DUNNER

SWISS TOOLING PRODUCER


# Standard guide bushes

| Brochure caption | | | | | |
|---|---|---|---|---|---|
| [1] | Standard | ★★★ | Best | **$$$** | High price |
| [2] | Semi-standard | ★★ | Good | **$$** | Medium price |
| [3] | Custom made | ★ | Weak | **$** | Low price |
| [†] | On request | - | Avoid | | |


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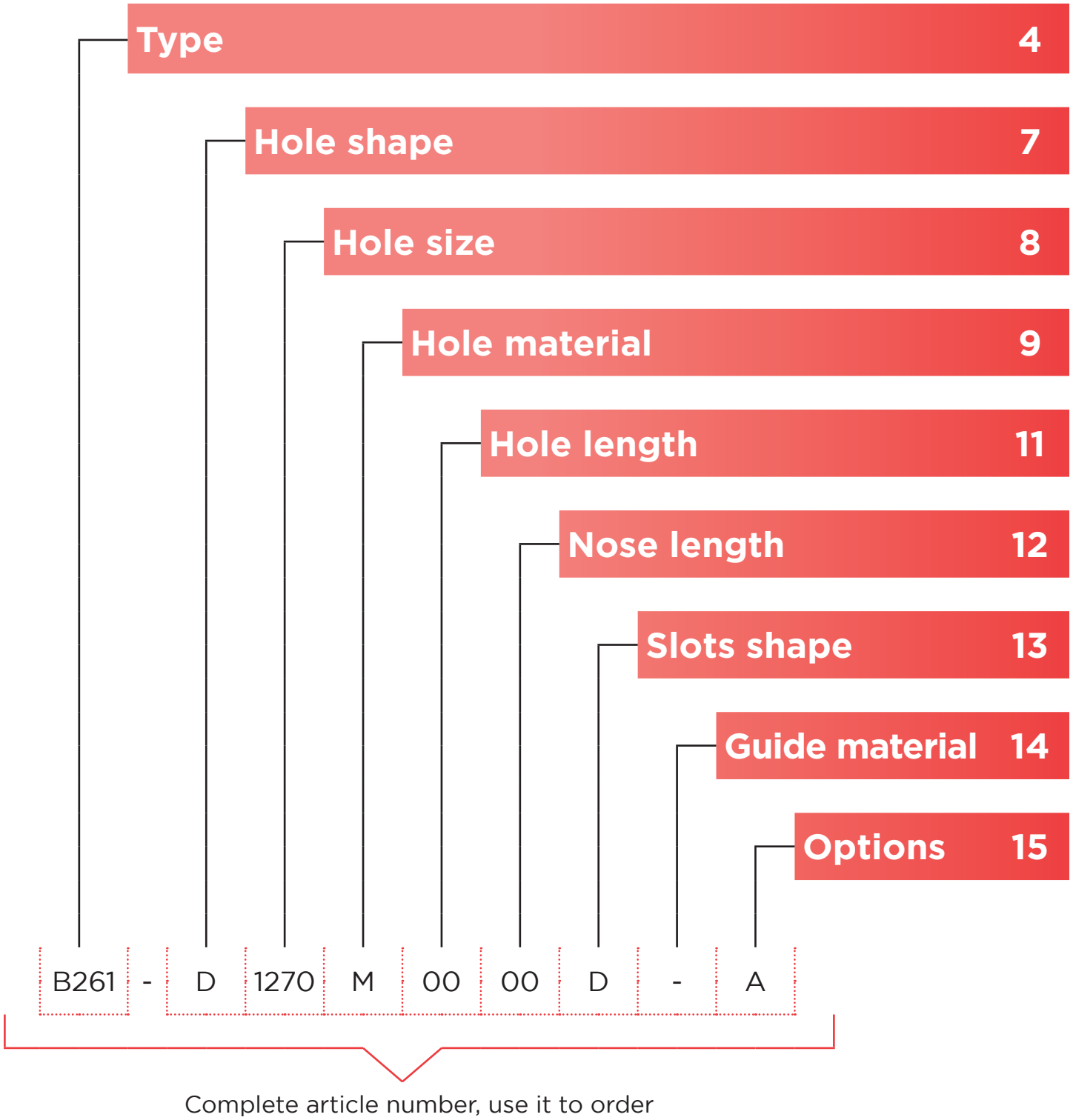
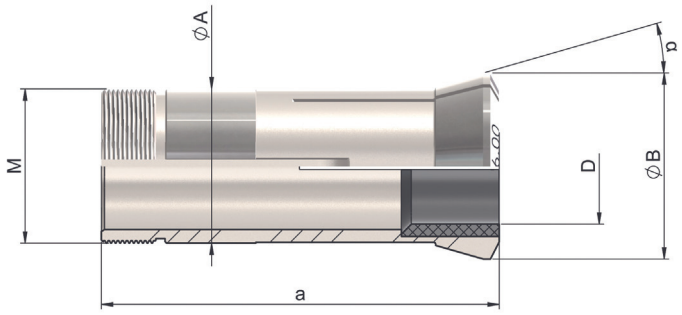
# Standard guide bushes



