



# MACHINING CONDITIONS

OFER 070405 TN LT 30

M0000033

| 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<br>C35, Ck45, 1020, 1045, 1060, 28Mn6        | 125 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 190         | 330         | 3                  | 0.37                | 250                |
|                                |                     |                                                | 190 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 190         | 300         | 3                  | 0.37                | 220                |
|                                |                     |                                                | 250 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 190         | 250         | 3                  | 0.37                | 200                |
|                                | Low Alloyed         | 2<br>42CrMo4, St50, Ck60, 4140, 4340, 100Cr6   | 230 HB                          | 0.5     | 4.5     | 0.18      | 0.4        | 150         | 210         | 3                  | 0.32                | 180                |
|                                |                     |                                                | 280 HB                          | 0.5     | 4.5     | 0.18      | 0.35       | 130         | 190         | 3                  | 0.29                | 150                |
|                                |                     |                                                | 180 HB                          | 0.5     | 4.5     | 0.18      | 0.4        | 150         | 240         | 3                  | 0.32                | 200                |
|                                |                     |                                                | 350 HB                          | 0.5     | 4.5     | 0.18      | 0.35       | 130         | 170         | 3                  | 0.29                | 140                |
|                                | High Alloyed        | 3<br>X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19   | 220 HB                          | 0.5     | 3.2     | 0.14      | 0.35       | 90          | 150         | 2.2                | 0.29                | 130                |
|                                |                     |                                                | 280 HB                          | 0.5     | 3.2     | 0.14      | 0.35       | 90          | 130         | 2.2                | 0.29                | 120                |
|                                |                     |                                                | 320 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 60          | 110         | 2.2                | 0.26                | 100                |
|                                |                     |                                                | 350 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 60          | 90          | 2.2                | 0.26                | 80                 |
|                                | Stainless Steel     | Austentic                                      | 4<br>304, 316, X5CrNi18-9       | 180 HB  | 0.5     | 4.5       | 0.18       | 0.35        | 190         | 250                | 3                   | 0.29               |
| 240 HB                         |                     |                                                |                                 | 0.5     | 4.5     | 0.14      | 0.32       | 160         | 210         | 3                  | 0.29                | 190                |
| Duplex                         |                     | 5<br>X2CrNiN23-4, S31500                       | 290 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 70          | 130         | 2.2                | 0.26                | 100                |
|                                |                     |                                                | 310 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 70          | 120         | 2.2                | 0.26                | 90                 |
| Ferritic & Martensitic         |                     | 6<br>410, X6Cr17, 17-4 PH, 430                 | 200 HB                          | 0.5     | 4.5     | 0.18      | 0.35       | 150         | 210         | 3                  | 0.29                | 190                |
|                                |                     |                                                | 42 HRc                          | 0.5     | 3.2     | 0.18      | 0.32       | 90          | 150         | 2.2                | 0.26                | 130                |
| Cast Iron                      | Grey                | 7<br>GG20, GG40, EN-GJL-250, N030B             | 150 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 150         | 240         | 3                  | 0.37                | 200                |
|                                |                     |                                                | 200 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 150         | 220         | 3                  | 0.37                | 180                |
|                                |                     |                                                | 250 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 150         | 190         | 3                  | 0.37                | 160                |
|                                | Malleable & Nodular | 8<br>GGG40, GGG70, 50005                       | 150 HB                          | 0.5     | 4.5     | 0.18      | 0.45       | 100         | 200         | 3                  | 0.32                | 180                |
|                                |                     |                                                | 200 HB                          | 0.5     | 4.5     | 0.18      | 0.45       | 100         | 180         | 3                  | 0.32                | 150                |
|                                |                     |                                                | 250 HB                          | 0.5     | 4.5     | 0.18      | 0.45       | 100         | 150         | 3                  | 0.32                | 130                |
| NITTI Alloy                    | Fe, Ni & Co Based   | 9<br>Incoloy 800<br>Inconel 700<br>Stellite 21 | 240 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 30          | 50          | 2.2                | 0.26                | 32                 |
|                                |                     |                                                | 250 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 30          | 50          | 2.2                | 0.26                | 30                 |
|                                |                     |                                                | 350 HB                          | 0.5     | 3.2     | 0.14      | 0.29       | 30          | 50          | 2.2                | 0.26                | 30                 |
|                                | Ti Based            | 10<br>T40<br>TiAl6V4                           | -                               | 0.5     | 3.2     | 0.14      | 0.29       | 30          | 60          | 2.2                | 0.26                | 40                 |
|                                |                     |                                                | -                               | 0.5     | 3.2     | 0.14      | 0.32       | 40          | 70          | 2.2                | 0.29                | 55                 |
|                                | Hardened Materials  | Steel Chilled<br>Cast Iron<br>White Cast Iron  | 11<br>G-X300CrMo15<br>Ni-Hard 2 | 55 HRc  | 0.4     | 1         | 0.12       | 0.22        | 30          | 60                 | 0.7                 | 0.19               |
| 400 HB                         |                     |                                                |                                 | 0.4     | 1.3     | 0.12      | 0.29       | 40          | 80          | 1.1                | 0.22                | 50                 |
| X100CrMo13, 440C, G-X260NiCr42 |                     |                                                | 45 HRc                          | 0.4     | 1.6     | 0.12      | 0.29       | 40          | 80          | 1.5                | 0.22                | 60                 |
|                                |                     |                                                | 50 HRc                          | 0.4     | 1.3     | 0.12      | 0.26       | 40          | 70          | 1.1                | 0.21                | 55                 |
|                                |                     |                                                | 55 HRc                          | 0.4     | 1       | 0.12      | 0.22       | 40          | 60          | 0.7                | 0.19                | 50                 |
| Aluminium                      | Al (>8%Si)          | 12<br>AlSi12                                   | 130 HB                          | 0.5     | 4.5     | 0.22      | 0.51       | 200         | 400         | 3                  | 0.4                 | 280                |