

## RIFERIMENTI NORMATIVI

| UNI    | AFNOR | DIN-W.Nr. | BS     | AISI-SAE |
|--------|-------|-----------|--------|----------|
| 51CrV4 | 50CV4 | 1.8159    | 735A50 | A29      |

## COMPOSIZIONE CHIMICA INDICATIVA [%]

| Elemento       | C           | Mn          | Si     | Cr          | Ni     | Mo     | Se P   |
|----------------|-------------|-------------|--------|-------------|--------|--------|--------|
| Intervallo [%] | 0.45 – 0.58 | 0.64 – 1.15 | ≤ 0.43 | 0.85 – 1.25 | ≤ 0.30 | ≤ 0.05 | ≤ 0.03 |

## LAVORAZIONE A CALDO E TRATTAMENTO TERMICO

Punti critici: Ac1 725°C, Ac3 760°C, Ms 270°C

| Operazione | Fucinatura | Normalizzazione | Ricottura subcritica | Ric. completa | Tempra    | Rinvenimento |
|------------|------------|-----------------|----------------------|---------------|-----------|--------------|
| Parametro  | 1100 - 850 | 850 - 870       | 670 - 720            | 830 - 850     | 840 - 860 | 400 - 450    |

## CARATTERISTICHE MECCANICHE

| Stato              | Saggio Ø [mm] | Re min. [N/mm²] | Rm [N/mm²]  | A min. [%] | KCU min. [J] | Durezze HB allo stato      |
|--------------------|---------------|-----------------|-------------|------------|--------------|----------------------------|
| Temprato e disteso | ≤ 25          | ≥ 1200          | 1350 - 1650 | ≥ 6        | ≥ 8          | Ricottura subcritica ≤ 250 |
|                    |               |                 |             |            |              | Ricottura globulare ≤ 230  |

## IMPIEGHI

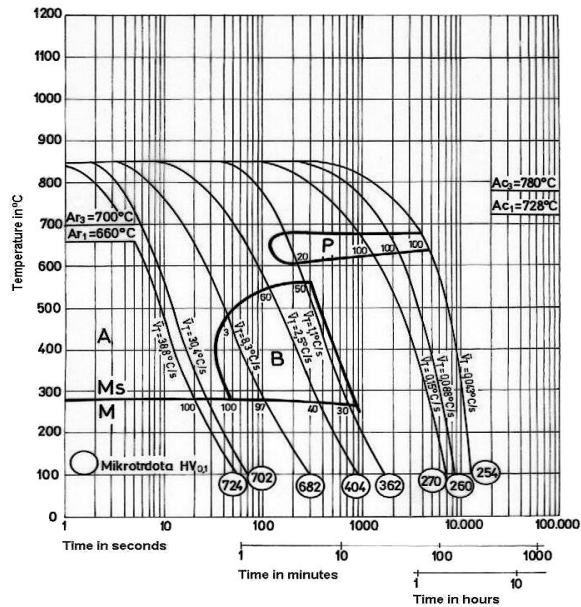
Utilizzato per **molle a bovolo, balestre e barre di torsione**, oltre che per la costruzione di **utensili per la lavorazione del legno**.

## JOMINY

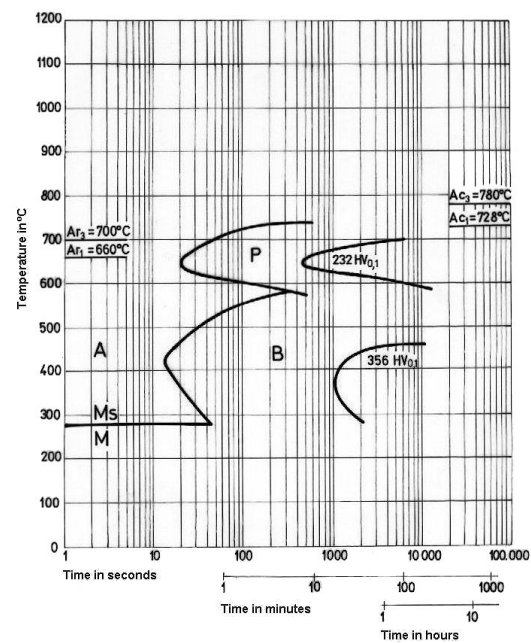
| Distanza dall'estremità temperata<br>mm | Durezza rockwell |         |
|-----------------------------------------|------------------|---------|
|                                         | HRc min          | HRc max |
| 1.5                                     | 57               | 65      |
| 3                                       | 56               | 65      |
| 5                                       | 55               | 64      |
| 7                                       | 54               | 64      |
| 9                                       | 53               | 63      |
| 11                                      | 52               | 62      |
| 13                                      | 50               | 62      |
| 15                                      | 48               | 61      |
| 20                                      | 44               | 60      |
| 25                                      | 41               | 58      |
| 30                                      | 37               | 57      |
| 35                                      | 35               | 55      |
| 40                                      | 34               | 54      |