# Standard guide bushes

## Type





*«B and J» shape*

| Type code | ØA | a | ØB | α | M | D max ● | D max ⬢ | D max ■ |
|---|---|---|---|---|---|---|---|---|
| **J2†** | 7 | 30 | 10 | 16 | M6x0.50 | 4 | 3 | 2.5 |
| **J3C** | 9 | 38 | 13 | 16 | M8x0.75 | 4 | 3 | 2.5 |
| **J3** | 9 | 44 | 13 | 16 | M8X0.75 | 4 | 3 | 2.5 |
| **B201†** | 9 | 52 | 13 | 30 | M9x0.70 | 5 | 4 | 3.5 |
| **J4** | 11 | 53 | 15 | 16 | M10x0.75 | 7 | 6 | 5 |
| **J5†** | 12 | 50 | 16 | 16 | M10x0.75 | 7 | 6 | 5 |
| **B211** | 12 | 52 | 15 | 30 | M12x1 | 8 | 7 | 5.5 |
| **B211H** | 12 | 52 | 15 | 30 | M10x0.50 | 8 | 7 | 5.5 |
| **B300†** | 13 | 41 | 16 | 15 | M12.5x0.75 | 9 | 7.5 | 6 |
| **B305†** | 14 | 64 | 18 | 16 | M13x0.75 | 8 | 7 | 5.5 |
| **J6C** | 16 | 50 | 20 | 16 | M14x1 | 10.5 | 9 | 7 |
| **B203†** | 16 | 55 | 20 | 30 | M16x1 | 10 | 8.5 | 7 |
| **J6** | 16 | 58 | 20 | 16 | M14x1 | 10.5 | 9 | 7 |
| **J6R** | 16 | 59 | 22 | 16 | M14x1 | 11 | 9.5 | 7.5 |
| **J6X†** | 16 | 59 | 22 | 16 | M16x1 | 13 | 11 | 9 |
| **J6N** | 16 | 63 | 20 | 16 | M14x1 | 10.5 | 9 | 7 |
| **B212** | 18 | 60 | 22 | 30 | M18x1 | 13 | 11 | 9 |
| **B212A** | 18 | 60 | 22 | 30 | M16x1 | 13 | 11 | 9 |
| **B208†** | 20 | 55 | 25 | 30 | M20x1 | 13 | 11 | 9 |
| **B301†** | 21 | 57 | 24 | 12 | M18x1 | 16 | 14 | 10 |
| **B301T** | 21 | 66 | 24 | 12 | M18X1 | 12.7 | 10 | 8 |
| **J7A** | 22 | 68 | 29 | 16 | M19x1 | 16 | 14 | 11 |
| **J7AR** | 22 | 68 | 29 | 16 | M22x1 | 17 | 14 | 11 |
| **J7AN** | 22 | 70 | 26 | 16 | M20x1 | 16 | 14 | 11 |
| **J8** | 23 | 72 | 28 | 16 | M22x1 | 16 | 14 | 11 |
| **B238** | 24 | 61 | 30 | 30 | M24x1 | 16 | 14 | 11 |

