



R. L. STEELS & ENERGY LTD.

TEST CERTIFICATE

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Customer: M/s AKAR AUTO INDUSTRIES UNIT II

PLOT NO.- C 5/6, MIDC AREA, WALUJ , AURANGABAD

General Information & Material Details

TC NO.	Date	Invoice No.	Date	Truck No.	No. of Pcs	Quantity in MT	Length	Supply Condition	Colour code
17-4419	20-02-2018						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-WID-4	20MnCr5		160X180		50DIA	14.68:1	ATL/TDC/EICHER/E1, Dt. 23/02/2015

Chemical Composition & Tramp Elements

Element	%C	%Si	%Mn	%P	%S	%Cr	%Ni	%Mo	%Cu	%V	%Al	%Ti	%B	%Ca	%W
Min.	0.17	0.15	1.10	-	0.020	1.00	-	-	-	-	0.017	-	-	-	-
Max.	0.22	0.35	1.40	0.025	0.035	1.30	0.30	0.080	-	-	0.040	-	-	-	-
Actual	0.19	0.22	1.21	0.023	0.026	1.10	0.086	0.023	0.052	0.005	0.029	-	-	-	-

Tramp Elements (Contd.) & DI / CE

Gas Analysis.

Dimension Tolerance

Element	%Sn	%Pb	%Sb	CE	DI Value	Gas (PPM)		O2	H2	N2	Size Tol. (MM)	-
Min	-	-	-	-	-		Min	-	-	-	Specification	As per IS 3739, Grade I.
Max	-	-	-	-	-		Max	30.00	2.00	80.00		
Actual	-	-	-	-	-		Actual	13.00	1.30	74.00		

Mechanical Properties

Macrostructure

Microstructure

Test Code	Hardness As Rolled (BHN)	Hardness (H&T Condition) (BHN)	YS (Kg/mm ²)	UTS (Kg/mm ²)	%El.	%RA	Impact Values (Joules)		Macrostructure As per ASTM E-381	Matrix
							Izod	Charpy		
Spec.	241 Max.	-	-	-	-	-	-	-	Better Than C2R2S2	Free from Banding, Uniform distribution of Ferrite plus Pearlite
Actual Value	170-178	-	-	-	-	-	-	-	C2R2S2	Free from Banding, Uniform distribution of Ferrite plus Pearlite

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)	-	Step Down Test
			Series	A	B	C	D					
Spec.	-	6.0 / 8.0	T / H	2.0 / 1.0	2.0 / 0.0	2.0 / 0.0	2.0 / 1.0	-	-	-	-	-
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	-	OK

Hardenability Test Result

Jominy Distance (mm/inch)	J 7.0 mm											
Spec (HRC)	36-40											
Actual Hardness (HRC)	37.00											

Remarks : Material is conforming to the customer specification.

For R L STEELS & ENERGY

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.



(AUTHORISED SIGNATORY)