### CHAPTER A

Step #1: Establish bore diameter  
Step #2: Find Depth of Cut (DOC) requirements  
Step #3: Follow column and row to find correct tool type  
Step #4: Look up tool type to find available widths

#### DOC (Depth of cut) \( t_{max} \)

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**Tool Type**

| Max. width as Standard | .079    | .098    | .098    | .125    | .125    | .098    | .125    | .118    | .157    | .250    | .128    | .157    | .118    | .118    |
|                       | (2.0)   | (2.5)   | (2.5)   | (3.2)   | (3.2)   | (2.5)   | (3.2)   | (3.0)   | (4.0)   | (6.3)   | (3.25)  | (4.0)   | (3.0)   | (3.0)   |
| Max. width as Special | .128    | .157    | .126    | .173    | .165    | .165    | .165    | .165    | .165    | .165    | .165    | .165    | .165    | .165    |
|                       | (3.2)   | (4.0)   | (3.2)   | (4.4)   | (4.4)   | (4.2)   | (4.2)   | (4.0)   | (4.0)   | (4.0)   | (4.0)   | (4.0)   | (4.0)   | (4.0)   |
| Page number           | A9      | A12     | A21     | A31     | A34     | A39     | A49     | A54     | A60     | A71     | A87     | A82     | A84     |

**Tool Type (continued)**

| Max. width as Standard | .157    | .157    | .157    | .118    | .236    |
|                       | (4.0)   | (4.0)   | (4.0)   | (3.0)   | (6.0)   |
| Max. width as Special | .398    | .303    | .398    | .299    | .228    | .598    |
|                       | (10.1)  | (7.7)   | (10.1)  | (5.8)   | (5.8)   | (15.2)  |
| Page number           | A101    | A105    | A117    | A117    | A122    | A129    |

*116 - With oriented spindle stopped offset of center line (single flute effective, see page A57).  
*328 - Requires holder for increased milling depth from page A95.  
*332 / 632 / 636 - Requires holder for increased milling depth from pages A112-A113.

Dimensions in inch (mm)
GROOVE MILLING by circular interpolation

MILLING SHANK type MU / M306

from bore Ø .394" (10.0 mm)
GROOVE MILLING by circular interpolation

MILLING SHANK Type

MU306
with through coolant supply

Cutting edge Ø Ds .378 - .461"

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type: U108 108 306 606

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
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<th>$l_2$</th>
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Further sizes upon request w, Ds, $l_{max}$ see inserts

Dimensions in inch

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 108.

Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>MU306.0...</td>
<td>2.6.5T8EP</td>
<td>T8PL</td>
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In the UNITED STATES call us toll free 1-888-818 HORN
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M306
with through coolant supply

Cutting edge Ø
Ds 9.6/11.7 mm

Material of shank: Carbide - Giving a good vibration resistance

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
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Further sizes upon request
w, Ds, tₚₑₑ see inserts
Dimensions in mm

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 108.
Milling cutter shanks with damaged seating can be repaired by HORN.
For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
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<tr>
<th>Milling Shank</th>
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<th>TORX PLUS® Wrench</th>
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<tbody>
<tr>
<td>M306.0012.0...</td>
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</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type

M306
with through coolant supply

Cutting edge Ø
D = 9.6/11.7 mm

Material of shank: Carbide - Giving a good vibration resistance

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
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Further sizes upon request
For use with Insert

Type
U108
U306
108
306
606

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

All milling cutter shanks can be used for right and left hand inserts type 108.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

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<th>Milling Shank</th>
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<td>T8PL</td>
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GROOVE MILLING by circular interpolation

MILLING SHANK Type

M306.ST
no coolant supply

Cylindrical steel milling shank for collets Ds 9.6 / 11.7 mm
with cylindrical shank for CNC-lathes

Type U108
U306
108
306
606

Further sizes upon request

Picture = right hand cutting version

Part number | l₁ | l₂ | d₁ | d | Form
---|---|---|---|---|---
M306.ST10.01A | 60 | 15 | 6 | 10 | A
M306.ST12.01A | 70 | 15 | 6 | 12 | A
M306.ST10.01B | 60 | 15 | 6 | 10 | B
M306.ST12.01B | 70 | 15 | 6 | 12 | B

