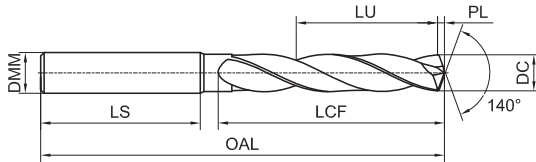


# D938-A5N

5D External Coolant Twist Drill for Plain Steel Machining



| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0100 | 1.00    | 9   | 45  | 4        | 28 | 7.5  | 0.18 | ●        |
| D938-A5N-0105 | 1.05    | 9   | 45  | 4        | 28 | 7.4  | 0.19 | ○        |
| D938-A5N-0110 | 1.10    | 9   | 45  | 4        | 28 | 7.4  | 0.20 | ○        |
| D938-A5N-0120 | 1.20    | 9   | 45  | 4        | 28 | 7.2  | 0.22 | ○        |
| D938-A5N-0130 | 1.30    | 9   | 45  | 4        | 28 | 7.1  | 0.24 | ○        |
| D938-A5N-0140 | 1.40    | 9   | 45  | 4        | 28 | 6.9  | 0.25 | ○        |
| D938-A5N-0145 | 1.45    | 9   | 45  | 4        | 28 | 6.8  | 0.26 | ○        |
| D938-A5N-0150 | 1.50    | 12  | 55  | 4        | 35 | 9.8  | 0.27 | ○        |
| D938-A5N-0155 | 1.55    | 12  | 55  | 4        | 35 | 9.7  | 0.28 | ○        |
| D938-A5N-0160 | 1.60    | 12  | 55  | 4        | 35 | 9.6  | 0.29 | ●        |
| D938-A5N-0165 | 1.65    | 12  | 55  | 4        | 35 | 9.5  | 0.30 | ●        |
| D938-A5N-0170 | 1.70    | 12  | 55  | 4        | 35 | 9.5  | 0.31 | ○        |
| D938-A5N-0175 | 1.75    | 12  | 55  | 4        | 35 | 9.4  | 0.32 | ○        |
| D938-A5N-0180 | 1.80    | 12  | 55  | 4        | 35 | 9.3  | 0.33 | ○        |
| D938-A5N-0185 | 1.85    | 12  | 55  | 4        | 35 | 9.2  | 0.34 | ○        |
| D938-A5N-0190 | 1.90    | 12  | 55  | 4        | 35 | 9.2  | 0.35 | ●        |
| D938-A5N-0195 | 1.95    | 12  | 55  | 4        | 35 | 9.1  | 0.35 | ○        |
| D938-A5N-0200 | 2.00    | 18  | 62  | 4        | 38 | 15.0 | 0.36 | ●        |
| D938-A5N-0205 | 2.05    | 18  | 62  | 4        | 38 | 14.9 | 0.37 | ○        |
| D938-A5N-0210 | 2.10    | 18  | 62  | 4        | 38 | 14.9 | 0.38 | ●        |
| D938-A5N-0215 | 2.15    | 18  | 62  | 4        | 38 | 14.8 | 0.39 | ○        |
| D938-A5N-0220 | 2.20    | 18  | 62  | 4        | 38 | 14.7 | 0.40 | ○        |
| D938-A5N-0230 | 2.30    | 18  | 62  | 4        | 38 | 14.6 | 0.42 | ●        |
| D938-A5N-0235 | 2.35    | 18  | 62  | 4        | 38 | 14.5 | 0.43 | ●        |
| D938-A5N-0240 | 2.40    | 22  | 62  | 4        | 35 | 18.4 | 0.44 | ●        |
| D938-A5N-0250 | 2.50    | 22  | 62  | 4        | 35 | 18.3 | 0.45 | ●        |
| D938-A5N-0255 | 2.55    | 22  | 62  | 4        | 35 | 18.2 | 0.46 | ○        |

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0260 | 2.60    | 22  | 62  | 4        | 35 | 18.1 | 0.47 | ●        |
| D938-A5N-0265 | 2.65    | 22  | 62  | 4        | 35 | 18.0 | 0.48 | ○        |
| D938-A5N-0270 | 2.70    | 22  | 62  | 4        | 35 | 18.0 | 0.49 | ●        |
| D938-A5N-0275 | 2.75    | 22  | 62  | 4        | 35 | 17.9 | 0.50 | ○        |
| D938-A5N-0280 | 2.80    | 22  | 62  | 4        | 35 | 17.8 | 0.51 | ●        |
| D938-A5N-0290 | 2.90    | 22  | 62  | 4        | 35 | 17.7 | 0.53 | ●        |
| D938-A5N-0295 | 2.95    | 22  | 62  | 4        | 35 | 17.6 | 0.54 | ○        |
| D938-A5N-0300 | 3.00    | 28  | 66  | 6        | 36 | 23.5 | 0.55 | ●        |
| D938-A5N-0305 | 3.05    | 28  | 66  | 6        | 36 | 23.4 | 0.56 | ○        |
| D938-A5N-0310 | 3.10    | 28  | 66  | 6        | 36 | 23.4 | 0.56 | ●        |
| D938-A5N-0315 | 3.15    | 28  | 66  | 6        | 36 | 23.3 | 0.57 | ●        |
| D938-A5N-0320 | 3.20    | 28  | 66  | 6        | 36 | 23.2 | 0.58 | ●        |
| D938-A5N-0325 | 3.25    | 28  | 66  | 6        | 36 | 23.1 | 0.59 | ○        |
| D938-A5N-0330 | 3.30    | 28  | 66  | 6        | 36 | 23.1 | 0.60 | ●        |
| D938-A5N-0335 | 3.35    | 28  | 66  | 6        | 36 | 23.0 | 0.61 | ○        |
| D938-A5N-0340 | 3.40    | 28  | 66  | 6        | 36 | 22.9 | 0.62 | ●        |
| D938-A5N-0350 | 3.50    | 28  | 66  | 6        | 36 | 22.8 | 0.64 | ●        |
| D938-A5N-0355 | 3.55    | 28  | 66  | 6        | 36 | 22.7 | 0.65 | ○        |
| D938-A5N-0360 | 3.60    | 28  | 66  | 6        | 36 | 22.6 | 0.66 | ●        |
| D938-A5N-0365 | 3.65    | 28  | 66  | 6        | 36 | 22.5 | 0.66 | ●        |
| D938-A5N-0370 | 3.70    | 28  | 66  | 6        | 36 | 22.5 | 0.67 | ●        |
| D938-A5N-0380 | 3.80    | 36  | 74  | 6        | 36 | 30.3 | 0.69 | ●        |
| D938-A5N-0385 | 3.85    | 36  | 74  | 6        | 36 | 30.2 | 0.70 | ○        |
| D938-A5N-0390 | 3.90    | 36  | 74  | 6        | 36 | 30.2 | 0.71 | ●        |
| D938-A5N-0395 | 3.95    | 36  | 74  | 6        | 36 | 30.1 | 0.72 | ○        |
| D938-A5N-0400 | 4.00    | 36  | 74  | 6        | 36 | 30.0 | 0.73 | ●        |
| D938-A5N-0405 | 4.05    | 36  | 74  | 6        | 36 | 29.9 | 0.74 | ●        |

● Stock ○ Available Upon Order

Notes: Non-standard customization is available for D1-D20 tools

Unit (mm)

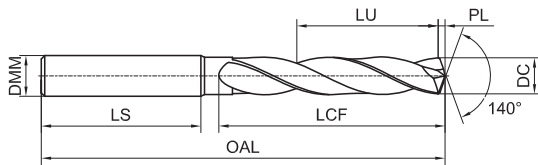
| Workpiece Material        |                         |                                   |                 |                                   |                      |                                             |                     |              |                    |                        |                |                |                |
|---------------------------|-------------------------|-----------------------------------|-----------------|-----------------------------------|----------------------|---------------------------------------------|---------------------|--------------|--------------------|------------------------|----------------|----------------|----------------|
| P                         |                         |                                   | M               | K                                 |                      | N                                           |                     |              |                    | S                      | H              |                |                |
| 1 2 3 4                   | 5                       | 6 7                               | 1 2 3           | 1 2                               | 3                    | 1 2                                         | 3                   | 4            | 5                  | 1 2 3                  | 4              | 1              | 2              |
| Carbon Steel, Alloy Steel | Alloy Steel, Tool Steel | PH and Ferritic/Martensitic Steel | Stainless Steel | Gray Cast Iron, Nodular Cast Iron | High Alloy Cast Iron | Forged Aluminum Alloy, Cast Aluminium Alloy | Cast Aluminum Alloy | Copper Alloy | Composite Material | High-temperature Alloy | Titanium Alloy | Hardened Steel | Hardened Steel |
| <35HRC                    | 35-48HRC                |                                   |                 | <32HRC                            | 35-45HRC             | Si<12%                                      | Si>12%              | <HB200       |                    | <HB450                 | <HB400         | 45-55HRC       | 55-60HRC       |
| ○                         | ○                       | ○                                 |                 | ○                                 | ○                    |                                             |                     |              |                    |                        |                |                |                |

