

|                            |                               |                           |                         |                   |
|----------------------------|-------------------------------|---------------------------|-------------------------|-------------------|
| Sample Result Name         | Type                          | Measure Date Time         | Recalculation Date Time | Origin            |
| 9860 (DIA-56MM) HNO-312029 | Unknown                       | Saturday, August 30, 2014 | 11:35:24 AM             | Measured          |
| Method Name                | Method Version                | Operator Name             | Check Type              | Check Status      |
| Fe-30-MO                   |                               | SARA SAE                  | None                    |                   |
| Grade Verification Name    | Grade Verification Similarity | Correction Type           | Type Corr Sample Name   | Grade Search Name |
|                            | 0                             | None                      |                         |                   |
| Grade Search Similarity    | Type                          | Status                    | Outlier Removal         |                   |
| 0                          | None                          | Not Used                  |                         |                   |

Sample Name  
9860 (DIA-56MM) HNO-312029

|         | C     | Si    | Mn    | P     | S     | Cr     | Mo     | Ni    | Al    | Co     | Cu     | Nb     | Ti      | V      | W      | Pb     | Sn    | As    | Zr     |
|---------|-------|-------|-------|-------|-------|--------|--------|-------|-------|--------|--------|--------|---------|--------|--------|--------|-------|-------|--------|
|         | Conc  | Conc  | Conc  | Conc  | Conc  | Conc   | Conc   | Conc  | Conc  | Conc   | Conc   | Conc   | Conc    | Conc   | Conc   | Conc   | Conc  | Conc  | Conc   |
| 1       | 0.20  | 0.21  | 0.37  | 0.032 | 0.046 | <0.005 | <0.003 | 0.031 | 0.010 | <0.005 | <0.002 | <0.005 | <0.0010 | <0.002 | <0.040 | <0.010 | 0.050 | 0.016 | <0.003 |
| 2       | 0.17  | 0.19  | 0.35  | 0.028 | 0.039 | <0.005 | <0.003 | 0.031 | 0.009 | <0.005 | <0.002 | <0.005 | <0.0010 | <0.002 | <0.040 | <0.010 | 0.041 | 0.013 | <0.003 |
| 4       | 0.18  | 0.20  | 0.36  | 0.033 | 0.044 | <0.005 | <0.003 | 0.025 | 0.012 | <0.005 | <0.002 | <0.005 | <0.0010 | <0.002 | <0.040 | <0.010 | 0.052 | 0.016 | <0.003 |
| 5       | 0.17  | 0.20  | 0.36  | 0.033 | 0.043 | <0.005 | <0.003 | 0.024 | 0.009 | <0.005 | <0.002 | <0.005 | <0.0010 | <0.002 | <0.040 | <0.010 | 0.054 | 0.015 | <0.003 |
| Rep     | 0.18  | 0.20  | 0.36  | 0.032 | 0.043 | <0.005 | <0.003 | 0.028 | 0.010 | <0.005 | <0.002 | <0.005 | <0.0010 | <0.002 | <0.040 | <0.010 | 0.049 | 0.015 | <0.003 |
| Min Cal | 0.006 | 0.005 | 0.004 | 0.003 | 0.002 | 0.005  | 0.003  | 0.005 | 0.003 | 0.005  | 0.002  | 0.005  | 0.0010  | 0.002  | 0.040  | 0.010  | 0.002 | 0.005 | 0.003  |
| Mean    | 0.18  | 0.20  | 0.36  | 0.032 | 0.043 | <0.021 | <0.018 | 0.028 | 0.010 | <0.006 | 0.002  | <0.055 | <0.013  | <0.018 | <0.18  | <0.006 | 0.049 | 0.015 | <0.001 |
| Max Cal | 3.00  | 5.04  | 18.12 | 0.18  | 0.30  | 36.00  | 10.20  | 55.2  | 6.24  | 21.60  | 7.44   | 3.60   | 3.60    | 12.00  | 7.32   | 0.13   | 0.27  | 0.13  | 0.19   |

|         | Ca      | B      | Fe   |
|---------|---------|--------|------|
|         | Conc    | Conc   | Conc |
| 1       | 0.004   | 0.005  | 99.0 |
| 2       | <0.0005 | 0.004  | 99.0 |
| 4       | 0.0005  | 0.005  | 99.0 |
| 5       | <0.0005 | 0.005  | 99.0 |
| Rep     | 0.001   | 0.005  | 99.0 |
| Min Cal | 0.0005  | 0.0005 |      |
| Mean    | 0.001   | 0.005  | 99.4 |
| Max Cal | 0.016   | 0.025  |      |

