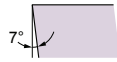




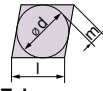
C C M T



Shape

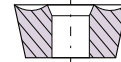


Clearance Angle



Tolerance

s ± 0.13  
For l = 06/09, d ± 0.05 m ± 0.08  
For l = 12, d ± 0.08 m ± 0.13



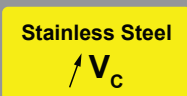
Fixing  
Chip breaker

| Insert Designation | Grade   | l  | s    | r   | Catalog Nr. |
|--------------------|---------|----|------|-----|-------------|
| CCMT 060204 NN     | LT 1000 | 6  | 2.38 | 0.4 | T0001888    |
| CCMT 09T304 NN     | LT 1000 | 9  | 3.97 | 0.4 | T0001889    |
| CCMT 09T308 NN     | LT 1000 | 9  | 3.97 | 0.8 | T0001890    |
| CCMT 120404 NN     | LT 1000 | 12 | 4.76 | 0.4 | T0001891    |
| CCMT 120408 NN     | LT 1000 | 12 | 4.76 | 0.8 | T0001892    |
| CCMT 120412 NN     | LT 1000 | 12 | 4.76 | 1.2 | T0001893    |

**NN** All purpose Chipbreaker 80° Diamond shape inserts, with positive chipbreaker geometry. Very popular and useful for Boring even of small diameters, Facing and external Turning operations.

Application Guide

|                | Finishing | Medium | Roughing / Interrupted cut |   |
|----------------|-----------|--------|----------------------------|---|
| CCMT 060204 NN | 😊         | 😐      | 😞                          | 😊 = Good<br>😐 = Acceptable<br>😞 = Not recommended<br><br><b>Finishing:</b><br>d.o.c. = 0.30 - 1.50 mm<br>fn = 0.08 - 0.20 mm/rev<br><br><b>Medium:</b><br>d.o.c. = 0.70 - 4.50 mm<br>fn = 0.15 - 0.45 mm/rev<br><br><b>Roughing</b><br>d.o.c. = 3.00 - 7.00 mm<br>fn = 0.35 - 0.70 mm/rev |
| CCMT 09T304 NN | 😊         | 😐      | 😞                          |   |
| CCMT 09T308 NN | 😐         | 😊      | 😐                          |   |
| CCMT 120404 NN | 😊         | 😐      | 😞                          |   |
| CCMT 120408 NN | 😐         | 😊      | 😐                          |   |
| CCMT 120412 NN | 😞         | 😐      | 😊                          |   |