○ Most Suitable ○ Suitable

Recommended Cutting Data ※ P126

# D938-A5N

5D External Coolant Twist Drill for Plain Steel Machining



Continued

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0410 | 4.10    | 36  | 74  | 6        | 36 | 29.9 | 0.75 | ●        |
| D938-A5N-0415 | 4.15    | 36  | 74  | 6        | 36 | 29.8 | 0.76 | ○        |
| D938-A5N-0420 | 4.20    | 36  | 74  | 6        | 36 | 29.7 | 0.76 | ●        |
| D938-A5N-0425 | 4.25    | 36  | 74  | 6        | 36 | 29.6 | 0.77 | ○        |
| D938-A5N-0430 | 4.30    | 36  | 74  | 6        | 36 | 29.6 | 0.78 | ●        |
| D938-A5N-0435 | 4.35    | 36  | 74  | 6        | 36 | 29.5 | 0.79 | ○        |
| D938-A5N-0440 | 4.40    | 36  | 74  | 6        | 36 | 29.4 | 0.80 | ●        |
| D938-A5N-0445 | 4.45    | 36  | 74  | 6        | 36 | 29.3 | 0.81 | ○        |
| D938-A5N-0450 | 4.50    | 36  | 74  | 6        | 36 | 29.3 | 0.82 | ●        |
| D938-A5N-0455 | 4.55    | 36  | 74  | 6        | 36 | 29.2 | 0.83 | ○        |
| D938-A5N-0460 | 4.60    | 36  | 74  | 6        | 36 | 29.1 | 0.84 | ●        |
| D938-A5N-0465 | 4.65    | 36  | 74  | 6        | 36 | 29.0 | 0.85 | ●        |
| D938-A5N-0470 | 4.70    | 36  | 74  | 6        | 36 | 29.0 | 0.86 | ●        |
| D938-A5N-0475 | 4.75    | 44  | 82  | 6        | 36 | 36.9 | 0.86 | ○        |
| D938-A5N-0480 | 4.80    | 44  | 82  | 6        | 36 | 36.8 | 0.87 | ●        |
| D938-A5N-0485 | 4.85    | 44  | 82  | 6        | 36 | 36.7 | 0.88 | ○        |
| D938-A5N-0490 | 4.90    | 44  | 82  | 6        | 36 | 36.7 | 0.89 | ●        |
| D938-A5N-0495 | 4.95    | 44  | 82  | 6        | 36 | 36.6 | 0.90 | ○        |
| D938-A5N-0500 | 5.00    | 44  | 82  | 6        | 36 | 36.5 | 0.91 | ●        |
| D938-A5N-0505 | 5.05    | 44  | 82  | 6        | 36 | 36.4 | 0.92 | ●        |
| D938-A5N-0510 | 5.10    | 44  | 82  | 6        | 36 | 36.4 | 0.93 | ●        |
| D938-A5N-0515 | 5.15    | 44  | 82  | 6        | 36 | 36.3 | 0.94 | ○        |
| D938-A5N-0520 | 5.20    | 44  | 82  | 6        | 36 | 36.2 | 0.95 | ●        |
| D938-A5N-0525 | 5.25    | 44  | 82  | 6        | 36 | 36.1 | 0.96 | ○        |
| D938-A5N-0530 | 5.30    | 44  | 82  | 6        | 36 | 36.1 | 0.96 | ●        |
| D938-A5N-0535 | 5.35    | 44  | 82  | 6        | 36 | 36.0 | 0.97 | ○        |
| D938-A5N-0540 | 5.40    | 44  | 82  | 6        | 36 | 35.9 | 0.98 | ●        |

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0545 | 5.45    | 44  | 82  | 6        | 36 | 35.8 | 0.99 | ○        |
| D938-A5N-0550 | 5.50    | 44  | 82  | 6        | 36 | 35.8 | 1.00 | ●        |
| D938-A5N-0555 | 5.55    | 44  | 82  | 6        | 36 | 35.7 | 1.01 | ●        |
| D938-A5N-0560 | 5.60    | 44  | 82  | 6        | 36 | 35.6 | 1.02 | ●        |
| D938-A5N-0565 | 5.65    | 44  | 82  | 6        | 36 | 35.5 | 1.03 | ○        |
| D938-A5N-0570 | 5.70    | 44  | 82  | 6        | 36 | 35.5 | 1.04 | ●        |
| D938-A5N-0575 | 5.75    | 44  | 82  | 6        | 36 | 35.4 | 1.05 | ○        |
| D938-A5N-0580 | 5.80    | 44  | 82  | 6        | 36 | 35.3 | 1.06 | ●        |
| D938-A5N-0585 | 5.85    | 44  | 82  | 6        | 36 | 35.2 | 1.06 | ○        |
| D938-A5N-0590 | 5.90    | 44  | 82  | 6        | 36 | 35.2 | 1.07 | ●        |
| D938-A5N-0595 | 5.95    | 44  | 82  | 6        | 36 | 35.1 | 1.08 | ○        |
| D938-A5N-0600 | 6.00    | 44  | 82  | 6        | 36 | 35.0 | 1.09 | ●        |
| D938-A5N-0605 | 6.05    | 44  | 82  | 6        | 36 | 34.9 | 1.10 | ○        |
| D938-A5N-0610 | 6.10    | 53  | 91  | 8        | 36 | 43.9 | 1.11 | ●        |
| D938-A5N-0620 | 6.20    | 53  | 91  | 8        | 36 | 43.7 | 1.13 | ●        |
| D938-A5N-0625 | 6.25    | 53  | 91  | 8        | 36 | 43.6 | 1.14 | ○        |
| D938-A5N-0630 | 6.30    | 53  | 91  | 8        | 36 | 43.6 | 1.15 | ●        |
| D938-A5N-0635 | 6.35    | 53  | 91  | 8        | 36 | 43.5 | 1.16 | ○        |
| D938-A5N-0640 | 6.40    | 53  | 91  | 8        | 36 | 43.4 | 1.16 | ●        |
| D938-A5N-0645 | 6.45    | 53  | 91  | 8        | 36 | 43.3 | 1.17 | ○        |
| D938-A5N-0650 | 6.50    | 53  | 91  | 8        | 36 | 43.3 | 1.18 | ●        |
| D938-A5N-0655 | 6.55    | 53  | 91  | 8        | 36 | 43.2 | 1.19 | ○        |
| D938-A5N-0660 | 6.60    | 53  | 91  | 8        | 36 | 43.1 | 1.20 | ●        |
| D938-A5N-0665 | 6.65    | 53  | 91  | 8        | 36 | 43.0 | 1.21 | ○        |
| D938-A5N-0670 | 6.70    | 53  | 91  | 8        | 36 | 43.0 | 1.22 | ●        |
| D938-A5N-0675 | 6.75    | 53  | 91  | 8        | 36 | 42.9 | 1.23 | ○        |
| D938-A5N-0680 | 6.80    | 53  | 91  | 8        | 36 | 42.8 | 1.24 | ●        |

● Stock ○ Available Upon Order

Notes: Non-standard customization is available for D1-D20 tools

Unit (mm)

