



M/S. - HAPPY FORGINGS LTD. U-II, B-XXIX, 2254 T.C.NO. 8006 Date :- 25/01/2018 19:36:54
/1.&OPP.HINDUSTAN TYRE. Invoice No. 20623
KANGANWAL ROADJUGIANA.LUDHIANA Truck No. PB10CH-6505

GRADE	SIZE	HEAT NO.	MANUFACTURING ROUTE	COLOUR CODE	SUPPLY COND.N.	QTY. (MT)	NO. OF PCS.
-------	------	----------	---------------------	-------------	----------------	-----------	-------------

EN 353	90 DIA	6045	E.A.F.+L.F.+V.D.+CCM+EMS	BLUE+WHITE	AS ROLLED	16.550	36
--------	--------	------	--------------------------	------------	-----------	--------	----

--: CHEMICAL COMPOSITION IN PERCENTAGE :-

	C	Mn	S	P	Si	Ni	Cr	Mo	V	Al	Cu	Sn	Ti	B	Ca
Min	--	0.5000	--	--	--	1.0000	0.7500	0.0800	--	--	--	--	--	--	--
Max	0.2000	1.0000	0.0500	0.0500	0.3500	1.5000	1.2500	0.1500	--	--	--	--	--	--	--
Actual	0.1730	0.9500	0.0260	0.0170	0.2150	1.0700	1.1900	0.1250	0.0056	0.0220	0.1150	0.0090	0.0030	0.0004	0.0007

--: METALLURGICAL RESULTS :-

INCLUSION RATING IS : 4163/JK CHART/ASTM E-45A										Aust. Grain Size ASTM No. (E-112)	Gas Content (ppm)
A			B			C			D		
T	H	T	H	T	H	T	H	T	H	Decarb. (MM)	O2
STD	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	1.0		16
MAX											85
ACTUAL	1.5	0.5	0.5	0.0	0.0	0.0	0.0	1.0	0.0	Micro-Structure	B+F+P

MECHANICAL PROPERTIES (ASTM A-370/IS-1608)		MACRO	ULTRASONIC TEST	MIX UP TEST
TEST CONDITION (N / H & T)				

Reqd.	U.T.S.	Y.S.	EL%	RA%	Impact Value	Hardness B.H.N./Rb	BETTER THAN C2,R2,S2 MAX LEVEL AS PER PLATE 1st OF ASTM-E-381	SPARK TEST 100% DONE OK
Actual	-	-	-	-	-	244-249		

--: HARDENABILITY (HRC) AS PER IS : 3848 :-

Distance	J1/16	J2/16	J3/16	J4/16	J5/16	J6/16	J7/16	J8/16	J9/16	J10/16	J12/16
Required	-	-	-	-	-	-	37-41	-	-	-	-
Actual	-	-	-	-	-	-	38.5	-	-	-	-

Remarks :- BILLET SIZE-240X240 MM, 100% MOBILE SPECTRO DONE OK (X-RAYS) REDUCTION RATIO=9.1, SURFACE SATISFACTORY

Note :- TESTED FOR RADIOACTIVE CONTAMINATION *OK*

CERTIFIED THAT THE TEST FINDINGS ARE CORRECT & ARE BASED ON
ACTUAL RESULTS CARRIED OUT ON SAMPLES DRAWN AS PER Q.A.P. PREPARED BY

Signature

AUTHORISED SIGNATORY