

# Drill LINE

DR-L SERIES



THE FUTURE OF PRECISION MACHINING

Deep extensive drilling  
with extra long cutting tool



[www.hpmt-industries.com](http://www.hpmt-industries.com)



▶ **T8090 Tip Coating**

- Multilayer AlTiN coating enhance tool life

▶ **Polished Flute**

- Smooth chips evacuation
- Less built-up edge

▶ **High-performance drill with internal cooling**

- Enhance hole quality
- Increase tool durability

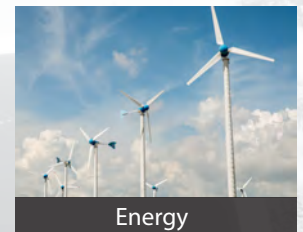
▶ **Four Margin for optimum hole quality and use on :**

- Inclined hole exits
- Workpieces with cross holes

▶ **Benefits :**

- Drilling without pecking
- Maximum process reliability at deep drilling depths

▶ **Applicable in various industries**



▶ **Suitable for 5 material groups**



\* Diameter range : 3mm to 10mm

# DR-L SB OIL FEED TWIST DRILLS - 135° Point Angle



| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP | Dimension ( mm ) |        |      |      |    |    |     |         | Coating |
|--|------------------|--------|------|------|----|----|-----|---------|---------|
|  | Hole Depth l2/D  | D (h7) | l1   | l2   | l3 | l4 | L   | d2 (h6) | T8090   |
| W05 0310 12                            | 12 x D           | 3.10   | 15.5 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0320 12                            | 12 x D           | 3.20   | 16.0 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0330 12                            | 12 x D           | 3.30   | 16.5 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0340 12                            | 12 x D           | 3.40   | 17.0 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0350 12                            | 12 x D           | 3.50   | 17.5 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0350 15                            | 15 x D           |        | 17.5 | 54.5 | 60 | 32 | 95  | 4       | ○       |
| W05 0350 20                            | 20 x D           |        | 17.5 | 72   | 77 | 32 | 110 | 4       | ○       |
| W05 0360 12                            | 12 x D           | 3.60   | 18.0 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0370 12                            | 12 x D           | 3.70   | 18.5 | 48   | 54 | 32 | 90  | 4       | ○       |
| W05 0380 12                            | 12 x D           | 3.80   | 19.0 | 57   | 64 | 32 | 100 | 4       | ○       |
| W05 0390 12                            | 12 x D           | 3.90   | 19.5 | 57   | 64 | 32 | 100 | 4       | ○       |
| W05 0400 12                            | 12 x D           | 4.00   | 20   | 57   | 64 | 32 | 100 | 4       | ○       |
| W05 0400 15                            | 15 x D           |        | 20   | 62   | 68 | 32 | 105 | 4       | ○       |
| W05 0400 20                            | 20 x D           |        | 20   | 82   | 88 | 32 | 125 | 4       | ○       |
| W05 0410 12                            | 12 x D           | 4.10   | 20.5 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0420 12                            | 12 x D           | 4.20   | 21.0 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0430 12                            | 12 x D           | 4.30   | 21.5 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0440 12                            | 12 x D           | 4.40   | 22.0 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0450 12                            | 12 x D           | 4.50   | 22.5 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0450 15                            | 15 x D           |        | 22.5 | 69.5 | 76 | 34 | 115 | 5       | ○       |
| W05 0450 20                            | 20 x D           |        | 22.5 | 92   | 99 | 34 | 135 | 5       | ○       |
| W05 0460 12                            | 12 x D           | 4.60   | 23.0 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0470 12                            | 12 x D           | 4.70   | 23.5 | 57   | 64 | 34 | 100 | 5       | ○       |
| W05 0480 12                            | 12 x D           | 4.80   | 24.0 | 72   | 81 | 34 | 120 | 5       | ○       |
| W05 0490 12                            | 12 x D           | 4.90   | 24.5 | 72   | 81 | 34 | 120 | 5       | ○       |

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Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02 | M03 | M04 | M05 | M06 | M07 | M08 | M09 | M10 | M11 | M12 | M13 | M14 | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26 | M27 | M28 | M33 | M01 | M29 | M30 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Working Material | Cutting Parameter

TECHNICAL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

# DR-L SB OIL FEED TWIST DRILLS - 135° Point Angle

| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP | Dimension (mm)  |        |      |     |     |    |     |         | Coating |
|--|-----------------|--------|------|-----|-----|----|-----|---------|---------|
|  | Hole Depth l2/D | D (h7) | l1   | l2  | l3  | l4 | L   | d2 (h6) | T8090   |
| W05 0500 12                            | 12 x D          | 5.00   | 25.0 | 72  | 81  | 34 | 120 | 5       | ○       |
| W05 0500 15                            | 15 x D          |        | 25.0 | 77  | 85  | 34 | 120 | 5       | ○       |
| W05 0500 20                            | 20 x D          |        | 25.0 | 102 | 110 | 34 | 145 | 5       | ○       |
| W05 0510 12                            | 12 x D          | 5.10   | 25.5 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0520 12                            | 12 x D          | 5.20   | 26.0 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0530 12                            | 12 x D          | 5.30   | 26.5 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0540 12                            | 12 x D          | 5.40   | 27.0 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0550 12                            | 12 x D          | 5.50   | 27.5 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0550 15                            | 15 x D          |        | 27.5 | 85  | 93  | 36 | 130 | 6       | ○       |
| W05 0550 20                            | 20 x D          |        | 27.5 | 112 | 120 | 36 | 160 | 6       | ○       |
| W05 0560 12                            | 12 x D          | 5.60   | 28.0 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0570 12                            | 12 x D          | 5.70   | 28.5 | 72  | 121 | 36 | 120 | 6       | ○       |
| W05 0580 12                            | 12 x D          | 5.80   | 29.0 | 72  | 160 | 36 | 120 | 6       | ○       |
| W05 0590 12                            | 12 x D          | 5.90   | 29.5 | 72  | 190 | 36 | 120 | 6       | ○       |
| W05 0600 12                            | 12 x D          | 6.00   | 30.0 | 72  | 81  | 36 | 120 | 6       | ○       |
| W05 0600 15                            | 15 x D          |        | 30.0 | 92  | 101 | 36 | 140 | 6       | ○       |
| W05 0600 20                            | 20 x D          |        | 30.0 | 122 | 131 | 36 | 170 | 6       | ○       |
| W05 0610 12                            | 12 x D          | 6.10   | 30.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0620 12                            | 12 x D          | 6.20   | 31.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0630 12                            | 12 x D          | 6.30   | 31.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0640 12                            | 12 x D          | 6.40   | 32.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0650 12                            | 12 x D          | 6.50   | 32.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0660 12                            | 12 x D          | 6.60   | 33.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0670 12                            | 12 x D          | 6.70   | 33.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0680 12                            | 12 x D          | 6.80   | 34.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0690 12                            | 12 x D          | 6.90   | 34.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0700 12                            | 12 x D          | 7.00   | 35.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0700 15                            | 15 x D          |        | 35.0 | 107 | 118 | 38 | 160 | 8       | ○       |
| W05 0700 20                            | 20 x D          |        | 35.0 | 142 | 153 | 38 | 195 | 8       | ○       |
| W05 0710 12                            | 12 x D          | 7.10   | 35.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0720 12                            | 12 x D          | 7.20   | 36.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0730 12                            | 12 x D          | 7.30   | 36.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0740 12                            | 12 x D          | 7.40   | 37.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0750 12                            | 12 x D          | 7.50   | 37.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0760 12                            | 12 x D          | 7.60   | 38.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0770 12                            | 12 x D          | 7.70   | 38.5 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0780 12                            | 12 x D          | 7.80   | 39.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0790 12                            | 12 x D          | 7.90   | 39.5 | 96  | 108 | 36 | 145 | 8       | ○       |

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Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02 | M03 | M04 | M05 | M06 | M07 | M08 | M09 | M10 | M11 | M12 | M13 | M14 | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26 | M27 | M28 | M33 | M01 | M29 | M30 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Working Material Cutting Parameter

TECHNISCHE ÄNDERUNGEN OHNE VORHERIGE INFORMATION VORBEHALTEN

## DR-L SB OIL FEED TWIST DRILLS - 135° Point Angle

| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP | Dimension (mm)  |        |      |     |     |    |     |         | Coating |
|--|-----------------|--------|------|-----|-----|----|-----|---------|---------|
|  | Hole Depth l2/D | D (h7) | l1   | l2  | l3  | l4 | L   | d2 (h6) | T8090   |
| W05 0800 12                            | 12 x D          | 8.00   | 40.0 | 96  | 108 | 36 | 145 | 8       | ○       |
| W05 0800 15                            | 15 x D          |        | 40.0 | 122 | 134 | 40 | 175 | 8       | ○       |
| W05 0800 20                            | 20 x D          |        | 40.0 | 162 | 174 | 40 | 215 | 8       | ○       |
| W05 0810 12                            | 12 x D          | 8.10   | 40.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0820 12                            | 12 x D          | 8.20   | 41.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0830 12                            | 12 x D          | 8.30   | 41.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0840 12                            | 12 x D          | 8.40   | 42.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0850 12                            | 12 x D          | 8.50   | 42.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0860 12                            | 12 x D          | 8.60   | 43.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0870 12                            | 12 x D          | 8.70   | 43.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0880 12                            | 12 x D          | 8.80   | 44.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0890 12                            | 12 x D          | 8.90   | 44.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0900 12                            | 12 x D          | 9.00   | 45.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0900 15                            | 15 x D          |        | 45.0 | 137 | 151 | 40 | 195 | 10      | ○       |
| W05 0900 20                            | 20 x D          |        | 45.0 | 182 | 196 | 40 | 240 | 10      | ○       |
| W05 0910 12                            | 12 x D          | 9.10   | 45.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0920 12                            | 12 x D          | 9.20   | 46.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0930 12                            | 12 x D          | 9.30   | 46.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0940 12                            | 12 x D          | 9.40   | 47.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0950 12                            | 12 x D          | 9.50   | 47.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0960 12                            | 12 x D          | 9.60   | 48.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0970 12                            | 12 x D          | 9.70   | 48.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0980 12                            | 12 x D          | 9.80   | 49.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 0990 12                            | 12 x D          | 9.90   | 49.5 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 1000 12                            | 12 x D          | 10.00  | 50.0 | 120 | 135 | 40 | 180 | 10      | ○       |
| W05 1000 15                            | 15 x D          |        | 50.0 | 152 | 167 | 40 | 210 | 10      | ○       |
| W05 1000 20                            | 20 x D          |        | 50.0 | 202 | 217 | 40 | 260 | 10      | ○       |

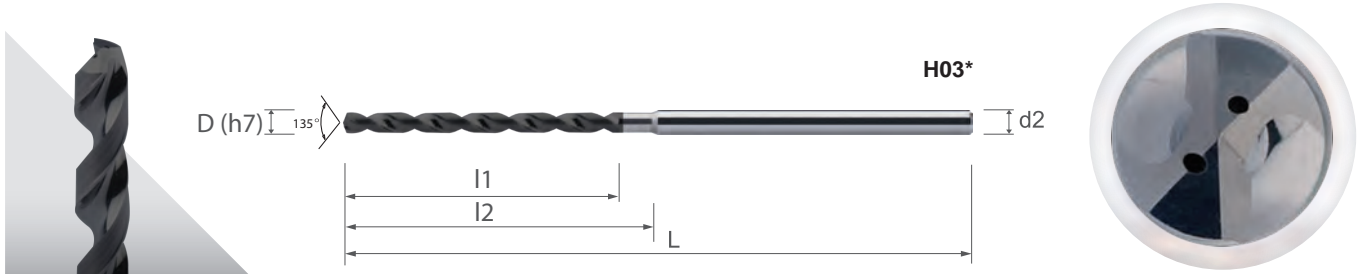
Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02 | M03 | M04 | M05 | M06 | M07 | M08 | M09 | M10 | M11 | M12 | M13 | M14 | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26 | M27 | M28 | M33 | M01 | M29 | M30 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Working Material Cutting Parameter

