

# FORATURA (METALLO DURO)

## MWE, MWS

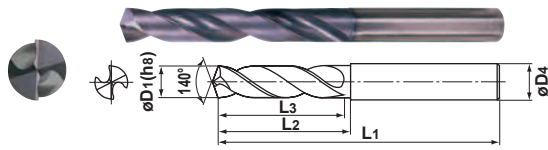
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



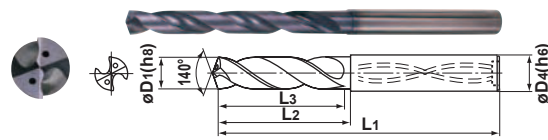
|                                       |                  |                      |       |         |                              |
|---------------------------------------|------------------|----------------------|-------|---------|------------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Leggera | Leggera resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +       | +                            |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWE            | -0.017 | -0.025 | -0.033  | -0.041   | -0.048   |
|                    | MWS-X10-X30DB  | -0.031 | -0.043 | -0.055  | -0.068   | -0.081   |
| Tolleranza D4 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS            | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS            | -0.006 | -0.008 | -0.009  | -0.011   | -0.013   |

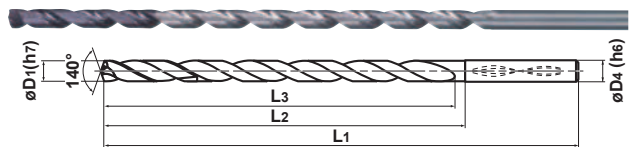
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi$  5.0 hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP-15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|-----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                       |                       | L3              | L2  | L1  | D4  |
| 3.0                    | 2                     | Est.                     | ●                     | MWE0300SA             | 16              | 16  | 55  | 3   |
|                        | 3                     | Est.                     | ●                     | MWE0300MA             | 21              | 21  | 60  | 3   |
|                        | 3                     | Int.                     | ●                     | MWS0300MB             | 24              | 24  | 72  | 3   |
|                        | 5                     | Int.                     | ●                     | MWS0300LB             | 33              | 33  | 81  | 3   |
|                        | 8                     | Int.                     | ★                     | MWS0300X8DB           | 35              | 35  | 81  | 3   |
|                        | 10                    | Int.                     | ★                     | MWS0300X10DB          | 39              | 42  | 90  | 3   |
|                        | 15                    | Int.                     | ★                     | MWS0300X15DB          | 54              | 57  | 105 | 3   |
|                        | 20                    | Int.                     | ★                     | MWS0300X20DB          | 69              | 72  | 120 | 3   |
|                        | 25                    | Int.                     | ★                     | MWS0300X25DB          | 84              | 87  | 135 | 3   |
| 3.1                    | 30                    | Int.                     | ★                     | MWS0300X30DB          | 99              | 102 | 150 | 3   |
|                        | 2                     | Est.                     | ●                     | MWE0310SA             | 18              | 18  | 55  | 3.1 |
|                        | 3                     | Est.                     | ●                     | MWE0310MA             | 24              | 24  | 60  | 3.1 |
|                        | 3                     | Int.                     | ●                     | MWS0310MB             | 28              | 28  | 76  | 4   |
|                        | 5                     | Int.                     | ●                     | MWS0310LB             | 39              | 39  | 87  | 4   |
|                        | 8                     | Int.                     | ★                     | MWS0310X8DB           | 41              | 41  | 87  | 4   |
|                        | 10                    | Int.                     | ★                     | MWS0310X10DB          | 46              | 49  | 97  | 4   |
|                        | 15                    | Int.                     | ★                     | MWS0310X15DB          | 63              | 66  | 114 | 4   |
|                        | 20                    | Int.                     | ★                     | MWS0310X20DB          | 81              | 84  | 132 | 4   |
| 3.2                    | 25                    | Int.                     | ★                     | MWS0310X25DB          | 98              | 101 | 149 | 4   |
|                        | 30                    | Int.                     | ★                     | MWS0310X30DB          | 116             | 119 | 167 | 4   |
|                        | 2                     | Est.                     | ●                     | MWE0320SA             | 18              | 18  | 55  | 3.2 |
|                        | 3                     | Est.                     | ●                     | MWE0320MA             | 24              | 24  | 60  | 3.2 |
|                        | 3                     | Int.                     | ●                     | MWS0320MB             | 28              | 28  | 76  | 4   |
|                        | 5                     | Int.                     | ●                     | MWS0320LB             | 39              | 39  | 87  | 4   |
|                        | 8                     | Int.                     | ★                     | MWS0320X8DB           | 41              | 41  | 87  | 4   |
|                        | 10                    | Int.                     | ★                     | MWS0320X10DB          | 46              | 49  | 97  | 4   |
|                        | 15                    | Int.                     | ★                     | MWS0320X15DB          | 63              | 66  | 114 | 4   |
| 3.3                    | 20                    | Int.                     | ★                     | MWS0320X20DB          | 81              | 84  | 132 | 4   |
|                        | 25                    | Int.                     | ★                     | MWS0320X25DB          | 98              | 101 | 149 | 4   |
|                        | 30                    | Int.                     | ★                     | MWS0320X30DB          | 116             | 119 | 167 | 4   |
|                        | 2                     | Est.                     | ●                     | MWE0330SA             | 18              | 18  | 55  | 3.3 |
|                        | 3                     | Est.                     | ●                     | MWE0330MA             | 24              | 24  | 60  | 3.3 |
|                        | 3                     | Int.                     | ●                     | MWS0330MB             | 28              | 28  | 76  | 4   |
|                        | 5                     | Int.                     | ●                     | MWS0330LB             | 39              | 39  | 87  | 4   |
|                        | 8                     | Int.                     | ★                     | MWS0330X8DB           | 41              | 41  | 87  | 4   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP-15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|-----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                       |                       | L3              | L2  | L1  | D4  |
| 3.3                    | 10                    | Int.                     | ★                     | MWS0330X10DB          | 46              | 49  | 97  | 4   |
|                        | 15                    | Int.                     | ★                     | MWS0330X15DB          | 63              | 66  | 114 | 4   |
|                        | 20                    | Int.                     | ★                     | MWS0330X20DB          | 81              | 84  | 132 | 4   |
|                        | 25                    | Int.                     | ★                     | MWS0330X25DB          | 98              | 101 | 149 | 4   |
|                        | 30                    | Int.                     | ★                     | MWS0330X30DB          | 116             | 119 | 167 | 4   |
| 3.4                    | 2                     | Est.                     | ●                     | MWE0340SA             | 20              | 20  | 55  | 3.4 |
|                        | 3                     | Est.                     | ●                     | MWE0340MA             | 24              | 24  | 60  | 3.4 |
|                        | 3                     | Int.                     | ●                     | MWS0340MB             | 28              | 28  | 76  | 4   |
|                        | 5                     | Int.                     | ●                     | MWS0340LB             | 39              | 39  | 87  | 4   |
|                        | 8                     | Int.                     | ★                     | MWS0340X8DB           | 41              | 41  | 87  | 4   |
|                        | 10                    | Int.                     | ★                     | MWS0340X10DB          | 46              | 49  | 97  | 4   |
|                        | 15                    | Int.                     | ★                     | MWS0340X15DB          | 63              | 66  | 114 | 4   |
|                        | 20                    | Int.                     | ★                     | MWS0340X20DB          | 81              | 84  | 132 | 4   |
|                        | 25                    | Int.                     | ★                     | MWS0340X25DB          | 98              | 101 | 149 | 4   |
| 3.5                    | 30                    | Int.                     | ★                     | MWS0340X30DB          | 116             | 119 | 167 | 4   |
|                        | 2                     | Est.                     | ●                     | MWE0350SA             | 20              | 20  | 55  | 3.5 |
|                        | 3                     | Est.                     | ●                     | MWE0350MA             | 24              | 24  | 60  | 3.5 |
|                        | 3                     | Int.                     | ●                     | MWS0350MB             | 28              | 28  | 76  | 4   |
|                        | 5                     | Int.                     | ●                     | MWS0350LB             | 39              | 39  | 87  | 4   |
|                        | 8                     | Int.                     | ★                     | MWS0350X8DB           | 41              | 41  | 87  | 4   |
|                        | 10                    | Int.                     | ★                     | MWS0350X10DB          | 46              | 49  | 97  | 4   |
|                        | 15                    | Int.                     | ★                     | MWS0350X15DB          | 63              | 66  | 114 | 4   |
|                        | 20                    | Int.                     | ★                     | MWS0350X20DB          | 81              | 84  | 132 | 4   |
| 3.6                    | 25                    | Int.                     | ★                     | MWS0350X25DB          | 98              | 101 | 149 | 4   |
|                        | 30                    | Int.                     | ★                     | MWS0350X30DB          | 116             | 119 | 167 | 4   |
|                        | 2                     | Est.                     | ★                     | MWE0360SA             | 20              | 20  | 55  | 3.6 |
|                        | 3                     | Est.                     | ●                     | MWE0360MA             | 27              | 27  | 60  | 3.6 |
|                        | 3                     | Int.                     | ●                     | MWS0360MB             | 32              | 32  | 80  | 4   |
|                        | 5                     | Int.                     | ★                     | MWS0360LB             | 44              | 44  | 92  | 4   |
|                        | 8                     | Int.                     | ★                     | MWS0360X8DB           | 46              | 46  | 92  | 4   |
|                        | 10                    | Int.                     | ★                     | MWS0360X10DB          | 52              | 55  | 103 | 4   |
|                        | 15                    | Int.                     | ★                     | MWS0360X15DB          | 72              | 75  | 123 | 4   |
| 3.6                    | 20                    | Int.                     | ★                     | MWS0360X20DB          | 92              | 95  | 143 | 4   |
|                        | 25                    | Int.                     | ★                     | MWS0360X25DB          | 112             | 115 | 163 | 4   |
|                        | 30                    | Int.                     | ★                     | MWS0360X30DB          | 132             | 135 | 183 | 4   |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 3.7                       | 2                        | Est.                        | ★                       | MWE0370SA             | 20              | 20  | 55  | 3.7 |
|                           | 3                        | Est.                        | ★                       | MWE0370MA             | 27              | 27  | 60  | 3.7 |
|                           | 3                        | Int.                        | ●                       | MWS0370MB             | 32              | 32  | 80  | 4   |
|                           | 5                        | Int.                        | ●                       | MWS0370LB             | 44              | 44  | 92  | 4   |
|                           | 8                        | Int.                        | ★                       | MWS0370X8DB           | 46              | 46  | 92  | 4   |
|                           | 10                       | Int.                        | ★                       | MWS0370X10DB          | 52              | 55  | 103 | 4   |
|                           | 15                       | Int.                        | ★                       | MWS0370X15DB          | 72              | 75  | 123 | 4   |
|                           | 20                       | Int.                        | ★                       | MWS0370X20DB          | 92              | 95  | 143 | 4   |
|                           | 25                       | Int.                        | ★                       | MWS0370X25DB          | 112             | 115 | 163 | 4   |
|                           | 30                       | Int.                        | ★                       | MWS0370X30DB          | 132             | 135 | 183 | 4   |
| 3.8                       | 2                        | Est.                        | ●                       | MWE0380SA             | 22              | 22  | 55  | 3.8 |
|                           | 3                        | Est.                        | ●                       | MWE0380MA             | 27              | 27  | 60  | 3.8 |
|                           | 3                        | Int.                        | ●                       | MWS0380MB             | 32              | 32  | 80  | 4   |
|                           | 5                        | Int.                        | ●                       | MWS0380LB             | 44              | 44  | 92  | 4   |
|                           | 8                        | Int.                        | ★                       | MWS0380X8DB           | 46              | 46  | 92  | 4   |
|                           | 10                       | Int.                        | ★                       | MWS0380X10DB          | 52              | 55  | 103 | 4   |
|                           | 15                       | Int.                        | ★                       | MWS0380X15DB          | 72              | 75  | 123 | 4   |
|                           | 20                       | Int.                        | ★                       | MWS0380X20DB          | 92              | 95  | 143 | 4   |
|                           | 25                       | Int.                        | ★                       | MWS0380X25DB          | 112             | 115 | 163 | 4   |
|                           | 30                       | Int.                        | ★                       | MWS0380X30DB          | 132             | 135 | 183 | 4   |
| 3.9                       | 2                        | Est.                        | ●                       | MWE0390SA             | 22              | 22  | 55  | 3.9 |
|                           | 3                        | Est.                        | ★                       | MWE0390MA             | 27              | 27  | 60  | 3.9 |
|                           | 3                        | Int.                        | ★                       | MWS0390MB             | 32              | 32  | 80  | 4   |
|                           | 5                        | Int.                        | ●                       | MWS0390LB             | 44              | 44  | 92  | 4   |
|                           | 8                        | Int.                        | ★                       | MWS0390X8DB           | 46              | 46  | 92  | 4   |
|                           | 10                       | Int.                        | ★                       | MWS0390X10DB          | 52              | 55  | 103 | 4   |
|                           | 15                       | Int.                        | ★                       | MWS0390X15DB          | 72              | 75  | 123 | 4   |
|                           | 20                       | Int.                        | ★                       | MWS0390X20DB          | 92              | 95  | 143 | 4   |
|                           | 25                       | Int.                        | ★                       | MWS0390X25DB          | 112             | 115 | 163 | 4   |
|                           | 30                       | Int.                        | ★                       | MWS0390X30DB          | 132             | 135 | 183 | 4   |
| 4.0                       | 2                        | Est.                        | ●                       | MWE0400SA             | 22              | 22  | 55  | 4   |
|                           | 3                        | Est.                        | ●                       | MWE0400MA             | 27              | 27  | 60  | 4   |
|                           | 3                        | Int.                        | ●                       | MWS0400MB             | 32              | 32  | 80  | 4   |
|                           | 5                        | Int.                        | ●                       | MWS0400LB             | 44              | 44  | 92  | 4   |
|                           | 8                        | Int.                        | ★                       | MWS0400X8DB           | 46              | 46  | 92  | 4   |
|                           | 10                       | Int.                        | ★                       | MWS0400X10DB          | 52              | 55  | 103 | 4   |
|                           | 15                       | Int.                        | ★                       | MWS0400X15DB          | 72              | 75  | 123 | 4   |
|                           | 20                       | Int.                        | ★                       | MWS0400X20DB          | 92              | 95  | 143 | 4   |
|                           | 25                       | Int.                        | ★                       | MWS0400X25DB          | 112             | 115 | 163 | 4   |
|                           | 30                       | Int.                        | ★                       | MWS0400X30DB          | 132             | 135 | 183 | 4   |
| 4.1                       | 2                        | Est.                        | ●                       | MWE0410SA             | 22              | 22  | 55  | 4.1 |
|                           | 3                        | Est.                        | ★                       | MWE0410MA             | 29              | 29  | 63  | 4.1 |
|                           | 3                        | Int.                        | ●                       | MWS0410MB             | 36              | 36  | 86  | 5   |
|                           | 5                        | Int.                        | ★                       | MWS0410LB             | 50              | 50  | 100 | 5   |
|                           | 8                        | Int.                        | ★                       | MWS0410X8DB           | 52              | 52  | 100 | 5   |
|                           | 10                       | Int.                        | ★                       | MWS0410X10DB          | 59              | 62  | 112 | 5   |
|                           | 15                       | Int.                        | ★                       | MWS0410X15DB          | 81              | 84  | 134 | 5   |
|                           | 20                       | Int.                        | ★                       | MWS0410X20DB          | 104             | 107 | 157 | 5   |
|                           | 25                       | Int.                        | ★                       | MWS0410X25DB          | 126             | 129 | 179 | 5   |
|                           | 30                       | Int.                        | ★                       | MWS0410X30DB          | 149             | 152 | 202 | 5   |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 4.2                       | 2                        | Est.                        | ●                       | MWE0420SA             | 22              | 22  | 55  | 4.2 |
|                           | 3                        | Est.                        | ●                       | MWE0420MA             | 29              | 29  | 63  | 4.2 |
|                           | 3                        | Int.                        | ●                       | MWS0420MB             | 36              | 36  | 86  | 5   |
|                           | 5                        | Int.                        | ●                       | MWS0420LB             | 50              | 50  | 100 | 5   |
|                           | 8                        | Int.                        | ★                       | MWS0420X8DB           | 52              | 52  | 100 | 5   |
|                           | 10                       | Int.                        | ★                       | MWS0420X10DB          | 59              | 62  | 112 | 5   |
|                           | 15                       | Int.                        | ★                       | MWS0420X15DB          | 81              | 84  | 134 | 5   |
|                           | 20                       | Int.                        | ★                       | MWS0420X20DB          | 104             | 107 | 157 | 5   |
|                           | 25                       | Int.                        | ★                       | MWS0420X25DB          | 126             | 129 | 179 | 5   |
|                           | 30                       | Int.                        | ★                       | MWS0420X30DB          | 149             | 152 | 202 | 5   |
| 4.3                       | 2                        | Est.                        | ●                       | MWE0430SA             | 24              | 24  | 58  | 4.3 |
|                           | 3                        | Est.                        | ●                       | MWE0430MA             | 29              | 29  | 63  | 4.3 |
|                           | 3                        | Int.                        | ●                       | MWS0430MB             | 36              | 36  | 86  | 5   |
|                           | 5                        | Int.                        | ●                       | MWS0430LB             | 50              | 50  | 100 | 5   |
|                           | 8                        | Int.                        | ★                       | MWS0430X8DB           | 52              | 52  | 100 | 5   |
|                           | 10                       | Int.                        | ★                       | MWS0430X10DB          | 59              | 62  | 112 | 5   |
|                           | 15                       | Int.                        | ★                       | MWS0430X15DB          | 81              | 84  | 134 | 5   |
|                           | 20                       | Int.                        | ★                       | MWS0430X20DB          | 104             | 107 | 157 | 5   |
|                           | 25                       | Int.                        | ★                       | MWS0430X25DB          | 126             | 129 | 179 | 5   |
|                           | 30                       | Int.                        | ★                       | MWS0430X30DB          | 149             | 152 | 202 | 5   |
| 4.4                       | 2                        | Est.                        | ★                       | MWE0440SA             | 24              | 24  | 58  | 4.4 |
|                           | 3                        | Est.                        | ●                       | MWE0440MA             | 29              | 29  | 63  | 4.4 |
|                           | 3                        | Int.                        | ●                       | MWS0440MB             | 36              | 36  | 86  | 5   |
|                           | 5                        | Int.                        | ★                       | MWS0440LB             | 50              | 50  | 100 | 5   |
|                           | 8                        | Int.                        | ★                       | MWS0440X8DB           | 52              | 52  | 100 | 5   |
|                           | 10                       | Int.                        | ★                       | MWS0440X10DB          | 59              | 62  | 112 | 5   |
|                           | 15                       | Int.                        | ★                       | MWS0440X15DB          | 81              | 84  | 134 | 5   |
|                           | 20                       | Int.                        | ★                       | MWS0440X20DB          | 104             | 107 | 157 | 5   |
|                           | 25                       | Int.                        | ★                       | MWS0440X25DB          | 126             | 129 | 179 | 5   |
|                           | 30                       | Int.                        | ★                       | MWS0440X30DB          | 149             | 152 | 202 | 5   |
| 4.5                       | 2                        | Est.                        | ★                       | MWE0450SA             | 24              | 24  | 58  | 4.5 |
|                           | 3                        | Est.                        | ●                       | MWE0450MA             | 29              | 29  | 63  | 4.5 |
|                           | 3                        | Int.                        | ●                       | MWS0450MB             | 36              | 36  | 86  | 5   |
|                           | 5                        | Int.                        | ●                       | MWS0450LB             | 50              | 50  | 100 | 5   |
|                           | 8                        | Int.                        | ★                       | MWS0450X8DB           | 52              | 52  | 100 | 5   |
|                           | 10                       | Int.                        | ★                       | MWS0450X10DB          | 59              | 62  | 112 | 5   |
|                           | 15                       | Int.                        | ★                       | MWS0450X15DB          | 81              | 84  | 134 | 5   |
|                           | 20                       | Int.                        | ★                       | MWS0450X20DB          | 104             | 107 | 157 | 5   |
|                           | 25                       | Int.                        | ★                       | MWS0450X25DB          | 126             | 129 | 179 | 5   |
|                           | 30                       | Int.                        | ★                       | MWS0450X30DB          | 149             | 152 | 202 | 5   |
| 4.6                       | 2                        | Est.                        | ★                       | MWE0460SA             | 24              | 24  | 58  | 4.6 |
|                           | 3                        | Est.                        | ●                       | MWE0460MA             | 32              | 32  | 68  | 4.6 |
|                           | 3                        | Int.                        | ●                       | MWS0460MB             | 40              | 40  | 90  | 5   |
|                           | 5                        | Int.                        | ●                       | MWS0460LB             | 55              | 55  | 105 | 5   |
|                           | 8                        | Int.                        | ★                       | MWS0460X8DB           | 57              | 57  | 105 | 5   |
|                           | 10                       | Int.                        | ★                       | MWS0460X10DB          | 65              | 68  | 118 | 5   |
|                           | 15                       | Int.                        | ★                       | MWS0460X15DB          | 90              | 93  | 143 | 5   |
|                           | 20                       | Int.                        | ★                       | MWS0460X20DB          | 115             | 118 | 168 | 5   |
|                           | 25                       | Int.                        | ★                       | MWS0460X25DB          | 140             | 143 | 193 | 5   |
|                           | 30                       | Int.                        | ★                       | MWS0460X30DB          | 165             | 168 | 218 | 5   |



