


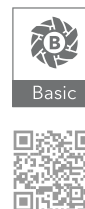
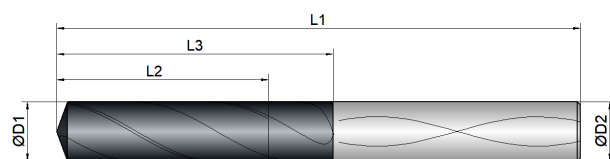
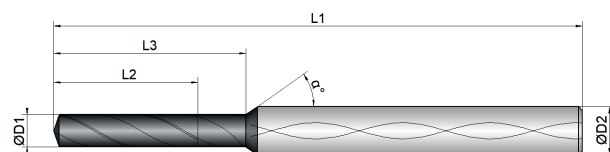




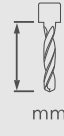


| | |
|-----------|---|
| Cooling |  |
| Tolerance | h7 |
| Coating | BetaUni Iron |




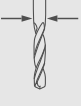

| | | | | |
|-------------|---|------------|-------------|---|
| Strategy | UNI | HPC | | |
| Application |  | | | |
| Features | HA | 3xD | 140° |  |




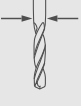








- Versatile universal geometry
 - Double-guided chip space for ideal chip evacuation
 - Polished surfaces for minimised frictional resistance
-
- Specially curved face cutting edge for higher feed rates and secure centring



| | D1 | L2 | L3 | D2 | L1 |
|---------------|---|--|--|---|--|
| BCU1-D01-0213 |  mm ∅ |  mm |  mm |  mm ∅ |  mm |
| 3 | 3 | 15 | 20 | 6 | 62 |
| 3,1 | 3.1 | 15 | 20 | 6 | 62 |
| 1/8 | 3.175 (1/8 ") | 15 | 20 | 6 | 62 |
| 3,2 | 3.2 | 15 | 20 | 6 | 62 |
| 3,3 | 3.3 | 15 | 20 | 6 | 62 |
| 3,4 | 3.4 | 15 | 20 | 6 | 62 |
| 3,5 | 3.5 | 15 | 20 | 6 | 62 |
| 3,6 | 3.6 | 15 | 20 | 6 | 62 |
| 3,7 | 3.7 | 15 | 20 | 6 | 62 |
| 3,8 | 3.8 | 18 | 24 | 6 | 66 |
| 3,9 | 3.9 | 18 | 24 | 6 | 66 |
| 5/32 | 3.96875 (5/32 ") | 18 | 24 | 6 | 66 |
| 4 | 4 | 18 | 24 | 6 | 66 |
| 4,1 | 4.1 | 18 | 24 | 6 | 66 |
| 4,2 | 4.2 | 18 | 24 | 6 | 66 |
| 4,3 | 4.3 | 18 | 24 | 6 | 66 |

| BCU1-D01-0213 |  mm ∅ |  mm |  mm |  mm ∅ |  mm |
|---------------|--|---|---|--|---|
| 4,4 | 4.4 | 18 | 24 | 6 | 66 |
| 4,5 | 4.5 | 18 | 24 | 6 | 66 |
| 4,6 | 4.6 | 18 | 24 | 6 | 66 |
| 4,7 | 4.7 | 18 | 24 | 6 | 66 |
| 3/16 | 4.7625 (3/16 ") | 21 | 28 | 6 | 66 |
| 4,8 | 4.8 | 21 | 28 | 6 | 66 |
| 4,9 | 4.9 | 21 | 28 | 6 | 66 |
| 5 | 5 | 21 | 28 | 6 | 66 |
| 5,1 | 5.1 | 21 | 28 | 6 | 66 |
| 5,2 | 5.2 | 21 | 28 | 6 | 66 |
| 5,3 | 5.3 | 21 | 28 | 6 | 66 |
| 5,4 | 5.4 | 21 | 28 | 6 | 66 |
| 7/32 | 5.55625 (7/32 ") | 21 | 28 | 6 | 66 |
| 5,5 | 5.5 | 21 | 28 | 6 | 66 |
| 5,6 | 5.6 | 21 | 28 | 6 | 66 |
| 5,7 | 5.7 | 21 | 28 | 6 | 66 |
| 5,8 | 5.8 | 21 | 28 | 6 | 66 |
| 5,9 | 5.9 | 21 | 28 | 6 | 66 |
| 6 | 6 | 21 | 28 | 6 | 66 |
| 6,1 | 6.1 | 25 | 34 | 8 | 79 |
| 6,15 | 6.15 | 25 | 34 | 8 | 79 |
| 6,2 | 6.2 | 25 | 34 | 8 | 79 |
| 6,3 | 6.3 | 25 | 34 | 8 | 79 |
| 6,35 | 6.35 | 25 | 34 | 8 | 79 |
| 6,4 | 6.4 | 25 | 34 | 8 | 79 |
| 6,5 | 6.5 | 25 | 34 | 8 | 79 |
| 6,6 | 6.6 | 25 | 34 | 8 | 79 |
| 6,7 | 6.7 | 25 | 34 | 8 | 79 |
| 6,8 | 6.8 | 25 | 34 | 8 | 79 |

| BCU1-D01-0213 |  mm ∅ |  mm |  mm |  mm ∅ |  mm |
|---------------|--|---|---|--|---|
| 6,9 | 6.9 | 25 | 34 | 8 | 79 |
| 7 | 7 | 25 | 34 | 8 | 79 |
| 7,1 | 7.1 | 31 | 41 | 8 | 79 |
| 9/32 | 7.14375 (9/32 ") | 31 | 41 | 8 | 79 |
| 7,2 | 7.2 | 31 | 41 | 8 | 79 |
| 7,3 | 7.3 | 31 | 41 | 8 | 79 |
| 7,4 | 7.4 | 31 | 41 | 8 | 79 |
| 7,5 | 7.5 | 31 | 41 | 8 | 79 |
| 7,6 | 7.6 | 31 | 41 | 8 | 79 |
| 7,7 | 7.7 | 31 | 41 | 8 | 79 |
| 7,8 | 7.8 | 31 | 41 | 8 | 79 |
| 7,9 | 7.9 | 31 | 41 | 8 | 79 |
| 5/16 | 7.9375 (5/16 ") | 31 | 41 | 8 | 79 |
| 8 | 8 | 31 | 41 | 8 | 79 |
| 8,1 | 8.1 | 36 | 47 | 10 | 89 |
| 8,2 | 8.2 | 36 | 47 | 10 | 89 |
| 8,3 | 8.3 | 36 | 47 | 10 | 89 |
| 8,4 | 8.4 | 36 | 47 | 10 | 89 |
| 8,5 | 8.5 | 36 | 47 | 10 | 89 |
| 8,6 | 8.6 | 36 | 47 | 10 | 89 |
| 8,7 | 8.7 | 36 | 47 | 10 | 89 |
| 11/32 | 8.73125 (11/32 ") | 36 | 47 | 10 | 89 |
| 8,8 | 8.8 | 36 | 47 | 10 | 89 |
| 8,9 | 8.9 | 36 | 47 | 10 | 89 |
| 9 | 9 | 36 | 47 | 10 | 89 |
| 9,1 | 9.1 | 36 | 47 | 10 | 89 |
| 9,2 | 9.2 | 36 | 47 | 10 | 89 |
| 9,3 | 9.3 | 36 | 47 | 10 | 89 |
| 9,4 | 9.4 | 36 | 47 | 10 | 89 |

| BCU1-D01-0213 |  D1 mm ∅ |  L2 mm |  L3 mm |  D2 mm ∅ |  L1 mm |
|---------------|--|---|---|--|---|
| 9,5 | 9.5 | 36 | 47 | 10 | 89 |
| 3/8 | 9.525 (3/8 ") 3/8 | 36 | 47 | 10 | 89 |
| 9,6 | 9.6 | 36 | 47 | 10 | 89 |
| 9,7 | 9.7 | 36 | 47 | 10 | 89 |
| 9,8 | 9.8 | 36 | 47 | 10 | 89 |
| 9,9 | 9.9 | 36 | 47 | 10 | 89 |
| 10 | 10 | 36 | 47 | 10 | 89 |
| 10,1 | 10.1 | 41 | 55 | 12 | 102 |
| 10,2 | 10.2 | 41 | 55 | 12 | 102 |
| 10,3 | 10.3 | 41 | 55 | 12 | 102 |
| 13/32 | 10.3187 (13/32 ") | 41 | 55 | 12 | 102 |
| 10,4 | 10.4 | 41 | 55 | 12 | 102 |
| 10,5 | 10.5 | 41 | 55 | 12 | 102 |
| 10,6 | 10.6 | 41 | 55 | 12 | 102 |
| 10,7 | 10.7 | 41 | 55 | 12 | 102 |
| 10,8 | 10.8 | 41 | 55 | 12 | 102 |
| 10,9 | 10.9 | 41 | 55 | 12 | 102 |
| 11 | 11 | 41 | 55 | 12 | 102 |
| 11,1 | 11.1 | 41 | 55 | 12 | 102 |
| 7/16 | 11.1125 (7/16 ") | 41 | 55 | 12 | 102 |
| 11,2 | 11.2 | 41 | 55 | 12 | 102 |
| 11,3 | 11.3 | 41 | 55 | 12 | 102 |
| 11,4 | 11.4 | 41 | 55 | 12 | 102 |
| 11,5 | 11.5 | 41 | 55 | 12 | 102 |
| 11,6 | 11.6 | 41 | 55 | 12 | 102 |
| 11,7 | 11.7 | 41 | 55 | 12 | 102 |
| 11,8 | 11.8 | 41 | 55 | 12 | 102 |
| 11,9 | 11.9 | 41 | 55 | 12 | 102 |
| 12 | 12 | 41 | 55 | 12 | 102 |



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| Dimension | Ø2,5 - Ø3 | Ø3,1 - Ø4 | Ø4,1 - Ø5 | Ø5,1 - Ø6 | Ø6,1 - Ø7,5 | Ø7,6 - Ø9 | Ø9,1 - Ø10,5 | Ø10,6 - Ø12 | Ø12,2 - Ø14 |
|-------------|-----------|-----------|-----------|-----------|-------------|-----------|--------------|-------------|-------------|
| Depth (mm) | L2 | L2 | L2 | L2 | L2 | L2 | L2 | L2 | L2 |
| Application | | | | | | | | | |

| | Material | Strength (N/mm ²) | Feed (mm/r) | fu | fu | fu | fu | fu | fu | fu | fu | fu |
|--------------------------|---------------------------------|-------------------------------|-------------|-------------------|-------|-------|-------|------|------|------|-------|------|
| P STEEL | | | | Vc (m/min) | | | | | | | | |
| 1.1 | unalloyed | <500 | 190 | 0.095 | 0.115 | 0.14 | 0.16 | 0.2 | 0.22 | 0.25 | 0.27 | 0.29 |
| 1.2-1.5 | unalloyed | <1100 | 170 | 0.09 | 0.11 | 0.13 | 0.15 | 0.19 | 0.21 | 0.24 | 0.27 | 0.28 |
| 2.1-2.2 | low alloyed | <950 | 130 | 0.09 | 0.11 | 0.13 | 0.15 | 0.19 | 0.21 | 0.24 | 0.27 | 0.28 |
| 2.3-2.4 | low alloyed | <1300 | 90 | 0.085 | 0.1 | 0.12 | 0.14 | 0.18 | 0.2 | 0.23 | 0.25 | 0.27 |
| 3.1-3.2 | high alloyed | <1100 | 110 | 0.085 | 0.1 | 0.12 | 0.14 | 0.18 | 0.2 | 0.23 | 0.25 | 0.27 |
| 3.3 | high alloyed | <1400 | 85 | 0.075 | 0.09 | 0.11 | 0.13 | 0.17 | 0.19 | 0.22 | 0.24 | 0.26 |
| K CASTINGS | | | | Vc (m/min) | | | | | | | | |
| 1.1-1.2 | grey cast iron | <1000 | 150 | 0.11 | 0.13 | 0.15 | 0.17 | 0.21 | 0.23 | 0.26 | 0.28 | 0.3 |
| M STAINLESS STEEL | | | | Vc (m/min) | | | | | | | | |
| 1.1 | ferritic/martensitic | <850 | 110 | 0.065 | 0.08 | 0.09 | 0.11 | 0.13 | 0.15 | 0.17 | 0.19 | 0.2 |
| 2.1 | austenitic | <650 | 90 | 0.06 | 0.07 | 0.08 | 0.1 | 0.12 | 0.13 | 0.14 | 0.16 | 0.18 |
| 2.2 | austenitic | <750 | 80 | 0.06 | 0.07 | 0.08 | 0.1 | 0.12 | 0.13 | 0.14 | 0.16 | 0.18 |
| 3.1 | DUPLEX STEEL super austenitic | <1100 | 80 | 0.05 | 0.058 | 0.067 | 0.09 | 0.11 | 0.12 | 0.13 | 0.145 | 0.16 |
| N NON-FERROUS | | | | Vc (m/min) | | | | | | | | |
| 1.1-2.3 | ALUMINIUM alloyed/cast | <600 | 200 | 0.14 | 0.15 | 0.16 | 0.17 | 0.18 | 0.2 | 0.23 | 0.26 | 0.28 |
| 3.1-3.3 | COPPER alloyed | <600 | 100 | 0.06 | 0.07 | 0.08 | 0.105 | 0.12 | 0.13 | 0.14 | 0.16 | 0.18 |
| T TITANIUM | | | | Vc (m/min) | | | | | | | | |
| 2.1-2.2 | pure/alloyed | <1000 | 35 | 0.06 | 0.07 | 0.08 | 0.1 | 0.11 | 0.12 | 0.13 | 0.15 | 0.16 |
| S SUPER ALLOYS | | | | Vc (m/min) | | | | | | | | |
| 1.1-1.3 | HRS A | <1450 | 20 | 0.03 | 0.05 | 0.065 | 0.08 | 0.1 | 0.12 | 0.13 | 0.14 | 0.15 |

ADVICE | The values marked in turquoise are side applications!
 Use maximum IC pressure.
 When using air cooling, please only use air through the spindle.
 Air cooling is only suitable to a limited extent, meaning that the tool needs some time to cool down after a certain number of holes have been drilled.