Further sizes upon request

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 108.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

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GROOVE MILLING by circular interpolation

SCREW-IN CUTTER Type

M306.M
no coolant supply

Screw-in Cutter for basic holder type WFB.20

for use with Insert

Type
U108
U306
108
306
606

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
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<th>l₃</th>
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Further sizes upon request

w, Dₛ, lₑₘₐₓ see inserts

Dimensions in mm

All milling cutter shanks can be used for right and left hand inserts type 108.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

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<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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<td>T8PL</td>
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GROOVE MILLING by circular interpolation

BASIC HOLDER Type  WFB

Basic holder WFB.20 for screw-in cutter

for use with Screw-in cutter

Type  M306.M081...
M308.M081...
M311.M081...
M313.M081...
M328.M081...
M332.M081...

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Further sizes upon request

Dimensions in mm

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GROOVE MILLING by circular interpolation

MILLING SHANK Type M306.ER
no coolant supply

Milling shanks for collet chucks DIN6499-A (8°) Ds 9.6 / 11.7 mm

with ER taper for CNC-lathes

for use with Insert

Type
U108
U306
108
306
606

Part number
Part number
M306.ER11.02
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Further sizes upon request w, Ds, l₁ see inserts Dimensions in mm

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 108.

For torque specifications of the screw, please see Technical Instructions.

Clamping nut is not combined with milling shank - separate order required!

Spare parts

Milling shank Screw TORX PLUS® Wrench
M306.ER11.02 2.6.5T8EP T8PL

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# GROOVE MILLING by circular interpolation

## INSERT Type

**108/U108**

- **Depth of groove up to**: .039"
- **Width of circlip Nw**: .028 - .063"
- **Cutting edge Ø Ds**: .378"

Widths for circlip grooves DIN 471/472

---

**Part number**

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<th>s</th>
<th>f</th>
<th>a</th>
<th>d</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
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- **R = right hand version shown**
- **L = left hand version**

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### Carbide grades

- **Uncoated grades**
- **Coated grades**
- **Brazed/Cermet**

**Dimensions in inch**

**State R or L version**

**Note:**

Inserts with width of groove w .029" - .039" are NOT face cutting!
GROOVE MILLING by circular interpolation

INSERT Type 108/U108

Depth of groove up to .039"
Width of groove up to .079"
Cutting edge Ø Ds .378"

for use with Milling shank

Type MU306
       M306
       M306. ST
       M306.ER
       M306.M

R = right hand version shown
L = left hand version

Part number | w  | s  | f  | a  | d  | t_{max} | Ds  |
------------|----|----|----|----|----|---------|-----|
R/L108.0150.00 | .059 | .126 | .189 | .307 | .236 | .039 | .378 |
R/L108.0200.00 | .079 | .126 | .189 | .307 | .236 | .039 | .378 |
R/LU108.0046.00 | .046 | .126 | .189 | .307 | .236 | .039 | .378 |
R/LU108.0056.00 | .056 | .126 | .189 | .307 | .236 | .039 | .378 |
R/LU108.0062.00 | .062 | .126 | .189 | .307 | .236 | .039 | .378 |
R/LU108.0078.00 | .078 | .126 | .189 | .307 | .236 | .039 | .378 |

△ on stock △ 4 weeks
* main recommendation
o alternative recommendation

uncoated grades
coated grades
brazed/Cermet

Dimensions in inch
State R or L version

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GROOVE MILLING by circular interpolation

**INSERT Type**

**108/U108**

- **Depth of groove up to**: .039"
- **Full radius**: r .015 - .039"
- **Cutting edge Ø**: Ds .378"

for use with Milling shank

<table>
<thead>
<tr>
<th>Type</th>
<th>MU306</th>
<th>M306</th>
<th>M306.ST</th>
<th>M306.ER</th>
<th>M306.M</th>
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<td>.126</td>
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</tr>
<tr>
<td>R/LU108.0031.62</td>
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<td>.039</td>
<td>.126</td>
<td>.189</td>
<td>.307</td>
</tr>
</tbody>
</table>

