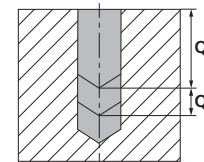


| Materials group | Material   | Material number    | DIN                   | AISI/ASTM/UNS           | v <sub>c</sub><br>[m/min] | Q <sub>1</sub>    | Q <sub>x</sub>   | Ød <sub>1</sub><br>2.00 | Ød <sub>1</sub><br>2.50 | Ød <sub>1</sub><br>3.00 | Ød <sub>1</sub><br>4.00 | Ød <sub>1</sub><br>5.00 | Ød <sub>1</sub><br>6.00 |
|-----------------|--|--------------------|-----------------------|-------------------------|---------------------------|-------------------|------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                 |  |                    |                       |                         |                           |                   |                  | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           |
| P               | Unalloyed carbon steel<br>R <sub>m</sub> < 800 N/mm <sup>2</sup>   | 1.0301             | C10                   | AISI 1010               | 50 - 100                  | 40xd <sub>1</sub> | -                | 0.080                   | 0.080                   | 0.100                   | 0.120                   | 0.140                   | 0.160                   |
|                 |  | 1.0401             | C15                   | AISI 1015               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.1191             | C45E/CK45             | AISI 1045               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.0044             | S275JR                | AISI 1020               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.0715             | 11SMn30               | AISI 1215               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 | Low alloyed steel<br>R <sub>m</sub> > 900 N/mm <sup>2</sup>        | 1.5752             | 15NiCr13              | ASTM 3415 / AISI 3310   | 50 - 100                  | 40xd <sub>1</sub> | -                | 0.080                   | 0.100                   | 0.120                   | 0.140                   | 0.160                   | 0.180                   |
|                 |  | 1.7131             | 16MnCr5               | AISI 5115               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.3505             | 100Cr6                | AISI 52100              |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.7225             | 42CrMo4               | AISI 4140               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.2842             | 90MnCrV8              | AISI O2                 |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.2379             | X153CrMoV12           | AISI D2                 |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 | High alloyed tool steel<br>R <sub>m</sub> < 1200 N/mm <sup>2</sup> | 1.2436             | X210CrW12             | AISI D4/D6              | 40 - 80                   | 40xd <sub>1</sub> | -                | 0.080                   | 0.100                   | 0.110                   | 0.140                   | 0.160                   | 0.170                   |
| 1.3343          |  | HS6-5-2C           | AISI M2 / UNS T11302  |                         |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| 1.3355          |  | HS18-0-1           | AISI T1 / UNS T12001  |                         |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| 1.4016          |  | X6Cr17             | AISI 430 / UNS S43000 |                         |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| 1.4105          |  | X6CrMoS17          | AISI 430F             |                         |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| M               | Stainless steel ferritic   | 1.4034             | X46Cr13               | AISI 420C               | 40 - 80                   | 40xd <sub>1</sub> | -                | 0.100                   | 0.120                   | 0.150                   | 0.180                   | 0.200                   | 0.220                   |
|                 |  | 1.4112             | X90CrMoV18            | AISI 440B               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 | Stainless steel martensitic  | 1.4542             | X5CrNiCuNb 16-4       | AISI 630 / ASTM 17-4 PH |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.4545             | X5CrNiCuNb 15-5       | ASTM 15-5 PH            |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 | Stainless steel austenitic   | 1.4301             | X5CrNi 18-10          | AISI 304                | 30 - 60                   | 5xd <sub>1</sub>  | 2xd <sub>1</sub> | 0.060                   | 0.070                   | 0.100                   | 0.120                   | 0.150                   | 0.180                   |
|                 |  | 1.4435             | X2CrNiMo 18-14-3      | AISI 316L               |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 1.4441             | X2CrNiMo 18-14-3      | AISI 316LM              |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| 1.4539          |  | X1NiCrMoCu 25-20-5 | AISI 904L             |                         |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| K               | Cast iron  | 0.6020             | GG20                  | ASTM 30                 | 100 - 200                 | 40xd <sub>1</sub> | -                | 0.100                   | 0.120                   | 0.150                   | 0.180                   | 0.200                   | 0.250                   |
|                 |  | 0.6030             | GG30                  | ASTM 40B                |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 0.7040             | GGG40                 | ASTM 60-40-18           |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  | 0.7060             | GGG60                 | ASTM 80-60-03           |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|                 |  |                    |                       |                         |                           |                   |                  |                         |                         |                         |                         |                         |                         |



|           |      |            |                 |
|-----------|------|------------|-----------------|
| ●         | ◐    | ○          | ⊗               |
| Excellent | Good | Acceptable | Not recommended |

