



Tool material **Solid Carbide**

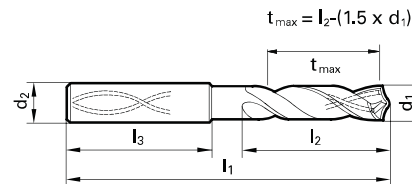
Surface **a**

|                          |   |
|--------------------------|---|
| <b>P</b> Steel           |   |
| <b>M</b> Stainless steel | ★ |
| <b>K</b> Cast iron       |   |
| <b>N</b> Aluminum        |   |
| <b>S</b> Titanium alloys | ● |
| <b>H</b> Hardened steel  |   |

web thinning ≥ Ø 3.000 • facet point grinding • main cutting edge form straight • optimized cutting geometry

stainless/acid-/heat-resistant steels • Titanium and Titanium alloys • Inconel, Hastelloy, Monel

- ★ = 1st choice
- = Optimal suitability
- = Limited suitability



Speeds and feeds information on pg. 573

| Diameter (d1) |          |      | d2   | l1    | t <sub>max</sub> | l2    | EDP #         |
|---------------|----------|------|------|-------|------------------|-------|---------------|
| inch          | wire/ltr | mm   | mm   | mm    | mm               | mm    |               |
| 0.1181        |          | 3.00 | 6.00 | 62.00 | 15.50            | 20.00 | 9085100030000 |
| 0.1220        |          | 3.10 | 6.00 | 62.00 | 15.35            | 20.00 | 9085100031000 |
| 0.1248        | 1/8      | 3.17 | 6.00 | 62.00 | 15.25            | 20.00 | 9085100031700 |
| 0.1260        |          | 3.20 | 6.00 | 62.00 | 15.20            | 20.00 | 9085100032000 |
| 0.1280        |          | 3.25 | 6.00 | 62.00 | 15.13            | 20.00 | 9085100032500 |
| 0.1299        |          | 3.30 | 6.00 | 62.00 | 15.05            | 20.00 | 9085100033000 |
| 0.1339        |          | 3.40 | 6.00 | 62.00 | 14.90            | 20.00 | 9085100034000 |
| 0.1378        |          | 3.50 | 6.00 | 62.00 | 14.75            | 20.00 | 9085100035000 |
| 0.1406        | 9/64 #28 | 3.57 | 6.00 | 62.00 | 14.65            | 20.00 | 9085100035700 |
| 0.1417        |          | 3.60 | 6.00 | 62.00 | 14.60            | 20.00 | 9085100036000 |
| 0.1457        |          | 3.70 | 6.00 | 62.00 | 14.45            | 20.00 | 9085100037000 |
| 0.1496        | #25      | 3.80 | 6.00 | 66.00 | 18.30            | 24.00 | 9085100038000 |
| 0.1535        |          | 3.90 | 6.00 | 66.00 | 18.15            | 24.00 | 9085100039000 |
| 0.1563        | 5/32     | 3.97 | 6.00 | 66.00 | 18.05            | 24.00 | 9085100039700 |
| 0.1575        |          | 4.00 | 6.00 | 66.00 | 18.00            | 24.00 | 9085100040000 |
| 0.1614        |          | 4.10 | 6.00 | 66.00 | 17.85            | 24.00 | 9085100041000 |
