

METTALURGICAL TEST REPORT									
HAPPY FORGINGS LIMITED,LUDHIANA					RAW MATERIAL BILLET/FORGINGS				
(FROM SUB CONTRACTOR)									
(DOC. NO. FM:HT-LB-11)									
CUSTOMER	M/s	Ve Commercial (Dewas)							
STEEL MILL	JSW Steels				REPORT NO.	234476			
CHALLAN NO.					DATE	04.03.2018			
HEAT NO.	A-5580				SECTION SIZE	110 RCS			
GRADE	20MNCR5				NO. OF BARS/BILLET				
QTY.					LENGTH RANGE	4.5 TO 5.5 MTRS			
PART NO.	53141				COLOUR CODE	Billet/Bloom Size			
CHEMICAL PROPERTIES									
SPEC.	C%	Mn%	SI%	S%	P%	Cr%	NI%	Mo%	
MIN.	0.17	1.1	0.15	.	.	1	.	.	
MAX	0.22	1.4	0.35	0.035	0.035	1.3	.	.	
OBSERVED	0.175	1.226	0.227	0.022	0.011	1.223	0.022	0.009	
PHYSICAL PROPERTIES									
INTERNAL SOUNDNESS	C2 R1 S1								
GRAIN FLOW									
SURFACE HARDNESS(BHN)									
UPSETTING TESTING	OK								
METALLOGRAPHY									
GRAIN SIZE-ASTM E-112	ASTM-7								
INCLUSION RATING WORST FIELD AS PER ASTM E-45	A		B		C		D		
	TK	TN	TK	TN	TK	TN	TK	TN	
	1	2	0	0.5	0	0	0	0.5	
JOMINY TRASVELET									
DISTT.		J11MM							
SPEC.		34-39							
HFL OBSERVED HRC		34 HRC							
REMARKS									
MILL T. C. ENCLOSED									
AUTHORISED SIGNATORY									