

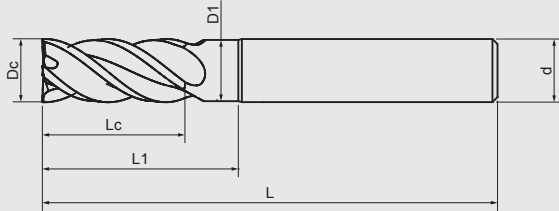
## F514SX / F515SX

## Multipurpose End Mills

Designed with variable helix geometry, unequal flutes.

Have a good wear resistance and impact resistance.

Good wear resistance and lubricating effect with Nano ZrN multilayer coating.

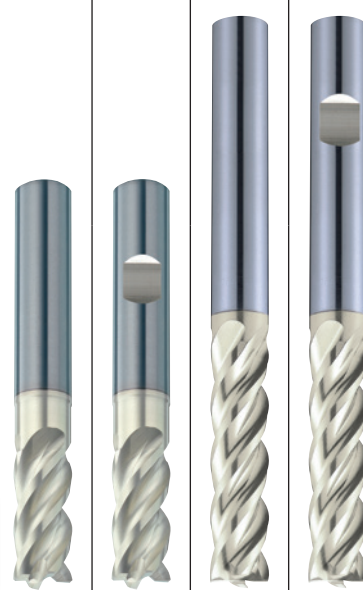


**VHM Carbide**

**AlTiXN+ZrN SX**

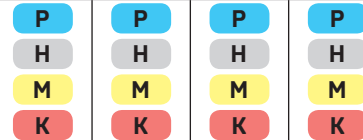


**Steel <48HRC**



Suitable for cutting different steel below 48HRC as well as stainless steel and aluminium.

Application from roughing to finishing cutting, drilling, ramping... in different materials.



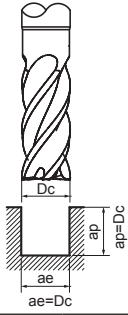
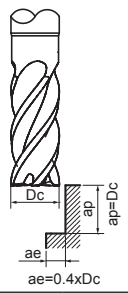
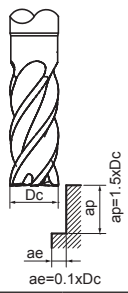
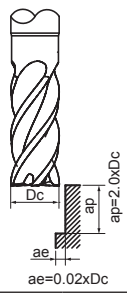
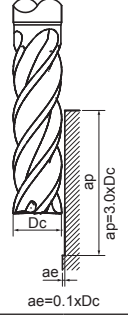
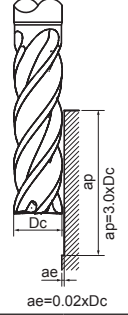
## DIN 6527 Standard Length

| Dc<br>0<br>-0.02 | Lc<br>mm | L<br>mm | d<br>h5 | L1<br>mm | D1<br>mm | 45°<br>mm | F514SX<br>HA | F514SX<br>HB |  |  |  |  |
|------------------|----------|---------|---------|----------|----------|-----------|--------------|--------------|--|--|--|--|
| 3                | 8        | 57      | 6       | 14       | 2.8      | 0.10      | ●            | ●            |  |  |  |  |
| 4                | 11       | 57      | 6       | 16       | 3.8      | 0.10      | ●            | ●            |  |  |  |  |
| 5                | 13       | 57      | 6       | 18       | 4.8      | 0.15      | ●            | ●            |  |  |  |  |
| 6                | 13       | 57      | 6       | 20       | 5.8      | 0.15      | ●            | ●            |  |  |  |  |
| 8                | 19       | 63      | 8       | 26       | 7.7      | 0.15      | ●            | ●            |  |  |  |  |
| 10               | 22       | 72      | 10      | 31       | 9.7      | 0.20      | ●            | ●            |  |  |  |  |
| 12               | 26       | 83      | 12      | 37       | 11.6     | 0.20      | ●            | ●            |  |  |  |  |
| 14               | 26       | 83      | 14      | 37       | 13.5     | 0.20      | ●            | ●            |  |  |  |  |
| 16               | 32       | 92      | 16      | 43       | 15.5     | 0.20      | ●            | ●            |  |  |  |  |
| 18               | 32       | 92      | 18      | 43       | 17.5     | 0.20      | ●            | ●            |  |  |  |  |
| 20               | 38       | 104     | 20      | 53       | 19.5     | 0.20      | ●            | ●            |  |  |  |  |