| 0.1654        |          | 4.20 | 6.00 | 66.00 | 17.70            | 24.00 | 9085100042000 |
| 0.1693        |          | 4.30 | 6.00 | 66.00 | 17.55            | 24.00 | 9085100043000 |
| 0.1720        | 11/64    | 4.37 | 6.00 | 66.00 | 17.45            | 24.00 | 9085100043700 |
| 0.1732        |          | 4.40 | 6.00 | 66.00 | 17.40            | 24.00 | 9085100044000 |
| 0.1772        | #16      | 4.50 | 6.00 | 66.00 | 17.25            | 24.00 | 9085100045000 |
| 0.1811        |          | 4.60 | 6.00 | 66.00 | 17.10            | 24.00 | 9085100046000 |
| 0.1831        |          | 4.65 | 6.00 | 66.00 | 17.03            | 24.00 | 9085100046500 |
| 0.1850        |          | 4.70 | 6.00 | 66.00 | 16.95            | 24.00 | 9085100047000 |
| 0.1874        | 3/16     | 4.76 | 6.00 | 66.00 | 20.86            | 28.00 | 9085100047600 |
| 0.1890        | #12      | 4.80 | 6.00 | 66.00 | 20.80            | 28.00 | 9085100048000 |
| 0.1929        |          | 4.90 | 6.00 | 66.00 | 20.65            | 28.00 | 9085100049000 |
| 0.1969        |          | 5.00 | 6.00 | 66.00 | 20.50            | 28.00 | 9085100050000 |
| 0.2008        |          | 5.10 | 6.00 | 66.00 | 20.35            | 28.00 | 9085100051000 |
| 0.2031        | 13/64    | 5.16 | 6.00 | 66.00 | 20.26            | 28.00 | 9085100051600 |
| 0.2047        |          | 5.20 | 6.00 | 66.00 | 20.20            | 28.00 | 9085100052000 |
| 0.2087        |          | 5.30 | 6.00 | 66.00 | 20.05            | 28.00 | 9085100053000 |
| 0.2126        |          | 5.40 | 6.00 | 66.00 | 19.90            | 28.00 | 9085100054000 |
| 0.2165        |          | 5.50 | 6.00 | 66.00 | 19.75            | 28.00 | 9085100055000 |
| 0.2185        |          | 5.55 | 6.00 | 66.00 | 19.68            | 28.00 | 9085100055500 |
| 0.2189        | 7/32     | 5.56 | 6.00 | 66.00 | 19.66            | 28.00 | 9085100055600 |
| 0.2205        |          | 5.60 | 6.00 | 66.00 | 19.60            | 28.00 | 9085100056000 |
| 0.2244        |          | 5.70 | 6.00 | 66.00 | 19.45            | 28.00 | 9085100057000 |
| 0.2283        |          | 5.80 | 6.00 | 66.00 | 19.30            | 28.00 | 9085100058000 |
| 0.2323        |          | 5.90 | 6.00 | 66.00 | 19.15            | 28.00 | 9085100059000 |
| 0.2343        | 15/64    | 5.95 | 6.00 | 66.00 | 19.08            | 28.00 | 9085100059500 |
| 0.2362        |          | 6.00 | 6.00 | 66.00 | 19.00            | 28.00 | 9085100060000 |