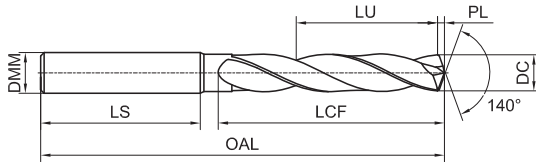
| Workpiece Material        |                         |                                   |                 |                                   |                      |                                            |                     |              |                    |                        |                |                |                |
|---------------------------|-------------------------|-----------------------------------|-----------------|-----------------------------------|----------------------|--------------------------------------------|---------------------|--------------|--------------------|------------------------|----------------|----------------|----------------|
| P                         |                         |                                   | M               | K                                 |                      |                                            | N                   |              |                    | S                      | H              |                |                |
| 1 2 3 4                   | 5                       | 6 7                               | 1 2 3           | 1 2                               | 3                    | 1 2                                        | 3                   | 4            | 5                  | 1 2 3                  | 4              | 1              | 2              |
| Carbon Steel, Alloy Steel | Alloy Steel, Tool Steel | PH and Ferritic/Martensitic Steel | Stainless Steel | Gray Cast Iron, Nodular Cast Iron | High Alloy Cast Iron | Forged Aluminum Alloy, Cast Aluminum Alloy | Cast Aluminum Alloy | Copper Alloy | Composite Material | High-temperature Alloy | Titanium Alloy | Hardened Steel | Hardened Steel |
| <35HRC                    | 35-48HRC                |                                   |                 | <32HRC                            | 35-45HRC             | Si<12%                                     | Si>12%              | <HB200       |                    | <HB450                 | <HB400         | 45-55HRC       | 55-60HRC       |
| ◎                         | ◎                       | ◎                                 |                 | ○                                 | ○                    |                                            |                     |              |                    |                        |                |                |                |

◎ Most Suitable ○ Suitable

Recommended Cutting Data ※ P126

# D938-A5N

5D External Coolant Twist Drill for Plain Steel Machining



Continued

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0685 | 6.85    | 53  | 91  | 8        | 36 | 42.7 | 1.25 | ○        |
| D938-A5N-0690 | 6.90    | 53  | 91  | 8        | 36 | 42.7 | 1.26 | ●        |
| D938-A5N-0695 | 6.95    | 53  | 91  | 8        | 36 | 42.6 | 1.26 | ○        |
| D938-A5N-0700 | 7.00    | 53  | 91  | 8        | 36 | 42.5 | 1.27 | ●        |
| D938-A5N-0705 | 7.05    | 53  | 91  | 8        | 36 | 42.4 | 1.28 | ○        |
| D938-A5N-0710 | 7.10    | 53  | 91  | 8        | 36 | 42.4 | 1.29 | ●        |
| D938-A5N-0720 | 7.20    | 53  | 91  | 8        | 36 | 42.2 | 1.31 | ●        |
| D938-A5N-0730 | 7.30    | 53  | 91  | 8        | 36 | 42.1 | 1.33 | ●        |
| D938-A5N-0735 | 7.35    | 53  | 91  | 8        | 36 | 42.0 | 1.34 | ○        |
| D938-A5N-0740 | 7.40    | 53  | 91  | 8        | 36 | 41.9 | 1.35 | ●        |
| D938-A5N-0745 | 7.45    | 53  | 91  | 8        | 36 | 41.8 | 1.36 | ●        |
| D938-A5N-0750 | 7.50    | 53  | 91  | 8        | 36 | 41.8 | 1.36 | ●        |
| D938-A5N-0755 | 7.55    | 53  | 91  | 8        | 36 | 41.7 | 1.37 | ●        |
| D938-A5N-0760 | 7.60    | 53  | 91  | 8        | 36 | 41.6 | 1.38 | ●        |
| D938-A5N-0765 | 7.65    | 53  | 91  | 8        | 36 | 41.5 | 1.39 | ○        |
| D938-A5N-0770 | 7.70    | 53  | 91  | 8        | 36 | 41.5 | 1.40 | ●        |
| D938-A5N-0775 | 7.75    | 53  | 91  | 8        | 36 | 41.4 | 1.41 | ○        |
| D938-A5N-0780 | 7.80    | 53  | 91  | 8        | 36 | 41.3 | 1.42 | ●        |
| D938-A5N-0785 | 7.85    | 53  | 91  | 8        | 36 | 41.2 | 1.43 | ○        |
| D938-A5N-0790 | 7.90    | 53  | 91  | 8        | 36 | 41.2 | 1.44 | ●        |
| D938-A5N-0795 | 7.95    | 53  | 91  | 8        | 36 | 41.1 | 1.45 | ○        |
| D938-A5N-0800 | 8.00    | 53  | 91  | 8        | 36 | 41.0 | 1.46 | ●        |
| D938-A5N-0805 | 8.05    | 53  | 91  | 8        | 36 | 40.9 | 1.46 | ○        |
| D938-A5N-0810 | 8.10    | 61  | 103 | 10       | 40 | 48.9 | 1.47 | ●        |
| D938-A5N-0815 | 8.15    | 61  | 103 | 10       | 40 | 48.8 | 1.48 | ●        |
| D938-A5N-0820 | 8.20    | 61  | 103 | 10       | 40 | 48.7 | 1.49 | ●        |
| D938-A5N-0825 | 8.25    | 61  | 103 | 10       | 40 | 48.6 | 1.50 | ○        |

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0830 | 8.30    | 61  | 103 | 10       | 40 | 48.6 | 1.51 | ●        |
| D938-A5N-0840 | 8.40    | 61  | 103 | 10       | 40 | 48.4 | 1.53 | ●        |
| D938-A5N-0845 | 8.45    | 61  | 103 | 10       | 40 | 48.3 | 1.54 | ○        |
| D938-A5N-0850 | 8.50    | 61  | 103 | 10       | 40 | 48.3 | 1.55 | ●        |
| D938-A5N-0855 | 8.55    | 61  | 103 | 10       | 40 | 48.2 | 1.56 | ○        |
| D938-A5N-0860 | 8.60    | 61  | 103 | 10       | 40 | 48.1 | 1.57 | ●        |
| D938-A5N-0870 | 8.70    | 61  | 103 | 10       | 40 | 48.0 | 1.58 | ●        |
| D938-A5N-0880 | 8.80    | 61  | 103 | 10       | 40 | 47.8 | 1.60 | ●        |
| D938-A5N-0885 | 8.85    | 61  | 103 | 10       | 40 | 47.7 | 1.61 | ○        |
| D938-A5N-0890 | 8.90    | 61  | 103 | 10       | 40 | 47.7 | 1.62 | ●        |
| D938-A5N-0895 | 8.95    | 61  | 103 | 10       | 40 | 47.6 | 1.63 | ○        |
| D938-A5N-0900 | 9.00    | 61  | 103 | 10       | 40 | 47.5 | 1.64 | ●        |
| D938-A5N-0905 | 9.05    | 61  | 103 | 10       | 40 | 47.4 | 1.65 | ○        |
| D938-A5N-0910 | 9.10    | 61  | 103 | 10       | 40 | 47.4 | 1.66 | ●        |
| D938-A5N-0915 | 9.15    | 61  | 103 | 10       | 40 | 47.3 | 1.67 | ○        |
| D938-A5N-0920 | 9.20    | 61  | 103 | 10       | 40 | 47.2 | 1.67 | ●        |
| D938-A5N-0925 | 9.25    | 61  | 103 | 10       | 40 | 47.1 | 1.68 | ●        |
| D938-A5N-0930 | 9.30    | 61  | 103 | 10       | 40 | 47.1 | 1.69 | ●        |
| D938-A5N-0935 | 9.35    | 61  | 103 | 10       | 40 | 47.0 | 1.70 | ●        |
| D938-A5N-0940 | 9.40    | 61  | 103 | 10       | 40 | 46.9 | 1.71 | ●        |
| D938-A5N-0945 | 9.45    | 61  | 103 | 10       | 40 | 46.8 | 1.72 | ○        |
| D938-A5N-0950 | 9.50    | 61  | 103 | 10       | 40 | 46.8 | 1.73 | ●        |
| D938-A5N-0955 | 9.55    | 61  | 103 | 10       | 40 | 46.7 | 1.74 | ●        |
| D938-A5N-0960 | 9.60    | 61  | 103 | 10       | 40 | 46.6 | 1.75 | ●        |
| D938-A5N-0965 | 9.65    | 61  | 103 | 10       | 40 | 46.5 | 1.76 | ○        |
| D938-A5N-0970 | 9.70    | 61  | 103 | 10       | 40 | 46.5 | 1.77 | ●        |
| D938-A5N-0975 | 9.75    | 61  | 103 | 10       | 40 | 46.4 | 1.77 | ○        |