# FORATURA (METALLO DURO)

## MWE, MWS

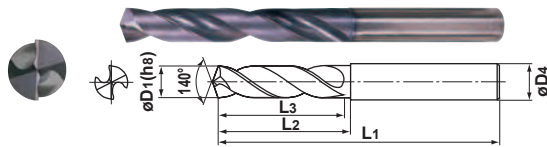
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



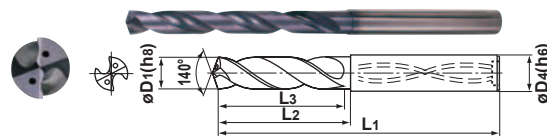
|                                       |                  |                      |       |              |                           |
|---------------------------------------|------------------|----------------------|-------|--------------|---------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Lega leggera | Lega resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +            | +                         |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWS            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-X10-X30DB  | -0.017 | -0.025 | -0.033  | -0.041   | -0.068   |

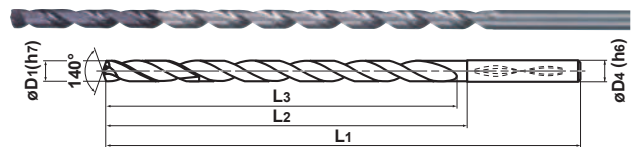
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi$  5.0 hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4  |
| 4.7                    | 2                     | Est.                     | ★                    | MWE0470SA             | 24              | 24  | 58  | 4.7 |
|                        | 3                     | Est.                     | ★                    | MWE0470MA             | 32              | 32  | 68  | 4.7 |
|                        | 3                     | Int.                     | ●                    | MWS0470MB             | 40              | 40  | 90  | 5   |
|                        | 5                     | Int.                     | ●                    | MWS0470LB             | 55              | 55  | 105 | 5   |
|                        | 8                     | Int.                     | ★                    | MWS0470X8DB           | 57              | 57  | 105 | 5   |
|                        | 10                    | Int.                     | ★                    | MWS0470X10DB          | 65              | 68  | 118 | 5   |
|                        | 15                    | Int.                     | ★                    | MWS0470X15DB          | 90              | 93  | 143 | 5   |
|                        | 20                    | Int.                     | ★                    | MWS0470X20DB          | 115             | 118 | 168 | 5   |
| 4.8                    | 2                     | Est.                     | ★                    | MWE0480SA             | 26              | 26  | 62  | 4.8 |
|                        | 3                     | Est.                     | ●                    | MWE0480MA             | 32              | 32  | 68  | 4.8 |
|                        | 3                     | Int.                     | ●                    | MWS0480MB             | 40              | 40  | 90  | 5   |
|                        | 5                     | Int.                     | ★                    | MWS0480LB             | 55              | 55  | 105 | 5   |
|                        | 8                     | Int.                     | ★                    | MWS0480X8DB           | 57              | 57  | 105 | 5   |
|                        | 10                    | Int.                     | ★                    | MWS0480X10DB          | 65              | 68  | 118 | 5   |
|                        | 15                    | Int.                     | ★                    | MWS0480X15DB          | 90              | 93  | 143 | 5   |
|                        | 20                    | Int.                     | ★                    | MWS0480X20DB          | 115             | 118 | 168 | 5   |
| 4.9                    | 2                     | Est.                     | ★                    | MWE0490SA             | 26              | 26  | 62  | 4.9 |
|                        | 3                     | Est.                     | ●                    | MWE0490MA             | 32              | 32  | 68  | 4.9 |
|                        | 3                     | Int.                     | ●                    | MWS0490MB             | 40              | 40  | 90  | 5   |
|                        | 5                     | Int.                     | ★                    | MWS0490LB             | 55              | 55  | 105 | 5   |
|                        | 8                     | Int.                     | ★                    | MWS0490X8DB           | 57              | 57  | 105 | 5   |
|                        | 10                    | Int.                     | ★                    | MWS0490X10DB          | 65              | 68  | 118 | 5   |
|                        | 15                    | Int.                     | ★                    | MWS0490X15DB          | 90              | 93  | 143 | 5   |
|                        | 20                    | Int.                     | ★                    | MWS0490X20DB          | 115             | 118 | 168 | 5   |
| 5.0                    | 2                     | Est.                     | ●                    | MWE0500SA             | 26              | 26  | 62  | 5   |
|                        | 3                     | Est.                     | ●                    | MWE0500MA             | 32              | 32  | 68  | 5   |
|                        | 3                     | Int.                     | ●                    | MWS0500MB             | 27.5            | 30  | 82  | 6   |
|                        | 5                     | Int.                     | ●                    | MWS0500LB             | 44              | 48  | 100 | 6   |
|                        | 8                     | Int.                     | ★                    | MWS0500X8DB           | 57              | 57  | 105 | 5   |
|                        | 10                    | Int.                     | ★                    | MWS0500X10DB          | 65              | 68  | 118 | 5   |
|                        | 15                    | Int.                     | ★                    | MWS0500X15DB          | 90              | 93  | 143 | 5   |
|                        | 20                    | Int.                     | ★                    | MWS0500X20DB          | 115             | 118 | 168 | 5   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4  |
| 5.0                    | 10                    | Int.                     | ★                    | MWS0500X10DB          | 65              | 68  | 118 | 5   |
|                        | 15                    | Int.                     | ★                    | MWS0500X15DB          | 90              | 93  | 143 | 5   |
|                        | 20                    | Int.                     | ★                    | MWS0500X20DB          | 115             | 118 | 168 | 5   |
|                        | 25                    | Int.                     | ★                    | MWS0500X25DB          | 140             | 143 | 193 | 5   |
|                        | 30                    | Int.                     | ★                    | MWS0500X30DB          | 165             | 168 | 218 | 5   |
| 5.1                    | 2                     | Est.                     | ●                    | MWE0510SA             | 26              | 26  | 62  | 5.1 |
|                        | 3                     | Est.                     | ●                    | MWE0510MA             | 34              | 34  | 72  | 5.1 |
|                        | 3                     | Int.                     | ●                    | MWS0510MB             | 27.5            | 30  | 82  | 6   |
|                        | 5                     | Int.                     | ●                    | MWS0510LB             | 44              | 48  | 100 | 6   |
|                        | 8                     | Int.                     | ★                    | MWS0510X8DB           | 61              | 66  | 118 | 6   |
|                        | 10                    | Int.                     | ★                    | MWS0510X10DB          | 72              | 75  | 127 | 6   |
|                        | 15                    | Int.                     | ★                    | MWS0510X15DB          | 99              | 102 | 154 | 6   |
|                        | 20                    | Int.                     | ★                    | MWS0510X20DB          | 127             | 130 | 182 | 6   |
| 5.2                    | 2                     | Est.                     | ●                    | MWE0520SA             | 26              | 26  | 62  | 5.2 |
|                        | 3                     | Est.                     | ●                    | MWE0520MA             | 34              | 34  | 72  | 5.2 |
|                        | 3                     | Int.                     | ●                    | MWS0520MB             | 27.5            | 30  | 82  | 6   |
|                        | 5                     | Int.                     | ●                    | MWS0520LB             | 44              | 48  | 100 | 6   |
|                        | 8                     | Int.                     | ★                    | MWS0520X8DB           | 61              | 66  | 118 | 6   |
|                        | 10                    | Int.                     | ★                    | MWS0520X10DB          | 72              | 75  | 127 | 6   |
|                        | 15                    | Int.                     | ★                    | MWS0520X15DB          | 99              | 102 | 154 | 6   |
|                        | 20                    | Int.                     | ★                    | MWS0520X20DB          | 127             | 130 | 182 | 6   |
| 5.3                    | 2                     | Est.                     | ★                    | MWE0530SA             | 26              | 26  | 62  | 5.3 |
|                        | 3                     | Est.                     | ★                    | MWE0530MA             | 34              | 34  | 72  | 5.3 |
|                        | 3                     | Int.                     | ●                    | MWS0530MB             | 27.5            | 30  | 82  | 6   |
|                        | 5                     | Int.                     | ●                    | MWS0530LB             | 44              | 48  | 100 | 6   |
|                        | 8                     | Int.                     | ★                    | MWS0530X8DB           | 61              | 66  | 118 | 6   |
|                        | 10                    | Int.                     | ★                    | MWS0530X10DB          | 72              | 75  | 127 | 6   |
|                        | 15                    | Int.                     | ★                    | MWS0530X15DB          | 99              | 102 | 154 | 6   |
|                        | 20                    | Int.                     | ★                    | MWS0530X20DB          | 127             | 130 | 182 | 6   |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 5.4                       | 2                        | Est.                        | ★                       | MWE0540SA             | 28              | 28  | 66  | 5.4 |
|                           | 3                        | Est.                        | ●                       | MWE0540MA             | 34              | 34  | 72  | 5.4 |
|                           | 3                        | Int.                        | ●                       | MWS0540MB             | 27.5            | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ★                       | MWS0540LB             | 44              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0540X8DB           | 61              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0540X10DB          | 72              | 75  | 127 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0540X15DB          | 99              | 102 | 154 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0540X20DB          | 127             | 130 | 182 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0540X25DB          | 154             | 157 | 209 | 6   |
| 30                        | Int.                     | ★                           | MWS0540X30DB            | 182                   | 185             | 237 | 6   |     |
| 5.5                       | 2                        | Est.                        | ●                       | MWE0550SA             | 28              | 28  | 66  | 5.5 |
|                           | 3                        | Est.                        | ●                       | MWE0550MA             | 34              | 34  | 72  | 5.5 |
|                           | 3                        | Int.                        | ●                       | MWS0550MB             | 27.5            | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ●                       | MWS0550LB             | 44              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0550X8DB           | 61              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0550X10DB          | 72              | 75  | 127 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0550X15DB          | 99              | 102 | 154 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0550X20DB          | 127             | 130 | 182 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0550X25DB          | 154             | 157 | 209 | 6   |
| 30                        | Int.                     | ★                           | MWS0550X30DB            | 182                   | 185             | 237 | 6   |     |
| 5.6                       | 2                        | Est.                        | ★                       | MWE0560SA             | 28              | 28  | 66  | 5.6 |
|                           | 3                        | Est.                        | ●                       | MWE0560MA             | 36              | 36  | 74  | 5.6 |
|                           | 3                        | Int.                        | ★                       | MWS0560MB             | 30              | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ★                       | MWS0560LB             | 48              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0560X8DB           | 66              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0560X10DB          | 78              | 81  | 133 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0560X15DB          | 108             | 111 | 163 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0560X20DB          | 138             | 141 | 193 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0560X25DB          | 168             | 171 | 223 | 6   |
| 30                        | Int.                     | ★                           | MWS0560X30DB            | 198                   | 201             | 253 | 6   |     |
| 5.7                       | 2                        | Est.                        | ★                       | MWE0570SA             | 28              | 28  | 66  | 5.7 |
|                           | 3                        | Est.                        | ★                       | MWE0570MA             | 36              | 36  | 74  | 5.7 |
|                           | 3                        | Int.                        | ★                       | MWS0570MB             | 30              | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ●                       | MWS0570LB             | 48              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0570X8DB           | 66              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0570X10DB          | 78              | 81  | 133 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0570X15DB          | 108             | 111 | 163 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0570X20DB          | 138             | 141 | 193 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0570X25DB          | 168             | 171 | 223 | 6   |
| 30                        | Int.                     | ★                           | MWS0570X30DB            | 198                   | 201             | 253 | 6   |     |
| 5.8                       | 2                        | Est.                        | ★                       | MWE0580SA             | 28              | 28  | 66  | 5.8 |
|                           | 3                        | Est.                        | ●                       | MWE0580MA             | 36              | 36  | 74  | 5.8 |
|                           | 3                        | Int.                        | ★                       | MWS0580MB             | 30              | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ●                       | MWS0580LB             | 48              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0580X8DB           | 66              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0580X10DB          | 78              | 81  | 133 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0580X15DB          | 108             | 111 | 163 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0580X20DB          | 138             | 141 | 193 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0580X25DB          | 168             | 171 | 223 | 6   |
| 30                        | Int.                     | ★                           | MWS0580X30DB            | 198                   | 201             | 253 | 6   |     |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 5.9                       | 2                        | Est.                        | ★                       | MWE0590SA             | 28              | 28  | 66  | 5.9 |
|                           | 3                        | Est.                        | ★                       | MWE0590MA             | 36              | 36  | 74  | 5.9 |
|                           | 3                        | Int.                        | ★                       | MWS0590MB             | 30              | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ●                       | MWS0590LB             | 48              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0590X8DB           | 66              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0590X10DB          | 78              | 81  | 133 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0590X15DB          | 108             | 111 | 163 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0590X20DB          | 138             | 141 | 193 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0590X25DB          | 168             | 171 | 223 | 6   |
| 30                        | Int.                     | ★                           | MWS0590X30DB            | 198                   | 201             | 253 | 6   |     |
| 6.0                       | 2                        | Est.                        | ●                       | MWE0600SA             | 28              | 28  | 66  | 6   |
|                           | 3                        | Est.                        | ●                       | MWE0600MA             | 41              | 41  | 81  | 6   |
|                           | 3                        | Int.                        | ●                       | MWS0600MB             | 30              | 30  | 82  | 6   |
|                           | 5                        | Int.                        | ●                       | MWS0600LB             | 48              | 48  | 100 | 6   |
|                           | 8                        | Int.                        | ★                       | MWS0600X8DB           | 66              | 66  | 118 | 6   |
|                           | 10                       | Int.                        | ★                       | MWS0600X10DB          | 78              | 81  | 133 | 6   |
|                           | 15                       | Int.                        | ★                       | MWS0600X15DB          | 108             | 111 | 163 | 6   |
|                           | 20                       | Int.                        | ★                       | MWS0600X20DB          | 138             | 141 | 193 | 6   |
|                           | 25                       | Int.                        | ★                       | MWS0600X25DB          | 168             | 171 | 223 | 6   |
| 30                        | Int.                     | ★                           | MWS0600X30DB            | 198                   | 201             | 253 | 6   |     |
| 6.1                       | 2                        | Est.                        | ★                       | MWE0610SA             | 31              | 31  | 70  | 6.1 |
|                           | 3                        | Est.                        | ●                       | MWE0610MA             | 41              | 41  | 81  | 6.1 |
|                           | 3                        | Int.                        | ●                       | MWS0610MB             | 32.5            | 35  | 88  | 7   |
|                           | 5                        | Int.                        | ●                       | MWS0610LB             | 52              | 56  | 109 | 7   |
|                           | 8                        | Int.                        | ★                       | MWS0610X8DB           | 72              | 77  | 130 | 7   |
|                           | 10                       | Int.                        | ★                       | MWS0610X10DB          | 85              | 88  | 141 | 7   |
|                           | 15                       | Int.                        | ★                       | MWS0610X15DB          | 117             | 120 | 173 | 7   |
|                           | 20                       | Int.                        | ★                       | MWS0610X20DB          | 150             | 153 | 206 | 7   |
|                           | 25                       | Int.                        | ★                       | MWS0610X25DB          | 182             | 185 | 238 | 7   |
| 30                        | Int.                     | ★                           | MWS0610X30DB            | 215                   | 218             | 271 | 7   |     |
| 6.2                       | 2                        | Est.                        | ★                       | MWE0620SA             | 31              | 31  | 70  | 6.2 |
|                           | 3                        | Est.                        | ●                       | MWE0620MA             | 41              | 41  | 81  | 6.2 |
|                           | 3                        | Int.                        | ★                       | MWS0620MB             | 32.5            | 35  | 88  | 7   |
|                           | 5                        | Int.                        | ●                       | MWS0620LB             | 52              | 56  | 109 | 7   |
|                           | 8                        | Int.                        | ★                       | MWS0620X8DB           | 72              | 77  | 130 | 7   |
|                           | 10                       | Int.                        | ★                       | MWS0620X10DB          | 85              | 88  | 141 | 7   |
|                           | 15                       | Int.                        | ★                       | MWS0620X15DB          | 117             | 120 | 173 | 7   |
|                           | 20                       | Int.                        | ★                       | MWS0620X20DB          | 150             | 153 | 206 | 7   |
|                           | 25                       | Int.                        | ★                       | MWS0620X25DB          | 182             | 185 | 238 | 7   |
| 30                        | Int.                     | ★                           | MWS0620X30DB            | 215                   | 218             | 271 | 7   |     |
| 6.3                       | 2                        | Est.                        | ★                       | MWE0630SA             | 31              | 31  | 70  | 6.3 |
|                           | 3                        | Est.                        | ●                       | MWE0630MA             | 41              | 41  | 81  | 6.3 |
|                           | 3                        | Int.                        | ★                       | MWS0630MB             | 32.5            | 35  | 88  | 7   |
|                           | 5                        | Int.                        | ●                       | MWS0630LB             | 52              | 56  | 109 | 7   |
|                           | 8                        | Int.                        | ★                       | MWS0630X8DB           | 72              | 77  | 130 | 7   |
|                           | 10                       | Int.                        | ★                       | MWS0630X10DB          | 85              | 88  | 141 | 7   |
|                           | 15                       | Int.                        | ★                       | MWS0630X15DB          | 117             | 120 | 173 | 7   |
|                           | 20                       | Int.                        | ★                       | MWS0630X20DB          | 150             | 153 | 206 | 7   |
|                           | 25                       | Int.                        | ★                       | MWS0630X25DB          | 182             | 185 | 238 | 7   |
| 30                        | Int.                     | ★                           | MWS0630X30DB            | 215                   | 218             | 271 | 7   |     |



# FORATURA (METALLO DURO)

## MWE, MWS

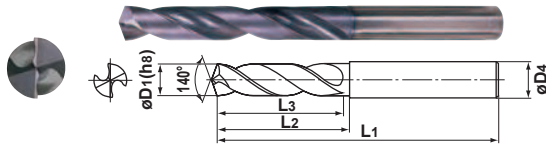
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



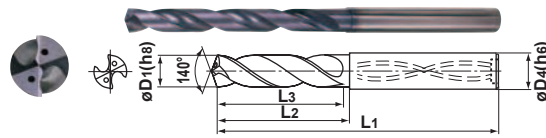
|                                       |                  |                      |       |              |                           |
|---------------------------------------|------------------|----------------------|-------|--------------|---------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Lega leggera | Lega resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +            | +                         |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS            | -0.017 | -0.025 | -0.033  | -0.041   | -0.048   |
|                    |                | -0.031 | -0.043 | -0.055  | -0.068   | -0.081   |