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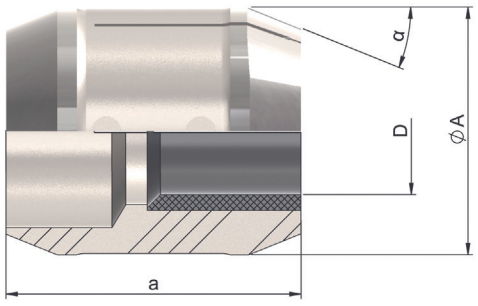
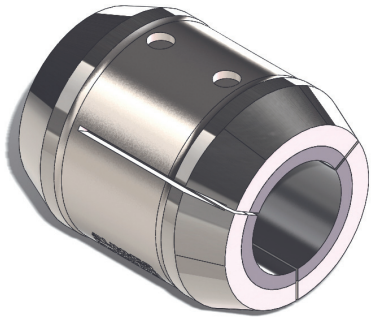
| Type code | ØA | a | ØB | α | M | D max ● | D max ⬢ | D max ■ |
|---|---|---|---|---|---|---|---|---|
| **B213**† | 25 | 71 | 30 | 30 | M25x1 | 16 | 14 | 11 |
| **B215** | 26 | 77 | 29 | 16 | M25x1 | 20 | 17.5 | 14 |
| **B302**† | 27 | 57 | 30 | 13 | M24x1 | 18 | 15 | 12 |
| **B304**† | 27 | 67 | 30 | 12 | M24x1 | 16 | 14 | 11 |
| **B304T** | 27 | 68 | 30 | 12 | M24x1 | 16 | 14 | 11 |
| **B260** | 28 | 81 | 38 | 30 | M25x1 | 20 | 17.5 | 14 |
| **B261** | 28 | 81 | 34 | 16 | M25x1 | 20 | 17.5 | 14 |
| **B261R** | 28 | 81 | 34 | 16 | M27x1 | 23 | 20 | 16 |
| **B230** | 30 | 59 | 35 | 16 | M30x1 | 22 | 19 | 15 |
| **B230N** | 30 | 68 | 35 | 16 | M30x1 | 22 | 19 | 15 |
| **B230T** | 30 | 70 | 36 | 16 | M28x1 | 22 | 19 | 15 |
| **B214**† | 32 | 71 | 40 | 30 | M32x1 | 21 | 18 | 15 |
| **B227** | 34 | 87 | 41 | 10 | M34x1 | 26 | 22 | 18 |
| **B226**† | 36 | 90 | 44 | 13 | M36x1 | 26 | 22 | 18 |
| **B209**† | 40 | 65 | 48 | 30 | M40x1 | 28 | 24 | 20 |
| **B303**† | 40 | 65 | 45 | 12 | M38x1 | 22 | 19 | 15 |
| **B207**† | 40 | 72 | 48 | 30 | M40x1 | 26 | 22 | 18 |
| **B207A**† | 40 | 72 | 48 | 30 | M36x1 | 26 | 22 | 18 |
| **B207G**† | 40 | 72 | 48 | 30 | M36x1 | 28 | 24 | 20 |
| **B232** | 41 | 54 | 46 | 10 | M38x1 | 32 | 27 | 22 |
| **J9** | 42 | 81 | 49 | 16 | M40x1 | 32 | 27 | 22 |
| **J9C** | 42 | 81 | 49 | 20 | M40x1 | 32 | 27 | 22 |
| **B306**† | 43 | 65 | 48 | 12 | M42x1 | 32 | 27 | 22 |
| **J10**† | 44 | 87 | 53 | 20 | M40x1 | 32 | 27 | 22 |
| **B250** | 45 | 82 | 52 | 16 | M42x1 | 35 | 30 | 24 |
| **B246** | 46 | 92 | 53 | 16 | M45x1 | 38 | 33 | 27 |
| **B234**† | 48 | 73 | 58 | 19 | M48x1.25 | 33 | 28 | 23 |
| **B236** | 48 | 81 | 56 | 30 | M48x1.25 | 42 | 36 | 30 |
| **B240** | 48 | 81 | 54 | 10 | M46x1 | 38 | 33 | 27 |
| **B248** | 48 | 82 | 54 | 16 | M46x1 | 40 | 34 | 28 |
| **B252**† | 52 | 99 | 60 | 10 | M48x1.5L | 42 | 36 | 30 |

**B261** - D 1270 M 00 00 D - A

# Standard guide bushes

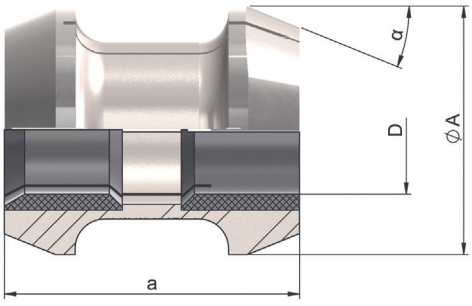
## Type

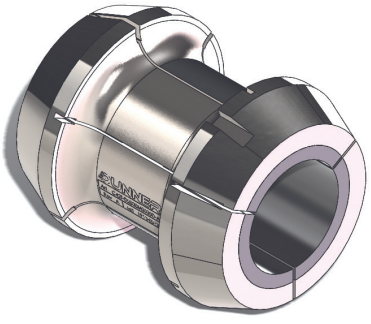


*«C» shape*

| Type code | ØA | a | α | D max | | |
|---|---|---|---|---|---|---|
| | | | | ● | ⬢ | ■ |
| **C42P**† | 42 | 50 | 22.5° | 32 | 27 | 22 |



| Type code | ØA | a | α | D max | | |
|---|---|---|---|---|---|---|
| | | | | ● | ⬢ | ■ |
| **C42T**† | 42 | 50 | 22.5° | 32 | 27 | 22 |

