

Forged Steel Roll Specifications

GRADE: 3CRMO



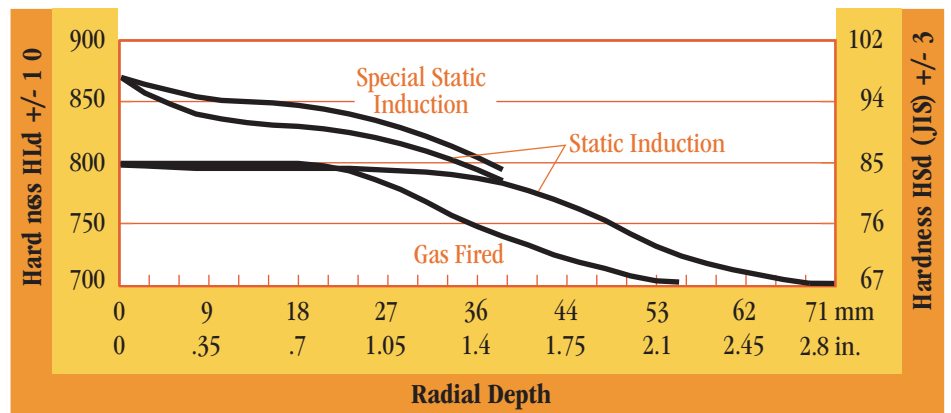
DESCRIPTION

This alloy is used for both work rolls and intermediate rolls in all types of ferrous and nonferrous cold mill applications. Grade 3CRMO is also used as a back-up roll grade in small diameter rolls (<35", 880 mm) and applications with a high surface hardness (>800 HLd). This alloy can be heat treated utilizing gas, static induction, and special static induction heat treatment options. These options depend upon total roll life designed in the roll and/ or the customer's requirements for depth of hardness.

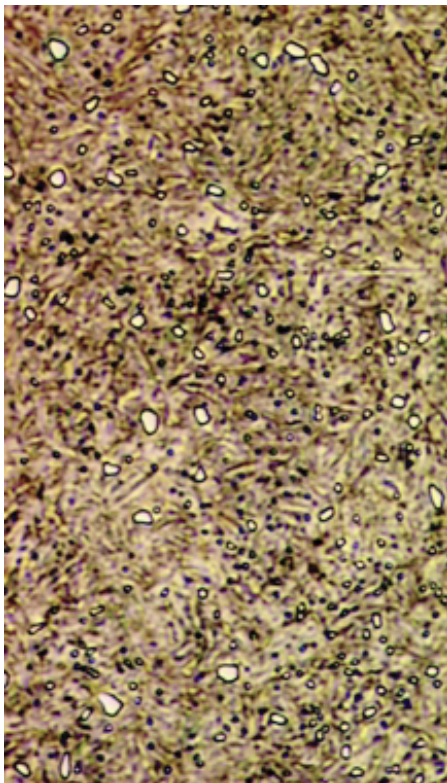
AIM CHEMISTRY (WT%)

C	Mn	P	S	Si	Cr	Mo	V
.81	.37	.015 max	.012 max	.30	3.12	.53	.06

DEPTH OF HARDNESS



MICROSTRUCTURE



1500X

HEAT TREATMENT CAPABILITY

Decrease from Initial Surface Hardness (Radial Depth)

Work Rolls

Hardening Method	20/30 HLd	40/50 HLd
	4/6 Hsd (JIS)	8/10 Hsd (JIS)
Static Induction	0.30" (8 mm)	0.90" (23 mm)
Special Static Induction*	0.80" (20 mm)	1.10" (28 mm)

Intermediate and Small Diameter Back-up Rolls

Hardening Method	10/20 HLd	50/60 HLd
	2/4 Hsd (JIS)	10/12 Hsd (JIS)
Gas Fired	1.00" (25 mm)	1.40" (36 mm)
Static Induction	1.50" (38 mm)	2.00" (51 mm)

*Cryogenic treatment utilized in this method.

TYPICAL CARBIDE ANALYSIS

Carbide Type	Carbide Hardness (HV)	Surface Area (%)	Average Diameter (μ)	Carbide Density (Carbide/mm ²)
M ₃ C	850-1100	6 - 7	.8	1.4 x 10 ⁵