SPÉCIFICATIONS TECHNIQUES SUJETTES À CHANGEMENT SANS AVIS PRÉALABLE

# DR VA OIL FEED MINIATURE TWIST DRILLS



| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP<br>= *+Ødata | Dimension ( mm ) |        |      |      |    |         | Coating |  |
|---|------------------|--------|------|------|----|---------|---------|--|
|   | Hole Depth l2/D  | D (h7) | l1   | l2   | L  | d2 (h6) | G6110   |  |
| H03 0100 5  | 5 x D            | 1.00   | 6.5  | 8.0  | 50 | 3       | ○       |  |
| H03 0100 8  | 8 x D            |        | 9.5  | 11.0 | 50 | 3       | ○       |  |
| H03 0100 12   | 12 x D           |        | 13.5 | 15.0 | 55 | 3       | ○       |  |
| H03 0100 20   | 20 x D           |        | 21.5 | 23.0 | 65 | 3       | ○       |  |
| H03 0100 25   | 25 x D           |        | 26.5 | 28.0 | 70 | 3       | ○       |  |
| H03 0100 30   | 30 x D           |        | 31.5 | 33.0 | 75 | 3       | ○       |  |
| H03 0110 5  | 5 x D            | 1.10   | 7.2  | 8.7  | 50 | 3       | ○       |  |
| H03 0110 8  | 8 x D            |        | 10.5 | 12.0 | 50 | 3       | ○       |  |
| H03 0110 12   | 12 x D           |        | 14.9 | 16.4 | 55 | 3       | ○       |  |
| H03 0110 20   | 20 x D           |        | 23.7 | 25.2 | 65 | 3       | ○       |  |
| H03 0110 25   | 25 x D           |        | 29.2 | 30.7 | 70 | 3       | ○       |  |
| H03 0110 30   | 30 x D           |        | 34.7 | 36.2 | 75 | 3       | ○       |  |
| H03 0120 5  | 5 x D            | 1.20   | 7.8  | 9.3  | 50 | 3       | ○       |  |
| H03 0120 8  | 8 x D            |        | 11.4 | 12.9 | 50 | 3       | ○       |  |
| H03 0120 12   | 12 x D           |        | 16.2 | 17.7 | 55 | 3       | ○       |  |
| H03 0120 20   | 20 x D           |        | 25.8 | 27.3 | 65 | 3       | ○       |  |
| H03 0120 25   | 25 x D           |        | 31.8 | 33.3 | 70 | 3       | ○       |  |
| H03 0120 30   | 30 x D           |        | 37.8 | 39.3 | 75 | 3       | ○       |  |
| H03 0130 5  | 5 x D            | 1.30   | 8.5  | 10.0 | 50 | 3       | ○       |  |
| H03 0130 8  | 8 x D            |        | 12.4 | 13.9 | 50 | 3       | ○       |  |
| H03 0130 12   | 12 x D           |        | 17.6 | 19.1 | 55 | 3       | ○       |  |
| H03 0130 20   | 20 x D           |        | 28.0 | 29.5 | 65 | 3       | ○       |  |
| H03 0130 25   | 25 x D           |        | 34.5 | 36.0 | 70 | 3       | ○       |  |
| H03 0130 30   | 30 x D           |        | 41.0 | 42.5 | 85 | 3       | ○       |  |
| H03 0140 5  | 5 x D            | 1.40   | 9.1  | 10.6 | 50 | 3       | ○       |  |
| H03 0140 8  | 8 x D            |        | 13.3 | 14.8 | 50 | 3       | ○       |  |
| H03 0140 12   | 12 x D           |        | 18.9 | 20.4 | 55 | 3       | ○       |  |
| H03 0140 20   | 20 x D           |        | 30.1 | 31.6 | 65 | 3       | ○       |  |
| H03 0140 25   | 25 x D           |        | 37.1 | 38.6 | 75 | 3       | ○       |  |
| H03 0140 30   | 30 x D           |        | 44.1 | 45.6 | 85 | 3       | ○       |  |

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| Material group   |     | Material-Gruppe |     | Groupe matière |     | Gruppo materiali |     | 材质主类 |     |                   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------|-----|-----------------|-----|----------------|-----|------------------|-----|------|-----|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02              | M03 | M04             | M05 | M06            | M07 | M08              | M09 | M10  | M11 | M12               | M13 | M14 | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26              | M27 | M28             | M33 | M01            | M29 | M30              |     |      |     |                   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Working Material |     |                 |     |                |     |                  |     |      |     | Cutting Parameter |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

TECHNICAL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

# DR VA OIL FEED MINIATURE TWIST DRILLS

| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP<br>= *+Ødata | Dimension ( mm ) |        |      |      |     |         | Coating |
|---|------------------|--------|------|------|-----|---------|---------|
|   | Hole Depth l2/D  | D (h7) | l1   | l2   | L   | d2 (h6) | G6110   |
| H03 0150 5  | 5 x D            | 1.50   | 9.8  | 11.3 | 50  | 3       | ○       |
| H03 0150 8  | 8 x D            |        | 14.3 | 15.8 | 50  | 3       | ○       |
| H03 0150 12   | 12 x D           |        | 20.3 | 21.8 | 55  | 3       | ○       |
| H03 0150 20   | 20 x D           |        | 32.3 | 33.8 | 75  | 3       | ○       |
| H03 0150 25   | 25 x D           |        | 40.0 | 41.3 | 80  | 3       | ○       |
| H03 0150 30   | 30 x D           |        | 47.3 | 48.8 | 85  | 3       | ○       |
| H03 0160 5  | 5 x D            | 1.60   | 10.4 | 11.9 | 50  | 3       | ○       |
| H03 0160 8  | 8 x D            |        | 15.2 | 16.7 | 50  | 3       | ○       |
| H03 0160 12   | 12 x D           |        | 21.6 | 23.1 | 65  | 3       | ○       |
| H03 0160 20   | 20 x D           |        | 34.4 | 35.9 | 75  | 3       | ○       |
| H03 0160 25   | 25 x D           |        | 42.4 | 43.9 | 80  | 3       | ○       |
| H03 0160 30   | 30 x D           |        | 50.4 | 51.9 | 90  | 3       | ○       |
| H03 0170 5  | 5 x D            | 1.70   | 11.1 | 12.6 | 55  | 3       | ○       |
| H03 0170 8  | 8 x D            |        | 16.2 | 17.7 | 60  | 3       | ○       |
| H03 0170 12   | 12 x D           |        | 23.0 | 24.5 | 65  | 3       | ○       |
| H03 0170 20   | 20 x D           |        | 36.6 | 38.1 | 75  | 3       | ○       |
| H03 0170 25   | 25 x D           |        | 45.1 | 46.6 | 80  | 3       | ○       |
| H03 0170 30   | 30 x D           |        | 53.6 | 55.1 | 90  | 3       | ○       |
| H03 0180 5  | 5 x D            | 1.80   | 11.7 | 13.2 | 55  | 3       | ○       |
| H03 0180 8  | 8 x D            |        | 17.1 | 18.6 | 60  | 3       | ○       |
| H03 0180 12   | 12 x D           |        | 24.3 | 25.8 | 65  | 3       | ○       |
| H03 0180 20   | 20 x D           |        | 38.7 | 40.2 | 75  | 3       | ○       |
| H03 0180 25   | 25 x D           |        | 47.7 | 49.2 | 90  | 3       | ○       |
| H03 0180 30   | 30 x D           |        | 56.7 | 58.2 | 100 | 3       | ○       |
| H03 0190 5  | 5 x D            | 1.90   | 12.4 | 13.9 | 55  | 3       | ○       |
| H03 0190 8  | 8 x D            |        | 18.1 | 19.6 | 60  | 3       | ○       |
| H03 0190 12   | 12 x D           |        | 25.7 | 27.2 | 65  | 3       | ○       |
| H03 0190 20   | 20 x D           |        | 40.9 | 42.4 | 75  | 3       | ○       |
| H03 0190 25   | 25 x D           |        | 50.4 | 51.9 | 90  | 3       | ○       |
| H03 0190 30   | 30 x D           |        | 59.9 | 61.4 | 100 | 3       | ○       |
| H03 0200 5  | 5 x D            | 2.00   | 13.0 | 16.0 | 55  | 3       | ○       |
| H03 0200 8  | 8 x D            |        | 19.0 | 22.0 | 60  | 3       | ○       |
| H03 0200 12   | 12 x D           |        | 27.0 | 30.0 | 65  | 3       | ○       |
| H03 0200 20   | 20 x D           |        | 43.0 | 46.0 | 82  | 3       | ○       |
| H03 0200 25   | 25 x D           |        | 53.0 | 56.0 | 90  | 3       | ○       |
| H03 0200 30   | 30 x D           |        | 63.0 | 66.0 | 100 | 3       | ○       |
| H03 0210 5  | 5 x D            | 2.10   | 13.7 | 16.9 | 55  | 3       | ○       |
| H03 0210 8  | 8 x D            |        | 20.0 | 23.2 | 60  | 3       | ○       |
| H03 0210 12   | 12 x D           |        | 28.4 | 31.6 | 65  | 3       | ○       |
| H03 0210 20   | 20 x D           |        | 45.2 | 48.4 | 82  | 3       | ○       |
| H03 0210 25   | 25 x D           |        | 55.7 | 58.8 | 100 | 3       | ○       |
| H03 0210 30   | 30 x D           |        | 66.2 | 69.3 | 110 | 3       | ○       |

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| Material group   |     | Material-Gruppe |     | Groupe matière |     | Gruppo materiali |     | 材质主类 |     |     |     |                   |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------|-----|-----------------|-----|----------------|-----|------------------|-----|------|-----|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02              | M03 | M04             | M05 | M06            | M07 | M08              | M09 | M10  | M11 | M12 | M13 | M14               | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26              | M27 | M28             | M33 | M01            | M29 | M30              |     |      |     |     |     |                   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Working Material |     |                 |     |                |     |                  |     |      |     |     |     | Cutting Parameter |     |     |     |     |     |     |     |     |     |     |     |     |     |

TECHNISCHE ÄNDERUNGEN OHNE VORHERIGE INFORMATION VORBEHALTEN

## DR VA OIL FEED MINIATURE TWIST DRILLS

| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP | Dimension ( mm ) |        |      |      |     |         | Coating |
|--|------------------|--------|------|------|-----|---------|---------|
|  | Hole Depth l2/D  | D (h7) | l1   | l2   | L   | d2 (h6) | G6110   |
| H03 0220 5                             | 5 x D            | 2.20   | 14.3 | 17.6 | 55  | 3       | ○       |
| H03 0220 8                             | 8 x D            |        | 20.9 | 24.2 | 60  | 3       | ○       |
| H03 0220 12                            | 12 x D           |        | 29.7 | 33.0 | 65  | 3       | ○       |
| H03 0220 20                            | 20 x D           |        | 47.3 | 50.6 | 82  | 3       | ○       |
| H03 0220 25                            | 25 x D           |        | 58.3 | 61.6 | 100 | 3       | ○       |
| H03 0220 30                            | 30 x D           |        | 69.3 | 72.6 | 110 | 3       | ○       |
| H03 0230 5                             | 5 x D            | 2.30   | 15.0 | 18.5 | 55  | 3       | ○       |
| H03 0230 8                             | 8 x D            |        | 21.9 | 25.4 | 60  | 3       | ○       |
| H03 023012                             | 12 x D           |        | 31.1 | 34.6 | 65  | 3       | ○       |
| H03 0230 20                            | 20 x D           |        | 49.5 | 53.0 | 100 | 3       | ○       |
| H03 0230 25                            | 25 x D           |        | 61.0 | 64.4 | 100 | 3       | ○       |
| H03 0230 30                            | 30 x D           |        | 72.5 | 75.9 | 110 | 3       | ○       |
| H03 0240 5                             | 5 x D            | 2.40   | 15.6 | 19.2 | 55  | 3       | ○       |
| H03 0240 8                             | 8 x D            |        | 22.8 | 26.4 | 60  | 3       | ○       |
| H03 0240 12                            | 12 x D           |        | 32.4 | 36.0 | 75  | 3       | ○       |
| H03 0240 20                            | 20 x D           |        | 51.6 | 55.2 | 100 | 3       | ○       |
| H03 0240 25                            | 25 x D           |        | 63.6 | 67.2 | 100 | 3       | ○       |
| H03 0240 30                            | 30 x D           |        | 75.6 | 79.2 | 120 | 3       | ○       |
| H03 0250 5                             | 5 x D            | 2.50   | 16.3 | 20.1 | 55  | 3       | ○       |
| H03 0250 8                             | 8 x D            |        | 23.8 | 27.6 | 60  | 3       | ○       |
| H03 0250 12                            | 12 x D           |        | 33.8 | 37.6 | 75  | 3       | ○       |
| H03 0250 20                            | 20 x D           |        | 53.8 | 57.6 | 100 | 3       | ○       |
| H03 0250 25                            | 25 x D           |        | 66.3 | 70.0 | 110 | 3       | ○       |
| H03 0250 30                            | 30 x D           |        | 78.8 | 82.5 | 120 | 3       | ○       |
| H03 0260 5                             | 5 x D            | 2.60   | 16.9 | 20.8 | 55  | 3       | ○       |
| H03 0260 8                             | 8 x D            |        | 24.7 | 28.6 | 60  | 3       | ○       |
| H03 0260 12                            | 12 x D           |        | 35.1 | 39.0 | 75  | 3       | ○       |
| H03 0260 20                            | 20 x D           |        | 55.9 | 59.8 | 100 | 3       | ○       |
| H03 0260 25                            | 25 x D           |        | 68.9 | 72.8 | 110 | 3       | ○       |
| H03 0260 30                            | 30 x D           |        | 81.9 | 85.8 | 120 | 3       | ○       |
| H03 0270 5                             | 5 x D            | 2.70   | 17.6 | 21.7 | 55  | 3       | ○       |
| H03 0270 8                             | 8 x D            |        | 25.7 | 29.8 | 60  | 3       | ○       |
| H03 0270 12                            | 12 x D           |        | 36.5 | 40.6 | 75  | 3       | ○       |
| H03 0270 20                            | 20 x D           |        | 58.1 | 62.2 | 100 | 3       | ○       |
| H03 0270 25                            | 25 x D           |        | 71.6 | 75.6 | 110 | 3       | ○       |
| H03 0270 30                            | 30 x D           |        | 85.1 | 89.1 | 120 | 3       | ○       |
| H03 0280 5                             | 5 x D            | 2.80   | 18.2 | 22.4 | 55  | 3       | ○       |
| H03 0280 8                             | 8 x D            |        | 26.6 | 30.8 | 60  | 3       | ○       |
| H03 028012                             | 12 x D           |        | 37.8 | 42.0 | 75  | 3       | ○       |
| H03 0280 20                            | 20 x D           |        | 60.2 | 64.4 | 100 | 3       | ○       |
| H03 0280 25                            | 25 x D           |        | 74.2 | 78.4 | 110 | 3       | ○       |
| H03 0280 30                            | 30 x D           |        | 88.2 | 92.4 | 130 | 3       | ○       |

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Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02 | M03 | M04 | M05 | M06 | M07 | M08 | M09 | M10 | M11 | M12 | M13 | M14 | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26 | M27 | M28 | M33 | M01 | M29 | M30 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Working Material | Cutting Parameter

