



KALYANI
STEELS LTD.

KALYANI STEELS LTD - HOSPET DIVISION
Hospet Road, Ginigera - 583228 Taluka & Dist : Koppal, Karnataka.
Telephone : 08539 - 286603-08 (6lines) Telefax : 08539 -286611

TEST CERTIFICATE

CUSTOMER : S S B ENGINEERS PVT LIMITED ALWAR				Delivery.No: 8370042229		PROCESS ROUTE			TC NO. K175513 DATE:08.02.2023				
CUSTOMER SPECIFICATION NO ZF 7B Issue 2021-07				HEAT NO K175513		GRADE ZF7B		SECTION (IN mm.) 65 ROUND		EOF-LRF-VD-CCM(EMS + AMLC)-R MILL.		TRUCK NO: RJ14GJ5857	
										COLOR CODE HALF(RED+YELLOW W)	SUPPLY CONDITION AS ROLLED	LENGHT (IN Mtrs.) 4-6 METERS	OVALITY (IN mm)

CHEMICAL COMPOSITION

%C	%Si	%Mn	%P	%S	%Ni	%Mo	%Cr	%Cu	%Al	%Sn	%V	N ₂ ppm	O ₂ ppm	H ₂ ppm	%Ti	CaPPM	Bppm	%As	%Sb	%Pb
EQ 0.1400.190	0.300Max	1.200/1.500	0.025Max	0.010/0.025	0.300Max	0.080Max	1.100/1.400	0.300Max	0.020/0.050	0.030Max		90.0NMin	25.0NMax		0.005NMax	30.000Max	10.000/30.0		0.005NMax	
CT 0.1610	0.2600	1.2530	0.0190	0.0120	0.1950	0.0590	1.2120	0.1000	0.0350	0.0010	0.0043	115.000	13.000		0.0020	15.0000	16.000J	0.0010	0.0010	0.0001

MECHANICAL PROPERTIES

TENSILE VALUES			IMPACT		HARDNESS		JOMINY VALUES (HRC)						D.I.	
YS	UTS	%EL	%RA	STRENGTH (IZOD/CHARPY)	(BHIN)		5mm	10mm	125mm	150mm			VALUE	
EQ							39/44	35/40	27/32	24Min				
CT							43/9	38/5	29/5	26.8				

METALLURGICAL PROPERTIES

	SPARK/ SPECTRAL TEST	STEP DOWN TEST	MACRO ETCH RESULTS(ASTM E-381)	INCLUSION RATING (ASTM - E - 45) Method 'A' Plate I(Worst Fields)												GRAIN SIZE (ASTM E-112)	SURFACE DEFECT LEVEL (mm)	CORE HARDNESS (OIL-QUENCH (HRC)	UPSET TEST RESULTS	TOTAL DEPTH OF DECARBURIZATION IN mm
				A			B			C			D							
				T	H		T	H		T	H		T	H						
EQ	OK	NA	C2R2S2Max				2.0	1.0	0.5	0.5	0.5	1.0	1.0	5 and finer	OK	NA	NA	NA		
CT	OK	NA	<C2/R2/S2				0.5	0.0	0.0	0.0	0.0	1.0	0.5	100.0	OK	NA	NA	NA		

REMARKS 1 BLOOM SIZE 200X200MM/2 REDUCTION RATIO 1:12.05

2 ROLLED PRODUCT SIZE 65MM DIA

3 GRAIN SIZE PREPARATION ACCORDING TO ZF15-33 TESTING ACCORDING TO ZFN 500

100% S& FINER FINER4 ACT %NB 0.0011

5 JOMINY TEST PERFORMED ACCORDING TO ZF 15-53 TESTING AS PER ISO 642

5 INCLUSION RATING AS PER ISO 4967, REQ DS 2MX, ACT NIL

6 ULTRASONIC TEST:100% CHECKED, OK AS PER ASTM A388 4MM FBH

7 MATERIAL IS FREE FROM RADIOACTIVE ELEMENTS

8 TEST CERTIFICATE ACCORDING TO DIN EN 10204 J1

9 THE HEAT IS RELEASED BY ZF



PREPARED BY

AUTHORISED SIGNATORY

K POMESH/SF-CM-QADH

BHARTIYA ENTERPRISES**Material Testing Laboratory**

Plot No.-254, Sector-24, Faridabad-121005 (India)