EXPLANATION
































APPLICATIONS

| | | | |
|---|---|--|---|
|  Multipass milling |  Trimming |  Deburring |  Engraving |
|  Corner rounding |  Full slot milling |  Forward and backward deburring |  Infeed Z |






COOLINGS

| | | | |
|--|--|--|--|
|  Air-cooling |  Dry machining |  Oil cooling |  Cooling Lubricant |
|  Minimum quantity lubrication | | | |

FEATURES


















| | | | |
|---|---|---|---|
|  0,5xD |  1xD |  1,5xD |  2xD |
|  2,5xD |  3xD |  3,5xD |  4xD |
|  5xD |  8xD |  Center cutting |  Non-center cutting |
|  Without Weldon |  With Weldon |  With Notch surface |  Internal cooling |
|  Twisted internal cooling |  Dynamic helical pitch |  Chip breaker |  Unequal tooth pitch |
|  Roughing teeth |  Helical immersion |  Feed directions x,y |  Feed directions x, y, z |
|  Feed directions x, y, (z) |  Feed direction z |  Corner radius |  Corner bevel |
|  Sharp edged |  60° Tip |  90° Tip |  140° Tip |

STRATEGY

| | | | |
|---|--|--|--|
|  Extended Trochoidal Cutting |  High Performance Cutting |  High Speed Cutting |  Multi Task Cutting |
|  Universal Machining | | | |



PROPERTIES

| | | | |
|---|--|--|---|
|  Cutting diameter |  Small cutting diameter |  Large cutting diameter |  Undercut diameter |
|  Cutting length |  Total bevel length |  Undercut length |  Total length |
|  Shank diameter |  Number of teeth |  Corner radius |  Corner bevel |
|  Programming radius |  Maximum cutting depth |  Helical angle |  Alpha angle |
|  Recess and cut length | | | |

APPLICATION TABLE

The values given in the application table are only guidelines. These values are largely dependent on the machining situation and application.

FIGURES

All technical drawings and photographs are given as an example. The product may deviate from the original in terms of colour and dimensions.

P 1.1 **STEEL** | unalloyed <500 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|---------------|--------------|--------------|-------------|------------|
| 1.0498 | ST42.8 | | | | | | | STPT 42 | |
| 1.0044 | ST442 | | E28-2 | 4360-43 B | Fe 430 BFN | 1412 | AE 275-B | SM 41 B | 570 Gr. 40 |
| 1.0420 | GS38 | GE 200 | 230-400M | | | 1306 | | | |
| 1.0446 | GS45 | GE 230 | E23-45M | A1 | | 1305 | F.221 | SC 450 | |
| 1.0136 | St42-3 | | | | | | | | |
| 1.0254 | St37.0 | P235T1 | | | | | | STPG 38 | |
| 1.1120 | GS20Mn5 | | | | | | | SMnC 420 | |
| 1.1121 | Ck10 | 2 C 10 | XC 10 | 040 A 10 | C 10 | 1265 | C 10 k | S 10 C | 1010 |
| 1.1131 | GS15Mn5 | | | | | | | | |
| 1.1151 | Ck22 | 2 C 22 | XC 25 | 050 A 20 | C 20 | | C 25 k | S 22 C | 1023 |
| 1.5523 | 19MnB4 | | | 170 H 20 | | | 20 Mn B 4 DF | SWRCHB | |
| 1.8961 | WTSt373 | | | | Fe 360 D FF | | | SMA 50 A | |
| 1.0035 | ST33 | | A 33 | | FE 320 | | | SS 330 | |
| 1.0037 | ST37-2 | | | | | | | STKR 400 | |
| 1.0710 | 15S10 | | | | | | | | |
| 1.0715 | 9SMn28 | 11 SMn 28 | S 250 | 230 M 07 | CF 9 SMn 28 | 1912 | 11 SMn 28 | SUM 22 | 1213 |
| 1.0718 | 9SMnPb28 | 11 SMnPb28 | S 250 Pb | | CF 9SMnPb 28 | 1914 | 11 SMnPb 28 | SUM 22 L | 12 L 13 |
| 1.0721 | 10S20 | 10 S 20 | 10 F 1 | 210 M 15 | CF 10 S 20 | | 10 S 20 | | 1108 |
| 1.0722 | 10SPb20 | 10 SPb 20 | 10 Pb F 2 | | CF 10 SPb 20 | | 10 SPb 20 | | 11 L 08 |
| 1.0736 | 9SMn36 | | S300 | 240 M 07 | CF 9 SMn 36 | | 12 SMn 35 | SUM 25 | 1215 |
| 1.0737 | 9SMnPb36 | | S 300 Pb | | CF 9 SMnPb 36 | 1926 | 12 SMnPb 35 | | 12 L 14 |

P 1.2 **STEEL** | unalloyed <700 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|--------------|
| 1.0553 | S244J0 | S355J0 | E 36-3 | En 50 C | Fe 510 C FN | | | SM 520 M | S355J0 |
| 1.0581 | ST52.4 | | | | | | | STS 49 | |
| 1.1140 | C15R | C15R | C15R | C15R | | | C 16 k-1 | | |
| 1.1141 | Ck15 | 2 C 15 | XC 15 | 080 M 15 | C 15 | 1370 | C 16 k | S 15 C | 1015 |
| 1.1190 | S355G15 | | | | | | | | |
| 1.0116 | ST373 | | E 24-3 | 4360-40 C | Fe 37-3 | 1312 | A 360 C | | A 570 Gr. 36 |
| 1.0144 | ST443 | | E 28-3 | 4360-43 C | Fe 430 D FF | 1414 | AE 275-D | SM 41 B | A 573 Gr. 70 |
| 1.0401 | C15 | | CC12 | 080 M 15 | C 15 | 1350 | F.111 | S 15 C | 1015 |
| 1.0402 | C22 | 1 C 22 | CC 22 | 070 M 20 | C 22 | | C 22 k | SFVC 1 | |
| 1.0406 | C25 | 1 C 25 | CC 25 | 070 M 26 | C 25 | | C 25 k | S 22 C | 1025 |
| 1.0461 | STE255 | | | | | | | | |
| 1.0482 | 19Mn5 | | A 52 CP | 224-460 | | | | SG 37 | |
| 1.0486 | STE285 | | | | FE E 285 KG | | AE 285 KG | SM 41 A | |
| 1.0501 | C35 | 1 C 35 | CC 35 | 060 A 35 | C 35 | 1550 | F.113 | S 35 C | 1035 |
| 1.0503 | C45 | 1 C 45 | CC 45 | 080 M 46 | C 45 | 1650 | C 45 k | S 45 C | 1045 |
| 1.0505 | STE315 | | | | | | | SM 50 A | |
| 1.0511 | C40 | 1 C 40 | | 080 M 40 | | | F.114.A | S 40 C | 1040 |
| 1.0528 | C30 | 1 C 30 | CC 32 | 080 M 30 | C30 | | | SUP 7 | 1030 |
| 1.0540 | C50 | 1 C 50 | | 080 M 50 | | 1674 | | S 50 C | 1050 |
| 1.0552 | GS52 | GE 260 | | | | | | | |
| 1.0558 | GS60 | GE 300 | 320-560M | A3 | C 45 | 1606 | | | |
| 1.0562 | STE355 | | E 355 R/FP | | Fe E 355 KG | 2132 | AE 355 KG | SM 50 YB | A 633 Gr. C |
| 1.0711 | 9S20 | | | 220 M 07 | CF 9 S 22 | | | G 11120 | 1212 |
| 1.0970 | 38Si7 | | 41 S 7 | | | | | | |
| 1.1106 | ESTE355 | | | P 355 NL 2 | | | | STK 500 | |
| 1.1127 | 36Mn6 | | | 212 M 36 | | | | SMn 443 | 1141 |
| 1.1133 | 20Mn5 | | | 120 M 19 | G 22 Mn3 | | 20 Mn 6 | SMn 420 | 1022 |
| 1.1169 | 20Mn6 | | | | | | | | |
| 1.1520 | C70W1 | | | | C 70 KU | | | | |
| 1.5637 | 10Ni14 | | | 503 | 18 Ni 14 KT | | | | A 350-LF 5 |
| 1.8962 | 9CrNiCuP324 | | | WR 50 A | | | | SPA-H | |
| 1.0726 | 35S20 | 35 S 20 | 35 MF 4 | 212 M 36 | | 1957 | F.210G | | 1140 |
| 1.0760 | 38SMn28 | 38SMn28 | 38SMn28 | 38SMn28 | | | 38SMn28 | | |
| 1.1158 | Ck25 | 2 C 25 | XC 25 | 070 M 26 | C 25 | | C 25 k | S 25 C | 1025 |
| 1.1178 | Ck30 | 2 C 30 | XC 32 | 080 M 30 | C30 | | | S 30 C | 1030 |
| 1.1181 | Ck35 | 2 C 35 | XC 38 H1 | 080 M 36 | C35 | 1572 | C 35 k | S 35 C | 1034 |
| 1.1183 | Cf35 | | XC 38 TS | 060 A 35 | C35 | 1572 | | S 35 C | 1035 |
| 1.1191 | Ck45 | 2 C 45 | XC 42 | 080 M 46 | C40 | | C45 k | S 45 C | 1045 |
| 1.1206 | Ck50 | 2 C 50 | | 080 M 50 | C50 | 1674 | | S 50 C | 1050 |
| 1.1730 | C45W | C 45 U | Y3 42 | | | | | | |
| 1.5423 | 16Mo5 | | | 1503-245-420 | 16 Mo 5 | | 16 Mo 5 | SBC 690 | 4520 |

P 1.3 **STEEL** | unalloyed <850 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|---------------|----------------|--------------------|-----------------|--------------|-------------|-------------|--------------------|
| 1.1165 | G530Mn5 | | 35 M 5 | 120 M 36 | | 1330 | 30 Mn 5 | SMn 433 H | 1330 |
| 1.1525 | C80W1 | C 80 U | Y1 90 | | C 80 KU | 1880 | F.513 | | W 108 |
| 1.1545 | C105W1 | C 105 U | Y1 105 | BW 1A | C 100 KU | 1880 | F.515 | | W 110 |
| 1.1620 | C70W2 | C 70 U | | | | | | | |
| 1.1625 | C80W2 | | Y1 80 | BW 1B | C 80 KU | | C 80 | SKC 3 | W 1 |
| 1.1645 | C105W2 | | | | | | C 102 | SK 3 | |
| 1.1663 | C125W | C 120 U | Y2 120 | | C 120 KU | | C 120 | SK 2 | W 112 |
| 1.1673 | C135W | | Y2 140 | | C 140 KU | | | SK 1 | |
| 1.1740 | C60W | | Y3 55 | | | | | SK 7 | |
| 1.1820 | C55W | | | | | | | | |
| 1.1830 | C85W | C 90 U | Y3 90 | | | | | SK 5 | 1084 |
| 1.1744 | C67W | | Y1 70 | | | | F.512 | | A-6 |
| 1.1750 | C75W | | | BW 1A | | | | | W 1 |
| 1.5404 | 21MoV53 | | | | | | | | |
| 1.5406 | 17MoV84 | | | | | | | | |
| 1.5633 | 24Ni8 | G 9 Ni 10 | 22 N 8 | | G 9 Ni 10 | | | SCPL 21 | |
| 1.6311 | 20MnMoNi45 | 20 MnMoNi 4 5 | | | | | | SOV 2 B | |
| 1.7242 | 16CrMo4 | 18 CrMo 4 | 15 CD 3.5 | | 18 CrMo 4 | | 18 CrMo 4 | SCM 418 H | |
| 1.7258 | 24CrMo4 | | | | | | | SCM 822 H | |
| 1.7259 | 26CrMo7 | | | | | | | | |
| 1.7273 | 24CrMo10 | | | | | | | | |
| 1.7337 | 16CrMo44 | | | | A18 CrMo 4 5 KW | | | | A 387 Gr. 12 Cl. 2 |
| 1.7350 | 22CrMo44 | | | | | | | | |
| 1.7362 | 12CrMo195 | X 12 CrMo 5 | Z 10 CD 5.05 | 3606-625 | 16 CrMo 20 5 | | | SCMV 6 | |
| 1.7709 | 21CrMoV57 | 21 CrMoV 5 7 | 20 CDV 5.07 | | | | | | |
| 1.7766 | 17CrMoV10 | | | | | | | | |
| 1.7779 | 20CrMoV135 | | | | | | | | |