| Diameter (d1) |          |      | d2    | l1    | t <sub>max</sub> | l2    | EDP #         |
|---------------|----------|------|-------|-------|------------------|-------|---------------|
| inch          | wire/ltr | mm   | mm    | mm    | mm               | mm    |               |
| 0.2402        |          | 6.10 | 8.00  | 79.00 | 24.85            | 34.00 | 9085100061000 |
| 0.2441        |          | 6.20 | 8.00  | 79.00 | 24.70            | 34.00 | 9085100062000 |
| 0.2480        |          | 6.30 | 8.00  | 79.00 | 24.55            | 34.00 | 9085100063000 |
| 0.2500        | 1/4 E    | 6.35 | 8.00  | 79.00 | 24.48            | 34.00 | 9085100063500 |
| 0.2520        |          | 6.40 | 8.00  | 79.00 | 24.40            | 34.00 | 9085100064000 |
| 0.2559        |          | 6.50 | 8.00  | 79.00 | 24.25            | 34.00 | 9085100065000 |
| 0.2598        |          | 6.60 | 8.00  | 79.00 | 24.10            | 34.00 | 9085100066000 |
| 0.2638        |          | 6.70 | 8.00  | 79.00 | 23.95            | 34.00 | 9085100067000 |
| 0.2657        | 17/64 H  | 6.75 | 8.00  | 79.00 | 23.88            | 34.00 | 9085100067500 |
| 0.2677        |          | 6.80 | 8.00  | 79.00 | 23.80            | 34.00 | 9085100068000 |
| 0.2717        | I        | 6.90 | 8.00  | 79.00 | 23.65            | 34.00 | 9085100069000 |
| 0.2756        |          | 7.00 | 8.00  | 79.00 | 23.50            | 34.00 | 9085100070000 |
| 0.2795        |          | 7.10 | 8.00  | 79.00 | 30.35            | 41.00 | 9085100071000 |
| 0.2811        | 9/32 K   | 7.14 | 8.00  | 79.00 | 30.29            | 41.00 | 9085100071400 |
| 0.2835        |          | 7.20 | 8.00  | 79.00 | 30.20            | 41.00 | 9085100072000 |
| 0.2874        |          | 7.30 | 8.00  | 79.00 | 30.05            | 41.00 | 9085100073000 |
| 0.2913        |          | 7.40 | 8.00  | 79.00 | 29.90            | 41.00 | 9085100074000 |
| 0.2953        |          | 7.50 | 8.00  | 79.00 | 29.75            | 41.00 | 9085100075000 |
| 0.2969        | 19/64    | 7.54 | 8.00  | 79.00 | 29.69            | 41.00 | 9085100075400 |
| 0.2992        |          | 7.60 | 8.00  | 79.00 | 29.60            | 41.00 | 9085100076000 |
| 0.3031        |          | 7.70 | 8.00  | 79.00 | 29.45            | 41.00 | 9085100077000 |
| 0.3071        |          | 7.80 | 8.00  | 79.00 | 29.30            | 41.00 | 9085100078000 |
| 0.3110        |          | 7.90 | 8.00  | 79.00 | 29.15            | 41.00 | 9085100079000 |
| 0.3126        | 5/16     | 7.94 | 8.00  | 79.00 | 29.09            | 41.00 | 9085100079400 |
| 0.3150        |          | 8.00 | 8.00  | 79.00 | 29.00            | 41.00 | 9085100080000 |
| 0.3189        |          | 8.10 | 10.00 | 89.00 | 34.85            | 47.00 | 9085100081000 |
| 0.3228        | P        | 8.20 | 10.00 | 89.00 | 34.70            | 47.00 | 9085100082000 |
| 0.3268        |          | 8.30 | 10.00 | 89.00 | 34.55            | 47.00 | 9085100083000 |
| 0.3280        | 21/64    | 8.33 | 10.00 | 89.00 | 34.51            | 47.00 | 9085100083300 |
| 0.3307        |          | 8.40 | 10.00 | 89.00 | 34.40            | 47.00 | 9085100084000 |
| 0.3346        |          | 8.50 | 10.00 | 89.00 | 34.25            | 47.00 | 9085100085000 |
| 0.3386        |          | 8.60 | 10.00 | 89.00 | 34.10            | 47.00 | 9085100086000 |
| 0.3425        |          | 8.70 | 10.00 | 89.00 | 33.95            | 47.00 | 9085100087000 |
| 0.3437        | 11/32    | 8.73 | 10.00 | 89.00 | 33.91            | 47.00 | 9085100087300 |
| 0.3465        |          | 8.80 | 10.00 | 89.00 | 33.80            | 47.00 | 9085100088000 |
| 0.3504        |          | 8.90 | 10.00 | 89.00 | 33.65            | 47.00 | 9085100089000 |
| 0.3543        |          | 9.00 | 10.00 | 89.00 | 33.50            | 47.00 | 9085100090000 |
| 0.3583        |          | 9.10 | 10.00 | 89.00 | 33.35            | 47.00 | 9085100091000 |
| 0.3594        | 23/64    | 9.13 | 10.00 | 89.00 | 33.31            | 47.00 | 9085100091300 |
| 0.3622        |          | 9.20 | 10.00 | 89.00 | 33.20            | 47.00 | 9085100092000 |
| 0.3642        |          | 9.25 | 10.00 | 89.00 | 33.13            | 47.00 | 9085100092500 |
| 0.3661        |          | 9.30 | 10.00 | 89.00 | 33.05            | 47.00 | 9085100093000 |