Machine Recommendations Guide. Details on page 10

## CCMT 060204 NN LT 10 & LT 1000

| 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         | 2.1  | 0.08          | 0.20 | 0.37                    | 180                    | 330 | 1.0                        | 0.18 | 300            |     |
|                   |                        | 2            |   | 190 HB   |             | 1.8  |               | 0.19 | 0.32                    |                        | 280 |                            |      | 260            |     |
|                   |                        | 3            |   | 250 HB   |             | 1.8  |               | 0.17 | 0.30                    |                        | 250 |                            |      | 240            |     |
|                   | Low alloyed            | 2            | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 180 HB   | 0.2         | 1.8  | 0.08          | 0.17 | 0.31                    | 120                    | 280 | 1.0                        | 0.15 | 260            |     |
|                   |                        | 4,6          |   | 230 HB   |             | 1.8  |               | 0.17 | 0.30                    |                        | 250 |                            |      | 240            |     |
|                   |                        | 5,7          |   | 280 HB   |             | 1.4  |               | 0.15 | 0.25                    |                        | 210 |                            |      | 200            |     |
|                   |                        | 8            |   | 350 HB   |             | 1.4  |               | 0.15 | 0.22                    |                        | 180 |                            |      | 180            |     |
|                   | High alloyed           | 3            | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB   | 0.2         | 1.8  | 0.07          | 0.15 | 0.25                    | 70                     | 190 | 1.0                        | 0.12 | 180            |     |
|                   |                        | 10           |   | 280 HB   |             | 1.8  |               | 0.14 | 0.25                    |                        | 150 |                            |      | 140            |     |
|                   |                        | 11           |   | 320 HB   |             | 1.4  |               | 0.12 | 0.20                    |                        | 130 |                            |      | 120            |     |
|                   |                        | 11           |   | 350 HB   |             | 1.4  |               | 0.12 | 0.16                    |                        | 110 |                            |      | 110            |     |
| Stainless Steel   | Austenitic             | 4            | 304, 316, X5CrNi18-9                    | 180 HB   | 0.2         | 1.8  | 0.08          | 0.15 | 0.20                    | 170                    | 270 | 1.0                        | 0.12 | 260            |     |
|                   |                        | 14           |   | 240 HB   |             | 1.8  |               | 0.15 | 0.16                    |                        | 160 |                            |      | 210            |     |
|                   | Duplex                 | 5            | X2CrNiN23-4, S31500                     | 290 HB   | 0.2         | 1.4  | 0.07          | 0.12 | 0.12                    | 80                     | 150 | 1.0                        | 0.12 | 140            |     |
|                   |                        | 14           |   | 310 HB   |             | 1.4  |               | 0.12 | 0.12                    |                        | 70  |                            |      | 140            |     |
|                   | Ferritic & Martensitic | 6            | 410, X6Cr17, 17-4 PH, 430               | 200 HB   | 0.2         | 1.8  | 0.08          | 0.15 | 0.20                    | 170                    | 250 | 1.0                        | 0.15 | 240            |     |
|                   |                        | 13           |   | 42 HRc   |             | 1.4  |               | 0.14 | 0.16                    |                        | 120 |                            |      | 190            |     |
| Cast Iron         | Grey                   | 7            | GG20, GG40, EN-GJL-250, No30B           | 150 HB   | 0.2         | 2.1  | 0.06          | 0.17 | 0.40                    | 170                    | 250 | 1.0                        | 0.18 | 240            |     |
|                   |                        | 15           |   | 200 HB   |             | 2.1  |               | 0.17 | 0.37                    |                        | 160 |                            |      | 230            |     |
|                   |                        | 16           |   | 250 HB   |             | 2.1  |               | 0.17 | 0.37                    |                        | 150 |                            |      | 210            |     |
|                   | Malleable & Nodular    | 8            | GGG40, GGG70, 50005                     | 150 HB   | 0.2         | 1.8  | 0.06          | 0.15 | 0.30                    | 120                    | 250 | 1.0                        | 0.15 | 240            |     |
|                   |                        | 17,19        |   | 200 HB   |             | 1.8  |               | 0.15 | 0.25                    |                        | 230 |                            |      | 220            |     |
| 18,20             | 250 HB                 | 1.8          | 0.15                                    | 0.25     | 190         | 180  |               |      |                         |                        |     |                            |      |                |     |
| High Temp. Alloys | Fe, Ni & Co based      | 9            | Incoloy 800, Inconel 700, Stellite 21   | 240 HB   | 0.2         | 1.4  | 0.08          | 0.13 | 0.16                    | 25                     | 50  | 1.0                        | 0.12 | 40             |     |
|                   |                        | 33           |   | 250 HB   |             | 1.4  |               | 0.13 | 0.16                    |                        | 25  |                            |      | 50             |     |
|                   |                        | 34           |   | 350 HB   |             | 1.4  |               | 0.13 | 0.13                    |                        | 23  |                            |      | 45             |     |
|                   | Ti based               | 10           | TiAl6V4, T40                            | -        | 0.2         | 1.4  | 0.08          | 0.14 | 0.20                    | 45                     | 65  | 1.0                        | 0.14 | 60             |     |
| 37                | -                      | 1.4          |   | 0.12     |             | 0.16 |               | 35   | 60                      |                        |     |                            |      |                |     |
| Hardened Mat.     | Steel                  | 11           | X100CrMo13, 440C, G-X260NiCr42          | 45 HRc   | 0.2         | 1.3  | 0.04          | 0.10 | 0.12                    | 50                     | 100 | 0.8                        | 0.11 | 90             |     |
|                   |                        | 38           |   | 50 HRc   |             | 1.1  |               | 0.09 | 0.11                    |                        | 40  |                            |      | 90             |     |
|                   |                        | 38           |   | 55 HRc   |             | 1.0  |               | 0.08 | 0.08                    |                        | 40  |                            |      | 80             |     |
|                   | Chilled Cast Iron      | 40           | Ni-Hard 2                               | 400 HB   | 0.2         | 1.1  | 0.04          | 0.10 | 0.11                    | 40                     | 60  | 0.6                        | 0.11 | 50             |     |
| White Cast Iron   | 41                     | G-X300CrMo15 | 55 HRc                                  | 0.2      | 1.0         | 0.04 | 0.08          | 0.08 | 30                      | 50                     | 0.5 | 0.07                       | 40   |                |     |
| NF                | Al (>8%Si)             | 12           | 25                                      | AISI12   | 130 HB      | 0.2  | 2.8           | 0.08 | 0.26                    | 0.43                   | 200 | 400                        | 1.0  | 0.20           | 350 |

