

# FRAISE-D'ÉBAUCHE-MD-E2+-EZI-ALPHA+L3-POUR-MATÉRIAUX-DIFFICILES · ROUGHING-ENDMILL-SC-E2+-EZI-ALPHA+L3-FOR-DIFFICULT-MATERIALS · SCHAFT-SCHRUPPFRÄSER-HM-E2+-EZI-ALPHA+L3-FÜR-HARTE-WERKSTOFFE



SWISS MADE

21133A-16

Version 07.05.2026

|  |  |   |                                      |  |                                       |                                  |                           |
|--|--|---|--------------------------------------|--|---------------------------------------|----------------------------------|---------------------------|
| <b>E2</b><br>E2 HIGH PRECISION TOOL MATERIAL | $\lambda = 50^\circ$<br>$\gamma = -12^\circ$<br>CUTTING ANGLES<br>$750^\circ$ $7-12^\circ$ | $0.005-0.03$<br>45°<br>45° CHAMFER TOLERANCE 0.005-0.03 | <br>DUAL DIRECTION HELICAL DRILL BIT | $1.5 \times D$<br>1.5XD DEPTH PRECISION TOOL | <b>L3</b><br>THREE-POINT CONTACT TOOL | <br>STANDARD TOOL WEAR INDICATOR | <br>ADJUSTABLE ANGLE ICON |
|--|--|---|--------------------------------------|--|---------------------------------------|----------------------------------|---------------------------|

## MATERIAL COMPATIBILITY

●●● Excellent (3/3) ●●○ Good (2/3) ●○○ Possible (1/3) ○○○ Not recommended

| MATERIAL   | SPECIFICATION                | GRP | 21133A-16 |
|--|------------------------------|-----|-----------|
| <b>Alloyed and non-alloyed steels</b><br><small>Non-alloyed steels</small> | Rm < 450 N/mm <sup>2</sup>   | 1a  | ○○○       |
|  | Rm 450–700 N/mm <sup>2</sup> | 1b  | ○○○       |
|  | Rm 700–900 N/mm <sup>2</sup> | 1c  | ●○○       |
|  | Rm > 1200 N/mm <sup>2</sup>  | 1d  | ●●●       |
| <b>Stainless steels</b><br><small>Stainless steels</small>                 | Rm < 650 N/mm <sup>2</sup>   | 2a  | ○○○       |
|  | Rm 650–950 N/mm <sup>2</sup> | 2b  | ●○○       |
|  | Rm > 950 N/mm <sup>2</sup>   | 2c  | ●●○       |
| <b>Hardened steels</b><br><small>Hardened steels</small>                   | 44–56 HRC                    | 3a  | ●●●       |
|  | 57–67 HRC                    | 3b  | ●●○       |
| <b>Exotic materials</b><br><small>Special alloys</small>                   | < 32 HRC                     | 4a  | ●●●       |
|  | > 32 HRC                     | 4b  | ●●●       |
| <b>Graphite</b><br><small>Industrial graphite</small>                      |                              | 5   | ○○○       |
| <b>Cast iron</b><br><small>Grey / nodular cast iron</small>                | < 32 HRC                     | 6a  | ●○○       |
|  | > 32 HRC                     | 6b  | ●○○       |
| <b>Titanium</b><br><small>Titanium alloys</small>                          | Rm < 600 N/mm <sup>2</sup>   | 7a  | ●○○       |
|  | 600 < Rm N/mm <sup>2</sup>   | 7b  | ●○○       |
| <b>Nickel alloys</b><br><small>Inconel, Hastelloy</small>                  | Rm < 1000 N/mm <sup>2</sup>  | 8a  | ●●●       |
|  | Rm > 1000 N/mm <sup>2</sup>  | 8b  | ●●●       |
| <b>Copper, brass, bronze</b><br><small>Copper-based</small>                | Rm < 850 N/mm <sup>2</sup>   | 9a  | ○○○       |
|  | Rm > 850 N/mm <sup>2</sup>   | 9b  | ○○○       |
| <b>Aluminum</b><br><small>Aluminum alloys</small>                          | Si < 0.5%                    | 10a | ○○○       |
|  | 0.5% < Si < 5%               | 10b | ○○○       |
|  | Si > 5%                      | 10c | ○○○       |
| <b>Synthetic materials</b><br><small>Engineering plastics</small>          | Thermoplastic                | 11a | ○○○       |
|  | Thermoset                    | 11b | ○○○       |
| <b>Composite materials</b><br><small>Reinforced composites</small>         | Glass fiber / GFK            | 12a | ○○○       |
|  | Carbon fiber / KFK           | 12b | ○○○       |
| <b>Precious metals</b><br><small>Gold, platinum, silver</small>            | Gold                         | 13a | ○○○       |
|  | Platinum                     | 13b | ○○○       |

## TECHNICAL DRAWING



## DIMENSIONS

| NOMINAL DIMENSIONS |       |
|--------------------|-------|
| D (0 / -0.01)      | 16 mm |
| d (h5)             | 16 mm |
| L                  | 92 mm |
| l1                 | 24 mm |
| l3                 | 43 mm |
| d3                 | –     |
| R                  | –     |
| e                  | –     |
| Z                  | 4     |
| Chamfer K          | 0.1   |
| w° collision       | –     |



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eskenazi.ch/eshop/21133A-16