3xD Drills

| Diameter (d1) |          |       | d2<br>mm | l1<br>mm | t <sub>max</sub><br>mm | l2<br>mm | EDP #         |
|---------------|----------|-------|----------|----------|------------------------|----------|---------------|
| inch          | wire/ltr | mm    |          |          |                        |          |               |
| 0.3701        |          | 9.40  | 10.00    | 89.00    | 32.90                  | 47.00    | 9085100094000 |
| 0.3740        |          | 9.50  | 10.00    | 89.00    | 32.75                  | 47.00    | 9085100095000 |
| 0.3748        | 3/8      | 9.52  | 10.00    | 89.00    | 32.72                  | 47.00    | 9085100095200 |
| 0.3780        |          | 9.60  | 10.00    | 89.00    | 32.60                  | 47.00    | 9085100096000 |
| 0.3819        |          | 9.70  | 10.00    | 89.00    | 32.45                  | 47.00    | 9085100097000 |
| 0.3858        | W        | 9.80  | 10.00    | 89.00    | 32.30                  | 47.00    | 9085100098000 |
| 0.3898        |          | 9.90  | 10.00    | 89.00    | 32.15                  | 47.00    | 9085100099000 |
| 0.3906        | 25/64    | 9.92  | 10.00    | 89.00    | 32.12                  | 47.00    | 9085100099200 |
| 0.3937        |          | 10.00 | 10.00    | 89.00    | 32.00                  | 47.00    | 9085100100000 |
| 0.3976        |          | 10.10 | 12.00    | 102.00   | 39.85                  | 55.00    | 9085100101000 |
| 0.4016        |          | 10.20 | 12.00    | 102.00   | 39.70                  | 55.00    | 9085100102000 |
| 0.4055        |          | 10.30 | 12.00    | 102.00   | 39.55                  | 55.00    | 9085100103000 |
| 0.4063        | 13/32    | 10.32 | 12.00    | 102.00   | 39.52                  | 55.00    | 9085100103200 |
| 0.4094        |          | 10.40 | 12.00    | 102.00   | 39.40                  | 55.00    | 9085100104000 |
| 0.4134        |          | 10.50 | 12.00    | 102.00   | 39.25                  | 55.00    | 9085100105000 |
| 0.4173        |          | 10.60 | 12.00    | 102.00   | 39.10                  | 55.00    | 9085100106000 |
| 0.4213        |          | 10.70 | 12.00    | 102.00   | 38.95                  | 55.00    | 9085100107000 |
| 0.4252        |          | 10.80 | 12.00    | 102.00   | 38.80                  | 55.00    | 9085100108000 |
| 0.4291        |          | 10.90 | 12.00    | 102.00   | 38.65                  | 55.00    | 9085100109000 |
| 0.4331        |          | 11.00 | 12.00    | 102.00   | 38.50                  | 55.00    | 9085100110000 |
| 0.4370        |          | 11.10 | 12.00    | 102.00   | 38.35                  | 55.00    | 9085100111000 |
| 0.4374        | 7/16     | 11.11 | 12.00    | 102.00   | 38.34                  | 55.00    | 9085100111100 |
| 0.4409        |          | 11.20 | 12.00    | 102.00   | 38.20                  | 55.00    | 9085100112000 |
| 0.4449        |          | 11.30 | 12.00    | 102.00   | 38.05                  | 55.00    | 9085100113000 |
| 0.4488        |          | 11.40 | 12.00    | 102.00   | 37.90                  | 55.00    | 9085100114000 |
| 0.4528        |          | 11.50 | 12.00    | 102.00   | 37.75                  | 55.00    | 9085100115000 |
| 0.4567        |          | 11.60 | 12.00    | 102.00   | 37.60                  | 55.00    | 9085100116000 |
| 0.4606        |          | 11.70 | 12.00    | 102.00   | 37.45                  | 55.00    | 9085100117000 |
| 0.4646        |          | 11.80 | 12.00    | 102.00   | 37.30                  | 55.00    | 9085100118000 |
| 0.4685        |          | 11.90 | 12.00    | 102.00   | 37.15                  | 55.00    | 9085100119000 |
| 0.4689        | 15/32    | 11.91 | 12.00    | 102.00   | 37.14                  | 55.00    | 9085100119100 |
| 0.4724        |          | 12.00 | 12.00    | 102.00   | 37.00                  | 55.00    | 9085100120000 |
| 0.4803        |          | 12.20 | 14.00    | 107.00   | 41.70                  | 60.00    | 9085100122000 |