## CCMT 09T304 NN LT 10 &amp; LT 1000

| Material Group    | Gr. N°                 | VDI Group | Material Examples*                      | Hardness                       | D.O.C. [mm] |     | Feed [mm/rev] |      | Amax [mm²] | 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, S150, 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         | X2CrNi23-4, 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 | 70         |                        | 140 |                            |      | 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         | Incoloy 800, Inconel 700, Stellite 21   | 240 HB                         | 0.2         | 2.0 | 0.09          | 0.15 | 0.26       | 25                     | 50  | 2.0                        | 0.12 | 40             |     |      |    |
|                   |                        | 33        |   | 250 HB                         |             | 2.0 |               | 0.15 | 25         |                        | 50  |                            |      | 40             |     |      |    |
|                   |                        | 34        |   | 350 HB                         |             | 2.0 |               | 0.15 | 23         |                        | 45  |                            |      | 35             |     |      |    |
|                   | Ti based               | 10        | TiAl6V4, T40                            | -                              | 0.2         | 2.0 | 0.09          | 0.16 | 0.32       | 45                     | 65  | 2.0                        | 0.15 | 60             |     |      |    |
|                   |                        | 37        |   | -                              |             | 2.0 |               | 0.14 | 0.26       |                        | 35  |                            |      | 60             | 50  |      |    |
|                   | Hardened Mat.          | Steel     | 11                                      | 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                                      | AlSi12                         | 130 HB      | 0.2 | 4.0           | 0.10 | 0.30       | 0.70                   | 200 | 400                        | 2.0  | 0.20           | 350 |      |    |