● Stock ○ Available Upon Order

Notes: Non-standard customization is available for D1-D20 tools

Unit (mm)

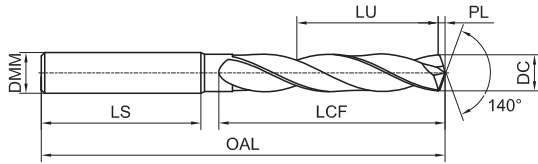
| Workpiece Material        |                         |                                   |                 |                                   |                      |                                            |                     |              |                    |                        |                |                |                |
|---------------------------|-------------------------|-----------------------------------|-----------------|-----------------------------------|----------------------|--------------------------------------------|---------------------|--------------|--------------------|------------------------|----------------|----------------|----------------|
| P                         |                         |                                   | M               | K                                 |                      | N                                          |                     |              |                    | S                      | H              |                |                |
| 1 2 3 4                   | 5                       | 6 7                               | 1 2 3           | 1 2                               | 3                    | 1 2                                        | 3                   | 4            | 5                  | 1 2 3                  | 4              | 1              | 2              |
| Carbon Steel, Alloy Steel | Alloy Steel, Tool Steel | PH and Ferritic/Martensitic Steel | Stainless Steel | Gray Cast Iron, Nodular Cast Iron | High Alloy Cast Iron | Forged Aluminum Alloy, Cast Aluminum Alloy | Cast Aluminum Alloy | Copper Alloy | Composite Material | High-temperature Alloy | Titanium Alloy | Hardened Steel | Hardened Steel |
| <35HRC                    | 35-48HRC                |                                   |                 | <32HRC                            | 35-45HRC             | Si<12%                                     | Si>12%              | <HB200       |                    | <HB450                 | <HB400         | 45-55HRC       | 55-60HRC       |
| ○                         | ○                       | ○                                 |                 | ○                                 | ○                    |                                            |                     |              |                    |                        |                |                |                |

○ Most Suitable ○ Suitable

Recommended Cutting Data ※ P126

# D938-A5N

5D External Coolant Twist Drill for Plain Steel Machining



Continued

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-0980 | 9.80    | 61  | 103 | 10       | 40 | 46.3 | 1.78 | ●        |
| D938-A5N-0985 | 9.85    | 61  | 103 | 10       | 40 | 46.2 | 1.79 | ○        |
| D938-A5N-0990 | 9.90    | 61  | 103 | 10       | 40 | 46.2 | 1.80 | ●        |
| D938-A5N-0995 | 9.95    | 61  | 103 | 10       | 40 | 46.1 | 1.81 | ○        |
| D938-A5N-1000 | 10.00   | 61  | 103 | 10       | 40 | 46.0 | 1.82 | ●        |
| D938-A5N-1005 | 10.05   | 61  | 103 | 10       | 40 | 45.9 | 1.83 | ●        |
| D938-A5N-1010 | 10.10   | 71  | 118 | 12       | 45 | 55.9 | 1.84 | ●        |
| D938-A5N-1015 | 10.15   | 71  | 118 | 12       | 45 | 55.8 | 1.85 | ○        |
| D938-A5N-1020 | 10.20   | 71  | 118 | 12       | 45 | 55.7 | 1.86 | ●        |
| D938-A5N-1025 | 10.25   | 71  | 118 | 12       | 45 | 55.6 | 1.87 | ●        |
| D938-A5N-1030 | 10.30   | 71  | 118 | 12       | 45 | 55.6 | 1.87 | ●        |
| D938-A5N-1035 | 10.35   | 71  | 118 | 12       | 45 | 55.5 | 1.88 | ○        |
| D938-A5N-1040 | 10.40   | 71  | 118 | 12       | 45 | 55.4 | 1.89 | ●        |
| D938-A5N-1050 | 10.50   | 71  | 118 | 12       | 45 | 55.3 | 1.91 | ●        |
| D938-A5N-1060 | 10.60   | 71  | 118 | 12       | 45 | 55.1 | 1.93 | ●        |
| D938-A5N-1070 | 10.70   | 71  | 118 | 12       | 45 | 55.0 | 1.95 | ●        |
| D938-A5N-1080 | 10.80   | 71  | 118 | 12       | 45 | 54.8 | 1.97 | ●        |
| D938-A5N-1085 | 10.85   | 71  | 118 | 12       | 45 | 54.7 | 1.97 | ●        |
| D938-A5N-1090 | 10.90   | 71  | 118 | 12       | 45 | 54.7 | 1.98 | ●        |
| D938-A5N-1100 | 11.00   | 71  | 118 | 12       | 45 | 54.5 | 2.00 | ●        |
| D938-A5N-1105 | 11.05   | 71  | 118 | 12       | 45 | 54.4 | 2.01 | ○        |
| D938-A5N-1110 | 11.10   | 71  | 118 | 12       | 45 | 54.4 | 2.02 | ●        |
| D938-A5N-1115 | 11.15   | 71  | 118 | 12       | 45 | 54.3 | 2.03 | ○        |
| D938-A5N-1120 | 11.20   | 71  | 118 | 12       | 45 | 54.2 | 2.04 | ●        |
| D938-A5N-1125 | 11.25   | 71  | 118 | 12       | 45 | 54.1 | 2.05 | ○        |
| D938-A5N-1130 | 11.30   | 71  | 118 | 12       | 45 | 54.1 | 2.06 | ●        |
| D938-A5N-1135 | 11.35   | 71  | 118 | 12       | 45 | 54.0 | 2.07 | ○        |

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-1140 | 11.40   | 71  | 118 | 12       | 45 | 53.9 | 2.07 | ●        |
| D938-A5N-1145 | 11.45   | 71  | 118 | 12       | 45 | 53.8 | 2.08 | ○        |
| D938-A5N-1150 | 11.50   | 71  | 118 | 12       | 45 | 53.8 | 2.09 | ●        |
| D938-A5N-1155 | 11.55   | 71  | 118 | 12       | 45 | 53.7 | 2.10 | ○        |
| D938-A5N-1160 | 11.60   | 71  | 118 | 12       | 45 | 53.6 | 2.11 | ●        |
| D938-A5N-1170 | 11.70   | 71  | 118 | 12       | 45 | 53.5 | 2.13 | ●        |
| D938-A5N-1180 | 11.80   | 71  | 118 | 12       | 45 | 53.3 | 2.15 | ●        |
| D938-A5N-1190 | 11.90   | 71  | 118 | 12       | 45 | 53.2 | 2.17 | ●        |
| D938-A5N-1195 | 11.95   | 71  | 118 | 12       | 45 | 53.1 | 2.17 | ○        |
| D938-A5N-1200 | 12.00   | 71  | 118 | 12       | 45 | 53.0 | 2.18 | ●        |
| D938-A5N-1205 | 12.05   | 71  | 118 | 12       | 45 | 52.9 | 2.19 | ○        |
| D938-A5N-1210 | 12.10   | 77  | 124 | 14       | 45 | 58.9 | 2.20 | ○        |
| D938-A5N-1215 | 12.15   | 77  | 124 | 14       | 45 | 58.8 | 2.21 | ○        |
| D938-A5N-1220 | 12.20   | 77  | 124 | 14       | 45 | 58.7 | 2.22 | ●        |
| D938-A5N-1225 | 12.25   | 77  | 124 | 14       | 45 | 58.6 | 2.23 | ○        |
| D938-A5N-1230 | 12.30   | 77  | 124 | 14       | 45 | 58.6 | 2.24 | ●        |
| D938-A5N-1240 | 12.40   | 77  | 124 | 14       | 45 | 58.4 | 2.26 | ○        |
| D938-A5N-1245 | 12.45   | 77  | 124 | 14       | 45 | 58.3 | 2.27 | ○        |
| D938-A5N-1250 | 12.50   | 77  | 124 | 14       | 45 | 58.3 | 2.27 | ●        |
| D938-A5N-1255 | 12.55   | 77  | 124 | 14       | 45 | 58.2 | 2.28 | ○        |
| D938-A5N-1260 | 12.60   | 77  | 124 | 14       | 45 | 58.1 | 2.29 | ●        |
| D938-A5N-1270 | 12.70   | 77  | 124 | 14       | 45 | 58.0 | 2.31 | ●        |
| D938-A5N-1275 | 12.75   | 77  | 124 | 14       | 45 | 57.9 | 2.32 | ○        |
| D938-A5N-1280 | 12.80   | 77  | 124 | 14       | 45 | 57.8 | 2.33 | ●        |
| D938-A5N-1285 | 12.85   | 77  | 124 | 14       | 45 | 57.7 | 2.34 | ○        |
| D938-A5N-1290 | 12.90   | 77  | 124 | 14       | 45 | 57.7 | 2.35 | ●        |
| D938-A5N-1300 | 13.00   | 77  | 124 | 14       | 45 | 57.5 | 2.37 | ●        |

