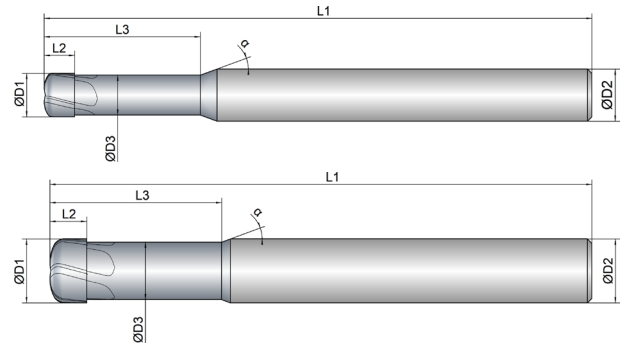


| | |
|--------------|---------------------|
| Kühlung | |
| Toleranz | h9 |
| Beschichtung | AlphaFerro Platin X |

| | |
|---------------|--|
| Strategie | HSC |
| Anwendung | |
| Eigenschaften | HA ≠ 0,5xD R |



- Vertikale Abführung der Schnittkraft durch spezielle Aufteilung der Schneiden
 - Geometrie mit tangentialen Übergängen zum HSC-Fräsen
 - Weicher Schnitt durch gezielt positive Spanwinkel
-
- Zum Schruppen und Schlichten unter HSC Bedingungen
-
- Programmierradius und ap max. Zustellung laut Variantentabelle beachten



Schruppen



Schlichten



| EXPK1-M07-0023 | D1 mm ∅ | D3 mm ∅ | L2 mm | L3 mm | L1 mm | D2 mm ∅ | z # | mm | mm max | ° | ° |
|----------------|-------------------|-------------------|--------------|--------------|--------------|-------------------|------------|--------|---------------|-------|-------|
| 2 | 2,0 | 1,7 | 1,5 | 13,0 | 54,0 | 6,0 | 2 | 0,3 | 0,15 | 15 | 20 |
| 3 | 3,0 | 2,7 | 1,5 | 15,0 | 54,0 | 6,0 | 2 | 0,3 | 0,20 | 15 | 20 |
| 4 | 4,0 | 3,6 | 2,5 | 16,0 | 57,0 | 6,0 | 2 | 0,5 | 0,25 | 15 | 20 |
| 5 | 5,0 | 4,6 | 3,5 | 18,0 | 63,0 | 6,0 | 4 | 0,5 | 0,35 | 15 | 20 |
| 6 | 6,0 | 5,2 | 3,5 | 20,0 | 63,0 | 6,0 | 4 | 1,0 | 0,40 | 15 | 20 |
| 8 | 8,0 | 7,0 | 4,8 | 24,0 | 70,0 | 8,0 | 5 | 1,5 | 0,50 | 15 | 20 |
| 10 | 10,0 | 9,0 | 5,8 | 26,0 | 85,0 | 10,0 | 5 | 2,0 | 0,75 | 15 | 20 |
| 12 | 12,0 | 11,0 | 6,8 | 30,0 | 93,0 | 12,0 | 5 | 2,0 | 0,80 | 15 | 20 |
| 16 | 16,0 | 14,5 | 8,8 | 35,0 | 100,0 | 16,0 | 5 | 2,5 | 1,00 | 15 | 20 |



Download Catalog Pages (PDF)

Multipass Milling

**Materialgroup
Factor
fz / a**

| Material | | Strength (N/mm²) | Vc = m/min | |
|-----------------|------------------------------------|--|-------------------|------|
| P | STEEL | | | |
| 1.1 | unalloyed | <500 | 170 | 1 |
| 1.2-1.5 | unalloyed | <1100 | 155 | 0,9 |
| 2.1-2.2 | low-alloyed | <950 | 145 | 0,9 |
| 2.3-2.4 | low-alloyed | <1300 | 125 | 0,8 |
| 3.1-3.2 | high-alloyed | <1100 | 140 | 0,8 |
| 3.3 | high-alloyed | <1400 | 115 | 0,7 |
| K | CASTINGS | | | |
| 1.1-1.2 | Grey cast iron | <1000 | 190 | 0,9 |
| 2.1-2.2 | Modular cast iron | <850 | 155 | 0,8 |
| 3.1-3.2 | Malleable cast iron | <800 | 135 | 0,8 |
| M | STAINLESS STEEL | | | |
| 1.1 | ferritic/martensitic | <850 | 110 | 0,9 |
| 2.1 | austenitic | <650 | 100 | 0,8 |
| 2.2 | austenitic | <750 | 90 | 0,75 |
| 3.1 | DUPLEX STEEL super austenitic | <1100 | | |








