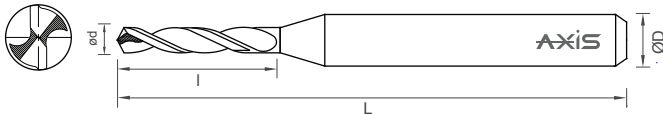


# INDRILL<sup>+</sup>

ø 0.30 - 3.00 mm



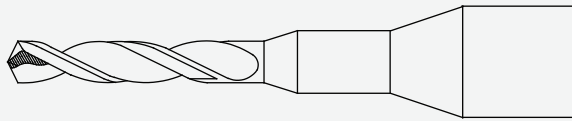


|       |       | T311 Stub Length |       | T312 Standard Length |       | T313 Long Length |       |
|-------|-------|------------------|-------|----------------------|-------|------------------|-------|
| ød h6 | ØD h6 | l                | L     | l                    | L     | l                | L     |
| 0.30  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.31  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.32  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.33  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.34  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.35  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.36  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.37  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.38  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.39  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 5.50             | 38.00 |
| 0.40  | 3.00  | 1.50             | 38.00 | 3.00                 | 38.00 | 6.00             | 38.00 |
| 0.41  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.42  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.43  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.44  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.45  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.46  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.47  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.48  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.49  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.50  | 3.00  | 2.00             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.51  | 3.00  | 2.50             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.52  | 3.00  | 2.50             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.53  | 3.00  | 2.50             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.54  | 3.00  | 2.50             | 38.00 | 4.00                 | 38.00 | 6.00             | 38.00 |
| 0.55  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.56  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.57  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.58  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.59  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.60  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.61  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.62  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.63  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.64  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.65  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.66  | 3.00  | 2.50             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.67  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.68  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.69  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.70  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.71  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.72  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.73  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.74  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.75  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.76  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.77  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.78  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.79  | 3.00  | 3.00             | 38.00 | 5.00                 | 38.00 | 8.00             | 38.00 |
| 0.80  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.81  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.82  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.83  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.84  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.85  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.86  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.87  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.88  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.89  | 3.00  | 4.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.90  | 3.00  | 5.00             | 38.00 | 6.00                 | 38.00 | 8.00             | 38.00 |
| 0.91  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.92  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.93  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.94  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.95  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |

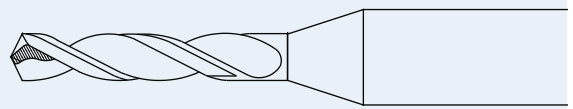
|       |       | T311 Stub Length |       | T312 Standard Length |       | T313 Long Length |       |
|-------|-------|------------------|-------|----------------------|-------|------------------|-------|
| ød h6 | ØD h6 | I                | L     | I                    | L     | I                | L     |
| 0.96  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.97  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.98  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 0.99  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.00  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.01  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.02  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.03  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.04  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.05  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.06  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.07  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.08  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.09  | 3.00  | 5.00             | 38.00 | 8.00                 | 38.00 | 10.00            | 38.00 |
| 1.10  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.11  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.12  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.13  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.14  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.15  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.16  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.17  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.18  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.19  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.20  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.21  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.22  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.23  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.24  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.25  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.26  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.27  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.28  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.29  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 12.00            | 38.00 |
| 1.30  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.31  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.32  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.33  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.34  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.35  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.36  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.37  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.38  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.39  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.40  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.41  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.42  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.43  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.44  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.45  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.46  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.47  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.48  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.49  | 3.00  | 6.00             | 38.00 | 10.00                | 38.00 | 14.00            | 45.00 |
| 1.50  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.51  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.52  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.53  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.54  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.55  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.56  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.57  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.58  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.59  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.60  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.61  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.62  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.63  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.64  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.65  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.66  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.67  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.68  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.69  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 16.00            | 45.00 |
| 1.70  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00 |
| 1.71  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00 |
| 1.72  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00 |
| 1.73  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00 |
| 1.74  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00 |
| 1.75  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00 |

|       |       | T311 Stub Length |       | T312 Standard Length |       | T313 Long Length |         |
|-------|-------|------------------|-------|----------------------|-------|------------------|---------|
| ød h6 | ØD h6 | I                | L     | I                    | L     | I                | L       |
| 1.76  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.77  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.78  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.79  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.80  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.81  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.82  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.83  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.84  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.85  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.86  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.87  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.88  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.89  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.90  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.91  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.92  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.93  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.94  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.95  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.96  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.97  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.98  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 1.99  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 2.00  | 3.00  | 8.00             | 38.00 | 12.00                | 38.00 | 18.00            | 45.00   |
| 2.01  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.02  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.03  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.04  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.05  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.06  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.07  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.08  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.09  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.10  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.11  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.12  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.13  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.14  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.15  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.16  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.17  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.18  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.19  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.20  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.21  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.22  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.23  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00   |
| 2.24  | 3.00  | 12.00            | 38.00 | 14.00                | 45.00 | 20.00            | 50.00</ |

