



# MACHINING CONDITIONS

## DNMG 150604 NN LT 10

FT000583

| Material Group     | SAPPHIRE TOOLS                                   | Material Example | Hardness                                      | D.O.C   |         | Feed      |           | Amax<br>[mm <sup>2</sup> ] | Vc         |                | Advised D.O.C<br>[mm] | Advised Feed<br>[mm/t] | Advised Vc<br>[m/min] |     |
|--------------------|--|------------------|---|---------|---------|-----------|-----------|----------------------------|------------|----------------|-----------------------|------------------------|-----------------------|-----|
|                    |  |                  |   | min[mm] | max[mm] | min[mm/t] | max[mm/t] |                            | min[m/min] | max<br>[m/min] |                       |                        |                       |     |
| Steel              | Non Alloyed                                      | 1                | C35, Ck45,<br>1020, 1045,<br>1060, 28Mn6      | 125 HB  | 0.3     | 3         | 0.11      | 0.23                       | 0.6        | 180            | 330                   | 2                      | 0.18                  | 300 |
|                    |  |                  |   | 190 HB  | 0.3     | 2.5       | 0.11      | 0.22                       | 0.52       | 180            | 280                   | 2                      | 0.18                  | 260 |
|                    |  |                  |   | 250 HB  | 0.3     | 2.5       | 0.11      | 0.2                        | 0.48       | 180            | 250                   | 2                      | 0.18                  | 240 |
|                    | Low Alloyed                                      | 2                | 42CrMo4, St50,<br>Ck60, 4140,<br>4340, 100Cr6 | 230 HB  | 0.3     | 2.5       | 0.1       | 0.2                        | 0.48       | 120            | 250                   | 2                      | 0.14                  | 240 |
|                    |  |                  |   | 280 HB  | 0.3     | 2         | 0.1       | 0.18                       | 0.4        | 120            | 210                   | 2                      | 0.13                  | 200 |
|                    |  |                  |   | 180 HB  | 0.3     | 2.5       | 0.1       | 0.2                        | 0.5        | 120            | 280                   | 2                      | 0.14                  | 260 |
|                    | High Alloyed                                     | 3                | X40CrMOV5,<br>H13, M42, D3,<br>S6-5-2, 12Ni19 | 350 HB  | 0.3     | 2         | 0.1       | 0.18                       | 0.36       | 120            | 180                   | 2                      | 0.13                  | 180 |
|                    |  |                  |   | 220 HB  | 0.3     | 2.5       | 0.09      | 0.18                       | 0.4        | 70             | 190                   | 1.7                    | 0.1                   | 180 |
|                    |  |                  |   | 280 HB  | 0.3     | 2.5       | 0.09      | 0.16                       | 0.4        | 70             | 150                   | 1.7                    | 0.1                   | 140 |
|                    |  |                  |   | 320 HB  | 0.3     | 2         | 0.09      | 0.14                       | 0.32       | 70             | 130                   | 1.7                    | 0.1                   | 120 |
| Stainless Steel    | Austenitic                                       | 4                | 304, 316,<br>X5CrNi18-9                       | 180 HB  | 0.3     | 2.5       | 0.08      | 0.18                       | 0.32       | 170            | 270                   | 2                      | 0.09                  | 260 |
|                    |  |                  |   | 240 HB  | 0.3     | 2.5       | 0.08      | 0.18                       | 0.26       | 160            | 220                   | 2                      | 0.08                  | 210 |
|                    | Duplex   | 5                | X2CrNiN23-4,<br>S31500                        | 290 HB  | 0.3     | 2         | 0.08      | 0.14                       | 0.2        | 80             | 150                   | 1.7                    | 0.08                  | 140 |
|                    |  |                  |   | 310 HB  | 0.3     | 2         | 0.08      | 0.14                       | 0.2        | 70             | 140                   | 1.7                    | 0.08                  | 140 |
|                    | Ferritic & Martensitic                           | 6                | 410, X6Cr17,<br>17-4 PH, 430                  | 200 HB  | 0.3     | 2.5       | 0.08      | 0.18                       | 0.32       | 170            | 250                   | 1.7                    | 0.09                  | 240 |