| Diameter (d1) |          |       | d2<br>mm | l1<br>mm | t <sub>max</sub><br>mm | l2<br>mm | EDP #         |
|---------------|----------|-------|----------|----------|------------------------|----------|---------------|
| inch          | wire/ltr | mm    |          |          |                        |          |               |
| 0.4921        |          | 12.50 | 14.00    | 107.00   | 41.25                  | 60.00    | 9085100125000 |
| 0.5000        | 1/2      | 12.70 | 14.00    | 107.00   | 40.95                  | 60.00    | 9085100127000 |
| 0.5039        |          | 12.80 | 14.00    | 107.00   | 40.80                  | 60.00    | 9085100128000 |
| 0.5118        |          | 13.00 | 14.00    | 107.00   | 40.50                  | 60.00    | 9085100130000 |
| 0.5236        |          | 13.30 | 14.00    | 107.00   | 40.05                  | 60.00    | 9085100133000 |
| 0.5315        |          | 13.50 | 14.00    | 107.00   | 39.75                  | 60.00    | 9085100135000 |
| 0.5394        |          | 13.70 | 14.00    | 107.00   | 39.45                  | 60.00    | 9085100137000 |
| 0.5512        |          | 14.00 | 14.00    | 107.00   | 39.00                  | 60.00    | 9085100140000 |
| 0.5591        |          | 14.20 | 16.00    | 115.00   | 43.70                  | 65.00    | 9085100142000 |
| 0.5626        | 9/16     | 14.29 | 16.00    | 115.00   | 43.57                  | 65.00    | 9085100142900 |
| 0.5630        |          | 14.30 | 16.00    | 115.00   | 43.55                  | 65.00    | 9085100143000 |
| 0.5709        |          | 14.50 | 16.00    | 115.00   | 43.25                  | 65.00    | 9085100145000 |
| 0.5787        |          | 14.70 | 16.00    | 115.00   | 42.95                  | 65.00    | 9085100147000 |
| 0.5906        |          | 15.00 | 16.00    | 115.00   | 42.50                  | 65.00    | 9085100150000 |
| 0.5984        |          | 15.20 | 16.00    | 115.00   | 42.20                  | 65.00    | 9085100152000 |
| 0.6024        |          | 15.30 | 16.00    | 115.00   | 42.05                  | 65.00    | 9085100153000 |
| 0.6102        |          | 15.50 | 16.00    | 115.00   | 41.75                  | 65.00    | 9085100155000 |
| 0.6181        |          | 15.70 | 16.00    | 115.00   | 41.45                  | 65.00    | 9085100157000 |
| 0.6299        |          | 16.00 | 16.00    | 115.00   | 41.00                  | 65.00    | 9085100160000 |
| 0.6417        |          | 16.30 | 18.00    | 123.00   | 48.55                  | 73.00    | 9085100163000 |
| 0.6496        |          | 16.50 | 18.00    | 123.00   | 48.25                  | 73.00    | 9085100165000 |
| 0.6654        |          | 16.90 | 18.00    | 123.00   | 47.65                  | 73.00    | 9085100169000 |
| 0.6693        |          | 17.00 | 18.00    | 123.00   | 47.50                  | 73.00    | 9085100170000 |
| 0.6811        |          | 17.30 | 18.00    | 123.00   | 47.05                  | 73.00    | 9085100173000 |
| 0.6890        |          | 17.50 | 18.00    | 123.00   | 46.75                  | 73.00    | 9085100175000 |
| 0.7087        |          | 18.00 | 18.00    | 123.00   | 46.00                  | 73.00    | 9085100180000 |
| 0.7283        |          | 18.50 | 20.00    | 131.00   | 51.25                  | 79.00    | 9085100185000 |
| 0.7441        |          | 18.90 | 20.00    | 131.00   | 50.65                  | 79.00    | 9085100189000 |
| 0.7480        |          | 19.00 | 20.00    | 131.00   | 50.50                  | 79.00    | 9085100190000 |
| 0.7500        | 3/4      | 19.05 | 20.00    | 131.00   | 50.43                  | 79.00    | 9085100190500 |
| 0.7598        |          | 19.30 | 20.00    | 131.00   | 50.05                  | 79.00    | 9085100193000 |
| 0.7677        |          | 19.50 | 20.00    | 131.00   | 49.75                  | 79.00    | 9085100195000 |
| 0.7874        |          | 20.00 | 20.00    | 131.00   | 49.00                  | 79.00    | 9085100200000 |

