

# TEMPERED, NITRIDING AND SPRING STEEL

| DESCRIPTION       | MATERIAL NO. | NORM                 | USUAL HEAT TREATMENT CONDITION    | MECHANICAL-TECHNOLOGICAL CHARACTERISTICS |  |                                       | ANNEALING HARDNESS |       | USAGE/<br>SPECIAL APPLICATION EXAMPLES   |
|-------------------|--------------|----------------------|-----------------------------------|--|--|---------------------------------------|--------------------|-------|--|
|                   |              |                      |                                   | 0,2-YIELD STRENGTH<br>R <sub>p0.2</sub>  | TENSILE STRENGTH<br>R <sub>m</sub> (MPa) | FRACTURE STRAIN<br>A <sub>5</sub> (%) | HARDNESS           | (HB)  |  |
| GS C TL           | TL 2350-002  | BWB                  | hardened and tempered             | ≥ 785                                    | 930-1180                                 | ≥ 10                                  | 260-330            | ≤ 230 | Armored steel castings; for components with high heat resistance and toughness   |
| C 22              | 1.0402       | EN 10083<br>EN 10250 | hardened and tempered             | ≥ 350                                    | 550-700                                  | ≥ 15                                  |                    | ≤ 160 | For components of low wall thickness and low stress; Machine and apparatus construction  |
| C 35              | 1.0501       | EN 10083<br>EN 10343 | hardened and tempered             | ≥ 430                                    | 630-780                                  | ≥ 15                                  |                    | ≤ 185 | For thin-walled components slightly higher stress in mechanical engineering  |
| C 45              | 1.0503       | EN 10083<br>EN 10343 | hardened and tempered             | ≥ 500                                    | 700-850                                  | ≥ 10                                  |                    | ≤ 210 | Castings of higher strength with small cross-sections and average stress   |
| C 55              | 1.0535       | EN 10083<br>T1 - T2  | hardened and tempered             | ≥ 550                                    | 800-950                                  | ≥ 10                                  |                    | ≤ 230 | For thin-walled castings of high strength  |
| CK 60             | 1.1221       | EN 10083<br>T1 - T2  | hardened and tempered             | ≥ 580                                    | 850-1000                                 | ≥ 8                                   |                    | ≤ 240 | For components with higher strength by low profile / higher purity   |
| GS 36<br>CrNiMo 4 | 1.6511       | EN 10083<br>EN 10297 | hardened and tempered             | ≥ 900                                    | 1100-1300                                | ≥ 8                                   |                    | 248   | Tempered steel casting for highly stressed components with good throughput up to 50 mm wall thickness; highly stressed parts in vehicle construction |
| 30 CrNiMo 8       | 1.6580       | EN 10083<br>T1 - T2  | hardened and tempered             | ≥ 800                                    | 1000-1200                                | ≥ 8                                   |                    | 248   | Tempered steel casting for large cross sections; can be tempered up to 100 mm wall thickness; high toughness and elasticity                          |
| 67 SiCr 5         | 1.7103       | EN 10132<br>T - T4   | hardened and tempered<br>vergütet | ≥ 1320                                   | 1450-1650                                | ≥ 3                                   |                    | 240   | On cast and bend stressed castings with a small cross-section  |
| 60 SiCr 7         | 1.7108       | EN 10089             | hardened and tempered             | ~ 1100                                   | 1350-1550                                | ≥ 4                                   |                    | ≤ 240 | Highly tempered components with high demands on spring properties  |

# TEMPERED, NITRIDING AND SPRING STEEL

| DESCRIPTION  | MATERIAL NO.     | NORM                   | USUAL HEAT TREATMENT CONDITION | MECHANICAL-TECHNOLOGICAL CHARACTERISTICS |                           |                                    | ANNEALING HARDNESS |              | USAGE/SPECIAL APPLICATION EXAMPLES   |
|--------------|------------------|------------------------|--------------------------------|--|---------------------------|------------------------------------|--------------------|--------------|--|
|              |                  |                        |                                | 0,2-YIELD STRENGTH RP <sub>0.2</sub>     | TENSILE STRENGTH RM (MPa) | FRACTURE STRAIN A <sub>5</sub> (%) | HARDNESS           | (HB)         |  |
| GS 25 CrMo 4 | 1.7218<br>1.7254 | DIN 17205<br>WL 1.7254 | hardened and tempered          | ≥ 600<br>≥ 700                           | 750-900<br>900-1100       | ≥ 10<br>≥ 9                        | ≥ 265 HV           | 215<br>215   | Aviation parts and parts in machinery and apparatus construction; for further data see WL 1.7254 |
| GS 34 CrMo 4 | 1.7220           | DIN 17205              | hardened and tempered          | ≥ 700                                    | 850-1000                  | ≥ 10                               |                    | 200          | High-strength tempered steel casting; Wall thickness <50 mm                                      |
| GS 42 CrMo 4 | 1.7225           | DIN 17205              | hardened and tempered          | ≥ 800                                    | 900-1100                  | ≥ 10                               |                    | 240          | Universal, high-strength tempered steel casting with medium toughness requirements               |
| 42 CrMo S4   | 1.7227           | EN 10083<br>T1 - T2    | hardened and tempered          | ≥ 750                                    | 850-1050                  | ≥ 8                                |                    | 240          | Appropriate material: 1.7225; good machinability due to adjusted sulfur content                  |
| GS 50 CrMo 4 | 1.7228           | EN 10083<br>T1 - T2    | hardened and tempered          | ≥ 800                                    | 1050-1250                 | ≥ 5                                |                    | 245          | Tempered steel casting according to 1.7225; but with higher strength                             |
| 15 CrMoV 69  | 1.7744           | WL 1.7744              | hardened and tempered          | ≥ 800<br>≥ 930                           | 1000-1150<br>1030-1180    | ≥ 10<br>≥ 10                       | ≥ 290              | 220<br>≥ 310 | Aviation material with high tempering resistance for temperatures from -75°C to about 500°C      |
| 15 CrMoV 59  | 1.8521           | DIN 17211              | hardened and tempered          | ≥ 900                                    | 1000-1150                 | ≥ 10                               | ≥ 300              | 220          | Good weldable steel even when tempered; Nitriding steel for machine parts subject to wear        |
| GS 50 CrV 4  | 1.8159           | SEW 835                | hardened and tempered          | ≥ 850                                    | 1100-1250                 | ≥ 6                                | ≥ 330              | 245          | Highly wear-resistant tempering steel with good toughness properties                             |
| 58 CrV 4     | 1.8161           |                        | hardened and tempered          | ≥ 1000                                   | ≥ 1200                    | ≥ 5                                |                    | 235          | Highly wear-resistant components; also spring steel; Gears, waves                                |
| 31 CrMoV9    | 1.8519<br>1.8514 | DIN 17211<br>WL 1.8514 | hardened and tempered          | ≥ 900                                    | ≥ 1050                    | ≥ 10                               |                    | 248          | Tempered and nitriding steel for highly stressed wear parts up to approx. 100 mm wall thickness  |