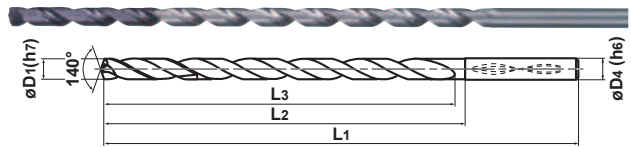
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi 5.0$  hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4  |
| 6.4                    | 2                     | Est.                     | ★                    | MWE0640SA             | 31              | 31  | 70  | 6.4 |
|                        | 3                     | Est.                     | ★                    | MWE0640MA             | 41              | 41  | 81  | 6.4 |
|                        | 3                     | Int.                     | ●                    | MWS0640MB             | 32.5            | 35  | 88  | 7   |
|                        | 5                     | Int.                     | ●                    | MWS0640LB             | 52              | 56  | 109 | 7   |
|                        | 8                     | Int.                     | ★                    | MWS0640X8DB           | 72              | 77  | 130 | 7   |
|                        | 10                    | Int.                     | ★                    | MWS0640X10DB          | 85              | 88  | 141 | 7   |
|                        | 15                    | Int.                     | ★                    | MWS0640X15DB          | 117             | 120 | 173 | 7   |
|                        | 20                    | Int.                     | ★                    | MWS0640X20DB          | 150             | 153 | 206 | 7   |
|                        | 25                    | Int.                     | ★                    | MWS0640X25DB          | 182             | 185 | 238 | 7   |
| 30                     | Int.                  | ★                        | MWS0640X30DB         | 215                   | 218             | 271 | 7   |     |
| 6.5                    | 2                     | Est.                     | ●                    | MWE0650SA             | 31              | 31  | 70  | 6.5 |
|                        | 3                     | Est.                     | ●                    | MWE0650MA             | 41              | 41  | 81  | 6.5 |
|                        | 3                     | Int.                     | ●                    | MWS0650MB             | 32.5            | 35  | 88  | 7   |
|                        | 5                     | Int.                     | ●                    | MWS0650LB             | 52              | 56  | 109 | 7   |
|                        | 8                     | Int.                     | ★                    | MWS0650X8DB           | 72              | 77  | 130 | 7   |
|                        | 10                    | Int.                     | ★                    | MWS0650X10DB          | 85              | 88  | 141 | 7   |
|                        | 15                    | Int.                     | ★                    | MWS0650X15DB          | 117             | 120 | 173 | 7   |
|                        | 20                    | Int.                     | ★                    | MWS0650X20DB          | 150             | 153 | 206 | 7   |
|                        | 25                    | Int.                     | ★                    | MWS0650X25DB          | 182             | 185 | 238 | 7   |
| 30                     | Int.                  | ★                        | MWS0650X30DB         | 215                   | 218             | 271 | 7   |     |
| 6.6                    | 2                     | Est.                     | ★                    | MWE0660SA             | 31              | 31  | 70  | 6.6 |
|                        | 3                     | Est.                     | ★                    | MWE0660MA             | 43              | 43  | 83  | 6.6 |
|                        | 3                     | Int.                     | ★                    | MWS0660MB             | 35              | 35  | 88  | 7   |
|                        | 5                     | Int.                     | ●                    | MWS0660LB             | 56              | 56  | 109 | 7   |
|                        | 8                     | Int.                     | ★                    | MWS0660X8DB           | 77              | 77  | 130 | 7   |
|                        | 10                    | Int.                     | ★                    | MWS0660X10DB          | 91              | 94  | 147 | 7   |
|                        | 15                    | Int.                     | ★                    | MWS0660X15DB          | 126             | 129 | 182 | 7   |
|                        | 20                    | Int.                     | ★                    | MWS0660X20DB          | 161             | 164 | 217 | 7   |
|                        | 25                    | Int.                     | ★                    | MWS0660X25DB          | 196             | 199 | 252 | 7   |
| 30                     | Int.                  | ★                        | MWS0660X30DB         | 231                   | 234             | 287 | 7   |     |
| 6.7                    | 2                     | Est.                     | ★                    | MWE0670SA             | 31              | 31  | 70  | 6.7 |
|                        | 3                     | Est.                     | ★                    | MWE0670MA             | 43              | 43  | 83  | 6.7 |
|                        | 3                     | Int.                     | ●                    | MWS0670MB             | 35              | 35  | 88  | 7   |
|                        | 5                     | Int.                     | ★                    | MWS0670LB             | 56              | 56  | 109 | 7   |
|                        | 8                     | Int.                     | ★                    | MWS0670X8DB           | 77              | 77  | 130 | 7   |
|                        | 10                    | Int.                     | ★                    | MWS0670X10DB          | 91              | 94  | 147 | 7   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4  |
| 6.7                    | 10                    | Int.                     | ★                    | MWS0670X10DB          | 91              | 94  | 147 | 7   |
|                        | 15                    | Int.                     | ★                    | MWS0670X15DB          | 126             | 129 | 182 | 7   |
|                        | 20                    | Int.                     | ★                    | MWS0670X20DB          | 161             | 164 | 217 | 7   |
|                        | 25                    | Int.                     | ★                    | MWS0670X25DB          | 196             | 199 | 252 | 7   |
|                        | 30                    | Int.                     | ★                    | MWS0670X30DB          | 231             | 234 | 287 | 7   |
|                        | 6.8                   | 2                        | Est.                 | ●                     | MWE0680SA       | 34  | 34  | 74  |
| 3                      |                       | Est.                     | ●                    | MWE0680MA             | 43              | 43  | 83  | 6.8 |
| 3                      |                       | Int.                     | ●                    | MWS0680MB             | 35              | 35  | 88  | 7   |
| 5                      |                       | Int.                     | ●                    | MWS0680LB             | 56              | 56  | 109 | 7   |
| 8                      |                       | Int.                     | ★                    | MWS0680X8DB           | 77              | 77  | 130 | 7   |
| 10                     |                       | Int.                     | ★                    | MWS0680X10DB          | 91              | 94  | 147 | 7   |
| 15                     |                       | Int.                     | ★                    | MWS0680X15DB          | 126             | 129 | 182 | 7   |
| 20                     |                       | Int.                     | ★                    | MWS0680X20DB          | 161             | 164 | 217 | 7   |
| 25                     |                       | Int.                     | ★                    | MWS0680X25DB          | 196             | 199 | 252 | 7   |
| 30                     | Int.                  | ★                        | MWS0680X30DB         | 231                   | 234             | 287 | 7   |     |
| 6.9                    | 2                     | Est.                     | ★                    | MWE0690SA             | 34              | 34  | 74  | 6.9 |
|                        | 3                     | Est.                     | ●                    | MWE0690MA             | 43              | 43  | 83  | 6.9 |
|                        | 3                     | Int.                     | ●                    | MWS0690MB             | 35              | 35  | 88  | 7   |
|                        | 5                     | Int.                     | ●                    | MWS0690LB             | 56              | 56  | 109 | 7   |
|                        | 8                     | Int.                     | ★                    | MWS0690X8DB           | 77              | 77  | 130 | 7   |
|                        | 10                    | Int.                     | ★                    | MWS0690X10DB          | 91              | 94  | 147 | 7   |
|                        | 15                    | Int.                     | ★                    | MWS0690X15DB          | 126             | 129 | 182 | 7   |
|                        | 20                    | Int.                     | ★                    | MWS0690X20DB          | 161             | 164 | 217 | 7   |
|                        | 25                    | Int.                     | ★                    | MWS0690X25DB          | 196             | 199 | 252 | 7   |
| 30                     | Int.                  | ★                        | MWS0690X30DB         | 231                   | 234             | 287 | 7   |     |
| 7.0                    | 2                     | Est.                     | ●                    | MWE0700SA             | 34              | 34  | 74  | 7   |
|                        | 3                     | Est.                     | ●                    | MWE0700MA             | 43              | 43  | 83  | 7   |
|                        | 3                     | Int.                     | ●                    | MWS0700MB             | 35              | 35  | 88  | 7   |
|                        | 5                     | Int.                     | ●                    | MWS0700LB             | 56              | 56  | 109 | 7   |
|                        | 8                     | Int.                     | ★                    | MWS0700X8DB           | 77              | 77  | 130 | 7   |
|                        | 10                    | Int.                     | ★                    | MWS0700X10DB          | 91              | 94  | 147 | 7   |
|                        | 15                    | Int.                     | ★                    | MWS0700X15DB          | 126             | 129 | 182 | 7   |
|                        | 20                    | Int.                     | ★                    | MWS0700X20DB          | 161             | 164 | 217 | 7   |
|                        | 25                    | Int.                     | ★                    | MWS0700X25DB          | 196             | 199 | 252 | 7   |
| 30                     | Int.                  | ★                        | MWS0700X30DB         | 231                   | 234             | 287 | 7   |     |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 7.1                       | 2                        | Est.                        | ★                       | MWE0710SA             | 34              | 34  | 74  | 7.1 |
|                           | 3                        | Est.                        | ●                       | MWE0710MA             | 45              | 45  | 87  | 7.1 |
|                           | 3                        | Int.                        | ●                       | MWS0710MB             | 37.5            | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ●                       | MWS0710LB             | 60              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0710X8DB           | 83              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0710X10DB          | 98              | 101 | 155 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0710X15DB          | 135             | 138 | 192 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0710X20DB          | 173             | 176 | 230 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0710X25DB          | 210             | 213 | 267 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0710X30DB          | 248             | 251 | 305 | 8   |
| 7.2                       | 2                        | Est.                        | ★                       | MWE0720SA             | 34              | 34  | 74  | 7.2 |
|                           | 3                        | Est.                        | ★                       | MWE0720MA             | 45              | 45  | 87  | 7.2 |
|                           | 3                        | Int.                        | ●                       | MWS0720MB             | 37.5            | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ★                       | MWS0720LB             | 60              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0720X8DB           | 83              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0720X10DB          | 98              | 101 | 155 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0720X15DB          | 135             | 138 | 192 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0720X20DB          | 173             | 176 | 230 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0720X25DB          | 210             | 213 | 267 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0720X30DB          | 248             | 251 | 305 | 8   |
| 7.3                       | 2                        | Est.                        | ★                       | MWE0730SA             | 34              | 34  | 74  | 7.3 |
|                           | 3                        | Est.                        | ●                       | MWE0730MA             | 45              | 45  | 87  | 7.3 |
|                           | 3                        | Int.                        | ★                       | MWS0730MB             | 37.5            | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ●                       | MWS0730LB             | 60              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0730X8DB           | 83              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0730X10DB          | 98              | 101 | 155 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0730X15DB          | 135             | 138 | 192 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0730X20DB          | 173             | 176 | 230 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0730X25DB          | 210             | 213 | 267 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0730X30DB          | 248             | 251 | 305 | 8   |
| 7.4                       | 2                        | Est.                        | ★                       | MWE0740SA             | 34              | 34  | 74  | 7.4 |
|                           | 3                        | Est.                        | ●                       | MWE0740MA             | 45              | 45  | 87  | 7.4 |
|                           | 3                        | Int.                        | ★                       | MWS0740MB             | 37.5            | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ●                       | MWS0740LB             | 60              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0740X8DB           | 83              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0740X10DB          | 98              | 101 | 155 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0740X15DB          | 135             | 138 | 192 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0740X20DB          | 173             | 176 | 230 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0740X25DB          | 210             | 213 | 267 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0740X30DB          | 248             | 251 | 305 | 8   |
| 7.5                       | 2                        | Est.                        | ★                       | MWE0750SA             | 34              | 34  | 74  | 7.5 |
|                           | 3                        | Est.                        | ●                       | MWE0750MA             | 45              | 45  | 87  | 7.5 |
|                           | 3                        | Int.                        | ●                       | MWS0750MB             | 37.5            | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ●                       | MWS0750LB             | 60              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0750X8DB           | 83              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0750X10DB          | 98              | 101 | 155 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0750X15DB          | 135             | 138 | 192 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0750X20DB          | 173             | 176 | 230 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0750X25DB          | 210             | 213 | 267 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0750X30DB          | 248             | 251 | 305 | 8   |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 7.6                       | 2                        | Est.                        | ★                       | MWE0760SA             | 37              | 37  | 79  | 7.6 |
|                           | 3                        | Est.                        | ●                       | MWE0760MA             | 48              | 48  | 90  | 7.6 |
|                           | 3                        | Int.                        | ★                       | MWS0760MB             | 40              | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ★                       | MWS0760LB             | 64              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0760X8DB           | 88              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0760X10DB          | 104             | 107 | 161 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0760X15DB          | 144             | 147 | 201 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0760X20DB          | 184             | 187 | 241 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0760X25DB          | 224             | 227 | 281 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0760X30DB          | 264             | 267 | 321 | 8   |
| 7.7                       | 2                        | Est.                        | ★                       | MWE0770SA             | 37              | 37  | 79  | 7.7 |
|                           | 3                        | Est.                        | ●                       | MWE0770MA             | 48              | 48  | 90  | 7.7 |
|                           | 3                        | Int.                        | ★                       | MWS0770MB             | 40              | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ★                       | MWS0770LB             | 64              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0770X8DB           | 88              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0770X10DB          | 104             | 107 | 161 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0770X15DB          | 144             | 147 | 201 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0770X20DB          | 184             | 187 | 241 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0770X25DB          | 224             | 227 | 281 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0770X30DB          | 264             | 267 | 321 | 8   |
| 7.8                       | 2                        | Est.                        | ●                       | MWE0780SA             | 37              | 37  | 79  | 7.8 |
|                           | 3                        | Est.                        | ★                       | MWE0780MA             | 48              | 48  | 90  | 7.8 |
|                           | 3                        | Int.                        | ●                       | MWS0780MB             | 40              | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ●                       | MWS0780LB             | 64              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0780X8DB           | 88              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0780X10DB          | 104             | 107 | 161 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0780X15DB          | 144             | 147 | 201 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0780X20DB          | 184             | 187 | 241 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0780X25DB          | 224             | 227 | 281 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0780X30DB          | 264             | 267 | 321 | 8   |
| 7.9                       | 2                        | Est.                        | ★                       | MWE0790SA             | 37              | 37  | 79  | 7.9 |
|                           | 3                        | Est.                        | ★                       | MWE0790MA             | 48              | 48  | 90  | 7.9 |
|                           | 3                        | Int.                        | ★                       | MWS0790MB             | 40              | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ★                       | MWS0790LB             | 64              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0790X8DB           | 88              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0790X10DB          | 104             | 107 | 161 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0790X15DB          | 144             | 147 | 201 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0790X20DB          | 184             | 187 | 241 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0790X25DB          | 224             | 227 | 281 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0790X30DB          | 264             | 267 | 321 | 8   |
| 8.0                       | 2                        | Est.                        | ●                       | MWE0800SA             | 37              | 37  | 79  | 8   |
|                           | 3                        | Est.                        | ●                       | MWE0800MA             | 48              | 48  | 90  | 8   |
|                           | 3                        | Int.                        | ●                       | MWS0800MB             | 40              | 40  | 94  | 8   |
|                           | 5                        | Int.                        | ●                       | MWS0800LB             | 64              | 64  | 118 | 8   |
|                           | 8                        | Int.                        | ★                       | MWS0800X8DB           | 88              | 88  | 142 | 8   |
|                           | 10                       | Int.                        | ★                       | MWS0800X10DB          | 104             | 107 | 161 | 8   |
|                           | 15                       | Int.                        | ★                       | MWS0800X15DB          | 144             | 147 | 201 | 8   |
|                           | 20                       | Int.                        | ★                       | MWS0800X20DB          | 184             | 187 | 241 | 8   |
|                           | 25                       | Int.                        | ★                       | MWS0800X25DB          | 224             | 227 | 281 | 8   |
|                           | 30                       | Int.                        | ★                       | MWS0800X30DB          | 264             | 267 | 321 | 8   |



# FORATURA (METALLO DURO)

## MWE, MWS

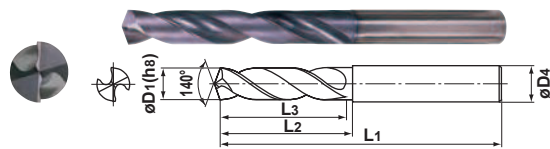
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ★ Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



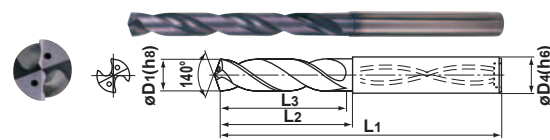
|                                       |                  |                      |       |              |                           |
|---------------------------------------|------------------|----------------------|-------|--------------|---------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Lega leggera | Lega resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +            | +                         |

|                    |                |                  |                  |                  |                  |                  |
|--------------------|----------------|------------------|------------------|------------------|------------------|------------------|
|                    |                | D1=3             | 3<D1≤6           | 6<D1≤10          | 10<D1≤18         | 18<D1≤25         |
| Tolleranza D1 (mm) | MWE            | 0                | 0                | 0                | 0                | 0                |
|                    | MWS-MB/LB/X8DB | -0.014           | -0.018           | -0.022           | -0.027           | -0.033           |
| Tolleranza D4 (mm) | MWS            | 0                | 0                | 0                | 0                | 0                |
|                    | MWS-X10-X30DB  | -0.017<br>-0.031 | -0.025<br>-0.043 | -0.033<br>-0.055 | -0.041<br>-0.068 | -0.033<br>-0.013 |