HINWEIS | Die in Türkis markierten Werte sind Nebenanwendungen!
 Alle fz/a Werte in der Tabelle für Materialgruppe 1.1, Faktoren für die anderen Gruppen beachten!
 Beim helikalen Eintauchen und Rampen fz 75 % verwenden!
 Die angegebenen Werte stellen Startwerte für eine solide Aufspannsituation dar.
 Bitte ap max in der Tabelle beachten!

Material P 1.1

| D1 | L2 | Immersion Angle | Multipass Milling | | |
|--------|--------|------------------------|-----------------------|--------------------|----------------|
| | | | fz (mm/Z) | ae = 0,4xD (mm) | ap max (mm) |
| Ø | mm | α° | | | |
| 2 | 1,5 | 0,5° | 0,035 | 0,8 | 0,15 |
| 3 | 1,5 | 0,5° | 0,05 | 1,2 | 0,2 |
| 4 | 2,5 | 0,8° | 0,07 | 1,6 | 0,25 |
| 5 | 3,5 | 0,8° | 0,08 | 2 | 0,35 |
| 6 | 3,5 | 1° | 0,09 | 2,4 | 0,4 |
| 8 | 4,8 | 1,2° | 0,12 | 3,2 | 0,5 |
| 10 | 5,8 | 1,5° | 0,15 | 4 | 0,75 |
| 12 | 6,8 | 1,5° | 0,22 | 4,8 | 0,8 |
| 16 | 8,8 | 1,8° | 0,25 | 6,4 | 1 |

LEGENDE


























ANWENDUNGEN

| | | | |
|--|--|---|---|
|  Abzeilen |  Besäumen |  Entgraten |  Gravieren |
|  Viertelkreisfräsen |  Vollnut |  Vorwärts-Rückwärtsentgraten | |






