



# R. L. STEELS & ENERGY LTD.

## TEST CERTIFICATE

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Customer: M/S SADHU FORGING LTD.

UNIT-2,PLOT NO-84,SECTOR-25, FARIDABAD-121001

### General Information & Material Details

TC NO.	Date	Invoice No.	Date	Truck No.	No. of PCS	Quantity in MT	Length	Supply Condition	Colour code
18-0389	03-05-2018	RL18-SI-0383	03-05-2018	RJ 25 GA 3643	110	38.490	5.0 TO 6.0 MTR	AS ROLLED	YELLOW+ BLUE+WHITE
Process Route		Heat No.	Grade	As Cast Size		Product Size		Reduction Ratio	Customer TDC
EAF/LRF/VD/CCP-with MEMS		2-XOO-4	EN 353	240X280		90RCS		8.29:1	As per TATA MOTORS SS-4027

### Chemical Composition & Tramp Elements

Element	%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%Cu	%V	%Al	%Ti	%B	%Ca	%As
Min.	0.14	-	0.50	-	0.020	0.75	0.080	1.00	-	-	0.020	-	-	-	-
Max.	0.20	0.35	1.00	0.035	0.040	1.25	0.15	1.50	-	0.030	0.040	-	0.0004	-	-
Actual	0.18	0.21	1.00	0.031	0.033	1.12	0.12	1.02	-	0.005	0.026	-	0.0003	-	-

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

Element	%Sn	%Pb	%Sb	CE	DI Value	Gas (PPM)	O2	H2	N2	Size Tol. (MM)	-
Min	-	-	-	-	-	Min	-	-	70.00	Specification	As per IS 3739, Grade I.
Max	-	-	-	-	-	Max	20.00	2.00	100.00		
Actual	0.006	-	-	-	-	Actual	13.00	1.30	72.00		

### Mechanical Properties

Test Code	Hardness As Rolled (BHN)	Hardness (H&T Condition) (BHN)	YS (Mpa)	UTS (Mpa)	%El.	%RA	Impact Values (Joules)		Macrostructure As per ASTM-381	Microstructure
							Izod	Charpy		
Spec.	240 Max.	-	-	-	-	-	-	-	Better Than C2R2S2	-
Actual Value	206-217	-	-	-	-	-	-	-	C2R2S2	-

### Metallurgical Properties

Test Code	Decarb ASTM J419 (mm)	Grain Size as per ASTM E112	Inclusion Rating (As per IS 4163/ ASTM-45A) Plate IR					Magnaflux Test (100% Bars)	UT Test (100% Bars)	Spark/Spectral Test (100% Bars)	-	Step Down Test
			Series	A	B	C	D					
Spec.	-	5.0 / 8.0	T / H	2.0 / 1.0	2.0 / 0.0	2.0 / 0.0	2.0 / 0.0	-	-	-	-	-
Actual Value	-	6.0 / 7.0	T / H	1.5 / 0.5	0.5 / 0.0	0.0 / 0.0	1.5 / 0.0	OK	OK	OK	-	OK

### Hardenability Test Result

Jominy Distance (mm/inch)	J10.0											
Spec (HRC)	39-44											
Actual Hardness (HRC)	39.00											

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)