P 1.4 **STEEL** | unalloyed <950 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 1.0062 | ST601 | | | | | | | | |
| 1.0532 | ST522 | S 390 G 1 S | | | | | | | |
| 1.0535 | C55 | 1 C 55 | C 55 | 070 M 55 | C 55 | 1655 | | C 55 | 1055 |
| 1.0570 | ST523 | S 355 J2 F3 | E 36-3 | 4360-50 B | Fe 510 B | 2132 | A 510 C | SM 50 YB | |
| 1.0728 | 60S20 | 60 S 20 | 60 MF 4 | | | | | | 1151 |
| 1.1203 | Ck55 | 2 C 55 | XC 55 H1 | 070 M 55 | C 55 | 1655 | C 55 k | S 55 C | 1055 |
| 1.7276 | 10CrMo11 | | 12 CD 10 | | | | | | |
| 1.7281 | 16CrMo93 | | 20 CD 8 | | | | | | |

P 1.5 **STEEL** | unalloyed <1100 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 1.0070 | ST702 | | A 70-2 | | Fe 70-2 | | A 690-2 | | |
| 1.0601 | C60 | 1 C 60 | AF 70 C 55 | 080 A 62 | C 60 | | | S 60 C-CSP | 1060 |
| 1.1221 | Ck60 | 2 C 60 | XC 60 | 060 A 62 | C 60 | 1678 | | S 58 C | 1060 |
| 1.1223 | Cm60 | 3 C 60 | C 60 R | 080 A 67 | C 60 R | | | | |
| 1.0603 | C67W | | | | | | | | |

P 2.1 **STEEL | low alloyed <750 N/mm²**

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-----------------|----------------|--------------------|---------------|--------------|-------------|-------------|------------|
| 1.0961 | 60SiCr7 | 60 SiCr 8 | 60 SC 7 | 250 A 61 | 60 SiCr 8 | | 60 SiCr 8 | SUP 7 | 9262 |
| 1.2101 | 62SiMnCr4 | | | | | | | | |
| 1.2162 | 21MnCr5 | 21 MnCr 5 | 20 NC 5 | | | | | SCR 420 H | |
| 1.2208 | 31CrV3 | | | | | | | | |
| 1.2210 | 115CrV3 | 107 CrV 3 KU | 100 C 3 | | 107 CrV 3 KU | | F.520.L | | L2 |
| 1.2235 | 80CrV2 | | | | | | F.520.J | | |
| 1.2241 | 51CrV4 | 51 CRMnV 4 | | | 51 CrMnV 4 KU | | | | S6 |
| 1.2307 | 29CrMoV9 | | | | | | | | |
| 1.2323 | 48CrMoV67 | | 45 CDV 6 | | | | | | |
| 1.2382 | GX155CrVMo121 | | | | | | | | |
| 1.2414 | 120W4 | | | | | | F.532 | | |
| 1.2542 | 45WCrV7 | 45 WCrV 8 | | BS 1 | 45 WCrV 8 KU | 2710 | 45 WCrSi 8 | | S1 |
| 1.2552 | 80WCrV8 | | | | | | 60 WCrSi 8 | | |
| 1.2726 | 26NiCrMoV5 | | | | | | | | |
| 1.2737 | 28NiCrV5 | | | | | | | | |
| 1.2738 | 40CrMnNiMo864 | 40CrMnNiMo8-6-4 | | | | | | | |
| 1.2826 | 60MnSi4 | | 60 MSC 4 | | | | | | |
| 1.2838 | 145V33 | | | | | | | | |
| 1.2842 | 90MnCrV8 | 90 MnV 8 | 90 MV 8 | BO 2 | 90 MnVCr 8 KU | | | | 0 2 |
| 1.5752 | 14NiCr14 | 13 NiCr 12 | 16 NC 12 | 655 M 13 | 16 NiCr 11 | | | SNC 815 H | E3310 |
| 1.5919 | 15CrNi6 | 14 CrNi 6 | 16 NC 6 | S 107 | 16 CrNi 4 | | | SNCM 420 | |
| 1.7003 | 38Cr2 | 38 Cr 2 KD | 38 C 2 | 120 M 36 | 38 Cr 3 | | 38 Cr 3 | SMn 438 | 50 B40 |
| 1.7012 | 13Cr2 | | | | | | | | |
| 1.7045 | 42Cr4 | 40 NiCrMo 3 | 42 C 4 TS | 530 A 40 | 41 Cr 4 | 2245 | 42 Cr 4 | SCr 440 | 5140 |
| 1.7103 | 67SiCr5 | 67 SiCr 5 | | | 67 SiCr 5 | | | | |
| 1.7131 | 16MnCr5 | 16 MnCr 5 KD | 16 MC 5 | 527 M 17 | 16 MnCr 5 | 2173 | 16 MnCr 5 | SCR 415 | 5115 |
| 1.7271 | 23CrMoB33 | | | | | | | | |
| 1.7715 | 14MoV63 | 14 MoV 6-3 | | 1503-660-440 | | | 13 MoCrV 6 | | |
| 1.8907 | STE500 | | | | | | | SM 58 | |
| 1.8911 | ESTE380 | | | | | | | | |

P 2.2 **STEEL | low alloyed <950 N/mm²**

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|---------------|--------------|-------------|-------------|------------|
| 1.0902 | 46Si7 | | 45 S7 | | | | 46 Si 7 | | |
| 1.0906 | 65Si7 | | | 250 A 61 | | | | | |
| 1.0985 | QSTE500N | | | | | | | | |
| 1.1157 | 40Mn4 | | 35 M 5 | 150 M 36 | | | | | 1039 |
| 1.1167 | 36Mn5 | | 40 M 5 | 150 M 36 | | 2120 | 36 Mn 5 | | 1335 |
| 1.1170 | 28Mn6 | 28 Mn 6 | 35 M 5 | 150 M 17 | C 28 Mn | | 36 Mn 6 | SCMn 1 | 1330 |
| 1.1199 | 49MnV53 | | | 280 M 01 | | | | | |
| 1.2002 | 125Cr1 | | Y2 120 C | | | | | | |
| 1.2003 | 75Cr1 | | 35 M 5 | 150 M 36 | | | | | |
| 1.2004 | 85Cr1 | | Y1 100 C 2 | | | | | | |
| 1.2008 | 140Cr3 | | Y2 140 C | | | | | SKS 8 | |
| 1.2056 | 90Cr3 | | | | | | | | |
| 1.2057 | 105Cr4 | | | | | | F.120.J | SKC 11 | |
| 1.2108 | 90CrSi5 | P 280 GH | | | C 100 KU | 2092 | | SFVC 2A | |
| 1.2109 | 125CrSi5 | | | | | | | | |
| 1.2127 | 105MnCr4 | | | | 100 CrMn 4 KU | | | SUJ 3 | |
| 1.2206 | 140CrV1 | | 130 C 3 | | | | | | 0 6 |
| 1.2242 | 59CrV4 | | | | | | | | |
| 1.2243 | 61CrSiV5 | | | | | | | | |
| 1.2249 | 45SiCrV6 | | | | | | | | |
| 1.2303 | 100CrMo5 | | | | | | F.520.F | | L 7 |
| 1.2312 | 40CrMnMoS86 | | 40 CMD 8 | | | | | | |
| 1.2519 | 110WCrV5 | | | | | | 102 WCrV 5 | | |
| 1.2562 | 142WV13 | | | | | | | | |
| 1.2740 | 28NiCrMoV10 | | | | | | | | |
| 1.2743 | 60NiCrMoV124 | | | | | | | | |
| 1.2747 | 28NiMo17 | | | | | | | | |
| 1.2766 | 35NiCrMo16 | | | | | | | | |
| 1.2851 | 34CrAl6 | | | | | | | | |
| 1.3501 | 100Cr2 | | 100 C 2 | | | | | | E 50100 |
| 1.3503 | 105Cr4 | | | | | | | | E51100 |
| 1.3505 | 100Cr6 | 100 Cr 6 | 100 C 6 | 535 A 99 | 100 Cr 6 | 2258 | 100 Cr 6 | SUJ 2 | E52100 |
| 1.3520 | 100CrMn6 | 100 Cr Mn 6 | 100 CM 6 | | | | 100 CrMn 6 | | |

P 2.3 **STEEL** | low alloyed <1100 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-----------------|----------------|--------------------|----------------|--------------|-------------|-------------|------------|
| 1.2419 | 105WCr6 | 105 WCr 5 | 105 WC 13 | | 107 WcR 5 KU | 2140 | 105 WCr 5 | SKS 31 | |
| 1.2511 | 80WCrV3 | | | | | | | | |
| 1.2515 | 100WV4 | | | | | | | SKS 21 | |
| 1.3561 | 44Cr2 | 46 Cr 1 KD | 44 Cr 2 | | | | | | 5046 |
| 1.3563 | 43CrMo4 | | 43 CrMo 4 | | | | | | 4142 |
| 1.3565 | 48CrMo4 | | | | | | | | |
| 1.5023 | 38Si7 | | | | | | | | |
| 1.5025 | 51Si7 | 50 Si 7 | | | 48 Si 7 | 2090 | | | 9259 H |
| 1.5029 | 71Si7 | | | | | | | | |
| 1.5085 | 51Mn7 | | | | | | | | |
| 1.5094 | 38MnS6 | 38 MnS 6 | | | | | | | |
| 1.5131 | 50MnSi4 | | | | | | | | |
| 1.5141 | 53MnSi4 | | | | | | | | |
| 1.5142 | 60MnSi5 | | | | | | | | |
| 1.5213 | 15MnV5 | | | | | | | | |
| 1.5217 | 20MnV6 | | | | | | | | |
| 1.5223 | 42MnV7 | | | | | | | | |
| 1.5225 | 51MnV7 | | | | | | | | |
| 1.5231 | 38MnSiVS5 | | | | | | | | |
| 1.5232 | 27MnSiVS6 | | | | | | | | |
| 1.5233 | 44MnSiVS6 | | | | | | | | |
| 1.5403 | 17MnMoV64 | | | 1501-261 | | | | SBV 3 | |
| 1.5526 | 30MnB4 | | | | | | | | |
| 1.5710 | 36NiCr6 | | 30 NC 6 | 640 A 35 | | | | SNC 236 | 3135 |
| 1.5736 | 36NiCr10 | | 30 NC 11 | | 35 NiCr 9 | | | SNC 631 H | 3435 |
| 1.5755 | 31NiCr14 | | 18 NC 13 | 653 M 31 | | | | SNC 836 | |
| 1.6225 | 11NiMn54 | | | | | | | | |
| 1.6310 | 20MnMoNi55 | | 18 MND 5 | | | | | | |
| 1.6368 | 15NiCuMoNb5 | | | 3604-591 | | | | SBV 2 | |
| 1.6511 | 36CrNiMo4 | 36 CrNiMo 4 | 40 NCD 3 | 816 M 40 | 38 NiCrMo 4 KB | | 35 NiCrMo 4 | | 9840 |
| 1.6582 | 34CrNiMo6 | 34 CrNiMo 6 | 35 NCD 6 | 817 M 40 | 35 NiCrMo 6 KB | 2541 | 40 NiCrMo 7 | SNCM 447 | 4340 |
| 1.6946 | 30CrMoNiV511 | | | | | | | | |
| 1.6948 | 26NiCrMoV115 | | | | | | | | |
| 1.6971 | 79Ni1 | | | | | | | | |
| 1.6972 | 83Ni1 | | | | | | | | |
| 1.7038 | 37CrS4 | 37 CrS 4 | | | | | | SUP 11 | 50 B50 H |
| 1.7214 | 25CrMo4 | | | | 25 CrMo 4 F | | | | |
| 1.7389 | GX12CrMo101 | | | | | | | | |
| 1.7561 | 42CrV6 | | | | | | | | |
| 1.7701 | 51CrMoV4 | | 51 CDV 4 | | 51 CrMoV 4 | | | | |
| 1.7707 | 30CrMoV9 | | | | | | | | |
| 1.7711 | 40CrMoV47 | 40 CrMoV 4 6 | 42 CDV 4 | 1506-670-860 | | | | SNB 21-1-5 | |
| 1.7725 | GS30CrMoV64 | | | | | | | | |
| 1.7733 | 24CrMoV55 | | 20 CDV 6 | | 24 CrMoV 5 5 | | | | |
| 1.7735 | 14CrMoV69 | | | | | | | | |
| 1.7741 | 42CrMoV73 | | | | | | | | |
| 1.7755 | GS45CrMoV104 | | | | | | | | |
| 1.7756 | GS36CrMoV104 | G 36 CrMoV 10 4 | | | | | | | |
| 1.8070 | 21CrMoV511 | | | | 21 CrMoV 5 11 | | | | |
| 1.8159 | 50CrV4 | 51 CrV 4 | 50 CV 4 | 735 A 50 | 50 CrV 4 | 2230 | 51 CrV 4 | SUP 10 | 6150 |
| 1.8212 | 21CrVMoW12 | | | | | | | | |
| 1.8521 | 15CrMoV59 | | | | | | | | |
| 1.8509 | 41CrAlMo7 | 41 CrAlMo 7 | 40 CAD 6. 12 | 905 M 39 | 41 CrAlMo 7 | 2940 | 41 CrAlMo 7 | SACM 645 | E 71400 |
| 1.8515 | 31CrMo12 | 31 CrMo 12 | 30 CD 12 | 722 M 24 | 31 CrMo 12 | 2240 | 31 CrMo 12 | | |
| 1.8523 | 39CrMoV139 | 39 CrMoV 13 9 | | 897 M 39 | 36 CrMoV 10 | | | | |
| 1.8550 | 34CrAlNi7 | 34 CrAlMo 5 | | | | | | | |
| 1.8827 | S460M | S 460 M | E 460 | S 460 M | S460M | | S460M | | |