## CCMT 09T308 NN LT 10 & LT 1000

| 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   | 0.5         | 4.0  | 0.21          | 0.50 | 1.62                    | 180                    | 280 | 3.0                        | 0.32 | 240            |      |     |     |      |    |
|                   |                        | 190 HB    |   | 4.0      |             | 0.50 |               | 1.62 |                         |                        |     |                            |      | 220            |      |     |     |      |    |
|                   |                        | 250 HB    |   | 4.0      |             | 0.45 |               | 1.35 |                         |                        |     |                            |      | 200            |      |     |     |      |    |
|                   | Low alloyed            | 2         | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 180 HB   | 0.5         | 4.0  | 0.21          | 0.45 | 1.08                    | 120                    | 280 | 3.0                        | 0.29 | 200            |      |     |     |      |    |
|                   |                        |           |   | 230 HB   |             | 3.2  |               | 0.45 |                         |                        |     |                            |      | 1.08           | 180  |     |     |      |    |
|                   |                        |           |   | 280 HB   |             | 3.2  |               | 0.18 |                         |                        |     |                            |      | 0.40           | 1.08 | 210 | 150 |      |    |
|                   |                        |           |   | 350 HB   |             | 2.8  |               | 0.18 |                         |                        |     |                            |      | 0.40           | 0.90 | 180 | 150 |      |    |
|                   | High alloyed           | 3         | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB   | 0.5         | 3.2  | 0.18          | 0.40 | 1.08                    | 70                     | 190 | 2.5                        | 0.27 | 140            |      |     |     |      |    |
|                   |                        |           |   | 280 HB   |             | 3.2  |               | 0.40 |                         |                        |     |                            |      | 1.08           | 150  | 120 |     |      |    |
|                   |                        |           |   | 320 HB   |             | 2.4  |               | 0.35 |                         |                        |     |                            |      | 0.72           | 130  | 100 |     |      |    |
|                   |                        |           |   | 350 HB   |             | 2.4  |               | 0.35 |                         |                        |     |                            |      | 0.72           | 110  | 90  |     |      |    |
| Stainless Steel   | Austenitic             | 4         | 304, 316, X5CrNi18-9                    | 180 HB   | 0.5         | 4.0  | 0.20          | 0.40 | 1.08                    | 170                    | 270 | 3.0                        | 0.32 | 200            |      |     |     |      |    |
|                   |                        |           |   | 240 HB   |             | 4.0  |               | 0.40 |                         |                        |     |                            |      | 0.90           | 160  | 220 | 180 |      |    |
|                   | Duplex                 | 5         | X2CrNiN23-4, S31500                     | 290 HB   | 0.5         | 3.2  | 0.18          | 0.35 | 0.72                    | 80                     | 150 | 2.5                        | 0.25 | 100            |      |     |     |      |    |
|                   |                        |           |   | 310 HB   |             | 3.2  |               | 0.35 |                         |                        |     |                            |      | 0.72           | 70   | 140 | 90  |      |    |
|                   | Ferritic & Martensitic | 6         | 410, X6Cr17, 17-4 PH, 430               | 200 HB   | 0.5         | 4.0  | 0.22          | 0.40 | 0.90                    | 170                    | 250 | 3.0                        | 0.29 | 190            |      |     |     |      |    |
|                   |                        |           |   | 42 HRc   |             | 3.2  |               | 0.22 |                         |                        |     |                            |      | 0.40           | 120  | 190 | 130 |      |    |
