

**STANDARD REFERENCE:**
**UNI EN 10083-3: 2006 (Hot-rolled products) | UNI EN 10277-5: 2008 (Bright products)**
**RODACCIAI REFERENCES AND COMPARABLE STANDARDS**

|            | EUROPE                                       |        | ITALY         | GERMANY        |        | FRANCE           | UK               | USA       |
|------------|--|--------|---------------|----------------|--------|------------------|------------------|-----------|
|            | UNI EN 10083-2: 2006<br>UNI EN 10277-5: 2008 |        | (UNI 7845-78) | (DIN 17200-86) |        | (NF A 35-552-86) | (BS 970 pt.3-96) | ASTM A 29 |
|            | Grade  | N°     |               | Werkstoff      | N°     |                  |                  |           |
| <b>RK1</b> | 42CrMo4                                      | 1.7225 | 42CrMo4       | 42CrMo4        | 1.7225 | 42 CD 4          | 708M40           | 4140      |
|            | 42CrMoS4                                     | 1.7227 |               | 42CrMoS4       | 1.7227 |                  |                  |           |

**CHEMICAL COMPOSITION (CAST ANALYSIS) (%)**

|              | Europe     | C         | Si / max | Mn        | P / max | S           | Cr        | Mo        | Al          | Pb        |
|--------------|------------|-----------|----------|-----------|---------|-------------|-----------|-----------|-------------|-----------|
| <b>RK1</b>   | 42CrMo4    | 0,38÷0,45 | 0,40     | 0,60÷0,90 | 0,025   | ≤ 0,035     | 0,90÷1,20 | 0,15÷0,30 | 0,020÷0,050 | -         |
|              | 42CrMoS4   |           |          |           |         | 0,020÷0,040 |           |           |             | -         |
| <b>RK1Pb</b> | 42CrMoS4Pb |           |          |           |         | 0,020÷0,040 |           |           |             | 0,15÷0,30 |

**MECHANICAL PROPERTIES - AS ROLLED CONDITION**

| Size<br>mm  | HB max to condition:                    |                     | Quenched and tempered (+QT) |                      |                        |           |            |
|-------------|---|---------------------|-----------------------------|----------------------|------------------------|-----------|------------|
|             | Treated to improve<br>shearability (+S) | Soft annealing (+A) | R <sub>p0,2</sub> (MPa) min | R <sub>m</sub> (MPa) | A <sub>5</sub> (%) min | Z (%) min | KV (J) min |
| ≤ 16        | 255                                     | 241                 | 900                         | 1100÷1300            | 10                     | 40        | 30         |
| > 16 ≤ 40   | 255                                     | 241                 | 750                         | 1000÷1200            | 11                     | 45        | 35         |
| > 40 ≤ 100  | 255                                     | 241                 | 550                         | 900÷1100             | 12                     | 50        | 35         |
| > 100 ≤ 160 | 255                                     | 241                 | 550                         | 800÷950              | 13                     | 50        | 35         |
| > 160 ≤ 250 | 255                                     | 241                 | 550                         | 750÷900              | 14                     | 55        | 35         |

\*Depending on the chemical composition of the cast, and on the dimension, particularly in the case of the +HH grades, soft annealing can be necessary

**MECHANICAL PROPERTIES - BRIGHT PRODUCTS CONDITION**

| Size<br>mm | as Rolled + Turned (+A +SH) | Quenched + Tempered<br>+ Turned (+QT+SH)** |                      |                        | Quenched + Tempered<br>+ Cold Drawn (+QT +C) |                      |                        | as Rolled + Cold Drawn(+A +C) |
|------------|-----------------------------|--|----------------------|------------------------|--|----------------------|------------------------|-------------------------------|
|            | Hardness HB max             | R <sub>p0,2</sub> (MPa) min                | R <sub>m</sub> (MPa) | A <sub>5</sub> (%) min | R <sub>p0,2</sub> (MPa) min                  | R <sub>m</sub> (MPa) | A <sub>5</sub> (%) min | Hardness HB max               |
| ≥ 5 ≤ 10   | -                           | -  | -                    | -                      | 770  | 1000÷1200            | 8                      | 300                           |
| > 10 ≤ 16  | -                           | -  | -                    | -                      | 750  | 1000÷1200            | 8                      | 290                           |
| > 16 ≤ 40  | 241                         | 750  | 1000÷1200            | 11                     | 720  | 1000÷1200            | 9                      | 285                           |
| > 40 ≤ 63  | 241                         | 650  | 900÷1100             | 12                     | 650  | 900÷1100             | 10                     | 280                           |
| > 63 ≤ 100 | 241                         | 650  | 900÷1100             | 12                     | 650  | 900÷1100             | 10                     | 280                           |