SPÉCIFICATIONS TECHNIQUES SUJETTES À CHANGEMENT SANS AVIS PRÉALABLE



## DR VA OIL FEED MINIATURE TWIST DRILLS

| EDPNo./EDV-Nr./<br>CODEusine/CodiceEDP<br>=*+Ødata | Dimension ( mm ) |        |      |      |     |         | Coating |
|--|------------------|--------|------|------|-----|---------|---------|
|  | Hole Depth l2/D  | D (h7) | l1   | l2   | L   | d2 (h6) | G6110   |
| H03 0290 5   | 5 x D            | 2.90   | 18.9 | 23.3 | 55  | 3       | ○       |
| H03 0290 8   | 8 x D            |        | 27.6 | 32.0 | 60  | 3       | ○       |
| H03 0290 12  | 12 x D           |        | 39.2 | 43.6 | 75  | 3       | ○       |
| H03 0290 20  | 20 x D           |        | 61.4 | 65.8 | 100 | 3       | ○       |
| H03 0290 25  | 25 x D           |        | 76.9 | 81.2 | 110 | 3       | ○       |
| H03 0290 30  | 30 x D           |        | 91.4 | 95.7 | 130 | 3       | ○       |
| H03 0300 5   | 5 x D            | 3.00   | 19.5 | 24.0 | 55  | 3       | ○       |
| H03 0300 8   | 8 x D            |        | 28.5 | 33.0 | 60  | 3       | ○       |
| H03 0300 12  | 12 x D           |        | 40.5 | 45.0 | 75  | 3       | ○       |
| H03 0300 20  | 20 x D           |        | 64.5 | 69.0 | 100 | 3       | ○       |
| H03 0300 25  | 25 x D           |        | 79.5 | 84.0 | 120 | 3       | ○       |
| H03 0300 30  | 30 x D           |        | 94.5 | 99.0 | 130 | 3       | ○       |

Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| M02 | M03 | M04 | M05 | M06 | M07 | M08 | M09 | M10 | M11 | M12 | M13 | M14 | M15 | M18 | M22 | M25 | M31 | M16 | M20 | M17 | M19 | M21 | M23 | M24 | M32 |
| M26 | M27 | M28 | M33 | M01 | M29 | M30 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Working Material | Cutting Parameter

MODIFICHE TECNICHE POSSIBILI SENZA PREAVVISO

## DR-L Oil Feed Twist Drills Cutting Parameters - 12xø & 15xø

| Work Material                        | Material Groups / Hardness (HB) | 12xø, 15xø    |                           |                                 |                                |                     |
|--------------------------------------|---------------------------------|---------------|---------------------------|---------------------------------|--------------------------------|---------------------|
|                                      |                                 | Diameter (mm) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Feed Rate (Min - Max) (mm/rev) | Table Feed (mm/min) |
| P<br>Non - Alloyed Steel, Cast Steel | M15, M18, M22<br>≤ 180 HB       | 1.00          | 30                        | 8,160                           | 0.04 (0.015 - 0.05)            | 325                 |
|                                      |                                 | 1.50          | 40                        | 8,000                           | 0.045 (0.02 - 0.055)           | 360                 |
|                                      |                                 | 2.00          | 50                        | 7,950                           | 0.05 (0.025 - 0.06)            | 390                 |
|                                      |                                 | 2.50          | 60                        | 7,810                           | 0.055 (0.03 - 0.07)            | 420                 |
|                                      |                                 | 3.00          | 70                        | 7,560                           | 0.06 (0.035 - 0.08)            | 450                 |
|                                      |                                 | 3.50          | 75                        | 6,800                           | 0.07 (0.04 - 0.09)             | 475                 |
|                                      |                                 | 4.00          | 80                        | 6,460                           | 0.08 (0.05 - 0.10)             | 500                 |
|                                      |                                 | 4.50          | 80                        | 5,810                           | 0.09 (0.055 - 0.11)            | 510                 |
|                                      |                                 | 5.00          | 80                        | 4,840                           | 0.10 (0.06 - 0.12)             | 485                 |
|                                      |                                 | 5.50          | 80                        | 4,670                           | 0.11 (0.07 - 0.13)             | 520                 |
|                                      |                                 | 6.00          | 85                        | 4,500                           | 0.12 (0.08 - 0.15)             | 540                 |
|                                      |                                 | 6.50          | 90                        | 4,350                           | 0.13 (0.09 - 0.17)             | 560                 |
|                                      |                                 | 7.00          | 90                        | 4,250                           | 0.14 (0.10 - 0.20)             | 850                 |
|                                      |                                 | 7.50          | 90                        | 4,130                           | 0.15 (0.11 - 0.23)             | 590                 |
|                                      |                                 | 8.00          | 95                        | 3,820                           | 0.16 (0.13 - 0.25)             | 610                 |
|                                      |                                 | 8.50          | 95                        | 3,650                           | 0.18 (0.14 - 0.26)             | 650                 |
|                                      |                                 | 9.00          | 100                       | 3,480                           | 0.20 (0.15 - 0.28)             | 690                 |
|                                      |                                 | 9.50          | 100                       | 3,300                           | 0.22 (0.16 - 0.30)             | 720                 |
|                                      |                                 | 10.00         | 100                       | 2,970                           | 0.24 (0.20 - 0.32)             | 710                 |
|                                      |                                 | 10.50         | 100                       | 2,820                           | 0.25 (0.21 - 0.33)             | 705                 |
| 11.00                                | 100                             | 2,690         | 0.26 (0.22 - 0.34)        | 695                             |                                |                     |
| 11.50                                | 100                             | 2,500         | 0.28 (0.23 - 0.35)        | 700                             |                                |                     |
| 12.00                                | 100                             | 2,430         | 0.30 (0.24 - 0.36)        | 730                             |                                |                     |
| 12.50                                | 100                             | 2,350         | 0.31 (0.25 - 0.37)        | 725                             |                                |                     |
| Alloyed Steel                        | M25, M31<br>180 ~ 280 HB        | 1.00          | 30                        | 7,080                           | 0.04 (0.015 - 0.080)           | 285                 |
|                                      |                                 | 1.50          | 30                        | 7,020                           | 0.045 (0.02 - 0.09)            | 315                 |
|                                      |                                 | 2.00          | 40                        | 7,010                           | 0.05 (0.025 - 0.10)            | 350                 |
|                                      |                                 | 2.50          | 50                        | 6,900                           | 0.055 (0.03 - 0.11)            | 380                 |
|                                      |                                 | 3.00          | 60                        | 6,810                           | 0.06 (0.035 - 0.080)           | 400                 |
|                                      |                                 | 3.50          | 65                        | 6,120                           | 0.07 (0.04 - 0.09)             | 420                 |
|                                      |                                 | 4.00          | 70                        | 5,810                           | 0.08 (0.05 - 0.10)             | 460                 |
|                                      |                                 | 4.50          | 70                        | 5,220                           | 0.09 (0.055 - 0.11)            | 470                 |
|                                      |                                 | 5.00          | 70                        | 4,350                           | 0.10 (0.06 - 0.12)             | 440                 |
|                                      |                                 | 5.50          | 70                        | 4,200                           | 0.11 (0.07 - 0.13)             | 465                 |
|                                      |                                 | 6.00          | 70                        | 4,050                           | 0.12 (0.08 - 0.15)             | 480                 |
|                                      |                                 | 6.50          | 80                        | 3,910                           | 0.13 (0.09 - 0.17)             | 500                 |
|                                      |                                 | 7.00          | 80                        | 3,820                           | 0.14 (0.10 - 0.20)             | 530                 |
|                                      |                                 | 7.50          | 80                        | 3,710                           | 0.15 (0.11 - 0.23)             | 550                 |
|                                      |                                 | 8.00          | 80                        | 3,430                           | 0.16 (0.13 - 0.25)             | 540                 |
|                                      |                                 | 8.50          | 80                        | 3,280                           | 0.18 (0.14 - 0.26)             | 580                 |
|                                      |                                 | 9.00          | 85                        | 3,130                           | 0.20 (0.15 - 0.28)             | 620                 |
|                                      |                                 | 9.50          | 85                        | 2,970                           | 0.22 (0.16 - 0.30)             | 650                 |
|                                      |                                 | 10.00         | 85                        | 2,670                           | 0.24 (0.20 - 0.32)             | 640                 |
|                                      |                                 | 10.50         | 85                        | 2,530                           | 0.25 (0.21 - 0.33)             | 635                 |
| 11.00                                | 85                              | 2,420         | 0.26 (0.22 - 0.34)        | 625                             |                                |                     |
| 11.50                                | 85                              | 2,250         | 0.28 (0.23 - 0.35)        | 630                             |                                |                     |
| 12.00                                | 85                              | 2,180         | 0.30 (0.24 - 0.36)        | 655                             |                                |                     |
| 12.50                                | 85                              | 2,110         | 0.31 (0.25 - 0.37)        | 660                             |                                |                     |

## DR-L Oil Feed Twist Drills Cutting Parameters - 12xø & 15xø

| Work Material                           | Material Groups / Hardness (HB)      | 12xø, 15xø    |                           |                                 |                                |                     |
|---|--------------------------------------|---------------|---------------------------|---------------------------------|--------------------------------|---------------------|
|   |                                      | Diameter (mm) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Feed Rate (Min - Max) (mm/rev) | Table Feed (mm/min) |
| P                                       | Alloyed Steel<br>M31<br>280 ~ 350 HB | 1.00          | 30                        | 8,580                           | 0.015 (0.009 - 0.04)           | 125                 |
|   |                                      | 1.50          | 30                        | 8,200                           | 0.02 (0.01 - 0.05)             | 160                 |
|   |                                      | 2.00          | 45                        | 7,150                           | 0.03 (0.015 - 0.06)            | 215                 |
|   |                                      | 2.50          | 55                        | 7,100                           | 0.035 (0.02 - 0.07)            | 245                 |
|   |                                      | 3.00          | 65                        | 6,900                           | 0.05 (0.025 - 0.08)            | 350                 |
|   |                                      | 3.50          | 70                        | 6,800                           | 0.06 (0.03 - 0.09)             | 400                 |
|   |                                      | 4.00          | 70                        | 6,500                           | 0.07 (0.04 - 0.10)             | 450                 |
|   |                                      | 4.50          | 70                        | 5,500                           | 0.08 (0.05 - 0.11)             | 440                 |
|   |                                      | 5.00          | 70                        | 4,400                           | 0.09 (0.06 - 0.12)             | 395                 |
|   |                                      | 5.50          | 70                        | 4,200                           | 0.11 (0.07 - 0.13)             | 460                 |
|   |                                      | 6.00          | 75                        | 4,000                           | 0.12 (0.08 - 0.15)             | 470                 |
|   |                                      | 6.50          | 75                        | 3,800                           | 0.13 (0.09 - 0.17)             | 490                 |
|   |                                      | 7.00          | 75                        | 3,500                           | 0.14 (0.10 - 0.20)             | 500                 |
|   |                                      | 7.50          | 75                        | 3,300                           | 0.15 (0.11 - 0.23)             | 495                 |
|   |                                      | 8.00          | 80                        | 3,100                           | 0.16 (0.13 - 0.25)             | 480                 |
|   |                                      | 8.50          | 80                        | 3,000                           | 0.17 (0.14 - 0.26)             | 500                 |
|   |                                      | 9.00          | 80                        | 2,800                           | 0.18 (0.15 - 0.28)             | 505                 |
|   |                                      | 9.50          | 80                        | 2,650                           | 0.19 (0.16 - 0.30)             | 510                 |
|   |                                      | 10.00         | 80                        | 2,500                           | 0.20 (0.20 - 0.32)             | 515                 |
|   |                                      | 10.50         | 80                        | 2,400                           | 0.22 (0.21 - 0.33)             | 520                 |
| 11.00                                   | 80                                   | 2,300         | 0.23 (0.22 - 0.34)        | 530                             |                                |                     |
| 11.50                                   | 80                                   | 2,200         | 0.24 (0.23 - 0.35)        | 535                             |                                |                     |
| 12.00                                   | 80                                   | 2,100         | 0.25 (0.24 - 0.36)        | 525                             |                                |                     |
| 12.50                                   | 80                                   | 2,050         | 0.26 (0.25 - 0.37)        | 530                             |                                |                     |
| M                                       | Stainless Steel up to 35 HRC<br>M16  | 1.00          | 25                        | 7,500                           | 0.015 (0.009 - 0.04)           | 120                 |
|   |                                      | 1.50          | 30                        | 6,570                           | 0.02 (0.01 - 0.05)             | 150                 |
|   |                                      | 2.00          | 30                        | 5,460                           | 0.035 (0.015 - 0.06)           | 210                 |
|   |                                      | 2.50          | 35                        | 4,500                           | 0.04 (0.020 - 0.065)           | 230                 |
|   |                                      | 3.00          | 35                        | 3,980                           | 0.05 (0.025 - 0.07)            | 280                 |
|   |                                      | 3.50          | 35                        | 3,600                           | 0.06 (0.03 - 0.08)             | 300                 |
|   |                                      | 4.00          | 35                        | 3,100                           | 0.065 (0.05 - 0.09)            | 315                 |
|   |                                      | 4.50          | 35                        | 2,675                           | 0.07 (0.055 - 0.10)            | 320                 |
|   |                                      | 5.00          | 40                        | 2,540                           | 0.075 (0.06 - 0.11)            | 330                 |
|   |                                      | 5.50          | 40                        | 2,350                           | 0.085 (0.07 - 0.12)            | 340                 |
|   | 6.00                                 | 40            | 2,200                     | 0.09 (0.08 - 0.13)              | 325                            |                     |
|   | 6.50                                 | 40            | 2,130                     | 0.10 (0.09 - 0.14)              | 305                            |                     |
|   | 7.00                                 | 40            | 2,000                     | 0.11 (0.10 - 0.15)              | 335                            |                     |
|   | 7.50                                 | 40            | 1,990                     | 0.12 (0.11 - 0.16)              | 310                            |                     |
|   | 8.00                                 | 40            | 1,880                     | 0.13 (0.12 - 0.17)              | 345                            |                     |
|   | 8.50                                 | 40            | 1,550                     | 0.14 (0.13 - 0.18)              | 355                            |                     |
|   | 9.00                                 | 45            | 1,380                     | 0.15 (0.14 - 0.19)              | 285                            |                     |
|   | 9.50                                 | 45            | 1,350                     | 0.16 (0.15 - 0.20)              | 295                            |                     |
|   | 10.00                                | 45            | 1,225                     | 0.17 (0.16 - 0.21)              | 275                            |                     |
|   | 10.50                                | 45            | 1,150                     | 0.18 (0.17 - 0.22)              | 270                            |                     |
| 11.00                                   | 45                                   | 1,100         | 0.19 (0.18 - 0.23)        | 255                             |                                |                     |
| 11.50                                   | 45                                   | 1,050         | 0.20 (0.19 - 0.24)        | 260                             |                                |                     |
| 12.00                                   | 45                                   | 990           | 0.21 (0.20 - 0.25)        | 250                             |                                |                     |
| 12.50                                   | 45                                   | 985           | 0.22 (0.21 - 0.26)        | 240                             |                                |                     |
| Stainless Steel more than 35 HRC<br>M20 | 7.00                                 | 40            | 2,000                     | 0.11 (0.10 - 0.15)              | 335                            |                     |
|   | 7.50                                 | 40            | 1,990                     | 0.12 (0.11 - 0.16)              | 310                            |                     |
|   | 8.00                                 | 40            | 1,880                     | 0.13 (0.12 - 0.17)              | 345                            |                     |
|   | 8.50                                 | 40            | 1,550                     | 0.14 (0.13 - 0.18)              | 355                            |                     |
|   | 9.00                                 | 45            | 1,380                     | 0.15 (0.14 - 0.19)              | 285                            |                     |
|   | 9.50                                 | 45            | 1,350                     | 0.16 (0.15 - 0.20)              | 295                            |                     |
|   | 10.00                                | 45            | 1,225                     | 0.17 (0.16 - 0.21)              | 275                            |                     |
|   | 10.50                                | 45            | 1,150                     | 0.18 (0.17 - 0.22)              | 270                            |                     |
|   | 11.00                                | 45            | 1,100                     | 0.19 (0.18 - 0.23)              | 255                            |                     |
|   | 11.50                                | 45            | 1,050                     | 0.20 (0.19 - 0.24)              | 260                            |                     |

