

| Material Group | SAPPHIRE CUTTING TOOLS Group | Material Example | Hardness | D.O.C | | Feed | | Amax [mm ²] | Vc | | Advised D.O.C [mm] | Advised Feed [mm/t] | Advised Vc [m/min] | |
|------------------------|--|--|--|---------|---------|-----------|---------------|----------------------------|----------------|----------------|--------------------------|---------------------------|--------------------------|-----|
| | | | | min[mm] | max[mm] | min[mm/t] | max [mm/t] | | min [m/min] | max [m/min] | | | | |
| Steel | Non Alloyed | C35, Ck45, 1020, 1045, 1060, 28Mn6 | 125 HB | 0.5 | 5 | 0.18 | 0.5 | 1.71 | 180 | 330 | 3 | 0.36 | 240 | |
| | | | 190 HB | 0.5 | 5 | 0.18 | 0.5 | 1.71 | 180 | 280 | 3 | 0.33 | 220 | |
| | | | 250 HB | 0.5 | 5 | 0.18 | 0.45 | 1.43 | 180 | 250 | 3 | 0.31 | 200 | |
| | Low Alloyed | 2 | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 230 HB | 0.5 | 4 | 0.18 | 0.45 | 1.14 | 120 | 250 | 3 | 0.3 | 180 |
| | | | | 280 HB | 0.5 | 4 | 0.16 | 0.4 | 1.14 | 120 | 210 | 3 | 0.29 | 150 |
| | | | | 180 HB | 0.5 | 5 | 0.18 | 0.45 | 1.14 | 120 | 280 | 3 | 0.3 | 200 |
| | | | | 350 HB | 0.5 | 3.5 | 0.16 | 0.4 | 0.95 | 120 | 180 | 2.7 | 0.29 | 130 |
| | High Alloyed | 3 | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB | 0.5 | 4 | 0.16 | 0.4 | 1.14 | 70 | 190 | 2.5 | 0.29 | 140 |
| | | | | 280 HB | 0.5 | 4 | 0.16 | 0.4 | 1.14 | 70 | 150 | 2.5 | 0.29 | 120 |
| | | | | 320 HB | 0.5 | 3 | 0.16 | 0.35 | 0.76 | 70 | 130 | 2.2 | 0.27 | 100 |
| | | | | 350 HB | 0.5 | 3 | 0.16 | 0.35 | 0.76 | 70 | 110 | 2.2 | 0.27 | 90 |
| | Stainless Steel | Austenitic | 304, 316, X5CrNi18-9 | 180 HB | 0.5 | 5 | 0.18 | 0.4 | 1.14 | 170 | 270 | 3 | 0.24 | 190 |
| 240 HB | | | | 0.5 | 5 | 0.18 | 0.4 | 0.95 | 160 | 220 | 3 | 0.21 | 170 | |
| Duplex | | X2CrNiN23-4, S31500 | 290 HB | 0.5 | 4 | 0.16 | 0.35 | 0.76 | 80 | 150 | 2.5 | 0.23 | 100 | |
| | | | 310 HB | 0.5 | 4 | 0.16 | 0.35 | 0.76 | 70 | 140 | 2.5 | 0.23 | 90 | |
| Ferritic & Martensitic | | 6 | 410, X6Cr17, 17-4 PH, 430 | 200 HB | 0.5 | 5 | 0.16 | 0.4 | 0.67 | 170 | 250 | 2.5 | 0.19 | 190 |
| | | | | 42 HRc | 0.5 | 4 | 0.16 | 0.4 | 0.67 | 120 | 190 | 2.2 | 0.19 | 130 |
| Cast Iron | Grey | GG20, GG40, EN-GJL-250, N030B | 150 HB | 0.5 | 5 | 0.13 | 0.6 | 1.9 | 170 | 250 | 3 | 0.33 | 200 | |
| | | | 200 HB | 0.5 | 5 | 0.13 | 0.6 | 1.71 | 160 | 230 | 3 | 0.33 | 180 | |
| | | | 250 HB | 0.5 | 5 | 0.13 | 0.55 | 1.71 | 150 | 210 | 3 | 0.33 | 160 | |
| | Malleable & Nodular | 8 | GGG40, GGG70, 50005 | 150 HB | 0.5 | 5 | 0.13 | 0.5 | 1.43 | 120 | 250 | 3 | 0.29 | 180 |
| | | | | 200 HB | 0.5 | 5 | 0.13 | 0.5 | 1.24 | 120 | 230 | 3 | 0.29 | 160 |
| | | | | 250 HB | 0.5 | 5 | 0.13 | 0.5 | 1.14 | 120 | 190 | 3 | 0.29 | 140 |
| NITI Alloy | Fe, Ni & Co Based | 9 | Incoloy 800 | 240 HB | 0.5 | 3 | 0.18 | 0.35 | 0.67 | 30 | 50 | 2 | 0.27 | 30 |
| | | | Inconel 700 | 250 HB | 0.5 | 3 | 0.18 | 0.35 | 0.67 | 30 | 50 | 2 | 0.27 | 30 |
| | | | Stellite 21 | 350 HB | 0.5 | 3 | 0.18 | 0.35 | 0.67 | 30 | 40 | 2 | 0.27 | 30 |
| | Ti Based | 10 | T40 | - | 0.5 | 3 | 0.18 | 0.35 | 0.67 | 40 | 60 | 2 | 0.29 | 45 |
| | | | TiAl6V4 | - | 0.5 | 3.5 | 0.18 | 0.4 | 0.76 | 50 | 70 | 2 | 0.31 | 55 |
| Hardened Materials | Steel Chilled Cast Iron White Cast Iron | 11 | G- X300CrMo15 | 55 HRc | 0.5 | 1.5 | 0.1 | 0.2 | 0.29 | 30 | 50 | 1 | 0.14 | 40 |
| | | | Ni-Hard 2 | 400 HB | 0.5 | 2 | 0.1 | 0.25 | 0.38 | 40 | 60 | 1.5 | 0.17 | 50 |
| | | | X100CrMo13, 440C, G- X260NiCr42 | 45 HRc | 0.5 | 2.5 | 0.1 | 0.3 | 0.57 | 50 | 100 | 2 | 0.24 | 80 |
| | | | | 50 HRc | 0.5 | 2 | 0.1 | 0.25 | 0.38 | 40 | 90 | 1.5 | 0.19 | 70 |
| | | | | 55 HRc | 0.5 | 1.5 | 0.1 | 0.2 | 0.29 | 40 | 80 | 1 | 0.17 | 60 |
| Aluminium | Al (>8%Si) | 12 | AlSi12 | 130 HB | 0.5 | 6 | 0.18 | 0.6 | 1.71 | 200 | 400 | 3 | 0.38 | 280 |