

M M FORGINGS LIMITED

INCOMING METALLURGICAL INSPECTION REPORT

Lot No : 010000339387 Mat.Des: RM - 42CRMO4, 75RCS REV.01

SI.No:0

Matl: MA003L01075.0R Supplier Supp TC No 228367 Heat Number: E71505 ICIN Number: 5000352456 : JSW Steel Limited

| PO Number | : 45 | 00012 | 827 | Size: | : 75.0 | 75.000 RCS Supp TC date: 17:01:2018 | | | | | | | | | | | | | Qty in MT : | | | 7.060 Ba | | | atch : 0000657336 | | | | | | |
|---------------|---------------------------|--------|--------|--------|--------|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|------|------|------|--------|----|-------------|----|--------|----------------|---|----|-------------------|--------------|--------|--------|-----|-----|--|
| | Chemical composition in % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | n | Mn | Si | P | ន | Ni | Cr | Мо | V | Cu | Nb | В | Al | Ti | Co | Sn | Fe | Sb | Pb | As | Ca | W | Zr | Ta | N2 | н2 | 02 | CE1 | CE2 | |
| As per Spec. | Min | 0.3800 | 0.6000 | 0.1500 | | 0.0200 | | 0.9000 | 0.1500 | | | | | | | | | | | | 0.0000 | | | | | | | | | | |
| | Max | 0.4500 | 0.9000 | 0.4000 | 0.0250 | 0.0350 | 0.2000 | 1.2000 | 0.3000 | 0.0300 | 0.3500 | | | | | | 0.0300 | | 0.0100 | | 0.0100 | | | | | 0.0100 | 0.0002 | 0.0020 | | | |
| Act. Analysis | 1 | 0.4020 | 0.7450 | 0.2230 | 0.0090 | 0.0220 | 0.0090 | 1.1100 | 0.2230 | 0.0050 | 0.0110 | | | | | | 0.0020 | | | | 0.0050 | | | | | | | | | | |
| | 2 | 0.4100 | 0.7460 | 0.2190 | 0.0080 | 0.0220 | 0.0100 | 1.1200 | 0.2160 | 0.0040 | 0.0110 | | | | | | 0.0020 | | | | 0.0050 | | | | | | | | | | |
| | 3 | 0.4050 | 0.7240 | 0.2220 | 0.0090 | 0.0210 | 0.0120 | 1.1000 | 0.2160 | 0.0030 | 0.0120 | | | | | | 0.0020 | | | | 0.0050 | | | | | | | | | | |
| | 4 | 0.4030 | 0.7440 | 0.2300 | 0.0080 | 0.0220 | 0.0140 | 1.1100 | 0.2130 | 0.0040 | 0.0120 | | | | | | 0.0020 | | | | 0.0050 | | | | | | | | | | |
| | 5 | 0.4020 | 0.7400 | 0.2250 | 0.0100 | 0.0210 | 0.0120 | 1.1200 | 0.2140 | 0.0020 | 0.0100 | | | | | | 0.0020 | | | | 0.0050 | | | | | | | | | | |
| As per To | 1 | 0.4020 | 0.7420 | 0.2270 | 0.0110 | 0.0230 | 0.0240 | 1.1100 | 0.2150 | 0.0020 | 0.0130 | | | | | | 0.0050 | | | | 0.0010 | | | | | 0.0060 | 0.0001 | 0.0011 | | | |
| | Vi | sual | | | | | | | 5 | Size & | Surfac | e sati | sfacto | ry | | | | | | | s | Shearabilit NA | | | | Forgeability | | | | OK | |
| _ | | | | | | | | | | | 1 | 4ech | anic | al p | rope | rtie | es | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | UTS | YS | El | RA | Izod | | Charpy Impact | :-1 | Charpy Ipmact | -2 | RM | Upset | H/T |
|---------------------|-----|----------|--------|-------|-------|-------|-------|---------------|-------|----------------------|-------|----------|----------|----------|
| | | (Mpa) | (Mpa) | (%) | (%) | Joule | T(°C) | Joule | T(°C) | Joule | T(°C) | Hardness | Hardness | Hardness |
| As per Spec. | Min | 900.00 | 705.00 | 12.00 | 48.00 | | | | | | | 179 | 179 | 264 |
| | Max | 1,095.00 | | | | | | | | | | 285 | 285 | 327 |
| Tested Value | | 967.75 | 758.77 | 26.00 | 59.04 | | | | | | | 223 | 229 | 277 |
| As per TC | | 978.00 | 767.00 | 22.00 | 56.00 | | | | | | | | | |

| N | Micro | | |
|---|-------|--|--|
| | | | |

| Inclusion rating | | | A | | | В | | C | | D | | | Grain size | | | Decarb | | | | Macro | | | | Step Down | | | | Bend Test | | | |
|-------------------------|------|------------|------------|----|------------|---|----|------------|--|------------|------------|--|------------|--------|--|--------|------|--|--|-------|--------|--|--|-----------|--|--|--|-----------|--|--|--|
| (%) | | | n/Thi | ck | Thin/Thick | | ck | Thin/Thick | | ck | Thin/Thick | | | (ASTM) | | | (mm) | | | | | | | | | | | | | | |
| As per Spec. Min | | | | | | | | | | | 5.00 | | | | | | | | | | | | | | | | | | | | |
| Max | | 2.00 /1.00 | |) | 2.00 /1.00 | |) | 0.50 /0.50 | | 1.00 /1.00 | | | 8.00 | | | | | | | | | | | | | | | | | | |
| Tested Value | | 1.00 /0.50 | |) | 1.00 /- | | | - /- | | | 1.00 /- | | | 7.00 | | | | | | | C2S2R2 | | | | | | | | | | |
| As Per TC Value | | 2.0 | 2.00 /0.50 | | 0.50 /- | | | - /- | | | 0.50 /- | | | 7.00 | | | | | | | C2S2R2 | | | | | | | | | | |
| Jominy hardenability | 9.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| As per spec min | 52.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| max | 60.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tested Value | 54.0 | | | | | | | | | | | | | | | | | | | Ì | | | | | | | | | | | |
| As per TC Value | 55.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Any other test specified :100% UT & MPI Tested at supplier end

Our RM color code: Yellow / Light Green

Remarks:Material accepted

Heat code allocated: YXN

Head Metallurgy Tested By :LAB2 Lot Cleared Date:13.02.2018