- ▲ on stock ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ■ uncoated grades
- ♦ coated grades
- □ brazed/Cermet

Dimensions in inch

State R or L version

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
**GROOVE MILLING by circular interpolation**

**INSERT Type**

**306**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>s₁</th>
<th>s</th>
<th>tₓₘₓ</th>
<th>Dₛ</th>
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</thead>
<tbody>
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<td>.382</td>
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<td>.126</td>
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</tbody>
</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- uncoated grades
- coated grades
- brazed/Cermet

Dimensions in inch

---

**for use with Milling shank**

- **Type**
  - MU306
  - M306
  - M306.ST
  - M306.ER
  - M306.M

---

**not face cutting, limited depth of cut**

---

**Carbide grades**
### INSERT Type

**306**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>s</th>
<th>$t_{\text{max}}$</th>
<th>Ds</th>
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<tr>
<td>306.0080.10.00</td>
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<td>.067</td>
<td></td>
<td>.126</td>
<td>.059</td>
</tr>
</tbody>
</table>

- **Depth of groove up to**: 0.059*
- **Width of circlip Nw**: 0.031 - 0.063*
- **Cutting edge Ø Ds**: 0.382*

Widths for circlip grooves DIN 471/472

**for use with Milling shank**

**Type**
- MU306
- M306
- M306.ST
- M306.ER
- M306.M

**Picture = right hand cutting version**

#### Dimensions in inch

**Carbide grades**

- ▲ on stock ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation

- uncoated grades
- coated grades
- brazed/Cermet

---

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A13
GROOVE MILLING by circular interpolation

INSERT Type 306

Depth of groove up to Width of groove up to Cutting edge Ø

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>(t_{\text{max}})</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

▲ on stock  △ 4 weeks  • main recommendation  ○ alternative recommendation

uncoated grades  coated grades  brazed/Cermet

Dimensions in inch

for use with Milling shank

Type  
MU306  M306  M306.ST  M306.ER  M306.M

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GROOVE MILLING by circular interpolation

INSERT Type 306

Depth of groove up to \(0.098"\)
Width of groove \(0.039"
Cutting edge \(\varnothing\) \(Ds\) \(0.461"

for use with Milling Shank

Type MU306
M306
M306.ST
M306.ER
M306.M

Part number | \(w\) | \(s\) | \(t_{\text{max}}\) | \(Ds\) | MG12 | TN35 | AS45
--- | --- | --- | --- | --- | --- | --- | ---
306.0100.1.00 | 0.039 | 0.126 | 0.098 | 0.461 | ▲ | ▲ | ▲
▲ on stock  ▲ 4 weeks
* main recommendation
O alternative recommendation

uncoated grades
coated grades
brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free
1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

**INSERT Type** 306

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
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<th>s</th>
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<th>Ds</th>
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<td>.067</td>
<td>.016</td>
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</table>

- ▲ on stock △ 4 weeks
- ● main recommendation ○ alternative recommendation
- ■ uncoated grades □ coated grades ▲ brazed/Cermet

Dimensions in inch

Widths for circlip grooves DIN 471/472

**Type**

- MU306
- M306
- M306.ST
- M306.ER
- M306.M

306.0110.00, 306.0130.00, 306.0160.00

For use with Milling Shank

- Carbide grades

Picture = right hand cutting version

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
**GROOVE MILLING** by circular interpolation

**INSERT Type**

**306/U306**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>$t_{\text{max}}$</th>
<th>Ds</th>
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</thead>
<tbody>
<tr>
<td>306.0150.00</td>
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<td></td>
<td></td>
<td></td>
<td>.098</td>
</tr>
<tr>
<td>306.0200.00</td>
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<td>.098</td>
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<td>U306.0046.00</td>
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<td>U306.0078.00</td>
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<td>.098</td>
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<td>U306.0094.00</td>
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<td></td>
<td></td>
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<td>U306.0046.08</td>
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<tr>
<td>U306.0094.08</td>
<td>.094</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **w**: width of groove up to
- **r**: depth of groove up to
- **s**: cutting edge Ø
- **$t_{\text{max}}$**: maximum depth
- **Ds**: diameter of shank