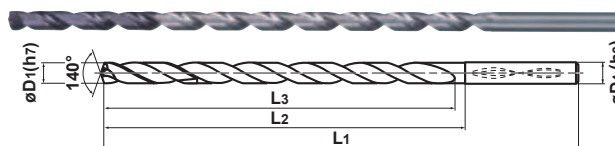
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi$  5.0 hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP-15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|-----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                       |                       | L3              | L2  | L1  | D4  |
| 8.1                    | 2                     | Est.                     | ●                     | MWE0810SA             | 37              | 37  | 79  | 8.1 |
|                        | 3                     | Est.                     | ●                     | MWE0810MA             | 53              | 53  | 96  | 8.1 |
|                        | 3                     | Int.                     | ★                     | MWS0810MB             | 42.5            | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ●                     | MWS0810LB             | 68              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0810X8DB           | 94              | 99  | 154 | 9   |
|                        | 10                    | Int.                     | ★                     | MWS0810X10DB          | 111             | 114 | 169 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0810X15DB          | 153             | 156 | 211 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0810X20DB          | 196             | 199 | 254 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0810X25DB          | 238             | 241 | 296 | 9   |
| 30                     | Int.                  | ★                        | MWS0810X30DB          | 281                   | 284             | 339 | 9   |     |
| 8.2                    | 2                     | Est.                     | ★                     | MWE0820SA             | 37              | 37  | 79  | 8.2 |
|                        | 3                     | Est.                     | ●                     | MWE0820MA             | 53              | 53  | 96  | 8.2 |
|                        | 3                     | Int.                     | ●                     | MWS0820MB             | 42.5            | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ●                     | MWS0820LB             | 68              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0820X8DB           | 94              | 99  | 154 | 9   |
|                        | 10                    | Int.                     | ★                     | MWS0820X10DB          | 111             | 114 | 169 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0820X15DB          | 153             | 156 | 211 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0820X20DB          | 196             | 199 | 254 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0820X25DB          | 238             | 241 | 296 | 9   |
| 30                     | Int.                  | ★                        | MWS0820X30DB          | 281                   | 284             | 339 | 9   |     |
| 8.3                    | 2                     | Est.                     | ★                     | MWE0830SA             | 37              | 37  | 79  | 8.3 |
|                        | 3                     | Est.                     | ●                     | MWE0830MA             | 53              | 53  | 96  | 8.3 |
|                        | 3                     | Int.                     | ★                     | MWS0830MB             | 42.5            | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ★                     | MWS0830LB             | 68              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0830X8DB           | 94              | 99  | 154 | 9   |
|                        | 10                    | Int.                     | ★                     | MWS0830X10DB          | 111             | 114 | 169 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0830X15DB          | 153             | 156 | 211 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0830X20DB          | 196             | 199 | 254 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0830X25DB          | 238             | 241 | 296 | 9   |
| 30                     | Int.                  | ★                        | MWS0830X30DB          | 281                   | 284             | 339 | 9   |     |
| 8.4                    | 2                     | Est.                     | ★                     | MWE0840SA             | 37              | 37  | 79  | 8.4 |
|                        | 3                     | Est.                     | ●                     | MWE0840MA             | 53              | 53  | 96  | 8.4 |
|                        | 3                     | Int.                     | ★                     | MWS0840MB             | 42.5            | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ●                     | MWS0840LB             | 68              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0840X8DB           | 94              | 99  | 154 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0840X8DB           | 94              | 99  | 154 | 9   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP-15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|------------------------|-----------------------|--------------------------|-----------------------|-----------------------|-----------------|-----|-----|-----|
|                        |                       |                          |                       |                       | L3              | L2  | L1  | D4  |
| 8.4                    | 10                    | Int.                     | ★                     | MWS0840X10DB          | 111             | 114 | 169 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0840X15DB          | 153             | 156 | 211 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0840X20DB          | 196             | 199 | 254 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0840X25DB          | 238             | 241 | 296 | 9   |
|                        | 30                    | Int.                     | ★                     | MWS0840X30DB          | 281             | 284 | 339 | 9   |
|                        | 30                    | Int.                     | ★                     | MWS0840X30DB          | 281             | 284 | 339 | 9   |
| 8.5                    | 2                     | Est.                     | ●                     | MWE0850SA             | 37              | 37  | 79  | 8.5 |
|                        | 3                     | Est.                     | ●                     | MWE0850MA             | 53              | 53  | 96  | 8.5 |
|                        | 3                     | Int.                     | ●                     | MWS0850MB             | 42.5            | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ●                     | MWS0850LB             | 68              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0850X8DB           | 94              | 99  | 154 | 9   |
|                        | 10                    | Int.                     | ★                     | MWS0850X10DB          | 111             | 114 | 169 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0850X15DB          | 153             | 156 | 211 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0850X20DB          | 196             | 199 | 254 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0850X25DB          | 238             | 241 | 296 | 9   |
| 30                     | Int.                  | ★                        | MWS0850X30DB          | 281                   | 284             | 339 | 9   |     |
| 8.6                    | 2                     | Est.                     | ★                     | MWE0860SA             | 40              | 40  | 84  | 8.6 |
|                        | 3                     | Est.                     | ●                     | MWE0860MA             | 55              | 55  | 98  | 8.6 |
|                        | 3                     | Int.                     | ●                     | MWS0860MB             | 45              | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ★                     | MWS0860LB             | 72              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0860X8DB           | 99              | 99  | 154 | 9   |
|                        | 10                    | Int.                     | ★                     | MWS0860X10DB          | 117             | 120 | 175 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0860X15DB          | 162             | 165 | 220 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0860X20DB          | 207             | 210 | 265 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0860X25DB          | 252             | 255 | 310 | 9   |
| 30                     | Int.                  | ★                        | MWS0860X30DB          | 297                   | 300             | 355 | 9   |     |
| 8.7                    | 2                     | Est.                     | ★                     | MWE0870SA             | 40              | 40  | 84  | 8.7 |
|                        | 3                     | Est.                     | ●                     | MWE0870MA             | 55              | 55  | 98  | 8.7 |
|                        | 3                     | Int.                     | ★                     | MWS0870MB             | 45              | 45  | 100 | 9   |
|                        | 5                     | Int.                     | ★                     | MWS0870LB             | 72              | 72  | 127 | 9   |
|                        | 8                     | Int.                     | ★                     | MWS0870X8DB           | 99              | 99  | 154 | 9   |
|                        | 10                    | Int.                     | ★                     | MWS0870X10DB          | 117             | 120 | 175 | 9   |
|                        | 15                    | Int.                     | ★                     | MWS0870X15DB          | 162             | 165 | 220 | 9   |
|                        | 20                    | Int.                     | ★                     | MWS0870X20DB          | 207             | 210 | 265 | 9   |
|                        | 25                    | Int.                     | ★                     | MWS0870X25DB          | 252             | 255 | 310 | 9   |
| 30                     | Int.                  | ★                        | MWS0870X30DB          | 297                   | 300             | 355 | 9   |     |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 8.8                       | 2                        | Est.                        | ★                       | MWE0880SA             | 40              | 40  | 84  | 8.8 |
|                           | 3                        | Est.                        | ●                       | MWE0880MA             | 55              | 55  | 98  | 8.8 |
|                           | 3                        | Int.                        | ●                       | MWS0880MB             | 45              | 45  | 100 | 9   |
|                           | 5                        | Int.                        | ●                       | MWS0880LB             | 72              | 72  | 127 | 9   |
|                           | 8                        | Int.                        | ★                       | MWS0880X8DB           | 99              | 99  | 154 | 9   |
|                           | 10                       | Int.                        | ★                       | MWS0880X10DB          | 117             | 120 | 175 | 9   |
|                           | 15                       | Int.                        | ★                       | MWS0880X15DB          | 162             | 165 | 220 | 9   |
|                           | 20                       | Int.                        | ★                       | MWS0880X20DB          | 207             | 210 | 265 | 9   |
|                           | 25                       | Int.                        | ★                       | MWS0880X25DB          | 252             | 255 | 310 | 9   |
|                           | 30                       | Int.                        | ★                       | MWS0880X30DB          | 297             | 300 | 355 | 9   |
| 8.9                       | 2                        | Est.                        | ★                       | MWE0890SA             | 40              | 40  | 84  | 8.9 |
|                           | 3                        | Est.                        | ★                       | MWE0890MA             | 55              | 55  | 98  | 8.9 |
|                           | 3                        | Int.                        | ★                       | MWS0890MB             | 45              | 45  | 100 | 9   |
|                           | 5                        | Int.                        | ★                       | MWS0890LB             | 72              | 72  | 127 | 9   |
|                           | 8                        | Int.                        | ★                       | MWS0890X8DB           | 99              | 99  | 154 | 9   |
|                           | 10                       | Int.                        | ★                       | MWS0890X10DB          | 117             | 120 | 175 | 9   |
|                           | 15                       | Int.                        | ★                       | MWS0890X15DB          | 162             | 165 | 220 | 9   |
|                           | 20                       | Int.                        | ★                       | MWS0890X20DB          | 207             | 210 | 265 | 9   |
|                           | 25                       | Int.                        | ★                       | MWS0890X25DB          | 252             | 255 | 310 | 9   |
|                           | 30                       | Int.                        | ★                       | MWS0890X30DB          | 297             | 300 | 355 | 9   |
| 9.0                       | 2                        | Est.                        | ●                       | MWE0900SA             | 40              | 40  | 84  | 9   |
|                           | 3                        | Est.                        | ●                       | MWE0900MA             | 55              | 55  | 98  | 9   |
|                           | 3                        | Int.                        | ●                       | MWS0900MB             | 45              | 45  | 100 | 9   |
|                           | 5                        | Int.                        | ●                       | MWS0900LB             | 72              | 72  | 127 | 9   |
|                           | 8                        | Int.                        | ★                       | MWS0900X8DB           | 99              | 99  | 154 | 9   |
|                           | 10                       | Int.                        | ★                       | MWS0900X10DB          | 117             | 120 | 175 | 9   |
|                           | 15                       | Int.                        | ★                       | MWS0900X15DB          | 162             | 165 | 220 | 9   |
|                           | 20                       | Int.                        | ★                       | MWS0900X20DB          | 207             | 210 | 265 | 9   |
|                           | 25                       | Int.                        | ★                       | MWS0900X25DB          | 252             | 255 | 310 | 9   |
|                           | 30                       | Int.                        | ★                       | MWS0900X30DB          | 297             | 300 | 355 | 9   |
| 9.1                       | 2                        | Est.                        | ●                       | MWE0910SA             | 40              | 40  | 84  | 9.1 |
|                           | 3                        | Est.                        | ●                       | MWE0910MA             | 58              | 58  | 102 | 9.1 |
|                           | 3                        | Int.                        | ★                       | MWS0910MB             | 47.5            | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ●                       | MWS0910LB             | 76              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0910X8DB           | 105             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0910X10DB          | 124             | 127 | 182 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0910X15DB          | 171             | 174 | 229 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0910X20DB          | 219             | 222 | 277 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0910X25DB          | 266             | 269 | 324 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0910X30DB          | 314             | 317 | 372 | 10  |
| 9.2                       | 2                        | Est.                        | ●                       | MWE0920SA             | 40              | 40  | 84  | 9.2 |
|                           | 3                        | Est.                        | ●                       | MWE0920MA             | 58              | 58  | 102 | 9.2 |
|                           | 3                        | Int.                        | ★                       | MWS0920MB             | 47.5            | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ●                       | MWS0920LB             | 76              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0920X8DB           | 105             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0920X10DB          | 124             | 127 | 182 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0920X15DB          | 171             | 174 | 229 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0920X20DB          | 219             | 222 | 277 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0920X25DB          | 266             | 269 | 324 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0920X30DB          | 314             | 317 | 372 | 10  |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |     |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|-----|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4  |
| 9.3                       | 2                        | Est.                        | ★                       | MWE0930SA             | 40              | 40  | 84  | 9.3 |
|                           | 3                        | Est.                        | ★                       | MWE0930MA             | 58              | 58  | 102 | 9.3 |
|                           | 3                        | Int.                        | ★                       | MWS0930MB             | 47.5            | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ★                       | MWS0930LB             | 76              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0930X8DB           | 105             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0930X10DB          | 124             | 127 | 182 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0930X15DB          | 171             | 174 | 229 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0930X20DB          | 219             | 222 | 277 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0930X25DB          | 266             | 269 | 324 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0930X30DB          | 314             | 317 | 372 | 10  |
| 9.4                       | 2                        | Est.                        | ★                       | MWE0940SA             | 40              | 40  | 84  | 9.4 |
|                           | 3                        | Est.                        | ★                       | MWE0940MA             | 58              | 58  | 102 | 9.4 |
|                           | 3                        | Int.                        | ★                       | MWS0940MB             | 47.5            | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ★                       | MWS0940LB             | 76              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0940X8DB           | 105             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0940X10DB          | 124             | 127 | 182 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0940X15DB          | 171             | 174 | 229 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0940X20DB          | 219             | 222 | 277 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0940X25DB          | 266             | 269 | 324 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0940X30DB          | 314             | 317 | 372 | 10  |
| 9.5                       | 2                        | Est.                        | ★                       | MWE0950SA             | 40              | 40  | 84  | 9.5 |
|                           | 3                        | Est.                        | ●                       | MWE0950MA             | 58              | 58  | 102 | 9.5 |
|                           | 3                        | Int.                        | ●                       | MWS0950MB             | 47.5            | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ●                       | MWS0950LB             | 76              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0950X8DB           | 105             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0950X10DB          | 124             | 127 | 182 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0950X15DB          | 171             | 174 | 229 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0950X20DB          | 219             | 222 | 277 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0950X25DB          | 266             | 269 | 324 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0950X30DB          | 314             | 317 | 372 | 10  |
| 9.6                       | 2                        | Est.                        | ★                       | MWE0960SA             | 43              | 43  | 89  | 9.6 |
|                           | 3                        | Est.                        | ●                       | MWE0960MA             | 60              | 60  | 105 | 9.6 |
|                           | 3                        | Int.                        | ★                       | MWS0960MB             | 50              | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ★                       | MWS0960LB             | 80              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0960X8DB           | 110             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0960X10DB          | 130             | 133 | 188 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0960X15DB          | 180             | 183 | 238 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0960X20DB          | 230             | 233 | 288 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0960X25DB          | 280             | 283 | 338 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0960X30DB          | 330             | 333 | 388 | 10  |
| 9.7                       | 2                        | Est.                        | ★                       | MWE0970SA             | 43              | 43  | 89  | 9.7 |
|                           | 3                        | Est.                        | ●                       | MWE0970MA             | 60              | 60  | 105 | 9.7 |
|                           | 3                        | Int.                        | ●                       | MWS0970MB             | 50              | 50  | 106 | 10  |
|                           | 5                        | Int.                        | ●                       | MWS0970LB             | 80              | 80  | 136 | 10  |
|                           | 8                        | Int.                        | ★                       | MWS0970X8DB           | 110             | 110 | 166 | 10  |
|                           | 10                       | Int.                        | ★                       | MWS0970X10DB          | 130             | 133 | 188 | 10  |
|                           | 15                       | Int.                        | ★                       | MWS0970X15DB          | 180             | 183 | 238 | 10  |
|                           | 20                       | Int.                        | ★                       | MWS0970X20DB          | 230             | 233 | 288 | 10  |
|                           | 25                       | Int.                        | ★                       | MWS0970X25DB          | 280             | 283 | 338 | 10  |
|                           | 30                       | Int.                        | ★                       | MWS0970X30DB          | 330             | 333 | 388 | 10  |





# FORATURA (METALLO DURO)

## MWE, MWS

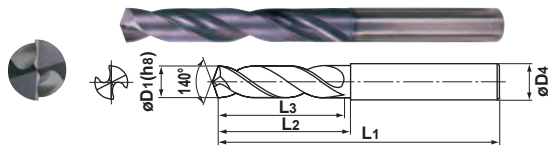
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



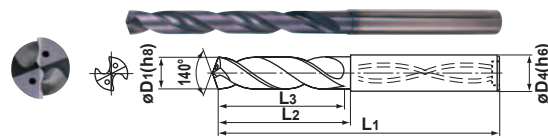
|                                       |                  |                      |       |              |                           |
|---------------------------------------|------------------|----------------------|-------|--------------|---------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Lega leggera | Lega resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +            | +                         |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWS-X10-X30DB  | -0.017 | -0.025 | -0.033  | -0.041   | -0.068   |
|                    | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS            | -0.006 | -0.008 | -0.009  | -0.011   | -0.013   |

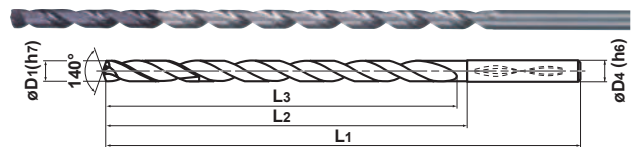
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi$  5.0 hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4   |
| 9.8                    | 2                     | Est.                     | ★                    | MWE0980SA             | 43              | 43  | 89  | 9.8  |
|                        | 3                     | Est.                     | ★                    | MWE0980MA             | 60              | 60  | 105 | 9.8  |
|                        | 3                     | Int.                     | ●                    | MWS0980MB             | 50              | 50  | 106 | 10   |
|                        | 5                     | Int.                     | ●                    | MWS0980LB             | 80              | 80  | 136 | 10   |
|                        | 8                     | Int.                     | ★                    | MWS0980X8DB           | 110             | 110 | 166 | 10   |
|                        | 10                    | Int.                     | ★                    | MWS0980X10DB          | 130             | 133 | 188 | 10   |
|                        | 15                    | Int.                     | ★                    | MWS0980X15DB          | 180             | 183 | 238 | 10   |
|                        | 20                    | Int.                     | ★                    | MWS0980X20DB          | 230             | 233 | 288 | 10   |
| 9.9                    | 2                     | Est.                     | ★                    | MWE0990SA             | 43              | 43  | 89  | 9.9  |
|                        | 3                     | Est.                     | ★                    | MWE0990MA             | 60              | 60  | 105 | 9.9  |
|                        | 3                     | Int.                     | ★                    | MWS0990MB             | 50              | 50  | 106 | 10   |
|                        | 5                     | Int.                     | ★                    | MWS0990LB             | 80              | 80  | 136 | 10   |
|                        | 8                     | Int.                     | ★                    | MWS0990X8DB           | 110             | 110 | 166 | 10   |
|                        | 10                    | Int.                     | ★                    | MWS0990X10DB          | 130             | 133 | 188 | 10   |
|                        | 15                    | Int.                     | ★                    | MWS0990X15DB          | 180             | 183 | 238 | 10   |
|                        | 20                    | Int.                     | ★                    | MWS0990X20DB          | 230             | 233 | 288 | 10   |
| 10.0                   | 2                     | Est.                     | ●                    | MWE1000SA             | 43              | 43  | 89  | 10   |
|                        | 3                     | Est.                     | ●                    | MWE1000MA             | 60              | 60  | 105 | 10   |
|                        | 3                     | Int.                     | ●                    | MWS1000MB             | 50              | 50  | 106 | 10   |
|                        | 5                     | Int.                     | ●                    | MWS1000LB             | 80              | 80  | 136 | 10   |
|                        | 8                     | Int.                     | ★                    | MWS1000X8DB           | 110             | 110 | 166 | 10   |
|                        | 10                    | Int.                     | ★                    | MWS1000X10DB          | 130             | 133 | 188 | 10   |
|                        | 15                    | Int.                     | ★                    | MWS1000X15DB          | 180             | 183 | 238 | 10   |
|                        | 20                    | Int.                     | ★                    | MWS1000X20DB          | 230             | 233 | 288 | 10   |
| 10.1                   | 2                     | Est.                     | ★                    | MWE1010SA             | 43              | 43  | 89  | 10.1 |
|                        | 3                     | Est.                     | ●                    | MWE1010MA             | 66              | 66  | 112 | 10.1 |
|                        | 3                     | Int.                     | ★                    | MWS1010MB             | 52.5            | 55  | 116 | 11   |
|                        | 5                     | Int.                     | ●                    | MWS1010LB             | 84              | 88  | 149 | 11   |
|                        | 8                     | Int.                     | ★                    | MWS1010X8DB           | 116             | 121 | 182 | 11   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4   |
| 10.1                   | 10                    | Int.                     | ★                    | MWS1010X10DB          | 137             | 140 | 201 | 11   |
|                        | 15                    | Int.                     | ★                    | MWS1010X15DB          | 189             | 192 | 253 | 11   |
|                        | 20                    | Int.                     | ★                    | MWS1010X20DB          | 242             | 245 | 306 | 11   |
|                        | 25                    | Int.                     | ★                    | MWS1010X25DB          | 294             | 297 | 358 | 11   |
|                        | 10.2                  | 2                        | Est.                 | ●                     | MWE1020SA       | 43  | 43  | 89   |
| 3                      |                       | Est.                     | ●                    | MWE1020MA             | 66              | 66  | 112 | 10.2 |
| 3                      |                       | Int.                     | ●                    | MWS1020MB             | 52.5            | 55  | 116 | 11   |
| 5                      |                       | Int.                     | ●                    | MWS1020LB             | 84              | 88  | 149 | 11   |
| 8                      |                       | Int.                     | ★                    | MWS1020X8DB           | 116             | 121 | 182 | 11   |
| 10                     |                       | Int.                     | ★                    | MWS1020X10DB          | 137             | 140 | 201 | 11   |
| 15                     |                       | Int.                     | ★                    | MWS1020X15DB          | 189             | 192 | 253 | 11   |
| 20                     |                       | Int.                     | ★                    | MWS1020X20DB          | 242             | 245 | 306 | 11   |
| 10.3                   | 2                     | Est.                     | ★                    | MWE1030SA             | 43              | 43  | 89  | 10.3 |
|                        | 3                     | Est.                     | ●                    | MWE1030MA             | 66              | 66  | 112 | 10.3 |
|                        | 3                     | Int.                     | ★                    | MWS1030MB             | 52.5            | 55  | 116 | 11   |
|                        | 5                     | Int.                     | ●                    | MWS1030LB             | 84              | 88  | 149 | 11   |
|                        | 8                     | Int.                     | ★                    | MWS1030X8DB           | 116             | 121 | 182 | 11   |
|                        | 10                    | Int.                     | ★                    | MWS1030X10DB          | 137             | 140 | 201 | 11   |
|                        | 15                    | Int.                     | ★                    | MWS1030X15DB          | 189             | 192 | 253 | 11   |
|                        | 20                    | Int.                     | ★                    | MWS1030X20DB          | 242             | 245 | 306 | 11   |
| 10.4                   | 2                     | Est.                     | ★                    | MWE1040SA             | 43              | 43  | 89  | 10.4 |
|                        | 3                     | Est.                     | ●                    | MWE1040MA             | 66              | 66  | 112 | 10.4 |
|                        | 3                     | Int.                     | ★                    | MWS1040MB             | 52.5            | 55  | 116 | 11   |
|                        | 5                     | Int.                     | ★                    | MWS1040LB             | 84              | 88  | 149 | 11   |
|                        | 8                     | Int.                     | ★                    | MWS1040X8DB           | 116             | 121 | 182 | 11   |
|                        | 10                    | Int.                     | ★                    | MWS1040X10DB          | 137             | 140 | 201 | 11   |
|                        | 15                    | Int.                     | ★                    | MWS1040X15DB          | 189             | 192 | 253 | 11   |
|                        | 20                    | Int.                     | ★                    | MWS1040X20DB          | 242             | 245 | 306 | 11   |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 10.5                      | 2                        | Est.                        | ●                       | MWE1050SA             | 43              | 43  | 89  | 10.5 |
|                           | 3                        | Est.                        | ●                       | MWE1050MA             | 66              | 66  | 112 | 10.5 |
|                           | 3                        | Int.                        | ●                       | MWS1050MB             | 52.5            | 55  | 116 | 11   |
|                           | 5                        | Int.                        | ●                       | MWS1050LB             | 84              | 88  | 149 | 11   |
|                           | 8                        | Int.                        | ★                       | MWS1050X8DB           | 116             | 121 | 182 | 11   |
|                           | 10                       | Int.                        | ★                       | MWS1050X10DB          | 137             | 140 | 201 | 11   |
|                           | 15                       | Int.                        | ★                       | MWS1050X15DB          | 189             | 192 | 253 | 11   |
|                           | 20                       | Int.                        | ★                       | MWS1050X20DB          | 242             | 245 | 306 | 11   |
| 25                        | Int.                     | ★                           | MWS1050X25DB            | 294                   | 297             | 358 | 11  |      |
| 10.6                      | 2                        | Est.                        | ★                       | MWE1060SA             | 43              | 43  | 89  | 10.6 |
|                           | 3                        | Est.                        | ★                       | MWE1060MA             | 68              | 68  | 114 | 10.6 |
|                           | 3                        | Int.                        | ●                       | MWS1060MB             | 55              | 55  | 116 | 11   |
|                           | 5                        | Int.                        | ★                       | MWS1060LB             | 88              | 88  | 149 | 11   |
|                           | 8                        | Int.                        | ★                       | MWS1060X8DB           | 121             | 121 | 182 | 11   |
|                           | 10                       | Int.                        | ★                       | MWS1060X10DB          | 143             | 146 | 207 | 11   |
|                           | 15                       | Int.                        | ★                       | MWS1060X15DB          | 198             | 201 | 262 | 11   |
|                           | 20                       | Int.                        | ★                       | MWS1060X20DB          | 253             | 256 | 317 | 11   |
| 25                        | Int.                     | ★                           | MWS1060X25DB            | 308                   | 311             | 372 | 11  |      |
| 10.7                      | 2                        | Est.                        | ★                       | MWE1070SA             | 47              | 47  | 95  | 10.7 |
|                           | 3                        | Est.                        | ★                       | MWE1070MA             | 68              | 68  | 114 | 10.7 |
|                           | 3                        | Int.                        | ★                       | MWS1070MB             | 55              | 55  | 116 | 11   |
|                           | 5                        | Int.                        | ★                       | MWS1070LB             | 88              | 88  | 149 | 11   |
|                           | 8                        | Int.                        | ★                       | MWS1070X8DB           | 121             | 121 | 182 | 11   |
|                           | 10                       | Int.                        | ★                       | MWS1070X10DB          | 143             | 146 | 207 | 11   |
|                           | 15                       | Int.                        | ★                       | MWS1070X15DB          | 198             | 201 | 262 | 11   |
|                           | 20                       | Int.                        | ★                       | MWS1070X20DB          | 253             | 256 | 317 | 11   |
| 25                        | Int.                     | ★                           | MWS1070X25DB            | 308                   | 311             | 372 | 11  |      |
| 10.8                      | 2                        | Est.                        | ★                       | MWE1080SA             | 47              | 47  | 95  | 10.8 |
|                           | 3                        | Est.                        | ●                       | MWE1080MA             | 68              | 68  | 114 | 10.8 |
|                           | 3                        | Int.                        | ★                       | MWS1080MB             | 55              | 55  | 116 | 11   |
|                           | 5                        | Int.                        | ★                       | MWS1080LB             | 88              | 88  | 149 | 11   |
|                           | 8                        | Int.                        | ★                       | MWS1080X8DB           | 121             | 121 | 182 | 11   |
|                           | 10                       | Int.                        | ★                       | MWS1080X10DB          | 143             | 146 | 207 | 11   |
|                           | 15                       | Int.                        | ★                       | MWS1080X15DB          | 198             | 201 | 262 | 11   |
|                           | 20                       | Int.                        | ★                       | MWS1080X20DB          | 253             | 256 | 317 | 11   |
| 25                        | Int.                     | ★                           | MWS1080X25DB            | 308                   | 311             | 372 | 11  |      |
| 10.9                      | 2                        | Est.                        | ★                       | MWE1090SA             | 47              | 47  | 95  | 10.9 |
|                           | 3                        | Est.                        | ★                       | MWE1090MA             | 68              | 68  | 114 | 10.9 |
|                           | 3                        | Int.                        | ★                       | MWS1090MB             | 55              | 55  | 116 | 11   |
|                           | 5                        | Int.                        | ★                       | MWS1090LB             | 88              | 88  | 149 | 11   |
|                           | 8                        | Int.                        | ★                       | MWS1090X8DB           | 121             | 121 | 182 | 11   |
|                           | 10                       | Int.                        | ★                       | MWS1090X10DB          | 143             | 146 | 207 | 11   |
|                           | 15                       | Int.                        | ★                       | MWS1090X15DB          | 198             | 201 | 262 | 11   |
|                           | 20                       | Int.                        | ★                       | MWS1090X20DB          | 253             | 256 | 317 | 11   |
| 25                        | Int.                     | ★                           | MWS1090X25DB            | 308                   | 311             | 372 | 11  |      |
| 11.0                      | 2                        | Est.                        | ●                       | MWE1100SA             | 47              | 47  | 95  | 11   |
|                           | 3                        | Est.                        | ●                       | MWE1100MA             | 68              | 68  | 114 | 11   |
|                           | 3                        | Int.                        | ●                       | MWS1100MB             | 55              | 55  | 116 | 11   |
|                           | 5                        | Int.                        | ●                       | MWS1100LB             | 88              | 88  | 149 | 11   |
|                           | 8                        | Int.                        | ★                       | MWS1100X8DB           | 121             | 121 | 182 | 11   |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 11.0                      | 10                       | Int.                        | ★                       | MWS1100X10DB          | 143             | 146 | 207 | 11   |
|                           | 15                       | Int.                        | ★                       | MWS1100X15DB          | 198             | 201 | 262 | 11   |
|                           | 20                       | Int.                        | ★                       | MWS1100X20DB          | 253             | 256 | 317 | 11   |
|                           | 25                       | Int.                        | ★                       | MWS1100X25DB          | 308             | 311 | 372 | 11   |
|                           | 11.1                     | 2                           | Est.                    | ★                     | MWE1110SA       | 47  | 47  | 95   |
| 3                         |                          | Est.                        | ●                       | MWE1110MA             | 71              | 71  | 118 | 11.1 |
| 3                         |                          | Int.                        | ★                       | MWS1110MB             | 57.5            | 60  | 122 | 12   |
| 5                         |                          | Int.                        | ●                       | MWS1110LB             | 92              | 96  | 158 | 12   |
| 8                         |                          | Int.                        | ★                       | MWS1110X8DB           | 127             | 132 | 194 | 12   |
| 10                        |                          | Int.                        | ★                       | MWS1110X10DB          | 150             | 153 | 215 | 12   |
| 15                        |                          | Int.                        | ★                       | MWS1110X15DB          | 207             | 210 | 272 | 12   |
| 20                        |                          | Int.                        | ★                       | MWS1110X20DB          | 265             | 268 | 330 | 12   |
| 25                        | Int.                     | ★                           | MWS1110X25DB            | 322                   | 325             | 387 | 12  |      |
| 11.2                      | 2                        | Est.                        | ●                       | MWE1120SA             | 47              | 47  | 95  | 11.2 |
|                           | 3                        | Est.                        | ●                       | MWE1120MA             | 71              | 71  | 118 | 11.2 |
|                           | 3                        | Int.                        | ★                       | MWS1120MB             | 57.5            | 60  | 122 | 12   |
|                           | 5                        | Int.                        | ●                       | MWS1120LB             | 92              | 96  | 158 | 12   |
|                           | 8                        | Int.                        | ★                       | MWS1120X8DB           | 127             | 132 | 194 | 12   |
|                           | 10                       | Int.                        | ★                       | MWS1120X10DB          | 150             | 153 | 215 | 12   |
|                           | 15                       | Int.                        | ★                       | MWS1120X15DB          | 207             | 210 | 272 | 12   |
|                           | 20                       | Int.                        | ★                       | MWS1120X20DB          | 265             | 268 | 330 | 12   |
| 25                        | Int.                     | ★                           | MWS1120X25DB            | 322                   | 325             | 387 | 12  |      |
| 11.3                      | 2                        | Est.                        | ★                       | MWE1130SA             | 47              | 47  | 95  | 11.3 |
|                           | 3                        | Est.                        | ★                       | MWE1130MA             | 71              | 71  | 118 | 11.3 |
|                           | 3                        | Int.                        | ★                       | MWS1130MB             | 57.5            | 60  | 122 | 12   |
|                           | 5                        | Int.                        | ★                       | MWS1130LB             | 92              | 96  | 158 | 12   |
|                           | 8                        | Int.                        | ★                       | MWS1130X8DB           | 127             | 132 | 194 | 12   |
|                           | 10                       | Int.                        | ★                       | MWS1130X10DB          | 150             | 153 | 215 | 12   |
|                           | 15                       | Int.                        | ★                       | MWS1130X15DB          | 207             | 210 | 272 | 12   |
|                           | 20                       | Int.                        | ★                       | MWS1130X20DB          | 265             | 268 | 330 | 12   |
| 25                        | Int.                     | ★                           | MWS1130X25DB            | 322                   | 325             | 387 | 12  |      |
| 11.4                      | 2                        | Est.                        | ★                       | MWE1140SA             | 47              | 47  | 95  | 11.4 |
|                           | 3                        | Est.                        | ★                       | MWE1140MA             | 71              | 71  | 118 | 11.4 |
|                           | 3                        | Int.                        | ★                       | MWS1140MB             | 57.5            | 60  | 122 | 12   |
|                           | 5                        | Int.                        | ●                       | MWS1140LB             | 92              | 96  | 158 | 12   |
|                           | 8                        | Int.                        | ★                       | MWS1140X8DB           | 127             | 132 | 194 | 12   |
|                           | 10                       | Int.                        | ★                       | MWS1140X10DB          | 150             | 153 | 215 | 12   |
|                           | 15                       | Int.                        | ★                       | MWS1140X15DB          | 207             | 210 | 272 | 12   |
|                           | 20                       | Int.                        | ★                       | MWS1140X20DB          | 265             | 268 | 330 | 12   |
| 25                        | Int.                     | ★                           | MWS1140X25DB            | 322                   | 325             | 387 | 12  |      |
| 11.5                      | 2                        | Est.                        | ★                       | MWE1150SA             | 47              | 47  | 95  | 11.5 |
|                           | 3                        | Est.                        | ●                       | MWE1150MA             | 71              | 71  | 118 | 11.5 |
|                           | 3                        | Int.                        | ★                       | MWS1150MB             | 57.5            | 60  | 122 | 12   |
|                           | 5                        | Int.                        | ●                       | MWS1150LB             | 92              | 96  | 158 | 12   |
|                           | 8                        | Int.                        | ★                       | MWS1150X8DB           | 127             | 132 | 194 | 12   |
|                           | 10                       | Int.                        | ★                       | MWS1150X10DB          | 150             | 153 | 215 | 12   |
|                           | 15                       | Int.                        | ★                       | MWS1150X15DB          | 207             | 210 | 272 | 12   |
|                           | 20                       | Int.                        | ★                       | MWS1150X20DB          | 265             | 268 | 330 | 12   |
| 25                        | Int.                     | ★                           | MWS1150X25DB            | 322                   | 325             | 387 | 12  |      |