Quality in 1010 as per  
986 21-747  
Duplex



**RASHTRIYA ISPAT NIGAM LIMITED**  
**VISAKHAPATNAM STEEL PLANT**  
**QUALITY ASSURANCE & TECHNOLOGY DEVELOPMENT DEPARTMENT**  
**VISAKHAPATNAM STEEL PLANT**

18686

**TEST CERTIFICATE**

PAGE 1 OF

| DETAILS                                                        |  |  |  | CUSTOMER/DESTINATION                                                                                                                                          |  |  |  | WAGON/TRUCK/TRAILOR NUMBERS |  | R.R. WEIGHT (T) |  |
|----------------------------------------------------------------|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|-----------------------------|--|-----------------|--|
| T.C.NO: QMS/R/QAD/RM/15/M/2014-15/9180/000065 DATE: 22.08.2014 |  |  |  | SARA SAE PRIVATE LIMITED UNIT - II,<br>A-2, SARA INDUSTRIAL ESTATE LIMITED, RAMPUR, CHAKRATA<br>ROAD, SELAQUI, DEHRADUN, Dehradun-Dist,<br>Uttarakhand, India |  |  |  | UK07CA 3830.                |  | 7.870           |  |
| INV NO: 7180400490                                             |  |  |  | DATE: 22.08.2014                                                                                                                                              |  |  |  |                             |  |                 |  |

| HEAT /<br>LOT<br>NUMBER | SECTION | NOMINAL<br>SIZE<br>(mm) | NO. OF<br>COILS/<br>BUNDLES/<br>BILLETS/<br>BLOOMS | CHEMICAL COMPOSITION |       |       |       |       |       |       |       |       |      | MECHANICAL PROPERTIES |      |     |              |                     | COLOR<br>CODE | GRAD<br>DESIGNA |
|-------------------------|---------|-------------------------|----------------------------------------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|-----------------------|------|-----|--------------|---------------------|---------------|-----------------|
|                         |         |                         |                                                    | C                    | MIN   | P     | S     | SI    | AL    | CR    | CU    | CE    | YS   | UTS                   | %EL  | RA  | BEND<br>TEST | RE-<br>BEND<br>TEST |               |                 |
| 312029                  | MP      | 56                      | 1                                                  | 0.100                | 0.410 | 0.016 | 0.013 | 0.160 | 0.043 | 0.008 | 0.000 | 0.170 | 0270 | 0379                  | 0029 | --- | NA           | NA                  | BLACK+PINK    | SAE1010         |

| STANDARD SPECIFICATION: |               |               |          |          |          |               |          |    |              |  |  |  |  |  |  |  |  |
|-------------------------|---------------|---------------|----------|----------|----------|---------------|----------|----|--------------|--|--|--|--|--|--|--|--|
| CHEMICAL                | C             | Mn            | P        | S        | Si       | Al            | Cr       | Cu | Ce           |  |  |  |  |  |  |  |  |
|                         | 0.080 - 0.130 | 0.300 - 0.600 | <= 0.040 | <= 0.050 | <= 0.300 | 0.020 - 0.150 | <= 0.050 | NA | 0.130 - 0.20 |  |  |  |  |  |  |  |  |
| MECHANICAL              | YS            | UTS           | %EL      | RA       |          |               |          |    |              |  |  |  |  |  |  |  |  |
|                         | 200 - 380     | 300 - 450     | >= 20    | >= 20    |          |               |          |    |              |  |  |  |  |  |  |  |  |

THE MATERIAL SUPPLIED CONFORMS TO THE STANDARD ROLLING AND MASS TOLERANCES

AVERAGE WEIGHT OF EACH BUNDLE/COIL/BILET/BLOOM IS 7.870 TONS APPROXIMATELY

MANUFACTURING ROUTE: BOF-LF/RUT-CCM-ROUND

REDUCTION RATIO: 24.36 : 1

Quality in 1010  
per sec 26-742  
Rashtriya

**RASHTRIYA ISPAT NIGAM LTD.**  
1<sup>st</sup> FLOOR, 27-E.C. ROAD,  
DEHRADUN-248001  
TIN No.-05001202922 TNAM STEEL PLANT  
FOR (QA & QC)  
DEHRADUN-248001