Tel. : +91-129-4061739, Mob. : 9871299112, 9810760405

**Bhartiya****Test Report**

Report No.-ULR : TC573923000005667F Issued to : M/s S.S.B. ENGINEERS PVT. LTD.
 Issue Date : 16/02/2023 Customer : 133,M.I.A. ALWAR (RAJ.)-301001
 Job Order No. : 5854
 Sample Receipt Date : 15/02/2023 Sample Description : ROUND DIA 65mm
 H.NO.K175513 GR.ZF7B

Discipline / Group : CHEMICAL- METALS & ALLOYS

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Reference No.	5754
Date of Analysis	16-02-2023
Test Method	OES/JIS G1253

Test Results	
Element	%
Carbon	0.176
Silicon	0.260
Manganese	1.296
Chromium	1.250
Nickel	0.204
Molybdenum	0.057
Vanadium	0.002
Copper	0.097
Aluminium	0.031
Sulphur	0.012
Phosphorus	0.018
Boron	0.0025
Titanium	0.004
Niobium	0.002

Nuraj
 Checked by :

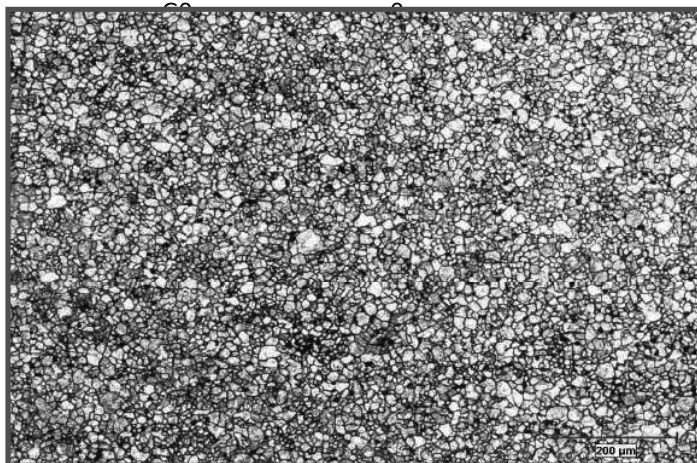


- Notes: 1. Sample not drawn by us. Analysis conducted on "As received basis" unless specified otherwise. Sample will be retained only for 15 days.
 2. The results listed refer only to the tested sample and applicable parameters. Endorsement of product is neither inferred nor implied.
 3. Measurement uncertainty and associated risks are not taken into account when reporting statement of conformity as agreed by the customer.
 4. This report can not be used as an evidence in the court of law, and shall not be reproduced except in full, without the written approval of Laboratory.
 5. Total liability of our works is limited to the invoiced amount only.

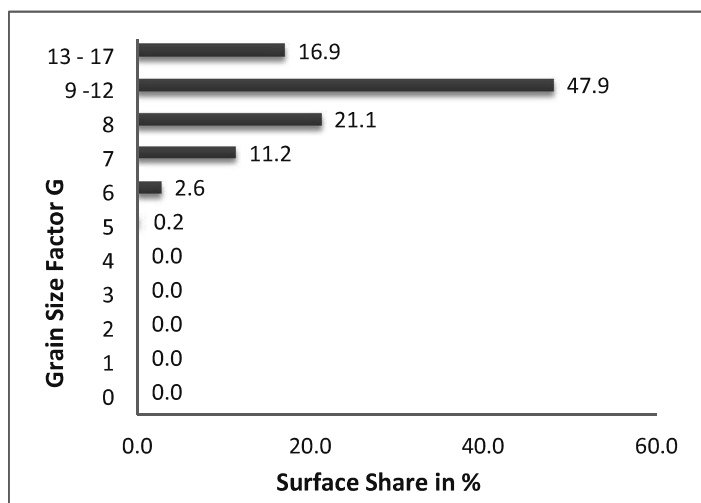
E-mail : bhartiylab@gmail.com

KALYANI STEELS LTD

Parts Details			
Customer	SSB	Report Date	17.04.2023
Part No.	4475_480_053	H.Treatment Date	15.04.2023
Batch No.		Sample ID	SSB (K175513)
Magnification	100X	Scanned Area	3.989 mm ²