| Cast Iron         | Grey                   | 7         | GG20, GG40, EN-GJL-250, No30B           | 150 HB   | 0.5         | 4.0  | 0.15          | 0.60 | 1.80                    | 170                    | 250 | 3.0                        | 0.32 | 200            |      |     |     |      |    |
|                   |                        |           |   | 200 HB   |             | 4.0  |               | 0.60 |                         |                        |     |                            |      | 1.62           | 160  | 230 | 180 |      |    |
|                   |                        |           |   | 250 HB   |             | 4.0  |               | 0.55 |                         |                        |     |                            |      | 1.62           | 150  | 210 | 160 |      |    |
|                   | Malleable & Nodular    | 8         | GGG40, GGG70, 50005                     | 150 HB   | 0.5         | 4.0  | 0.15          | 0.50 | 1.35                    | 120                    | 230 | 3.0                        | 0.27 | 180            |      |     |     |      |    |
|                   |                        |           |   | 200 HB   |             | 4.0  |               | 0.50 |                         |                        |     |                            |      | 1.17           | 190  | 160 |     |      |    |
| 250 HB            | 4.0                    | 0.50      | 1.08                                    | 190      | 140         | 140  |               |      |                         |                        |     |                            |      |                |      |     |     |      |    |
| High Temp. Alloys | Fe, Ni & Co based      | 9         | Incoloy 800, Inconel 700, Stellite 21   | 240 HB   | 0.5         | 2.4  | 0.20          | 0.35 | 0.63                    | 25                     | 45  | 2.0                        | 0.25 | 32             |      |     |     |      |    |
|                   |                        |           |   | 250 HB   |             | 2.4  |               | 0.35 |                         |                        |     |                            |      | 0.63           | 25   | 45  | 30  |      |    |
|                   |                        |           |   | 350 HB   |             | 2.4  |               | 0.35 |                         |                        |     |                            |      | 0.63           | 23   | 40  | 28  |      |    |
|                   | Ti based               | 10        | TiAl6V4, T40                            | -        | 0.5         | 3.2  | 0.20          | 0.40 | 0.72                    | 45                     | 65  | 2.0                        | 0.30 | 55             |      |     |     |      |    |
| -                 | 2.4                    | 0.35      | 0.63                                    | 35       |             | 55   |               | 45   |                         |                        |     |                            |      |                |      |     |     |      |    |
| Hardened Mat.     | Steel                  | 11        | X100CrMo13, 440C, G-X260NiCr42          | 45 HRc   | 0.5         | 2.0  | 0.11          | 0.30 | 0.54                    | 50                     | 100 | 2.0                        | 0.23 | 80             |      |     |     |      |    |
|                   |                        |           |   | 50 HRc   |             | 1.6  |               | 0.25 |                         |                        |     |                            |      | 0.36           | 40   | 90  | 1.5 | 0.18 | 70 |
|                   |                        |           |   | 55 HRc   |             | 1.2  |               | 0.20 |                         |                        |     |                            |      | 0.27           | 40   | 80  | 1.0 | 0.16 | 60 |
|                   | Chilled Cast Iron      | 40        | Ni-Hard 2                               | 400 HB   | 0.5         | 1.6  | 0.11          | 0.25 | 0.36                    | 40                     | 60  | 1.5                        | 0.16 | 50             |      |     |     |      |    |
|                   | White Cast Iron        | 41        | G-X300CrMo15                            | 55 HRc   | 0.5         | 1.2  | 0.11          | 0.20 | 0.27                    | 30                     | 50  | 1.0                        | 0.14 | 40             |      |     |     |      |    |
| NF                | Al (>8%Si)             | 12        | 25                                      | AISi12   | 130 HB      | 0.5  | 4.8           | 0.20 | 0.60                    | 1.60                   | 200 | 400                        | 3.0  | 0.36           | 280  |     |     |      |    |