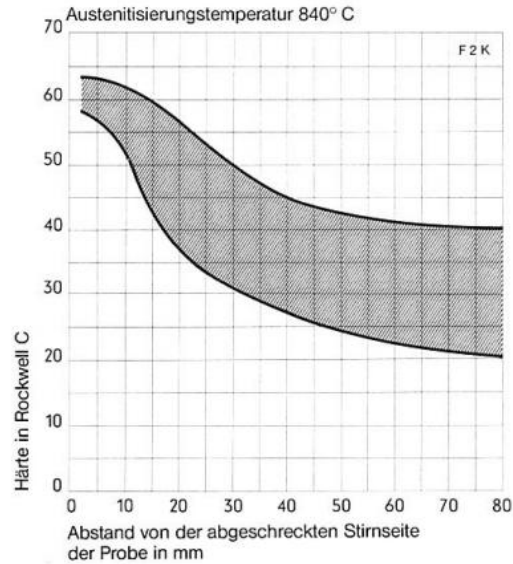
## CURVA CCT



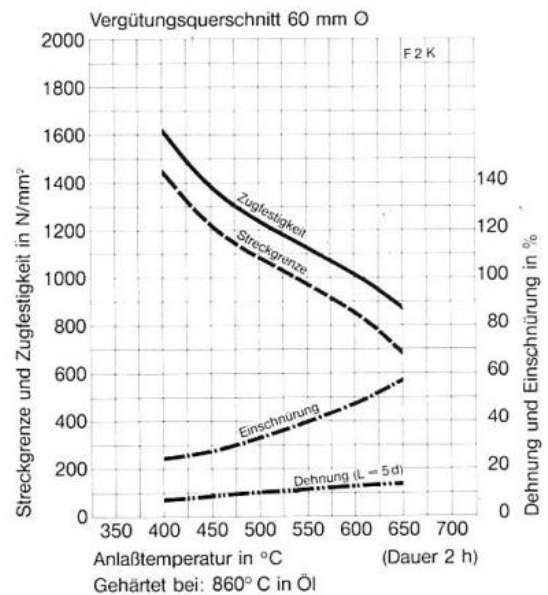
## CURVA TTT



## DIAGRAMMA DUREZZA



## DIAGRAMMA DI RINVENIMENTO



## REFERENCES

| UNI    | AFNOR | DIN-W.Nr. | BS     | AISI-SAE |
|--------|-------|-----------|--------|----------|
| 51CrV4 | 50CV4 | 1.8159    | 735A50 | A29      |

## CHEMICAL COMPOSITION

| Element      | C           | Mn          | Si     | Cr          | Ni     | Mo     | S      |
|--------------|-------------|-------------|--------|-------------|--------|--------|--------|
| Interval [%] | 0.45 – 0.58 | 0.64 – 1.15 | ≤ 0.43 | 0.85 – 1.25 | ≤ 0.30 | ≤ 0.05 | ≤ 0.03 |

## HOT WORKING AND HEAT TREATMENT

**Critical points:** Ac1 730 °C, Ac3 815 °C, Ms(n) 360 °C, Ms(c) 180 °C .

| Operation | Forging    | Normalizing | Subcritical annealing | Spheroidal annealing | Tempering | Quenching |
|-----------|------------|-------------|-----------------------|----------------------|-----------|-----------|
| Parameter | 1100 - 850 | 850 - 870   | 670 - 720             | 830 - 850            | 840 - 860 | 400 - 450 |

## MECHANICAL PROPERTIES

| Status                 | Size Ø [mm] | Re min. [N/mm²] | Rm [N/mm²]  | E min. [%] | KCU min. [J] | HB hardness                    |
|------------------------|-------------|-----------------|-------------|------------|--------------|--------------------------------|
| Tempered and stretched | ≤ 25        | ≥ 1200          | 1350 - 1650 | ≥ 6        | ≥ 8          | Subcritical annealing<br>≤ 250 |
|                        |             |                 |             |            |              | Globular annealing<br>≤ 230    |