● Stock ○ Available Upon Order

Notes: Non-standard customization is available for D1-D20 tools

Unit (mm)

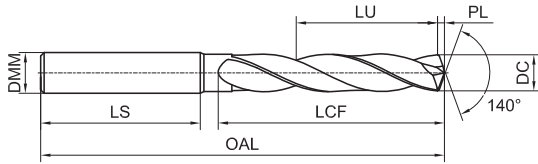
| Workpiece Material        |                         |                                   |                 |                                   |                      |                                             |                     |              |                    |                        |                |                |                |
|---------------------------|-------------------------|-----------------------------------|-----------------|-----------------------------------|----------------------|---------------------------------------------|---------------------|--------------|--------------------|------------------------|----------------|----------------|----------------|
| P                         |                         |                                   | M               | K                                 |                      |                                             | N                   |              |                    | S                      | H              |                |                |
| 1 2 3 4                   | 5                       | 6 7                               | 1 2 3           | 1 2                               | 3                    | 1 2                                         | 3                   | 4            | 5                  | 1 2 3                  | 4              | 1              | 2              |
| Carbon Steel, Alloy Steel | Alloy Steel, Tool Steel | PH and Ferritic/Martensitic Steel | Stainless Steel | Gray Cast Iron, Nodular Cast Iron | High Alloy Cast Iron | Forged Aluminum Alloy, Cast Aluminium Alloy | Cast Aluminum Alloy | Copper Alloy | Composite Material | High-temperature Alloy | Titanium Alloy | Hardened Steel | Hardened Steel |
| <35HRC                    | 35-48HRC                |                                   |                 | <32HRC                            | 35-45HRC             | Si<12%                                      | Si>12%              | <HB200       |                    | <HB450                 | <HB400         | 45-55HRC       | 55-60HRC       |
| ◎                         | ◎                       | ◎                                 |                 | ○                                 | ○                    |                                             |                     |              |                    |                        |                |                |                |

◎ Most Suitable ○ Suitable

Recommended Cutting Data ※ P126

# D938-A5N

5D External Coolant Twist Drill for Plain Steel Machining



Continued

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-1305 | 13.05   | 77  | 124 | 14       | 45 | 57.4 | 2.37 | ○        |
| D938-A5N-1310 | 13.10   | 77  | 124 | 14       | 45 | 57.4 | 2.38 | ○        |
| D938-A5N-1315 | 13.15   | 77  | 124 | 14       | 45 | 57.3 | 2.39 | ○        |
| D938-A5N-1320 | 13.20   | 77  | 124 | 14       | 45 | 57.2 | 2.40 | ●        |
| D938-A5N-1325 | 13.25   | 77  | 124 | 14       | 45 | 57.1 | 2.41 | ○        |
| D938-A5N-1330 | 13.30   | 77  | 124 | 14       | 45 | 57.1 | 2.42 | ○        |
| D938-A5N-1335 | 13.35   | 77  | 124 | 14       | 45 | 57.0 | 2.43 | ○        |
| D938-A5N-1340 | 13.40   | 77  | 124 | 14       | 45 | 56.9 | 2.44 | ○        |
| D938-A5N-1350 | 13.50   | 77  | 124 | 14       | 45 | 56.8 | 2.46 | ●        |
| D938-A5N-1355 | 13.55   | 77  | 124 | 14       | 45 | 56.7 | 2.47 | ○        |
| D938-A5N-1360 | 13.60   | 77  | 124 | 14       | 45 | 56.6 | 2.47 | ○        |
| D938-A5N-1370 | 13.70   | 77  | 124 | 14       | 45 | 56.5 | 2.49 | ●        |
| D938-A5N-1375 | 13.75   | 77  | 124 | 14       | 45 | 56.4 | 2.50 | ●        |
| D938-A5N-1380 | 13.80   | 77  | 124 | 14       | 45 | 56.3 | 2.51 | ●        |
| D938-A5N-1390 | 13.90   | 77  | 124 | 14       | 45 | 56.2 | 2.53 | ●        |
| D938-A5N-1395 | 13.95   | 77  | 124 | 14       | 45 | 56.1 | 2.54 | ○        |
| D938-A5N-1400 | 14.00   | 77  | 124 | 14       | 45 | 56.0 | 2.55 | ●        |
| D938-A5N-1405 | 14.05   | 77  | 124 | 14       | 45 | 55.9 | 2.56 | ○        |
| D938-A5N-1410 | 14.10   | 83  | 133 | 16       | 48 | 61.9 | 2.57 | ○        |
| D938-A5N-1420 | 14.20   | 83  | 133 | 16       | 48 | 61.7 | 2.58 | ●        |
| D938-A5N-1425 | 14.25   | 83  | 133 | 16       | 48 | 61.6 | 2.59 | ○        |
| D938-A5N-1430 | 14.30   | 83  | 133 | 16       | 48 | 61.6 | 2.60 | ○        |
| D938-A5N-1440 | 14.40   | 83  | 133 | 16       | 48 | 61.4 | 2.62 | ○        |
| D938-A5N-1450 | 14.50   | 83  | 133 | 16       | 48 | 61.3 | 2.64 | ●        |
| D938-A5N-1460 | 14.60   | 83  | 133 | 16       | 48 | 61.1 | 2.66 | ●        |
| D938-A5N-1470 | 14.70   | 83  | 133 | 16       | 48 | 61.0 | 2.68 | ○        |
| D938-A5N-1475 | 14.75   | 83  | 133 | 16       | 48 | 60.9 | 2.68 | ○        |

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-1480 | 14.80   | 83  | 133 | 16       | 48 | 60.8 | 2.69 | ●        |
| D938-A5N-1490 | 14.90   | 83  | 133 | 16       | 48 | 60.7 | 2.71 | ○        |
| D938-A5N-1500 | 15.00   | 83  | 133 | 16       | 48 | 60.5 | 2.73 | ●        |
| D938-A5N-1505 | 15.05   | 83  | 133 | 16       | 48 | 60.4 | 2.74 | ○        |
| D938-A5N-1510 | 15.10   | 83  | 133 | 16       | 48 | 60.4 | 2.75 | ○        |
| D938-A5N-1515 | 15.15   | 83  | 133 | 16       | 48 | 60.3 | 2.76 | ○        |
| D938-A5N-1520 | 15.20   | 83  | 133 | 16       | 48 | 60.2 | 2.77 | ○        |
| D938-A5N-1525 | 15.25   | 83  | 133 | 16       | 48 | 60.1 | 2.78 | ○        |
| D938-A5N-1530 | 15.30   | 83  | 133 | 16       | 48 | 60.1 | 2.78 | ○        |
| D938-A5N-1535 | 15.35   | 83  | 133 | 16       | 48 | 60.0 | 2.79 | ○        |
| D938-A5N-1540 | 15.40   | 83  | 133 | 16       | 48 | 59.9 | 2.80 | ○        |
| D938-A5N-1550 | 15.50   | 83  | 133 | 16       | 48 | 59.8 | 2.82 | ●        |
| D938-A5N-1555 | 15.55   | 83  | 133 | 16       | 48 | 59.7 | 2.83 | ○        |
| D938-A5N-1560 | 15.60   | 83  | 133 | 16       | 48 | 59.6 | 2.84 | ○        |
| D938-A5N-1570 | 15.70   | 83  | 133 | 16       | 48 | 59.5 | 2.86 | ●        |
| D938-A5N-1580 | 15.80   | 83  | 133 | 16       | 48 | 59.3 | 2.88 | ●        |
| D938-A5N-1590 | 15.90   | 83  | 133 | 16       | 48 | 59.2 | 2.89 | ○        |
| D938-A5N-1600 | 16.00   | 83  | 133 | 16       | 48 | 59.0 | 2.91 | ●        |
| D938-A5N-1605 | 16.05   | 83  | 133 | 16       | 48 | 58.9 | 2.92 | ○        |
| D938-A5N-1610 | 16.10   | 93  | 143 | 18       | 48 | 68.9 | 2.93 | ○        |
| D938-A5N-1620 | 16.20   | 93  | 143 | 18       | 48 | 68.7 | 2.95 | ○        |
| D938-A5N-1625 | 16.25   | 93  | 143 | 18       | 48 | 68.6 | 2.96 | ○        |
| D938-A5N-1630 | 16.30   | 93  | 143 | 18       | 48 | 68.6 | 2.97 | ○        |
| D938-A5N-1640 | 16.40   | 93  | 143 | 18       | 48 | 68.4 | 2.98 | ○        |
| D938-A5N-1650 | 16.50   | 93  | 143 | 18       | 48 | 68.3 | 3.00 | ●        |
| D938-A5N-1660 | 16.60   | 93  | 143 | 18       | 48 | 68.1 | 3.02 | ●        |
| D938-A5N-1670 | 16.70   | 93  | 143 | 18       | 48 | 68.0 | 3.04 | ○        |