\*For reference only \*\*This values are valid also for Cold Drawn - Quenched + Tempered Condition (+C +QT)  
For size <5 mm the mechanical properties may be agreed at the time of enquiry and order

**WORKING TEMPERATURES RECOMMENDED**

| Operation | Hot forgings<br>deformation | Isothermal annealing | Soft annealing | Quenching in oil | Tempering |
|-----------|-----------------------------|----------------------|----------------|------------------|-----------|
| °C        | 850÷1150                    | 830÷860 → 650        | 680÷720        | 830÷850          | 550÷650   |

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**DIRECT-HARDENING**  
**ALLOYED**

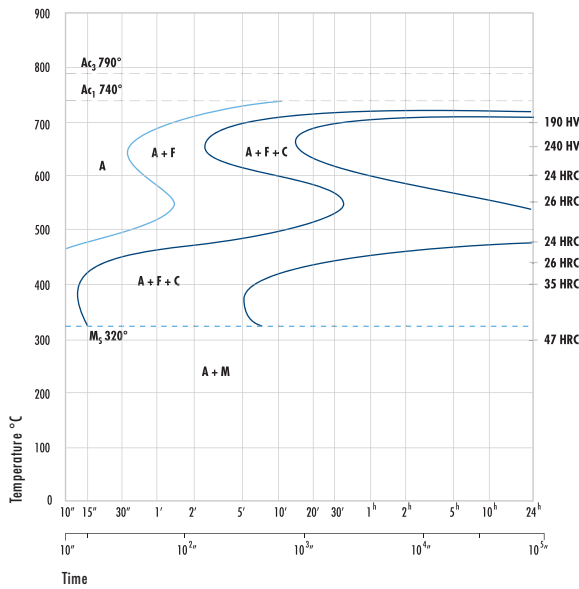
Rodacciai name

**RK1 - RK1Pb**
**3206**

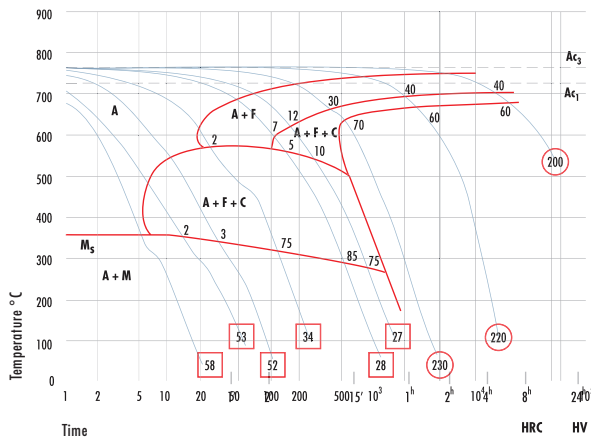
## HARDNESS LIMITS (JOMINY TEST)

| Limits of range | Hardness HRC at a distance from quenched end of test pieces (mm) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                 | 1,5  | 3  | 5  | 7  | 9  | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |    |
| +H              | Max  | 61 | 61 | 61 | 60 | 60 | 59 | 59 | 58 | 56 | 53 | 51 | 48 | 47 | 46 | 45 |
|                 | Min  | 53 | 53 | 52 | 51 | 49 | 43 | 40 | 37 | 34 | 32 | 31 | 30 | 30 | 29 | 29 |
| +HH             | Max  | 61 | 61 | 61 | 60 | 60 | 59 | 59 | 58 | 56 | 53 | 51 | 48 | 47 | 46 | 45 |
|                 | Min  | 56 | 56 | 55 | 54 | 52 | 48 | 46 | 44 | 41 | 39 | 38 | 36 | 36 | 35 | 34 |
| +HL             | Max  | 58 | 58 | 58 | 57 | 56 | 54 | 53 | 51 | 49 | 46 | 44 | 42 | 41 | 40 | 40 |
|                 | Min  | 53 | 53 | 52 | 51 | 49 | 43 | 40 | 37 | 34 | 32 | 31 | 30 | 30 | 29 | 29 |

### TTT



### CCT



### TEMPERING CURVE