NOTE : Standard C type guide bush could be replaced by AirFlex guide bush.
Ask for the dedicated brochure or download it from www.dunner.ch.

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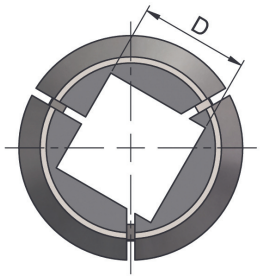
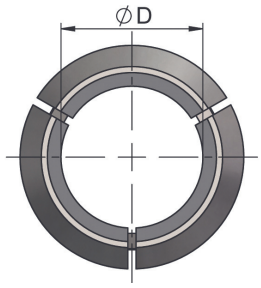
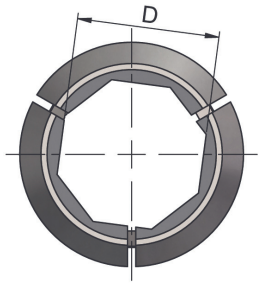
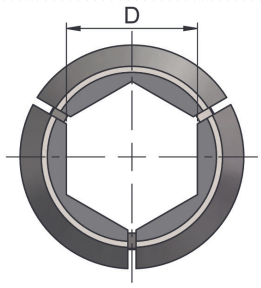
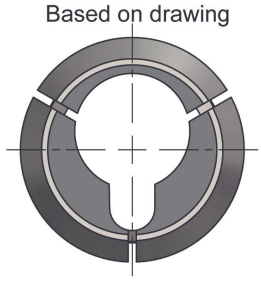
# Hole shape

| Shape code | Description | Remarks | Illustration |
|---|---|---|---|
| **C**[2] | Square | - Not available with NewSurf® material. |  |
| **D**[1] | Round | |  |
| **O**[3] | Octagon | - Not available with NewSurf® material. |  |
| **S**[2] | Hexagon | - Not available with NewSurf® material. |  |
| **Z**[3] | Special profile | - Not available with NewSurf® material.<br>- Necessary to send a drawing of the material profile and a sample of 30cm to DUNNER sales team. |  |

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|---|---|---|---|---|---|---|---|---|---|

# Standard guide bushes

## Hole size

For quotation and other commercial discussion, you can use:

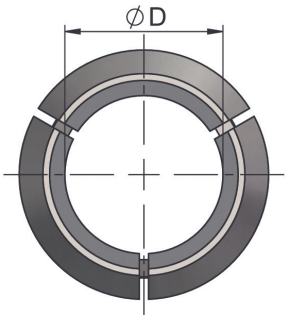
- Millimeters (for example 16.50)
- Inches (for example .357")
- Imperial (for example 1/16 ")

But if you intend to use the code, you need to convert the value in millimeter.

### *Standard size steps*

| Hole size | | Standard steps | Description | Remarks |
|---|---|---|---|---|
| From | Up to | | | |
| **0.50mm** | **5.00mm** | 0.10mm and 1/32" | From 0.50 mm up to 5.00 mm | Valid only for guide bush type B201, B211, B211H, J3, J3C, J4 |
| **0.50mm** | **D max** | 0.50mm and 1/16" | From 0.50 mm up to the maximal size | All guide bushes |

### *Size code examples*

| Size code | Description | Remarks | Illustration |
|---|---|---|---|
| **2540** | Example of a 25.40mm ØD size (1 inch) | - The hole size is given in 1/100 mm in the article code.<br>- The material size should be equal to the nominal guide bush size and with a tolerance between 0 and -20µm. In other cases, the tolerances of your material must be specified.<br>- Standard runout value is less than 15Qm (more information under chapter «options» ). |  |
| **0080** | Example of a 0.80mm ØD size | | |