|                    |  |                  |   | 42 HRc  | 0.3     | 2         | 0.08      | 0.16                       | 0.26       | 120            | 190                   | 1.5                    | 0.08                  | 180 |
| Cast Iron          | Grey   | 7                | GG20, GG40,<br>EN-GJL-250,<br>N030B           | 150 HB  | 0.3     | 3         | 0.08      | 0.2                        | 0.64       | 170            | 250                   | 2                      | 0.18                  | 240 |
|                    |  |                  |   | 200 HB  | 0.3     | 3         | 0.08      | 0.2                        | 0.6        | 160            | 230                   | 2                      | 0.18                  | 220 |
|                    |  |                  |   | 250 HB  | 0.3     | 3         | 0.08      | 0.2                        | 0.6        | 150            | 210                   | 2                      | 0.18                  | 200 |
|                    | Malleable & Nodular                              | 8                | GGG40,<br>GGG70, 50005                        | 150 HB  | 0.3     | 2.5       | 0.08      | 0.18                       | 0.48       | 120            | 250                   | 2                      | 0.13                  | 240 |
|                    |  |                  |   | 200 HB  | 0.3     | 2.5       | 0.08      | 0.18                       | 0.4        | 120            | 230                   | 2                      | 0.13                  | 220 |
| 250 HB             | 0.3  | 2.5              | 0.08  | 0.18    | 0.4     | 120       | 190       | 2                          | 0.13       | 180            |                       |                        |                       |     |
| NiTi Alloy         | Fe, Ni & Co Based                                | 9                | Incoloy 800                                   | 240 HB  | 0.3     | 2         | 0.09      | 0.15                       | 0.26       | 30             | 50                    | 1.3                    | 0.1                   | 40  |
|                    |  |                  | Inconel 700                                   | 250 HB  | 0.3     | 2         | 0.09      | 0.15                       | 0.26       | 30             | 50                    | 1.3                    | 0.1                   | 40  |
|                    |  |                  | Stellite 21                                   | 350 HB  | 0.3     | 2         | 0.09      | 0.15                       | 0.26       | 20             | 50                    | 1.3                    | 0.1                   | 35  |
|                    | Ti Based   | 10               | T40   | -       | 0.3     | 2         | 0.09      | 0.14                       | 0.26       | 40             | 60                    | 1.3                    | 0.1                   | 50  |
| TiAl6V4            |  |                  | -   | 0.3     | 2       | 0.09      | 0.16      | 0.32                       | 50         | 70             | 1.3                   | 0.14                   | 60                    |     |
| Hardened Materials | Steel Chilled<br>Cast Iron<br>White Cast<br>Iron | 11               | G-X300CrMo15                                  | 55 HRc  | 0.3     | 1.4       | 0.05      | 0.09                       | 0.13       | 30             | 50                    | 0.9                    | 0.06                  | 40  |
|                    |  |                  | Ni-Hard 2                                     | 400 HB  | 0.3     | 1.6       | 0.05      | 0.12                       | 0.17       | 40             | 60                    | 1.1                    | 0.1                   | 50  |
|                    |  |                  | X100CrMo13,<br>440C, G-<br>X260NiCr42         | 45 HRc  | 0.3     | 1.8       | 0.05      | 0.12                       | 0.2        | 50             | 100                   | 1.4                    | 0.1                   | 90  |
|                    |  |                  |   | 50 HRc  | 0.3     | 1.5       | 0.05      | 0.1                        | 0.17       | 40             | 90                    | 1.1                    | 0.08                  | 80  |
|                    |  |                  |   | 55 HRc  | 0       | 1.4       | 0.05      | 0.09                       | 0.13       | 40             | 80                    | 0.9                    | 0.06                  | 70  |
| Aluminium          | Al (>8%Si)                                       | 12               | AlSi12  | 130 HB  | 0.3     | 4         | 0.1       | 0.3                        | 0.7        | 200            | 400                   | 2                      | 0.23                  | 350 |