For use with Milling shank

**Type**

- MU306
- M306
- M306.ST
- M306.ER
- M306.M

**Dimensions in inch**

Carbide grades

**Picture** = right hand cutting version

**In the UNITED STATES** call us toll free
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GROOVE MILLING by circular interpolation

**INSERT Type**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
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<tbody>
<tr>
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<td>0.048</td>
<td>0.048</td>
<td>0.126</td>
<td>0.098</td>
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<td>0.056</td>
<td>0.056</td>
<td>0.126</td>
<td>0.098</td>
</tr>
<tr>
<td>306.0160.40</td>
<td>0.063</td>
<td>0.067</td>
<td>0.067</td>
<td>0.126</td>
<td>0.098</td>
</tr>
</tbody>
</table>

- **Depth of groove up to**
- **Width of circlip** Nw
- **Cutting edge Ø** Ds

Widths for circlip grooves DIN 471/472

For use with Milling shank Type MU306, M306, M306.ST, M306.ER, M306.M

**Dimensions in inch**

**Carbide grades**

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
### INSERT Type 306
machining of aluminium

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>( t_{\text{max}} )</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>306.0150.40</td>
<td>.059</td>
<td>-</td>
<td>.008</td>
<td>.126</td>
<td>.098</td>
</tr>
<tr>
<td>306.0200.40</td>
<td>.079</td>
<td>.008</td>
<td>.008</td>
<td>.098</td>
<td>.461</td>
</tr>
<tr>
<td>306.0250.40</td>
<td>.098</td>
<td>.008</td>
<td>.008</td>
<td>.098</td>
<td>.461</td>
</tr>
</tbody>
</table>

Diagram:

- Depth of groove up to \( .098" \)
- Width of groove up to \( .098" \)
- Cutting edge \( \varnothing \) \( Ds \: .461" \)

for use with Milling shank

Type: MU306, M306, M306.ST, M306.ER, M306.M

Picture = right hand cutting version

- **\( \Delta \)** on stock \( \Delta 4 \text{ weeks} \)
- ● main recommendation
- ○ alternative recommendation
- ▲ uncoated grades
- ▼ coated grades
- ▼ brazed/Cermet

Dimensions in inch

---

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---

A19
### INSERT Type 306/U306

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>( t_{\text{max}} )</th>
<th>Ds</th>
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</thead>
<tbody>
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<td>.461</td>
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<td>.126</td>
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<td>.461</td>
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<tr>
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<td>.094</td>
<td>.047</td>
<td>.126</td>
<td>.098</td>
<td>.461</td>
</tr>
</tbody>
</table>

- **Depth of groove up to**: \( .098" \)
- **Full radius**: \( .031 - .047" \)
- **Cutting edge Ø**: \( .461" \)

**Type**
- MU306
- M306
- M306.ST
- M306.ER
- M306.M

For use with Milling shank: Type MU306

**Dimensions in inch**

**Carbide grades**

- MG12
- TN95
- TiC5
- AS45
- TF45

- **Main recommendation**
- **Alternative recommendation**
- **Uncoated grades**
- **Coated grades**
- **Brazed/Cermet**
GROOVE MILLING by circular interpolation

**INSERT Type 606**

| Depth of groove up to | .098" |
| Width of circlip Nw  | .043 - .063" |
| Cutting edge Ø      | .461" |

Widths for circlip grooves DIN 471/472

**for use with Milling shank**

Type  MU306  
M306  
M306.ST  
M306.ER  
M306.M

**Part number**  
<table>
<thead>
<tr>
<th>Nw</th>
<th>w</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
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<td>606.0130.00</td>
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<td>1.38</td>
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</tbody>
</table>

▲ on stock  
△ 4 weeks  
● main recommendation  
○ alternative recommendation

| uncoated grades |
| coated grades |
| brazed/Cermet |

Dimensions in inch

**Picture = right hand cutting version**

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GROOVE MILLING by circular interpolation

