



KALYANI
STEELS LTD

KALYANI STEELS LTD - HOSPET DIVISION
Hospet Road, Gimigera - 583228 Taluka & Dist : Koppal, Karnataka.
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TEST CERTIFICATE



CUSTOMER : M/S OM KAMAL TECHNO SYSTEMS

Invoice No: 9700005675

PROCESS ROUTE

TC NO. K194521 DATE: 14.08.2024

CUSTOMER

EOF-LRF-VD-CCM/EMS + AMLC-R MILL

TRUCK NO. HR742270

SPECIFICATION NO

HEAT NO

GRADE

SECTION

COLOR CODE

SUPPLY

LENGTH

OVALITY

NO OF

QUANTITY

Q F 1001 Rev02, Date : 12.05.2020

K194521

16MNCr5

60 ROUND

HALF(RED+WHITE)

AS ROLLED

5 TO 6 METER

AS PER IS

104

13.910

CHEMICAL COMPOSITION

%C	%Si	%Mn	%P	%S	%Ni	%Mo	%Cr	%Cu	%Al	%Sn	%V	N ₂ ppm	O ₂ ppm	H ₂ ppm	%Ti	CaPPM	Bppm	%As	%Sb	%Pb
REQ 0.130/0.180	0.150/0.400	1.000/1.300	0.020/Max	0.015/0.030	0.300/Max	0.100/Max	0.800/1.100	0.300/Max	0.020/0.050			60.0/120.0	20.0/Max	2.50/Max		10.000/Max	5.000/Max			
ACT 0.1590	0.2330	1.2260	0.0160	0.0240	0.0200	0.0090	1.0520	0.0120	0.0230			70.000	10.000	1.370		6.0000	1.0000			

MECHANICAL PROPERTIES

TENSILE VALUES					IMPACT		HARDNESS		JOMINY VALUES (HRC)										D.L.	
YS	UTS	%EL	%RA		STRENGTH		(BHN)		JOMINY VALUES (HRC)										VALUE	
(N/MM ²)	(N/MM ²)				(IZOD/CHARPY)				J1.5mm	J5mm	J10mm	J15mm	J20mm	J25mm	J30mm					
REQ 735.00N/mm	1030.00/1370	8.00/Min			25.00/Min J		240 BHN MX		39/44	34.5/40.5	29/35.5	25/31.5	22.5/29	21/27.5	20/26.5					
ACT 916.00	1227.00	15.1			91.00 J		167		44.0	39.0	30.5	28.0	25.0	22.5	21.5					

METALLURGICAL PROPERTIES

SPARK/ SPECTRAL TEST	STEP DOWN TEST	MACRO ETCH RESULTS(ASTM E-381)	INCLUSION RATING (ASTM - E - 45)										GRAIN SIZE (ASTM E-112)	SURFACE DEFECT LEVEL (mm)	CORE HARDNESS (OIL QUENCH (HRC)	UPSET TEST RESULTS	TOTAL DEPTH OF DECARBURIZATION IN mm
			Method 'A' Plate I(Worst Fields)														
			A		B		C		D								
			T	H	T	H	T	H	T	H							
REQ	OK	NA	C2R3S3Max	2.0	1.5	2.0	1.0	0.5	0.5	1.0	1.0	5 to 8	OK	NA	NA	0.60 mm Max	
ACT	OK	NA	<C2R3/S3	1.5	0.5	0.5	0.0	0.0	0.0	1.0	0.5	7.0	OK	NA	NA	0.39	

REMARKS: 1. BLOOM SIZE 200X200MM2 REDUCTION RATIO 1:14:14

2. MPI TEST 100% DONE & 100%ND OK

3. BANDING OK AS PER UNI 8449/A MAX OF GR-4 IS ACCEPTABLE

4. ULTRASONIC TEST: 100% DONE AS PER ASTM A-388, 4MM FBH

5. REQ AL/N2 2.1 MIN ACT 3.28.6 REQ %C E 0.65 MAX ACT 0.575

7. MATERIAL FREE FROM RADIO ACTIVE CONTAMINATION

8. TENSILE/CHARPY TEST AS PER UNI EN10025-1 UNI EN 10045-1

9. JOMINY TEST AS PER ISO642, DECARB TEST AS PER ASTM E1077

PREPARED BY

AUTHORISED SIGNATORY

OF NO. HS - 001/10/01 TUG B-00/01 TUG-03/03/2012

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