

HAPPY FORGINGS LIMITED, LUDHIANA

METTALURGICAL TEST REPORT

RAW MATERIAL BILLET/FORGINGS

(FROM SUB CONTRACTOR)

(DOC. NO. FM:HT-LB-11)

| | | | | | | |
|-------------|-----|-----------------------|--|--|--------------------|-----------------|
| CUSTOMER | M/s | VE Commercial (Dewas) | | | REPORT NO. | 8554 |
| STEEL MILL | M/S | Aarti steels | | | DATE | 16.02.2018 |
| CHALLAN NO. | | | | | SECTION SIZE | 80 DIA |
| HEAT NO. | | 6297 | | | NO. OF BARS/BILLET | |
| GRADE | | EN 353 | | | LENGTH RANGE | 4.5 TO 5.5 MTRS |
| QTY | | | | | COLOUR CODE | BLUE+WHITE BASE |
| PART NO. | | 5647/5626 | | | | |

HAPPY CHEMICAL PROPERTIES

| | | | | | | | | |
|--------------|------|------|-------|-------|-------|------|------|------|
| SPEC. | C% | Mn% | Si% | S% | P% | Cr% | Ni% | Mo% |
| MIN. | | 0.5 | | | | 0.75 | 1 | 0.08 |
| MAXIMUM | 0.2 | 1 | 0.35 | 0.05 | 0.05 | 1.25 | 1.5 | 0.15 |
| HFL OBSERVED | 0.18 | 0.86 | 0.205 | 0.022 | 0.021 | 1.1 | 1.08 | 0.12 |

HAPPY PHYSICAL PROPERTIES

| | | | | | | | | |
|-----------------------|----------|--|--|--|--|--|--|--|
| INTERNAL SOUNDNESS | C2 R1 S1 | | | | | | | |
| GRAIN FLOW | | | | | | | | |
| SURFACE HARDNESS(BHN) | | | | | | | | |
| UPSETTING TESTING | OK | | | | | | | |

HAPPY METALLOGRAPHY

| | | | | | | | | |
|------------------------|--------|-----|----|-----|----|----|----|----|
| GRAIN SIZE-ASTM E-112 | ASTM-7 | | | | | | | |
| | A | | B | | C | | D | |
| INCLUSION RATING WORST | TK | TN | TK | TN | TK | TN | TK | TN |
| FIELD AS PER ASTM E-45 | 0.5 | 1.5 | 0 | 0.5 | 0 | 0 | 0 | 1 |

HAPPY JOMINY TRASVELET

| | | | | | | | | |
|------------------|--|-------|--|--|--|--|--|--|
| DIST. | | J4/16 | | | | | | |
| SPEC. | | 40/44 | | | | | | |
| HFL OBSERVED HRC | | 41.5 | | | | | | |

REMARKS MILL T. C. ENCLOSED

AUTHORISED SIGNATORY