## DR-L Oil Feed Twist Drills Cutting Parameters - 12xø & 15xø

| Work Material                               | Material Groups / Hardness (HB)        | 12xø, 15xø                               |                           |                                 |                                |                     |
|---|--|--|---------------------------|---------------------------------|--------------------------------|---------------------|
|   |  | Diameter (mm)                            | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Feed Rate (Min - Max) (mm/rev) | Table Feed (mm/min) |
| Cast iron<br>GG10 ... GG20<br>Cobalt Chrome | M10<br>up to 200 HB                    | 1.00                                     | 30                        | 9,900                           | 0.02 (0.01 - 0.04)             | 200                 |
|   |  | 1.50                                     | 45                        | 9,380                           | 0.025 (0.015 - 0.05)           | 230                 |
|   |  | 2.00                                     | 50                        | 9,000                           | 0.03 (0.02 - 0.06)             | 270                 |
|   |  | 2.50                                     | 65                        | 8,570                           | 0.045 (0.025 - 0.07)           | 400                 |
|   |  | 3.00                                     | 75                        | 8,120                           | 0.055 (0.03 - 0.08)            | 480                 |
|   |  | 3.50                                     | 80                        | 7,500                           | 0.065 (0.04 - 0.09)            | 485                 |
|   |  | 4.00                                     | 85                        | 6,900                           | 0.07 (0.05 - 0.10)             | 490                 |
|   |  | 4.50                                     | 90                        | 6,500                           | 0.08 (0.06 - 0.11)             | 520                 |
|   |  | 5.00                                     | 90                        | 5,700                           | 0.09 (0.065 - 0.12)            | 515                 |
|   |  | 5.50                                     | 95                        | 5,500                           | 0.10 (0.07 - 0.13)             | 550                 |
|   |  | 6.00                                     | 95                        | 5,100                           | 0.11 (0.08 - 0.15)             | 555                 |
|   |  | 6.50                                     | 95                        | 4,700                           | 0.12 (0.09 - 0.17)             | 570                 |
|   |  | 7.00                                     | 95                        | 4,300                           | 0.13 (0.10 - 0.19)             | 560                 |
|   |  | 7.50                                     | 95                        | 3,990                           | 0.14 (0.11 - 0.21)             | 530                 |
|   |  | 8.00                                     | 95                        | 3,700                           | 0.15 (0.13 - 0.22)             | 525                 |
| Cast iron<br>GG25 ... GG35                  | M11<br>up to 250 HB                    | 8.50                                     | 95                        | 3,620                           | 0.16 (0.14 - 0.23)             | 540                 |
|   |  | 9.00                                     | 95                        | 3,400                           | 0.17 (0.15 - 0.25)             | 510                 |
|   |  | 9.50                                     | 95                        | 3,230                           | 0.18 (0.16 - 0.26)             | 470                 |
|   |  | 10.00                                    | 100                       | 3,150                           | 0.19 (0.17 - 0.28)             | 475                 |
|   |  | 10.50                                    | 100                       | 3,000                           | 0.20 (0.21 - 0.30)             | 480                 |
|   |  | 11.00                                    | 100                       | 2,980                           | 0.22 (0.22 - 0.31)             | 500                 |
|   |  | 11.50                                    | 100                       | 2,800                           | 0.24 (0.23 - 0.32)             | 505                 |
|   |  | 12.00                                    | 100                       | 2,670                           | 0.25 (0.24 - 0.33)             | 545                 |
|   |  | 12.50                                    | 100                       | 2,400                           | 0.26 (0.25 - 0.34)             | 535                 |
|   |  | Nodular Iron<br>(SG-Iron)<br>GGG40-GGG50 | M12<br>over 250 HB        | 1.00                            | 25                             | 7,950               |
| 1.50  | 30                                     |  |                           | 6,320                           | 0.015 (0.007 - 0.03)           | 125                 |
| 2.00  | 35                                     |  |                           | 5,910                           | 0.02 (0.008 - 0.05)            | 150                 |
| 2.50  | 35                                     |  |                           | 4,560                           | 0.025 (0.009 - 0.06)           | 175                 |
| 3.00  | 35                                     |  |                           | 4,025                           | 0.03 (0.01 - 0.07)             | 190                 |
| 3.50  | 40                                     |  |                           | 3,880                           | 0.035 (0.02 - 0.08)            | 200                 |
| 4.00  | 40                                     |  |                           | 3,210                           | 0.05 (0.03 - 0.09)             | 280                 |
| 4.50  | 45                                     |  |                           | 3,180                           | 0.07 (0.055 - 0.10)            | 385                 |
| 5.00  | 45                                     |  |                           | 3,000                           | 0.075 (0.06 - 0.11)            | 400                 |
| 5.50  | 45                                     |  |                           | 2,780                           | 0.085 (0.07 - 0.12)            | 415                 |
| Nodular Iron<br>(SG-Iron)<br>GGG60-GGG90    | M13<br>up to 600 N/mm <sup>2</sup>     | 6.00                                     | 45                        | 2,510                           | 0.09 (0.08 - 0.13)             | 410                 |
|   |  | 6.50                                     | 45                        | 2,370                           | 0.10 (0.09 - 0.14)             | 420                 |
|   |  | 7.00                                     | 45                        | 2,180                           | 0.11 (0.10 - 0.15)             | 425                 |
|   |  | 7.50                                     | 45                        | 2,050                           | 0.12 (0.11 - 0.16)             | 440                 |
|   |  | 8.00                                     | 50                        | 1,990                           | 0.13 (0.12 - 0.17)             | 450                 |
|   |  | 8.50                                     | 50                        | 1,880                           | 0.14 (0.13 - 0.18)             | 460                 |
|   |  | 9.00                                     | 50                        | 1,760                           | 0.15 (0.14 - 0.19)             | 435                 |
|   |  | 9.50                                     | 50                        | 1,580                           | 0.16 (0.15 - 0.20)             | 405                 |
| Malleable Iron                              | M14<br>more than 600 N/mm <sup>2</sup> | 10.00                                    | 50                        | 1,530                           | 0.17 (0.16 - 0.21)             | 430                 |
|   |  | 10.50                                    | 50                        | 1,490                           | 0.18 (0.17 - 0.22)             | 445                 |
|   |  | 11.00                                    | 50                        | 1,420                           | 0.19 (0.18 - 0.23)             | 455                 |
|   |  | 11.50                                    | 50                        | 1,375                           | 0.20 (0.19 - 0.24)             | 380                 |
|   |  | 12.00                                    | 50                        | 1,320                           | 0.21 (0.20 - 0.25)             | 340                 |
|   |  | 12.50                                    | 50                        | 1,285                           | 0.22 (0.21 - 0.26)             | 310                 |

## DR-L Oil Feed Twist Drills Cutting Parameters - 12xø & 15xø

| Work Material | Material Groups / Hardness (HB) | 12xø, 15xø    |                           |                                 |                                |                      |                     |     |
|---------------|---------------------------------|---------------|---------------------------|---------------------------------|--------------------------------|----------------------|---------------------|-----|
|               |                                 | Diameter (mm) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Feed Rate (Min - Max) (mm/rev) | Table Feed (mm/min)  |                     |     |
| N             | Aluminium (Si content > 10%)    | M06, M07      | 1.00                      | 40                              | 13,100                         | 0.06 (0.035 - 0.10)  | 790                 |     |
|               |                                 | 1.50          | 60                        | 12,900                          | 0.075 (0.04 - 0.12)            | 960                  |                     |     |
|               |                                 | 2.00          | 80                        | 12,650                          | 0.08 (0.045 - 0.15)            | 1,010                |                     |     |
|               |                                 | 2.50          | 95                        | 11,950                          | 0.09 (0.055 - 0.18)            | 1,125                |                     |     |
|               |                                 | 3.00          | 100                       | 10,650                          | 0.10 (0.06 - 0.20)             | 1,200                |                     |     |
|               |                                 | 3.50          | 100                       | 9,500                           | 0.12 (0.07 - 0.22)             | 1,260                |                     |     |
|               |                                 | 4.00          | 100                       | 7,860                           | 0.15 (0.09 - 0.24)             | 1,215                |                     |     |
|               | 4.50                            | 100           | 7,050                     | 0.18 (0.11 - 0.26)              | 1,314                          |                      |                     |     |
|               | Aluminium (Si content < 10%)    | M02, M04, M05 | 5.00                      | 100                             | 6,350                          | 0.20 (0.17 - 0.31)   | 1,270               |     |
|               |                                 | 5.50          | 100                       | 5,800                           | 0.22 (0.20 - 0.33)             | 1,275                |                     |     |
|               |                                 | 6.00          | 100                       | 5,370                           | 0.24 (0.22 - 0.35)             | 1,285                |                     |     |
|               |                                 | 6.50          | 100                       | 4,950                           | 0.26 (0.23 - 0.37)             | 1,280                |                     |     |
|               |                                 | 7.00          | 105                       | 4,760                           | 0.28 (0.24 - 0.39)             | 1,335                |                     |     |
|               |                                 | 7.50          | 105                       | 4,550                           | 0.31 (0.26 - 0.41)             | 1,410                |                     |     |
|               |                                 | 8.00          | 110                       | 4,300                           | 0.32 (0.28 - 0.42)             | 1,375                |                     |     |
|               | Copper, Brass, Bronze           | M03, M08, M09 | 8.50                      | 110                             | 4,120                          | 0.33 (0.29 - 0.43)   | 1,360               |     |
|               |                                 | 9.00          | 110                       | 3,900                           | 0.34 (0.31 - 0.45)             | 1,325                |                     |     |
|               |                                 | 9.50          | 110                       | 3,700                           | 0.34 (0.31 - 0.45)             | 1,255                |                     |     |
|               |                                 | 10.00         | 110                       | 3,490                           | 0.38 (0.33 - 0.48)             | 1,320                |                     |     |
|               |                                 | 10.50         | 110                       | 3,350                           | 0.40 (0.34 - 0.50)             | 1,340                |                     |     |
|               |                                 | 11.00         | 110                       | 3,180                           | 0.42 (0.36 - 0.51)             | 1,335                |                     |     |
| 11.50         |                                 | 115           | 3,150                     | 0.43 (0.37 - 0.52)              | 1,355                          |                      |                     |     |
| 12.00         | 125                             | 3,100         | 0.44 (0.38 - 0.53)        | 1,365                           |                                |                      |                     |     |
| 12.50         | 125                             | 3,090         | 0.45 (0.40 - 0.54)        | 1,390                           |                                |                      |                     |     |
| S             | Titanium Alloys                 | M17, M21      | 1.00                      | 10                              | 2,800                          | 0.012 (0.01 - 0.025) | 35                  |     |
|               |                                 | 1.50          | 10                        | 2,000                           | 0.015 (0.012 - 0.03)           | 30                   |                     |     |
|               |                                 | 2.00          | 10                        | 1,780                           | 0.02 (0.015 - 0.05)            | 40                   |                     |     |
|               |                                 | 2.50          | 10                        | 1,450                           | 0.03 (0.02 - 0.06)             | 60                   |                     |     |
|               |                                 | 3.00          | 10                        | 1,300                           | 0.05 (0.03 - 0.08)             | 95                   |                     |     |
|               |                                 | 3.50          | 10                        | 1,220                           | 0.055 (0.035 - 0.09)           | 100                  |                     |     |
|               |                                 | 4.00          | 10                        | 1,130                           | 0.06 (0.04 - 0.10)             | 105                  |                     |     |
|               |                                 | 4.50          | 15                        | 1,050                           | 0.065 (0.045 - 0.11)           | 110                  |                     |     |
|               |                                 | 5.00          | 15                        | 980                             | 0.07 (0.05 - 0.12)             | 115                  |                     |     |
|               |                                 | 5.50          | 15                        | 900                             | 0.075 (0.07 - 0.13)            | 120                  |                     |     |
|               |                                 | 6.00          | 15                        | 850                             | 0.08 (0.075 - 0.14)            | 125                  |                     |     |
|               |                                 | 6.50          | 15                        | 800                             | 0.09 (0.085 - 0.145)           | 130                  |                     |     |
|               |                                 | Nickel Alloys | M19, M23, M24, M32        | 7.00                            | 15                             | 760                  | 0.095 (0.09 - 0.15) | 135 |
|               |                                 |               | 7.50                      | 15                              | 720                            | 0.10 (0.095 - 0.16)  | 90                  |     |
|               | 8.00                            |               | 15                        | 660                             | 0.12 (0.11 - 0.17)             | 85                   |                     |     |
|               | 8.50                            |               | 15                        | 620                             | 0.125 (0.12 - 0.18)            | 80                   |                     |     |
|               | 9.00                            |               | 15                        | 580                             | 0.13 (0.125 - 0.19)            | 75                   |                     |     |
|               | 9.50                            |               | 15                        | 520                             | 0.135 (0.13 - 0.20)            | 70                   |                     |     |
|               | 10.00                           |               | 15                        | 500                             | 0.14 (0.135 - 0.21)            | 70                   |                     |     |
|               | 10.50                           | 15            | 480                       | 0.145 (0.14 - 0.22)             | 65                             |                      |                     |     |
|               | 11.00                           | 15            | 440                       | 0.15 (0.145 - 0.23)             | 65                             |                      |                     |     |
| 11.50         | 15                              | 420           | 0.155 (0.15 - 0.24)       | 65                              |                                |                      |                     |     |
| 12.00         | 15                              | 380           | 0.16 (0.155 - 0.25)       | 60                              |                                |                      |                     |     |
| 12.50         | 15                              | 300           | 0.165 (0.16 - 0.26)       | 55                              |                                |                      |                     |     |

