

# R. L. STEELS & ENERGY LTD.

## TEST CERTIFICATE

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**Customer: M/S SHARDA PRECISION PVT LTD**

PLOT NO. K-1, MIDC, WALUJ, AURANGABAD.

### General Information & Material Details

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TC NO.	Date	Invoice No.	Date	Truck No.	No. of Pieces	Quantity in MT	Length	Supply Condition	Colour code
17-4456	18-02-2018	RL17-SI-4047	18-02-2018	MH 20 W 7014	294	13.410	5.00-6.00MTR	AS ROLLED	GREEN+WHITE+RED+GREEN
Process Route		Heat No.	Grade	As Cast Size		Product Size		Reduction Ratio	Customer TDC
EAF/LRF/VD/CCP-with MEMS		2-WGT-3	16MnCr5	130X130		38DIA		-	-

### Chemical Composition & Tramp Elements

	%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%Cu	%V	%Al	%Ti	%B	%Ca	%As
Actual	0.14	0.15	1.00	-	0.020	0.80	-	-	-	-	0.020	-	-	-	-
Spec.	0.19	0.35	1.30	0.025	0.035	1.10	0.060	0.20	-	-	0.040	-	-	-	-
Actual	0.18	0.22	1.19	0.024	0.024	1.05	0.025	0.086	0.036	0.003	0.029	-	-	-	-

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

Element	%Sn	%Pb	%Sb	CE	DI Value
Min	-	-	-	-	-
Max	-	-	-	-	-
Actual	-	-	-	-	-

### Gas Analysis.

	O2	H2	N2
Min	-	-	-
Max	25.00	-	-
Actual	10.00	1.20	76.00

### Dimension Tolerance

Size Tol. (MM)	
Specification	As per IS 3739, Grade I.

### Mechanical Properties

Test Code	Hardness As Rolled (BHN)	Hardness (H&T Condition) (BHN)	YS (Kg/mm <sup>2</sup> )	UTS (Kg/mm <sup>2</sup> )	%El.	%RA	Impact Values (Joules)	Macrostructure As per ASTM-381
							Izod	Charpy
Spec.	-	-	-	-	-	-	-	-
Actual Value	170-178	-	-	-	-	-	-	-

### Metallurgical Properties

Actual Value	170-178	-						Other Test Results				
Metallurgical Properties								Magnaflux Test (100% Bars)	UT Test (100% Bars)	Spark/ Spectral Test (100% Bars)		
Test Code	Decarb ASTM J419 (mm)	Grain Size as per ASTM E112	Inclusion Rating (As per IS 4163/ ASTM-45A) Plate IR									
			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 4/16"
Spec (HRC)	33-37
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)







## PAHARIMATA ENGINEERING PVT. LTD.

Date:- 22-02-2018

### MATERIAL TEST CERTIFICATE FOR CHEMICAL ANALYSIS

TO -

M/S EICHER

Equipment used:- SPECTROMAXx  
Raw Material Size:- DIA.38.00MM  
Heat no 2-WGT-3-4  
Heat Code :- EI 27  
Raw Material Supplier :- R L STEEL  
Sample No.:- Sample no.1

#### TEST RESULTS

Test Conducted	Specified as per "16Mncr5" Grade (in %age)	Obsevation (in %age)
<b>Chemical Analysis</b>		
% C	0.14-0.19	0.168
% Mn	1.00-1.30	1.15
% Si	0.40 MAX	0.21
% S	0.035 MAX	0.027
% P	0.025MAX	0.019
% Cr	0.80-1.10	1.00
% Ni		
%Mo		
% Al	0.05MAX	0.027

**Remarks:** The checked Parameters of given sample conforms to-16MNCr5 grade.

**Jominy Test :SPECIFICATION-**J1/16" = 43 HRCMAX, J4/16" = 33-37 HRC

**Jominy Test Findings:** OBSERVED-J1/16" = 42 HRC, J4/16" = 36 HRC

THIS MATERIAL USED FOR ED2404,2405,2406,2407,2408,2414,2415,2416,2417

for   
For Paharimata engineering pvt. Ltd.

