

TEST CERTIFICATE

Certificate No. : 246305					Date : 26.04.2018			Po Number:EMAIL		
Customer Name: RAMAKRISHNA FORGINGS LIMITED					SO No : 400809775			Po date :04.04.2018		
Cust. Address : PLOT NO. M-15, 16 & NS-26,					SO Date : 04.04.2018			Packing Slip No :705850428		
JAMSHEDPUR,Jharkhand-832109,India					Truck No.: NL01AB1612			Invoice No :7100822793		
Heat No	Grade	Size (mm)	Length (mm)	M/L (mm)	No. of Bundles	No. of PCS	Weight	Billet/Bloom Size		
E75020	EN353	125.00 mm DIA	6,000.00 mm	0 mm	9	36	20.871 MT	340MM 400MM		

TDC NO : RF_14_D_4_01_EN353_VEC,3_0,29.01.2018

Process Route : BF_EOF_LRF_VD_CCM_EMS_BM

Reduction Ratio : 8.00 / - 11.09 : 1

CHEMICAL ANALYSIS

Prod STD No : QDQA06_929

Element	C%	Si%	Mn%	P%	S%	Cr%	Mo%	Ni%	B ppm	V%	Cu%	Pb%	Sn%	Ti%	Nb%	Zr%	As%	Sb%	Al%	Ca ppm	CE%
MIN	0.1400		0.500			0.750	0.080	1.000											0.0200		
MAX	0.2000	0.350	1.000	0.050	0.0500	1.250	0.150	1.500		0.030	0.250			0.0060	0.150				0.0600	20	
Actual	0.190	0.180	0.820	0.010	0.026	1.010	0.130	1.040	3	0.003	0.011	0.001	0.004	0.0039	0.002	0.001	0.003	0.002	0.026	5	0.625

Gas Levels : N ppm : [/ 80] -80

O ppm : [/ 20] -11.9

H ppm : [/ 2.00] -1.40

MECHANICAL PROPERTIES :

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	Tensile Test ()				Hardness Test			Impact Test ()									
Cond.								Spec.									
Spec.	YS	UTS	Elong.	RA	As Rolled	As Quenched		As Q&T	Test Temp	Imp. Value (min)	1		2		3		Avg.
			%	%													
Min																	
Max																	
Actual																	

Edge / Corner Radius (mm) :

Upset Type :

Upsetability:

JOMINY HARDENABILITY (SAE J406_200903)

Ideal Diameter (DI) : [/] -

Distance	J5	J11																			
MIN (HRC)	37.0	33.0																			
MAX (HRC)	44.0	37.0																			
Actual(HRC)	44.00	34.25																			

METALLURGICAL PROPERTIES & PHYSICAL INSPECTION

	Surface Inspection	Step Down Test	BFT Test	MPI Test	Segregation Test	Spark Test	Spectra Test	Metascope Test					
Actual	OK	Pass		100 % OK		100 % OK	100 % OK	100% OK.					
	Macro Etch Test	Micro Structure	CN	CZ Looser	CZ Closer	GBC Level	DEG. SPH	Distortion					
Spec	C2R2S2	F_P	/	/	/								
Actual	C2R2S2	Ferrite - Pearlite											
	Grain Size	Decarb (mm)	Banding (µm)	A		B		C		D		DOS µm	Ultrasonic Test
Spec	5.0 / 8.0	/ 0.40	/	2.0	1.0	2.0	0.0	2.0	0.0	2.0	1.0		20% / 80% Back Wall Echo
Actual	7.00	0.360 mm		2.00	0.50	0.50	0.00	0.00	0.00	0.50	0.00		100% Pass

Inclusion Rating Test Standard: ASTM E45 - 13, A

Grain Size Standard: ASTM E112 - 13

Decarb Standard:

Macro Etch Test Standard: ASTM E381 - 17

Banding Test Standard:

UT Standard: ASTM A388/A388M - 16

JSW COLOR CODE :

CUSTOMER COLOR CODE :

INSPECTION CERTIFICATE 3.1 ACCORDING TO EN 10204 : 2004

Supply Condition : AS ROLLED

Remarks :

Reference : WE HERE BY CERTIFY THAT THE MATERIAL SHIPPED UNDER THIS TEST CERTIFICATE DID NOT COME IN DIRECT CONTACT WITH ANY MERCURY, CADMIUM HEXAVALENT. CHROMIUM CONTAINING DEVICES, FREE FROM RADIOACTIVE CONTAMINATION EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT DURING THE MANUFACTURING PROCESS, TESTS.

INSPECTION AND STORAGE

WE CERTIFY THAT CONTENTS OF THIS REPORT ARE CORRECT AND ACCURATE AND MEET THE REQUIREMENTS OF THE PURCHASE ORDER, TECHNICAL DELIVERY CONDITION, GENERAL STEEL REQUIREMENTS AND THE MATERIAL CERTIFICATION REQUIREMENTS.

NOTE:

1. THE RESULTS RELATES ONLY TO THE ITEM TESTED.
2. CERTIFICATE SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF ISSUING AUTHORITY.

For JSW STEEL LIMITED

S. M. KUMAR - AVP (PC & QAD)

M-5896 GGD