# FORATURA (METALLO DURO)

## MWE, MWS

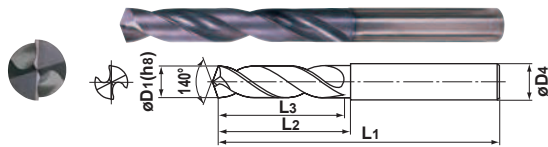
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



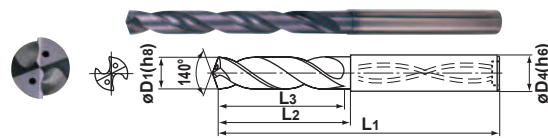
|                                       |                  |                      |       |         |                              |
|---------------------------------------|------------------|----------------------|-------|---------|------------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Leggera | Leggera resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +       | +                            |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS            | -0.017 | -0.025 | -0.033  | -0.041   | -0.068   |
|                    |                | -0.031 | -0.043 | -0.055  | -0.068   | -0.113   |

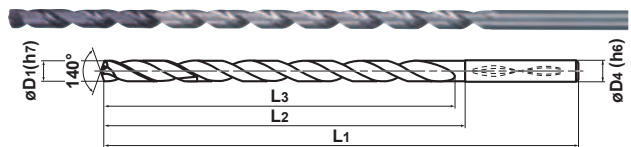
**MWE** (Refrigerante esterno)



**MWS** (Refrigerante interno) MB, LB, X8DB



X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi$  5.0 hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4   |
| 11.6                   | 2                     | Est.                     | ★                    | MWE1160SA             | 47              | 47  | 95  | 11.6 |
|                        | 3                     | Est.                     | ★                    | MWE1160MA             | 73              | 73  | 121 | 11.6 |
|                        | 3                     | Int.                     | ★                    | MWS1160MB             | 60              | 60  | 122 | 12   |
|                        | 5                     | Int.                     | ★                    | MWS1160LB             | 96              | 96  | 158 | 12   |
|                        | 8                     | Int.                     | ★                    | MWS1160X8DB           | 132             | 132 | 194 | 12   |
|                        | 10                    | Int.                     | ★                    | MWS1160X10DB          | 156             | 159 | 221 | 12   |
|                        | 15                    | Int.                     | ★                    | MWS1160X15DB          | 216             | 219 | 281 | 12   |
|                        | 20                    | Int.                     | ★                    | MWS1160X20DB          | 276             | 279 | 341 | 12   |
| 11.7                   | 2                     | Est.                     | ★                    | MWE1170SA             | 47              | 47  | 95  | 11.7 |
|                        | 3                     | Est.                     | ●                    | MWE1170MA             | 73              | 73  | 121 | 11.7 |
|                        | 3                     | Int.                     | ★                    | MWS1170MB             | 60              | 60  | 122 | 12   |
|                        | 5                     | Int.                     | ★                    | MWS1170LB             | 96              | 96  | 158 | 12   |
|                        | 8                     | Int.                     | ★                    | MWS1170X8DB           | 132             | 132 | 194 | 12   |
|                        | 10                    | Int.                     | ★                    | MWS1170X10DB          | 156             | 159 | 221 | 12   |
|                        | 15                    | Int.                     | ★                    | MWS1170X15DB          | 216             | 219 | 281 | 12   |
|                        | 20                    | Int.                     | ★                    | MWS1170X20DB          | 276             | 279 | 341 | 12   |
| 11.8                   | 2                     | Est.                     | ★                    | MWE1180SA             | 47              | 47  | 95  | 11.8 |
|                        | 3                     | Est.                     | ●                    | MWE1180MA             | 73              | 73  | 121 | 11.8 |
|                        | 3                     | Int.                     | ★                    | MWS1180MB             | 60              | 60  | 122 | 12   |
|                        | 5                     | Int.                     | ●                    | MWS1180LB             | 96              | 96  | 158 | 12   |
|                        | 8                     | Int.                     | ★                    | MWS1180X8DB           | 132             | 132 | 194 | 12   |
|                        | 10                    | Int.                     | ★                    | MWS1180X10DB          | 156             | 159 | 221 | 12   |
|                        | 15                    | Int.                     | ★                    | MWS1180X15DB          | 216             | 219 | 281 | 12   |
|                        | 20                    | Int.                     | ★                    | MWS1180X20DB          | 276             | 279 | 341 | 12   |
| 11.9                   | 2                     | Est.                     | ★                    | MWE1190SA             | 51              | 51  | 102 | 11.9 |
|                        | 3                     | Est.                     | ★                    | MWE1190MA             | 73              | 73  | 121 | 11.9 |
|                        | 3                     | Int.                     | ★                    | MWS1190MB             | 60              | 60  | 122 | 12   |
|                        | 5                     | Int.                     | ★                    | MWS1190LB             | 96              | 96  | 158 | 12   |
|                        | 8                     | Int.                     | ★                    | MWS1190X8DB           | 132             | 132 | 194 | 12   |
|                        | 10                    | Int.                     | ★                    | MWS1190X10DB          | 156             | 159 | 221 | 12   |
|                        | 15                    | Int.                     | ★                    | MWS1190X15DB          | 216             | 219 | 281 | 12   |
|                        | 20                    | Int.                     | ★                    | MWS1190X20DB          | 276             | 279 | 341 | 12   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |    |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|------|----|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4   |    |
| 11.9                   | 25                    | Int.                     | ★                    | MWS1190X25DB          | 336             | 339 | 401 | 12   |    |
|                        | 12.0                  | 2                        | Est.                 | ●                     | MWE1200SA       | 51  | 51  | 102  | 12 |
|                        |                       | 3                        | Est.                 | ●                     | MWE1200MA       | 73  | 73  | 121  | 12 |
|                        |                       | 3                        | Int.                 | ●                     | MWS1200MB       | 60  | 60  | 122  | 12 |
|                        |                       | 5                        | Int.                 | ●                     | MWS1200LB       | 96  | 96  | 158  | 12 |
|                        |                       | 8                        | Int.                 | ★                     | MWS1200X8DB     | 132 | 132 | 194  | 12 |
|                        |                       | 10                       | Int.                 | ★                     | MWS1200X10DB    | 156 | 159 | 221  | 12 |
|                        |                       | 15                       | Int.                 | ★                     | MWS1200X15DB    | 216 | 219 | 281  | 12 |
| 20                     |                       | Int.                     | ★                    | MWS1200X20DB          | 276             | 279 | 341 | 12   |    |
| 12.1                   | 25                    | Int.                     | ★                    | MWS1200X25DB          | 336             | 339 | 401 | 12   |    |
|                        | 2                     | Est.                     | ★                    | MWE1210SA             | 51              | 51  | 102 | 12.1 |    |
|                        | 3                     | Est.                     | ●                    | MWE1210MA             | 76              | 76  | 135 | 12.1 |    |
|                        | 3                     | Int.                     | ●                    | MWS1210MB             | 62.5            | 65  | 128 | 13   |    |
|                        | 5                     | Int.                     | ●                    | MWS1210LB             | 100             | 104 | 167 | 13   |    |
|                        | 8                     | Int.                     | □                    | MWS1210X8DB           | 138             | 143 | 206 | 13   |    |
|                        | 10                    | Int.                     | □                    | MWS1210X10DB          | 163             | 166 | 229 | 13   |    |
|                        | 15                    | Int.                     | □                    | MWS1210X15DB          | 225             | 228 | 291 | 13   |    |
| 12.2                   | 20                    | Int.                     | □                    | MWS1210X20DB          | 288             | 291 | 354 | 13   |    |
|                        | 2                     | Est.                     | ★                    | MWE1220SA             | 51              | 51  | 102 | 12.2 |    |
|                        | 3                     | Est.                     | ●                    | MWE1220MA             | 76              | 76  | 135 | 12.2 |    |
|                        | 3                     | Int.                     | ●                    | MWS1220MB             | 62.5            | 65  | 128 | 13   |    |
|                        | 5                     | Int.                     | ●                    | MWS1220LB             | 100             | 104 | 167 | 13   |    |
|                        | 8                     | Int.                     | □                    | MWS1220X8DB           | 138             | 143 | 206 | 13   |    |
|                        | 10                    | Int.                     | □                    | MWS1220X10DB          | 163             | 166 | 229 | 13   |    |
|                        | 15                    | Int.                     | □                    | MWS1220X15DB          | 225             | 228 | 291 | 13   |    |
| 12.3                   | 20                    | Int.                     | □                    | MWS1220X20DB          | 288             | 291 | 354 | 13   |    |
|                        | 2                     | Est.                     | ★                    | MWE1230SA             | 51              | 51  | 102 | 12.3 |    |
|                        | 3                     | Est.                     | ●                    | MWE1230MA             | 76              | 76  | 135 | 12.3 |    |
|                        | 3                     | Int.                     | ★                    | MWS1230MB             | 62.5            | 65  | 128 | 13   |    |
|                        | 5                     | Int.                     | ★                    | MWS1230LB             | 100             | 104 | 167 | 13   |    |
|                        | 8                     | Int.                     | □                    | MWS1230X8DB           | 138             | 143 | 206 | 13   |    |
|                        | 10                    | Int.                     | □                    | MWS1230X10DB          | 163             | 166 | 229 | 13   |    |
|                        | 15                    | Int.                     | □                    | MWS1230X15DB          | 225             | 228 | 291 | 13   |    |
| 20                     | Int.                  | □                        | MWS1230X20DB         | 288                   | 291             | 354 | 13  |      |    |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