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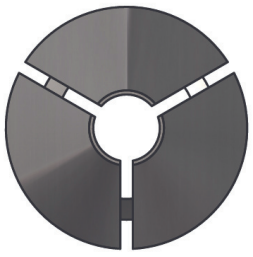
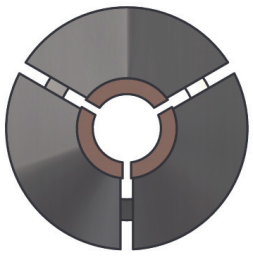
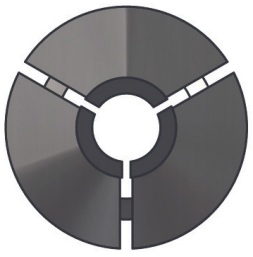
# Hole material

| Material code | Description | Guided material | | | | | Price & Medical compliance | Illustration |
|---|---|---|---|---|---|---|---|---|
| | | Steel | Brass / copper | Aluminium | Stainless steel | Titanium | | |
| **A**[3] | Steel | Wear resistance ★ | ★★ | ★★ | ★ | ★ | Price **$** |  |
| | | Gliding - | ★ | ★ | - | - | Medical part production **Yes** | |
| | | No marking - | ★ | ★ | - | - | | |
| **B**[2] | Bronze | Wear resistance ★★ | ★★ | ★★★ | ★★ | ★ | Price **$$** |  |
| | | Gliding ★★★ | ★ | ★★ | ★★★ | ★★ | Medical part production **Restricted** | |
| | | No marking ★★★ | ★★ | ★★ | ★★★ | ★★★ | | |
| **M**[1] | Carbide | Wear resistance ★★★ | ★★★ | ★★★ | ★★ | ★★ | Price **$$** |  |
| | | Gliding ★★★ | ★★★ | ★★ | ★★ | ★★ | Medical part production **Yes** | |
| | | No marking ★★ | ★★★ | ★★ | ★★ | ★★ | | |

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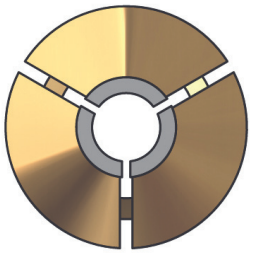
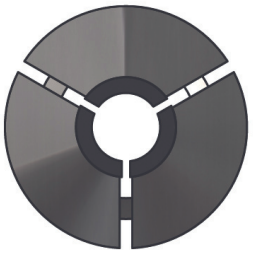
# Standard guide bushes

## Hole material

| Material code | Description | Guided material | | | | | Price & Medical compliance | Illustration |
|---|---|---|---|---|---|---|---|---|
| | | Steel | Brass / copper | Aluminium | Stainless steel | Titanium | | |
| **S**[1] | NewSurf® | Wear resistance ★★★ | ★★ | ★★ | ★★★ | ★★ | Price **$$$** |  |
| | | Gliding ★★★ | ★ | ★★ | ★★★ | ★★ | Medical part production **Yes** | |
| | | No marking ★★★ | ★★ | ★★ | ★★★ | ★★ | | |

The NewSurf® is a special ceramic developed to improve the machining of stainless steel and other difficult materials. Thanks to the low friction coefficient, this material allows to tight more and reduces at the minimum the play between the bar and the guide bush.
This material is more sensitive to vibrations and could brake if these are very strong.
The actual maximal hole diameter available is 22.00mm.

Be sure to always adjust the guide bush without oil when using fix. For safety the inserts are released at 300 °C to avoid any risk of fire.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **T**[2] | Titane | Wear resistance ★★ | ★ | ★ | ★★ | ★ | Price **$$** |  |
| | | Gliding ★★★ | ★ | ★ | ★★ | ★★★ | Medical part production **Yes** | |
| | | No marking ★ | ★ | ★ | ★★ | ★★ | | |

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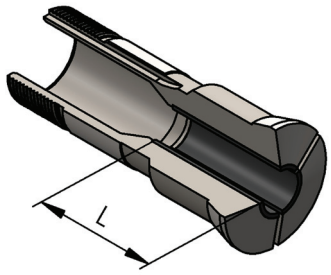
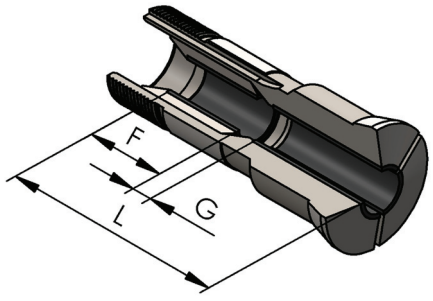
# Hole length

