

|                        |                        |                       |
|------------------------|------------------------|-----------------------|
| <b>Quality</b>         | <b>Cf 53</b>           | <i>Technical card</i> |
| According to standards | <b>DIN 17212: 1972</b> | <i>Lucefin Group</i>  |
| Number                 | <b>1.1213</b>          |                       |

### Chemical composition

| C%        | Si%       | Mn%       | P%<br>max | S%<br>max |                                |
|-----------|-----------|-----------|-----------|-----------|--------------------------------|
| 0,50-0,57 | 0,15-0,35 | 0,40-0,70 | 0,025     | 0,035     | Product deviations are allowed |
| ± 0.03    | ± 0.03    | ± 0.04    | + 0.005   | + 0.005   |                                |

### Temperature °C

| Hot-forming                | Normalizing                                             | Quenching     | Quenching                     | Tempering           | Stress-relieving               |
|----------------------------|---------------------------------------------------------|---------------|-------------------------------|---------------------|--------------------------------|
| 1050-850                   | 860<br>air                                              | 830<br>water  | 860<br>oil or polymer         | 550-660<br>air      | 180                            |
| Soft annealing             | Isothermal annealing                                    | Natural state | End quench hardenability test | Pre-heating welding | Stress-relieving after welding |
| 700<br>air<br>(HB max 223) | 820 furnace cooling<br>to 660, then air<br>(HB 180-230) | (HB max 260)  |                               | not recommended     |                                |
|                            |                                                         |               |                               | <b>AC1</b>          | <b>AC3</b>                     |
|                            |                                                         |               |                               | 730                 | 765                            |
|                            |                                                         |               |                               |                     | <b>Ms</b>                      |
|                            |                                                         |               |                               |                     | 320                            |
|                            |                                                         |               |                               |                     | <b>Mf</b>                      |
|                            |                                                         |               |                               |                     | 100                            |

### Mechanical properties

**Hot-rolled** mechanical properties in **normalized** condition DIN 17212: 1972

| test blanks   |     | Testing at room temperature (longitudinal) |                        |           |           |          |                 |
|---------------|-----|--------------------------------------------|------------------------|-----------|-----------|----------|-----------------|
| diameter (mm) |     | <b>R</b>                                   | <b>Rp 0.2</b>          | <b>A%</b> | <b>C%</b> | <b>K</b> | <b>HB</b>       |
| from          | to  | N/mm <sup>2</sup>                          | N/mm <sup>2</sup> min. | min.      | min.      | J min.   | for information |
| 16            | 100 | 610-760                                    | 340                    | 16        |           |          | 183-226         |

**Hot-rolled** mechanical properties in **quenched and tempered** condition DIN 17212: 1972

| test blanks   |     | Testing at room temperature (longitudinal) |                       |           |           |          |                 |
|---------------|-----|--------------------------------------------|-----------------------|-----------|-----------|----------|-----------------|
| diameter (mm) |     | <b>R</b>                                   | <b>Rp 0.2</b>         | <b>A%</b> | <b>C%</b> | <b>K</b> | <b>HB</b>       |
| from          | to  | N/mm <sup>2</sup>                          | N/mm <sup>2</sup> min | min.      | min.      | J min    | for information |
|               | 16  | 740-880                                    | 510                   | 12        | 25        |          | 224-263         |
| 16            | 40  | 690-830                                    | 430                   | 14        | 35        |          | 210-249         |
| 40            | 100 | 640-780                                    | 400                   | 15        | 40        |          | 198-232         |

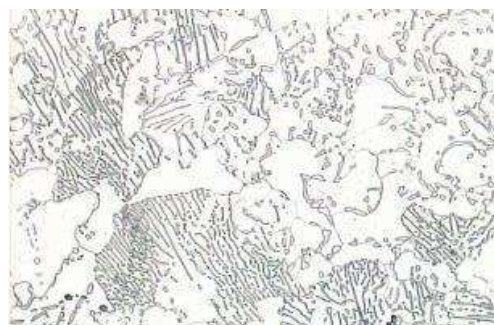
**Cold-drawn** +QT+C 070M55 BS 970 pt.3: 1991. Use only as reference

| diameter |     | Testing at room temperature (longitudinal) |                       |           |           |          |                 |
|----------|-----|--------------------------------------------|-----------------------|-----------|-----------|----------|-----------------|
| mm       |     | <b>R</b>                                   | <b>Rp 0.2</b>         | <b>A%</b> | <b>C%</b> | <b>K</b> | <b>HB</b>       |
| from     | to  | N/mm <sup>2</sup>                          | N/mm <sup>2</sup> min | min       | min.      | J min    | for information |
| 13       | 29  | 700-850                                    | 475                   | 10        |           |          | 201-255         |
| 29       | 100 | 700-850                                    | 435                   | 10        |           |          | 201-255         |

### Jominy test HRC

| mm distance from quenched extremity                                        |   |   |   |   |    |    |    |    |    |    |    |    | Min. surface hardness after hardening and stress-relieving |    |
|----------------------------------------------------------------------------|---|---|---|---|----|----|----|----|----|----|----|----|------------------------------------------------------------|----|
| 1.5                                                                        | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 |                                                            |    |
| min No indications from reference standards; use C 50E values as reference |   |   |   |   |    |    |    |    |    |    |    |    | HRC                                                        | 57 |
| max                                                                        |   |   |   |   |    |    |    |    |    |    |    |    |                                                            |    |

| EUROPE EN | ITALY UNI | CHINA GB | GERMANY DIN | FRANCE AFNOR | U.K. B.S. | RUSSIA GOST | USA AISI/SAE |
|-----------|-----------|----------|-------------|--------------|-----------|-------------|--------------|
| C53       | C53       |          | Cf53        | XC48 TS      | 070M55    |             | 1050         |



Hot-rolled steel  
Spheroidizing annealing