P 2.4 **STEEL | low alloyed <1300 N/mm²**

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|--------------|--------------|--------------|-------------|------------|
| 1.1273 | 90Mn4 | | | 060 A 96 | | | | SUP 4 | 1090 |
| 1.2311 | 40CrMnMo7 | | | BP 20 | 35 CrMo 8 KU | | | | P 20 |
| 1.2710 | 45NiCr6 | | | | | | | | |
| 1.2762 | 75CrMoNiW67 | | | | | | | | |
| 1.5864 | 35NiCr18 | | | | | | | | |
| 1.6587 | 17CrNiMo6 | 17 CrNiMo 7 | 18 NCD 6 | 820 A 16 | 18 NiCrMo 7 | 2523 | 14 NiCrMo 13 | SNCM 815 | |
| 1.7222 | 42CrMoPb4 | | | | | | | | |
| 1.7225 | 42CrMo4.M4S | 42 CrMo 4 | 42 CD 4 | 708 A 42 | 42 CrMo 4 | 2244 | | SCM 440 H | 4140 |
| 1.7227 | 42CrMoS4 | 42 CrMoS 4 | 42 CD | 708 H 42 | 42 CrMoS 4 | 2244 | 40 CrMo 4 | | |
| 1.7238 | 49CrMo4 | | | | | | | | |

P 3.1 **STEEL | high alloyed <800 N/mm²**

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------------|----------------|--------------------|---------------------|--------------|---------------|-------------|------------|
| 1.2362 | X63CrMoV51 | | | | | | | | |
| 1.2363 | X100CrMoV51 | X 100 CrMoV 5 1 | Z 100 CDV 5 | BA 2 | X 100 CrMoV 5 1 KU | 2260 | X 100 CrMoV 5 | SKD 12 | A 2 |
| 1.2367 | X38CrMoV53 | | Z 38 CDV 5 3 | | | | | | |
| 1.2376 | X96CrMoV12 | | | | | | | | |
| 1.2379 | X155CrMo121 | X 153 CrMoV 12 | Z 160 CDV 12 | BD 2 | X 155 CrMoV 12 1 KU | 2310 | | SKD 11 | D 2 |
| 1.2453 | X130W5 | | | | | | | | |
| 1.2564 | X30WCrV41 | 30 WCrV 15 1 | | | | | F.527 | | |
| 1.2567 | X30WCrV53 | X 30 WCrV 5 3 | Z 32 WCV 5 | | X 30 WCrV 5 3 KU | | | SKD 4 | |
| 1.2606 | X37CrMoW51 | | Z 35 CWDV 5 | BH 12 | X 35 CrMoW 05 KU | | F.537 | SKD 62 | H 12 |
| 1.2631 | X50CrMoW911 | | | | | | | | |
| 1.2786 | X13NiCrSi3615 | X 13 CrNiSi 36 15 | Z 35 NCS 37-18 | | | | | | |
| 1.2889 | X45CoCrMoV553 | | | | | | | | |

P 3.2 **STEEL | high alloyed <1100 N/mm²**

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|----------------|-----------------------|--------------------|---------------------|--------------|----------------|-------------|------------|
| 1.2083 | X42Cr13 | X 42 Cr 13 | Z 40 C 14 | | X 41 Cr 13 KU | 2314 | | SUS 420 J2 | 420 |
| 1.2316 | X36CrMo17 | X 36 CrMo 17 | X38CrMo 16 1 | | X 38 CrMo 16 1 KU | | X 38 CrMo 16 | | D-4 |
| 1.2343 | X38CrMoVH1 | X 38 CrMoV 5 1 | Z 38 CDV 5 | BH 11 | X 37 CrMoV 5 1 KU | | X 37 CrMoV 5 | SKD 6 | H 11 |
| 1.2344 | X40CrMoV51 | X 40 CrMoV 5 1 | Z 40 CDV 5 | BH 13 | X 40 CrMoV 5 1 1 KU | 2242 | X 40 CrMoV 5 | SKD 61 | H 13 |
| 1.2436 | X210CrW12 | X 210 CrW 12 | Z 210 CW1 2 | | X 215 CrW 12 1 KU | 2312 | X 210 CrW 12 | SKD 2 | |
| 1.2581 | X30WCrV93 | X 30 WCrV 9 3 | Z 30 WCV 9 | BH 21 | X 30 WCrV 9 3 KU | | X 30 WCrV 9 | SKD 5 | H 21 |
| 1.2601 | X165CrMoV12 | X 165 CrMoV 12 | | | X 165 CrMoW 12 KU | 2310 | X 160 CrMoV 12 | | |
| 1.2622 | X60WCrMoV94 | | | | | | | | |
| 1.2678 | X45CrCoVW555 | | | | | | | | H 19 |
| 1.2731 | X50NiCrW1313 | | | | | | | | |
| 1.2764 | X19NiCrMo4 | | | | | | | | |
| 1.2767 | X45NiCrMo4 | 40 NiCrMo 4 | Y 35 NCD 16 | | 42 NiCrMo 15 7 KU | | | | A 9 |
| 1.2779 | X6NiCrTi2615 | | | S 66286 | | | | | 660 |
| 1.2787 | X23CrNi17 | HS 6-5-2 | Z 85 WDCV 06 05 04 02 | BM 2 | HS 6 5 2 2 | 2722 | | SKH 9 | |
| 1.3302 | S1214 | HS 12 1 4 | | | X 150 WV 1305 KU | | | | A 7 |
| 1.3318 | S1212 | HS 02.01.12 | | | | | | | |
| 1.3401 | X120Mn12 | X 120 Mn 12 | Z 120 M 12 | BW 10 | X G 120 Mn 12 | 2183 | AM-X 120 Mn 12 | SCMnH 1 | A 128 |
| 1.3543 | X102CrMo17 | X 102 CrMo 17 | X100CrMo17 | | X 105 CrMo 17 | | X 100 CrMo 17 | | |
| 1.3549 | X89CrMoV81 | | | | | | | | |
| 1.3551 | 80MoCrV4216 | | 80 DCV 40 | T 11350 | X 80 MoCrV 4 4 | | 80 MoCrV 40-16 | | M 50 |

P 3.3 **STEEL** | high alloyed <1400 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|----------------|-------------|-----------------------|--------------------|----------------|--------------|----------------|-------------|------------|
| 1.2709 | X3NiCoMoTi1895 | | | | | | | | |
| 1.2790 | 72SiNiCrMoV54 | | | | | | | | |
| 1.2888 | X20CoCrWMo109 | | | | | | | | |
| 1.3202 | S12145 | HS12-1-5-5 | | BT 15 | HS 12-1-5-5 | | 12-1-5-5 | | T 15 |
| 1.3207 | S104310 | HS10-4-3-10 | Z130WKCDV10-10-04-04 | BT 42 | HS 10-4-3-10 | | 10-4-3-10 | SKH 57 | M 44 |
| 1.3243 | S6525 | HS6-5-2-5 | KCV 06-05-05-04-02 | | HS 6-5-2-5 | 2723 | 6-5-2-5 | SKH 55 | M 35 |
| 1.3246 | S7425 | HS1-8-1 | Z110 WKCDV 07-05-04 | T 11341 | HS 7-4-2-5 | | 7-4-2-5 | | M 41 |
| 1.3247 | S21018 | HS2-9-1-8 | Z110 DKCWV 09-08-04 | BM 42 | HS 2-9-1-8 | | 2-10-1-8 | | M 42 |
| 1.3249 | S2928 | | | BM 34 | | | 2-9-2-8 | | |
| 1.3255 | S18125 | HS18-1-1-4 | Z80 WKCV 18-05-04-01 | BT 4 | HS 18-1-1-5 | | 18-1-1-5 | SKH 3 | T 4 |
| 1.3257 | S181215 | | | | | | | | |
| 1.3265 | S181210 | HS18-0-1-10 | | BT 5 | HS 18-0-1-10 | | 18-0-2-10 | SKH 4A | T 5 |
| 1.3342 | SC652 | HS6-5-2 | Z90 WDCV 06-05-04-02 | | HSC 6-5-3 | | | | M 3 |
| 1.3343 | S652 | HS6-5-3 | Z85 WDCV 06-05-04-02 | BM 2 | HS 6-5-2 | 2722 | 6-5-2 | SKH 51 | M2 |
| 1.3344 | S653 | | Z120 WDCV 06-05-04-03 | | | | 6-5-3 | SKH 52 | M 3 Cl.2 |
| 1.3346 | S291 | HS1-8-1 | Z85 DCWV 08-04-02-01 | BM 1 | HS 1-8-1 | | | | M1 |
| 1.3348 | S292 | HS2-9-2 | Z100 DCWV 09-04-02-02 | | HS 2-9-2 | 2782 | 2-9-2 | | M 7 |
| 1.3355 | S1801 | HS18-0-1 | Z80 WCV 18-04-01 | BT 1 | HS 18-0-1 | | 18-0-1 | SKH 2 | T 1 |
| 1.3549 | X89CrMoV81 | | | | | | | | |
| 1.3551 | 80MoCrV4216 | | 80 DCV 40 | T 11350 | X 80 MoCrV 4 4 | | 80 MoCrV 40-16 | | M 50 |

K 1.1 **GREY CAST IRON** <600 N/mm² (180 HB)

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 0.6010 | GG10 | GJL-100 | FGL 100 | Grade 100 | G 10 | 0110-00 | FG 10 | FC 100 | A48-20 B |
| 0.6012 | GG150 HB | GJL-HB 170 | | | | | | | |
| 0.6015 | GG15 | GJL-150 | FGL 150 | Grade 150 | G 15 | 0115-00 | FG 15 | FC 150 | A48-25 B |
| 0.6017 | GG170 HB | GJL-HB 205 | | | | | | | |

K 1.2 **GREY CAST IRON** <1000 N/mm² (300 HB)

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 0.6020 | GG20 | GJL-200 | FGL 200 | Grade 220 | G 20 | 0120-00 | FG 20 | FC 200 | A48-30 B |
| 0.6022 | GG190 HB | GJL-HB 230 | | | | | | | |
| 0.6025 | GG25 | GJL-250 | FGL 250 | Grade 260 | G 25 | 0125-00 | FG 25 | FC 250 | A48-40 B |
| 0.6027 | GG220 HB | GJL-HB 250 | FGL 250 | | | | | | |
| 0.6030 | GG30 | GJL-300 | FGL 300 | Grade 300 | G 30 | 0130-00 | FG 30 | FC 300 | A48-45 B |
| 0.6032 | GG240 HB | GJL-HB 275 | | | | | | | |
| 0.6035 | GG35 | GJL-350 | FGL 350 | Grade 350 | G 35 | 0135-00 | FG 35 | FC 350 | A48-50 B |
| 0.6037 | GG260 HB | GJL-HB 275 | | | | | | | |
| 0.6040 | GG40 | GJL-400 | FGL 400 | Grade 400 | | 0140-00 | | | A48-60 B |

