Crane Rail Chemical Composition

Designation	A	B	C	D	E	F	G	H	R1	R2	R3	R4	R5	R6	R7
ISCR 80	130	130	87	80	35	32	26	9.75	400	44	26	8	8	6	1.5
ISCR 100	150	150	108	100	40	38	30	11.2	450	50	30	8	8	8	2

Designation	Cross Sectional Area	Weight	Positions of Centre of Gravity		Moments of Inertia		Section Moduli		
	cm^2	kg/m	c_x	e_x	I_x	I_y	$Z_{x1} = I_x/c_x$	$Z_{x2} = I_x/e_x$	$Z_y = I_y/b/2$
CR 80	81.8	64.2	6.47	6.53	1524	468.6	233	233	72.1
CR 100	113	89.0	7.63	7.37	2806	920	368	381	123

Designation According to IS : 1762 (Part 1) 1974		C	Mn	Si	S Max	P Max
New	Old					
55C11	C55Mn1	0.50-0.60	0.95-1.25	0.05-0.30	0.060	0.060
50C12	C50Mn1	0.40-0.60	0.90-1.45	0.03-0.30	0.060	0.060

Steel grade	Sample	% by mass									10^-4 (ppm) by mass max.		Tensile strength Rm min MPa	Elongation A min %	Hardness of the rail running surface center line HBW
		C	Si	Mn	P max.	S max.	Cr max.	Al max.	V max.	N max.	O	H			
R200	Liquid	0.40 to 0.60	0.15 to 0.58	0.70 to 1.20	0.035	0.035	≤0.15	0.004	0.050	0.009	20	3.0	680	14	200 to 240
	Solid	0.38 to 0.62	0.13 to 0.60	0.65 to 1.26	0.040	0.040	≤0.15	0.004	0.030	0.010	20	3.0	—	—	
R220	Liquid	0.50 to 0.60	0.20 to 0.60	1.00 to 1.25	0.025	0.025	≤0.15	0.004	0.030	0.009	20	3.0	770	12	220 to 260
	Solid	0.48 to 0.62	0.18 to 0.62	0.95 to 1.30	0.030	0.030	≤0.15	0.004	0.030	0.010	20	2.5	—	—	
R260	Liquid	0.62 to 0.80	0.15 to 0.58	0.70 to 1.20	0.025	0.025	≤0.15	0.004	0.030	0.009	20	2.5	880	10	260 to 300
	Solid	0.60 to 0.82	0.13 to 0.60	0.65 to 1.25	0.030	0.030	≤0.15	0.004	0.030	0.010	20	2.5	—	—	
R350HT	Liquid	0.72 to 0.88	0.15 to 0.64	0.70 to 1.20	0.025	0.025	≤0.15	0.004	0.030	0.009	20	2.5	1175	9	350 to 390
	Solid	0.70 to 0.82	0.13 to 0.60	0.65 to 1.25	0.025	0.030	≤0.15	0.003	0.010	20	2.5	—	—		

Chemical Composition (Percentage)															
Grade	C	Mn	Si	S (max)	P (max)	Al (max)	Mo (max)	Cr	V (max)	10^-4 % (ppm) max by mass O	Hydrogen content in liquid steel (max.)	UTS (MPa)	Yield Strength (MPa)	Elongation % on gauge length – 5.65 √50 (min)	Running surface hardness (BHN)
880	0.60-0.80	0.80-1.30	0.10-0.50	0.030*	0.030*	0.015	–	–	–	–	1.6ppm	880	460	10.0	Min260
1080HH	0.60-0.80	0.80-1.30	0.10-0.50	0.030*	0.030*	0.015	–	–	–	–	1.6ppm	1080	460	10.0	340-390

Steel grade	Sample	% by mass								Tensile strength min, MPa	Bongartz test at 600°C, min h	Hardness of the rail running surface (center line) HBW
		C	Si	Mn	P max.	S max.	Cr	Al min.	N max.			
R200	Solid	0.40 to 0.60	0.15 to 0.50	0.70 to 1.20	0.035	0.035	0.015	0.004	0.030	680	0	140 to 240
	Liquid	0.38 to 0.62	0.15 to 0.60	0.65 to 1.15	0.035	0.035	0.015	0.003	0.030	720	0	140 to 240

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	Liquid	0.38 to 0.62	0.15 to 0.60	0.65 to 1.15	0.035	0.035	0.015	0.003	0.030	720	0	140 to 240
R200		0.60	0.50	1.20								
	Liquid	0.38 to 0.62	0.15 to 0.60	0.65 to 1.15	0.035	0.035	0.015	0.003	0.030	720	0	140 to 240