□ : Non a magazzino, prodotti solo su ordinazione.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 12.4                      | 2                        | Est.                        | ★                       | MWE1240SA             | 51              | 51  | 102 | 12.4 |
|                           | 3                        | Est.                        | ★                       | MWE1240MA             | 76              | 76  | 135 | 12.4 |
|                           | 3                        | Int.                        | ★                       | MWS1240MB             | 62.5            | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ★                       | MWS1240LB             | 100             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | □                       | MWS1240X8DB           | 138             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | □                       | MWS1240X10DB          | 163             | 166 | 229 | 13   |
|                           | 15                       | Int.                        | □                       | MWS1240X15DB          | 225             | 228 | 291 | 13   |
|                           | 20                       | Int.                        | □                       | MWS1240X20DB          | 288             | 291 | 354 | 13   |
| 12.5                      | 2                        | Est.                        | ★                       | MWE1250SA             | 51              | 51  | 102 | 12.5 |
|                           | 3                        | Est.                        | ●                       | MWE1250MA             | 76              | 76  | 135 | 12.5 |
|                           | 3                        | Int.                        | ●                       | MWS1250MB             | 62.5            | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ●                       | MWS1250LB             | 100             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | ★                       | MWS1250X8DB           | 138             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | ★                       | MWS1250X10DB          | 163             | 166 | 229 | 13   |
|                           | 15                       | Int.                        | ★                       | MWS1250X15DB          | 225             | 228 | 291 | 13   |
|                           | 20                       | Int.                        | ★                       | MWS1250X20DB          | 288             | 291 | 354 | 13   |
| 12.6                      | 2                        | Est.                        | ★                       | MWE1260SA             | 51              | 51  | 102 | 12.6 |
|                           | 3                        | Est.                        | ★                       | MWE1260MA             | 78              | 78  | 137 | 12.6 |
|                           | 3                        | Int.                        | ★                       | MWS1260MB             | 65              | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ★                       | MWS1260LB             | 104             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | □                       | MWS1260X8DB           | 143             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | □                       | MWS1260X10DB          | 169             | 172 | 235 | 13   |
|                           | 15                       | Int.                        | □                       | MWS1260X15DB          | 234             | 237 | 300 | 13   |
|                           | 20                       | Int.                        | □                       | MWS1260X20DB          | 299             | 302 | 365 | 13   |
| 12.7                      | 2                        | Est.                        | ★                       | MWE1270SA             | 51              | 51  | 102 | 12.7 |
|                           | 3                        | Est.                        | ●                       | MWE1270MA             | 78              | 78  | 137 | 12.7 |
|                           | 3                        | Int.                        | ★                       | MWS1270MB             | 65              | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ★                       | MWS1270LB             | 104             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | □                       | MWS1270X8DB           | 143             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | □                       | MWS1270X10DB          | 169             | 172 | 235 | 13   |
|                           | 15                       | Int.                        | □                       | MWS1270X15DB          | 234             | 237 | 300 | 13   |
|                           | 20                       | Int.                        | □                       | MWS1270X20DB          | 299             | 302 | 365 | 13   |
| 12.8                      | 2                        | Est.                        | ★                       | MWE1280SA             | 51              | 51  | 102 | 12.8 |
|                           | 3                        | Est.                        | ★                       | MWE1280MA             | 78              | 78  | 137 | 12.8 |
|                           | 3                        | Int.                        | ★                       | MWS1280MB             | 65              | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ★                       | MWS1280LB             | 104             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | □                       | MWS1280X8DB           | 143             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | □                       | MWS1280X10DB          | 169             | 172 | 235 | 13   |
|                           | 15                       | Int.                        | □                       | MWS1280X15DB          | 234             | 237 | 300 | 13   |
|                           | 20                       | Int.                        | □                       | MWS1280X20DB          | 299             | 302 | 365 | 13   |
| 12.9                      | 2                        | Est.                        | ★                       | MWE1290SA             | 51              | 51  | 102 | 12.9 |
|                           | 3                        | Est.                        | ★                       | MWE1290MA             | 78              | 78  | 137 | 12.9 |
|                           | 3                        | Int.                        | ★                       | MWS1290MB             | 65              | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ★                       | MWS1290LB             | 104             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | □                       | MWS1290X8DB           | 143             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | □                       | MWS1290X10DB          | 169             | 172 | 235 | 13   |
|                           | 15                       | Int.                        | □                       | MWS1290X15DB          | 234             | 237 | 300 | 13   |
|                           | 20                       | Int.                        | □                       | MWS1290X20DB          | 299             | 302 | 365 | 13   |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 13.0                      | 2                        | Est.                        | ●                       | MWE1300SA             | 51              | 51  | 102 | 13   |
|                           | 3                        | Est.                        | ●                       | MWE1300MA             | 78              | 78  | 137 | 13   |
|                           | 3                        | Int.                        | ●                       | MWS1300MB             | 65              | 65  | 128 | 13   |
|                           | 5                        | Int.                        | ●                       | MWS1300LB             | 104             | 104 | 167 | 13   |
|                           | 8                        | Int.                        | ★                       | MWS1300X8DB           | 143             | 143 | 206 | 13   |
|                           | 10                       | Int.                        | ★                       | MWS1300X10DB          | 169             | 172 | 235 | 13   |
|                           | 15                       | Int.                        | ★                       | MWS1300X15DB          | 234             | 237 | 300 | 13   |
|                           | 20                       | Int.                        | ★                       | MWS1300X20DB          | 299             | 302 | 365 | 13   |
| 13.1                      | 2                        | Est.                        | ★                       | MWE1310SA             | 51              | 51  | 102 | 13.1 |
|                           | 3                        | Est.                        | ●                       | MWE1310MA             | 84              | 84  | 144 | 13.1 |
|                           | 3                        | Int.                        | ●                       | MWS1310MB             | 67.5            | 70  | 134 | 14   |
|                           | 5                        | Int.                        | ★                       | MWS1310LB             | 108             | 112 | 176 | 14   |
|                           | 8                        | Int.                        | □                       | MWS1310X8DB           | 149             | 154 | 218 | 14   |
|                           | 10                       | Int.                        | □                       | MWS1310X10DB          | 176             | 179 | 243 | 14   |
|                           | 15                       | Int.                        | □                       | MWS1310X15DB          | 243             | 246 | 310 | 14   |
|                           | 20                       | Int.                        | □                       | MWS1310X20DB          | 311             | 314 | 378 | 14   |
| 13.2                      | 2                        | Est.                        | ★                       | MWE1320SA             | 51              | 51  | 102 | 13.2 |
|                           | 3                        | Est.                        | ★                       | MWE1320MA             | 84              | 84  | 144 | 13.2 |
|                           | 3                        | Int.                        | ★                       | MWS1320MB             | 67.5            | 70  | 134 | 14   |
|                           | 5                        | Int.                        | ★                       | MWS1320LB             | 108             | 112 | 176 | 14   |
|                           | 8                        | Int.                        | □                       | MWS1320X8DB           | 149             | 154 | 218 | 14   |
|                           | 10                       | Int.                        | □                       | MWS1320X10DB          | 176             | 179 | 243 | 14   |
|                           | 15                       | Int.                        | □                       | MWS1320X15DB          | 243             | 246 | 310 | 14   |
|                           | 20                       | Int.                        | □                       | MWS1320X20DB          | 311             | 314 | 378 | 14   |
| 13.3                      | 2                        | Est.                        | ★                       | MWE1330SA             | 54              | 54  | 107 | 13.3 |
|                           | 3                        | Est.                        | ★                       | MWE1330MA             | 84              | 84  | 144 | 13.3 |
|                           | 3                        | Int.                        | ★                       | MWS1330MB             | 67.5            | 70  | 134 | 14   |
|                           | 5                        | Int.                        | ★                       | MWS1330LB             | 108             | 112 | 176 | 14   |
|                           | 8                        | Int.                        | □                       | MWS1330X8DB           | 149             | 154 | 218 | 14   |
|                           | 10                       | Int.                        | □                       | MWS1330X10DB          | 176             | 179 | 243 | 14   |
|                           | 15                       | Int.                        | □                       | MWS1330X15DB          | 243             | 246 | 310 | 14   |
|                           | 20                       | Int.                        | □                       | MWS1330X20DB          | 311             | 314 | 378 | 14   |
| 13.4                      | 2                        | Est.                        | ★                       | MWE1340SA             | 54              | 54  | 107 | 13.4 |
|                           | 3                        | Est.                        | ★                       | MWE1340MA             | 84              | 84  | 144 | 13.4 |
|                           | 3                        | Int.                        | ★                       | MWS1340MB             | 67.5            | 70  | 134 | 14   |
|                           | 5                        | Int.                        | ★                       | MWS1340LB             | 108             | 112 | 176 | 14   |
|                           | 8                        | Int.                        | □                       | MWS1340X8DB           | 149             | 154 | 218 | 14   |
|                           | 10                       | Int.                        | □                       | MWS1340X10DB          | 176             | 179 | 243 | 14   |
|                           | 15                       | Int.                        | □                       | MWS1340X15DB          | 243             | 246 | 310 | 14   |
|                           | 20                       | Int.                        | □                       | MWS1340X20DB          | 311             | 314 | 378 | 14   |
| 13.5                      | 2                        | Est.                        | ●                       | MWE1350SA             | 54              | 54  | 107 | 13.5 |
|                           | 3                        | Est.                        | ●                       | MWE1350MA             | 84              | 84  | 144 | 13.5 |
|                           | 3                        | Int.                        | ●                       | MWS1350MB             | 67.5            | 70  | 134 | 14   |
|                           | 5                        | Int.                        | ●                       | MWS1350LB             | 108             | 112 | 176 | 14   |
|                           | 8                        | Int.                        | ★                       | MWS1350X8DB           | 149             | 154 | 218 | 14   |
|                           | 10                       | Int.                        | ★                       | MWS1350X10DB          | 176             | 179 | 243 | 14   |
|                           | 15                       | Int.                        | ★                       | MWS1350X15DB          | 243             | 246 | 310 | 14   |
|                           | 20                       | Int.                        | ★                       | MWS1350X20DB          | 311             | 314 | 378 | 14   |



# FORATURA (METALLO DURO)

## MWE, MWS

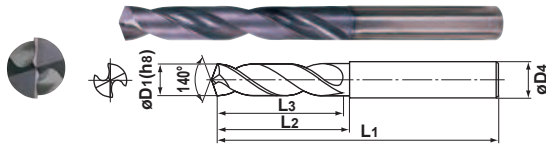
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



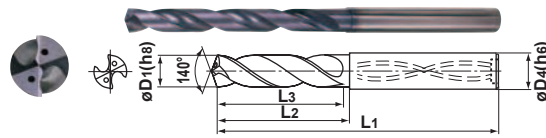
|                                       |                  |                      |       |              |                           |
|---------------------------------------|------------------|----------------------|-------|--------------|---------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Lega leggera | Lega resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +            | +                         |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS            | -0.017 | -0.025 | -0.033  | -0.041   | -0.068   |
|                    |                | 0      | 0      | 0       | 0        | 0        |
|                    |                | -0.006 | -0.008 | -0.009  | -0.011   | -0.013   |

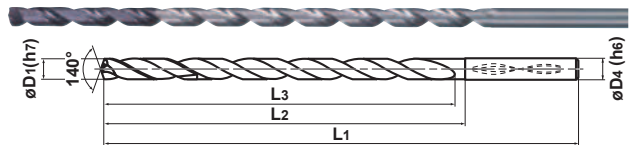
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a ø 5.0 hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4   |
| 13.6                   | 2                     | Est.                     | ★                    | MWE1360SA             | 54              | 54  | 107 | 13.6 |
|                        | 3                     | Est.                     | ★                    | MWE1360MA             | 86              | 86  | 147 | 13.6 |
|                        | 3                     | Int.                     | ★                    | MWS1360MB             | 70              | 70  | 134 | 14   |
|                        | 5                     | Int.                     | ★                    | MWS1360LB             | 112             | 112 | 176 | 14   |
|                        | 8                     | Int.                     | □                    | MWS1360X8DB           | 154             | 154 | 218 | 14   |
|                        | 10                    | Int.                     | □                    | MWS1360X10DB          | 182             | 185 | 249 | 14   |
|                        | 15                    | Int.                     | □                    | MWS1360X15DB          | 252             | 255 | 319 | 14   |
|                        | 20                    | Int.                     | □                    | MWS1360X20DB          | 322             | 325 | 389 | 14   |
| 13.7                   | 2                     | Est.                     | ★                    | MWE1370SA             | 54              | 54  | 107 | 13.7 |
|                        | 3                     | Est.                     | ●                    | MWE1370MA             | 86              | 86  | 147 | 13.7 |
|                        | 3                     | Int.                     | ★                    | MWS1370MB             | 70              | 70  | 134 | 14   |
|                        | 5                     | Int.                     | ★                    | MWS1370LB             | 112             | 112 | 176 | 14   |
|                        | 8                     | Int.                     | □                    | MWS1370X8DB           | 154             | 154 | 218 | 14   |
|                        | 10                    | Int.                     | □                    | MWS1370X10DB          | 182             | 185 | 249 | 14   |
|                        | 15                    | Int.                     | □                    | MWS1370X15DB          | 252             | 255 | 319 | 14   |
|                        | 20                    | Int.                     | □                    | MWS1370X20DB          | 322             | 325 | 389 | 14   |
| 13.8                   | 2                     | Est.                     | ●                    | MWE1380SA             | 54              | 54  | 107 | 13.8 |
|                        | 3                     | Est.                     | ★                    | MWE1380MA             | 86              | 86  | 147 | 13.8 |
|                        | 3                     | Int.                     | ★                    | MWS1380MB             | 70              | 70  | 134 | 14   |
|                        | 5                     | Int.                     | ●                    | MWS1380LB             | 112             | 112 | 176 | 14   |
|                        | 8                     | Int.                     | □                    | MWS1380X8DB           | 154             | 154 | 218 | 14   |
|                        | 10                    | Int.                     | □                    | MWS1380X10DB          | 182             | 185 | 249 | 14   |
|                        | 15                    | Int.                     | □                    | MWS1380X15DB          | 252             | 255 | 319 | 14   |
|                        | 20                    | Int.                     | □                    | MWS1380X20DB          | 322             | 325 | 389 | 14   |
| 13.9                   | 2                     | Est.                     | ★                    | MWE1390SA             | 54              | 54  | 107 | 13.9 |
|                        | 3                     | Est.                     | ★                    | MWE1390MA             | 86              | 86  | 147 | 13.9 |
|                        | 3                     | Int.                     | ★                    | MWS1390MB             | 70              | 70  | 134 | 14   |
|                        | 5                     | Int.                     | ●                    | MWS1390LB             | 112             | 112 | 176 | 14   |
|                        | 8                     | Int.                     | □                    | MWS1390X8DB           | 154             | 154 | 218 | 14   |
|                        | 10                    | Int.                     | □                    | MWS1390X10DB          | 182             | 185 | 249 | 14   |
|                        | 15                    | Int.                     | □                    | MWS1390X15DB          | 252             | 255 | 319 | 14   |
|                        | 20                    | Int.                     | □                    | MWS1390X20DB          | 322             | 325 | 389 | 14   |
| 14.0                   | 2                     | Est.                     | ●                    | MWE1400SA             | 54              | 54  | 107 | 14   |
|                        | 3                     | Est.                     | ●                    | MWE1400MA             | 86              | 86  | 147 | 14   |
|                        | 3                     | Int.                     | ●                    | MWS1400MB             | 70              | 70  | 134 | 14   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|----------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                      |                       | L3              | L2  | L1  | D4   |
| 14.0                   | 5                     | Int.                     | ●                    | MWS1400LB             | 112             | 112 | 176 | 14   |
|                        | 8                     | Int.                     | ★                    | MWS1400X8DB           | 154             | 154 | 218 | 14   |
|                        | 10                    | Int.                     | ★                    | MWS1400X10DB          | 182             | 185 | 249 | 14   |
|                        | 15                    | Int.                     | ★                    | MWS1400X15DB          | 252             | 255 | 319 | 14   |
|                        | 20                    | Int.                     | ★                    | MWS1400X20DB          | 322             | 325 | 389 | 14   |
| 14.1                   | 2                     | Est.                     | ★                    | MWE1410SA             | 56              | 56  | 111 | 14.1 |
|                        | 3                     | Est.                     | ★                    | MWE1410MA             | 89              | 89  | 151 | 14.1 |
|                        | 3                     | Int.                     | ★                    | MWS1410MB             | 72.5            | 75  | 140 | 15   |
|                        | 5                     | Int.                     | ★                    | MWS1410LB             | 116             | 120 | 185 | 15   |
| 14.2                   | 8                     | Int.                     | □                    | MWS1410X8DB           | 160             | 165 | 225 | 15   |
|                        | 2                     | Est.                     | ★                    | MWE1420SA             | 56              | 56  | 111 | 14.2 |
|                        | 3                     | Est.                     | ●                    | MWE1420MA             | 89              | 89  | 151 | 14.2 |
|                        | 3                     | Int.                     | ●                    | MWS1420MB             | 72.5            | 75  | 140 | 15   |
| 14.3                   | 5                     | Int.                     | ★                    | MWS1420LB             | 116             | 120 | 185 | 15   |
|                        | 8                     | Int.                     | ★                    | MWS1420X8DB           | 160             | 165 | 225 | 15   |
|                        | 2                     | Est.                     | □                    | MWE1430SA             | 56              | 56  | 111 | 14.3 |
|                        | 3                     | Est.                     | ★                    | MWE1430MA             | 89              | 89  | 151 | 14.3 |
| 14.4                   | 3                     | Int.                     | ★                    | MWS1430MB             | 72.5            | 75  | 140 | 15   |
|                        | 5                     | Int.                     | ★                    | MWS1430LB             | 116             | 120 | 185 | 15   |
|                        | 8                     | Int.                     | □                    | MWS1430X8DB           | 160             | 165 | 225 | 15   |
|                        | 2                     | Est.                     | □                    | MWE1440SA             | 56              | 56  | 111 | 14.4 |
| 14.5                   | 3                     | Est.                     | ★                    | MWE1440MA             | 89              | 89  | 151 | 14.4 |
|                        | 3                     | Int.                     | ★                    | MWS1440MB             | 72.5            | 75  | 140 | 15   |
|                        | 5                     | Int.                     | ★                    | MWS1440LB             | 116             | 120 | 185 | 15   |
|                        | 8                     | Int.                     | □                    | MWS1440X8DB           | 160             | 165 | 225 | 15   |
| 14.6                   | 2                     | Est.                     | ●                    | MWE1450SA             | 56              | 56  | 111 | 14.5 |
|                        | 3                     | Est.                     | ●                    | MWE1450MA             | 89              | 89  | 151 | 14.5 |
|                        | 3                     | Int.                     | ●                    | MWS1450MB             | 72.5            | 75  | 140 | 15   |
|                        | 5                     | Int.                     | ●                    | MWS1450LB             | 116             | 120 | 185 | 15   |
| 14.6                   | 8                     | Int.                     | ★                    | MWS1450X8DB           | 160             | 165 | 225 | 15   |
|                        | 2                     | Est.                     | □                    | MWE1460SA             | 56              | 56  | 111 | 14.6 |
|                        | 3                     | Est.                     | ★                    | MWE1460MA             | 91              | 91  | 153 | 14.6 |
|                        | 3                     | Int.                     | ★                    | MWS1460MB             | 75              | 75  | 140 | 15   |
| 14.6                   | 5                     | Int.                     | ★                    | MWS1460LB             | 120             | 120 | 185 | 15   |
|                        | 8                     | Int.                     | □                    | MWS1460X8DB           | 165             | 165 | 225 | 15   |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.

□ : Non a magazzino, prodotti solo su ordinazione.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 14.7                      | 2                        | Est.                        | □                       | MWE1470SA             | 56              | 56  | 111 | 14.7 |
|                           | 3                        | Est.                        | ★                       | MWE1470MA             | 91              | 91  | 153 | 14.7 |
|                           | 3                        | Int.                        | ★                       | MWS1470MB             | 75              | 75  | 140 | 15   |
|                           | 5                        | Int.                        | ★                       | MWS1470LB             | 120             | 120 | 185 | 15   |
|                           | 8                        | Int.                        | □                       | MWS1470X8DB           | 165             | 165 | 225 | 15   |
| 14.8                      | 2                        | Est.                        | □                       | MWE1480SA             | 56              | 56  | 111 | 14.8 |
|                           | 3                        | Est.                        | ★                       | MWE1480MA             | 91              | 91  | 153 | 14.8 |
|                           | 3                        | Int.                        | ★                       | MWS1480MB             | 75              | 75  | 140 | 15   |
|                           | 5                        | Int.                        | ★                       | MWS1480LB             | 120             | 120 | 185 | 15   |
|                           | 8                        | Int.                        | □                       | MWS1480X8DB           | 165             | 165 | 225 | 15   |
| 14.9                      | 2                        | Est.                        | □                       | MWE1490SA             | 56              | 56  | 111 | 14.9 |
|                           | 3                        | Est.                        | ★                       | MWE1490MA             | 91              | 91  | 153 | 14.9 |
|                           | 3                        | Int.                        | ★                       | MWS1490MB             | 75              | 75  | 140 | 15   |
|                           | 5                        | Int.                        | ★                       | MWS1490LB             | 120             | 120 | 185 | 15   |
|                           | 8                        | Int.                        | □                       | MWS1490X8DB           | 165             | 165 | 225 | 15   |
| 15.0                      | 2                        | Est.                        | ●                       | MWE1500SA             | 56              | 56  | 111 | 15   |
|                           | 3                        | Est.                        | ●                       | MWE1500MA             | 91              | 91  | 153 | 15   |
|                           | 3                        | Int.                        | ●                       | MWS1500MB             | 75              | 75  | 140 | 15   |
|                           | 5                        | Int.                        | ●                       | MWS1500LB             | 120             | 120 | 185 | 15   |
|                           | 8                        | Int.                        | ●                       | MWS1500X8DB           | 165             | 165 | 225 | 15   |
| 15.1                      | 2                        | Est.                        | □                       | MWE1510SA             | 58              | 58  | 115 | 15.1 |
|                           | 3                        | Est.                        | ★                       | MWE1510MA             | 94              | 94  | 157 | 15.1 |
|                           | 3                        | Int.                        | ●                       | MWS1510MB             | 77.5            | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1510LB             | 124             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1510X8DB           | 171             | 181 | 241 | 16   |
| 15.2                      | 2                        | Est.                        | ★                       | MWE1520SA             | 58              | 58  | 115 | 15.2 |
|                           | 3                        | Est.                        | ★                       | MWE1520MA             | 94              | 94  | 157 | 15.2 |
|                           | 3                        | Int.                        | ●                       | MWS1520MB             | 77.5            | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1520LB             | 124             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1520X8DB           | 171             | 181 | 241 | 16   |
| 15.3                      | 2                        | Est.                        | □                       | MWE1530SA             | 58              | 58  | 115 | 15.3 |
|                           | 3                        | Est.                        | ★                       | MWE1530MA             | 94              | 94  | 157 | 15.3 |
|                           | 3                        | Int.                        | ★                       | MWS1530MB             | 77.5            | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1530LB             | 124             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1530X8DB           | 171             | 181 | 241 | 16   |
| 15.4                      | 2                        | Est.                        | □                       | MWE1540SA             | 58              | 58  | 115 | 15.4 |
|                           | 3                        | Est.                        | ★                       | MWE1540MA             | 94              | 94  | 157 | 15.4 |
|                           | 3                        | Int.                        | ★                       | MWS1540MB             | 77.5            | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1540LB             | 124             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1540X8DB           | 171             | 181 | 241 | 16   |
| 15.5                      | 2                        | Est.                        | ●                       | MWE1550SA             | 58              | 58  | 115 | 15.5 |
|                           | 3                        | Est.                        | ★                       | MWE1550MA             | 94              | 94  | 157 | 15.5 |
|                           | 3                        | Int.                        | ●                       | MWS1550MB             | 77.5            | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ●                       | MWS1550LB             | 124             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | ★                       | MWS1550X8DB           | 171             | 181 | 241 | 16   |
| 15.6                      | 2                        | Est.                        | □                       | MWE1560SA             | 58              | 58  | 115 | 15.6 |
|                           | 3                        | Est.                        | ★                       | MWE1560MA             | 96              | 96  | 160 | 15.6 |
|                           | 3                        | Int.                        | ★                       | MWS1560MB             | 80              | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1560LB             | 128             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1560X8DB           | 176             | 181 | 241 | 16   |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 15.7                      | 2                        | Est.                        | □                       | MWE1570SA             | 58              | 58  | 115 | 15.7 |
|                           | 3                        | Est.                        | ★                       | MWE1570MA             | 96              | 96  | 160 | 15.7 |
|                           | 3                        | Int.                        | ★                       | MWS1570MB             | 80              | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1570LB             | 128             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1570X8DB           | 176             | 181 | 241 | 16   |
| 15.8                      | 2                        | Est.                        | □                       | MWE1580SA             | 58              | 58  | 115 | 15.8 |
|                           | 3                        | Est.                        | ★                       | MWE1580MA             | 96              | 96  | 160 | 15.8 |
|                           | 3                        | Int.                        | ★                       | MWS1580MB             | 80              | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1580LB             | 128             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1580X8DB           | 176             | 181 | 241 | 16   |
| 15.9                      | 2                        | Est.                        | □                       | MWE1590SA             | 58              | 58  | 115 | 15.9 |
|                           | 3                        | Est.                        | ★                       | MWE1590MA             | 96              | 96  | 160 | 15.9 |
|                           | 3                        | Int.                        | ★                       | MWS1590MB             | 80              | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ★                       | MWS1590LB             | 128             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | □                       | MWS1590X8DB           | 176             | 181 | 241 | 16   |
| 16.0                      | 2                        | Est.                        | ●                       | MWE1600SA             | 58              | 58  | 115 | 16   |
|                           | 3                        | Est.                        | ●                       | MWE1600MA             | 96              | 96  | 160 | 16   |
|                           | 3                        | Int.                        | ●                       | MWS1600MB             | 80              | 80  | 145 | 16   |
|                           | 5                        | Int.                        | ●                       | MWS1600LB             | 128             | 128 | 193 | 16   |
|                           | 8                        | Int.                        | ●                       | MWS1600X8DB           | 176             | 181 | 241 | 16   |
| 16.1                      | 2                        | Est.                        | □                       | MWE1610SA             | 60              | 60  | 119 | 16.1 |
|                           | 3                        | Est.                        | □                       | MWE1610MA             | 102             | 102 | 167 | 16.1 |
|                           | 3                        | Int.                        | □                       | MWS1610MB             | 82.5            | 85  | 150 | 17   |
|                           | 5                        | Int.                        | □                       | MWS1610LB             | 132             | 136 | 201 | 17   |
|                           | 16.2                     | 2                           | Est.                    | ★                     | MWE1620SA       | 60  | 60  | 119  |
| 3                         |                          | Est.                        | □                       | MWE1620MA             | 102             | 102 | 167 | 16.2 |
| 3                         |                          | Int.                        | □                       | MWS1620MB             | 82.5            | 85  | 150 | 17   |
| 5                         |                          | Int.                        | □                       | MWS1620LB             | 132             | 136 | 201 | 17   |
| 16.3                      |                          | 2                           | Est.                    | ★                     | MWE1630SA       | 60  | 60  | 119  |
|                           | 3                        | Est.                        | □                       | MWE1630MA             | 102             | 102 | 167 | 16.3 |
|                           | 3                        | Int.                        | □                       | MWS1630MB             | 82.5            | 85  | 150 | 17   |
|                           | 5                        | Int.                        | □                       | MWS1630LB             | 132             | 136 | 201 | 17   |
|                           | 16.4                     | 2                           | Est.                    | □                     | MWE1640SA       | 60  | 60  | 119  |
| 3                         |                          | Est.                        | □                       | MWE1640MA             | 102             | 102 | 167 | 16.4 |
| 3                         |                          | Int.                        | □                       | MWS1640MB             | 82.5            | 85  | 150 | 17   |
| 5                         |                          | Int.                        | □                       | MWS1640LB             | 132             | 136 | 201 | 17   |
| 16.5                      |                          | 2                           | Est.                    | ★                     | MWE1650SA       | 60  | 60  | 119  |
|                           | 3                        | Est.                        | ●                       | MWE1650MA             | 102             | 102 | 167 | 16.5 |
|                           | 3                        | Int.                        | ●                       | MWS1650MB             | 82.5            | 85  | 150 | 17   |
|                           | 5                        | Int.                        | ●                       | MWS1650LB             | 132             | 136 | 201 | 17   |
|                           | 16.6                     | 2                           | Est.                    | □                     | MWE1660SA       | 60  | 60  | 119  |
| 3                         |                          | Est.                        | □                       | MWE1660MA             | 102             | 102 | 167 | 16.6 |
| 3                         |                          | Int.                        | □                       | MWS1660MB             | 85              | 85  | 150 | 17   |
| 5                         |                          | Int.                        | □                       | MWS1660LB             | 136             | 136 | 201 | 17   |
| 16.7                      |                          | 2                           | Est.                    | □                     | MWE1670SA       | 60  | 60  | 119  |
|                           | 3                        | Est.                        | □                       | MWE1670MA             | 102             | 102 | 167 | 16.7 |
|                           | 3                        | Int.                        | □                       | MWS1670MB             | 85              | 85  | 150 | 17   |
|                           | 5                        | Int.                        | □                       | MWS1670LB             | 136             | 136 | 201 | 17   |