● Stock ○ Available Upon Order

Notes: Non-standard customization is available for D1-D20 tools

Unit (mm)

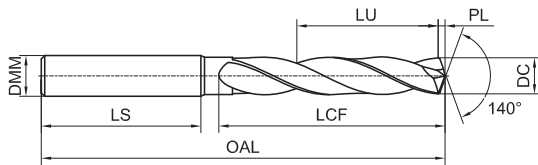
| Workpiece Material        |                         |                                   |                 |                                   |                      |                                             |                     |              |                    |                        |                |                |                |
|---------------------------|-------------------------|-----------------------------------|-----------------|-----------------------------------|----------------------|---------------------------------------------|---------------------|--------------|--------------------|------------------------|----------------|----------------|----------------|
| P                         |                         |                                   | M               | K                                 |                      | N                                           |                     |              |                    | S                      | H              |                |                |
| 1 2 3 4                   | 5                       | 6 7                               | 1 2 3           | 1 2                               | 3                    | 1 2                                         | 3                   | 4            | 5                  | 1 2 3                  | 4              | 1              | 2              |
| Carbon Steel, Alloy Steel | Alloy Steel, Tool Steel | PH and Ferritic/Martensitic Steel | Stainless Steel | Gray Cast Iron, Nodular Cast Iron | High Alloy Cast Iron | Forged Aluminum Alloy, Cast Aluminium Alloy | Cast Aluminum Alloy | Copper Alloy | Composite Material | High-temperature Alloy | Titanium Alloy | Hardened Steel | Hardened Steel |
| <35HRC                    | 35-48HRC                |                                   |                 | <32HRC                            | 35-45HRC             | Si<12%                                      | Si>12%              | <HB200       |                    | <HB450                 | <HB400         | 45-55HRC       | 55-60HRC       |
| ○                         | ○                       | ○                                 |                 | ○                                 | ○                    |                                             |                     |              |                    |                        |                |                |                |

○ Most Suitable ○ Suitable

Recommended Cutting Data ※ P126

# D938-A5N

5D External Coolant Twist Drill for Plain Steel Machining



Continued

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-1675 | 16.75   | 93  | 143 | 18       | 48 | 67.9 | 3.05 | ○        |
| D938-A5N-1680 | 16.80   | 93  | 143 | 18       | 48 | 67.8 | 3.06 | ○        |
| D938-A5N-1690 | 16.90   | 93  | 143 | 18       | 48 | 67.7 | 3.08 | ○        |
| D938-A5N-1695 | 16.95   | 93  | 143 | 18       | 48 | 67.6 | 3.08 | ●        |
| D938-A5N-1700 | 17.00   | 93  | 143 | 18       | 48 | 67.5 | 3.09 | ●        |
| D938-A5N-1710 | 17.10   | 93  | 143 | 18       | 48 | 67.4 | 3.11 | ○        |
| D938-A5N-1720 | 17.20   | 93  | 143 | 18       | 48 | 67.2 | 3.13 | ○        |
| D938-A5N-1730 | 17.30   | 93  | 143 | 18       | 48 | 67.1 | 3.15 | ○        |
| D938-A5N-1740 | 17.40   | 93  | 143 | 18       | 48 | 66.9 | 3.17 | ○        |
| D938-A5N-1750 | 17.50   | 93  | 143 | 18       | 48 | 66.8 | 3.18 | ●        |
| D938-A5N-1760 | 17.60   | 93  | 143 | 18       | 48 | 66.6 | 3.20 | ○        |
| D938-A5N-1770 | 17.70   | 93  | 143 | 18       | 48 | 66.5 | 3.22 | ○        |
| D938-A5N-1780 | 17.80   | 93  | 143 | 18       | 48 | 66.3 | 3.24 | ○        |
| D938-A5N-1790 | 17.90   | 93  | 143 | 18       | 48 | 66.2 | 3.26 | ○        |
| D938-A5N-1795 | 17.95   | 93  | 143 | 18       | 48 | 66.1 | 3.27 | ○        |
| D938-A5N-1800 | 18.00   | 93  | 143 | 18       | 48 | 66.0 | 3.28 | ●        |
| D938-A5N-1810 | 18.10   | 101 | 153 | 20       | 50 | 73.9 | 3.29 | ○        |
| D938-A5N-1820 | 18.20   | 101 | 153 | 20       | 50 | 73.7 | 3.31 | ○        |
| D938-A5N-1830 | 18.30   | 101 | 153 | 20       | 50 | 73.6 | 3.33 | ○        |

| Order No.     | DC (m7) | LCF | OAL | DMM (h6) | LS | LU   | PL   | In Stock |
|---------------|---------|-----|-----|----------|----|------|------|----------|
| D938-A5N-1840 | 18.40   | 101 | 153 | 20       | 50 | 73.4 | 3.35 | ○        |
| D938-A5N-1850 | 18.50   | 101 | 153 | 20       | 50 | 73.3 | 3.37 | ●        |
| D938-A5N-1860 | 18.60   | 101 | 153 | 20       | 50 | 73.1 | 3.38 | ●        |
| D938-A5N-1870 | 18.70   | 101 | 153 | 20       | 50 | 73.0 | 3.40 | ○        |
| D938-A5N-1880 | 18.80   | 101 | 153 | 20       | 50 | 72.8 | 3.42 | ○        |
| D938-A5N-1890 | 18.90   | 101 | 153 | 20       | 50 | 72.7 | 3.44 | ○        |
| D938-A5N-1900 | 19.00   | 101 | 153 | 20       | 50 | 72.5 | 3.46 | ●        |
| D938-A5N-1910 | 19.10   | 101 | 153 | 20       | 50 | 72.4 | 3.48 | ○        |
| D938-A5N-1915 | 19.15   | 101 | 153 | 20       | 50 | 72.3 | 3.49 | ○        |
| D938-A5N-1920 | 19.20   | 101 | 153 | 20       | 50 | 72.2 | 3.49 | ○        |
| D938-A5N-1930 | 19.30   | 101 | 153 | 20       | 50 | 72.1 | 3.51 | ○        |
| D938-A5N-1940 | 19.40   | 101 | 153 | 20       | 50 | 71.9 | 3.53 | ○        |
| D938-A5N-1950 | 19.50   | 101 | 153 | 20       | 50 | 71.8 | 3.55 | ●        |
| D938-A5N-1960 | 19.60   | 101 | 153 | 20       | 50 | 71.6 | 3.57 | ○        |
| D938-A5N-1970 | 19.70   | 101 | 153 | 20       | 50 | 71.5 | 3.59 | ○        |
| D938-A5N-1980 | 19.80   | 101 | 153 | 20       | 50 | 71.3 | 3.60 | ○        |
| D938-A5N-1990 | 19.90   | 101 | 153 | 20       | 50 | 71.2 | 3.62 | ○        |
| D938-A5N-2000 | 20.00   | 101 | 153 | 20       | 50 | 71.0 | 3.64 | ○        |

