#1 10070

# SPECTRO Sample Results

| Sample Result Name | Type | Measure Date Time | Recalculation Date Time | Origin |
|---|---|---|---|---|
| 10070 -C ( HNO-20977) R-54 RAHIL | Unknown | Saturday, September 27, 2014 | 5:49:39 PM | Measured |
| **Method Name** | **Method Version** | **Operator Name** | **Check Type** | **Check Status** |
| Fe-10-MO | | SARA SAE | None | Not Used |
| **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 | Grade |
|---|---|
| 10070 -C ( HNO-20977) R-54 RAHIL | |

| | C Conc % | Si Conc % | Mn Conc % | P Conc % | S Conc % | Cr Conc % | Mo Conc % | Ni Conc % | Al Conc % | Co Conc % | Cu Conc % | Nb Conc % | Ti Conc % | V Conc % | W Conc % | Pb Conc % | Sn Conc % | As Conc % | Zr Conc % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.080 | 0.057 | 0.37 | 0.039 | 0.029 | 0.032 | <0.003 | 0.019 | 0.056 | <0.002 | 0.007 | 0.005 | <0.0010 | 0.005 | 0.034 | <0.010 | <0.002 | <0.005 | <0.003 |
| 3 | 0.077 | 0.055 | 0.39 | 0.027 | 0.024 | 0.010 | <0.003 | <0.005 | 0.049 | <0.002 | 0.003 | 0.010 | <0.0010 | 0.006 | 0.036 | <0.010 | 0.002 | <0.005 | <0.003 |
| 4 | 0.093 | 0.038 | 0.23 | 0.053 | 0.018 | 0.006 | <0.003 | 0.021 | 0.19 | 0.003 | 0.008 | <0.003 | 0.002 | 0.003 | 0.047 | <0.010 | <0.002 | 0.013 | <0.003 |
| Rep | 0.083 | 0.050 | 0.33 | 0.040 | 0.024 | 0.016 | 0.003 | 0.015 | 0.097 | 0.002 | 0.006 | 0.006 | 0.001 | 0.005 | 0.039 | <0.010 | 0.002 | 0.008 | 0.003 |
| Min Cal | 0.005 | 0.005 | 0.004 | 0.003 | 0.002 | 0.005 | 0.003 | 0.005 | 0.003 | 0.002 | 0.002 | 0.003 | 0.0010 | 0.002 | 0.030 | 0.010 | 0.002 | 0.005 | 0.003 |
| Mean | 0.083 | 0.050 | 0.33 | 0.040 | 0.024 | 0.016 | <-0.0008 | 0.012 | 0.097 | <0.001 | 0.006 | 0.005 | <0.0009 | 0.005 | 0.039 | <-0.0003 | <0.001 | <0.002 | <0.001 |
| Max Cal | 1.80 | 24.00 | 2.76 | 0.16 | 0.30 | 10.10 | 10.20 | 6.48 | 2.40 | 2.52 | 1.44 | 0.39 | 1.20 | 1.32 | 3.72 | 0.31 | 0.18 | 0.17 | 0.28 |

| | Ca Conc % | Ce Conc % | B Conc % | Zn Conc % | La Conc % | Fe Conc % |
|---|---|---|---|---|---|---|
| 1 | 0.003 | 0.012 | 0.0005 | 0.007 | 0.002 | 99.2 |
| 3 | 0.003 | 0.017 | <0.0005 | 0.004 | 0.003 | 99.3 |
| 4 | 0.003 | 0.013 | 0.002 | 0.004 | <0.002 | 99.2 |
| Rep | 0.003 | 0.014 | 0.001 | 0.005 | 0.002 | 99.2 |
| Min Cal | 0.0005 | 0.006 | 0.0005 | 0.003 | 0.002 | |
| Mean | 0.003 | 0.014 | 0.0005 | 0.005 | 0.002 | 99.3 |
| Max Cal | 0.016 | 0.66 | 0.018 | 0.036 | 0.27 | |

