

| | | | |
|-----------------------|------------------------|--|---|
| Quality | 37Cr4 | Quenching and Tempering Steel | <i>Technical card Lucefin Group rev. 2024</i> |
| According to standard | ISO 683-2: 2018 | | |
| Number | 1.7034 | | |

Chemical composition

| C% | Si% a) | Mn% | P% max | S% max | Cr% | Cu% max | Product deviations are allowed |
|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------------------------------|
| 0,34-0,41 | 0,10-0,40 | 0,60-0,90 | 0,025 | 0,035 | 0,90-1,20 | 0,40 | |
| ± 0.03 | ± 0.03 | ± 0.04 | + 0.005 | ± 0.005 | ± 0.05 | + 0.05 | |

For 37CrS4 n° 1.7038 S% 0.020-0.040 product deviations ± 0.005

a) Steels may be supplied with a lower silicon content. In this case, alternative means of deoxidation shall be used

Temperature °C

| Hot-forming | Normalizing +N | Quenching +Q | Tempering +T | Stress-relieving +SR | | | |
|--------------------------------|----------------------------|----------------------------------|-----------------|---|------------|-----------------------------------|-----------|
| 1100-850 | 860 air | 825-865 oil, polymer water | 540-680 air | 50 under the temperature of tempering | | | |
| Soft annealing +A | Isothermal annealing +I | End quench hardenable tes | | Pre-heating welding | | Stress-relieving after welding | |
| 680-720 air (HB max 235) | - | 845 water | | 300 | | 550 furnace cooling | |
| | | | | Ac1 | Ac3 | Ms | Mf |
| | | | | 740 | 765 | 340 | 130 |

Mechanical properties

37Cr4 1.7034 – 37CrS4 1.7038 Hot-rolled mechanical properties in **quenched and tempered** condition ISO 683-2: 2018

| size d / t | | Testing at room temperature (longitudinal) | | | | | |
|------------|--------|--|---|-------------------|-------------------|---------------------------------|--------------------------------------|
| from | to | R N/mm ² | Rp 0.2 N/mm ² min. | A% min. | Z% min. | Kv₂ J min. | HBW <i>for information</i> |
| | 16/8 | 950-1150 | 750 | 11 | 35 | - | 286-348 |
| 16/8 | 40/20 | 850-1000 | 630 | 13 | 40 | 35 | 253-298 |
| 40/20 | 100/60 | 750-900 | 510 | 14 | 40 | 35 | 225-271 |

d = diameter t = thickness

Table of tempering values obtained at room temperature on rounds of Ø 10 mm after quenching at 850 °C in oil

| | | | | | | | | | |
|-----------------|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| HB | | - | - | - | - | 301 | 290 | 271 | 247 |
| HRC | | - | - | - | - | 32 | 31 | 28 | 24 |
| R | N/mm ² | - | - | - | - | 1000 | 960 | 900 | 820 |
| Rp 0.2 | N/mm ² | - | - | - | - | 750 | 700 | 640 | 600 |
| A | % | - | - | - | - | 13 | 16 | 18 | 20 |
| Z | % | - | - | - | - | 55 | 58 | 60 | 64 |
| Tempering at °C | | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 |

37Cr4 1.7034 - 37CrS4 1.7038 EN ISO 683-7:24**Lucefin Group**

| Hot-rolled, annealed and Cold-drawn +A+C | | | | | | Hot-rolled, annealed and Peeled +A+SH | | | |
|---|-----|--|-----------------------|-----------|------------|--|-----------------------|-----------|------------|
| size mm | | Testing at room temperature (longitudinal) | | | | Testing at room temperature (longitudinal) | | | |
| from | to | R | Rp 0.2 | A% | HBW | R | Rp 0.2 | A% | HBW |
| | | N/mm ² | N/mm ² min | min | max | N/mm ² | N/mm ² min | min | max |
| 5 ^{b)} | 10 | - | - | - | - | - | - | - | - |
| 10 | 16 | - | - | - | - | - | - | - | - |
| 16 | 40 | - | - | - | - | - | - | - | 235 |
| 40 | 63 | - | - | - | - | - | - | - | 235 |
| 63 | 100 | - | - | - | - | - | - | - | 235 |

^{b)} per spessori inferiori a 5 mm le caratteristiche meccaniche possono essere concordate in fase di ordine

| Hot-rolled, quenched and tempered and Cold-drawn +QT+C | | | | | | Hot-rolled, quenched and tempered, Peeled +QT+SH | | | |
|---|-----|--|-----------------------|-----------|-----------------------------|--|-----------------------|-----------|-----------------------------|
| size mm | | Testing at room temperature (longitudinal) | | | | Testing at room temperature (longitudinal) ^{a)} | | | |
| from | to | R | Rp 0.2 | A% | Kv₂ +20°C | R | Rp 0.2 | A% | Kv₂ +20°C |
| | | N/mm ² | N/mm ² min | min | J min | N/mm ² | N/mm ² min | max | J min |
| 5 ^{b)} | 10 | - | - | - | - | - | - | - | - |
| 10 | 16 | - | - | - | - | - | - | - | - |
| 16 | 40 | - | - | - | - | 850-1000 | 630 | 13 | 35 |
| 40 | 63 | - | - | - | - | 750-900 | 510 | 14 | 35 |
| 63 | 100 | - | - | - | - | 750-900 | 510 | 14 | 35 |

^{b)} for thickness < 5 mm, mechanical properties should be agreed before order placement^{a)} values valid also for +C+QT**37Cr4 1.7034 Forged quenched and tempered UNI EN 10250-3: 2001**

| size d / t | | Testing at room temperature | | | | | | |
|------------|--------|-----------------------------|-----------------------|-----------|-----------|-----------|-----------|-----------|
| mm | | R | Rp 0.2 | A% | A% | Kv | Kv | HB |
| oltre | fino a | N/mm ² min | N/mm ² min | min (L) | min (T) | J min (L) | J min (T) | min |
| | 100/70 | 750 | 510 | 14 | 14 | 35 | 35 | 225 |

L = longitudinal T = tangential Q = radial d = diameter t = thickness

ISO 683: 2018 Valori di temprabilità **Jominy test HRC** grandezza grano 5 minimo

| distance in mm from quenched end | 1.5 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | |
|----------------------------------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------|
| min | 51 | 50 | 48 | 44 | 39 | 36 | 33 | 31 | 26 | 24 | 22 | 20 | - | - | - | H |
| max | 59 | 59 | 58 | 57 | 55 | 52 | 50 | 48 | 42 | 39 | 37 | 36 | 35 | 34 | 33 | |
| min | 54 | 53 | 51 | 48 | 44 | 41 | 39 | 37 | 31 | 29 | 27 | 25 | 24 | 23 | 22 | HH |
| max | 59 | 59 | 58 | 57 | 55 | 52 | 50 | 48 | 42 | 39 | 37 | 36 | 35 | 34 | 33 | |
| min | 51 | 50 | 48 | 44 | 39 | 36 | 33 | 31 | 26 | 24 | 22 | 20 | - | - | - | HL |
| max | 56 | 56 | 55 | 53 | 50 | 47 | 44 | 42 | 37 | 34 | 32 | 31 | 30 | 29 | 28 | |

| EUROPE | ITALY | SPAIN | GERMANY | FRANCE | UK | SWEDEN | USA |
|--------|-------|-------|---------|--------|--------|--------|----------|
| EN | UNI | UNE | DIN | AFNOR | B.S. | SS | AISI/SAE |
| 37Cr4 | 37Cr4 | 38Cr4 | 37Cr4 | 37C4 | 530A36 | 2245 | Gr. 5135 |