



# R. L. STEELS & ENERGY LTD.

## TEST CERTIFICATE

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Customer: SAMPLE TC

### General Information & Material Details

TC NO.	Date	Invoice No.	Date	Truck No.		No. of Pieces	Quantity in MT	Length	Supply Condition	Colour code
17-2589	06-12-2017	-						5.00-6.00MTR	AS ROLLED	WHITE+YELLOW+WHITE
Process Route		Heat No.	Grade		As Cast Size		Product Size		Reduction Ratio	Customer TDC
EAF/LRF/VD/CCP-with MEMS		2-URG-4	20MnCr5		160X180		50DIA		-	-

### Chemical Composition & Tramp Elements

Element	%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%Cu	%V	%Al	%Ti	%B	%Ca	%As
Min.	0.17	0.15	1.10	-	-	1.00	-	-	-	-	-	-	-	-	-
Max.	0.22	0.35	1.40	0.035	0.035	1.30	-	-	-	-	-	-	-	-	-
Actual	0.19	0.23	1.21	0.021	0.024	1.02	0.044	0.085	0.036	0.006	0.032	-	-	-	-

### Tramp Elements (Contd.) & DI / CE

Element	%Sn	%Pb	%Sb	CE	DI Value	Gas Analysis.				Dimension Tolerance	
						Gas (PPM)	O2	H2	N2	Size Tol. (MM)	-
Min	-	-	-	-	-		Min	-	-	Specification	As per IS 3739, Grade I.
Max	-	-	-	-	-		Max	-	-		
Actual	-	-	-	-	-		Actual	15.00	1.00		

### Mechanical Properties

Test Code	Hardness As Rolled (BHN)	Hardness (H&T Condition) (BHN)	YS (Kg/mm²)	UTS (Kg/mm²)	%El.	%RA	Impact Values (Joules)		Macrostructure As per ASTME-381	-
							Izod	Charpy		
Spec.	-	-	-	-	-	-	-	-	-	-
Actual Value	170-178	-	-	-	-	-	-	-	C2R2S2	-

### Metallurgical Properties

								Other Test Results				
Test Code	Decarb ASTM J419 (mm)	Grain Size as per ASTM E112	Inclusion Rating (As per IS 4163/ ASTM E-45A) Plate IR					Magnaflux Test (100% Bars)	UT Test (100% Bars)	Spark/Spectral Test (100% Bars)	-	-
			Series	A	B	C	D					
Spec.	-	-	T / H	-	-	-	-	-	-	-	-	-
Actual Value	-	6.0 / 7.0	T / H	1.5 / 0.5	0.5 / 0.0	0.0 / 0.0	1.5 / 0.5	OK	OK	OK	-	-

### Hardenability Test Result

Jominy Distance (mm/inch)	J 7.0 mm												
Spec (HRC)	-												
Actual Hardness (HRC)	35.50												

Remarks : Material is conforming to the customer specification.

DECLARATION : TEST RESULTS ARE BASED ON ACTUAL TESTS CARRIED OUT ON SAMPLES DRAWN AS PER QUALITY ASSURANCE PLAN. TEST CERTIFICATE CONFORMS TO THE CUSTOMER TDC.

For R L STEELS & ENERGY



(AUTHORISED SIGNATORY)