## USES

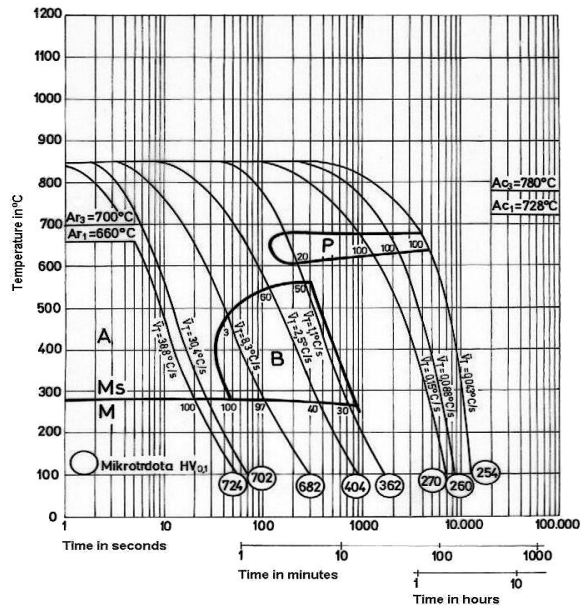
Used for **coil springs, leaf springs and torsion bars**, as well as for the **construction of woodworking tools**.

## JOMINY

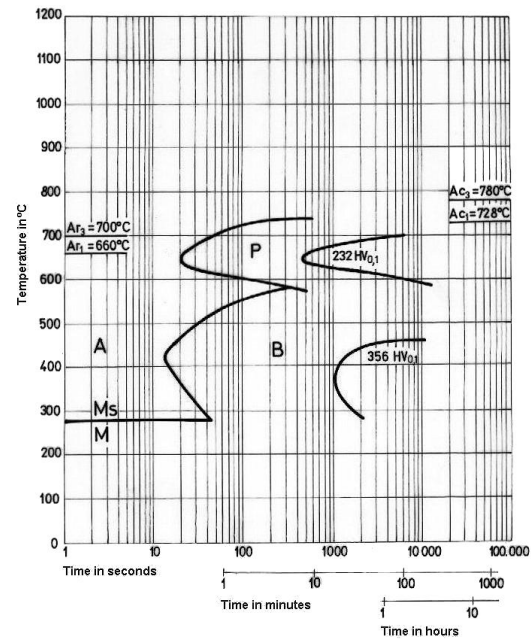
| Depth of quenching | Rockwell hardness |         |
|--------------------|-------------------|---------|
| mm                 | HRC min           | HRC max |
| 1.5                | 57                | 65      |
| 3                  | 56                | 65      |
| 5                  | 55                | 64      |
| 7                  | 54                | 64      |
| 9                  | 53                | 63      |
| 11                 | 52                | 62      |
| 13                 | 50                | 62      |
| 15                 | 48                | 61      |
| 20                 | 44                | 60      |
| 25                 | 41                | 58      |
| 30                 | 37                | 57      |
| 35                 | 35                | 55      |
| 40                 | 34                | 54      |



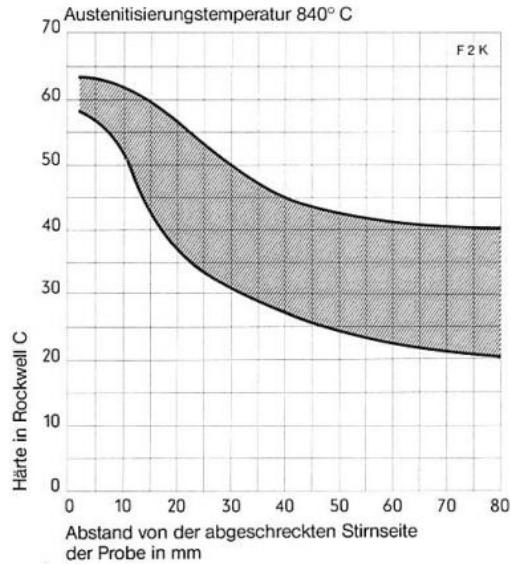
## CCT TREND



## TTT TREND



## HARDENABILITY DIAGRAM



## TEMPERING DIAGRAM