● Stock ○ Available Upon Order

Notes: Non-standard customization is available for D2-D20 tools

Unit (mm)

| Range of Sizes | DC(m7)        | DMM(h6)      |
|----------------|---------------|--------------|
| ≥2—3           | +0.002/+0.012 | 0.000/-0.006 |
| >3—6           | +0.004/+0.016 | 0.000/-0.008 |
| >6—10          | +0.006/+0.021 | 0.000/-0.009 |
| >10—18         | +0.007/+0.025 | 0.000/-0.011 |
| >18—20         | +0.008/+0.029 | 0.000/-0.013 |

| Workpiece Material        |                         |                                   |                 |                                   |                      |                                            |                     |              |                    |                        |                |                |                |
|---------------------------|-------------------------|-----------------------------------|-----------------|-----------------------------------|----------------------|--------------------------------------------|---------------------|--------------|--------------------|------------------------|----------------|----------------|----------------|
| P                         |                         |                                   | M               | K                                 |                      |                                            | N                   |              |                    | S                      | H              |                |                |
| 1 2 3 4                   | 5                       | 6 7                               | 1 2 3           | 1 2                               | 3                    | 1 2                                        | 3                   | 4            | 5                  | 1 2 3                  | 4              | 1              | 2              |
| Carbon Steel, Alloy Steel | Alloy Steel, Tool Steel | PH and Ferritic/Martensitic Steel | Stainless Steel | Gray Cast Iron, Nodular Cast Iron | High Alloy Cast Iron | Forged Aluminum Alloy, Cast Aluminum Alloy | Cast Aluminum Alloy | Copper Alloy | Composite Material | High-temperature Alloy | Titanium Alloy | Hardened Steel | Hardened Steel |
| <35HRC                    | 35-48HRC                |                                   |                 | <32HRC                            | 35-45HRC             | Si<12%                                     | Si>12%              | <HB200       |                    | <HB450                 | <HB400         | 45-55HRC       | 55-60HRC       |
| ◎                         | ◎                       | ◎                                 |                 | ○                                 | ○                    |                                            |                     |              |                    |                        |                |                |                |

◎ Most Suitable ○ Suitable

Recommended Cutting Data ※ P126

## Recommended Cutting Data

## D938 Plain Steel Machining Twist Drill 3D/5D

| Workpiece Material |                                                                              | Cutting speed Vc<br>(m/min)                                                       |                                                                                   | Feed fn<br>(mm/rev) |                |                |                |
|--------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------|----------------|----------------|----------------|
|                    |                                                                              |  |  | Φ1                  | Φ1.5           | Φ2             | Φ2.5           |
| <b>P</b>           | Low-carbon Steel, Long Chips (<125HB)                                        | 120-80-50                                                                         | 140-100-60                                                                        | 0.06-0.08-0.12      | 0.08-0.15-0.18 | 0.10-0.15-0.20 | 0.10-0.15-0.20 |
|                    | Low-carbon Steel, Short Chips, Free Cutting Steel (<125HB)                   | 120-75-50                                                                         | 140-100-60                                                                        | 0.06-0.08-0.12      | 0.08-0.15-0.18 | 0.10-0.15-0.20 | 0.10-0.15-0.20 |
|                    | High-carbon Steel and Medium-carbon Steel (<25HRC)                           | 120-70-45                                                                         | 120-80-60                                                                         | 0.06-0.08-0.12      | 0.08-0.15-0.18 | 0.10-0.15-0.20 | 0.10-0.15-0.20 |
|                    | Alloy Steel, Tool Steel (<35HRC)                                             | 100-70-45                                                                         | 110-80-60                                                                         | 0.05-0.07-0.11      | 0.08-0.13-0.16 | 0.08-0.13-0.16 | 0.09-0.13-0.16 |
|                    | Alloy Steel, Tool Steel (35-48HRC)                                           | 80-60-35                                                                          | 90-60-35                                                                          | 0.05-0.07-0.11      | 0.08-0.10-0.14 | 0.08-0.11-0.14 | 0.08-0.11-0.14 |
|                    | PH and Ferritic, Martensitic Steel (<35HRC)                                  | 70-50-30                                                                          | 90-60-30                                                                          | 0.04-0.07-0.10      | 0.05-0.08-0.11 | 0.05-0.08-0.11 | 0.05-0.08-0.11 |
|                    | High Strength PH and Ferritic, Martensitic Steel (35-48HRC)                  | 70-45-25                                                                          | 80-50-30                                                                          | 0.03-0.05-0.07      | 0.04-0.06-0.08 | 0.04-0.06-0.08 | 0.04-0.06-0.08 |
| <b>M</b>           | Austenitic Stainless Steels (130- 200HB)                                     | —                                                                                 | 80-60-40                                                                          | 0.02-0.04-0.06      | 0.03-0.05-0.07 | 0.03-0.06-0.08 | 0.03-0.06-0.08 |
|                    | High Strength Austenitic and Cast Stainless Steel (<25HRC)                   | —                                                                                 | 80-60-40                                                                          | 0.02-0.04-0.06      | 0.03-0.05-0.07 | 0.03-0.06-0.08 | 0.03-0.06-0.08 |
|                    | Duplex Stainless Steel (<30HRC)                                              | —                                                                                 | 60-45-30                                                                          | 0.03-0.04-0.07      | 0.03-0.05-0.07 | 0.03-0.06-0.08 | 0.03-0.06-0.08 |
| <b>K</b>           | Gray Cast Iron (<32HRC)                                                      | 140-100-60                                                                        | 160-120-60                                                                        | 0.08-0.10-0.14      | 0.10-0.13-0.16 | 0.12-0.15-0.18 | 0.13-0.17-0.20 |
|                    | Alloy Cast Iron with Medium Machining Difficulty, Nodular Cast Iron (<28HRC) | 120-80-60                                                                         | 140-100-60                                                                        | 0.06-0.09-0.13      | 0.09-0.12-0.15 | 0.11-0.14-0.17 | 0.11-0.15-0.18 |
|                    | Difficult-to-machine High Alloy Cast Iron, Nodular Cast Iron (<45HRC)        | 100-70-50                                                                         | 100-80-50                                                                         | 0.04-0.07-0.09      | 0.05-0.08-0.10 | 0.06-0.09-0.11 | 0.06-0.09-0.11 |

## [Notes]

1. Please use a machine with relatively high rigidity. It is recommended to adopt hydraulic tool holders, thermal expansion tool holders and powerful handles with spring collets.
2. When installing the tool, it is necessary to ensure that the radial bounce of the drill bit tip is less than 0.02mm.
3. This standard cutting condition table is suitable for water-soluble cutting fluids
4. For the tool edge diameter specifications not listed in the table, please refer to the closest edge diameter specifications in the table to select the cutting data. Meanwhile, during the machining process, please adjust the cutting data appropriately according to the actual machining situation.