KÜHLUNGEN

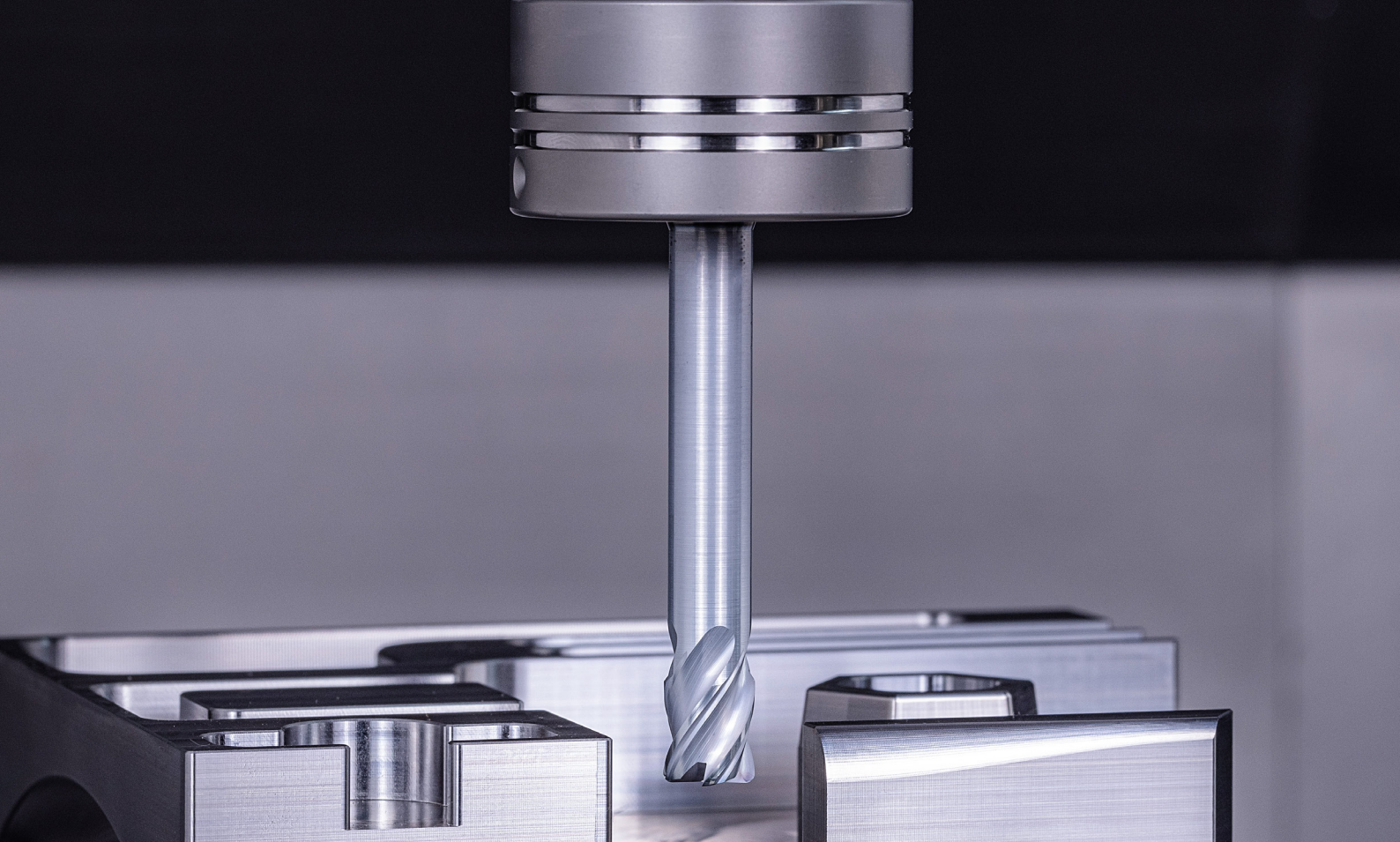
| | | | |
|---|---|--|--|
|  Luftgekühlt |  Trocken |  Öl |  Kühlschmierstoff (KSS) |
|  Minimalmengenschmierung (MMS) | | | |

EIGENSCHAFTEN

| | | | |
|---|---|--|---|
|  0,5xD |  1xD |  1,5xD |  2xD |
|  2,5xD |  3xD |  3,5xD |  4xD |
|  5xD |  Zentrumschneidend |  Nicht Zentrumschneidend |  Ohne Weldon |
|  Mit Weldon |  Kühlkanalsystem |  Dynamische Drallsteigung |  Spanbrecher |
|  Ungleiche Zahnteilung |  Wellenschliff |  Zustellung helikal |  Zustellrichtungen x,y |
|  Zustellrichtungen x, y, z |  Zustellrichtungen x, y, (z) |  Eckenradius |  Eckfase |
|  Scharfkantig | | | |

STRATEGIE

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



EIGENSCHAFTEN

| | | | |
|--|--|---|--|
|  Schneidendurchmesser |  Kleiner Schneidendurchmesser |  Großer Schneidendurchmesser |  Freistichdurchmesser |
|  Schneidenlänge |  Gesamtfasenlänge |  Freistichlänge |  Gesamtlänge |
|  Schaftdurchmesser |  Schneidenanzahl |  Eckradius |  Eckfase |
|  Programmierradius |  Maximale Schnitttiefe |  Spiralwinkel |  Winkel Alpha |

ANWENDUNGSTABELLE

Bei den angegebenen Werten der Anwendungstabelle handelt es sich lediglich um Richtwerte. Diese sind stark abhängig von der individuellen Anwendungssituation.