INSERT Type 606

Depth of groove up to .098"
Width of groove up to .098"
Cutting edge Ø Ds .461"

for use with Milling shank

Type MU306
M306
M306.ST
M306.ER
M306.M

Part number w r s t_max Ds
606.0150.00 .059 - .126 .098 .461
606.0200.00 .079 .008 .138 .098 .461
606.0250.00 .098 .008 .138 .098 .461

▲ on stock ▲ 4 weeks
● main recommendation
〇 alternative recommendation
-
- uncoated grades
-
- coated grades
-
- brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

MILLING SHANK type  MU / M308
from bore Ø .539" (13.7 mm)
GROOVE MILLING by circular interpolation

MILLING SHANK Type

MU308
with through coolant supply

Cutting edge Ø

Material of shank: Carbide - Giving a good vibration resistance

Type U111
U308
111
308
608

Picture = right hand cutting version

Part number | l₁ | l₂ | d₁ | d
--- | --- | --- | --- | ---
MU308.0500.01B | 3.740 | 1.142 
MU308.0500.02B | 4.331 | 1.654 | .315 | .500 
MU308.0500.03B | 4.724 | 2.205 | .374 | .625 
MU308.0625.01B | 4.331 | 1.299 

Further sizes upon request: for use with Insert
w, Ds, tₘₐₓ see inserts

Dimensions in inch

Ordering note:

All milling cutter shanks can be used for right and left hand inserts type 111.

Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU308.0...</td>
<td>3.5.12T10EP</td>
<td>T10PL</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free
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**GROOVE MILLING by circular interpolation**

**MILLING SHANK Type**

**M308**

with through coolant supply

![Milling Shank Diagram]

Cutting edge Ø  
Ds 13.4/15.7 mm

Material of shank: Carbide - Giving a good vibration resistance

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
<th>( d )</th>
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<td>56</td>
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<td>E</td>
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</tbody>
</table>

Further sizes upon request

w, Ds, \( t_{\text{min}} \) see inserts  
Dimensions in mm

**Ordering note:**

All milling cutter shanks can be used for **right** and **left** hand inserts type 111.

Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see **Technical Instructions**.

---

**Spare parts**

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M308.0012.0...</td>
<td>3.5.12T10EP</td>
<td>T10PL</td>
</tr>
</tbody>
</table>

*In the UNITED STATES call us toll free 1 - 888 - 818 HORN*
GROOVE MILLING by circular interpolation

MILLING SHANK Type M308
with through coolant supply

Cutting edge Ø Ds 13.4/15.7 mm

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type U111 U308 111 308 608

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>I₁</th>
<th>I₂</th>
<th>d₁</th>
<th>d</th>
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<td>M308.0012.03A</td>
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<td>56</td>
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</tbody>
</table>

Further sizes upon request w, Ds, tₚₑ see inserts

Dimensions in mm

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 111.

Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>M308.0012...</td>
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<td>T10PL</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M308.ST

no coolant supply

Cylindrical steel milling shank for collets Ds 13.4 / 15.7 mm

with cylindrical shank for CNC-lathes

for use with Insert

Type  U111
        U108
        111
        308
        608

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
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<th>d₁</th>
<th>d</th>
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<td>60</td>
<td>18</td>
<td></td>
<td>10</td>
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</tr>
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<td>10</td>
<td>13</td>
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<td>M308.ST10.01B</td>
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<td>10</td>
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<td>18</td>
<td></td>
<td>12</td>
<td>B</td>
</tr>
</tbody>
</table>

Further sizes upon request w, Ds, lₘₚ see inserts Dimensions in mm

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 111.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M308.ST1...</td>
<td>3.5.12T10EP</td>
<td>T10PL</td>
</tr>
</tbody>
</table>
GROOVE MILLING by circular interpolation

SCREW-IN CUTTER Type M308.M
no coolant supply

Screw-in Cutter for basic holder type WFB.20

for use with Insert

Type
U111
U308
111
308
608

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
<th>l₂</th>
<th>l₃</th>
<th>d₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>M308.M081.01</td>
<td>37</td>
<td>14</td>
<td>25</td>
<td>8</td>
</tr>
</tbody>
</table>

