



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



| CUSTOMER : HIM TEKNOFORGE LTD PITHAMPUR |  |         | Invoice.No: 9700005731 |                   | PROCESS ROUTE                     |                  |                     | TC NO. K196671 DATE.06.11.2024 |              |                |
|---|--|---------|------------------------|-------------------|-----------------------------------|------------------|---------------------|--------------------------------|--------------|----------------|
|   |  |         |                        |                   | EOF-LRF-VD-CCM(EMS + AMLC)-R MILL |                  |                     | TRUCK NO: HR55M9023            |              |                |
| CUSTOMER SPECIFICATION NO               |  | HEAT NO | GRADE                  | SECTION ( IN mm ) | COLOR CODE                        | SUPPLY CONDITION | LENGHT ( IN Mtrs. ) | OVALITY ( IN mm )              | NO.OF PIECES | QUANTITY (MTS) |
| ZF 7B Issue 2021-07                     |  | K196671 | ZF7B                   | 75 ROUND          | HALF(RED+YELLO W)                 | AS ROLLED        | 5 TO 6 METER        | AS PER IS 3739                 | 33           | 6.580          |

**CHEMICAL COMPOSITION**

|     | %C          | %Si      | %Mn         | %P       | %S          | %Ni      | %Mo      | %Cr         | %Cu      | %Al         | %Sn      | %V     | N <sub>2</sub> ppm | O <sub>2</sub> ppm | H <sub>2</sub> ppm | %Ti      | CaPPM     | Bppm        | %As    | %Sb      | %Pb    |
|-----|-------------|----------|-------------|----------|-------------|----------|----------|-------------|----------|-------------|----------|--------|--------------------|--------------------|--------------------|----------|-----------|-------------|--------|----------|--------|
| REQ | 0.140/0.190 | 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 |        | 90.0Min            | 25.0Max            |                    | 0.005Max | 30.000Max | 10.000/30.0 |        | 0.005Max |        |
| ACT | 0.1680      | 0.2500   | 1.2290      | 0.0150   | 0.0150      | 0.1890   | 0.0600   | 1.1900      | 0.1050   | 0.0300      | 0.0010   | 0.0038 | 129.000            | 18.000             |                    | 0.0020   | 11.0000   | 13.0000     | 0.0007 | 0.0030   | 0.0001 |

**MECHANICAL PROPERTIES**

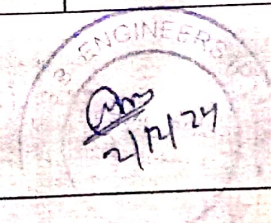
|     | TENSILE VALUES |     |     |     | IMPACT STRENGTH (IZOD/CHARPY) | HARDNESS (BHN) | JOMINY VALUES (HRC) |       |       |       |  |  |  |  | D.I. VALUE |
|-----|----------------|-----|-----|-----|-------------------------------|----------------|---------------------|-------|-------|-------|--|--|--|--|------------|
|     | YS             | UTS | %EL | %RA |                               |                | J5mm                | J10mm | J25mm | J50mm |  |  |  |  |            |
| REQ |                |     |     |     |                               |                | 39/44               | 35/40 | 27/32 | 24Min |  |  |  |  |            |
| ACT |                |     |     |     |                               |                | 42.8                | 38.2  | 30.0  | 27.4  |  |  |  |  |            |

**METALLURGICAL PROPERTIES**

| METALLURGICAL PROPERTIES                                 |                            |                      |                                      |   |   |     |     |     |     |     |     |                               |                                 |   |                          |  |
|--|----------------------------|----------------------|--------------------------------------|---|---|-----|-----|-----|-----|-----|-----|-------------------------------|---------------------------------|---|--------------------------|--|
|  | SPARK/<br>SPECTRAL<br>TEST | STEP<br>DOWN<br>TEST | MACRO ETCH<br>RESULTS(ASTM<br>E-381) | INCLUSION RATING (ASTM - E - 45 )<br>Method 'A' Plate I(Worst Fields) |   |     |     |     |     |     |     | GRAIN SIZE<br>(ASTM<br>E-112) | SURFACE<br>DEFECT<br>LEVEL (mm) | CORE<br>HARDNESS<br>(OILQUENCH<br>(HRC) | UPSET<br>TEST<br>RESULTS | TOTAL DEPTH OF<br>DECARBURIZATION<br>IN mm |
|  |                            |                      |                                      | A   |   | B   |     | C   |     | D   |     |                               |                                 |   |                          |  |
|  |                            |                      |                                      | T   | H | T   | H   | T   | H   | T   | H   |                               |                                 |   |                          |  |
| REQ  | OK                         | NA                   | C2R2S2Max                            |   |   | 2.0 | 1.0 | 0.5 | 0.5 | 1.0 | 1.0 | 5 and finer                   | OK                              | NA                                      | NA                       | NA   |
| ACT  | OK                         | NA                   | <C2/R2/S2                            |   |   | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 | 0.5 | 7.0                           | OK                              | NA                                      | NA                       | NA   |
| 5 INCLUSION RATING AS PER ISO 4967, REQ DS: 2MX, ACT:0.5 |                            |                      |                                      |   |   |     |     |     |     |     |     |                               |                                 |   |                          |  |

REMARKS: 1.BLOOM SIZE:240X280MM2.REDUCTION RATIO:1:15.21  
2.MPI TEST:100% DONE & FOUND OK.  
3.GRAIN SIZE:PREPARATION ACCORDING TO ZF15-53:TESTING ACCORDING TO ZFN 5016.  
100% 5& FINER FINER 4.ACT %NB : 0.0021.  
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:0.5  
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\_3.1"  
9."THE HEAT IS RELEAED BY ZF"



**AUTHORISED SIGNATORY**

**K.POMESH(Sr.GM-QAD)**

**PREPARED BY**

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