



AARTI STEELS LIMITED

Registered Office : G. T. Road, Miller Ganj, Ludhiana.

Works : Focal Point, LUDHIANA - 141010. (INDIA)

phone no :- 0161-3006200 Fax :- 0161-3006250

MANUFACTURER'S OF :- CARBON ALLOYS & SPECIAL STEELS

An ISO/TS 16949:2009 COMPANY



-: Original :-

TEST CERTIFICATE :-

M/S.- HAPPY FORGINGS LTD. U-II, B-XXIX, 2254
/1.&OPP. HINDUSTAN TYRE.

KANGANWAL ROADJUGIANA. LUDHIANA

GRADE	SIZE	HEAT NO.	MANUFACTURING ROUTE	COLOR CODE	SUPPLY COND.N.	QTY. (MT)	NO. OF PCS.
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20MnCr5	65 RCS	1645	E.A.F.+L.F.+V.D.+COM+EMS	YELLOW+BROWN+GREEN SPOT	AS ROLLED	9.490	48

:-: CHEMICAL COMPOSITION IN PERCENTAGE :-:

	C	Mn	S	P	Si	Ni	Cr	Mo	V	Al	Cu	Sn	Ti	B	Ca
Min	0.1300	1.0000	0.0150	--	0.1500	--	0.8000	--	--	0.0200	--	--	--	--	--
Max	0.1800	1.3000	0.0300	0.0200	0.4000	0.3000	1.1000	0.1000	--	0.0500	0.3000	--	--	0.0005	0.0010
Actual	0.1740	1.2800	0.0220	0.0120	0.2250	0.0210	1.0400	0.0010	0.0038	0.0230	0.0150	0.0021	0.0042	0.0004	0.0004

--: METALLURGICAL RESULTS :-

INCUSION RATING IS : 4163/JK CHART/ASTM E-45A

	A		B		C		D		Size- ASTM No. (E-112)	7	(ppm)	
	T	H	T	H	T	H	T	H				
STD MAX	2.0	1.5	2.0	1.0	0.5	0.5	1.0	1.0	Decarb. (MM)	0.11	02	15
											N2	85
ACTUAL	1.5	0.5	0.5	0.0	0.0	0.0	1.0	0.0	Micro- Structure	P+F	H2	.926

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

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

	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	100 % DONE OK	SPARK TEST 100% DONE OK
Reqd.	1030-1370	735 MIN	8 MIN	-	25 J MIN	260 MAX			
Actual	1196 MPA	990 MPA	9.5	-	41 J	158-161			

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

Distance	1.5MM	5 MM	10 MM	15 MM	20 MM	25 MM	30 MM
Required	39-44	34.5-40.5	28-35.5	25-31.5	22.5-29	21-27.5	20-26.5
Actual	43.5	40	30	25.5	23	21	20

PERCENTION PYMTO=95.100% MORTIE SPECTRO DONE OK (X-RAYS)

REDUCTION RATE= 2.5/1000 LBS
 3AY/3N2 RATIO=2 705 (2.1 MIN)

%EL/%NZ RAILLO-2.705 (Z.I. HIN)
MATERIAL CONFORMS TO GRAZIANO SPEC. Q.F. 1001, REV. LEVEL 1

BILLET SIZE=200X200 MM, SURFACE SATISFACTORY
BANDING OK AS PER UNIT 8449 (A MAX OF GR-4 IS ACCEPTABLE)

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 O.A.P.

AUTHORISED SIGNATORY