ABBILDUNGEN

Alle abgebildeten technischen Zeichnungen und Fotografien sind beispielhaft. Abweichungen zum Originalprodukt bei Farbe und Abmessungen sind möglich.

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 | WTS1373 | | | | 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 | 95Mn28 | 11 SMn 28 | S 250 | 230 M 07 | CF 9 SMn 28 | 1912 | 11 SMn 28 | SUM 22 | 1213 |
| 1.0718 | 95MnPb28 | 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 | 95Mn36 | | S300 | 240 M 07 | CF 9 SMn 36 | | 12 SMn 35 | SUM 25 | 1215 |
| 1.0737 | 95MnPb36 | | 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 | 9520 | | | 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 | GS30Mn5 | | 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 | | | | | | SQV 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 | | | | O 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 | STES500 | | | | | | | 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 | | | | | | O 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 | | | | | | | | |

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 |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 1.2747 | 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 | G530CrMoV64 | | | | | | | | |
| 1.7733 | 24CrMoV55 | | 20 CDV 6 | | 24 CrMoV 5 5 | | | | |
| 1.7735 | 14CrMoV69 | | | | | | | | |
| 1.7741 | 42CrMoV73 | | | | | | | | |

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 |
|----------------|---------------|-----------------|----------------|--------------------|---------------|--------------|-------------|-------------|------------|
| 1.7755 | 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 | X155CrVMo121 | X 153 CrMoV 12 | Z 160 CDV 12 | BD 2 | X 155 CrVMo 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 CrMoV 12 KU 2310 | | X 160 CrMoV 12 | | |
| 1.2622 | X60WCrMoV94 | | | | | | | | |
| 1.2678 | X45CrCoVW555 | | | | | | | | H 19 |
| 1.2731 | X50NiCrWV1313 | | | | | | | | |
| 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 | 725NiCrMoV54 | | | | | | | | |
| 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 |

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 |

K 2.1 CASTINGS | MODULAR CAST IRON <650 N/mm² (200 HB)

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 0.7033 | GGG353 | | | | | 0717-15 | | | |
| 0.7040 | GGG40 | GJS-400-15 | FGS 400-12 | FGS 420/12 | GS 400-12 | 0717-02 | | FCD 400 | 60-40-18 |
| 0.7043 | GGG403 | GJS-400-18 | FGS 370-17 | FGS 370/17 | GSO 42/15 | 0717-15 | | FCD 370 | |
| 0.7050 | GGG50 | GJS-500-7 | FGS 500-7 | FGS 500/7 | GS 500/7 | 0727-02 | | FCD 500 | 65-45-12 |

K 2.2 CASTINGS | MODULAR CAST IRON <850 N/mm² (250 HB)

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 0.7060 | GGG60 | GJS-600-3 | FGS 600-3 | SNG 600/3 | GS 600/3 | 0732-03 | | FCD 600 | 80-55-06 |
| 0.7070 | GGG70 | GJS-700-2 | FGS 700-2 | SNG 700/2 | GS 700-2 | 0737-01 | | FCD 700 | 100-70-03 |
| 0.7080 | GGG80 | GJS-800-2 | FGS 800-2 | SNG 800/2 | GS 800-2 | | | FCD 800 | |

K 3.1 CASTINGS | MALLEABLE CAST IRON <440 N/mm² (130 HB)

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 0.8038 | GTWS3818 | GJMW-360-12 | MB 300-12 | W 38-12 | W38-12 | 5922 | | | |
| 0.8040 | GTW4005 | GJMW-400-5 | MB 400-5 | W 40-05 | GMB 40 | | | FCMW 370 | |
| 0.8045 | GTW4507 | GJMW-450-7 | MB 450-7 | W 40-07 | GMB 45 | | | FCMWP 440 | |
| 0.8055 | GTW55 | | | | GMB 55 | | | | |
| 0.8065 | GTW65 | | | | GMB 65 | | | | |
| 0.8135 | GTS3510 | GJMB-350-10 | MN 350-10 | B 340/12 | | 0815 | | FCMP 330 | 32510 |
| 0.8145 | GTS4506 | GJMB-450-6 | MP 45-06 | P 440/7 | | 0852 | | FCMP 440 c3 | 40010 |