## CCMT 120404 NN LT 10 &amp; LT 1000

| Material Group    | Gr. N°                 | VDI Group | Material Examples*                      | Hardness                       | D.O.C. [mm] |     | Feed [mm/rev] |      | Amax [mm²] | 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, S150, 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         | X2CrNi23-4, 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 | 70         |                        | 140 |                            |      | 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         | Incoloy 800, Inconel 700, Stellite 21   | 240 HB                         | 0.2         | 2.0 | 0.09          | 0.15 | 0.26       | 25                     | 50  | 2.0                        | 0.12 | 40             |     |      |    |
|                   |                        | 33        |   | 250 HB                         |             | 2.0 |               | 0.15 | 25         |                        | 50  |                            |      | 40             |     |      |    |
|                   |                        | 34        |   | 350 HB                         |             | 2.0 |               | 0.15 | 23         |                        | 45  |                            |      | 35             |     |      |    |
|                   | Ti based               | 10        | TiAl6V4, T40                            | -                              | 0.2         | 2.0 | 0.09          | 0.16 | 0.32       | 45                     | 65  | 2.0                        | 0.15 | 60             |     |      |    |
|                   |                        | 37        |   | -                              |             | 2.0 |               | 0.14 | 0.26       |                        | 35  |                            |      | 60             | 50  |      |    |
|                   | Hardened Mat.          | Steel     | 11                                      | 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                                      | AlSi12                         | 130 HB      | 0.2 | 4.0           | 0.10 | 0.30       | 0.70                   | 200 | 400                        | 2.0  | 0.20           | 350 |      |    |

