

## TPMR 160304 NN LT 10

| Material Group    | Gr. N°                 | VDI Group | Material Examples*                      | Hardness | D.O.C. [mm] |      | Feed [mm/rev] |      | Amax [mm <sup>2</sup> ] | V <sub>c</sub> [m/min] |     | Optimal cutting conditions |      |                |    |
|-------------------|------------------------|-----------|---|----------|-------------|------|---------------|------|-------------------------|------------------------|-----|----------------------------|------|----------------|----|
|                   |                        |           |   |          | min         | max  | min           | max  |                         | min                    | max | D.O.C.                     | Feed | V <sub>c</sub> |    |
| Steel             | Non-alloyed            | 1         | C35, Ck45, 1020, 1045, 1060, 28Mn6      | 125 HB   | 0.2         | 3.0  | 0.11          | 0.23 | 0.60                    | 180                    | 330 | 2.0                        | 0.18 | 300            |    |
|                   |                        | 2         |   | 190 HB   |             | 2.5  |               | 0.22 | 0.52                    |                        | 280 |                            |      | 260            |    |
|                   |                        | 3         |   | 250 HB   |             | 2.5  |               | 0.20 | 0.48                    |                        | 250 |                            |      | 240            |    |
|                   | Low alloyed            | 2         | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 180 HB   | 0.2         | 2.5  | 0.10          | 0.20 | 0.50                    | 120                    | 280 | 2.0                        | 0.15 | 260            |    |
|                   |                        | 4,6       |   | 230 HB   |             | 2.5  |               | 0.20 | 0.48                    |                        | 250 |                            |      | 240            |    |
|                   |                        | 5,7       |   | 280 HB   |             | 2.0  |               | 0.18 | 0.40                    |                        | 210 |                            |      | 200            |    |
|                   |                        | 8         |   | 350 HB   |             | 2.0  |               | 0.18 | 0.36                    |                        | 180 |                            |      | 180            |    |
|                   | High alloyed           | 3         | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB   | 0.2         | 2.5  | 0.09          | 0.18 | 0.40                    | 70                     | 190 | 2.0                        | 0.12 | 180            |    |
|                   |                        | 10        |   | 280 HB   |             | 2.5  |               | 0.16 | 0.40                    |                        | 150 |                            |      | 140            |    |
|                   |                        | 11        |   | 320 HB   |             | 2.0  |               | 0.14 | 0.32                    |                        | 130 |                            |      | 120            |    |
|                   |                        | 11        |   | 350 HB   |             | 2.0  |               | 0.14 | 0.26                    |                        | 110 |                            |      | 110            |    |
| Stainless Steel   | Austenitic             | 4         | 304, 316, X5CrNi18-9                    | 180 HB   | 0.2         | 2.5  | 0.10          | 0.18 | 0.32                    | 170                    | 270 | 2.0                        | 0.12 | 260            |    |
|                   |                        | 14        | 240 HB                                  | 2.5      |             | 0.18 |               | 0.26 | 160                     | 220                    | 210 |                            |      |                |    |
|                   | Duplex                 | 5         | X2CrNiN23-4, S31500                     | 290 HB   | 0.2         | 2.0  | 0.09          | 0.14 | 0.20                    | 80                     | 150 | 2.0                        | 0.12 | 140            |    |
|                   |                        | 14        | 310 HB                                  | 2.0      |             | 0.14 |               | 0.20 | 70                      | 140                    |     |                            |      |                |    |
|                   | Ferritic & Martensitic | 6         | 410, X6Cr17, 17-4 PH, 430               | 200 HB   | 0.2         | 2.5  | 0.10          | 0.18 | 0.32                    | 170                    | 250 | 2.0                        | 0.15 | 240            |    |
|                   |                        | 13        | 42 HRC                                  | 2.0      |             | 0.16 |               | 0.26 | 120                     | 190                    | 180 |                            |      |                |    |
| Cast Iron         | Grey                   | 7         | GG20, GG40, EN-GJL-250, No30B           | 150 HB   | 0.2         | 3.0  | 0.08          | 0.20 | 0.64                    | 170                    | 250 | 2.0                        | 0.18 | 240            |    |
|                   |                        | 15        | 200 HB                                  | 3.0      |             | 0.20 |               | 0.60 | 160                     | 230                    | 220 |                            |      |                |    |
|                   |                        | 16        | 250 HB                                  | 3.0      |             | 0.20 |               | 0.60 | 150                     | 210                    | 200 |                            |      |                |    |
|                   | Malleable & Nodular    | 8         | GGG40, GGG70, 50005                     | 150 HB   | 0.2         | 2.5  | 0.08          | 0.18 | 0.48                    | 120                    | 250 | 2.0                        | 0.15 | 240            |    |
|                   |                        | 17,19     | 200 HB                                  | 2.5      |             | 0.18 |               | 0.40 | 230                     |                        | 220 |                            |      |                |    |
| 18,20             | 250 HB                 | 2.5       | 0.18                                    | 0.40     |             | 190  |               | 180  |                         |                        |     |                            |      |                |    |
| High Temp. Alloys | Fe, Ni & Co based      | 9         | 31,32 Incoloy 800                       | 240 HB   | 0.2         | 2.0  | 0.09          | 0.15 | 0.26                    | 25                     | 50  | 2.0                        | 0.12 | 40             |    |
|                   |                        | 33        | Inconel 700                             | 250 HB   |             | 2.0  |               | 0.15 | 0.26                    | 25                     | 50  |                            |      | 35             |    |
|                   |                        | 34        | Stellite 21                             | 350 HB   |             | 2.0  |               | 0.15 | 0.26                    | 23                     | 45  |                            |      |                |    |
|                   | Ti based               | 10        | 36 TiAl6V4                              | -        | 0.2         | 2.0  | 0.09          | 0.16 | 0.32                    | 45                     | 65  | 2.0                        | 0.15 | 60             |    |
|                   |                        | 37        | T40                                     | -        |             | 2.0  |               | 0.14 | 0.26                    | 35                     | 60  |                            |      | 50             |    |
| Hardened Mat.     | Steel                  | 11        | 38 X100CrMo13, 440C, G-X260NiCr42       | 45 HRC   | 0.2         | 1.8  | 0.05          | 0.12 | 0.20                    | 50                     | 100 | 1.5                        | 0.11 | 90             |    |
|                   |                        | 38        | 50 HRC                                  | 1.5      |             | 0.10 |               | 0.17 | 40                      | 90                     | 1.2 |                            |      | 0.09           | 80 |
|                   |                        | 38        | 55 HRC                                  | 1.4      |             | 0.09 |               | 0.13 | 40                      | 80                     | 1.0 |                            |      | 0.07           | 70 |
|                   | Chilled Cast Iron      | 40        | Ni-Hard 2                               | 400 HB   | 0.2         | 1.6  | 0.05          | 0.12 | 0.17                    | 40                     | 60  | 1.2                        | 0.11 | 50             |    |
|                   | White Cast Iron        | 41        | G-X300CrMo15                            | 55 HRC   | 0.2         | 1.4  | 0.05          | 0.09 | 0.13                    | 30                     | 50  | 1.0                        | 0.07 | 40             |    |
| NF                | Al (>8%Si)             | 12        | 25 AISI12                               | 130 HB   | 0.2         | 4.0  | 0.10          | 0.30 | 0.70                    | 200                    | 400 | 2.0                        | 0.20 | 350            |    |