

STANDARD REFERENCE:
UNI EN 10084: 2008 (Hot-rolled products)
RODACCIAI REFERENCES AND COMPARABLE STANDARDS

| | EUROPE | | ITALY | GERMANY | | FRANCE | UK | USA |
|-----|-----------------|--------|---------------|----------------|--------|------------------|------------------|-----------|
| | UNI 10084: 2008 | | (UNI 7845-78) | (DIN 17200-86) | | (NF A 35-552-86) | (BS 970 pt.3-96) | ASTM A 29 |
| RD6 | Grade | N° | 35CrMo4 | Werkstoff | N° | | | |
| | 34CrMo4 | 1.7220 | | 34CrMo4 | 1.7220 | 35 CD 4 | - | 4135 |
| | 34CrMoS4 | 1.7226 | | 34CrMoS 4 | 1.7226 | | | |

CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

| | Europe | C | Si / max | Mn | P / max | S | Cr | Mo | Al | Pb |
|-------|------------|-----------|----------|-----------|---------|-------------|-----------|-----------|-------------|-----------|
| RB2 | 34CrMo4 | | | | | ≤ 0,035 | | | | - |
| | 34CrMoS4 | 0,30÷0,37 | 0,40 | 0,60÷0,90 | 0,025 | 0,020÷0,040 | 0,90÷1,20 | 0,15÷0,30 | 0,020÷0,050 | - |
| RD6Pb | 34CrMoS4Pb | | | | | 0,020÷0,040 | | | | 0,15÷0,30 |

MECHANICAL PROPERTIES - AS ROLLED CONDITION*

| Size mm | HB max to condition: | | Quenched and tempered (+QT) | | | | |
|-------------|--|---------------------|-----------------------------|--------------------------|------------------------|-----------|------------|
| | Treated to improve shearability (+S)** | Soft annealing (+A) | R _{p0,2} (MPa) min | R _m (MPa) min | A ₅ (%) min | Z (%) min | KV (J) min |
| ≤ 16 | 255 | 223 | 800 | 1000÷1200 | 11 | 45 | 35 |
| > 16 ≤ 40 | 255 | 223 | 650 | 900÷1100 | 12 | 50 | 40 |
| > 40 ≤ 100 | 255 | 223 | 550 | 800÷950 | 14 | 55 | 45 |
| > 100 ≤ 160 | 255 | 223 | 500 | 750÷900 | 15 | 55 | 45 |
| > 160 ≤ 250 | 255 | 223 | 450 | 700÷850 | 15 | 60 | 45 |

*For reference only

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

MECHANICAL PROPERTIES - BRIGHT PRODUCTS CONDITION*

| Size mm | as Rolled + Turned (+A +SH) | Quenched + Tempered + Turned (+QT+SH)** | | | Quenched + Tempered + Cold Drawn (+QT +C) | | | as Rolled + Cold Drawn(+A +C) |
|------------|-----------------------------|---|----------------------|------------------------|---|----------------------|------------------------|-------------------------------|
| | Hardness HB max | R _{p0,2} (MPa) min | R _m (MPa) | A ₅ (%) min | R _{p0,2} (MPa) min | R _m (MPa) | A ₅ (%) min | Hardness HB max |
| ≥ 5 ≤ 10 | - | - | - | - | 750 | 1000÷1200 | 8 | 285 |
| > 10 ≤ 16 | - | - | - | - | 720 | 1000÷1200 | 8 | 275 |
| > 16 ≤ 40 | 223 | 650 | 900÷1100 | 12 | 650 | 900÷1100 | 9 | 270 |
| > 40 ≤ 63 | 223 | 550 | 800÷950 | 14 | 600 | 800÷950 | 10 | 265 |
| > 63 ≤ 100 | 223 | 550 | 800÷950 | 14 | 550 | 800÷950 | 10 | 265 |

*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

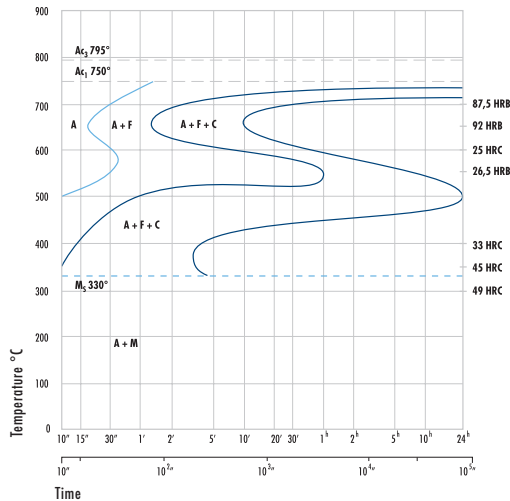
HARDNESS LIMITS (JOMINY TEST)

| 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 | 57 | 57 | 57 | 56 | 55 | 54 | 53 | 52 | 48 | 45 | 43 | 41 | 40 | 40 | 39 |
| | Min | 49 | 49 | 48 | 45 | 42 | 39 | 36 | 34 | 30 | 28 | 27 | 26 | 25 | 24 | 24 |
| +HH | Max | 57 | 57 | 57 | 56 | 55 | 54 | 53 | 52 | 48 | 45 | 43 | 41 | 40 | 40 | 39 |
| | Min | 52 | 52 | 51 | 49 | 46 | 44 | 42 | 40 | 36 | 34 | 32 | 31 | 30 | 29 | 29 |
| +HL | Max | 54 | 54 | 54 | 52 | 51 | 49 | 47 | 46 | 42 | 39 | 38 | 36 | 35 | 35 | 34 |
| | Min | 49 | 49 | 48 | 45 | 42 | 39 | 36 | 34 | 30 | 28 | 27 | 26 | 25 | 24 | 24 |

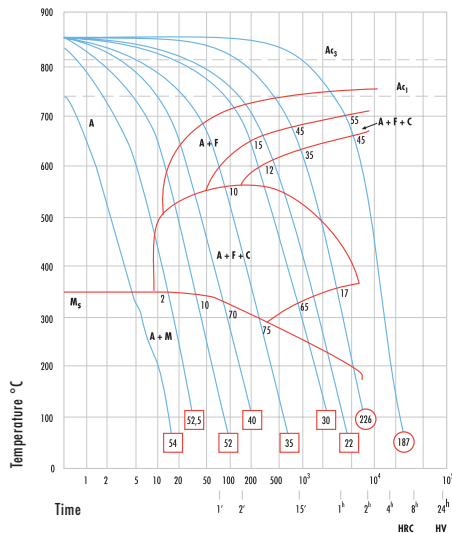
WORKING TEMPERATURES RECOMMENDED

| Operation | Hot forgings deformation | Isothermal annealing | Soft annealing | Quenching in water or oil | Tempering |
|-----------|--------------------------|----------------------|----------------|---------------------------|-----------|
| °C | 850÷1150 | 830÷870 → 650 | 680÷720 | 840÷860 | 550÷650 |

TTT



CCT



TEMPERING CURVE