## DR-L Oil Feed Twist Drills Cutting Parameters - 20xø, 25xø & 30xø

| Work Material                        | Material Groups / Hardness (HB) | Diameter (mm) | Feed Rate (Min - Max) (mm/rev) | 20xø, 25xø                |                                 |                     | 30xø                      |                                 |                     |
|--------------------------------------|---------------------------------|---------------|--------------------------------|---------------------------|---------------------------------|---------------------|---------------------------|---------------------------------|---------------------|
|                                      |                                 |               |                                | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) |
| P<br>Non - Alloyed Steel, Cast Steel | M15, M18, M22<br>≤ 180 HB       | 1.00          | 0.04 (0.015 - 0.05)            | 25                        | 7,750                           | 310                 | 20                        | 6,370                           | 290                 |
|                                      |                                 | 1.50          | 0.045 (0.02 - 0.055)           | 30                        | 7,600                           | 345                 | 25                        | 5,310                           | 330                 |
|                                      |                                 | 2.00          | 0.05 (0.025 - 0.06)            | 40                        | 7,550                           | 370                 | 30                        | 4,770                           | 350                 |
|                                      |                                 | 2.50          | 0.055 (0.03 - 0.07)            | 50                        | 7,420                           | 400                 | 40                        | 5,090                           | 380                 |
|                                      |                                 | 3.00          | 0.06 (0.035 - 0.08)            | 60                        | 7,180                           | 425                 | 50                        | 5,310                           | 400                 |
|                                      |                                 | 3.50          | 0.07 (0.04 - 0.09)             | 60                        | 6,460                           | 450                 | 50                        | 4,550                           | 430                 |
|                                      |                                 | 4.00          | 0.08 (0.05 - 0.10)             | 65                        | 6,135                           | 475                 | 55                        | 4,380                           | 450                 |
|                                      |                                 | 4.50          | 0.09 (0.055 - 0.11)            | 65                        | 5,520                           | 485                 | 55                        | 3,910                           | 460                 |
|                                      |                                 | 5.00          | 0.10 (0.06 - 0.12)             | 65                        | 4,555                           | 460                 | 55                        | 3,520                           | 440                 |
|                                      |                                 | 5.50          | 0.11 (0.07 - 0.13)             | 65                        | 4,435                           | 495                 | 55                        | 3,200                           | 470                 |
|                                      |                                 | 6.00          | 0.12 (0.08 - 0.15)             | 70                        | 4,275                           | 515                 | 60                        | 3,160                           | 480                 |
|                                      |                                 | 6.50          | 0.13 (0.09 - 0.17)             | 75                        | 4,130                           | 530                 | 60                        | 2,940                           | 500                 |
|                                      |                                 | 7.00          | 0.14 (0.10 - 0.20)             | 75                        | 4,035                           | 810                 | 60                        | 2,730                           | 760                 |
|                                      |                                 | 7.50          | 0.15 (0.11 - 0.23)             | 75                        | 3,925                           | 560                 | 60                        | 2,550                           | 530                 |
|                                      |                                 | 8.00          | 0.16 (0.13 - 0.25)             | 80                        | 3,630                           | 580                 | 65                        | 2,590                           | 550                 |
|                                      |                                 | 8.50          | 0.18 (0.14 - 0.26)             | 80                        | 3,470                           | 615                 | 65                        | 2,430                           | 580                 |
|                                      |                                 | 9.00          | 0.20 (0.15 - 0.28)             | 85                        | 3,305                           | 655                 | 70                        | 2,470                           | 620                 |
|                                      |                                 | 9.50          | 0.22 (0.16 - 0.30)             | 85                        | 3,135                           | 685                 | 70                        | 2,350                           | 650                 |
|                                      |                                 | 10.00         | 0.24 (0.20 - 0.32)             | 85                        | 2,825                           | 675                 | 70                        | 2,230                           | 640                 |
|                                      |                                 | 10.50         | 0.25 (0.21 - 0.33)             | 85                        | 2,680                           | 670                 | 70                        | 2,120                           | 635                 |
| 11.00                                | 0.26 (0.22 - 0.34)              | 85            | 2,555                          | 660                       | 70                              | 2,020               | 625                       |                                 |                     |
| 11.50                                | 0.28 (0.23 - 0.35)              | 85            | 2,375                          | 665                       | 70                              | 1,940               | 630                       |                                 |                     |
| 12.00                                | 0.30 (0.24 - 0.36)              | 85            | 2,310                          | 690                       | 70                              | 1,860               | 655                       |                                 |                     |
| 12.50                                | 0.31 (0.25 - 0.37)              | 85            | 2,235                          | 680                       | 70                              | 1,780               | 660                       |                                 |                     |
| Alloyed Steel                        | M25, M31<br>180 ~ 280 HB        | 1.00          | 0.04 (0.015 - 0.080)           | 25                        | 6,825                           | 270                 | 20                        | 6,370                           | 255                 |
|                                      |                                 | 1.50          | 0.045 (0.02 - 0.09)            | 25                        | 6,670                           | 300                 | 20                        | 4,245                           | 285                 |
|                                      |                                 | 2.00          | 0.05 (0.025 - 0.10)            | 30                        | 6,660                           | 335                 | 25                        | 3,980                           | 315                 |
|                                      |                                 | 2.50          | 0.055 (0.03 - 0.11)            | 40                        | 6,555                           | 360                 | 35                        | 4,460                           | 340                 |
|                                      |                                 | 3.00          | 0.06 (0.035 - 0.080)           | 50                        | 6,470                           | 380                 | 45                        | 4,770                           | 360                 |
|                                      |                                 | 3.50          | 0.07 (0.04 - 0.09)             | 55                        | 5,815                           | 400                 | 50                        | 4,550                           | 375                 |
|                                      |                                 | 4.00          | 0.08 (0.05 - 0.10)             | 60                        | 5,520                           | 435                 | 55                        | 4,380                           | 415                 |
|                                      |                                 | 4.50          | 0.09 (0.055 - 0.11)            | 60                        | 4,960                           | 445                 | 55                        | 3,890                           | 420                 |
|                                      |                                 | 5.00          | 0.10 (0.06 - 0.12)             | 60                        | 4,130                           | 415                 | 55                        | 3,500                           | 400                 |
|                                      |                                 | 5.50          | 0.11 (0.07 - 0.13)             | 60                        | 3,990                           | 440                 | 55                        | 3,185                           | 415                 |
|                                      |                                 | 6.00          | 0.12 (0.08 - 0.15)             | 60                        | 3,850                           | 450                 | 55                        | 2,920                           | 430                 |
|                                      |                                 | 6.50          | 0.13 (0.09 - 0.17)             | 65                        | 3,715                           | 475                 | 55                        | 2,700                           | 450                 |
|                                      |                                 | 7.00          | 0.14 (0.10 - 0.20)             | 65                        | 3,630                           | 505                 | 55                        | 2,515                           | 470                 |
|                                      |                                 | 7.50          | 0.15 (0.11 - 0.23)             | 65                        | 3,525                           | 520                 | 55                        | 2,350                           | 495                 |
|                                      |                                 | 8.00          | 0.16 (0.13 - 0.25)             | 65                        | 3,260                           | 510                 | 55                        | 2,200                           | 480                 |
|                                      |                                 | 8.50          | 0.18 (0.14 - 0.26)             | 65                        | 3,115                           | 555                 | 55                        | 2,070                           | 525                 |
|                                      |                                 | 9.00          | 0.20 (0.15 - 0.28)             | 70                        | 2,975                           | 590                 | 60                        | 2,105                           | 560                 |
|                                      |                                 | 9.50          | 0.22 (0.16 - 0.30)             | 70                        | 2,825                           | 615                 | 60                        | 1,995                           | 585                 |
|                                      |                                 | 10.00         | 0.24 (0.20 - 0.32)             | 70                        | 2,535                           | 610                 | 60                        | 1,895                           | 575                 |
|                                      |                                 | 10.50         | 0.25 (0.21 - 0.33)             | 70                        | 2,400                           | 605                 | 60                        | 1,805                           | 570                 |
| 11.00                                | 0.26 (0.22 - 0.34)              | 70            | 2,300                          | 595                       | 60                              | 1,725               | 565                       |                                 |                     |
| 11.50                                | 0.28 (0.23 - 0.35)              | 70            | 2,135                          | 600                       | 60                              | 1,650               | 580                       |                                 |                     |
| 12.00                                | 0.30 (0.24 - 0.36)              | 70            | 2,070                          | 625                       | 60                              | 1,580               | 585                       |                                 |                     |
| 12.50                                | 0.31 (0.25 - 0.37)              | 70            | 2,005                          | 630                       | 60                              | 1,515               | 595                       |                                 |                     |