Qualify in 1008 as per SES 21-615

Dabale

0227

# USHA MARTIN LIMITED

P.O. GAMHARIA,DIST.-SARAIKELA KHARASWAN, JAMSHEDPUR--832108 JHARKHAND. PHONE 0657-3982229

## TEST CERTIFICATE

F/BM-QA/04

| | | | | | |
|---|---|---|---|---|---|
| Customer | | | | | |
| TC NO :- 17286 | Challan No | | Quantity | Rolling Input | 200 x 240 mm |
| Batch No : 972098 | | | P.O. NO / Date | | |
| PROCESS ROUTE :- | MBF/EAF/LF/VD/CCP/RM | | Size 100 MM | | |
| Heat NO 20977 | Specification code:- | | Product : ROUND | Colour Code | BLUE + WHITE + RED |
| Prod Dt 02/07/2014 | Grade : SAE 1008 | Rev. | Condition HOT ROLLED | | |

CHEMICAL COMPOSITION

| Element | %C | %Mn | %Si | %P | %S | %Cr | %Ni | %Cu | %Mo | %Al | %Pb | %V | %Ti | %Ca |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min. | | 0.025 | | | | | | | | | | | | |
| Max. | 0.08 | 0.40 | | 0.040 | 0.050 | | | | | | | | | |
| Actual | 0.07 | 0.33 | 0.053 | 0.006 | 0.007 | 0.015 | 0.01 | 0.01 | | 0.031 | | | | |

OTHER ELEMENTS

| Element | %Sn | %As | %Sb |
|---|---|---|---|
| Min | | | |
| Max | | | |
| Actual | | | |

| | GAS LEVEL | | |
|---|---|---|---|
| | $O_2$ PPM | $H_2$ PPM | $N_2$ PPM |
| MIN | | | |
| MAX | | | |
| ACTUAL | | | |

MECHANICAL PROPERTIES

| Requirement | Hardness (BHN) | Impact Strength (IZOD/CHARPY) (Joules ) | Yield Strength (Kg/mm²) Mpa | UTS (Kg/mm²) /Mpa | %E | %RA |
|---|---|---|---|---|---|---|
| Min | | | | | | |
| Max. | | | | | | |
| Act. Min | | | | | | |
| Act. Max | | | | | | |

JOMINY HARDENABILITY ( HRC )

| | | | | | | |
|---|---|---|---|---|---|---|
| Min. | | | | | | |
| Max. | | | | | | |
| Actual | | | | | | |

METALLURGICAL PROPERTIES

| Requirement | Depth of Decarb (mm) | Macro Etch (ASTM E-381) | Max. Depth of Surface Defect(%) | Grain Size (ASTM E-112) | |
|---|---|---|---|---|---|
| Min. | | | | 5 | |
| Max. | | | | 8 | SPEC |
| Actual | | | | 7 | ACTUAL |

INCLUSION RATING AS PER ASTM-E-45

| | A | | B | | C | | D | |
|---|---|---|---|---|---|---|---|---|
| | T | H | T | H | T | H | T | H |
| SPEC | | | | | | | | |
| ACTUAL | 1.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 |

| | |
|---|---|
| Spark & Spectral Test: | 100% |
| Surface Inspection | 100% as per Spec. |
| Ultrasonic Test | |

Other Tests:

| | |
|---|---|
| 1. Magnaflux: | 100% |
| 2. Step Turn: | |
| 3. Blue Fracture: | |
| 4. Upset Test: | |

Hardness after Heat treatment of sample.

| | |
|---|---|
| Requirement | |
| Actual in BHN | |

Remarks: REDUCTION RATIO : 6.11 :1, SIZE TOLERANCE -- (+0.90) (-0.0) , OUT OF ROUNDNESS-- 0.50

Length of Bar 3.0 TO 6.0 MTRS.

Test certificate meets TDC. Results based on sample testing

Officer QA



Sahil Industries Dist. Jaipur METODA