M 1.1 STAINLESS STEEL FERRITIC/MARTENSITIC <850 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------|------------------|-------------|------------|
| 1.4000 | X6Cr13 | X 6 Cr 13 | Z 6 C 13 | 403 S 17 | X 6 Cr 13 | 2301 | X 6 Cr 13 | SUS 403 | 403 |
| 1.4002 | X6CrAl13 | X 6 CrAl 13 | Z 6 CA 13 | 405 S 17 | X 6 CrAl 13 | 2302 | X 6 CrAl 13 | SUS 405 | 405 |
| 1.4003 | X2CrNi12 | X2CrNi12 | CLC 4003 | | F 12N | | | | |
| 1.4005 | X12CrS13 | X 12 CrS 13 | Z 12 CF 13 | 416 S 21 | X 12 CrS 13 | 2380 | X12 CrS 13 | SUS 416 | 416 |
| 1.4006 | X10Cr13 | X 12 Cr 13 KD | Z 12 C 13 | 410 S 21 | X 12 Cr 13 | 2302 | X 12 Cr 13 | SUS 410 | 410 |
| 1.4008 | GX8CrNi13 | GX 7 CrNiMo 12 1 | Z 12 CN 13 M | 410 C 21 | GX 12 Cr 13 | | | SCS 1 | 414 |
| 1.4016 | X6Cr17 | X 8 Cr 17 | Z 8 C 17 | 430 S 15 | X 8 Cr 17 KD | 2320 | X 8 Cr 17 | SUS 430 | 430 |
| 1.4017 | X6CrNi171 | X 6 CrNi 17 1 | F 17 N | | X 6 CrNi 17 1 | | | | |
| 1.4021 | X20Cr13 | X 20 Cr 13 | Z 20 C 13 | 420 S 37 | X 20 Cr 13 | 2303 | X 20 Cr 13 | SUS 420 J1 | 420 |
| 1.4024 | X15Cr13 | X 15 Cr 13 | Z 12 C 13 M | 420 S 29 | X 12 Cr 13 | | | SUS 410 J1 | |
| 1.4027 | GX20Cr14 | | Z 20 C 13 M | 420 C 29 | | | | SCS 2 | |
| 1.4028 | X30Cr13 | X 30 Cr 13 | Z 30 Cr 13 | 420 S 45 | X 30 Cr 13 | 2304 | X 30 Cr 13 | SUS 420 J2 | 420 |
| 1.4031 | X40Cr13 | X 40 Cr 13 | Z 40 C 14 | | X 40 Cr 14 | 2304 | X 40 Cr 13 | SUS 420 | 420 |
| 1.4034 | X45Cr13 | X 45 Cr 13 | Z 40 C 14 | 420 S 45 | X 40 Cr 14 | | X 46 Cr 13 | SUS 420 | 420 |
| 1.4057 | X19CrNi172 | X 19 CrNi 17 2 | Z 15 CN 16.02 | 431 S 29 | X 16 CrNi 16 | 2321 | X 15 CrNi 16 | SUS 431 | 431 |
| 1.4059 | GX22CrNi17 | | Z 20 CN 17.2 M | ANC 2 | | | | | |
| 1.4085 | GX70Cr29 | | | | | | | | |
| 1.4086 | GX120Cr29 | | | 425 C 11 | | | | | |
| 1.4104 | X12CrMoS17 | X 14 CrMoS 17 | Z 10 CF 17 | 441 S 29 | X 10 CrS 17 | 2383 | X 10 CrS 17 | SUS 430 F | 430 F |
| 1.4105 | X4CrMoS18 | X 6 CrMoS 17 | Z 6 CDF 18-02 | | | | | SUS 430 F | 430 |
| 1.4106 | X10CrMo13 | | | | | | | | |
| 1.4107 | GX8CrNi12 | GX 8 CrNi 12 | GX 8 CrNi 12 | | GX 8 CrNi 12 | | | | |
| 1.4108 | X100CrMo13 | | | | | | | | |
| 1.4109 | X65CrMo14 | X 70 CrMo 15 | Z 70 CD 14 | | | | | SUS 440 A | 440 A |
| 1.4110 | X55CrMo14 | | Z 50 CD 13 | | | | | | |
| 1.4111 | X110CrMoV15 | | Z 4 CN b 17 | | X 6 CrNb 17 | | | SUS 430 LX | |
| 1.4112 | X90CrMoV18 | X 90 CrMoV 18 | Z 3 CT 1 2 | 409 S 1 9 | X 6 Cr Ti 1 2 | | | SUS 440 B | 440 B |
| 1.4113 | X6CrMo171 | X 8 CrMo 17 | Z 8 CD 17.02 | 434 S 17 | X 8 CrMo 17 | 2325 | | SUS 434 | 434 |
| 1.4115 | X20CrMo171 | | | | | | | | |
| 1.4116 | X45CrMoV15 | X 50 CrMoV 15 | Z 50 CD 15 | | X50 CrMoV 15 | | X 46 CrMo 16 | | |
| 1.4117 | X38CrMoV15 | | | | | | | | |
| 1.4119 | X15CrMo13 | | | | | | | | |
| 1.4120 | X20CrMo13 | | Z 20 CD 14 | | | | | | |
| 1.4122 | X35CrMo17 | X 39 CrMo 17 1 | X39CrMo17-1 | | X 35 CrMo 17 | | | | |
| 1.4123 | X15TN | | | | | | | | |
| 1.4125 | X105CrMo17 | X 105 CrMo 17 | Z 100 CD 17 | | X 105 CrMo 17 | | | SUS 440 C | 440 C |
| 1.4136 | GX70CrMo292 | | Z 60 CD 29.2 M | | | | | | |
| 1.4138 | GX120CrMo292 | | | | | | | | |
| 1.4313 | X5CrNi134 | X 3 CrNiMo 13 4 | Z 4 CDN 13.4 | 425 C 11 | X 3 CrNiMo 13 4 | 2385 | | SCS 5 | CA 6-NM |
| 1.4317 | GX4CrNi134 | GX 4 CrNi 13 4 | GX 4 CrNi 13 4 | | GX 4 CrNi 13 4 | | | | |
| 1.4351 | X3CrNi134 | X 3 CrNi 14 04 KE | | | | | | | |
| 1.4405 | GX5CrNiMo165 | GX 4 CrNiMo 16 5 1 | GX 4 CrNiMo 16 5 1 | | GX 4 CrNiMo 16 5 1 | | | | |
| 1.4502 | X8CrTi18 | X 6 Cr 18 KE | | | | | | | |
| 1.4510 | X6CrTi17 | X 8 CrTi 17 | Z 8 CT 17 | | X 6 CrTi 17 | | X 8 CrTi 17 | SUS 430 LX | 430 Ti |
| 1.4511 | X6CrNb17 | X 3 CrNb 17 | Z 8 CNb 17 | | X 6 CrNb 17 | | | SUS 430 LX | 430 Nb |
| 1.4512 | X6CrTi12 | X 5 CrTi 12 | Z 6 CT 12 | 409 S 19 | X 6 CrTi12 | | | SUH 409 | 409 |
| 1.4523 | X8CrMoTi17 | X 2 CrMoTiS 18 2 | X 2 CrMoTiS 18 2 | | | | | | |
| 1.4528 | X105CrCoMo182 | | | | | | | | |
| 1.4535 | X90CrCoMoV17 | | | | | | | | |
| 1.4543 | X3CrNiCuTi129 | | | | X 6 CrNiNB 18 11 | | | | |
| 1.4704 | X45SiCr4 | 45SiCr16-11 | | | | | | | HNV 2 |
| 1.4710 | GX30CrSi6 | GX 30 CrSi 6 | | | | | | | |
| 1.4712 | X10CrSi6 | | K 51255 | | | | | | |
| 1.4713 | X10CrAlSi7 | X 10 CrAlSi 7 | | | | | | | |
| 1.4718 | X45CrSi93* | X 45 CrSi 8 | Z 45 CS 9 | 401 S 45 | X 45 CrSi 8 | | F.3220 | SUH 1 | HNV 3 |
| 1.4722 | X10CrSi13 | | | | | | X 10 CrSi 13 | | |
| 1.4724 | X10CrAl13 | X 10 CrAl 13 | Z 10 C 13 | BH 12 | X 10 CrAl 12 | | X 10 CrAl 13 | SUS 405 | H-12 |
| 1.4725 | X8CrAl144 | CrAl 14 4 | K 91670 | | | | | | |
| 1.4729 | GX40CrSi13 | | | | GX 35 Cr 13 | | | SCH 1 | |
| 1.4740 | GX40CrSi17 | | | | GX 35 Cr 17 | | | | |
| 1.4742 | X10CrAl18 | | Z 10 CAS 18 | 403 S 15 | X 8 Cr 17 | | X 10 CrAl 18 | SUH 21 | 430 |
| 1.4745 | GX40CrSi23 | | | | | | | | |
| 1.4747 | X80CrNiSi20 | X 80 CrNiSi 20 | Z 80 CSN 20.02 | 433 S 65 | X 80 CrSiNi 20 | | X 80 CrSiNi20-02 | SUH 4 | HNV 6 |
| 1.4762 | X10CrAl24 | X 10 CrAl 24 | Z 10 CAS 24 | | X 16 Cr 26 | 2322 | X 10 CrAl 24 | SUH 442 | 446 |
| 1.4767 | X8CrAl205 | CrAl 20 5 | | | | | | | |
| 1.4773 | X8Cr30 | | | | | | | | |
| 1.4776 | GX40CrSi29 | | | 452 C 11 | GX 35 Cr 28 | | | SCH 2 | |

M 2.1 STAINLESS STEEL | austenitic <650 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|------------------|------------------------|---------------------|--------------------|---------------------|--------------|---------------------|-------------|------------|
| 1.4300 | X12CrNi188 | | | 302 | | | | | |
| 1.4301 | X5CrNi1810 | X 6 CrNi 18 10 KD | Z 6 CN 18.09 | 304 S 15 | X 5 CrNi 18 10 | 2332 | X 5 CrNi 18 11 | SUS 304 | 304 H |
| 1.4302 | X5CrNi199 | X 6 CrNi 20 10 KE | | 308 S 96 | | | | | |
| 1.4303 | X5CrNi1812 | X 8 CrNi 18 12 KD | Z 8 CN 17.07 | 305 S 19 | X 8 CrNi 19 10 | | X 8 CrNi 18 12 | SUS 305 | 308 |
| 1.4305 | X10CrNiS189 | X 8 CrNiS 19 9 | Z 8 CNF 18.09 | 303 S 31 | X 8 CrNiS 18 9 | 2346 | F.310.C | SUS 303 | 303 |
| 1.4307 | X2CrNi189 | X 2 CrNi 18 9 | CLC 18.9.L | 304 S 11 | X 2 CrNi 18 9 | | | SUS 304 L | 304 L |
| 1.4308 | GX6CrNi189 | X 2 CrNi 18 7 | Z 6 CN 18.10 M | 304 C 15 | GX 5 CrNi 19 10 | 2333 | | SCS 13 | CF-8 |
| 1.4310 | X12CrNi177 | X 12 CrNi 17 7 | Z 12 CN 17.07 | 301 S 21 | X 12 CrNi 17 07 | | X 12 CrNi 17 07 | SUS 301 | 301 |
| 1.4311 | X2CrNiN1810 | X 2 CrNiN 18 10 | Z 8 CN 18.12 | 304 S 62 | X 8 CrNi 19 10 | 2371 | X 8 CrNi 18 12 | SUS 304 LN | 304 LN |
| 1.4312 | GX10CrNi188 | | Z 10 CN 18.9 M | 302 C 25 | | | | SCS 12 | |
| 1.4318 | X 2 CrNiN 18 7 | X 2 CrNiN 18 7 | 18-7L | | 18-7L | | | | |
| 1.4319 | X3CrNiN178 | | | 302 S 26 | X 10 CrNi 18 09 | | | SUS 302 | |
| 1.4350 | X5CrNi189 | | Z 6 CN 18.09 | 304 S 31 | X 5 CrNi 18 10 | | | | 304 |
| 1.4401 | X5CrNiMo17122 | X 6 CrNiMo 17 12 2 KD | Z 6 CND 17.11 | 316 S 16 | X 5 CrNiMo 17 12 | 2347 | X 5 CrNiMo 17 12 | SUS 316 | 316 |
| 1.4404 | X2CrNiMo17132 | GX 3 CrNiMo 17 12 2 KD | Z 3 CND 19.10 M | 316 S 12 | GX 2 CrNiMo 19 11 | 2348 | X 2 CrNiMo | SUS 316 L | 316 L |
| 1.4406 | X2CrNiMoN17122 | X 3 CrNiMoN 17 12 2 | Z 2 CND 17.12 Az | 316 S 61 | X 2 CrNiMoN 17 12 | | | SUS 316 LN | 316 LN |
| 1.4407 | GX 5 CrNiMo 13 4 | GX 5 CrNiMo 13 4 | J 91550 | | | | | | A757 |
| 1.4408 | GX6CrNiMo1810 | GX 5 CrNiMo 19 11 2 | GX 5 CrNiMo 19 11 2 | 316 C 16 | GX 5 CrNiMo 19 11 2 | 2343 | X 7 CrNiMo 20 10 | SCS 14 | CF-8M |
| 1.4435 | X2CrNiMo18143 | X 2 CrNiMo 18 16 | Z 2 CDN 17.13 | 316 S 11 | X 2 CrNiMo 17 13 | 2353 | | SVS 16 | 316 L |
| 1.4436 | X5CrNiMo17133 | X 6 CrNiMo 18 13 3 KD | Z 6 CND 17.12 | 316 S 16 | X 5 CrNiMo 17 13 | 2343 | X 6 CrNiMo 17 12 03 | SUS 316 | 316 |
| 1.4438 | X2CrNiMo18164 | X 3 CrNiMo 18 16 4 | Z 2 CND 19.15 | 317 S 12 | X 2 CrNiMo 18 15 | 2367 | | SUS 317 L | 317 L |
| 1.4440 | X2CrNiMo18165 | | | | | | | | |
| 1.4442 | X2CrNiMo18154 | | X 3 CrNiMoN 18 14 | | | | | | |

