



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

| | | | | | | | | | | | |
|------------------------------|--|------------------|---------|-------|-------------------|----------------------------|------------------|---------------------|--------------------------------|--------------|----------|
| CUSTOMER: FORGE INDIA(P)LTD. | | | | | | PROCESS ROUTE | | | TC NO. K119760 DATE.08.03.2018 | | |
| | | | | | | EOF-LRF-VD-CCM(EMS)-R.MILL | | | TRUCK NO: | | |
| CUSTOMER SPECIFICATION NO | | CUSTOMER P.O.NO. | HEAT NO | GRADE | SECTION (IN mm) | COLOR CODE | SUPPLY CONDITION | LENGHT (IN Mtrs.) | OVALITY (IN mm) | NO.OF PIECES | QUANTITY |
| ZF 7B Issue 2008-07 | | | K119760 | ZF7B | 83 ROUND | HALF(RED+YELLO W) | AS ROLLED | 4.0 TO 6.0 | AS PER IS 3739 | | |

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 |
|-----|-------------|----------|-------------|----------|-------------|----------|----------|-------------|----------|-------------|----------|--------|--------------------|--------------------|--------------------|----------|-----------|-------------|--------|----------|-----|
| REQ | 0.150/0.200 | 0.300Max | 1.100/1.400 | 0.025Max | 0.020/0.035 | 0.300Max | 0.080Max | 1.000/1.300 | 0.300Max | 0.028/0.050 | 0.030Max | | 90.0Min | 25.00Ma | | 0.005Max | 30.000Max | 10.000/30.0 | | 0.005Max | |
| ACT | 0.1610 | 0.2580 | 1.2260 | 0.0150 | 0.0270 | 0.1830 | 0.0690 | 1.2320 | 0.1270 | 0.0360 | 0.0010 | 0.0039 | 106.000 | 7.000 | 1.720 | 0.0020 | 14.0000 | 21.0000 | 0.0025 | 0.0001 | |

MECHANICAL PROPERTIES

| | TENSILE VALUES | | | | IMPACT STRENGTH (IZOD/CHARPY) | HARDNESS (BHN) | JOMINY VALUES (HRC) | | | | | | | | | | D.I. VALUE |
|-----|----------------|-----|-----|-----|-------------------------------|----------------|---------------------|-------|-------|-------|--|--|--|--|--|--|------------|
| | YS | UTS | %EL | %RA | | | J5mm | J10mm | J25mm | J50mm | | | | | | | |
| REQ | | | | | | | 39/43 | 35/39 | 27/31 | 24Min | | | | | | | |
| ACT | | | | | | | 43.0 | 37.5 | 28.0 | 24.5 | | | | | | | |

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 (OILQUENCH (HRC) | UPSET TEST RESULTS | TOTAL DEPTH OF DECARBURIZATION IN mm |
|-----|----------------------------|----------------------|--------------------------------------|---|---|---|---|---|---|---|-------------|-------------------------------|---------------------------------|---|--------------------------|--|
| | | | | A | | B | | C | | D | | | | | | |
| | | | | T | H | T | H | T | H | T | H | | | | | |
| REQ | OK | NA | C2R2S2Max | | | | | | | | 5 and finer | OK | NA | NA | NA | |
| ACT | OK | NA | <C2/R2/S2 | | | | | | | | 7.0 | OK | NA | NA | NA | |

| | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| REMARKS: 1.BLOOM SIZE:240X280MM2.REDUCTION RATIO:1:12.43. | | | | | | | | | | | | 5.ACT %NB : 0.0016. | | | | |
| 2.ROLLED PRODUCT SIZE : 83MM DIA | | | | | | | | | | | | 6.ULTRASONIC TEST : OK | | | | |
| 3.K4(OXIDES)<25, ACT:NIL | | | | | | | | | | | | 7.MPI TEST : 100% DONE & FOUND OK | | | | |
| 4.ACT : GRAIN SIZE 100% | | | | | | | | | | | | 8."MATERIAL IS FREE FROM RADIO ACTIVE ELEMENTS". | | | | |

PREPARED BY

QF.NO.HS / QA/ 10.01 DG.Rev.01 Dtd : 23.02.2015

AUTHORISED SIGNATORY

K.POMESH(GM-QAD)