



# MACHINING CONDITIONS

ODMT 060508 TN LT 3000

M0002219

| Material Group         | SAPPHIRE TOOLS                                | Material Example | Hardness                                | D.O.C                |         | Feed      |            | 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                                   | 1                | C35, Ck45, 1020, 1045, 1060, 28Mn6      | 125 HB               | 0.5     | 4         | 0.22       | 0.54        | 190         | 330                | 2.5                 | 0.39               | 250  |
|                        |   |                  |   | 190 HB               | 0.5     | 4         | 0.22       | 0.54        | 190         | 300                | 2.5                 | 0.39               | 220  |
|                        |   |                  |   | 250 HB               | 0.5     | 4         | 0.22       | 0.54        | 190         | 250                | 2.5                 | 0.39               | 200  |
|                        | Low Alloyed                                   | 2                | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 230 HB               | 0.5     | 4         | 0.18       | 0.43        | 150         | 210                | 2.5                 | 0.34               | 180  |
|                        |   |                  |   | 280 HB               | 0.5     | 4         | 0.18       | 0.37        | 130         | 190                | 2.5                 | 0.31               | 150  |
|                        |   |                  |   | 180 HB               | 0.5     | 4         | 0.18       | 0.43        | 150         | 240                | 2.5                 | 0.34               | 200  |
|                        |   |                  |   | 350 HB               | 0.5     | 4         | 0.18       | 0.37        | 130         | 170                | 2.5                 | 0.31               | 140  |
|                        | High Alloyed                                  | 3                | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB               | 0.5     | 2.8       | 0.14       | 0.37        | 90          | 150                | 1.9                 | 0.31               | 130  |
|                        |   |                  |   | 280 HB               | 0.5     | 2.8       | 0.14       | 0.37        | 90          | 130                | 1.9                 | 0.31               | 120  |
|                        |   |                  |   | 320 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 60          | 110                | 1.9                 | 0.27               | 100  |
|                        |   |                  |   | 350 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 60          | 90                 | 1.9                 | 0.27               | 80   |
|                        | Stainless Steel                               | Austenitic       | 4                                       | 304, 316, X5CrNi18-9 | 180 HB  | 0.5       | 4          | 0.18        | 0.37        | 190                | 250                 | 2.5                | 0.31 |
| 240 HB                 |   |                  |   |                      | 0.5     | 4         | 0.14       | 0.34        | 160         | 210                | 2.5                 | 0.31               | 190  |
| Duplex                 |   | 5                | X2CrNiN23-4, S31500                     | 290 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 70          | 130                | 1.9                 | 0.27               | 100  |
|                        |   |                  |   | 310 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 70          | 120                | 1.9                 | 0.27               | 90   |
| Ferritic & Martensitic |   | 6                | 410, X6Cr17, 17-4 PH, 430               | 200 HB               | 0.5     | 4         | 0.18       | 0.37        | 150         | 210                | 2.5                 | 0.31               | 190  |
|                        |   |                  |   | 42 HRc               | 0.5     | 2.8       | 0.18       | 0.34        | 90          | 150                | 1.9                 | 0.27               | 130  |
| Cast Iron              | Grey  | 7                | GG20, GG40, EN-GJL-250, N030B           | 150 HB               | 0.5     | 4         | 0.22       | 0.54        | 150         | 240                | 2.5                 | 0.39               | 200  |
|                        |   |                  |   | 200 HB               | 0.5     | 4         | 0.22       | 0.54        | 150         | 220                | 2.5                 | 0.39               | 180  |
|                        |   |                  |   | 250 HB               | 0.5     | 4         | 0.22       | 0.54        | 150         | 190                | 2.5                 | 0.39               | 160  |
|                        | Malleable & Nodular                           | 8                | GGG40, GGG70, 50005                     | 150 HB               | 0.5     | 4         | 0.18       | 0.48        | 100         | 200                | 2.5                 | 0.34               | 180  |
|                        |   |                  |   | 200 HB               | 0.5     | 4         | 0.18       | 0.48        | 100         | 180                | 2.5                 | 0.34               | 150  |
|                        |   |                  |   | 250 HB               | 0.5     | 4         | 0.18       | 0.48        | 100         | 150                | 2.5                 | 0.34               | 130  |
| NITTI Alloy            | Fe, Ni & Co Based                             | 9                | Incoloy 800                             | 240 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 30          | 50                 | 1.9                 | 0.27               | 32   |
|                        |   |                  | Inconel 700                             | 250 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 30          | 50                 | 1.9                 | 0.27               | 30   |
|                        |   |                  | Stellite 21                             | 350 HB               | 0.5     | 2.8       | 0.14       | 0.31        | 30          | 50                 | 1.9                 | 0.27               | 30   |
|                        | Ti Based                                      | 10               | T40                                     | -                    | 0.5     | 2.8       | 0.14       | 0.31        | 30          | 60                 | 1.9                 | 0.27               | 40   |
|                        |   |                  | TiAl6V4                                 | -                    | 0.5     | 2.8       | 0.14       | 0.34        | 40          | 70                 | 1.9                 | 0.31               | 55   |
|                        |   |                  |   |                      |         |           |            |             |             |                    |                     |                    |      |
| Hardened Materials     | Steel Chilled<br>Cast Iron<br>White Cast Iron | 11               | G-X300CrMo15                            | 55 HRc               | 0.4     | 0.9       | 0.12       | 0.24        | 30          | 60                 | 0.6                 | 0.2                | 40   |
|                        |   |                  | Ni-Hard 2                               | 400 HB               | 0.4     | 1.1       | 0.12       | 0.31        | 40          | 80                 | 0.9                 | 0.24               | 50   |
|                        |   |                  | X100CrMo13, 440C, G-X260NiCr42          | 45 HRc               | 0.4     | 1.4       | 0.12       | 0.31        | 40          | 80                 | 1.3                 | 0.24               | 60   |
|                        |   |                  |   | 50 HRc               | 0.4     | 1.1       | 0.12       | 0.27        | 40          | 70                 | 0.9                 | 0.22               | 55   |
|                        |   |                  |   | 55 HRc               | 0.4     | 0.9       | 0.12       | 0.24        | 40          | 60                 | 0.6                 | 0.2                | 50   |
| Aluminium              | Al (>8%Si)                                    | 12               | AlSi12                                  | 130 HB               | 0.5     | 4         | 0.22       | 0.54        | 200         | 400                | 2.5                 | 0.43               | 280  |