## Long Length

| Dc<br>0<br>-0.02 | Lc<br>mm | L<br>mm | d<br>h5 | L1<br>mm | D1<br>mm | 45°<br>mm |  |  | F515SX<br>HA | F515SX<br>HB |  |  |
|------------------|----------|---------|---------|----------|----------|-----------|--|--|--------------|--------------|--|--|
| 6                | 19       | 63      | 6       | 26       | 5.8      | 0.15      |  |  | ●            | ●            |  |  |
| 8                | 28       | 72      | 8       | 35       | 7.7      | 0.15      |  |  | ●            | ●            |  |  |
| 10               | 34       | 84      | 10      | 43       | 9.7      | 0.20      |  |  | ●            | ●            |  |  |
| 12               | 40       | 97      | 12      | 51       | 11.6     | 0.20      |  |  | ●            | ●            |  |  |
| 16               | 48       | 108     | 16      | 59       | 15.5     | 0.20      |  |  | ●            | ●            |  |  |
| 20               | 56       | 122     | 20      | 71       | 19.5     | 0.20      |  |  | ●            | ●            |  |  |

## Cutting Conditions

| F514SX<br>F515SX                 |  | F514SX  |   | F514SX  |  | F514SX  |   | F514SX                      |                          | F515SX                      |                          | F515SX                      |                          |
|----------------------------------|--|---|---|---|--|---|---|-----------------------------|--------------------------|-----------------------------|--------------------------|-----------------------------|--------------------------|
|                                  |  |  |  |  |  |  |  | cutting speed<br>Vc (m/min) | feed per tooth<br>fz(mm) | cutting speed<br>Vc (m/min) | feed per tooth<br>fz(mm) | cutting speed<br>Vc (m/min) | feed per tooth<br>fz(mm) |
| <b>Carbon Steel Materials</b>    |  |   |   |   |  |   |   |                             |                          |                             |                          |                             |                          |
| P                                | GR1 Carbon Steel                         | 120   | 0.006xDc  | 120   | 0.006xDc   | 130   | 0.006xDc  | 140                         | 0.007xDc                 | 110                         | 0.006xDc                 | 120                         | 0.006xDc                 |
|                                  | GR2 <24HRC Low-alloyed Steel             | 120   | 0.005xDc  | 120   | 0.005xDc   | 130   | 0.005xDc  | 140                         | 0.006xDc                 | 110                         | 0.005xDc                 | 120                         | 0.005xDc                 |
|                                  | GR3 <30HRC Hi-alloyed Steel              | 80  | 0.005xDc  | 80  | 0.005xDc   | 90  | 0.005xDc  | 100                         | 0.006xDc                 | 70                          | 0.005xDc                 | 80                          | 0.005xDc                 |
| <b>Hardened Steel Materials</b>  |  |   |   |   |  |   |   |                             |                          |                             |                          |                             |                          |
| H                                | GR4 30-38HRC Hardened Steel              | 65  | 0.004xDc  | 90  | 0.003xDc   | 90  | 0.003xDc  | 100                         | 0.003xDc                 | 90                          | 0.004xDc                 | 100                         | 0.003xDc                 |
|                                  | GR5 38-48HRC Hardened Steel              | 60  | 0.003xDc  | 80  | 0.003xDc   | 80  | 0.003xDc  | 90                          | 0.003xDc                 | 70                          | 0.003xDc                 | 80                          | 0.003xDc                 |
| <b>Stainless Steel Materials</b> |  |   |   |   |  |   |   |                             |                          |                             |                          |                             |                          |
| M                                | GR8-1 Ferritic \ Martensitic             | 80  | 0.003xDc  | 90  | 0.004xDc   | 110   | 0.003xDc  | 130                         | 0.003xDc                 | 70                          | 0.003xDc                 | 80                          | 0.004xDc                 |
|                                  | GR8-2 Austenitic                         | 70  | 0.003xDc  | 80  | 0.003xDc   | 90  | 0.003xDc  | 100                         | 0.003xDc                 | 60                          | 0.003xDc                 | 70                          | 0.003xDc                 |
|                                  | GR8-3 Austenitic-ferritic                | 40  | 0.002xDc  | 50  | 0.003xDc   | 90  | 0.002xDc  | 60                          | 0.002xDc                 | 50                          | 0.002xDc                 | 60                          | 0.003xDc                 |
|                                  | GR8-4 Austenitic-ferritic Heat-resistant | 30  | 0.002xDc  | 40  | 0.003xDc   | 40  | 0.002xDc  | 50                          | 0.002xDc                 | 40                          | 0.002xDc                 | 50                          | 0.003xDc                 |
| <b>Cast Iron Materials</b>       |  |   |   |   |  |   |   |                             |                          |                             |                          |                             |                          |
| K                                | GR9-1 Grey cast iron                     | 110   | 0.006xDc  | 110   | 0.006xDc   | 120   | 0.006xDc  | 130                         | 0.007xDc                 | 100                         | 0.006xDc                 | 110                         | 0.005xDc                 |
|                                  | GR9-2 Nodular cast iron                  | 120   | 0.006xDc  | 120   | 0.006xDc   | 130   | 0.006xDc  | 140                         | 0.007xDc                 | 110                         | 0.006xDc                 | 120                         | 0.005xDc                 |

All cutting data serve for orientation only and should be adapted individually to the technical conditions on location

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.