## DR-L Oil Feed Twist Drills Cutting Parameters - 20xø, 25xø & 30xø

| Work Material | Material Groups / Hardness (HB)      | Diameter (mm) | Feed Rate (Min - Max) (mm/rev) | 20xø, 25xø                |                                 |                     | 30xø                      |                                 |                     |     |
|---------------|--------------------------------------|---------------|--------------------------------|---------------------------|---------------------------------|---------------------|---------------------------|---------------------------------|---------------------|-----|
|               |                                      |               |                                | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) |     |
| P             | Alloyed Steel<br>M31<br>280 ~ 350 HB | 1.00          | 0.015 (0.009 - 0.04)           | 25                        | 8,155                           | 120                 | 20                        | 7,720                           | 115                 |     |
|               |                                      | 1.50          | 0.02 (0.01 - 0.05)             | 25                        | 7,790                           | 150                 | 20                        | 7,380                           | 145                 |     |
|               |                                      | 2.00          | 0.03 (0.015 - 0.06)            | 35                        | 6,790                           | 200                 | 30                        | 6,435                           | 195                 |     |
|               |                                      | 2.50          | 0.035 (0.02 - 0.07)            | 40                        | 6,745                           | 235                 | 35                        | 6,390                           | 220                 |     |
|               |                                      | 3.00          | 0.05 (0.025 - 0.08)            | 55                        | 6,555                           | 330                 | 45                        | 6,210                           | 315                 |     |
|               |                                      | 3.50          | 0.06 (0.03 - 0.09)             | 60                        | 6,460                           | 380                 | 50                        | 6,120                           | 360                 |     |
|               |                                      | 4.00          | 0.07 (0.04 - 0.10)             | 60                        | 6,175                           | 425                 | 50                        | 5,850                           | 405                 |     |
|               |                                      | 4.50          | 0.08 (0.05 - 0.11)             | 60                        | 5,225                           | 415                 | 50                        | 4,950                           | 395                 |     |
|               |                                      | 5.00          | 0.09 (0.06 - 0.12)             | 60                        | 4,180                           | 375                 | 50                        | 3,960                           | 355                 |     |
|               |                                      | 5.50          | 0.11 (0.07 - 0.13)             | 60                        | 3,990                           | 435                 | 50                        | 3,780                           | 415                 |     |
|               |                                      | 6.00          | 0.12 (0.08 - 0.15)             | 65                        | 3,800                           | 445                 | 55                        | 3,600                           | 420                 |     |
|               |                                      | 6.50          | 0.13 (0.09 - 0.17)             | 65                        | 3,610                           | 460                 | 55                        | 3,420                           | 440                 |     |
|               |                                      | 7.00          | 0.14 (0.10 - 0.20)             | 65                        | 3,325                           | 475                 | 55                        | 3,150                           | 450                 |     |
|               |                                      | 7.50          | 0.15 (0.11 - 0.23)             | 65                        | 3,135                           | 470                 | 55                        | 2,970                           | 445                 |     |
|               |                                      | 8.00          | 0.16 (0.13 - 0.25)             | 65                        | 2,945                           | 450                 | 55                        | 2,790                           | 430                 |     |
|               |                                      | 8.50          | 0.17 (0.14 - 0.26)             | 65                        | 2,850                           | 475                 | 55                        | 2,700                           | 455                 |     |
|               |                                      | 9.00          | 0.18 (0.15 - 0.28)             | 70                        | 2,660                           | 480                 | 60                        | 2,520                           | 500                 |     |
|               |                                      | 9.50          | 0.19 (0.16 - 0.30)             | 70                        | 2,515                           | 485                 | 60                        | 2,385                           | 435                 |     |
| 10.00         | 0.20 (0.20 - 0.32)                   | 70            | 2,375                          | 490                       | 60                              | 2,250               | 460                       |                                 |                     |     |
| 10.50         | 0.22 (0.21 - 0.33)                   | 70            | 2,280                          | 495                       | 60                              | 2,160               | 465                       |                                 |                     |     |
| 11.00         | 0.23 (0.22 - 0.34)                   | 70            | 2,185                          | 505                       | 60                              | 2,070               | 475                       |                                 |                     |     |
| 11.50         | 0.24 (0.23 - 0.35)                   | 70            | 2,090                          | 515                       | 60                              | 1,980               | 480                       |                                 |                     |     |
| 12.00         | 0.25 (0.24 - 0.36)                   | 70            | 1,995                          | 500                       | 60                              | 1,890               | 470                       |                                 |                     |     |
| 12.50         | 0.26 (0.25 - 0.37)                   | 70            | 1,950                          | 510                       | 60                              | 1,845               | 485                       |                                 |                     |     |
| M             | Stainless Steel up to 35 HRC         | 1.00          | 0.015 (0.009 - 0.04)           | 20                        | 7,125                           | 115                 | 18                        | 6,750                           | 105                 |     |
|               |                                      | 1.50          | 0.02 (0.01 - 0.05)             | 20                        | 6,245                           | 140                 | 18                        | 5,910                           | 135                 |     |
|               |                                      | 2.00          | 0.035 (0.015 - 0.06)           | 25                        | 5,185                           | 200                 | 23                        | 4,915                           | 190                 |     |
|               |                                      | 2.50          | 0.04 (0.020 - 0.065)           | 30                        | 4,275                           | 215                 | 27                        | 4,050                           | 205                 |     |
|               |                                      | 3.00          | 0.05 (0.025 - 0.07)            | 30                        | 3,780                           | 260                 | 27                        | 3,580                           | 250                 |     |
|               |                                      | 3.50          | 0.06 (0.03 - 0.08)             | 30                        | 3,420                           | 285                 | 27                        | 3,240                           | 270                 |     |
|               |                                      | 4.00          | 0.065 (0.05 - 0.09)            | 35                        | 2,945                           | 300                 | 32                        | 2,790                           | 280                 |     |
|               |                                      | 4.50          | 0.07 (0.055 - 0.10)            | 35                        | 2,545                           | 305                 | 32                        | 2,410                           | 285                 |     |
|               |                                      | 5.00          | 0.075 (0.06 - 0.11)            | 35                        | 2,415                           | 315                 | 32                        | 2,285                           | 295                 |     |
|               |                                      | 5.50          | 0.085 (0.07 - 0.12)            | 35                        | 2,230                           | 325                 | 32                        | 2,115                           | 305                 |     |
|               |                                      | 6.00          | 0.09 (0.08 - 0.13)             | 35                        | 2,090                           | 310                 | 32                        | 1,980                           | 290                 |     |
|               |                                      | 6.50          | 0.10 (0.09 - 0.14)             | 35                        | 2,025                           | 290                 | 32                        | 1,915                           | 275                 |     |
|               | Stainless Steel more than 35 HRC     | M20           | 7.00                           | 0.11 (0.10 - 0.15)        | 35                              | 1,900               | 320                       | 32                              | 1,800               | 300 |
|               |                                      |               | 7.50                           | 0.12 (0.11 - 0.16)        | 35                              | 1,890               | 295                       | 32                              | 1,790               | 265 |
|               |                                      |               | 8.00                           | 0.13 (0.12 - 0.17)        | 35                              | 1,785               | 330                       | 32                              | 1,690               | 310 |
|               |                                      |               | 8.50                           | 0.14 (0.13 - 0.18)        | 35                              | 1,475               | 335                       | 32                              | 1,395               | 315 |
|               |                                      |               | 9.00                           | 0.15 (0.14 - 0.19)        | 40                              | 1,310               | 275                       | 36                              | 1,240               | 255 |
|               |                                      |               | 9.50                           | 0.16 (0.15 - 0.20)        | 40                              | 1,285               | 280                       | 36                              | 1,215               | 305 |
|               |                                      |               | 10.00                          | 0.17 (0.16 - 0.21)        | 40                              | 1,165               | 265                       | 36                              | 1,105               | 245 |
|               |                                      |               | 10.50                          | 0.18 (0.17 - 0.22)        | 40                              | 1,090               | 255                       | 36                              | 1,035               | 240 |
|               |                                      |               | 11.00                          | 0.19 (0.18 - 0.23)        | 40                              | 1,045               | 240                       | 36                              | 990                 | 225 |
| 11.50         | 0.20 (0.19 - 0.24)                   | 40            | 995                            | 245                       | 36                              | 945                 | 230                       |                                 |                     |     |
| 12.00         | 0.21 (0.20 - 0.25)                   | 40            | 945                            | 235                       | 36                              | 890                 | 220                       |                                 |                     |     |
| 12.50         | 0.22 (0.21 - 0.26)                   | 40            | 936                            | 225                       | 36                              | 885                 | 215                       |                                 |                     |     |

## DR-L Oil Feed Twist Drills Cutting Parameters - 20xø, 25xø & 30xø

| Work Material                               | Material Groups / Hardness (HB)        | Diameter (mm)                            | Feed Rate (Min - Max) (mm/rev) | 20xø, 25xø                |                                 |                     | 30xø                      |                                 |                     |
|---|--|--|--------------------------------|---------------------------|---------------------------------|---------------------|---------------------------|---------------------------------|---------------------|
|   |  |  |                                | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) |
| Cast iron<br>GG10 ... GG20<br>Cobalt Chrome | M10<br>up to 200 HB                    | 1.00                                     | 0.02 (0.01 - 0.04)             | 25                        | 9,405                           | 190                 | 20                        | 8,910                           | 180                 |
|   |  | 1.50                                     | 0.025 (0.015 - 0.05)           | 40                        | 8,910                           | 215                 | 35                        | 8,440                           | 205                 |
|   |  | 2.00                                     | 0.03 (0.02 - 0.06)             | 45                        | 8,550                           | 250                 | 40                        | 8,100                           | 245                 |
|   |  | 2.50                                     | 0.045 (0.025 - 0.07)           | 55                        | 8,140                           | 380                 | 50                        | 7,715                           | 360                 |
|   |  | 3.00                                     | 0.055 (0.03 - 0.08)            | 65                        | 7,715                           | 455                 | 55                        | 7,310                           | 430                 |
|   |  | 3.50                                     | 0.065 (0.04 - 0.09)            | 70                        | 7,125                           | 460                 | 60                        | 6,750                           | 435                 |
|   |  | 4.00                                     | 0.07 (0.05 - 0.10)             | 75                        | 6,555                           | 465                 | 65                        | 6,210                           | 440                 |
|   |  | 4.50                                     | 0.08 (0.06 - 0.11)             | 80                        | 6,175                           | 495                 | 70                        | 5,850                           | 465                 |
|   |  | 5.00                                     | 0.09 (0.065 - 0.12)            | 80                        | 5,415                           | 485                 | 70                        | 5,130                           | 460                 |
|   |  | 5.50                                     | 0.10 (0.07 - 0.13)             | 80                        | 5,225                           | 520                 | 70                        | 4,950                           | 495                 |
|   |  | 6.00                                     | 0.11 (0.08 - 0.15)             | 80                        | 4,845                           | 525                 | 70                        | 4,590                           | 500                 |
|   |  | 6.50                                     | 0.12 (0.09 - 0.17)             | 80                        | 4,465                           | 540                 | 70                        | 4,230                           | 515                 |
|   |  | 7.00                                     | 0.13 (0.10 - 0.19)             | 80                        | 4,085                           | 530                 | 70                        | 3,870                           | 505                 |
|   |  | 7.50                                     | 0.14 (0.11 - 0.21)             | 80                        | 3,790                           | 505                 | 70                        | 3,590                           | 475                 |
|   |  | 8.00                                     | 0.15 (0.13 - 0.22)             | 80                        | 3,515                           | 500                 | 70                        | 3,330                           | 470                 |
| Cast iron<br>GG25 ... GG35                  | M11<br>up to 250 HB                    | 8.50                                     | 0.16 (0.14 - 0.23)             | 80                        | 3,440                           | 510                 | 70                        | 3,255                           | 485                 |
|   |  | 9.00                                     | 0.17 (0.15 - 0.25)             | 80                        | 3,230                           | 485                 | 70                        | 3,060                           | 455                 |
|   |  | 9.50                                     | 0.18 (0.16 - 0.26)             | 80                        | 3,070                           | 445                 | 70                        | 2,905                           | 420                 |
|   |  | 10.00                                    | 0.19 (0.17 - 0.28)             | 85                        | 2,995                           | 450                 | 75                        | 2,835                           | 415                 |
|   |  | 10.50                                    | 0.20 (0.21 - 0.30)             | 85                        | 2,850                           | 455                 | 75                        | 2,700                           | 445                 |
|   |  | 11.00                                    | 0.22 (0.22 - 0.31)             | 85                        | 2,830                           | 475                 | 75                        | 2,680                           | 450                 |
|   |  | 11.50                                    | 0.24 (0.23 - 0.32)             | 85                        | 2,660                           | 480                 | 75                        | 2,520                           | 480                 |
|   |  | 12.00                                    | 0.25 (0.24 - 0.33)             | 85                        | 2,535                           | 545                 | 75                        | 2,405                           | 490                 |
|   |  | 12.50                                    | 0.26 (0.25 - 0.34)             | 85                        | 2,280                           | 535                 | 75                        | 2,160                           | 495                 |
|   |  | Nodular Iron<br>(SG-Iron)<br>GGG40-GGG50 | M12<br>over 250 HB             | 1.00                      | 0.012 (0.006 - 0.02)            | 20                  | 7,555                     | 105                             | 18                  |
| 1.50  | 0.015 (0.007 - 0.03)                   |  |                                | 25                        | 6,005                           | 120                 | 23                        | 5,690                           | 115                 |
| 2.00  | 0.02 (0.008 - 0.05)                    |  |                                | 30                        | 5,615                           | 140                 | 27                        | 5,315                           | 135                 |
| 2.50  | 0.025 (0.009 - 0.06)                   |  |                                | 30                        | 4,330                           | 165                 | 27                        | 4,105                           | 155                 |
| 3.00  | 0.03 (0.01 - 0.07)                     |  |                                | 30                        | 3,825                           | 180                 | 27                        | 3,625                           | 170                 |
| 3.50  | 0.035 (0.02 - 0.08)                    |  |                                | 35                        | 3,685                           | 190                 | 32                        | 3,490                           | 180                 |
| 4.00  | 0.05 (0.03 - 0.09)                     |  |                                | 35                        | 3,050                           | 265                 | 32                        | 2,890                           | 250                 |
| Nodular Iron<br>(SG-Iron)<br>GGG60-GGG90    | M13<br>up to 600 N/mm <sup>2</sup>     | 4.50                                     | 0.07 (0.055 - 0.10)            | 40                        | 3,020                           | 365                 | 36                        | 2,865                           | 345                 |
|   |  | 5.00                                     | 0.075 (0.06 - 0.11)            | 40                        | 2,850                           | 380                 | 36                        | 2,700                           | 360                 |
|   |  | 5.50                                     | 0.085 (0.07 - 0.12)            | 40                        | 2,640                           | 395                 | 36                        | 2,505                           | 375                 |
|   |  | 6.00                                     | 0.09 (0.08 - 0.13)             | 40                        | 2,385                           | 390                 | 36                        | 2,260                           | 370                 |
|   |  | 6.50                                     | 0.10 (0.09 - 0.14)             | 40                        | 2,255                           | 400                 | 36                        | 2,135                           | 380                 |
|   |  | 7.00                                     | 0.11 (0.10 - 0.15)             | 40                        | 2,070                           | 405                 | 36                        | 1,960                           | 385                 |
|   |  | 7.50                                     | 0.12 (0.11 - 0.16)             | 40                        | 1,945                           | 415                 | 36                        | 1,845                           | 395                 |
|   |  | 8.00                                     | 0.13 (0.12 - 0.17)             | 45                        | 1,890                           | 425                 | 40                        | 1,790                           | 405                 |
| Malleable Iron                              | M14<br>more than 600 N/mm <sup>2</sup> | 8.50                                     | 0.14 (0.13 - 0.18)             | 45                        | 1,785                           | 435                 | 41                        | 1,692                           | 415                 |
|   |  | 9.00                                     | 0.15 (0.14 - 0.19)             | 45                        | 1,675                           | 415                 | 40                        | 1,585                           | 390                 |
|   |  | 9.50                                     | 0.16 (0.15 - 0.20)             | 45                        | 1,500                           | 385                 | 41                        | 1,420                           | 365                 |
|   |  | 10.00                                    | 0.17 (0.16 - 0.21)             | 45                        | 1,455                           | 410                 | 41                        | 1,375                           | 385                 |
|   |  | 10.50                                    | 0.18 (0.17 - 0.22)             | 45                        | 1,415                           | 440                 | 41                        | 1,340                           | 400                 |
|   |  | 11.00                                    | 0.19 (0.18 - 0.23)             | 45                        | 1,345                           | 430                 | 41                        | 1,275                           | 410                 |
|   |  | 11.50                                    | 0.20 (0.19 - 0.24)             | 45                        | 1,305                           | 360                 | 40                        | 1,235                           | 345                 |
| 12.00                                       | 0.21 (0.20 - 0.25)                     | 45                                       | 1,255                          | 325                       | 40                              | 1,185               | 305                       |                                 |                     |
| 12.50                                       | 0.22 (0.21 - 0.26)                     | 45                                       | 1,220                          | 295                       | 41                              | 1,155               | 280                       |                                 |                     |



