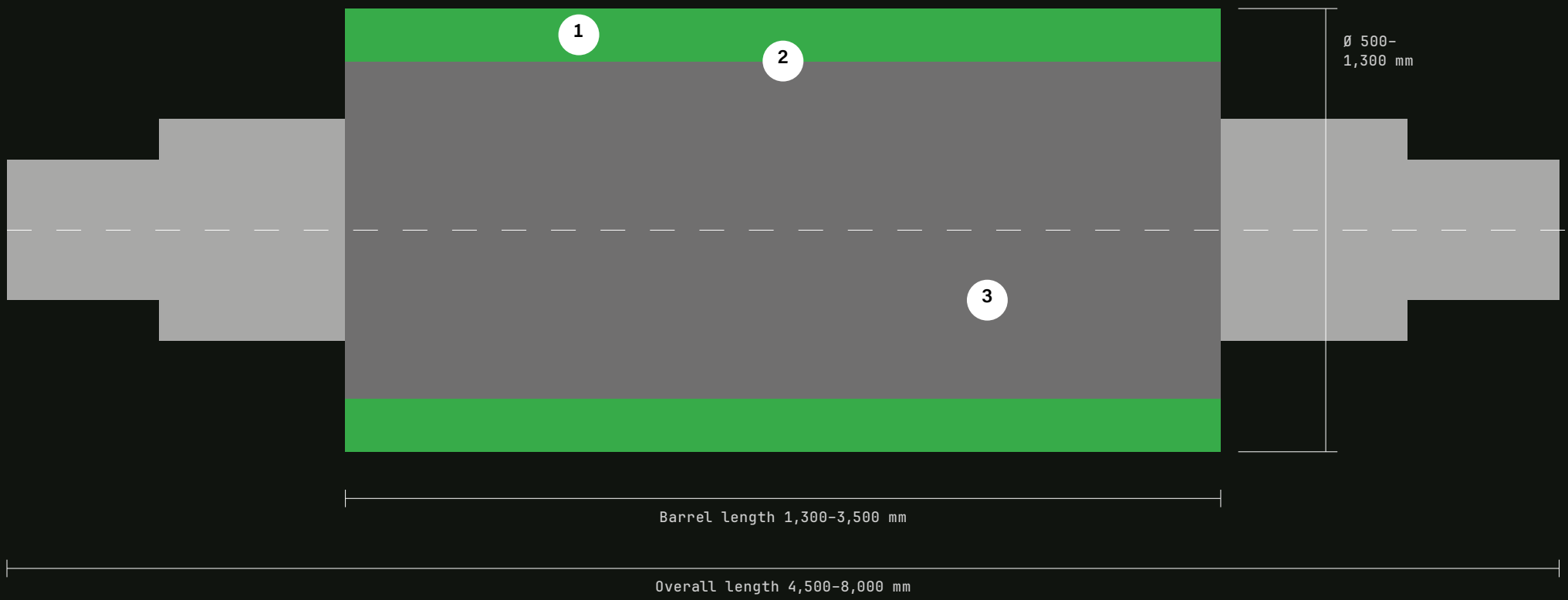
2 **Centrifugal bond**

The shell is poured into a horizontally spinning chill. Once solid, the mould is set upright and the core is cast into it.

3 **Core and necks**

Pearlitic-ferritic nodular cast iron, tuned for bending resistance and a neck hardness of 35 to 45 ShC.

ANATOMY OF A COMPOUND CAST ROLL



Drawing schematic, not to scale. Barrel Ø 500–1,300 mm, barrel length up to 3,500 mm, up to 32 t finished weight.
Necks and bores machined to your drawing.

ROUGHING STANDS / HICR STEEL

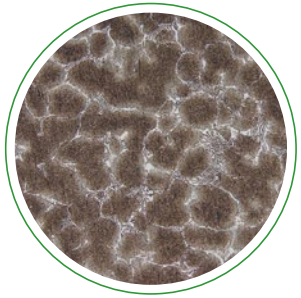
High chromium steel rolls

High chromium steel rolls combine a tempered martensitic matrix with a fine network of wear-resistant M_7C_3 chromium carbides and small, evenly dispersed $M_{23}C_6$ carbides within the matrix. They exhibit high wear and fire crack resistance with very good oxidation behaviour at high temperatures. Heat treated at high temperatures for optimal material properties, favourable stress levels and homogeneous hardness throughout the working layer. Suitable for continuous and reversing roughing stands, medium and heavy plate mills and combination plate mills.