M 2.2 STAINLESS STEEL | austenitic <750 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|------------------|------------------------|---------------------|--------------------|---------------------|--------------|-----------------------|-------------|------------|
| 1.4429 | X2CrNiMoN17133 | X 3 CrNiMoN 17 12 2 | Z 2 CND 17.13 Az | 316 S 62 | X 2 CrNiMoN 17 13 | 2375 | | SUS 316 LN | 316 LN |
| 1.4432 | X2CrNiMo17123 | X 2 CrNiMo 17 12 2 | Z 3 CND 17 13 30 | 316 S 13 | X 2 CrNiMo 17 12 3 | | | SUS 316L | 316 L |
| 1.4434 | X2CrNiMoN18124 | | CLC 18.12.4.LN | | X 2 CrNiMoN 18 12 4 | | | | 317 LN |
| 1.4439 | X2CrNiMoN17135 | X 3 CrNiMo 17 13 5 | Z 3 CnD 18.14-05 Az | | | | | | |
| 1.4465 | X1CrNiMoN25252 | | | | | | | | |
| 1.4505 | X5NiCrMoCuNb2018 | | | | | | | | |
| 1.4506 | X5NiCrMoCuTi2018 | | | | | | | | |
| 1.4529 | X1NiCrMoCuN25206 | | | | | | | | |
| 1.4536 | GX2NiCrMoCuN2520 | GX 2 CrNiMoCuN 25 20 6 | | | | | | | |
| 1.4539 | X1NiCrMoCuN25205 | X 1 NiCrMoCu 25 20 5 | Z 1 NCDU 25.20 | 904 S 13 | | 2662 | | | |
| 1.4541 | X6CrNiTi1810 | X 6 CrNiTi 18 10 | Z 6 CNT 18.10 | 321 S 12 | X 6 CrNiTi 18 11 | 2337 | X 7 CrNiTi 18 11 | SUS 321 | 321 |
| 1.4542 | X5CrNiCuNb164 | X 5 CrNiCuNb 16 4 | Z 7 CNU 17.04 | | X 5 CrNiCuNb 16 4 | | | SUS 630 | 630 |
| 1.4550 | X6CrNiNb1810 | X 6 CrNiNb 18 10 | Z 6 CNNb 18.10 | 347 S 17 | X 6 CrNiNb 18 11 | 2338 | X 6 CrNiNb 18 11 | SUS 347 | 347 |
| 1.4551 | X5CrNiNb199 | X 5 CrNiNb 20 10 KE | Z 6 CNNb 20-10 | | | | | SUS 347 Y | |
| 1.4552 | GX5CrNiNb189 | GX 5 CrNiNb 19 11 | Z 4 CNNb 19.10 M | 347 C 17 | GX 5 CrNiNb 19 11 | | | SCS 21 | |
| 1.4571 | X6CrNiMoTi17122 | X 6 CrNiMoTi 17 12 2 | Z 6 CNDT 17.12 | 320 S 31 | X 6 CrNiMoTi 17 12 | 2350 | X 6 CrNiMoTi 17 12.03 | SUS 316 Ti | 316 Ti |
| 1.4573 | X10CrNiMoTi812 | | | 320 S 33 | X 6 CrNiMoTi 17 13 | | | SUS 316 Ti | 316 Ti |
| 1.4575 | X2CrNiMoNb2842 | | | | | | | | |
| 1.4577 | X3CrNiMoTi2525 | | | | | | | | |
| 1.4580 | X6CrNiMoNb17122 | X 6 CrNiMoNb 17 12 2 | Z 6 CNDNb 17.12 | 318 S 17 | X 6 CrNiMo 17 12 2 | | | | 316 Cb |
| 1.4581 | GX5CrNiMoNb1810 | GX 5 CrNiMoNb 19 11 2 | Z 4 CNDNb 18.12 M | 318 C 17 | GX 6 CrNiMoNb 20 11 | | | SCS 22 | |
| 1.4582 | X4CrNiMoNb257 | | | | | | | SCS 22 | |
| 1.4583 | X10CrNiMoNb1812 | | | | X 6 CrNiMoNb 17 13 | | | | 318 |
| 1.4585 | GX7CrNiMoNb257 | | | | | | | | |
| 1.4586 | X5CrNiMoCuNb2218 | | | | | | | | |
| 1.4821 | X20CrNiSi254 | X 20 CrNiSi 25 4 | Z 20 CNS 25.04 | | | 2322 | | | |
| 1.4822 | GX40CrNi245 | | J 92605 | J 92605 | | | | | |
| 1.4823 | GX40CrNiSi274 | | | | | | | | |
| 1.4825 | GX25CrNiSi189 | | | 302 C 35 | GX 16 CrNi 20 10 | | | | |
| 1.4826 | GX40CrNiSi229 | | | | | | | SCH 12 | |
| 1.4828 | X15CrNiSi2012 | X 15 CrNiSi 20 12 | Z 15 CNS 20.12 | 309 S 24 | X 16 CrNiSi 20 12 | | X 15 CrNiSi 20 12 | SUH 309 | 309 |
| 1.4833 | X7CrNi2314 | X 12 CrNi 23 13 | Z 15 CN 24.13 | 309 S 24 | X 6 Cni 23 14 | | | SUS 309 S | 309 S |
| 1.4837 | GX40CrNiSi2512 | | | 309 C 30 | GX 35 CrNi 25 12 | | | SCS 17 | |

M 2.2 STAINLESS STEEL | austenitic <750 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|-----------------|---------------------|-------------------|--------------------|-------------------|--------------|--------------------|-------------|------------|
| 1.4841 | X15CrNiSi2520 | X 15 CrNiSi 25 20 | Z 15 CNS 25.20 | 314 S 25 | X 16 CrNiSi 25 20 | | X 15 CrNiSi 25 20 | SUH 310 | 310 |
| 1.4841 | X15CrNiSi2520 | X 15 CrNiSi 25 20 | Z 15 CNS 25.20 | 314 S 25 | X 16 CrNiSi 25 20 | | X 15 CrNiSi 25 20 | SUH 310 | 310 |
| 1.4845 | X12CrNi2521 | X 8 CrNi 25 21 | Z 12 CN 25.20 | 310 S 24 | X 6 CrNi 25 20 | 2361 | F.331 | SUS 310 S | 310 S |
| 1.4848 | GX40CrNiSi2520 | | | 310 C 40 | GX 40 CrNi 26 20 | | X 40 CrNi 25 20 | SCH 21 | HK |
| 1.4861 | " | X10NiCr3220* | | | | | | | |
| 1.4866 | X33CrNiMnN238 | X 33 CrNiMnN 23 8 | X 33 CrNiMnN 23 8 | | | | | | |
| 1.4871 | X53CrMnNiN219 | | Z 52 CMN 21.09 | 349 S 54 | X 53 CrMnNiN 21 9 | | X 53 CrMnNiN 21-09 | SUH 35 | EV 8 |
| 1.4873 | X45CrNiW189 | X 45 CrNiW 18 9 | Z 35 CNWS 14.14 | 331 S 40 | X 45 CrNiW 18 9 | | X 45 CrNiSiW 18-09 | SUH 31 | |
| 1.4878 | X12CrNiTi189 | X 10 CrNiTi 18 10 | Z 6 CNT 18.12 | 321 S 20 | X 6 CrNiTi 18.11 | 2337 | X 6 CrNiTi 18 11 | SUS 321 | 321 |
| 1.4881 | X70CrMnNiN216 | | | | X 70 CrMnNiN 21 6 | | | | EV 11 |
| 1.4882 | X50CrMnNiNbN219 | X 50 CrMnNiNbN 21 9 | Z 50 CMNNb 21.09 | | | | | | |
| 1.4919 | X6CrNiMo1713 | X 6 CrNiMo 17 12 2 | Z 6 CND 17.13 B | 316 S 51 | | | | | 316 H |
| 1.4948 | X6CrNi1811 | X 6 CrNi 18 10 | Z 6 CN 18.09 | 304 S 51 | X 5 CrNi 18 10 KW | 2333 | | | |
| 1.4949 | X3CrNi1811 | | | | X 2 CrNiN 18 11 | | | | |
| 1.4961 | X8CrNiNb1613 | | | 347 S 51 | | | X 7 CrNiNb 16 13 | | |
| 1.4981 | X8CrNiMoNb1616 | | | | | | X 7 CrNiMo 16 16 | | |

M 3.1 DUPLEX STEEL | austenitic <1100 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|-------------------|-----------------------|-------------------|--------------------|--------------------|--------------|------------------|-------------|------------|
| 1.4162 | X2CrMnNiN2252 | X 2 CrMnNiN 22 5 2 | | | X2CrMnNiN21-5-1 | | S32101 | LDX 2101 | S321 01 |
| 1.4362 | X2CrNiN234 | X 2 CrNiN 23 4 | Z 3 CN 23 04 AZ | | | 2327 | | | S323 04 |
| 1.4410 | X2CrNiMoN2574 | X 2 CrNiMoN 25 7 4 | Z 5 CND 20.10 M | | X 2 CrNiMoN 25 7 4 | | | SCS 14 A | S327 50 |
| 1.4460 | X4CrNiMo2752 | X 3 CrNiMo 27 5 2 | X 2 CrNiMo 25 7 3 | | | 2324 | X 8 CrNiMo 27 05 | SUS 329 J1 | S325 50 |
| 1.4462 | X2CrNiMoN2253 | X 2 CrNiMoN 22 5 3 | Z 3 CND 22.05 AZ | 318 S 13 | X 2 CrNiMoN 22 5 3 | 2377 | | SUS 329 J3L | S318 03 |
| 1.4465 | X1CrNiMoN25252 | X 1 CrNiMoN 25 25 2 | Z 1 CND 25.22 AZ | | | | | | S310 50 |
| 1.4501 | X2CrNiMo-CuWN2574 | X 2 CrNiMoCuWN 25 7 4 | Z 3 CND 25.06 AZ | | | | | SM 25 Cr | S327 60 |
| 1.4507 | X2CrNiMoCuN2563 | X 2 CrNiMoCuN 25 6 3 | Z 3 CNDU 25.06 AZ | | | | | QSA 2505 | S325 20 |
| 1.4534 | 13-8 PH | X 3 CrNiMoAl 13 8 2 | Z 4 CNDAT 13.09 | | | | | | S138 00 |
| 1.4542 | 17-4 PH | X 5 CrNiCuNb 16 4 | Z 7 CNU 17 04 | | | | | SUS 630 | 630 |
| 1.4545 | 15-5 PH | X 5 CrNiCu 15 5 | Z 6 CNU 15 05 | | | | | | XM-12 |
| 1.4548 | 17-4 PH | X5CrNiCuNb1744 | X 5 CrNiCuNb 16 4 | | | | | SUS 630 | S174 00 |
| 1.4568 | 17-7 PH | X 7 CrNiAl 17 7 | Z 9 CNA 17 07 | 301 S 81 | X 7 CrNiAl 17 7 | 2388 | X 7 CrNiAl 17 7 | SUS 631 | S177 00 |

N 1.1 ALUMINIUM | alloyed <500 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------------|--------------|-------------|-------------|------------|
| 3.1255 | AlCu 4 SiMg | AW-2014 | A-U4SG | H 15 | P-AlCu 4.4 SiMnMg | | L-3130 | A2014 | AA2014 |
| 3.1305 | AlCu 2.5 Mg | AW-2117 | A-U2G | L 86 | P-AlCu 2.5 MgSi | | L-3180 | A2117 | AA2117 |
| 3.1324 | AlCu 4 MgSi | AW-2017 A | | | | | | | |
| 3.1325 | AlCuMg1 | AW-2017 A | A-U4G | H 14 | P-AlCu 4.5 MgMn | GA631 | L-3120 | A2017 | AA2017 A |
| 3.1355 | AlCuMg2 | AW-2024 | A-U4G1 | L 97 / L 98 | P-AlCu 4.5 MgMn | 5 | L-3140 | A2024 | AA2024 |
| 3.2315 | AlMgSi 1 | AW-6082 | A-SGM0,7 | H 30 | P-AlMgSi | 4212 | L-3453 | | AA6082 |
| 3.3206 | AlMgSi 0.5 | AW-6060 | A-GS | H 9 | P-AlMgSi | 4140 | L-3442 | | AA6060 |
| 3.3208 | Al99.9 MgSi | AW-6401 | | | | | | | |
| 3.3210 | AlMgSi 0.7 | AW-6005 A | | | | | | | |
| 3.3211 | AlMg 1 SiCu | AW-6061 | A-GSUC | H 20 | P-AlMg 1 SiCu | | L-3420 | A6061 | AA6061 |
| 3.3315 | AlMg1 | AW-5005 A | A-G0,6 | N 41 | P-AlMg 0.9 | 4106 | L-3350 | A5005 | AA5005 A |
| 3.3316 | AlMg 1.5 | AW-5050 | A-G1,5 | 3L 44 | P-AlMg 1.5 | | L-3380 | | AA5050 B |
| 3.3317 | Al99.85 Mg 1 | AW-5305 | | | | | | | |
| 3.3318 | Al99.9 Mg 1 | AW-5505 | | | | | | | |
| 3.3326 | AlMg 1.8 | AW-5051 A | | | | | | | |
| 3.3345 | AlMg 4.5 | AW-5082 | A-G4,5 | | P-AlMg 4.4 | | | A5082 | AA5082 |
| 3.3523 | AlMg 2.5 | AW-5052 | A-G2,5C | L 80 / L 81 | P-AlMg 2.5 | 4120 | L-3360 | A5052 | AA5052 |
| 3.3525 | AlMg 2 Mn 0.3 | AW-5251 | A-G2M | N4 | P-AlMg 2 Mn | | L-3361 | | AA5251 |
| 3.3527 | AlMg 2 Mn 0.8 | AW-5049 | A-G2,5MC | | | | | A5049 | AA5049 |
| 3.3535 | AlMg 3 | AW-5754 | A-G3M | | P-AlMg 3.5 | 4130 | L-3390 | | AA5754 |
| 3.3537 | AlMg 2.7 Mn | AW-5454 | A-G2,5MC | | P-AlMg 2.7 Mn | 4130 | L-3391 | | AA5454 |
| 3.3541 | G-AlMg 3 | AC-51100 | | | | | | | |
| 3.3545 | AlMg 4 Mn | AW-5086 | A-G4MC | | P-AlMg 4.4 | | L-3382 | | AA5086 |
| 3.3547 | AlMg 4 Mn | AW-5086 | A-G4MC | N8 | P-AlMg 4.5 | 4140 | L-3321 | A5083 | AA5083 |