| Material group                                   | Hardness |     | SFM  | Feed Rate - IPR      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
|--|----------|-----|------|----------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|--------------------|------------------------|------------------------|
|  | HRc      | Bhn |      | 1/16 in.<br>1.590 mm | 1/8 in.<br>3.170 mm | 1/4 in.<br>6.350 mm | 3/8 in.<br>9.520 mm | 1/2 in.<br>12.700 mm | 5/8 in.<br>15.870 mm | 3/4 in.<br>19.050 mm | 1 in.<br>25.400 mm | 1 1/4 in.<br>31.750 mm | 1 1/2 in.<br>38.100 mm |
| Common structural steels                         | -        | 150 | 475  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
|  | 32       | 301 | 395  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               |                    |                        |                        |
| Free-cutting steels                              | 25       | 255 | 560  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
|  | 32       | 301 | 475  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
| Unalloyed heat-treatable steels                  | 20       | 220 | 425  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
|  | 25       | 255 | 410  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
|  | 32       | 301 | 395  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
| Alloyed heat-treatable steels                    | 32       | 301 | 395  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
|  | 43       | 402 | 345  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
| Unalloyed case hardened steels                   | 25       | 255 | 475  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
| Alloyed case hardened steels                     | 32       | 301 | 395  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
|  | 43       | 402 | 280  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.010                |                    |                        |                        |
| Nitriding steels                                 | 32       | 301 | 360  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
|  | 43       | 402 | 345  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               |                    |                        |                        |
| Tool steels                                      | 25       | 255 | 260  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               |                    |                        |                        |
|  | 43       | 402 | 215  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               |                    |                        |                        |
| High speed steels                                | 43       | 402 | 195  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               |                    |                        |                        |
| Spring steels                                    | 38       | 354 | 195  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               |                    |                        |                        |
| Hardened steels                                  | 48       | 460 | 180  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               |                    |                        |                        |
|  | 66       | -   | 115  |                      | 0.0020              | 0.0030              | 0.0040              | 0.0050               | 0.0050               | 0.0055               |                    |                        |                        |
| Stainless steels, sulphured                      | 28       | 273 | 195  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               |                    |                        |                        |
| austenitic                                       | 36       | 337 | 180  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               |                    |                        |                        |
| martensitic                                      | 46       | 435 | 165  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               |                    |                        |                        |
| Cast iron  | 23       | 242 | 690  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
|  | 38       | 354 | 525  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
| Spheroidal graphite iron and malleable cast iron | 23       | 242 | 460  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
|  | 38       | 354 | 425  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
| Chilled cast iron                                | 38       | 354 | 130  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               |                    |                        |                        |
| New cast materials GGV                           | 20       | 220 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
|  | 32       | 301 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| New cast materials ADI                           | 32       | 301 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
|  | 43       | 402 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Special alloys                                   | 54       | 549 | 115  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               |                    |                        |                        |
| Ti and Ti-alloys                                 | 25       | 255 | 150  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               |                    |                        |                        |
|  | 43       | 402 | 130  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               |                    |                        |                        |
| Aluminium and Al-alloys                          | -        | 120 | 1015 |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
| Al wrought alloys                                | -        | 200 | 1015 |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
| Al cast alloys ≤ 10 % Si                         | -        | 180 | 855  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
| ≤ 24 % Si  | -        | 180 | 720  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               |                    |                        |                        |
| Magnesium alloys                                 | -        | 120 | 920  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
| Copper, low-alloyed                              | -        | 150 | 410  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
| Brass, short-chipping                            | -        | 180 | 1065 |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               |                    |                        |                        |
| long-chipping                                    | -        | 180 | 720  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
| Bronze, short-chipping                           | -        | 180 | 410  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               |                    |                        |                        |
|  | 25       | 255 | 345  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               |                    |                        |                        |
| Bronze, long-chipping                            | 25       | 255 | 295  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               |                    |                        |                        |
|  | 32       | 301 | 260  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               |                    |                        |                        |
| Duroplastics                                     |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Thermoplastics                                   |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Reinforced plastics - Kevlar                     |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Reinforced plastics - GFK / CFK                  |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |