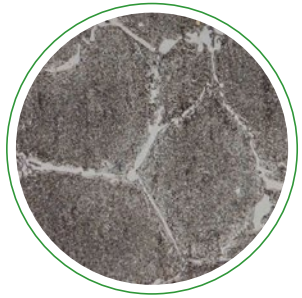
Hardness class	ShC	LD	HRC
72	70–75	737–764	51–55
77	75–80	764–793	55–58

Chemical composition, %

C	Si	Mn	P	S	Cr	Ni	Mo	V	W
1.0–2.0	0.5–1.0	0.6–1.2	<0.050	<0.030	10.0–13.0	1.0–2.0	1.0–2.0	0.2–0.5	0.5–2.0



HiCr steel 100x



HiCr steel 500x

FIRST FINISHING STANDS / HSS

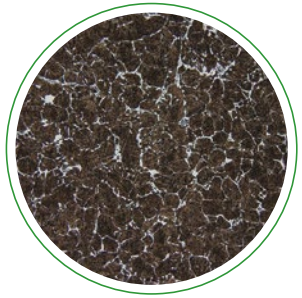
High-speed steel rolls

Centrifugally cast high-speed steel rolls combine a tempered martensitic matrix with extremely wear-resistant MC, M_2C and M_6C carbides. They exhibit excellent wear and fire crack resistance with very good oxidation behaviour at high temperatures. They enable longer rolling campaigns, a better wear profile and a smoother surface. Heat treated at high temperatures for optimum material properties, favourable stress levels and homogeneous hardness throughout the working layer. Suitable for first finishing stands in hot strip mills.

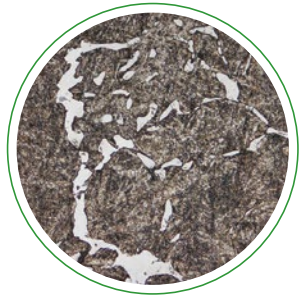
Hardness class	ShC	LD	HRC
72	70–75	737–764	51–55
77	75–80	764–793	55–58

Chemical composition, %

C	Si	Mn	P	S	Cr	Ni	Mo	V
1.5–2.5	0.5–1.0	0.5–1.5	<0.050	<0.015	4.0–8.0	1.0–2.0	3.0–8.0	3.0–7.0



HSS 100x



HSS 500x

FIRST FINISHING STANDS / HICR IRON

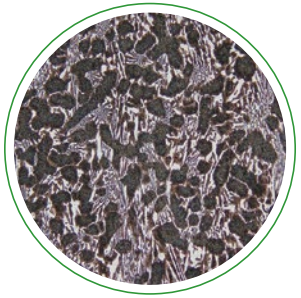
High chromium iron rolls

High chromium iron rolls combine a tempered martensitic matrix with a higher ratio of hard, wear-resistant M_7C_3 chromium carbides and small, evenly dispersed $M_{23}C_6$ carbides within the matrix. The rolls provide good wear resistance, mechanical crack resistance and retention. High chromium iron ensures a larger tolerance to demanding mill conditions, roll gap profile consistency and flexibility in roll shop operations. Most suited for work rolls in early finishing stands of hot strip mills, medium and heavy plate mills and skin-pass mills.

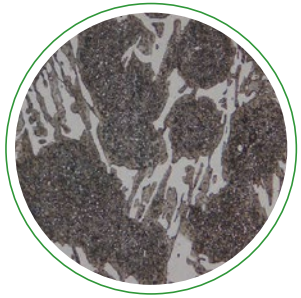
Hardness class	ShC	LD	HRC
72	70–75	737–764	51–55
77	75–80	764–793	55–58

Chemical composition, %

C	Si	Mn	P	S	Cr	Ni	Mo	V
2.5–3.0	0.5–1.0	0.5–1.0	<0.050	<0.030	16.0–18.0	1.0–1.5	1.0–1.5	0.2–0.5



HiCr iron 100x



HiCr iron 500x

LAST FINISHING STANDS / ICDP

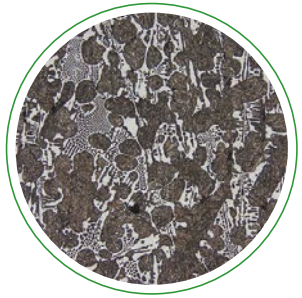
Indefinite chill double poured rolls

Indefinite chill iron rolls exhibit a unique microstructure: a high ratio of cementite for good wear resistance and surface finish, with intermittent graphite flakes for good anti-sticking properties and resistance to thermal shocks. Micro-alloyed and enhanced variants add special carbide-forming elements such as vanadium, niobium, tungsten and titanium, which form hard MC-type carbides for better wear resistance and a smaller hardness drop towards the scrap diameter. Suited for last finishing stands in hot strip mills, CSP and ESP lines and pinch rolls.

