Union Electric Åkers
Forged and Cast Rolls

Category:
FORGED ROLL

Application:
COLD MILL

4CRMO

Forged Hardened Steel Work and Intermediate Rolls

The Rolling Industry's Roll of Choice

Switch to the "roll of choice" used by most major steel and aluminum rolling mills around the world who can substantiate product differentiation and strive to maximize value-in-use. The Union Electric Åkers 4CRMO rolls are engineered using a unique combination of advanced heat treatment technology and chemistry, which results in improved performance in the main areas of interest to the rolling mill user: longer mill campaigns, lower roll consumption and higher resistance to mill incident damage than competitors' 3%, 4% and 5% chrome rolls.

The Union Electric Åkers Difference

Improve your overall roll performance through the use of our 4CRMO roll, which is engineered using **advanced full coil static induction heat treating technology** resulting in superior roll microstructure, depth of hardness and residual stress profile.

Features and Benefits

- **Optimized for Longer Campaign Life** due to better retention of surface profile and roughness
- **Lower Roll Consumption** due to superior wear resistance throughout the roll life
- **Increased Resistance to Mill Induced Roll Failures** due to optimized residual stress profile achieved through Union Electric Åkers proprietary full coil static induction hardening process
- **Maximum Roll Safety and Reliability** due to fully automated LISMAR Eddy Current and Ultrasonic inspection

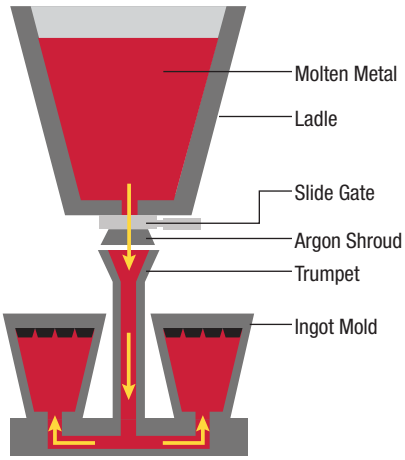
Mill Applications

- Ferrous & Non-Ferrous Rolling Mills
- Best value in steel rolling mills for automotive, tinplate and stainless applications
- Superior value in aluminum mill applications

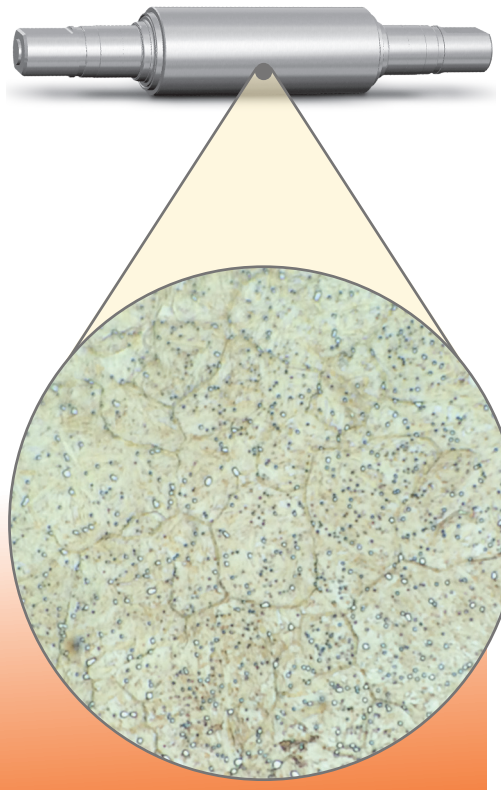
Manufacturing Method

Manufactured using the following sequence. ESR is also an option.

- Electric arc furnace melting
- Vacuum degassing
- Argon stirring
- Ingot bottom pouring



4CRMO Specifications



We engineer every product to meet your specific needs. Working closely with you, our highly trained sales team and technical support staff assess your rolling operations and recommend the most appropriate product for your application.

Aim Chemistry (Wt%)

C	Mn	P	S	Si	Cr	Mo	V
0.81	0.37	.015 max	.012 max	0.4	4.00	0.53	0.06

Microstructure

The microstructure consists of a uniform dispersion of high hardness alloy carbides in a fine grain tempered martensitic matrix that manifests enhanced wear resistance.

Typical Carbide Analysis

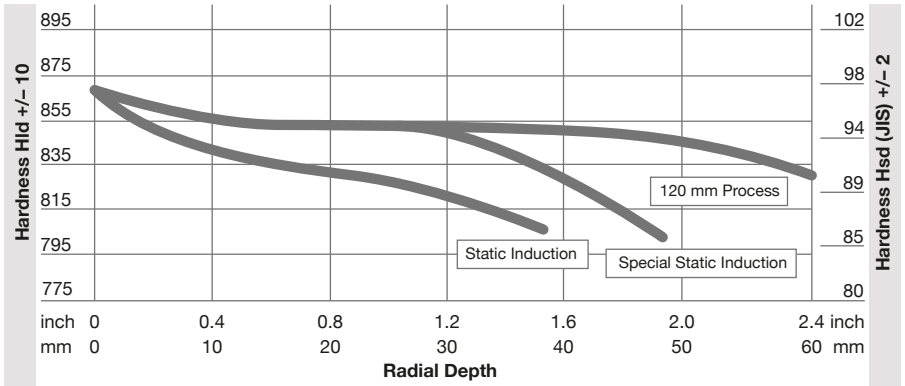
Carbide Type	Carbide Hardness (HV)	Surface Area (%)	Average Diameter (µ)	Carbide Density (Carbide/mm^2)
M_3C M_7C_3	(850-1100) (1200-1600)	7-8	0.9	2.5 x 10^5

The high hardness alloy carbides and the proper microstructure improve wear resistance resulting in a decrease in stock removal rates and extending the roll's campaign length.

Mechanical/Physical Properties

Tensile Strength (Roll Neck)	825 MPa
Yield Strength (Roll Neck)	500 MPa
Modulus of Elasticity	200,000 MPa
Thermal Conductivity	38 (50°C), 42 (400°C) W/M °C
Coefficient Thermal Expansion	12.6 x 10-6
Specific Heat	485 (50°C), 500 (400°C) J/KG °C

Typical Depth of Hardness



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™

Union Electric Åkers is the recognized global leader in roll technology for the most stringent mill requirements, superior product performance and world-class customer service.

For more information, please visit www.uniones.com.