K 3.2 CASTINGS | MALLEABLE CAST IRON <800 N/mm² (230 HB)

| Materialnumber | Germany DIN | Europe EN | France AFNOR | Great Britain BS | Italy UNI | Sweden SIS | Spain UNE | Japan JIS | USA AISI |
|----------------|---------------|-------------|----------------|--------------------|-------------|--------------|-------------|-------------|------------|
| 0.8035 | GTW3504 | GJMW-350-4 | | | | | | FCMW 330 c1 | |
| 0.8155 | GTS5504 | GJMB-550-4 | MP 50-5 | P 510/4 | | 0854 | | FCMP 490 | 50005 |
| 0.8165 | GTS6502 | GJMB-650-2 | MP 60-3 | P 570/3 | | 0858 | | FCMP 540 | 70003 |
| 0.8170 | GTS7002 | GJMB-700-2 | Mn 700-2 | P 690/2 | GMN 70 | 0862 | | FCMP 690 | 90001 |

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 | | 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 CrTi 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 |

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 |
|----------------|---------------|------------------|------------------|--------------------|------------------|--------------|------------------|-------------|------------|
| 1.4523 | X8CrMoTi17 | X 2 CrMoTiS 18 2 | X 2 CrMoTiS 18 2 | | | | | | |
| 1.4528 | X105CrCoMo182 | | | | | | | | |
| 1.4535 | X90CrCoMoV17 | | | | | | | | |
| 1.4543 | X3CrNiCuTi29 | | | | 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 | X2CrNi1810 | 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 | X3CrNi178 | | | 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 | | SUS 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 | |
| 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 | SUPER AUSTENITIC** | super 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 | | X 3 CrNiMo 27 5 2 | 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 | X2CrNiMoCuWN2574 | 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 |

Technische Formeln

Schnittgeschwindigkeit berechnen (m/min)

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

Drehzahl berechnen (U/min)

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

Vorschubgeschwindigkeit berechnen (mm/min)

$$V_f = n \cdot z \cdot f_z$$

Zahnvorschub berechnen (mm/Z)

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

Zeitspanvolumen berechnen (cm³/min)

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

Mittlere Spandicke berechnen (mm)

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

Begriffserläuterung

| | | |
|----|------------------------------|-------------------------|
| Vc | Schnittgeschwindigkeit | in m/min |
| n | Drehzahl | in U/min |
| Vf | Vorschubgeschwindigkeit | in mm/min |
| Fz | Zahnvorschub | in mm/Zahn |
| z | Anzahl der Zähne (Schneiden) | |
| ap | Zustelltiefe | in mm |
| ae | Eingriffsbreite | in mm |
| hm | Mittlere Spandicke | in mm |
| Q | Zeitspanvolumen | in cm ³ /min |
| D | Durchmesser Werkzeug | in mm |

ERKLÄRUNG SCHNITTDATENBESTIMMUNG

BEISPIEL FÜR BESÄUMEN VON 1.3561 MIT Ø10:

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 | 80WCv3 | | | | | | | | |
| 1.2515 | 100WV4 | | | | | | | SKS 21 | |
| 1.3561 | 44Cr2 | 46 Cr 1 KD | 44 Cr 2 | | | | | | 5046 |
| 1.3563 | 43CrMo4 | | 43 CrMo 4 | | | | | | 4142 |

DER MATERIALSCHLÜSSEL MIT DETAILLIERTEN AUFSCHLÜSSELUNGEN DER MATERIALIEN NACH MATERIALGRUPPEN BEFINDET SICH AM ENDE DES KATALOGS.