| Length code | Description | Illustration |
|---|---|---|
| **00**[1] | Standard length L, see next table to know the value according to hole size and material. |   |
| **25**[3] | 25 mm guiding length L guaranteed, only for the NewSurf® guide bush, as this is the maximum value with this material. | |
| **30**[2] | 30 mm guiding length L guaranteed. | |
| **50**[3] | 50 mm guiding length L guaranteed, only possible for guide bush longuer than 59mm. Length F is not adjustable and there will be a gap G between the two inserts. |   |
| **70**[3] | 70 mm guiding length L guaranteed, only possible for guide bush longuer than 79mm. Length F is not adjustable and there will be a gap G between the two inserts. | |

## *Standard hole length (00 code)*

| Hole size (mm) | | Guaranteed minimum standard guide length L (mm) | | | |
|---|---|---|---|---|---|
| From | Up to | Bronze | Carbide | NewSurf® | Titane |
| **0.20** | **1.00** | | 10 | 10 | |
| **1.00** | **1.95** | | 11 | 10 | |
| **2.00** | **2.95** | 20 | 13 | 10 | 20 |
| **3.00** | **4.95** | 20 | 14 | 13 | 20 |
| **5.00** | **6.95** | 20 | 14 | 14 | 20 |
| **7.00** | **7.95** | 20 | 14 | 15 | 20 |
| **8.00** | **11.95** | 20 | 15 | 15 | 20 |
| **12.00** | **13.45** | 20 | 17 | 15 | 20 |
| **13.50** | **16.95** | 20 | 19 | 15 | 20 |
| **17.00** | **21.95** | 20 | 19 | 17 | 20 |
| **22.00** | **32.95** | 20 | 20 | | 20 |
| **33.00** | **37.95** | 20 | 23 | | 20 |
| **38.00** | **42.00** | 20 | 25 | | 20 |

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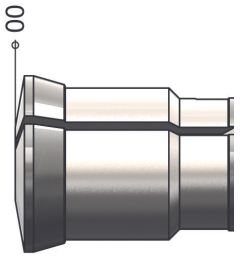
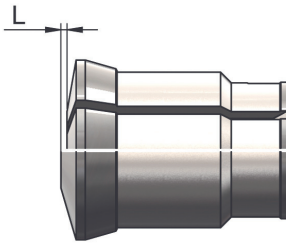
# Standard guide bushes

## Nose length

A longer nose is very unusual for guide bush. But for some special needs it helps to come nearer the tools with the material. The value is always in 1/10th of a millimeter.

| Length code | Description | Remarks | Illustration |
|---|---|---|---|
| **00**[1] | Standard | -The standard length is the reference. |   |

### *Custom length nose code example*

| Length code | Description | Remarks | Illustration |
|---|---|---|---|
| **08**[3] | Example of a 0.8mm longer nose | - The nose length is the added length from the standard nose.<br>- This always requires production from scratch. |   |
| **12**[3] | Example of a 1.2mm longer nose | | |

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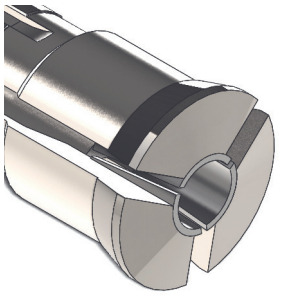
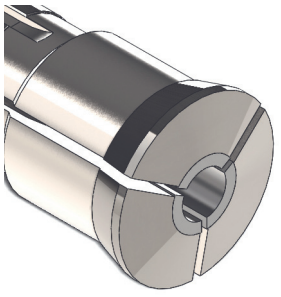
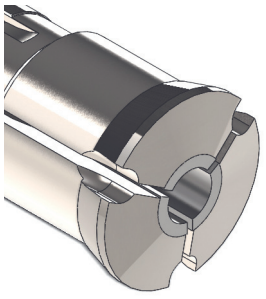
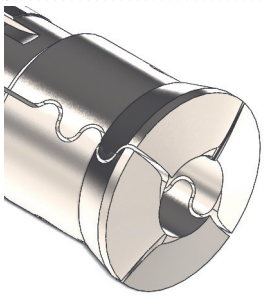
# Slots shape

| Shape code | Description | Specifications | | Price | Illustration |
|---|---|---|---|---|---|
| | | Advantage | Disadvantage | | |
| **B**[3] | Slanted | - Machining profile with round hole<br>- Compatible for fix mount<br>- Best lubrication<br>- Less sensitive to material ovality<br>- Less marking risk | - Medium chips income | Price **$$** |  |
| **D**[1] | Straight *(Standard)* | - Good lubrication<br>- Low chips income | - Not recommended for fix mount | Price **$** |  |
| **R**[2] | Rounded | - Recommended for fix mount<br>- Best lubrication | - Medium chips income | Price **$** |  |
| **S**[3] | «S» | - Lower chips income<br>- Good lubrication<br>- Less sensitive to material ovality<br>- Less marking risk | - Not recommended for fix mount | Price **$$$** |  |