# FORATURA (METALLO DURO)

## MWE, MWS

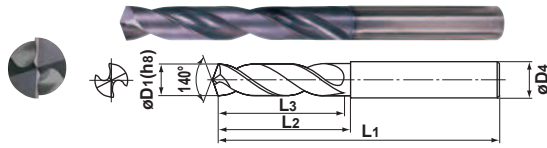
● Grande efficienza e alta precisione nella foratura di una grande varietà di materiali, dall'acciaio generico ai materiali difficili da tagliare.  
 ● Per tagli a bassa o ad alta velocità. Possibile uso nella gamma di taglio HSS.



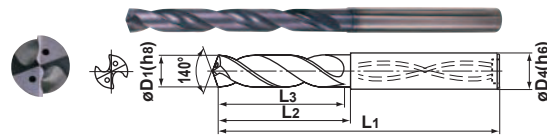
|                                       |                  |                      |       |              |                           |
|---------------------------------------|------------------|----------------------|-------|--------------|---------------------------|
| Acciaio al carbonio<br>Acciaio legato | Acciaio temprato | Acciaio inossidabile | Ghisa | Lega leggera | Lega resistente al calore |
| ++                                    | +(MWE Solo)      | ++<br>(MWE: +)       | ++    | +            | +                         |

|                    |                |        |        |         |          |          |
|--------------------|----------------|--------|--------|---------|----------|----------|
|                    |                | D1=3   | 3<D1≤6 | 6<D1≤10 | 10<D1≤18 | 18<D1≤25 |
| Tolleranza D1 (mm) | MWE            | 0      | 0      | 0       | 0        | 0        |
|                    | MWS-MB/LB/X8DB | -0.014 | -0.018 | -0.022  | -0.027   | -0.033   |
| Tolleranza D4 (mm) | MWE            | -0.017 | -0.025 | -0.033  | -0.041   | -0.048   |
|                    | MWS            | -0.031 | -0.043 | -0.055  | -0.068   | -0.080   |

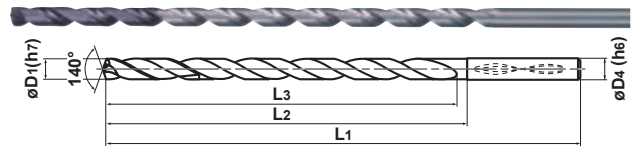
### MWE (Refrigerante esterno)



### MWS (Refrigerante interno) MB, LB, X8DB



### X10DB, X15DB, X20DB, X25DB, X30DB



(Nota 1) Il tipo MWS può essere impiegato per forature profonde.

(Nota 2) I tipi MWS superiori a  $\phi 5.0$  hanno una cavità nell'estremità.

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF     | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|--------------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                          |                       | L3              | L2  | L1  | D4   |
| 16.8                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1680SA             | 60              | 60  | 119 | 16.8 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1680MA             | 102             | 102 | 167 | 16.8 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1680MB             | 85              | 85  | 150 | 17   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1680LB             | 136             | 136 | 201 | 17   |
| 16.9                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1690SA             | 60              | 60  | 119 | 16.9 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1690MA             | 102             | 102 | 167 | 16.9 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1690MB             | 85              | 85  | 150 | 17   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1690LB             | 136             | 136 | 201 | 17   |
| 17.0                   | 2                     | Est.                     | ●                        | MWE1700SA             | 60              | 60  | 119 | 17   |
|                        | 3                     | Est.                     | ●                        | MWE1700MA             | 102             | 102 | 167 | 17   |
|                        | 3                     | Int.                     | ●                        | MWS1700MB             | 85              | 85  | 150 | 17   |
|                        | 5                     | Int.                     | ●                        | MWS1700LB             | 136             | 136 | 201 | 17   |
| 17.1                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1710SA             | 62              | 62  | 123 | 17.1 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1710MA             | 102             | 102 | 167 | 17.1 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1710MB             | 87.5            | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1710LB             | 140             | 144 | 209 | 18   |
| 17.2                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1720SA             | 62              | 62  | 123 | 17.2 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1720MA             | 102             | 102 | 167 | 17.2 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1720MB             | 87.5            | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1720LB             | 140             | 144 | 209 | 18   |
| 17.3                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1730SA             | 62              | 62  | 123 | 17.3 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1730MA             | 102             | 102 | 167 | 17.3 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1730MB             | 87.5            | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1730LB             | 140             | 144 | 209 | 18   |
| 17.4                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1740SA             | 62              | 62  | 123 | 17.4 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1740MA             | 102             | 102 | 167 | 17.4 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1740MB             | 87.5            | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1740LB             | 140             | 144 | 209 | 18   |
| 17.5                   | 2                     | Est.                     | ●                        | MWE1750SA             | 62              | 62  | 123 | 17.5 |
|                        | 3                     | Est.                     | ●                        | MWE1750MA             | 102             | 102 | 167 | 17.5 |
|                        | 3                     | Int.                     | ●                        | MWS1750MB             | 87.5            | 90  | 155 | 18   |
|                        | 5                     | Int.                     | ●                        | MWS1750LB             | 140             | 144 | 209 | 18   |

| Diam. Punta<br>D1 (mm) | Profondità foro (l/d) | Refrigerante (Int./Est.) | Disponibilità VP15TF     | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|------------------------|-----------------------|--------------------------|--------------------------|-----------------------|-----------------|-----|-----|------|
|                        |                       |                          |                          |                       | L3              | L2  | L1  | D4   |
| 17.6                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1760SA             | 62              | 62  | 123 | 17.6 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1760MA             | 102             | 102 | 167 | 17.6 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1760MB             | 90              | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1760LB             | 144             | 144 | 209 | 18   |
| 17.7                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1770SA             | 62              | 62  | 123 | 17.7 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1770MA             | 102             | 102 | 167 | 17.7 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1770MB             | 90              | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1770LB             | 144             | 144 | 209 | 18   |
| 17.8                   | 2                     | Est.                     | ★                        | MWE1780SA             | 62              | 62  | 123 | 17.8 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1780MA             | 102             | 102 | 167 | 17.8 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1780MB             | 90              | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1780LB             | 144             | 144 | 209 | 18   |
| 17.9                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1790SA             | 62              | 62  | 123 | 17.9 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1790MA             | 102             | 102 | 167 | 17.9 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1790MB             | 90              | 90  | 155 | 18   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1790LB             | 144             | 144 | 209 | 18   |
| 18.0                   | 2                     | Est.                     | ●                        | MWE1800SA             | 62              | 62  | 123 | 18   |
|                        | 3                     | Est.                     | ●                        | MWE1800MA             | 102             | 102 | 167 | 18   |
|                        | 3                     | Int.                     | ●                        | MWS1800MB             | 90              | 90  | 155 | 18   |
|                        | 5                     | Int.                     | ●                        | MWS1800LB             | 144             | 144 | 209 | 18   |
| 18.1                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1810SA             | 64              | 64  | 127 | 18.1 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1810MA             | 114             | 114 | 179 | 18.1 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1810MB             | 92.5            | 95  | 160 | 19   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1810LB             | 148             | 152 | 217 | 19   |
| 18.2                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1820SA             | 64              | 64  | 127 | 18.2 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1820MA             | 114             | 114 | 179 | 18.2 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1820MB             | 92.5            | 95  | 160 | 19   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1820LB             | 148             | 152 | 217 | 19   |
| 18.3                   | 2                     | Est.                     | <input type="checkbox"/> | MWE1830SA             | 64              | 64  | 127 | 18.3 |
|                        | 3                     | Est.                     | <input type="checkbox"/> | MWE1830MA             | 114             | 114 | 179 | 18.3 |
|                        | 3                     | Int.                     | <input type="checkbox"/> | MWS1830MB             | 92.5            | 95  | 160 | 19   |
|                        | 5                     | Int.                     | <input type="checkbox"/> | MWS1830LB             | 148             | 152 | 217 | 19   |

(Nota) Per le geometrie non comprese nel catalogo, si prega di contattarci (es. diametri e lunghezze diversi possono essere eseguiti su ordinazione).

● : Inventario mantenuto. ★ : Inventario mantenuto in Giappone.  
 : Non a magazzino, prodotti solo su ordinazione.

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 18.4                      | 2                        | Est.                        | □                       | MWE1840SA             | 64              | 64  | 127 | 18.4 |
|                           | 3                        | Est.                        | □                       | MWE1840MA             | 114             | 114 | 179 | 18.4 |
|                           | 3                        | Int.                        | □                       | MWS1840MB             | 92.5            | 95  | 160 | 19   |
|                           | 5                        | Int.                        | □                       | MWS1840LB             | 148             | 152 | 217 | 19   |
| 18.5                      | 2                        | Est.                        | ●                       | MWE1850SA             | 64              | 64  | 127 | 18.5 |
|                           | 3                        | Est.                        | ●                       | MWE1850MA             | 114             | 114 | 179 | 18.5 |
|                           | 3                        | Int.                        | ●                       | MWS1850MB             | 92.5            | 95  | 160 | 19   |
|                           | 5                        | Int.                        | ●                       | MWS1850LB             | 148             | 152 | 217 | 19   |
| 18.6                      | 2                        | Est.                        | □                       | MWE1860SA             | 64              | 64  | 127 | 18.6 |
|                           | 3                        | Est.                        | □                       | MWE1860MA             | 114             | 114 | 179 | 18.6 |
|                           | 3                        | Int.                        | □                       | MWS1860MB             | 95              | 95  | 160 | 19   |
|                           | 5                        | Int.                        | □                       | MWS1860LB             | 152             | 152 | 217 | 19   |
| 18.7                      | 2                        | Est.                        | □                       | MWE1870SA             | 64              | 64  | 127 | 18.7 |
|                           | 3                        | Est.                        | □                       | MWE1870MA             | 114             | 114 | 179 | 18.7 |
|                           | 3                        | Int.                        | □                       | MWS1870MB             | 95              | 95  | 160 | 19   |
|                           | 5                        | Int.                        | □                       | MWS1870LB             | 152             | 152 | 217 | 19   |
| 18.8                      | 2                        | Est.                        | □                       | MWE1880SA             | 64              | 64  | 127 | 18.8 |
|                           | 3                        | Est.                        | □                       | MWE1880MA             | 114             | 114 | 179 | 18.8 |
|                           | 3                        | Int.                        | □                       | MWS1880MB             | 95              | 95  | 160 | 19   |
|                           | 5                        | Int.                        | □                       | MWS1880LB             | 152             | 152 | 217 | 19   |
| 18.9                      | 2                        | Est.                        | □                       | MWE1890SA             | 64              | 64  | 127 | 18.9 |
|                           | 3                        | Est.                        | □                       | MWE1890MA             | 114             | 114 | 179 | 18.9 |
|                           | 3                        | Int.                        | □                       | MWS1890MB             | 95              | 95  | 160 | 19   |
|                           | 5                        | Int.                        | □                       | MWS1890LB             | 152             | 152 | 217 | 19   |
| 19.0                      | 2                        | Est.                        | ●                       | MWE1900SA             | 64              | 64  | 127 | 19   |
|                           | 3                        | Est.                        | ★                       | MWE1900MA             | 114             | 114 | 179 | 19   |
|                           | 3                        | Int.                        | ●                       | MWS1900MB             | 95              | 95  | 160 | 19   |
|                           | 5                        | Int.                        | ●                       | MWS1900LB             | 152             | 152 | 217 | 19   |
| 19.1                      | 2                        | Est.                        | □                       | MWE1910SA             | 66              | 66  | 131 | 19.1 |
|                           | 3                        | Est.                        | □                       | MWE1910MA             | 114             | 114 | 179 | 19.1 |
|                           | 3                        | Int.                        | □                       | MWS1910MB             | 97.5            | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1910LB             | 156             | 160 | 225 | 20   |
| 19.2                      | 2                        | Est.                        | □                       | MWE1920SA             | 66              | 66  | 131 | 19.2 |
|                           | 3                        | Est.                        | □                       | MWE1920MA             | 114             | 114 | 179 | 19.2 |
|                           | 3                        | Int.                        | □                       | MWS1920MB             | 97.5            | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1920LB             | 156             | 160 | 225 | 20   |
| 19.3                      | 2                        | Est.                        | □                       | MWE1930SA             | 66              | 66  | 131 | 19.3 |
|                           | 3                        | Est.                        | □                       | MWE1930MA             | 114             | 114 | 179 | 19.3 |
|                           | 3                        | Int.                        | □                       | MWS1930MB             | 97.5            | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1930LB             | 156             | 160 | 225 | 20   |
| 19.4                      | 2                        | Est.                        | □                       | MWE1940SA             | 66              | 66  | 131 | 19.4 |
|                           | 3                        | Est.                        | □                       | MWE1940MA             | 114             | 114 | 179 | 19.4 |
|                           | 3                        | Int.                        | □                       | MWS1940MB             | 97.5            | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1940LB             | 156             | 160 | 225 | 20   |
| 19.5                      | 2                        | Est.                        | ●                       | MWE1950SA             | 66              | 66  | 131 | 19.5 |
|                           | 3                        | Est.                        | ★                       | MWE1950MA             | 114             | 114 | 179 | 19.5 |
|                           | 3                        | Int.                        | ●                       | MWS1950MB             | 97.5            | 100 | 165 | 20   |
|                           | 5                        | Int.                        | ★                       | MWS1950LB             | 156             | 160 | 225 | 20   |

| Diam. Punta<br>D1<br>(mm) | Profondità foro<br>(l/d) | Refrigerante<br>(Int./Est.) | Disponibilità<br>VP15TF | Codice di ordinazione | Dimensioni (mm) |     |     |      |
|---------------------------|--------------------------|-----------------------------|-------------------------|-----------------------|-----------------|-----|-----|------|
|                           |                          |                             |                         |                       | L3              | L2  | L1  | D4   |
| 19.6                      | 2                        | Est.                        | □                       | MWE1960SA             | 66              | 66  | 131 | 19.6 |
|                           | 3                        | Est.                        | □                       | MWE1960MA             | 114             | 114 | 179 | 19.6 |
|                           | 3                        | Int.                        | □                       | MWS1960MB             | 100             | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1960LB             | 160             | 160 | 225 | 20   |
| 19.7                      | 2                        | Est.                        | □                       | MWE1970SA             | 66              | 66  | 131 | 19.7 |
|                           | 3                        | Est.                        | □                       | MWE1970MA             | 114             | 114 | 179 | 19.7 |
|                           | 3                        | Int.                        | □                       | MWS1970MB             | 100             | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1970LB             | 160             | 160 | 225 | 20   |
| 19.8                      | 2                        | Est.                        | □                       | MWE1980SA             | 66              | 66  | 131 | 19.8 |
|                           | 3                        | Est.                        | □                       | MWE1980MA             | 114             | 114 | 179 | 19.8 |
|                           | 3                        | Int.                        | □                       | MWS1980MB             | 100             | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1980LB             | 160             | 160 | 225 | 20   |
| 19.9                      | 2                        | Est.                        | □                       | MWE1990SA             | 66              | 66  | 131 | 19.9 |
|                           | 3                        | Est.                        | □                       | MWE1990MA             | 114             | 114 | 179 | 19.9 |
|                           | 3                        | Int.                        | □                       | MWS1990MB             | 100             | 100 | 165 | 20   |
|                           | 5                        | Int.                        | □                       | MWS1990LB             | 160             | 160 | 225 | 20   |
| 20.0                      | 2                        | Est.                        | ●                       | MWE2000SA             | 66              | 66  | 131 | 20   |
|                           | 3                        | Est.                        | ●                       | MWE2000MA             | 114             | 114 | 179 | 20   |
|                           | 3                        | Int.                        | ●                       | MWS2000MB             | 100             | 100 | 165 | 20   |
|                           | 5                        | Int.                        | ●                       | MWS2000LB             | 160             | 160 | 225 | 20   |
| 20.5                      | 3                        | Int.                        | ★                       | MWS2050MB             | 103             | 105 | 176 | 21   |
|                           | 5                        | Int.                        | ★                       | MWS2050LB             | 166             | 168 | 239 | 21   |
| 21.0                      | 3                        | Int.                        | ●                       | MWS2100MB             | 105             | 105 | 176 | 21   |
|                           | 5                        | Int.                        | ★                       | MWS2100LB             | 168             | 168 | 239 | 21   |
| 21.5                      | 3                        | Int.                        | ★                       | MWS2150MB             | 108             | 110 | 182 | 22   |
|                           | 5                        | Int.                        | ★                       | MWS2150LB             | 174             | 176 | 248 | 22   |
| 22.0                      | 3                        | Int.                        | ★                       | MWS2200MB             | 110             | 110 | 182 | 22   |
|                           | 5                        | Int.                        | ★                       | MWS2200LB             | 176             | 176 | 248 | 22   |
| 22.5                      | 3                        | Int.                        | ★                       | MWS2250MB             | 113             | 115 | 188 | 23   |
|                           | 5                        | Int.                        | ★                       | MWS2250LB             | 182             | 184 | 257 | 23   |
| 23.0                      | 3                        | Int.                        | ★                       | MWS2300MB             | 115             | 115 | 188 | 23   |
|                           | 5                        | Int.                        | ★                       | MWS2300LB             | 184             | 184 | 257 | 23   |
| 23.5                      | 3                        | Int.                        | ★                       | MWS2350MB             | 118             | 120 | 194 | 24   |
|                           | 5                        | Int.                        | ★                       | MWS2350LB             | 190             | 192 | 266 | 24   |
| 24.0                      | 3                        | Int.                        | ★                       | MWS2400MB             | 120             | 120 | 194 | 24   |
|                           | 5                        | Int.                        | ★                       | MWS2400LB             | 192             | 192 | 266 | 24   |
| 24.5                      | 3                        | Int.                        | ★                       | MWS2450MB             | 123             | 125 | 200 | 25   |
|                           | 5                        | Int.                        | ★                       | MWS2450LB             | 198             | 200 | 270 | 25   |
| 25.0                      | 3                        | Int.                        | ★                       | MWS2500MB             | 125             | 125 | 200 | 25   |
|                           | 5                        | Int.                        | ★                       | MWS2500LB             | 200             | 200 | 270 | 25   |