| P | Material | Strength (N/mm ²) | Side Milling | Finishing | ETC | Materialgroup Factor fz / a | Materialgroup Factor ae ETC |
|---------|---------------------------------|-------------------------------|--------------|------------|------------|-----------------------------|-----------------------------|
| | | | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1 | unalloyed | <500 | 240 | 260 | 380 | 1 | 1 |
| 1.2-1.5 | unalloyed | <1100 | 200 | 220 | 316 | 0,9 | 0,8 |
| 2.1-2.2 | low-alloyed | <950 | 190 | 210 | 290 | 0,9 | 0,8 |
| 2.3-2.4 | low-alloyed | <1300 | 160 | 180 | 203 | 0,8 | 0,75 |
| 3.1-3.2 | high-alloyed | <1100 | 180 | 190 | 220 | 0,8 | 0,7 |
| 3.3 | high-alloyed | <1400 | 150 | 160 | 196 | 0,7 | 0,68 |
| K | CASTINGS | | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1-1.2 | Grey cast iron | <1000 | 220 | 230 | 262 | 0,9 | 0,8 |
| 2.1-2.2 | Modular cast iron | <850 | 180 | 190 | 208 | 0,8 | 0,75 |
| 3.1-3.2 | Malleable cast iron | <800 | 160 | 170 | 193 | 0,8 | 0,75 |
| M | STAINLESS STEEL | | Vc = m/min | Vc = m/min | Vc = m/min | | |
| 1.1 | ferritic/martensitic | <850 | 90 | 95 | 172 | 0,9 | 0,6 |
| 2.1 | austenitic | <650 | 75 | 80 | 146 | 0,8 | 0,45 |
| 2.2 | austenitic | <750 | 70 | 75 | 128 | 0,75 | 0,4 |
| 3.1 | DUPLIX STEEL super austenitic | <1100 | | | | | |

ÜBERSICHT DER VERSCHIEDENEN MATERIALGRUPPEN FÜR DIESES WERKZEUG INKLUSIVE FAKTOREN

Material P 1.1

| D1 | L2 | Immersion Angle | Side Milling | | | Finishing | | | ETC | | | |
|----|----|-----------------|--------------|-----------------|---------|-----------|---------|---------|-----------|---------|---------|-----------|
| | | | 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) |
| 6 | 13 | 1° | 0,045 | 1,8 | L2max | 0,02 | 0,2 | L2max | 0,072 | 1,3 | L2max | 0,0593 |
| 8 | 19 | 1° | 0,06 | 2,4 | L2max | 0,025 | 0,2 | L2max | 0,096 | 1,5 | L2max | 0,0749 |
| 10 | 22 | 1,2° | 0,07 | 3 | L2max | 0,03 | 0,2 | L2max | 0,112 | 1,8 | L2max | 0,0861 |
| 12 | 26 | 1,2° | 0,08 | 3,6 | L2max | 0,035 | 0,2 | L2max | 0,136 | 2,1 | L2max | 0,1034 |
| 16 | 32 | 1,5° | 0,09 | 4,8 | L2max | 0,04 | 0,2 | L2max | 0,152 | 2,6 | L2max | 0,1121 |
| 20 | 41 | 2° | 0,11 | 6 | L2max | 0,045 | 0,2 | L2max | 0,176 | 2,9 | L2max | 0,1239 |

ALLE HIER ANGEgebenEN DATEN SIND FÜR DIE ERSTE GRUPPE P1.1 IN DER MATERIALGRUPPEN-ÜBERSICHT

SCHNITTDATENBESTIMMUNG:

Aus dem Materialschlüssel ergibt sich: **Materialgruppe P2.3**

Vc= 160 m/min (wie in der Tabelle angegeben)

fz= 0,07 mm/Z (wie in der Tabelle angegeben) x Faktor fz 0,8 = fz 0,056 mm/Z



ERKLÄRVIDEO

BEISPIEL FÜR ETC VON 1.3207 MIT Ø10:

P 3.3 STEEL | high alloyed <1400 N/mm²

| Materialnummer | 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 |

DER MATERIALSCHLÜSSEL MIT DETAILLIERTEN AUFSCHLÜSSELUNGEN DER MATERIALIEN NACH MATERIALGRUPPEN BEFINDET SICH AM ENDE DES KATALOGS.