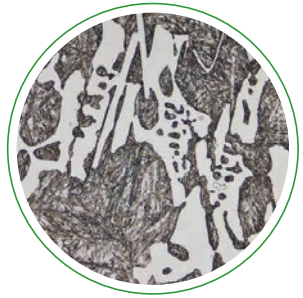
Hardness class	ShC	LD	HRC
77	75–80	764–793	55–58
82	80–85	793–820	58–62

Chemical composition, % *SCFE: V+Nb+W+Ti

C	Si	Mn	P	S	Cr	Ni	Mo	SCFE*
3.0–3.4	0.5–1.7	0.5–1.0	<0.060	<0.015	1.2–2.0	4.0–4.6	0.2–0.5	<2.0



ICDP 100x



ICDP 500x

Core and necks

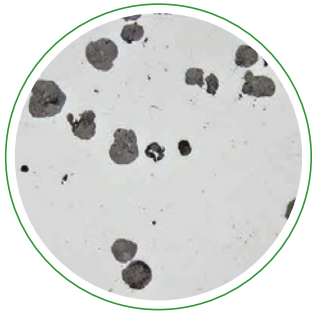
The core is the backbone of the roll, giving it stability and support. The necks must be tough enough to withstand the applied torque during rolling and ductile enough not to break under loading forces. We produce two families of core alloy, depending on the user's needs: grey cast iron with spheroidal graphite and grey cast iron with lamellar graphite. Alloying elements are adjusted to balance the pearlite and ferrite phases while ensuring sufficient hardness on the necks.



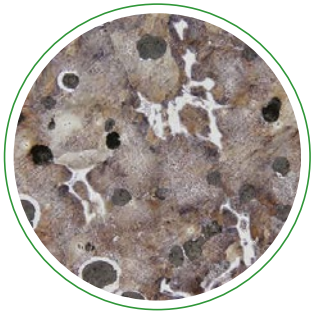
Lamellar, polished



Lamellar



Nodular, polished



Nodular

Chemical composition, %

Core	C	Si	Mn	P	S	Cr	Ni	Mg*
For ICDP	3.0–3.4	1.50–2.60	0.3–0.8	<0.060	<0.030	<0.50	0.5–1.5	0.040–0.060
For HiCr	2.8–3.1	1.50–2.75	0.3–0.6	<0.060	<0.030	<0.10	0.1–1.0	0.040–0.060
For HSS	3.0–3.3	1.50–2.75	0.3–0.6	<0.060	<0.030	<0.15	0.1–1.0	0.040–0.060
Lamellar	3.0–3.3	1.50–2.60	0.3–0.8	<0.060	<0.030	<0.50	0.5–1.5	–

*In the final melt

Typical neck hardness

	ShC	LD	HB
Neck	35–45	519–595	221–301

QUALITY

Measured at every step.

Quality control runs through all stages of roll production, from the chemical composition of the melts and microstructure analysis to dimensional control and NDT. All rolls are UT and EC inspected, with a USM 32 XL or on automated inspection systems. Surface hardness is measured with the Equotip 550. Before dispatch, all rolls go through final inspection.

ISO 9001:2015

Quality management since 1998, covering development, production and sale of rolls and castings.

ISO 14001:2015

Environmental management since 2007, audited yearly by SIQ Ljubljana.

Own research and development

A lab-scale centrifugal casting unit, wear and bending test rigs, new shell grades and papers at international rolling conferences. ISO 45001 for health and safety is in preparation.





Valji d.o.o.
Železarska cesta 3, 3220 Štore, Slovenia
+386 3 7805 400
sales@valji.si
www.valji.si

Scan for more.

A member of Rudolf Weinberger Holding. ISO 9001:2015 / ISO 14001:2015