| Material group                                   | Hardness |     | SFM  | Feed Rate - IPR      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
|--|----------|-----|------|----------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|--------------------|------------------------|------------------------|
|  | HRc      | Bhn |      | 1/16 in.<br>1.590 mm | 1/8 in.<br>3.170 mm | 1/4 in.<br>6.350 mm | 3/8 in.<br>9.520 mm | 1/2 in.<br>12.700 mm | 5/8 in.<br>15.870 mm | 3/4 in.<br>19.050 mm | 1 in.<br>25.400 mm | 1 1/4 in.<br>31.750 mm | 1 1/2 in.<br>38.100 mm |
| Common structural steels                         | -        | 150 | 475  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
|  | 32       | 301 | 395  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               | 0.0160             |                        |                        |
| Free-cutting steels                              | 25       | 255 | 560  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
|  | 32       | 301 | 475  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Unalloyed heat-treatable steels                  | 20       | 220 | 425  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
|  | 25       | 255 | 410  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
|  | 32       | 301 | 395  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
| Alloyed heat-treatable steels                    | 32       | 301 | 395  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
|  | 43       | 402 | 345  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
| Unalloyed case hardened steels                   | 25       | 255 | 475  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Alloyed case hardened steels                     | 32       | 301 | 395  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
|  | 43       | 402 | 280  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               | 0.0125             |                        |                        |
| Nitriding steels                                 | 32       | 301 | 350  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
|  | 43       | 402 | 330  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               | 0.0125             |                        |                        |
| Tool steels                                      | 25       | 255 | 240  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               | 0.0160             |                        |                        |
|  | 43       | 402 | 180  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               | 0.0125             |                        |                        |
| High speed steels                                | 43       | 402 | 195  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               | 0.0100             |                        |                        |
| Spring steels                                    | 38       | 354 | 195  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               | 0.0080             |                        |                        |
| Hardened steels                                  | 48       | 460 | 180  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               | 0.0080             |                        |                        |
|  | 66       | -   | 115  |                      | 0.0020              | 0.0030              | 0.0040              | 0.0050               | 0.0050               | 0.0055               | 0.0065             |                        |                        |
| Stainless steels, sulphured                      | 28       | 273 | 195  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               | 0.0125             |                        |                        |
| austenitic                                       | 36       | 337 | 180  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               | 0.0125             |                        |                        |
| martensitic                                      | 46       | 435 | 165  |                      | 0.0040              | 0.0065              | 0.0080              | 0.0100               | 0.0100               | 0.0110               | 0.0125             |                        |                        |
| Cast iron  | 23       | 242 | 690  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               | 0.0290             |                        |                        |
|  | 38       | 354 | 525  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               | 0.0290             |                        |                        |
| Spheroidal graphite iron and malleable cast iron | 23       | 242 | 450  |                      | 0.0100              | 0.0160              | 0.0200              | 0.0245               | 0.0245               | 0.0265               | 0.0290             |                        |                        |
|  | 38       | 354 | 425  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Chilled cast iron                                | 38       | 354 | 130  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               | 0.0080             |                        |                        |
| New cast materials GGV                           | 20       | 220 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
|  | 32       | 301 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| New cast materials ADI                           | 32       | 301 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
|  | 43       | 402 |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Special alloys                                   | 54       | 549 | 115  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               | 0.0100             |                        |                        |
| Ti and Ti-alloys                                 | 25       | 255 | 150  |                      | 0.0030              | 0.0050              | 0.0065              | 0.0080               | 0.0080               | 0.0090               | 0.0100             |                        |                        |
|  | 43       | 402 | 130  |                      | 0.0025              | 0.0040              | 0.0050              | 0.0065               | 0.0065               | 0.0070               | 0.0080             |                        |                        |
| Aluminium and Al-alloys                          | -        | 120 | 1015 |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Al wrought alloys                                | -        | 200 | 1015 |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Al cast alloys ≤ 10 % Si                         | -        | 180 | 855  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| ≤ 24 % Si  | -        | 180 | 720  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Magnesium alloys                                 | -        | 120 | 920  |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| Copper, low-alloyed                              | -        | 150 | 410  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
| Brass, short-chipping                            | -        | 180 | 1065 |                      | 0.0080              | 0.0125              | 0.0160              | 0.0200               | 0.0200               | 0.0220               | 0.0245             |                        |                        |
| long-chipping                                    | -        | 180 | 720  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
| Bronze, short-chipping                           | -        | 180 | 410  |                      | 0.0065              | 0.0100              | 0.0125              | 0.0160               | 0.0160               | 0.0180               | 0.0200             |                        |                        |
|  | 25       | 255 | 345  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               | 0.0160             |                        |                        |
| Bronze, long-chipping                            | 25       | 255 | 295  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               | 0.0160             |                        |                        |
|  | 32       | 301 | 260  |                      | 0.0050              | 0.0080              | 0.0100              | 0.0125               | 0.0125               | 0.0140               | 0.0160             |                        |                        |
| Duroplastics                                     |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Thermoplastics                                   |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Reinforced plastics - Kevlar                     |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |
| Reinforced plastics - GFK / CFK                  |          |     |      |                      |                     |                     |                     |                      |                      |                      |                    |                        |                        |