| P | Material | Strength (N/mm ²) | Side Milling | Finishing | ETC | Materialgroup Factor fz / a | Materialgroup Factor ae ETC |
|------------------------|---------------------------------|-------------------------------|--------------|------------|------------|-----------------------------|-----------------------------|
| | | | Vc = m/min | Vc = m/min | Vc = m/min | | |
| STEEL | | | | | | | |
| 1.1 | unalloyed | <500 | 240 | 260 | 380 | 1 | 1 |
| 1.2-1.5 | unalloyed | <1100 | 200 | 220 | 316 | 0,9 | 0,8 |
| 2.1-2.2 | low-alloyed | <950 | 190 | 210 | 290 | 0,9 | 0,8 |
| 2.3-2.4 | low-alloyed | <1300 | 160 | 180 | 203 | 0,8 | 0,75 |
| 3.1-3.2 | high-alloyed | <1100 | 180 | 190 | 220 | 0,8 | 0,7 |
| 3.3 | high-alloyed | <1400 | 150 | 160 | 196 | 0,7 | 0,68 |
| CASTINGS | | | | | | | |
| 1.1-1.2 | Grey cast iron | <1000 | 220 | 230 | 262 | 0,9 | 0,8 |
| 2.1-2.2 | Modular cast iron | <850 | 180 | 190 | 208 | 0,8 | 0,75 |
| 3.1-3.2 | Malleable cast iron | <800 | 160 | 170 | 193 | 0,8 | 0,75 |
| STAINLESS STEEL | | | | | | | |
| 1.1 | ferritic/martensitic | <850 | 90 | 95 | 172 | 0,9 | 0,6 |
| 2.1 | austenitic | <650 | 75 | 80 | 146 | 0,8 | 0,45 |
| 2.2 | austenitic | <750 | 70 | 75 | 128 | 0,75 | 0,4 |
| 3.1 | DUPLIX STEEL super austenitic | <1100 | | | | | |

ÜBERSICHT DER VERSCHIEDENEN MATERIALGRUPPEN FÜR DIESES WERKZEUG INKLUSIVE FAKTOREN

Material P 1.1

| D1 | L2 | Immersion Angle | Side Milling | | | Finishing | | | ETC | | | |
|----|----|-----------------|--------------|-----------------|---------|-----------|---------|---------|-----------|---------|---------|-----------|
| | | | 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) |
| 6 | 13 | 1° | 0,045 | 1,8 | L2max | 0,02 | 0,2 | L2max | 0,072 | 1,3 | L2max | 0,0593 |
| 8 | 19 | 1° | 0,06 | 2,4 | L2max | 0,025 | 0,2 | L2max | 0,096 | 1,5 | L2max | 0,0749 |
| 10 | 22 | 1,2° | 0,07 | 3 | L2max | 0,03 | 0,2 | L2max | 0,112 | 1,8 | L2max | 0,0861 |
| 12 | 26 | 1,2° | 0,08 | 3,6 | L2max | 0,035 | 0,2 | L2max | 0,136 | 2,1 | L2max | 0,1034 |
| 16 | 32 | 1,5° | 0,09 | 4,8 | L2max | 0,04 | 0,2 | L2max | 0,152 | 2,6 | L2max | 0,1121 |
| 20 | 41 | 2° | 0,11 | 6 | L2max | 0,045 | 0,2 | L2max | 0,176 | 2,9 | L2max | 0,1239 |

ALLE HIER ANGEgebenEN DATEN SIND FÜR DIE ERSTE GRUPPE P1.1 IN DER MATERIALGRUPPEN-ÜBERSICHT

SCHNITTDATENBESTIMMUNG:

Aus dem Materialschlüssel ergibt sich: **Materialgruppe P3.3**

Vc= 196 m/min (wie in der Tabelle angegeben)

fz= 0,112 mm/Z (wie in der Tabelle angegeben) x Faktor fz 0,7 = fz **0,0784 mm/Z**

ae= 1,8 mm (wie in der Tabelle angegeben) x Faktor ae 0,68 = **1,224 mm ae**