|       |       | T311 Stub Length |       | T312 Standard Length |       | T313 Long Length |       |
|-------|-------|------------------|-------|----------------------|-------|------------------|-------|
| ød h6 | ØD h6 | I                | L     | I                    | L     | I                | L     |
| 2.56  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.57  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.58  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.59  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.60  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.61  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.62  | 3.00  | 12.00            | 38.00 | 16.0v                | 45.00 | 24.00            | 50.00 |
| 2.63  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.64  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.65  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.66  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.67  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.68  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.69  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.70  | 3.00  | 12.00            | 38.00 | 16.00                | 45.00 | 24.00            | 50.00 |
| 2.71  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.72  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.73  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.74  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.75  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.76  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.77  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.78  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.79  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.80  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.81  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.82  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.83  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.84  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.85  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.86  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.87  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.88  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.89  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.90  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.91  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.92  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.93  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.94  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.95  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.96  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.97  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.98  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 2.99  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |
| 3.00  | 3.00  | 12.00            | 38.00 | 18.00                | 45.00 | 26.00            | 50.00 |

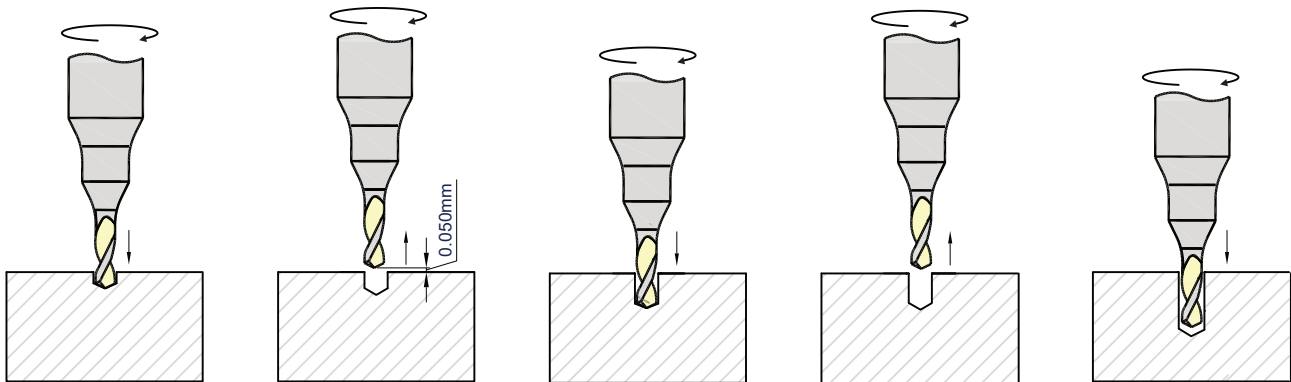


≥ 0.30 - 0.40 mm



> 0.40 - 3.00 mm

## Drilling Strategy



## Cautions

- mICRO Drilling is a challenging task, so high level of care and attention should be exercised.
- A rigid setup which prevents vibration is required for mICRO Drills, The tool and job should be firmly clamped to avoid slippage.
- The flatness of surface to be drilled is extremely important.
- For smaller Drills under  $\varnothing 0.5$ , the most stable rotation speed of the spindle takes precedence over the recommended conditions.
- When machines can not achieve a recommended rotation speed, please set maximum possible speed in stable rotation range of the machine and adjust the feed rate.
- Total Indicated Runout (T.I.R) should be less than  $3\mu\text{m}$ .
- When removing the tool from packing be careful not to touch the flute portion.
- Reduce RPM by 10% while entry and retraction of the tool.