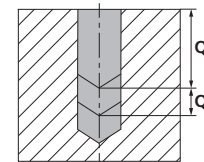
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| Materials group                                  | Material  | Material number | DIN                | AISI/ASTM/UNS    | v <sub>c</sub><br>[m/min] | Q <sub>1</sub>    | Q <sub>x</sub>   | Ød <sub>1</sub><br>2.00 | Ød <sub>1</sub><br>2.50 | Ød <sub>1</sub><br>3.00 | Ød <sub>1</sub><br>4.00 | Ød <sub>1</sub><br>5.00 | Ød <sub>1</sub><br>6.00 |
|--|---|-----------------|--------------------|------------------|---------------------------|-------------------|------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|  |   |                 |                    |                  |                           |                   |                  | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           | f<br>[mm/rev]           |
| N  | Aluminium alloy wrought                                 | 3.2315          | AlMgSi1            | ASTM 6351        | 100 - 200                 | 40xd <sub>1</sub> | -                | 0.070                   | 0.100                   | 0.120                   | 0.200                   | 0.200                   | 0.200                   |
|  |   | 3.4365          | AlZnMgCu1.5        | ASTM 7075        |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  | Aluminium alloy cast                                    | 3.2163          | GD-ALSi9Cu3        | ASTM A380        | 80 - 150                  | 40xd <sub>1</sub> | -                | 0.060                   | 0.080                   | 0.100                   | 0.120                   | 0.150                   | 0.200                   |
|  |   | 3.2381          | GD-ALSi10Mg        | UNS A03590       |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  | Copper  | 2.004           | Cu-OF / CW008A     | UNS C10100       | 40 - 80                   | 2xd <sub>1</sub>  | 2xd <sub>1</sub> | 0.065                   | 0.080                   | 0.110                   | 0.130                   | 0.160                   | 0.190                   |
|  |   | 2.0065          | Cu-ETP / CW004A    | UNS C11000       |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  | Brass lead free   | 2.0321          | CuZn37 CW508L      | UNS C27400       | 40 - 80                   | 2xd <sub>1</sub>  | 2xd <sub>1</sub> | 0.065                   | 0.080                   | 0.110                   | 0.130                   | 0.160                   | 0.190                   |
|  |   | 2.036           | CuZn40 CW509L      | UNS C28000       |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  | Brass, Bronze<br>R <sub>m</sub> < 400 N/mm <sup>2</sup> | 2.0401          | CuZn39Pb3 / CW614N | UNS C38500       | 50 - 120                  | 40xd <sub>1</sub> | -                | 0.100                   | 0.130                   | 0.160                   | 0.180                   | 0.230                   | 0.250                   |
|  |   | 2.102           | CuSn6              | UNS C51900       |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| Bronze<br>R <sub>m</sub> < 600 N/mm <sup>2</sup> | 2.0966  | CuAl10Ni5Fe4    | UNS C63000         | 40 - 80          | 40xd <sub>1</sub>         | -                 | 0.065            | 0.080                   | 0.110                   | 0.130                   | 0.160                   | 0.190                   |                         |
|  | 2.096   | CuAl9Mn2        | UNS C63200         |                  |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| S <sub>1</sub>                                   | Super alloys  | 2.4856          |                    | Inconel 625      |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  |   | 2.4668          |                    | Inconel 718      |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  |   | 2.4617          | NiMo28             | Hastelloy B-2    |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  |   | 2.4665          | NiCr22Fe18Mo       | Hastelloy X      |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| S <sub>2</sub>                                   | Titanium pure   | 3.7035          | Gr.2               | ASTM B348 / F67  | 25 - 50                   | 3xd <sub>1</sub>  | 1xd <sub>1</sub> | 0.030                   | 0.040                   | 0.055                   | 0.070                   | 0.080                   | 0.100                   |
|  |   | 3.7065          | Gr.4               | ASTM B348 / F68  |                           |                   |                  |                         |                         |                         |                         |                         |                         |
|  | Titanium alloys   | 3.7165          | TiAl6V4            | ASTM B348 / F136 | 20 - 40                   | 5xd <sub>1</sub>  | 1xd <sub>1</sub> | 0.030                   | 0.040                   | 0.055                   | 0.070                   | 0.080                   | 0.100                   |
|  |   | 9.9367          | TiAl6Nb7           | ASTM F1295       |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| S <sub>3</sub>                                   | Cr-Co alloys  | 2.4964          | CoCr20W15Ni        | Haynes 25        | 20 - 40                   | 5xd <sub>1</sub>  | 2xd <sub>1</sub> | 0.030                   | 0.040                   | 0.055                   | 0.070                   | 0.080                   | 0.100                   |
|  |   |                 | CrCoMo28           | ASTM F1537       |                           |                   |                  |                         |                         |                         |                         |                         |                         |
| H <sub>1</sub>                                   | Hardened steel<br>< 55 HRC                              | 1.2510          | 100MnCrMoW4        | AISI O1          | 30 - 60                   | 5 xd <sub>1</sub> | 1xd <sub>1</sub> | 0.080                   | 0.100                   | 0.120                   | 0.140                   | 0.160                   | 0.180                   |
| H <sub>2</sub>                                   | Hardened steel<br>≥ 55 HRC                              | 1.2379          | X153CrMoV12        | AISI D2          |                           |                   |                  |                         |                         |                         |                         |                         |                         |



|           |      |            |                 |
|-----------|------|------------|-----------------|
| ●         | ◐    | ○          | ⊗               |
| Excellent | Good | Acceptable | Not recommended |

|   |                |                |
|---|----------------|----------------|
| P | N              | S <sub>3</sub> |
| M | S <sub>1</sub> | H <sub>1</sub> |
| K | S <sub>2</sub> | H <sub>2</sub> |

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