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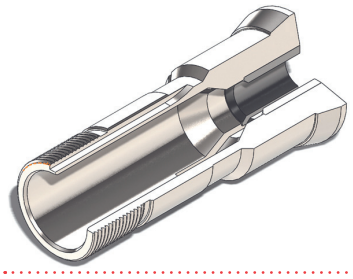
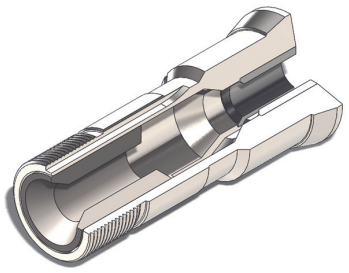
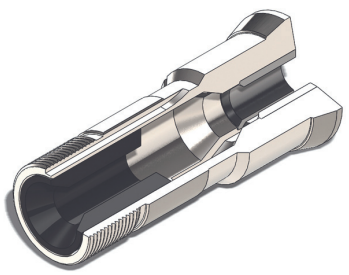
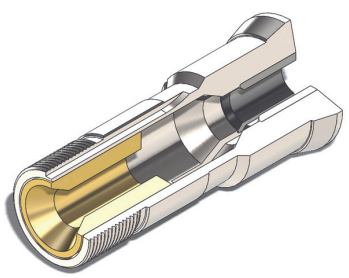
# Standard guide bushes

## Guide material

The guides are optional for guide bushes. But for NewSurf®, they are mandatory to keep the product integrity and to warranty a long-term use.

| Material code | Description | Specifications | | Price & Medical compliance | Illustration |
|---|---|---|---|---|---|
| | | Advantage | Disadvantage | | |
| -[1] | No guide | | | |  |
| A[3] | Steel guide | - Best wear resistance | - Marking risk | Price **$$**<br>Medical part production **Yes** |  |
| D[1] | Plastic guide | - No marking | - Medium wear resistance with small dimensions | Price **$**<br>Medical part production **Yes** |  |
| L[1] | Brass guide | - Low marking risk<br>- Good wear resistance | | Price **$**<br>Medical part production **Restricted** |  |

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|---|---|---|---|---|---|---|---|---|---|


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# Options

| Option code | Option combination | | | |
|---|---|---|---|---|
| | UP | UU | Silicone | Polished |
| A[1] | | | | |
| B[2] | ✓ | | | |
| C[3] | | ✓ | | |
| D[2] | | | ✓ | |
| E[2] | ✓ | | ✓ | |
| F[3] | | ✓ | ✓ | |
| G[2] | | | | ✓ |
| H[2] | ✓ | | | ✓ |
| I[3] | | ✓ | | ✓ |
| J[2] | | | ✓ | ✓ |
| K[2] | ✓ | | ✓ | ✓ |
| L[3] | | ✓ | ✓ | ✓ |

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# Standard guide bushes

# Options

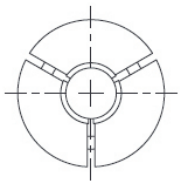
## *Accuracy option «UP» and «UU»*

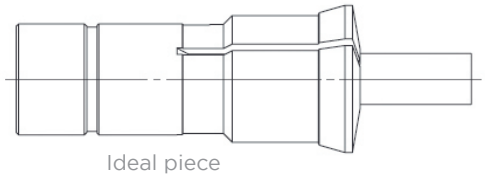
The options «UP» for ultra-precision and «UU» for ultimate ultra-precision are made to obtain a very high accuracy product.
Each piece is controlled mounted into a precision sleeve and tight to nominal diameter. Then we make the measurement of the deviation between an ideal piece and this piece.

There are two types of deviation:
- Position runout
- Angular runout

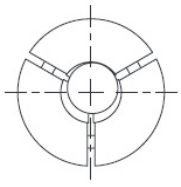
Both values of runout should be less than the values listed hereunder.