## CCMT 120408 NN LT 10 & LT 1000

| 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   | 0.5         | 5.0  | 0.21          | 0.50 | 1.80                    | 180                    | 280 | 3.0                        | 0.35 | 240            |      |     |      |    |
|                   |                        | 190 HB       |   | 5.0      |             | 0.50 |               | 1.80 |                         |                        |     |                            |      | 220            |      |     |      |    |
|                   |                        | 250 HB       |   | 5.0      |             | 0.45 |               | 1.50 |                         |                        |     |                            |      | 200            |      |     |      |    |
|                   | Low alloyed            | 2            | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 180 HB   | 0.5         | 5.0  | 0.21          | 0.45 | 1.20                    | 120                    | 280 | 3.0                        | 0.32 | 200            |      |     |      |    |
|                   |                        |              |   | 230 HB   |             | 4.0  |               | 0.45 |                         |                        |     |                            |      | 1.20           | 180  |     |      |    |
|                   |                        |              |   | 280 HB   |             | 4.0  |               | 0.18 |                         |                        |     |                            |      | 0.40           | 1.20 | 150 |      |    |
|                   |                        |              |   | 350 HB   |             | 3.5  |               | 0.18 |                         |                        |     |                            |      | 0.40           | 1.00 | 130 |      |    |
|                   | High alloyed           | 3            | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB   | 0.5         | 4.0  | 0.18          | 0.40 | 1.20                    | 70                     | 190 | 2.5                        | 0.30 | 140            |      |     |      |    |
|                   |                        |              |   | 280 HB   |             | 4.0  |               | 0.40 |                         |                        |     |                            |      | 1.20           | 120  |     |      |    |
|                   |                        |              |   | 320 HB   |             | 3.0  |               | 0.35 |                         |                        |     |                            |      | 0.80           | 130  |     |      |    |
|                   |                        |              |   | 350 HB   |             | 3.0  |               | 0.35 |                         |                        |     |                            |      | 0.80           | 110  |     |      |    |
| Stainless Steel   | Austenitic             | 4            | 304, 316, X5CrNi18-9                    | 180 HB   | 0.5         | 5.0  | 0.20          | 0.40 | 1.20                    | 170                    | 270 | 3.0                        | 0.35 | 190            |      |     |      |    |
|                   |                        |              |   | 240 HB   |             | 5.0  |               | 0.40 |                         | 1.00                   |     |                            |      | 160            | 220  | 170 |      |    |
|                   | Duplex                 | 5            | X2CrNiN23-4, S31500                     | 290 HB   | 0.5         | 4.0  | 0.18          | 0.35 | 0.80                    | 80                     | 150 | 2.5                        | 0.28 | 100            |      |     |      |    |
|                   |                        |              |   | 310 HB   |             | 4.0  |               | 0.35 |                         | 0.80                   |     |                            |      | 70             | 140  | 90  |      |    |
|                   | Ferritic & Martensitic | 6            | 410, X6Cr17, 17-4 PH, 430               | 200 HB   | 0.5         | 5.0  | 0.22          | 0.40 | 1.00                    | 170                    | 250 | 3.0                        | 0.32 | 190            |      |     |      |    |
|                   |                        |              |   | 42 HRc   |             | 4.0  |               | 0.40 |                         | 1.00                   |     |                            |      | 120            | 190  | 130 |      |    |
| Cast Iron         | Grey                   | 7            | GG20, GG40, EN-GJL-250, No30B           | 150 HB   | 0.5         | 5.0  | 0.15          | 0.60 | 2.00                    | 170                    | 250 | 3.0                        | 0.35 | 200            |      |     |      |    |
|                   |                        |              |   | 200 HB   |             | 5.0  |               | 0.60 |                         | 1.80                   |     |                            |      | 160            | 230  | 180 |      |    |
|                   |                        |              |   | 250 HB   |             | 5.0  |               | 0.55 |                         | 1.80                   |     |                            |      | 150            | 210  | 160 |      |    |
|                   | Malleable & Nodular    | 8            | GGG40, GGG70, 50005                     | 150 HB   | 0.5         | 5.0  | 0.15          | 0.50 | 1.50                    | 120                    | 230 | 3.0                        | 0.30 | 180            |      |     |      |    |
|                   |                        |              |   | 200 HB   |             | 5.0  |               | 0.50 |                         | 1.30                   |     |                            |      | 190            | 160  |     |      |    |
| 250 HB            | 5.0                    | 0.50         | 1.20                                    | 190      | 140         | 140  |               |      |                         |                        |     |                            |      |                |      |     |      |    |
| High Temp. Alloys | Fe, Ni & Co based      | 9            | Incoloy 800, Inconel 700, Stellite 21   | 240 HB   | 0.5         | 3.0  | 0.20          | 0.35 | 0.70                    | 25                     | 45  | 2.0                        | 0.28 | 32             |      |     |      |    |
|                   |                        |              |   | 250 HB   |             | 3.0  |               | 0.35 |                         | 0.70                   |     |                            |      | 25             | 45   | 30  |      |    |
|                   |                        |              |   | 350 HB   |             | 3.0  |               | 0.35 |                         | 0.70                   |     |                            |      | 23             | 40   | 28  |      |    |
|                   | Ti based               | 10           | TiAl6V4, T40                            | -        | 0.5         | 4.0  | 0.20          | 0.40 | 0.80                    | 45                     | 65  | 2.0                        | 0.33 | 55             |      |     |      |    |
| -                 |                        |              |   | 3.0      |             | 0.35 |               | 0.70 |                         | 35                     |     |                            |      | 55             | 45   |     |      |    |
| Hardened Mat.     | Steel                  | 11           | X100CrMo13, 440C, G-X260NiCr42          | 45 HRc   | 0.5         | 2.5  | 0.11          | 0.30 | 0.60                    | 50                     | 100 | 2.0                        | 0.25 | 80             |      |     |      |    |
|                   |                        |              |   | 50 HRc   |             | 2.0  |               | 0.25 |                         | 0.40                   |     |                            |      | 40             | 90   | 1.5 | 0.20 | 70 |
|                   |                        |              |   | 55 HRc   |             | 1.5  |               | 0.20 |                         | 0.30                   |     |                            |      | 40             | 80   | 1.0 | 0.18 | 60 |
|                   | Chilled Cast Iron      | 40           | Ni-Hard 2                               | 400 HB   | 0.5         | 2.0  | 0.11          | 0.25 | 0.40                    | 40                     | 60  | 1.5                        | 0.18 | 50             |      |     |      |    |
|                   |                        |              |   | 55 HRc   |             | 1.5  |               | 0.20 |                         | 0.30                   |     |                            |      | 30             | 50   | 1.0 | 0.15 | 40 |
| White Cast Iron   | 41                     | G-X300CrMo15 | 55 HRc                                  | 0.5      | 1.5         | 0.11 | 0.20          | 0.30 | 30                      | 50                     | 1.0 | 0.15                       | 40   |                |      |     |      |    |
| NF                | Al (>8%Si)             | 12           | 25                                      | AISi12   | 130 HB      | 0.5  | 6.0           | 0.20 | 0.60                    | 1.80                   | 200 | 400                        | 3.0  | 0.40           | 280  |     |      |    |

