

| Material Group         |  SAPPHIRE CUTTING TOOLS Group | Material Example | Hardness                                | D.O.C                |         | Feed      |            | Vc          |             | Advised D.O.C | Advised Feed | Advised Vc |      |
|------------------------|----------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------|----------------------|---------|-----------|------------|-------------|-------------|---------------|--------------|------------|------|
|                        |                                                                                                                |                  |                                         | min[mm]              | max[mm] | min[mm/t] | max [mm/t] | min [m/min] | max [m/min] | [mm]          | [mm/t]       | [m/min]    |      |
| Steel                  | Non Alloyed                                                                                                    | 1                | C35, Ck45, 1020, 1045, 1060, 28Mn6      | 125 HB               | 0.5     | 9         | 0.13       | 0.29        | 190         | 330           | 3            | 0.18       | 250  |
|                        |                                                                                                                |                  |                                         | 190 HB               | 0.5     | 9         | 0.13       | 0.29        | 190         | 300           | 3            | 0.18       | 220  |
|                        |                                                                                                                |                  |                                         | 250 HB               | 0.5     | 9         | 0.13       | 0.29        | 190         | 250           | 3            | 0.18       | 200  |
|                        | Low Alloyed                                                                                                    | 2                | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 230 HB               | 0.5     | 9         | 0.1        | 0.22        | 150         | 210           | 3            | 0.16       | 180  |
|                        |                                                                                                                |                  |                                         | 280 HB               | 0.5     | 9         | 0.1        | 0.2         | 130         | 190           | 3            | 0.14       | 150  |
|                        |                                                                                                                |                  |                                         | 180 HB               | 0.5     | 9         | 0.1        | 0.22        | 150         | 240           | 3            | 0.16       | 200  |
|                        |                                                                                                                |                  |                                         | 350 HB               | 0.5     | 9         | 0.1        | 0.2         | 130         | 170           | 3            | 0.14       | 140  |
|                        | High Alloyed                                                                                                   | 3                | X40CrM0V5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB               | 0.5     | 6.4       | 0.08       | 0.2         | 90          | 150           | 2.3          | 0.14       | 130  |
|                        |                                                                                                                |                  |                                         | 280 HB               | 0.5     | 6.4       | 0.08       | 0.2         | 90          | 130           | 2.3          | 0.14       | 120  |
|                        |                                                                                                                |                  |                                         | 320 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 60          | 110           | 2.3          | 0.13       | 100  |
|                        |                                                                                                                |                  |                                         | 350 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 60          | 90            | 2.3          | 0.13       | 80   |
|                        | Stainless Steel                                                                                                | Austentic        | 4                                       | 304, 316, X5CrNi18-9 | 180 HB  | 0.5       | 9          | 0.1         | 0.22        | 190           | 250          | 3          | 0.16 |
| 240 HB                 |                                                                                                                |                  |                                         |                      | 0.5     | 9         | 0.08       | 0.2         | 160         | 210           | 3            | 0.16       | 190  |
| Duplex                 |                                                                                                                | 5                | X2CrNiN23-4, S31500                     | 290 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 70          | 130           | 2.3          | 0.13       | 100  |
|                        |                                                                                                                |                  |                                         | 310 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 70          | 120           | 2.3          | 0.13       | 90   |
| Ferritic & Martensitic |                                                                                                                | 6                | 410, X6Cr17, 17-4 PH, 430               | 200 HB               | 0.5     | 9         | 0.1        | 0.22        | 150         | 210           | 3            | 0.16       | 190  |
|                        |                                                                                                                |                  |                                         | 42 HRc               | 0.5     | 6.4       | 0.1        | 0.18        | 90          | 150           | 2.3          | 0.13       | 130  |
| Cast Iron              | Grey                                                                                                           | 7                | GG20, GG40, EN-GJL-250, N030B           | 150 HB               | 0.5     | 9         | 0.13       | 0.29        | 150         | 240           | 3            | 0.18       | 200  |
|                        |                                                                                                                |                  |                                         | 200 HB               | 0.5     | 9         | 0.13       | 0.29        | 150         | 220           | 3            | 0.18       | 180  |
|                        |                                                                                                                |                  |                                         | 250 HB               | 0.5     | 9         | 0.13       | 0.29        | 150         | 190           | 3            | 0.18       | 160  |
|                        | Malleable & Nodular                                                                                            | 8                | GGG40, GGG70, 50005                     | 150 HB               | 0.5     | 9         | 0.1        | 0.25        | 100         | 200           | 3            | 0.16       | 180  |
|                        |                                                                                                                |                  |                                         | 200 HB               | 0.5     | 9         | 0.1        | 0.25        | 100         | 180           | 3            | 0.16       | 150  |
|                        |                                                                                                                |                  |                                         | 250 HB               | 0.5     | 9         | 0.1        | 0.25        | 100         | 150           | 3            | 0.16       | 130  |
| NITI Alloy             | Fe, Ni & Co Based                                                                                              | 9                | Incoloy 800                             | 240 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 30          | 50            | 2.3          | 0.13       | 32   |
|                        |                                                                                                                |                  | Inconel 700                             | 250 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 30          | 50            | 2.3          | 0.13       | 30   |
|                        |                                                                                                                |                  | Stellite 21                             | 350 HB               | 0.5     | 6.4       | 0.08       | 0.16        | 30          | 50            | 2.3          | 0.13       | 30   |
|                        | Ti Based                                                                                                       | 10               | T40                                     | -                    | 0.5     | 6.4       | 0.08       | 0.16        | 30          | 60            | 2.3          | 0.13       | 40   |
|                        |                                                                                                                |                  | TiAl6V4                                 | -                    | 0.5     | 6.4       | 0.08       | 0.18        | 40          | 70            | 2.3          | 0.14       | 55   |
| Hardened Materials     | Steel Chilled Cast Iron White Cast Iron                                                                        | 11               | G-X300CrMo15                            | 55 HRc               | 0.5     | 1         | 0.07       | 0.13        | 30          | 60            | 0.8          | 0.1        | 40   |
|                        |                                                                                                                |                  | Ni-Hard 2                               | 400 HB               | 0.5     | 2.6       | 0.07       | 0.16        | 40          | 80            | 1.1          | 0.11       | 50   |
|                        |                                                                                                                |                  | X100CrMo13, 440C, G-X260NiCr42          | 45 HRc               | 0.5     | 3.2       | 0.07       | 0.16        | 40          | 80            | 1.5          | 0.11       | 60   |
|                        |                                                                                                                |                  |                                         | 50 HRc               | 0.5     | 1.9       | 0.07       | 0.14        | 40          | 70            | 1.1          | 0.1        | 55   |
|                        |                                                                                                                |                  |                                         | 55 HRc               | 0.5     | 1         | 0.07       | 0.13        | 40          | 60            | 0.8          | 0.1        | 50   |
| Aluminium              | Al (>8%Si)                                                                                                     | 12               | AlSi12                                  | 130 HB               | 0.5     | 9         | 0.13       | 0.29        | 200         | 400           | 3            | 0.2        | 280  |