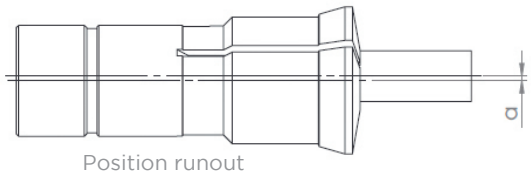
| | $X_{max}$ | $Y_{max}$ |
|---|---|---|
| **Standard** | 15µm | 15µm |
| **UP** | 5µm | 8µm |
| **UU** | 2µm | n.c. |



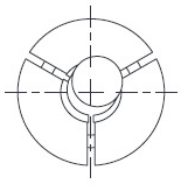


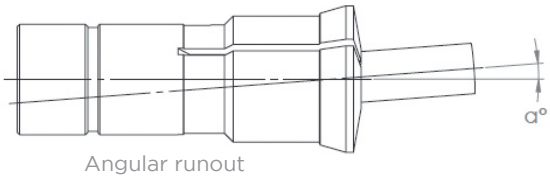
Ideal piece



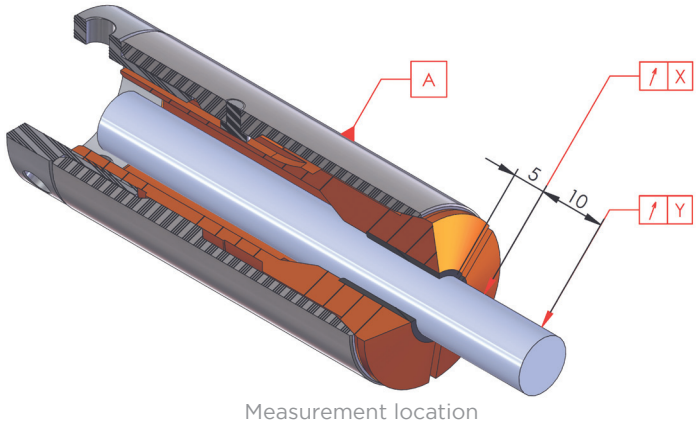



Position runout






Angular runout




Measurement location

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# Options

## *Anti-chips option «Silicone»*

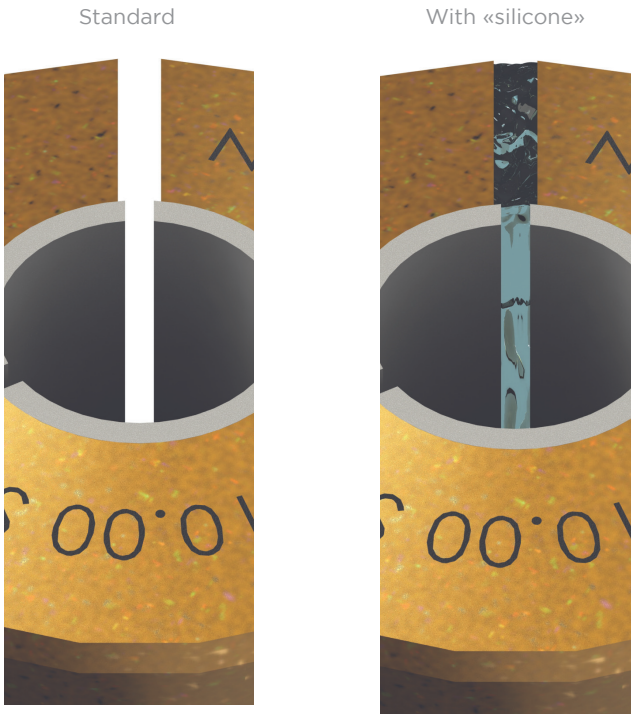
Guide bushes could be requested with the «Silicone» option.

This option is usually requested when small chips enter through the slots of the guide bush. These chips could generate marks or seizure.

The «Silicone» option can be combined with all other options available.
The coating used to make this protective layer is very resistant to oils and wear, and does not alter the adjustment properties of the guide bush.

The material bar is protected from chips until it comes out of the guide bush thanks to the coating that completely sealed the slots.

Note : Some medical pieces process prohibit the use of this option.




## *Tribological improvement and anti-scratch option «Polish»*

This option add a super-finishing operation at the end of the production operations. The machining is fully handmade with a special diamond paste to obtain the finest result.

The «polish» option is requested to upgrade the tribological properties of the material into the hole.

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|---|---|---|---|---|---|---|---|---|---|

# Personal notes


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