## CCMT 120412 NN LT 10 &amp; LT 1000

| 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   | 0.5         | 5.0  | 0.21          | 0.60 | 2.16                    | 180                    | 330  | 3.0                        | 0.42 | 240            |      |    |
|                   |                        | 2         |   | 190 HB   |             | 5.0  |               | 0.60 | 2.16                    |                        | 280  |                            |      | 220            |      |    |
|                   |                        | 3         |   | 250 HB   |             | 5.0  |               | 0.54 | 1.80                    |                        | 250  |                            |      | 200            |      |    |
|                   | Low alloyed            | 2         | 42CrMo4, St50, Ck60, 4140, 4340, 100Cr6 | 180 HB   | 0.5         | 5.0  | 0.21          | 0.54 | 1.44                    | 120                    | 280  | 3.0                        | 0.38 | 200            |      |    |
|                   |                        |           |   | 230 HB   |             | 4.0  | 0.21          | 0.54 | 1.44                    |                        | 250  |                            |      | 180            |      |    |
|                   |                        |           |   | 280 HB   |             | 4.0  | 0.18          | 0.48 | 1.44                    |                        | 210  |                            |      | 150            |      |    |
|                   |                        |           |   | 350 HB   |             | 3.5  | 0.18          | 0.48 | 1.20                    |                        | 180  |                            |      | 130            |      |    |
|                   | High alloyed           | 3         | X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19 | 220 HB   | 0.5         | 4.0  | 0.18          | 0.48 | 1.44                    | 70                     | 190  | 2.5                        | 0.36 | 140            |      |    |
|                   |                        |           |   | 280 HB   |             | 4.0  |               | 0.48 | 1.44                    |                        | 150  |                            |      | 120            |      |    |
|                   |                        |           |   | 320 HB   |             | 3.0  |               | 0.42 | 0.96                    |                        | 130  |                            |      | 100            |      |    |
|                   |                        |           |   | 350 HB   |             | 3.0  |               | 0.42 | 0.96                    |                        | 110  |                            |      | 90             |      |    |
| Stainless Steel   | Austenitic             | 4         | 304, 316, X5CrNi18-9                    | 180 HB   | 0.5         | 5.0  | 0.20          | 0.48 | 1.44                    | 170                    | 270  | 3.0                        | 0.35 | 190            |      |    |
|                   |                        |           |   | 240 HB   |             | 5.0  |               | 0.48 | 1.20                    | 160                    | 220  |                            |      | 170            |      |    |
|                   | Duplex                 | 5         | X2CrNiN23-4, S31500                     | 290 HB   | 0.5         | 4.0  | 0.18          | 0.42 | 0.96                    | 80                     | 150  | 2.5                        | 0.28 | 100            |      |    |
|                   |                        |           |   | 310 HB   |             | 4.0  |               | 0.42 | 0.96                    | 70                     | 140  |                            |      | 90             |      |    |
|                   | Ferritic & Martensitic | 6         | 410, X6Cr17, 17-4 PH, 430               | 200 HB   | 0.5         | 5.0  | 0.22          | 0.48 | 1.20                    | 170                    | 250  | 3.0                        | 0.35 | 190            |      |    |
|                   |                        |           |   | 42 HRC   |             | 4.0  |               | 0.48 | 1.20                    | 120                    | 190  |                            |      | 130            |      |    |
| Cast Iron         | Grey                   | 7         | GG20, GG40, EN-GJL-250, No30B           | 150 HB   | 0.5         | 5.0  | 0.15          | 0.72 | 2.40                    | 170                    | 250  | 3.0                        | 0.42 | 200            |      |    |
|                   |                        |           |   | 200 HB   |             | 5.0  |               | 0.72 | 2.16                    | 160                    | 230  |                            |      | 180            |      |    |
|                   |                        |           |   | 250 HB   |             | 5.0  |               | 0.66 | 2.16                    | 150                    | 210  |                            |      | 160            |      |    |
|                   | Malleable & Nodular    | 8         | GGG40, GGG70, 50005                     | 150 HB   | 0.5         | 5.0  | 0.15          | 0.60 | 1.80                    | 250                    | 3.0  | 0.36                       | 0.36 | 180            |      |    |
|                   |                        |           |   | 200 HB   |             | 5.0  |               | 0.60 | 1.56                    | 120                    |      |                            |      | 230            | 160  |    |
|                   |                        |           |   | 250 HB   |             | 5.0  |               | 0.60 | 1.44                    | 190                    |      |                            |      | 140            | 140  |    |
| High Temp. Alloys | Fe, Ni & Co based      | 9         | Incoloy 800                             | 240 HB   | 0.5         | 3.0  | 0.20          | 0.42 | 0.84                    | 25                     | 45   | 2.0                        | 0.30 | 32             |      |    |
|                   |                        |           |   | 250 HB   |             | 3.0  |               | 0.42 | 0.84                    | 25                     | 45   |                            |      | 30             |      |    |
|                   |                        |           |   | 350 HB   |             | 3.0  |               | 0.42 | 0.84                    | 23                     | 40   |                            |      | 28             |      |    |
|                   | Ti based               | 10        | TiAl6V4                                 | -        | 0.5         | 4.0  | 0.20          | 0.48 | 0.96                    | 45                     | 65   | 2.0                        | 0.35 | 55             |      |    |
|                   |                        |           |   | -        |             | 3.0  |               | 0.42 | 0.84                    | 35                     | 55   |                            |      | 45             |      |    |
| Hardened Mat.     | Steel                  | 11        | X100CrMo13, 440C, G-X260NiCr42          | 45 HRC   | 0.5         | 2.5  | 0.11          | 0.36 | 0.72                    | 50                     | 100  | 2.0                        | 0.30 | 80             |      |    |
|                   |                        |           |   | 50 HRC   |             | 2.0  |               | 0.30 | 0.48                    | 40                     | 90   |                            |      | 1.5            | 0.24 | 70 |
|                   |                        |           |   | 55 HRC   |             | 1.5  |               | 0.24 | 0.36                    | 40                     | 80   |                            |      | 1.0            | 0.22 | 60 |
|                   | Chilled Cast Iron      | 40        | 0.5                                     | 2.0      | 0.11        | 0.30 | 0.48          | 40   | 60                      | 1.5                    | 0.22 | 50                         |      |                |      |    |
|                   | White Cast Iron        | 41        | G-X300CrMo15                            | 55 HRC   | 0.5         | 1.5  | 0.11          | 0.24 | 0.36                    | 30                     | 50   | 1.0                        | 0.18 | 40             |      |    |
| NF                | Al (>8%Si)             | 12        | 25                                      | AlSi12   | 130 HB      | 0.5  | 6.0           | 0.20 | 0.72                    | 2.20                   | 200  | 400                        | 3.0  | 0.48           | 280  |    |