N 1.2 ALUMINIUM | alloyed <600 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-----------------|--------------|-------------|-------------|------------|
| 3.0615 | AlMgSiPb | AW-6012 | A-SGPb | | P-AISiMgMn | | L-3452 | | AA6012 |
| 3.1645 | AlCu 4 PbMgMn | AW-2007 | | | | 4355 | L-3121 | A2007 | AA2007 |
| 3.1655 | AlCu 6 BiPb | AW-2011 | A-U5PbBi | FC 1 | P-AlCu 5.5 PbBi | 4338 | L-3192 | A2011 | AA2011 |
| 3.4335 | AlZn 4.5 Mg 1 | AW-7020 | A-Z5G | H 17 | | 4425 | L-3741 | | AA7020 |
| 3.4345 | AlZnMgCu 0.5 | AW-7022 | A-Z4GU | | | | | | AA7022 |
| 3.4365 | AlZnMgCu 1.5 | AW-7075 | A-Z5GU | 2L 95 | P-AlZn 5.8 MgCu | | L-3710 | A7075 | AA7075 |

N 2.1 - 2.3 ALUMINIUM | cast <600 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|------------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 3.2151 | G-AlSi 6 Cu 4 | AC-45000 | A-S5UZ | LM 4 | | | | AC4B | A 319.0 |
| 3.2161 | G-AlSi 8 Cu 3 | AC-46200 | A-S9U3A-Y4 | LM 24 | 5075 | | | AC4D | A 328.0 |
| 3.2371 | G-AlSi 7 Mg 0,3 | AC-42100 | | | | | | AC4CH | A 356.0 |
| 3.2373 | G-AlSi 9 Mg | AC-43300 | | | | | | | |
| 3.2381 | G-AlSi 10 Mg | AC-43100 | | | | | | | |
| 3.2383 | G-AlSi 10 Mg(Cu) | AC-43400 | A-S10G | LM 9 | 3049 | 4253 | | ADC3 | A 360.2 |
| 3.2581 | G-AlSi 12 | AC-47100 | A-S13 | LM 6 | 4514 | 4261 | | AC3A | A 413.2 |
| 3.2583 | G-AlSi 12 Cu | AC-44300 | A-S12-Y4 | LM 20 | 5079 | 4260 | | ADC1 | A 413.1 |

N 3.1 - 3.3 COPPER | alloyed <600 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|-------------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 2.0240 | CuZn 15 | CW-502L | CuZn 15 | CZ 102 | | | | C 2300 | C 23000 |
| 2.0265 | CuZn 30 | CW-505L | CuZn 30 | CZ 102 | | | | C 2600 | C 26000 |
| 2.0321 | CuZn 37 | CW-508L | CuZn 37 | CZ 180 | C 2720 | | | | C 27200 |
| 2.0492 | G-CuZn 15 Si 4 | CC-761S-GS | | | | | | | B-198 |
| 2.0592 | G-CuZn 35 Al 1 | CC-765S | U-Z 36 N 3 | HTB 1 | | | | | C 86500 |
| 2.0966 | CuAl 10 Ni 5 Fe 4 | CW-307G | U-A 10 N | CA 104 | | | | | C 63000 |
| 2.1006 | SG-CuSn | | | | | | | | |
| 2.1050 | G-CuSn 10 | CC-480K-GS | | CT 1 | | | | | C 90700 |
| 2.1052 | G-CuSn 12 | CC-483K-GS | UE 12 P | Pb 2 | | | | | C 91700 |
| 2.1060 | G-CuSn 12 Ni 2 | CC-484K-GS | | | | | | | C 91700 |
| 2.1176 | G-CuPb 10 Sn | CC-495K-GS | UE 10 Pb 10 | LB 2 | | | | | C 93700 |
| 2.1182 | G-CuPb 15 Sn | CC-496K-GS | U-Pb 15 E 8 | LB 1 | | | | | C 93800 |
| 2.1188 | G-CuPb 20 Sn | CC-497K-GS | U-Pb 20 | LB 5 | | | | | C 94100 |
| 2.1266 | CuCd 1 | | | | | | | | |
| 2.1292 | G-CuCrF 35 | CC-140C | | CC1-FF | | | | | C 81500 |
| 2.1293 | CuCrZr | CW-106C | U-Cr 0.8 Zr | CC 102 | | | | | C 81500 |

S 2.1 TITANIUM | commercially pure <600 N/mm²

| Material-number | Tradename | Germany DIN | Europe EN | France AFNOR | GB BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|-----------------|-----------|---------------|---------------|----------------|----------|-------------|--------------|-------------|-------------|------------|
| 3.7025 | | Ti 99,8 | Titan Grade 1 | AIR:9182T35 | 2 TA 1 | | | | | R 50250 |
| 3.7035 | | Ti 99,7 | Titan Grade 2 | AIR:9182T40 | 2 TA 2-1 | | | | | R 50400 |
| 3.7055 | | Ti-99,6 | Titan Grade 3 | AIR:9182T50 | TA 3 | | | | | R 50550 |
| 3.7065 | | Ti-99,5 | Titan Grade 4 | AIR:9182T60 | 2 TA 6-9 | | | | | R 50700 |

S 2.2 TITANIUM | alloyed <1000 N/mm²

| Material-number | Tradename | Germany DIN | Europe EN | France AFNOR | GB BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|-----------------|-----------|-----------------|----------------|----------------|---------|-------------|--------------|-------------|-------------|----------------|
| 3.7105 | | TiNi 0,8 Mo 0,3 | Titan Grade 12 | | | | | | | |
| 3.7115 | | TiAl 5 Sn 2,5 | Titan Grade 6 | T-A 5 E | | | | | | Ti 5 Al-2,5 Sn |
| 3.7195 | | TiAl 3 V 2,5 | Titan Grade 9 | | | | | | | |
| 3.7225 | | Ti 1 Pd | Titan Grade 11 | | TP 1 | | | | | R 52250 |
| 3.7235 | | Ti 2 Pd | Titan Grade 7 | | | | | | | T 52400 |
| 3.7164 | | TiAl 6 V 4-LN | Titan Grade 5 | | | | | | | R 56400 |
| 3.7165 | | TiAl 6 V4 | Titan Grade 5 | T-A 6 V | | TA 10-13 | | | | |

S 1.1 IRON-BASED ALLOY [HRSA] <1200 N/mm²

| Material-number | Tradename | Germany DIN | Europe EN | France AFNOR | GB BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|-----------------|---------------------|--------------------|------------------------|-----------------------|----------|-----------------------|--------------|-------------|-------------|------------|
| 1.3910 | Magnifer® 36 | Ni36 | D 1 | | | | | | | |
| 1.3926 | Magnifer® 50 | RNi12 | | | | | | | | |
| 1.4361 | X1CrNiSi1815 | X 1 CrNiSi 18-15-4 | X 1 CrNiSi 18 15 4 | | | | | | | |
| 1.4562 | Nicrofer® 3127 | X1NiCrMoCu32287 | X 1 NiCrMoCu 32 28 7 | | | | | | | |
| 1.4562 | Alloy 31 | X1NiCrMoCu32287 | X 1 NiCrMoCu 32 28 7 | | | | | | | |
| 1.4563 | Sanicro® 28 | X1NiCrMoCuN31274 | X 1 NiCrMoCuN 31-27-4 | X 1 NiCrMoCuN 31 27 4 | | X 1 NiCrMoCuN 31 27 4 | 2584 | | | |
| 1.4862 | INCOLOY® Alloy DS | X12NiCr3618 | | Z 12 NCS 37-18 | NA 17 | | | | | |
| 1.4980 | INCOLOY® Alloy 286 | X6NiCrTiMoVB21152 | X 6 NiCrTiMoVB 21 15 2 | Z 6 NCTDV 25.15 B | 286 S 31 | | | | | |
| 2.4478 | Alloy 52 (NiLo® 52) | FeNi 52 | Titan Grade 4 | AIR:9182T60 | 2 TA 6-9 | | | | | N 14052 |

S 1.2 NICKEL-BASED ALLOY [HRSA] <1450 N/mm²

| Material-number | Tradename | Germany DIN | Europe EN | France AFNOR | GB BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|-----------------|------------------|-----------------|-------------|----------------|--------------|----------------|--------------|-------------|-------------|------------|
| 2.4602 | INCONEL® 622 | NiCr21Mo14W | | | | INCONEL® 622 | | | | |
| 2.4632 | Nimonic® 90 | NiCr20Co80Ti | HR 2 | NC 20 KTA | NA 36 | Nimonic® 90 | | | | N 07090 |
| 2.4642 | INCONEL® 690 | NiCr29Fe | | NC 30 Fe | | INCONEL® 690 | | | NCF 690 | N 06690 |
| 2.4650 | Nimonic® C-263 | NiCo20Cr20MoTi | HR 10 | NCK 20 D | NA 38 | Nimonic® C-263 | | | NCF 690 | N 07263 |
| 2.4654 | Waspaloy® | NiCr19Co14Mo4Ti | | NC 20 K14 Y | | Waspaloy® | | | | N 07001 |
| 2.4662 | INCOLOY® 901 | NiCr13Mo6Ti3 | | Z 8 NCDT 42 | | | | | | N 09901 |
| 2.4663 | INCONEL® 617 | NiCr23Co12Mo | | NC 22 K12 D9 A | | INCONEL® 617 | | | | N 06617 |
| 2.4665 | Hastelloy® X | NiCr22Fe18Mo | HR 6 | NC 22 FeD | NA 40 | Hastelloy X | | | | |
| 2.4666 | Nimonic® PK25 | NiCr18CoMo | | NKCD 20 ATU | | | | | | |
| 2.4668 | INCONEL® 718 | NiCr19FeNbMo | HR 8 | NC 19 Fe Nb | INCONEL® 718 | INCONEL® 718 | | | | N 07718 |
| 2.4669 | INCONEL® X-750 | NiCr15Fe7TiAl | | NC 15 Fe 7 TA | | INCONEL® X-750 | | | | N 07750 |
| 2.4694 | INCONEL® 751 | NiCr16Fe7TiAl | | | | | | | | N 07751 |
| 2.4816 | INCONEL® 600 | NiCr15Fe | | NC 15 Fe | NA 14 | INCONEL® 600 | | | NFC 600 | N 06600 |
| 2.4819 | Nimonic® C-276 | NiMo16Cr15W | | NC 17 D | | Nimonic® C-276 | | | | N 10276 |
| 2.4851 | INCONEL® 601 | NiCr23Fe15 | | NC 23 Fe 14 A | | INCONEL® 601 | | | NCF 601 | N 06601 |
| 2.4856 | INCONEL® 625 | NiCr22Mo9Nb | | NC 22 Fe DNb | NA 21 | INCONEL® 625 | | | NCF 625 | N 06625 |
| 2.4858 | INCOLOY® 825 | NiCr21Mo | 3072.76 | NC 21 Fe DU | NA 16 | INCOLOY® 825 | | | NCF 825 TB | N 08825 |
| 2.4869 | Alloy 80/20 | NiCr80-20 | | | | | | | | N 06003 |
| 2.4879 | Centralloy® 4879 | G-NiCr38W | | | | | | | | |
| 2.4883 | Hastelloy® C276 | G-NiMo16Cr | | | | | | | | |
| 2.4889 | Nicrofer® 45 TM | NiCr28FeSiCe | | | | | | | | N 06045 |
| 2.4951 | Nicrofer® 7520 | NiCr20Ti | | NC 20 T | HR 5 | | | | | N 06075 |

S 1.3 COBALT-BASED ALLOY [HRSA] <1450 N/mm²

| Material-number | Tradename | Germany DIN | Europe EN | France AFNOR | GB BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|-----------------|-----------------|---------------|-------------|----------------|---------|-----------------|--------------|-------------|-------------|------------|
| 2.4681 | ULTIMET® alloy | CoCr26Ni9Mo5W | | | | | | | | |
| 2.4682 | Stellite® 31 | G-CoCr25NiW | | KC 25 WN | | | | | | ASTM A567 |
| 2.4683 | Conicro® 4023 W | CoCr22NiW | | | | | | | | |
| 2.4691 | HS 21 | G-CoCr28Mo | | KC 27 D5 NFe | | | | | | ASTM F-75 |
| 2.4964 | Stellite® 25 | CoCr20W15Ni | | KC 22 WN | HR 240 | L605 Haynes® 25 | | | | R 30605 |
| 2.4979 | S 816 | CoCr28Mo6 | | | | | | | | |

