

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.	231984			
CHALLAN NO.					DATE	06.03.2018			
HEAT NO.	A-5124				SECTION SIZE	75 RCS			
GRADE	20MNCR5				NO. OF BARS/BILLET				
QTY.					LENGTH RANGE	4.5 TO 5.5 MTRS			
PART NO.	53169				COLOUR CODE	WHITE BASE+RED DOT			
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	0.179	1.25	0.279	0.023	0.012	1.22	0.036	0.004	
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	
	0.5	1.5	0	0.5	0	0	0	1	
JOMINY TRASVELET									
DISTT.		J5/16							
SPEC.		36-40							
HFL OBSERVED HRC		39.5 HRC							
REMARKS	MILL T. C. ENCLOSED								
AUTHORISED SIGNATORY									