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| HAPPY FORGINGS LIMITED, LUDHIANA | | | | METTALURGICAL TEST REPORT | | | | |
| | | | | RAW MATERIAL BILLET/FORGINGS | | | | |
| | | | | (FROM SUB CONTRACTOR) | | | | |
| | | | | (DOC. NO. FM:HT-LB-11) | | | | |
| | | VE COMM. (Deras) | | | | | | |
| STEEL MILL | JSW | | | REPORT NO. | 226515 | | | |
| CHALLAN NO. | | | | DATE | 29.01.2018 | | | |
| HEAT NO. | A-4596 | | | SECTION SIZE | 110 RCS | | | |
| GRADE | 20MnCr5 | | | NO. OF BARS/BILLET | | | | |
| QTY. | | | | LENGTH RANGE | 4.5 TO 5.5 MTRS | | | |
| PART NO. | 77191 | | | COLOUR CODE | WHITE BASE+RED DOT | | | |
| CHEMICAL PROPERTIES | | | | | | | | |
| SPEC. | C% | Mn% | Si% | S% | P% | Cr% | Ni% | Mo% |
| MIN. | 0.17 | 1.10 | 0.15 | - | - | 1.00 | | |
| MAX | 0.22 | 1.40 | 0.35 | 0.035 | 0.035 | 1.30 | | |
| OBSERVED | 0.18 | 1.26 | 0.248 | 0.024 | 0.015 | 1.26 | 0.022 | 0.005 |
| PHYSICAL PROPERTIES | | | | | | | | |
| INTERNAL SOUNDNESS | C2 R1 S1 | | | | | | | |
| GRAIN FLOW | | | | | | | | |
| SURFACE HARDNESS(BHN) | | | | | | | | |
| UPSETTING TESTING | OK | | | | | | | |
| METALLOGRAPHY | | | | | | | | |
| GRAIN SIZE-ASTM E-112 | ASTM-7 | | | | | | | |
| INCLUSION RATING WORST FIELD AS PER ASTM E-45 | A | | B | | C | | D | |
| | TK | TN | TK | TN | TK | TN | TK | TN |
| | 0.5 | 1.5 | 0 | 0.5 | 0 | 0 | 0 | 1 |
| JOMINY TRASVELET | | | | | | | | |
| DISTT. | | | J11MM | | | | | |
| SPEC. | | | 32-36 | | | | | |
| HRC | | | 32 | | | | | |
| INSPECTION RESULT OF BILLET&BARS | | | | | | | | |
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| REMARKS | | MILL T. C. ENCLOSED | | | | | | |
| AUTHORISED SIGNATURE | | | | | | | | |