Technical formulas

Calculate cutting speed (m/min)

$$V_c = \frac{D * \pi * n}{1000}$$

Calculate rotational speed (rpm)

$$n = \frac{V_c * 1000}{D * \pi}$$

Calculate feed rate (mm/min)

$$V_f = n * z * f_z$$

Calculate feed per tooth (mm/number of teeth)

$$f_z = \frac{V_f}{n * z}$$

Calculate chip removal rate (cm³/min)

$$Q = \frac{a_p * a_e * V_f}{1000}$$

Calculate average chip thickness (mm)

$$h_m = f_z * \frac{\sqrt{a_e}}{D}$$

Explanation of terms

| | | |
|----------------------|---------------------------|-------------------------|
| V_c | Cutting speed | in m/min |
| n | Rotational speed | in rpm |
| V_f | Feed rate | in mm/min |
| F_z | Feed per tooth | in mm/number of teeth |
| z | Number of teeth (cutting) | |
| a_p | Depth of cut | in mm |
| a_e | Width of cut | in mm |
| h_m | Average chip thickness | in mm |
| Q | Chip removal rate | in cm ³ /min |
| D | Diameter of tool | in mm |

EXPLANATION OF CUTTING DATA

EXAMPLE FOR SIDE MILLING OF 1.2343 WITH Ø10:

P 3.2 STEEL | high alloyed <1100 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|----------------|----------------|--------------------|--------------------------|--------------|--------------|-------------|------------|
| 1.2083 | X42Cr13 | X 42 Cr 13 | Z 40 C 14 | | X 41 Cr 13 KU | 2314 | | SUS 420 J2 | 420 |
| 1.2316 | X36CrMo17 | X 36 CrMo 17 | X38CrMo 16 1 | | X 38 CrMo 16 1 KU | | X 38 CrMo 16 | | D-4 |
| 1.2343 | X38CrMoVH1 | X 38 CrMoV 5 1 | Z 38 CDV 5 | BH 11 | X 37 CrMoV 5 1 KU | | X 37 CrMoV 5 | SKD 6 | H 11 |
| 1.2344 | X40CrMoV51 | X 40 CrMoV 5 1 | Z 40 CDV 5 | BH 13 | X 40 CrMoV 5 1 1 KU 2242 | | X 40 CrMoV 5 | SKD 61 | H 13 |
| 1.2436 | X210CrW12 | X 210 CrW 12 | Z 210 CW1 2 | | X 215 CrW 12 1 KU | 2312 | X 210 CrW 12 | SKD 2 | |

THE MATERIAL KEY WITH DETAILED BREAKDOWN OF MATERIALS BY MATERIAL GROUP CAN BE FOUND AT THE END OF THE CATALOGUE.

| Material | Strength (N/mm ²) | Full Slot | Side Milling | Finishing | ETC | Materialgroup Factor fz / a | Materialgroup Factor ae ETC |
|------------------------------------|-------------------------------|------------|--------------|------------|------------|-----------------------------|-----------------------------|
| | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| P STEEL | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.3 unalloyed | <850 | 200 | 200 | 220 | 315 | 1 | 1 |
| 2.1-2.2 low alloyed | <950 | 190 | 190 | 210 | 232 | 0.9 | 0.8 |
| 3.1-3.2 high alloyed | <1100 | 170 | 170 | 190 | 198 | 0.8 | 0.7 |
| K CASTINGS | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.2 grey cast iron | <1000 | 210 | 210 | 230 | 242 | 0.9 | 0.8 |
| M STAINLESS STEEL | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1 ferritic/martensitic | <850 | 90 | 90 | 95 | 152 | 0.9 | 0.7 |
| 2.1 austenitic | <650 | 80 | 80 | 85 | 132 | 0.8 | 0.5 |
| N NON-FERROUS | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-2.3 ALUMINIUM alloyed/casted | <600 | 400 | 400 | 420 | 500 | 1.6 | 2 |
| 3.1-3.3 COPPER alloyed | <600 | 200 | 200 | 220 | 262 | 1.5 | 1.6 |
| T TITANIUM | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 2.1-2.2 pure/alloyed | <1000 | 50 | 50 | 53 | 75 | 0.8 | 0.5 |
| S SUPER ALLOYS | | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.3 HRSA | <1450 | 25 | 25 | 28 | 42 | 0.7 | 0.3 |

OVERVIEW OF THE DIFFERENT MATERIAL GROUPS FOR THIS TOOL INCLUDING FACTORS

Material P 1.1-1.3

| D1 | L2 | Immersion Angle | Full Slot | | | Side Milling | | | Finishing | | | ETC | | | |
|----|----|-----------------|-----------|----------|----------|--------------|------------|-------|-----------|------|-------|--------|------|-------|--------|
| | | | fz | ae = 1xD | ap = 1xD | fz | ae = 0.3xD | ap | fz | ae | ap | fz | ae | ap | hmax |
| Ø | mm | α° | (mm/Z) | (mm) | (mm) | (mm/Z) | (mm) | (mm) | (mm/Z) | (mm) | (mm) | (mm/Z) | (mm) | (mm) | (mm) |
| 3 | 6 | 0.5° | 0.015 | 3 | 3 | 0.02 | 0.9 | L2max | 0.013 | 0.2 | L2max | 0.045 | 0.8 | L2max | 0.0398 |
| 4 | 8 | 0.5° | 0.015 | 4 | 4 | 0.02 | 1.2 | L2max | 0.013 | 0.2 | L2max | 0.06 | 1.1 | L2max | 0.0536 |
| 5 | 9 | 0.5° | 0.025 | 5 | 5 | 0.03 | 1.5 | L2max | 0.02 | 0.2 | L2max | 0.07 | 1.3 | L2max | 0.0614 |
| 6 | 10 | 0.8° | 0.035 | 6 | 6 | 0.04 | 1.8 | L2max | 0.025 | 0.2 | L2max | 0.09 | 1.6 | L2max | 0.0796 |
| 8 | 12 | 1° | 0.045 | 8 | 8 | 0.055 | 2.4 | L2max | 0.03 | 0.2 | L2max | 0.11 | 1.9 | L2max | 0.0936 |
| 10 | 14 | 1.5° | 0.05 | 10 | 10 | 0.065 | 3 | L2max | 0.033 | 0.2 | L2max | 0.13 | 2.3 | L2max | 0.1094 |
| 12 | 16 | 2° | 0.055 | 12 | 12 | 0.075 | 3.6 | L2max | 0.035 | 0.2 | L2max | 0.15 | 2.6 | L2max | 0.1236 |
| 16 | 22 | 2.5° | 0.065 | 16 | 16 | 0.085 | 4.8 | L2max | 0.04 | 0.2 | L2max | 0.17 | 3.3 | L2max | 0.1376 |
| 20 | 26 | 3° | 0.08 | 20 | 20 | 0.1 | 6 | L2max | 0.045 | 0.2 | L2max | 0.2 | 3.6 | L2max | 0.1537 |

ALL DATA GIVEN HERE IS FOR THE FIRST GROUP P1.1-1.3 IN THE MATERIAL GROUP OVERVIEW

DETERMINATION OF CUTTING DATA:

From the material key results: **material group P3.2**
 Vc= 170 m/min (as indicated in the table)
 fz= 0.065 mm/Z (as indicated in the table) x Factor fz 0.8 = **fz 0.052 mm/Z**



VIDEO EXPLANATION

EXAMPLE FOR ETC OF 1.4303 WITH Ø10:

M 2.1 STAINLESS STEEL | austenitic <650 N/mm²

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------------|----------------|--------------------|----------------|--------------|----------------|-------------|------------|
| 1.4300 | X12CrNi188 | | | 302 | | | | | |
| 1.4301 | X5CrNi1810 | X 6 CrNi 18 10 KD | Z 6 CN 18.09 | 304 S 15 | X 5 CrNi 18 10 | 2332 | X 5 CrNi 18 11 | SUS 304 | 304 H |
| 1.4302 | X5CrNi199 | X 6 CrNi 20 10 KE | | 308 S 96 | | | | | |
| 1.4303 | X5CrNi1812 | X 8 CrNi 18 12 KD | Z 8 CN 17.07 | 305 S 19 | X 8 CrNi 19 10 | | X 8 CrNi 18 12 | SUS 305 | 308 |
| 1.4305 | X10CrNiS189 | X 8 CrNiS 19 9 | Z 8 CNF 18.09 | 303 S 31 | X 8 CrNiS 18 9 | 2346 | F.310.C | SUS 303 | 303 |

THE MATERIAL KEY WITH DETAILED BREAKDOWN OF MATERIALS BY MATERIAL GROUP CAN BE FOUND AT THE END OF THE CATALOGUE.

| | | Full Slot | Side Milling | Finishing | ETC | Materialgroup Factor fz / a | Materialgroup Factor ae ETC |
|-------------------------------|---------------------------------|------------|--------------|------------|------------|-----------------------------|-----------------------------|
| | | | | | | | |
| Strength (N/mm ²) | | | | | | | |
| P | STEEL | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.3 | unalloyed <850 | 200 | 200 | 220 | 315 | 1 | 1 |
| 2.1-2.2 | low alloyed <950 | 190 | 190 | 210 | 232 | 0.9 | 0.8 |
| 3.1-3.2 | high alloyed <1100 | 170 | 170 | 190 | 198 | 0.8 | 0.7 |
| K | CASTINGS | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.2 | grey cast iron <1000 | 210 | 210 | 230 | 242 | 0.9 | 0.8 |
| M | STAINLESS STEEL | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1 | ferritic/martensitic <850 | 90 | 95 | 152 | 152 | 0.9 | 0.7 |
| 2.1 | austenitic <650 | 80 | 85 | 132 | 132 | 0.8 | 0.5 |
| N | NON-FERROUS | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-2.3 | ALUMINIUM alloyed/casted <600 | 400 | 400 | 420 | 500 | 1.6 | 2 |
| 3.1-3.3 | COPPER alloyed <600 | 200 | 200 | 220 | 262 | 1.5 | 1.6 |
| T | TITANIUM | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 2.1-2.2 | pure/alloyed <1000 | 50 | 53 | 75 | 75 | 0.8 | 0.5 |
| S | SUPER ALLOYS | Vc = m/min | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.3 | HRSA <1450 | 25 | 28 | 42 | 42 | 0.7 | 0.3 |

OVERVIEW OF THE DIFFERENT MATERIAL GROUPS FOR THIS TOOL INCLUDING FACTORS

Material P 1.1-1.3

| D1 | L2 | Immersion Angle α° | Full Slot | | | Side Milling | | | Finishing | | | ETC | | | |
|----|----|--------------------|-----------|---------------|---------------|--------------|-----------------|---------|-----------|---------|---------|-----------|---------|---------|-----------|
| | | | fz (mm/Z) | ae = 1xD (mm) | ap = 1xD (mm) | fz (mm/Z) | ae = 0.3xD (mm) | ap (mm) | fz (mm/Z) | ae (mm) | ap (mm) | fz (mm/Z) | ae (mm) | ap (mm) | hmax (mm) |
| 3 | 6 | 0.5° | 0.015 | 3 | 3 | 0.02 | 0.9 | L2max | 0.013 | 0.2 | L2max | 0.045 | 0.8 | L2max | 0.0398 |
| 4 | 8 | 0.5° | 0.015 | 4 | 4 | 0.02 | 1.2 | L2max | 0.013 | 0.2 | L2max | 0.06 | 1.1 | L2max | 0.0536 |
| 5 | 9 | 0.5° | 0.025 | 5 | 5 | 0.03 | 1.5 | L2max | 0.02 | 0.2 | L2max | 0.07 | 1.3 | L2max | 0.0614 |
| 6 | 10 | 0.8° | 0.035 | 6 | 6 | 0.04 | 1.8 | L2max | 0.025 | 0.2 | L2max | 0.09 | 1.6 | L2max | 0.0796 |
| 8 | 12 | 1° | 0.045 | 8 | 8 | 0.055 | 2.4 | L2max | 0.03 | 0.2 | L2max | 0.11 | 1.9 | L2max | 0.0936 |
| 10 | 14 | 1.5° | 0.05 | 10 | 10 | 0.065 | 3 | L2max | 0.033 | 0.2 | L2max | 0.13 | 2.3 | L2max | 0.1094 |
| 12 | 16 | 2° | 0.055 | 12 | 12 | 0.075 | 3.6 | L2max | 0.035 | 0.2 | L2max | 0.15 | 2.6 | L2max | 0.1236 |
| 16 | 22 | 2.5° | 0.065 | 16 | 16 | 0.085 | 4.8 | L2max | 0.04 | 0.2 | L2max | 0.17 | 3.3 | L2max | 0.1376 |
| 20 | 26 | 3° | 0.08 | 20 | 20 | 0.1 | 6 | L2max | 0.045 | 0.2 | L2max | 0.2 | 3.6 | L2max | 0.1537 |

ALL DATA GIVEN HERE IS FOR THE FIRST GROUP P1.1-1.3 IN THE MATERIAL GROUP OVERVIEW

DETERMINATION OF CUTTING DATA:

From the material key results: **material group M2.1**

Vc= 132 m/min (as indicated in the table)

fz= 0.13 mm/Z (as indicated in the table) x Factor fz 0.8 = **fz 0.104 mm/Z**

ae= 2.3 mm (as indicated in the table) x Factor ae 0.5 = **1.15 mm ae**