## Recommended Cutting Data

### D938 Plain Steel Machining Twist Drill 3D/5D

| Workpiece Material |                                                                              | Cutting speed Vc<br>(m/min)                                                       |                                                                                   | Feed fn<br>(mm/rev) |                |                |                |                |
|--------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------|----------------|----------------|----------------|----------------|
|                    |                                                                              |  |  | Φ3                  | Φ4             | Φ6             | Φ8             | Φ10            |
| <b>P</b>           | Low-carbon Steel, Long Chips (<125HB)                                        | 120-80-50                                                                         | 140-100-60                                                                        | 0.10-0.15-0.20      | 0.10-0.15-0.20 | 0.14-0.19-0.25 | 0.16-0.22-0.32 | 0.16-0.22-0.35 |
|                    | Low-carbon Steel, Short Chips, Free Cutting Steel (<125HB)                   | 120-75-50                                                                         | 140-100-60                                                                        | 0.10-0.15-0.20      | 0.10-0.15-0.20 | 0.14-0.19-0.25 | 0.16-0.22-0.32 | 0.16-0.22-0.35 |
|                    | High-carbon Steel and Medium-carbon Steel (<25HRC)                           | 120-70-45                                                                         | 120-80-60                                                                         | 0.10-0.15-0.20      | 0.10-0.15-0.20 | 0.14-0.19-0.25 | 0.16-0.22-0.30 | 0.16-0.22-0.32 |
|                    | Alloy Steel, Tool Steel (<35HRC)                                             | 100-70-45                                                                         | 110-80-60                                                                         | 0.09-0.13-0.16      | 0.09-0.13-0.16 | 0.12-0.17-0.23 | 0.14-0.20-0.28 | 0.14-0.20-0.30 |
|                    | Alloy Steel, Tool Steel (35-48HRC)                                           | 80-60-35                                                                          | 90-60-35                                                                          | 0.08-0.11-0.14      | 0.08-0.11-0.14 | 0.08-0.14-0.20 | 0.09-0.16-0.25 | 0.09-0.16-0.28 |
|                    | PH and Ferritic, Martensitic Steel (<35HRC)                                  | 70-50-30                                                                          | 90-60-30                                                                          | 0.05-0.08-0.11      | 0.05-0.08-0.11 | 0.07-0.12-0.17 | 0.08-0.14-0.20 | 0.08-0.14-0.23 |
|                    | High Strength PH and Ferritic, Martensitic Steel (35-48HRC)                  | 70-45-25                                                                          | 80-50-30                                                                          | 0.04-0.06-0.08      | 0.04-0.06-0.08 | 0.06-0.10-0.14 | 0.08-0.13-0.18 | 0.08-0.13-0.20 |
| <b>M</b>           | Austenitic Stainless Steels (130-200HB)                                      | —                                                                                 | 80-60-40                                                                          | 0.05-0.08-0.10      | 0.06-0.10-0.12 | 0.07-0.12-0.14 | 0.08-0.13-0.18 | 0.09-0.15-0.20 |
|                    | High Strength Austenitic and Cast Stainless Steel (<25HRC)                   | —                                                                                 | 80-60-40                                                                          | 0.03-0.06-0.08      | 0.04-0.08-0.10 | 0.05-0.08-0.10 | 0.06-0.10-0.12 | 0.07-0.11-0.14 |
|                    | Duplex Stainless Steel (<30HRC)                                              | —                                                                                 | 60-45-30                                                                          | 0.03-0.06-0.08      | 0.04-0.08-0.10 | 0.05-0.08-0.10 | 0.06-0.10-0.12 | 0.07-0.11-0.14 |
| <b>K</b>           | Gray Cast Iron (<32HRC)                                                      | 140-100-60                                                                        | 160-120-60                                                                        | 0.13-0.17-0.20      | 0.15-0.20-0.23 | 0.17-0.25-0.30 | 0.20-0.27-0.35 | 0.23-0.30-0.40 |
|                    | Alloy Cast Iron with Medium Machining Difficulty, Nodular Cast Iron (<28HRC) | 120-80-60                                                                         | 140-100-60                                                                        | 0.11-0.15-0.18      | 0.13-0.17-0.20 | 0.15-0.20-0.25 | 0.17-0.25-0.32 | 0.20-0.28-0.36 |
|                    | Difficult-to-machine High Alloy Cast Iron, Nodular Cast Iron (<45HRC)        | 100-70-50                                                                         | 100-80-50                                                                         | 0.06-0.09-0.11      | 0.08-0.10-0.13 | 0.10-0.13-0.16 | 0.12-0.16-0.20 | 0.14-0.20-0.26 |

#### [Notes]

1. Please use a machine with relatively high rigidity. It is recommended to adopt hydraulic tool holders, thermal expansion tool holders and powerful handles with spring collets.
2. When installing the tool, it is necessary to ensure that the radial bounce of the drill bit tip is less than 0.02mm.
3. This standard cutting condition table is suitable for water-soluble cutting fluids
4. For the tool edge diameter specifications not listed in the table, please refer to the closest edge diameter specifications in the table to select the cutting data. Meanwhile, during the machining process, please adjust the cutting data appropriately according to the actual machining situation.

## Recommended Cutting Data

## D938 Plain Steel Machining Twist Drill 3D/5D

| Workpiece Material |                                                                              | Cutting speed Vc<br>(m/min)                                                       |                                                                                   | Feed fn<br>(mm/rev) |                |                |                |                |
|--------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------|----------------|----------------|----------------|----------------|
|                    |                                                                              |  |  | Φ12                 | Φ14            | Φ16            | Φ18            | Φ20            |
| <b>P</b>           | Low-carbon Steel, Long Chips (<125HB)                                        | 120-80-50                                                                         | 140-100-60                                                                        | 0.18-0.28-0.40      | 0.22-0.32-0.45 | 0.22-0.32-0.45 | 0.25-0.38-0.50 | 0.25-0.38-0.50 |
|                    | Low-carbon Steel, Short Chips, Free Cutting steel (<125HB)                   | 120-75-50                                                                         | 140-100-60                                                                        | 0.18-0.28-0.40      | 0.22-0.32-0.45 | 0.22-0.32-0.45 | 0.25-0.38-0.50 | 0.25-0.38-0.50 |
|                    | High-carbon Steel and Medium-carbon Steel (<25HRC)                           | 120-70-45                                                                         | 120-80-60                                                                         | 0.18-0.28-0.38      | 0.22-0.32-0.45 | 0.22-0.32-0.45 | 0.25-0.38-0.50 | 0.25-0.38-0.50 |
|                    | Alloy Steel, Tool Steel (<35HRC)                                             | 100-70-45                                                                         | 110-80-60                                                                         | 0.15-0.23-0.34      | 0.18-0.25-0.38 | 0.18-0.25-0.38 | 0.20-0.30-0.40 | 0.20-0.30-0.40 |
|                    | Alloy Steel, Tool Steel (35-48HRC)                                           | 80-60-35                                                                          | 90-60-35                                                                          | 0.11-0.19-0.30      | 0.12-0.22-0.32 | 0.12-0.22-0.32 | 0.14-0.24-0.34 | 0.14-0.24-0.34 |
|                    | PH and Ferritic, Martensitic Steel (<35HRC)                                  | 70-50-30                                                                          | 90-60-30                                                                          | 0.10-0.18-0.28      | 0.12-0.20-0.30 | 0.12-0.20-0.30 | 0.14-0.24-0.32 | 0.14-0.24-0.32 |
|                    | High strength PH and Ferritic, Martensitic Steel (35-48HRC)                  | 70-45-25                                                                          | 80-50-30                                                                          | 0.10-0.18-0.28      | 0.12-0.20-0.30 | 0.12-0.20-0.30 | 0.14-0.24-0.32 | 0.14-0.24-0.32 |
| <b>M</b>           | Austenitic Stainless Steels (130- 200HB)                                     | —                                                                                 | 80-60-40                                                                          | 0.10-0.17-0.22      | 0.11-0.18-0.24 | 0.12-0.20-0.24 | 0.13-0.22-0.26 | 0.14-0.24-0.28 |
|                    | High Strength Austenitic and Cast Stainless Steel (<25HRC)                   | —                                                                                 | 80-60-40                                                                          | 0.08-0.13-0.16      | 0.09-0.13-0.18 | 0.10-0.14-0.18 | 0.10-0.14-0.20 | 0.12-0.16-0.22 |
|                    | Duplex Stainless Steel (<30HRC)                                              | —                                                                                 | 60-45-30                                                                          | 0.08-0.13-0.16      | 0.09-0.13-0.18 | 0.10-0.14-0.18 | 0.10-0.14-0.20 | 0.12-0.16-0.22 |
| <b>K</b>           | Gray Cast Iron (<32HRC)                                                      | 140-100-60                                                                        | 160-120-60                                                                        | 0.25-0.33-0.45      | 0.28-0.36-0.48 | 0.30-0.40-0.50 | 0.32-0.42-0.52 | 0.35-0.45-0.55 |
|                    | Alloy Cast Iron with Medium Machining Difficulty, Nodular Cast Iron (<28HRC) | 120-80-60                                                                         | 140-100-60                                                                        | 0.22-0.30-0.42      | 0.24-0.33-0.45 | 0.25-0.35-0.48 | 0.28-0.38-0.48 | 0.30-0.40-0.50 |
|                    | Difficult-to-machine High Alloy Cast Iron, Nodular Cast Iron (<45HRC)        | 100-70-50                                                                         | 100-80-50                                                                         | 0.16-0.22-0.28      | 0.18-0.24-0.30 | 0.20-0.26-0.32 | 0.22-0.28-0.34 | 0.23-0.28-0.35 |

## [ Notes]

1. Please use a machine with relatively high rigidity. It is recommended to adopt hydraulic tool holders, thermal expansion tool holders and powerful handles with spring collets.
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3. This standard cutting condition table is suitable for water-soluble cutting fluids
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