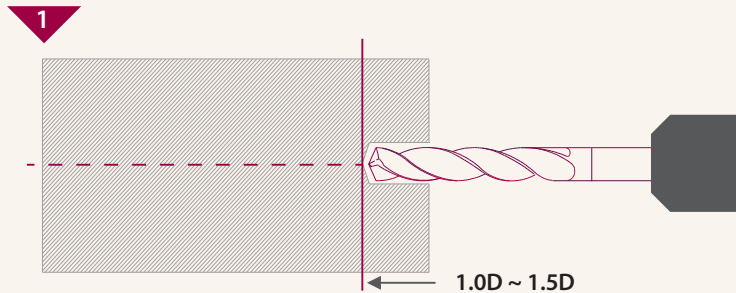
## DR-L Oil Feed Twist Drills Cutting Parameters - 20xø, 25xø & 30xø

| Work Material | Material Groups / Hardness (HB) | Diameter (mm)      | Feed Rate (Min - Max) (mm/rev) | 20xø, 25xø                |                                 |                     | 30xø                      |                                 |                     |       |    |
|---------------|---------------------------------|--------------------|--------------------------------|---------------------------|---------------------------------|---------------------|---------------------------|---------------------------------|---------------------|-------|----|
|               |                                 |                    |                                | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) | Cutting Speed, Vc (m/min) | Revolution (min <sup>-1</sup> ) | Table Feed (mm/min) |       |    |
| N             | Aluminium (Si content > 10%)    | M06, M07           | 1.00                           | 0.06 (0.035 - 0.10)       | 35                              | 12,445              | 715                       | 30                              | 11,790              | 715   |    |
|               |                                 | 1.50               | 0.075 (0.04 - 0.12)            | 55                        | 12,255                          | 865                 | 50                        | 11,610                          | 865                 |       |    |
|               |                                 | 2.00               | 0.08 (0.045 - 0.15)            | 75                        | 12,015                          | 910                 | 65                        | 11,385                          | 910                 |       |    |
|               |                                 | 2.50               | 0.09 (0.055 - 0.18)            | 85                        | 11,355                          | 1,015               | 75                        | 10,755                          | 1,010               |       |    |
|               |                                 | 3.00               | 0.10 (0.06 - 0.20)             | 90                        | 10,115                          | 1,080               | 80                        | 9,585                           | 1,080               |       |    |
|               |                                 | 3.50               | 0.12 (0.07 - 0.22)             | 90                        | 9,025                           | 1,135               | 80                        | 8,550                           | 1,135               |       |    |
|               |                                 | 4.00               | 0.15 (0.09 - 0.24)             | 90                        | 7,465                           | 1,095               | 80                        | 7,074                           | 1,090               |       |    |
|               | 4.50                            | 0.18 (0.11 - 0.26) | 90                             | 6,695                     | 1,180                           | 80                  | 6,345                     | 1,180                           |                     |       |    |
|               | 5.00                            | 0.20 (0.17 - 0.31) | 90                             | 6,035                     | 1,140                           | 80                  | 5,715                     | 1,145                           |                     |       |    |
|               | 5.50                            | 0.22 (0.20 - 0.33) | 90                             | 5,510                     | 1,045                           | 80                  | 5,220                     | 1,140                           |                     |       |    |
|               | 6.00                            | 0.24 (0.22 - 0.35) | 90                             | 5,100                     | 1,165                           | 80                  | 4,830                     | 1,155                           |                     |       |    |
|               | 6.50                            | 0.26 (0.23 - 0.37) | 90                             | 4,700                     | 1,115                           | 80                  | 4,455                     | 1,160                           |                     |       |    |
|               | 7.00                            | 0.28 (0.24 - 0.39) | 95                             | 4,520                     | 1,200                           | 85                  | 4,285                     | 1,190                           |                     |       |    |
|               | 7.50                            | 0.31 (0.26 - 0.41) | 95                             | 4,320                     | 1,265                           | 85                  | 4,095                     | 1,265                           |                     |       |    |
|               | 8.00                            | 0.32 (0.28 - 0.42) | 100                            | 4,085                     | 1,235                           | 90                  | 3,870                     | 1,235                           |                     |       |    |
|               | 8.50                            | 0.33 (0.29 - 0.43) | 100                            | 3,915                     | 1,225                           | 90                  | 3,710                     | 1,225                           |                     |       |    |
|               | 9.00                            | 0.34 (0.31 - 0.45) | 100                            | 3,705                     | 1,190                           | 90                  | 3,510                     | 1,195                           |                     |       |    |
|               | 9.50                            | 0.34 (0.31 - 0.45) | 100                            | 3,515                     | 1,135                           | 90                  | 3,330                     | 1,130                           |                     |       |    |
|               | 10.00                           | 0.38 (0.33 - 0.48) | 100                            | 3,315                     | 1,185                           | 90                  | 3,140                     | 1,185                           |                     |       |    |
|               | S                               | Titanium Alloys    | M17, M21                       | 1.00                      | 0.012 (0.01 - 0.025)            | 9                   | 2,660                     | 30                              | 8                   | 2,520 | 30 |
|               |                                 |                    |                                | 1.50                      | 0.015 (0.012 - 0.03)            | 9                   | 1,900                     | 25                              | 8                   | 1,800 | 25 |
| 2.00          |                                 |                    |                                | 0.02 (0.015 - 0.05)       | 9                               | 1,690               | 35                        | 8                               | 1,600               | 35    |    |
| 2.50          |                                 |                    |                                | 0.03 (0.02 - 0.06)        | 9                               | 1,375               | 55                        | 8                               | 1,305               | 50    |    |
| 3.00          |                                 |                    |                                | 0.05 (0.03 - 0.08)        | 9                               | 1,235               | 90                        | 8                               | 1,170               | 85    |    |
| 3.50          |                                 |                    |                                | 0.055 (0.035 - 0.09)      | 9                               | 1,155               | 95                        | 8                               | 1,090               | 90    |    |
| 4.00          |                                 |                    |                                | 0.06 (0.04 - 0.10)        | 9                               | 1,075               | 100                       | 8                               | 1,015               | 95    |    |
| 4.50          |                                 |                    |                                | 0.065 (0.045 - 0.11)      | 13                              | 998                 | 105                       | 10                              | 945                 | 100   |    |
| 5.00          |                                 |                    |                                | 0.07 (0.05 - 0.12)        | 13                              | 930                 | 110                       | 10                              | 880                 | 105   |    |
| 5.50          |                                 |                    |                                | 0.075 (0.07 - 0.13)       | 13                              | 855                 | 115                       | 10                              | 810                 | 110   |    |
| 6.00          |                                 |                    |                                | 0.08 (0.075 - 0.14)       | 13                              | 805                 | 120                       | 10                              | 765                 | 115   |    |
| 6.50          |                                 |                    |                                | 0.09 (0.085 - 0.145)      | 13                              | 760                 | 125                       | 10                              | 720                 | 120   |    |
| 7.00          |                                 |                    |                                | 0.095 (0.09 - 0.15)       | 13                              | 725                 | 130                       | 10                              | 685                 | 125   |    |
| 7.50          |                                 |                    |                                | 0.10 (0.095 - 0.16)       | 13                              | 685                 | 85                        | 10                              | 650                 | 75    |    |
| 8.00          | 0.12 (0.11 - 0.17)              | 13                 | 625                            | 80                        | 10                              | 595                 | 80                        |                                 |                     |       |    |
| 8.50          | 0.125 (0.12 - 0.18)             | 13                 | 590                            | 75                        | 10                              | 555                 | 70                        |                                 |                     |       |    |
| 9.00          | 0.13 (0.125 - 0.19)             | 14                 | 555                            | 70                        | 12                              | 520                 | 65                        |                                 |                     |       |    |
| 9.50          | 0.135 (0.13 - 0.20)             | 14                 | 495                            | 65                        | 12                              | 470                 | 60                        |                                 |                     |       |    |
| 10.00         | 0.14 (0.135 - 0.21)             | 14                 | 475                            | 66                        | 12                              | 450                 | 55                        |                                 |                     |       |    |
| 10.50         | 0.145 (0.14 - 0.22)             | 14                 | 455                            | 63                        | 12                              | 435                 | 57                        |                                 |                     |       |    |
| 11.00         | 0.15 (0.145 - 0.23)             | 14                 | 420                            | 62                        | 12                              | 400                 | 56                        |                                 |                     |       |    |
| 11.50         | 0.155 (0.15 - 0.24)             | 14                 | 400                            | 64                        | 12                              | 380                 | 58                        |                                 |                     |       |    |
| 12.00         | 0.16 (0.155 - 0.25)             | 14                 | 360                            | 58                        | 12                              | 340                 | 54                        |                                 |                     |       |    |
| 12.50         | 0.165 (0.16 - 0.26)             | 14                 | 285                            | 52                        | 12                              | 270                 | 49                        |                                 |                     |       |    |

## Long Drill Technical Info (Application)

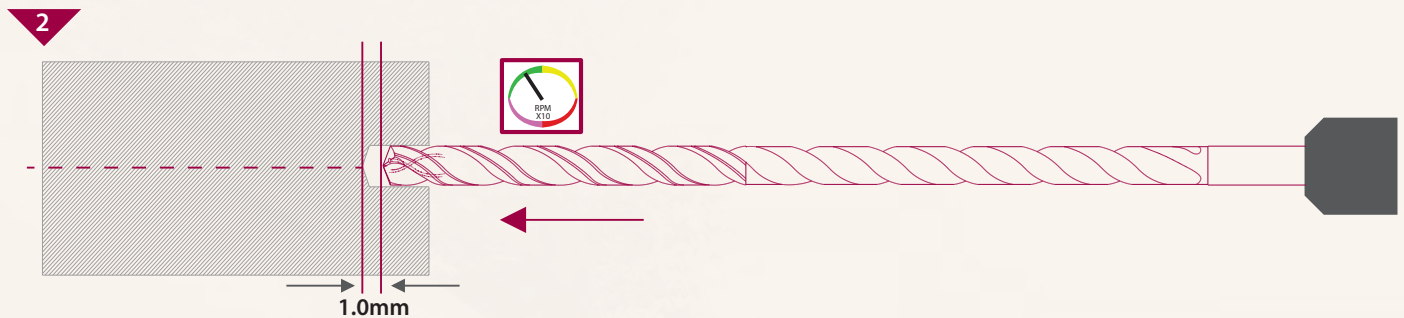
### Drilling on Standard Through Hole

\* For references only.