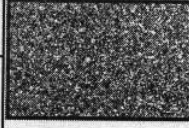
Grain Size Distribution DIN 50601-ZFN5016		
Grain Size factor G		Surface Area %
G	0	0.0
G	1	0.0
G	2	0.0
G	3	0.0
G	4	0.0
G	5	0.2
G	6	2.6
G	7	11.2
G	8	21.1
G	9 -12	47.9
G	13 - 17	16.9
Total Surface Area		100.00



Comments :

GRAIN SIZE:PREPARATION ACCORDING TO ZF15-53:TESTING ACCORDING TO ZFN 5016.

Signature Khada

S.S.B Engineering Pvt. Ltd., M.I.A, Alwar		METALLURGICAL TEST CERTIFICATE								D.C.NO		F/05/04	
										ISSUE NO./DATE		01/01.01.14	
										REV.		0	
Test Certificate No.:2023/04/11718		Date: 28-04-2023		INVOICE NO :		QTY :- PCS							
Customer		M/S ZF AUTOMOTIVE BRASIL LTDA		Steel Grade/ section		ZF-7B /65 mm							
Part Name		PLANETARY GEAR		Part No.		4475_480_053							
Supply Condition		ISO THERMAL ANNEALING		ZF Supplier ID		1749024							
RAW MATERIAL PARAMETERS													
Steel Heat No.		K175513		Steel supplier		M/S KALYANI STEELS LTD.							
Element	%C	%Mn	%Si	%S	%P	%Cr	%Ni	%Mo	%Cu	%Al	%B	%Ti	
Specified	0.14- 0.190	1.200- 1.500	0.300 MAX	0.010- 0.025	0.025 MAX	1.100- 1.400	0.300 MAX	0.080 MAX	0.300 MAX	0.020- 0.050	10.000- 30.0	0.005 MAX	
Observed	0.176	1.296	0.260	0.012	0.018	1.250	0.204	0.057	0.097	0.031	25PPM	0.004	
2										GRAIN SIZE (as per IS:4748 / ASTM E112)			
Class	A		B		C		D		Specified	5 and Finer			
Type	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick					
Specified (Max)			2.0	1.0	0.5	0.5	1.0	1.0					
Observation			0.5	0.0	0.0	0.0	1.0	0.5	Observed	100.0			
MACRO					MICROSTRUCTURE								
Specified	S2	R2	C2	MAX	Ferrite and Pearlite, Fine grained with even distribution.								
Observed	<S2	<R2	<C2		Drawn Pearlite in Ferrite matrix.								
PHYSICAL PROPERTIES: (As per mill TC attached)													
	HARDNESS (B.H.N.)		U.T.S. (KG/MM ²)		YIELD STRENGTH KG/mm ²		ELONGATION (%)		IMPACT VALUE (JOULES)		SPARK / SPECTRO		
Specified	NA		NA		NA		NA		NA		OK		
Observed	159-162 BHN		NA		NA		NA		NA		OK		
Distance	5	10	25	50									
Specified (Min.)	39-44	35-40	27-32	24 min									
Observed	43.9	38.5	29.5	26.8									
PART SUPPLY CONDITION PARAMETERS							SUPPLIER HEAT CODE						
PARAMETERS	HARDNESS (B.H.N.)						MAGNAFLUX						
Specified	146-178 BHN			Should be symmetrical to axis.			Free from crack, fold, laps, forging streaks & other harmful defects.						
Observed	155-165 BHN			FOUND O.K.			FOUND O.K.						
MACRO (Acid Etching)													
Specified	Free from any visible macro indications such as cavities, dendritic structure, cracks, porosity, and inclusions.												
Observed	found ok												
MICROSTRUCTURE													
Specified	Ferrite and Pearlite, Fine grained with even distribution.												
Observed	Uniformly distribution of Pearlite in Ferrite matrix.												
REMARKS											Disposition		
Material Confirm to M/S ZF										OK		OK	
										NOT OK			
METALLURGIST				APPROVED BY				Vinod Kuntal					