## PARAMETRI DI TAGLIO CONSIGLIATI

### ● MWE (Refrigerante esterno)

| Materiale da lavorare          | Diametro della punta<br>Condizioni<br>Durezza | φ3.0-φ6.0                  |                       | φ6.1-φ10.0                 |                       | φ10.1-φ14.0                |                       | φ14.1-φ20.0                |                       |
|--------------------------------|---|----------------------------|-----------------------|----------------------------|-----------------------|----------------------------|-----------------------|----------------------------|-----------------------|
|                                |   | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) |
| P<br>Acciaio dolce             | ≤180HB  | 85<br>(35-100)             | 0.20<br>(0.15-0.30)   | 85<br>(45-120)             | 0.25<br>(0.15-0.35)   | 90<br>(55-120)             | 0.30<br>(0.20-0.35)   | 100<br>(60-130)            | 0.35<br>(0.20-0.40)   |
|                                | 180-280HB                                     | 80<br>(40-95)              | 0.20<br>(0.15-0.30)   | 90<br>(50-120)             | 0.25<br>(0.15-0.35)   | 90<br>(60-130)             | 0.30<br>(0.15-0.35)   | 90<br>(60-130)             | 0.35<br>(0.20-0.40)   |
|                                | 280-350HB                                     | 75<br>(35-80)              | 0.15<br>(0.15-0.20)   | 80<br>(45-115)             | 0.20<br>(0.15-0.25)   | 85<br>(55-115)             | 0.25<br>(0.15-0.30)   | 85<br>(55-115)             | 0.30<br>(0.20-0.35)   |
| M<br>Acciaio inossidabile      | ≤200HB  | 20<br>(15-30)              | 0.10<br>(0.05-0.15)   | 25<br>(15-30)              | 0.12<br>(0.05-0.15)   | 25<br>(15-30)              | 0.15<br>(0.10-0.20)   | 25<br>(15-30)              | 0.20<br>(0.10-0.25)   |
| K<br>Ghisa                     | Resistenza alla trazione ≤350MPa              | 70<br>(40-85)              | 0.25<br>(0.15-0.30)   | 75<br>(50-90)              | 0.30<br>(0.20-0.35)   | 80<br>(50-95)              | 0.35<br>(0.20-0.40)   | 85<br>(55-95)              | 0.40<br>(0.30-0.45)   |
|                                | Resistenza alla trazione ≤450MPa              | 65<br>(35-80)              | 0.20<br>(0.15-0.25)   | 70<br>(45-85)              | 0.25<br>(0.15-0.30)   | 75<br>(45-90)              | 0.30<br>(0.20-0.35)   | 80<br>(50-90)              | 0.35<br>(0.20-0.40)   |
| N<br>Lega di alluminio         | -   | 80<br>(70-90)              | 0.20<br>(0.10-0.25)   | 90<br>(80-100)             | 0.25<br>(0.15-0.30)   | 100<br>(90-110)            | 0.30<br>(0.20-0.35)   | 110<br>(100-120)           | 0.35<br>(0.20-0.40)   |
| S<br>Lega resistente al calore | -   | 20<br>(10-25)              | 0.10<br>(0.05-0.15)   | 25<br>(15-30)              | 0.12<br>(0.05-0.15)   | 25<br>(15-30)              | 0.15<br>(0.10-0.20)   | 30<br>(25-35)              | 0.20<br>(0.10-0.25)   |
| H<br>Acciaio temprato          | 40-60HRC                                      | 20<br>(15-25)              | 0.10<br>(0.05-0.15)   | 25<br>(15-30)              | 0.12<br>(0.05-0.15)   | 25<br>(15-30)              | 0.15<br>(0.10-0.20)   | 30<br>(15-35)              | 0.20<br>(0.10-0.25)   |

### ● MWS (Refrigerante interno) MB, LB, X8DB

| Materiale da lavorare          | Diametro della punta<br>Condizioni<br>Durezza | φ1.0-φ3.0                  |                       | φ3.1-φ6.0                  |                       | φ6.1-φ10.0                 |                       | φ10.1-φ14.0                |                       | φ14.1-φ25.0                |                       |
|--------------------------------|---|----------------------------|-----------------------|----------------------------|-----------------------|----------------------------|-----------------------|----------------------------|-----------------------|----------------------------|-----------------------|
|                                |   | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) | Velocità di taglio (m/min) | Avanzamento (mm/giro) |
| P<br>Acciaio dolce             | ≤180HB  | 50<br>(40-60)              | 0.08<br>(0.04-0.12)   | 110<br>(50-120)            | 0.20<br>(0.15-0.25)   | 130<br>(80-140)            | 0.25<br>(0.20-0.35)   | 150<br>(90-170)            | 0.30<br>(0.20-0.40)   | 160<br>(100-180)           | 0.35<br>(0.20-0.40)   |
|                                | 180-280HB                                     | 50<br>(40-60)              | 0.08<br>(0.04-0.12)   | 90<br>(50-100)             | 0.20<br>(0.15-0.25)   | 110<br>(70-120)            | 0.25<br>(0.20-0.35)   | 130<br>(80-140)            | 0.25<br>(0.20-0.40)   | 140<br>(100-150)           | 0.30<br>(0.20-0.40)   |
|                                | 280-350HB                                     | 50<br>(40-60)              | 0.08<br>(0.04-0.12)   | 80<br>(40-90)              | 0.20<br>(0.15-0.30)   | 90<br>(60-110)             | 0.25<br>(0.15-0.30)   | 110<br>(70-130)            | 0.25<br>(0.15-0.40)   | 120<br>(90-140)            | 0.30<br>(0.20-0.40)   |
| M<br>Acciaio inossidabile      | ≤200HB  | 30<br>(20-40)              | 0.05<br>(0.02-0.10)   | 60<br>(20-100)             | 0.10<br>(0.05-0.15)   | 80<br>(40-120)             | 0.20<br>(0.10-0.25)   | 90<br>(50-120)             | 0.25<br>(0.15-0.30)   | 100<br>(60-120)            | 0.25<br>(0.15-0.30)   |
| K<br>Ghisa                     | Resistenza alla trazione ≤350MPa              | 50<br>(40-60)              | 0.08<br>(0.04-0.12)   | 100<br>(70-120)            | 0.25<br>(0.15-0.30)   | 130<br>(100-140)           | 0.30<br>(0.20-0.35)   | 150<br>(110-160)           | 0.35<br>(0.25-0.40)   | 160<br>(120-170)           | 0.35<br>(0.25-0.40)   |
|                                | Resistenza alla trazione ≤450MPa              | 30<br>(20-40)              | 0.06<br>(0.02-0.10)   | 65<br>(35-80)              | 0.20<br>(0.15-0.25)   | 70<br>(40-90)              | 0.20<br>(0.15-0.30)   | 90<br>(50-110)             | 0.25<br>(0.20-0.40)   | 100<br>(60-110)            | 0.30<br>(0.20-0.40)   |
| N<br>Lega di alluminio         | -   | 60<br>(50-80)              | 0.10<br>(0.05-0.15)   | 120<br>(80-150)            | 0.25<br>(0.20-0.35)   | 150<br>(100-170)           | 0.30<br>(0.20-0.50)   | 160<br>(100-170)           | 0.40<br>(0.20-0.80)   | 170<br>(100-180)           | 0.50<br>(0.20-1.00)   |
| S<br>Lega resistente al calore | -   | 10<br>(5-15)               | 0.03<br>(0.01-0.05)   | 20<br>(10-25)              | 0.10<br>(0.05-0.15)   | 25<br>(15-30)              | 0.12<br>(0.05-0.15)   | 25<br>(15-30)              | 0.15<br>(0.10-0.20)   | 30<br>(25-35)              | 0.20<br>(0.10-0.25)   |

(Nota 1) Per fori fino a φ2, la foratura ad intermittenza è raccomandata, utilizzando i parametri da tabella.

(Nota 2) Punta preforo : 1 x D (diametro della punta)

(Nota 3) Per ulteriori informazioni sull'utilizzo delle punte MWE e MWS, fare riferimento alla pagina successiva.

● **MWS (Refrigerante interno) X10DB, X15DB, X20DB, X25DB, X30DB**

| Materiale da lavorare                 | Diametro della punta                             | $\phi 3.0 - \phi 6.0$         |                          | $\phi 6.1 - \phi 10.0$        |                          | $\phi 10.1 - \phi 14.0$       |                          |
|---------------------------------------|--|-------------------------------|--------------------------|-------------------------------|--------------------------|-------------------------------|--------------------------|
|                                       | Condizioni<br>Durezza                            | Velocità di taglio<br>(m/min) | Avanzamento<br>(mm/giro) | Velocità di taglio<br>(m/min) | Avanzamento<br>(mm/giro) | Velocità di taglio<br>(m/min) | Avanzamento<br>(mm/giro) |
| <b>P</b><br>Acciaio dolce             | $\leq 180\text{HB}$                              | 90 (50–120)                   | 0.20 (0.15–0.30)         | 110 (80–140)                  | 0.25 (0.20–0.35)         | 130 (90–170)                  | 0.30 (0.20–0.40)         |
|                                       | 180–280HB  | 80 (50–100)                   | 0.20 (0.15–0.30)         | 90 (70–120)                   | 0.25 (0.20–0.35)         | 110 (80–140)                  | 0.25 (0.20–0.40)         |
|                                       | 280–350HB  | 70 (40–90)                    | 0.20 (0.15–0.25)         | 80 (60–110)                   | 0.25 (0.15–0.30)         | 90 (70–130)                   | 0.25 (0.15–0.35)         |
| <b>M</b><br>Acciaio inossidabile      | $\leq 200\text{HB}$                              | 50 (20–100)                   | 0.10 (0.05–0.15)         | 70 (40–120)                   | 0.20 (0.10–0.25)         | 80 (50–120)                   | 0.25 (0.15–0.30)         |
| <b>K</b><br>Ghisa                     | Resistenza alla trazione<br>$\leq 350\text{MPa}$ | 90 (70–120)                   | 0.25 (0.15–0.30)         | 110 (100–140)                 | 0.30 (0.15–0.35)         | 130 (110–160)                 | 0.35 (0.25–0.40)         |
|                                       | Resistenza alla trazione<br>$\leq 450\text{MPa}$ | 50 (30–80)                    | 0.20 (0.15–0.25)         | 60 (40–90)                    | 0.20 (0.15–0.30)         | 80 (50–110)                   | 0.25 (0.20–0.40)         |
| <b>N</b><br>Lega di alluminio         | –  | 100 (80–150)                  | 0.25 (0.20–0.35)         | 130 (100–170)                 | 0.30 (0.20–0.50)         | 140 (100–170)                 | 0.40 (0.20–0.80)         |
| <b>S</b><br>Lega resistente al calore | –  | 20 (10–25)                    | 0.10 (0.05–0.15)         | 20 (15–30)                    | 0.12 (0.05–0.15)         | 20 (15–30)                    | 0.15 (0.10–0.20)         |

(Nota 1) Quando si eseguono forature oltre  $l/d=10$ , ridurre la velocità di taglio mostrata in tabella.

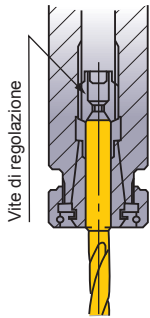
(Nota 2) Assicurarsi di eseguire un preforo di guida.

(Nota 3) Dopo avere inserito la punta lunga nel preforo, aumentare fino a regime la velocità di taglio.

(Nota 4) Per il preforo di guida, si raccomandano punte Mitsubishi MPS.

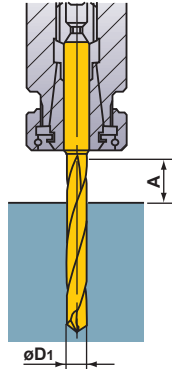
### GUIDA OPERATIVA

#### Mandrino di tenuta



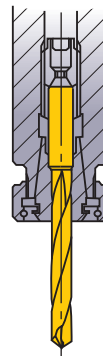
La ghiera reggispunta del mandrino blocca la punta in modo sicuro.

#### Lunghezza punta



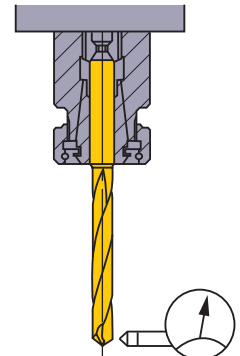
$$A \geq D1 \times 1.5$$

#### Montaggio punta



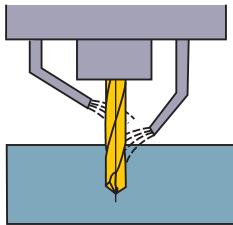
Non bloccare la punta sull'elica.

#### Tolleranza d'installazione



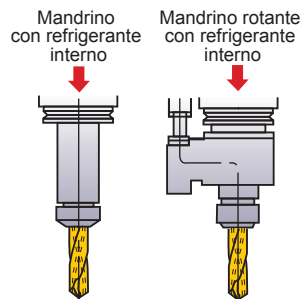
eccentricità  $\leq 0.03\text{mm}$

#### Metodo refrigerante (MWE)



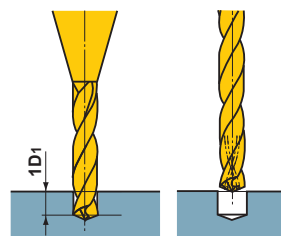
Due posizioni di refrigerante, nella zona centrale e alla fine della punta sono l'ideale.

#### Tipo con refrigerante interno (MWS)



la pressione del refrigerante è circa:  
 $0.5 - 1\text{MPa}$  ( $< \phi 5$ :  $2 - 3\text{MPa}$ ).  
 il volume del refrigerante è circa  $1.5 - 4.0\text{ L/min}$ .

#### Montaggio punta



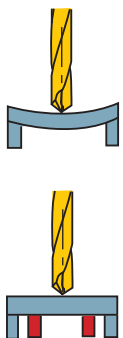
- ① Quando si deve eseguire un preforo, preparare un foro di profondità  $1D$  ( $D = \text{diametro della punta}$ ).
- ② Utilizzare il preforo come guida quando si utilizzano punte con fori di lubrificazione. A seconda delle condizioni di taglio, la foratura ad intermittenza è raccomandata.

#### Utilizzo del refrigerante

<Tipo MWS>

- 1) Piccole particelle di sporco, possono ostruire i fori di passaggio olio. Utilizzare sempre un filtro a maglia fine come misura preventiva.
- 2) Sporcizia e particelle metalliche aderiscono al vecchio refrigerante. Un regolare cambio di refrigerante è raccomandato.

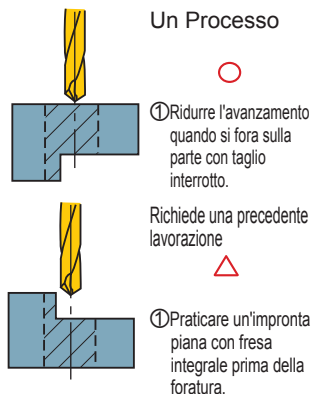
#### Pezzi sottili



Se tende a flettere

Supporti per il pezzo

#### Taglio interrotto



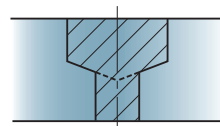
Un Processo

① Ridurre l'avanzamento quando si fora sulla parte con taglio interrotto.

Richiede una precedente lavorazione

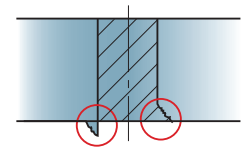
① Praticare un'impronta piana con fresa integrale prima della foratura.

#### Foratura a gradini



- ① Dividere in due fasi.
  - ② Forare il diametro maggiore per primo.
- \* La punta che realizza i due diametri contemporaneamente, può essere prodotta su richiesta.

#### Bave e scheggiature sul pezzo

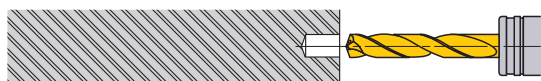


- ① Ridurre l'avanzamento di circa il 50% prima dell'uscita della punta dal foro.
- ② Aggiungere uno smusso a  $45^\circ$ .
- ③ Variare l'angolo della punta.

## ISTRUZIONI D'USO

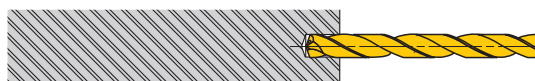
## ● Realizzazione di un foro cieco

## 1. Realizzare un foro pilota



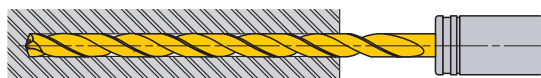
- ① Utilizzare una punta con un angolo più grande (più piatto) rispetto al tipo superlungo. Si consigliano Mitsubishi MWE o MWS.
- ② Usare punte con lo stesso diametro delle punte per fori profondi.
- ③ Profondità di foratura: circa  $2-3 \times D$  o superiore.
- ④ Praticare un foro pilota molto preciso.

## 2. Taglio iniziale con la punta di tipo lungo



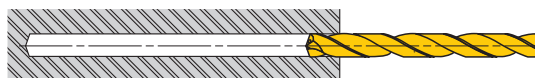
- ① Entrare nel foro pilota a velocità ridotta (velocità di taglio  $20-30$  m/min, avanzamento  $0.2-0.3$  mm/giro).
- ② Arrestare la punta lunga  $1-3$  mm prima del fondo del foro pilota.

## 3. Realizzare il foro profondo



- ① Iniziare alla velocità consigliata e avanzare in modo continuo (senza interrompere l'avanzamento).

## 4. Arretramento della punta

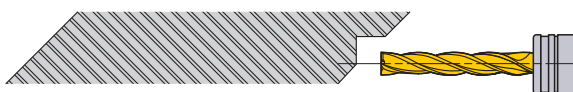


- ① Dopo la foratura ridurre la velocità  $1-2$  mm prima della fine del foro (velocità di circa  $20-30$  m/min).
- ② Arretrare la punta fino all'inizio del foro pilota ( $V_f=3000$  mm/min.)
- ③ Arretrare la punta dal foro pilota a bassa velocità ( $n=300$ ,  $V_f=3000$  mm/min).

## ISTRUZIONI D'USO

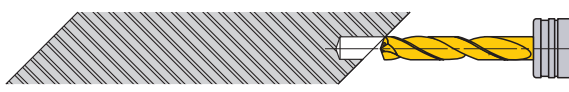
## ● Forature e rotture su superfici o angolazioni irregolari

## 1. Lamatura



- ① Realizzare una superficie piana, utilizzando una fresa frontale o una punta in grado di effettuare lamature. Il diametro di lamatura deve avere le stesse dimensioni del diametro del foro profondo.

## 2. Realizzare un foro pilota



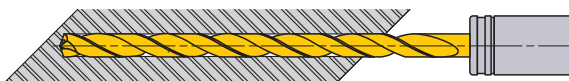
- ① Utilizzare una punta con un angolo più grande (più piatto) rispetto al tipo superlungo. Si consigliano Mitsubishi MWE o MWS.
- ② Usare punte con lo stesso diametro delle punte per fori profondi.
- ③ Profondità di foratura: circa  $2-3 \times D$  o superiore.
- ④ Praticare un foro pilota molto preciso.

## 3. Taglio iniziale con la punta di tipo lungo



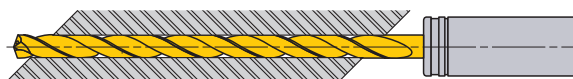
- ① Entrare nel foro pilota a velocità ridotta (velocità di taglio  $20-30$  m/min, avanzamento  $0.2-0.3$  mm/giro).
- ② Arrestare la punta lunga  $1-3$  mm prima del fondo del foro pilota.

## 4. Realizzare il foro profondo



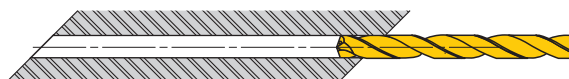
- ① Iniziare alla velocità consigliata e avanzare in modo continuo (senza interrompere l'avanzamento).

## 5. Sfondamento



- ① Durante lo sfondamento, il tagliente può danneggiarsi.
- ② Si consiglia un avanzamento di  $0.05-0.1$  mm/giro.

## 6. Arretramento della punta



- ① Quindi uscire dal foro ad una velocità di  $20-30$  m/min e un avanzamento di  $0.2-0.3$  mm/giro.
- ② Arretrare la punta alla profondità di partenza del foro pilota con avanzamento di  $3000$  mm/min.