| Materials |                                       | Dia Range |             |             |             |             |             |             |             |             |
|-----------|---------------------------------------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|           |                                       |           | 0.30-0.40   | 0.41-0.50   | 0.51-0.70   | 0.71-1.00   | 1.01-1.50   | 1.51-02.00  | 2.01-2.50   | 2.51-3.00   |
| P         | Low/Unalloyed Steel<br><600 N/mm²     | N min-1   | 20000-19000 | 29000-18000 | 18000-17000 | 17000-15000 | 15000-12000 | 12000-10000 | 10000-8000  | 8000-7000   |
|           |                                       | F mm/rev  | 0.010-0.015 | 0.015-0.020 | 0.020-0.030 | 0.030-0.040 | 0.040-0.050 | 0.050-0.060 | 0.060-0.075 | 0.075-0.090 |
|           | Low/Unalloyed Steel<br>600-1000 N/mm² | N min-1   | 20000-19000 | 29000-18000 | 18000-17000 | 17000-15000 | 15000-12000 | 12000-10000 | 10000-8000  | 8000-7000   |
|           |                                       | F mm/rev  | 0.010-0.015 | 0.015-0.020 | 0.020-0.030 | 0.030-0.040 | 0.040-0.050 | 0.050-0.060 | 0.060-0.075 | 0.075-0.090 |
|           | High Alloyed Steel<br>700-1500 N/mm²  | N min-1   | 18000-17000 | 17000-15000 | 15000-12000 | 12000-10000 | 10000-9000  | 9000-7000   | 7000-6000   | 6000-5000   |
|           |                                       | F mm/rev  | 0.010-0.015 | 0.015-0.020 | 0.020-0.030 | 0.030-0.040 | 0.040-0.050 | 0.050-0.060 | 0.060-0.075 | 0.075-0.090 |
| M         | Ferritic/Martensitic                  | N min-1   | 16500-15700 | 15700-14000 | 13500-10000 | 9000-7000   | 7000-6000   | 6000-5000   | 5000-4000   | 4000-3000   |
|           |                                       | F mm/rev  | 0.004-0.005 | 0.005-0.008 | 0.008-0.014 | 0.015-0.020 | 0.020-0.025 | 0.025-0.027 | 0.027-0.030 | 0.030-0.035 |
|           | Austenitic                            | N min-1   | 16500-15700 | 15700-14000 | 13500-10000 | 9000-7000   | 7000-6000   | 6000-5000   | 5000-4000   | 4000-3000   |
|           |                                       | F mm/rev  | 0.004-0.005 | 0.005-0.008 | 0.008-0.012 | 0.015-0.020 | 0.018-0.022 | 0.022-0.024 | 0.024-0.027 | 0.028-0.032 |
|           | Duplex/PH<br>> 800 N/mm²              | N min-1   | 16500-15700 | 15700-14000 | 13500-10000 | 9000-7000   | 7000-6000   | 6000-5000   | 5000-4000   | 4000-3000   |
|           |                                       | F mm/rev  | 0.004-0.005 | 0.005-0.008 | 0.008-0.012 | 0.015-0.020 | 0.018-0.022 | 0.022-0.024 | 0.024-0.027 | 0.028-0.032 |
| K         | GCI/NCI<br><180 BHN                   | N min-1   | 20000-19000 | 29000-18000 | 18000-17000 | 17000-15000 | 15000-12000 | 12000-10000 | 10000-8000  | 8000-7000   |
|           |                                       | F mm/rev  | 0.01-0.015  | 0.015-0.020 | 0.02-0.030  | 0.030-0.040 | 0.040-0.050 | 0.050-0.060 | 0.060-0.070 | 0.070-0.080 |
|           | GCI/NCI<br>200-250 BHN                | N min-1   | 17000-16000 | 15700-14000 | 14000-12000 | 11500-10000 | 9500-8000   | 8000-7000   | 7000-6000   | 6000-5000   |
|           |                                       | F mm/rev  | 0.01-0.015  | 0.015-0.020 | 0.020-0.030 | 0.030-0.040 | 0.040-0.050 | 0.050-0.060 | 0.060-0.070 | 0.070-0.080 |
| S         | Ti - Based                            | N min-1   | 7500-7000   | 7000-6500   | 6500-6000   | 6000-5600   | 5600-5000   | 5000-4000   | 4000-3000   | 3000-2500   |
|           |                                       | F mm/rev  | 0.004-0.005 | 0.005-0.008 | 0.008-0.014 | 0.015-0.020 | 0.020-0.025 | 0.025-0.027 | 0.027-0.030 | 0.030-0.035 |
|           | Fe, Ni, Co - Based                    | N min-1   | 7000-6500   | 6500-6000   | 6000-5600   | 5600-5000   | 5000-4000   | 4000-3000   | 3000-2500   | 2500-2200   |
|           |                                       | F mm/rev  | 0.004-0.005 | 0.005-0.008 | 0.008-0.012 | 0.015-0.020 | 0.018-0.022 | 0.022-0.024 | 0.024-0.027 | 0.028-0.032 |

|                 |             |           |
|-----------------|-------------|-----------|
| Dia D (mm)      | 0.30-0.50   | 0.51-3.00 |
| Peck Depth (mm) | (0.2-0.3)xd | 0.5xd     |

\* When machines can not achieve a recommended rotation speed, please set maximum speed but in stable rotation and adjust the feed rate.

\* For smaller drills under ø0.5, the most stable rotation speed of the spindle takes precedence over the recommended conditions indicated in the table.





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