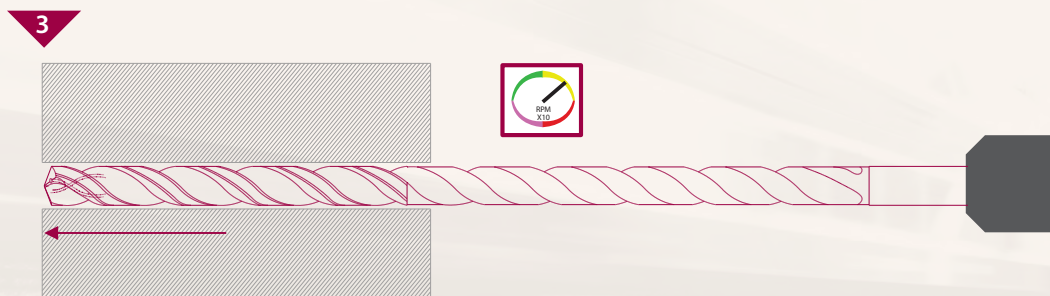
#### Develop pilot bore

- Using a 3xD pilot drill (DR45/DR-S) with point angle 140° and tolerance m7 ( 4 - 25 micron > Ø deep hole drill)
- Drilling pilot bore depth with minimum of 1 to 1.5D



#### Enter according to pilot bore

- Enter without coolant be upon 1mm before the end of pilot bore
- Approximate 300 rpm and feedrate of 500 mm/min
- Then start high pressure coolant



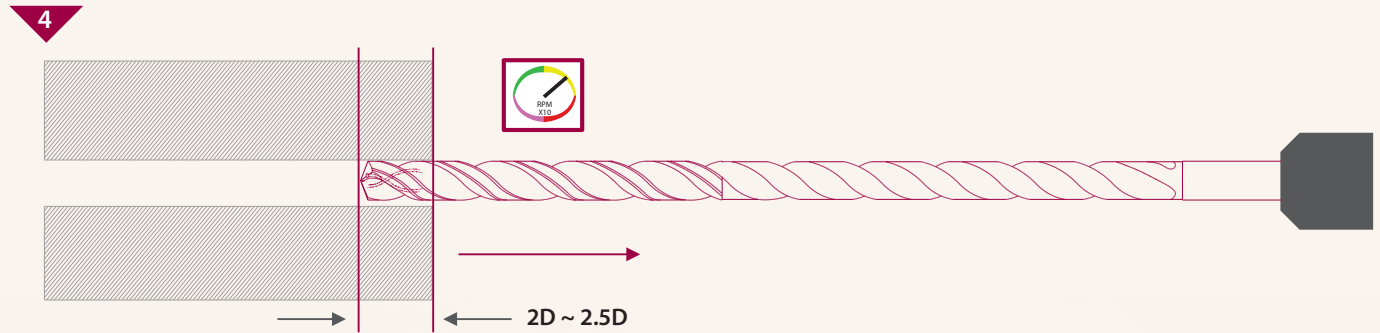
#### Deep drilling process

- Load higher spindle speed (Vc) and feedrate (f) as per recommended
- Continuous drilling upon complete hole depth without chip removal cycles/peck drilling cycles
- For through holes, reduce 30% of feedrate approximate 1mm before complete the hole depth

## Long Drill Technical Info (Application)

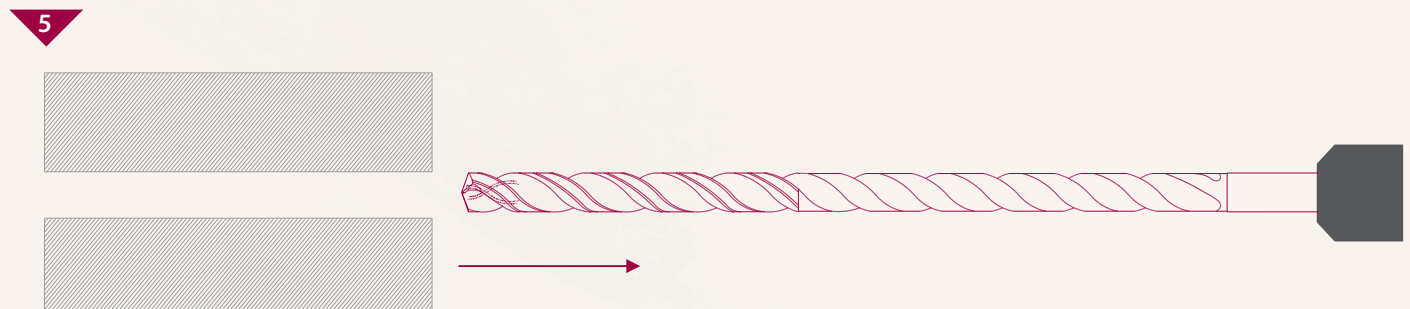
### Drilling on Standard Through Hole

\* For references only.



#### Withdrawal

- Switch off coolant supply
- Withdraw the long drills after completed drilling the hole depth
- Existing spindle speed ( $V_c$ ) and double up the feedrate ( $f$ )
- Withdraw towards approximate 2 to 2.5D of the beginning part of pilot bore



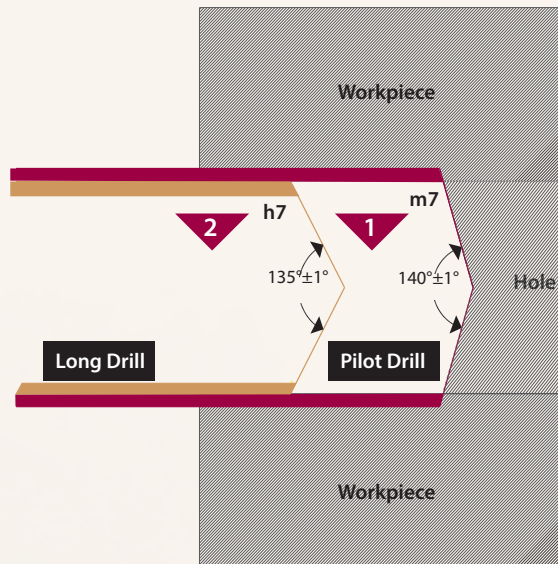
#### Discharge from the bore

- Discharge with lower and stationary speed from the remaining part

## Long Drill Technical Info (Application)

### Drilling on Standard Through Hole

\* For references only.



1

#### Pilot Bore

Please use the corresponding drill with internal coolant supply and the same nominal diameter for the pilot bore.  
Pilot Drill Series I **DR45 / DR 5 (140° I D(m7))**

Tolerance consideration for m7 in  $\mu\text{m}$

| Diameter                         | Tolerance, $\mu\text{m}$ |
|----------------------------------|--------------------------|
| $\leq \varnothing 3$             | +2 ~ +12                 |
| $\varnothing 4 - \varnothing 6$  | +4 ~ +16                 |
| $\varnothing 7 - \varnothing 10$ | +6 ~ +21                 |

2

#### Deep Hole Bore (12xD - 30xD)

Please use the corresponding drill with internal coolant supply and the same nominal diameter for the deep hole bore.  
Long Drill Series I **DR-L (135° I D(h7))**

Tolerance consideration for h7 in  $\mu\text{m}$

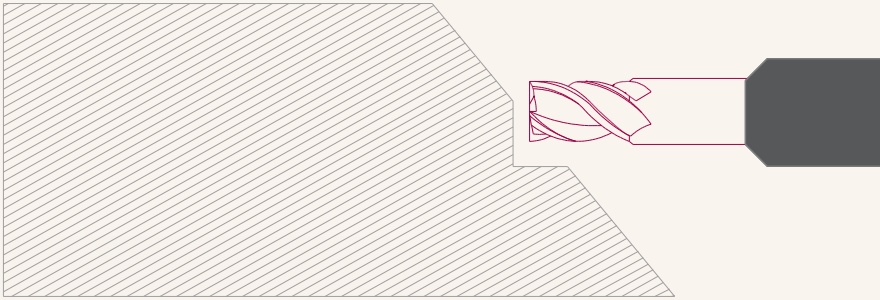
| Diameter                         | Tolerance, $\mu\text{m}$ |
|----------------------------------|--------------------------|
| $\leq \varnothing 3$             | 0 ~ -10                  |
| $\varnothing 4 - \varnothing 6$  | 0 ~ -12                  |
| $\varnothing 7 - \varnothing 10$ | 0 ~ -15                  |

## Long Drill Technical Info (Application)

### Drilling On Irregular Faces or Angles

\* For references only.

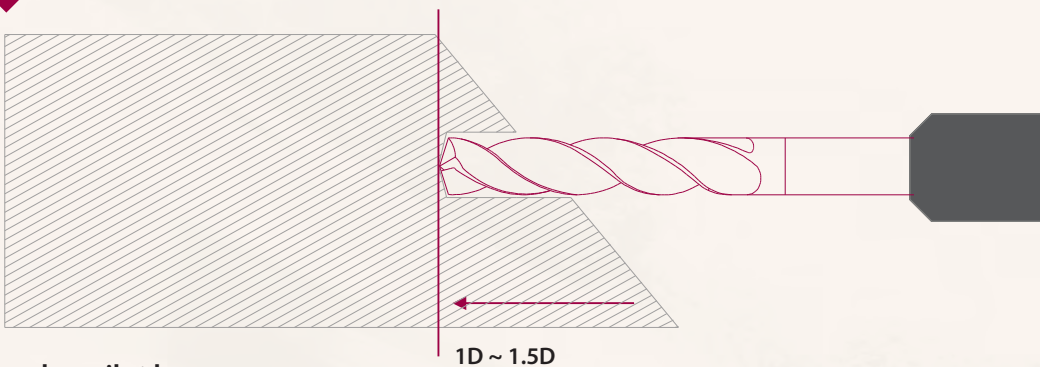
1



#### Spot Facing

- Make a flat surface by using an endmill (HPMT 918) with light slotting on the irregular faces/angles
- Machining the width and depth of spot face same size as the required deep hole diameter
- Endmill used required the capability of spot facing (ramping/plunging)

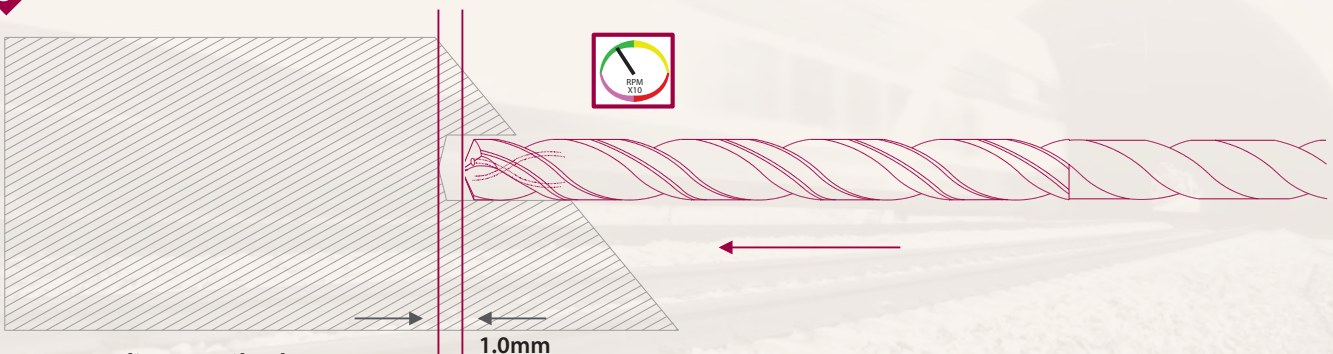
2



#### Develop pilot bore

- Using a 3xD pilot drill (DR45 / DR-S) with point angle 140° & tolerance m7 ( 4 - 25 micron > Ø deep hole drill)
- Drilling pilot bore depth with minimum of 1 to 1.5D

3



#### Enter according to pilot bore

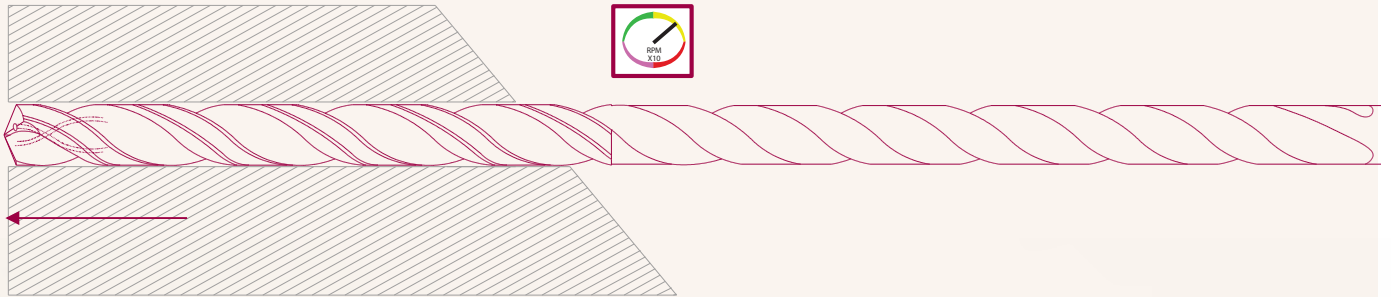
- Enter without coolant be upon 1mm before the end of pilot bore
- Approximate 300 rpm and feedrate of 500 mm/min
- Then start high pressure coolant

## Long Drill Technical Info (Application)

### Drilling On Irregular Faces or Angles

\* For references only.

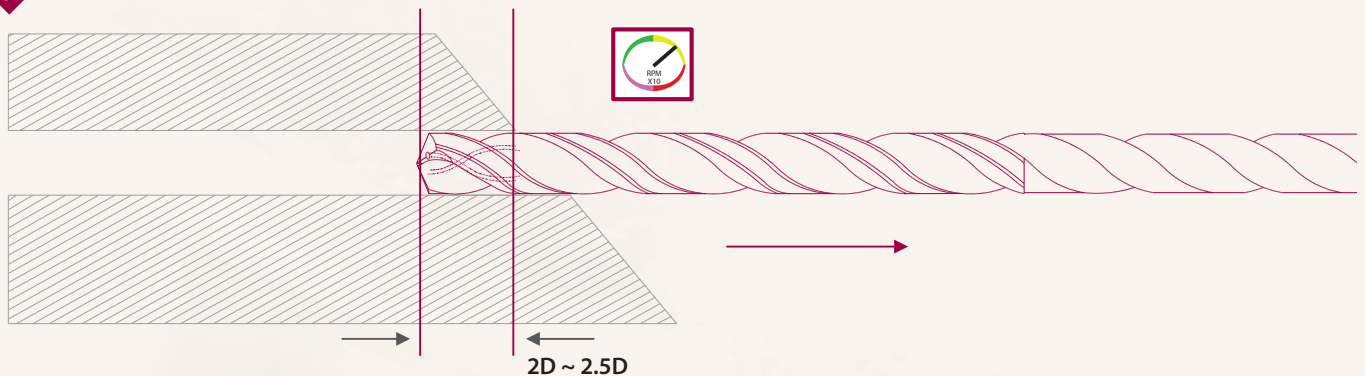
4



#### Deep drilling process

- Load higher spindle speed (Vc) and feedrate (f) as per recommended
- Continuous drilling upon complete hole depth without chip removal cycles/peck drilling cycles
- For through holes, reduce 30% of feedrate approximate 1mm before complete the hole depth

5



#### Withdrawal

- Switch off coolant supply
- Withdraw the long drills after completed drilling the hole depth
- Existing spindle speed (Vc) and double up the feedrate (f)
- Withdraw towards approximate 2 to 2.5D of the beginning part of pilot bore

6



#### Discharge from the bore

- Discharge with lower and stationary speed from the remaining part