Further sizes upon request w, Dₛ, tₘₐₓ see inserts

Dimensions in mm

All milling cutter shanks can be used for right and left hand inserts type 111.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Screw-in cutter</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M308.M081.01</td>
<td>3.5.12T10EP</td>
<td>T10PL</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

BASIC HOLDER Type

WFB

Basic shank WFB.20 for screw-in cutter

for use with Screw-in cutter

Type
M306.M081...
M308.M081...
M311.M081...
M313.M081...
M328.M081...
M332.M081...

Part number | \(l_1\) | \(l_2\) | \(d_1\) | \(d\)
---|---|---|---|---
WFB.2012.M081.01 | 35 | 7 | 16 | 30

Further sizes upon request

Dimensions in mm

In the UNITED STATES call us toll free 1-888-818 HORN
GROOVE MILLING by circular interpolation

MILLING SHANK Type **M308.ER**
no coolant supply

Milling shanks for collet chucks DIN6499-A (8°) Ds 13.4 / 15.7 mm
with ER taper for CNC-lathes

![Diagram of milling shank](image)

**Picture = right hand cutting version**

<table>
<thead>
<tr>
<th>Part number</th>
<th>(l_1)</th>
<th>(d_1)</th>
<th>(D)</th>
<th>Clamping nut</th>
</tr>
</thead>
<tbody>
<tr>
<td>M308.ER11.02</td>
<td>16</td>
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<td>11</td>
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<td>M308.ER16.02</td>
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<td>8</td>
<td>16</td>
<td>ER16.6499/ERM...</td>
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<tr>
<td>M308.ER20.02</td>
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<td>20</td>
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</tr>
</tbody>
</table>

Further sizes upon request
w, Ds, \(l_{\text{rev}}\) see inserts
Dimensions in mm

**Ordering note:**
All milling cutter shanks can be used for **right** and **left** hand inserts type 111.

For torque specifications of the screw, please see Technical Instructions.

Clamping nut is not combined with milling shank - separate order required!

**Spare parts**

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M308.ER...</td>
<td>3.5.12T10EP</td>
<td>T10PL</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

INSERT Type

111

Depth of groove up to .091"
Width of circlip Nw .028 -.063"
Cutting edge Ø Ds .528"

Widths for circlip grooves DIN 471/472

for use with Milling shank

Type: MU308
M308
M308.ST
M308.ER
M308.M

Part number Nw w s f a d t max Ds
R/L111.0070.00 .028 .029 .163 .264 .421 .315 .047 .528
R/L111.0080.00 .031 .033 .163 .051
R/L111.0090.00 .035 .037 .163 .059
R/L111.0110.00 .043 .047 .156 .091
R/L111.0130.00 .051 .055 .156 .091
R/L111.0160.00 .063 .067 .156 .091

▲ on stock △ 4 weeks
● main recommendation ◊ alternative recommendation
□ uncoated grades □ coated grades □ brazed/Cermet

Dimensions in inch

State R or L version

Note:
Inserts with width of groove w .029" -.039" are NOT face cutting!

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

**INSERT Type**

**111/U111**

- Depth of groove up to: .091"
- Width of groove up to: .125"
- Cutting edge Ø: Ds .528"

**for use with Milling shank**

- **Type**: MU308
  - M308
  - M308.ST
  - M308.ER
  - M308.M

**Part Number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>s</th>
<th>f</th>
<th>a</th>
<th>d</th>
<th>t_max</th>
<th>Ds</th>
<th>MG12</th>
<th>TN35</th>
<th>Ti25</th>
<th>TF45</th>
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<tr>
<td>R/L111.0150.00</td>
<td>.059</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>.079</td>
<td>.156</td>
<td>.264</td>
<td>.421</td>
<td>.315</td>
<td>.091</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>R/L111.0250.00</td>
<td>.098</td>
<td>.156</td>
<td>.264</td>
<td>.421</td>
<td>.315</td>
<td>.091</td>
<td>.528</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R/L111.0300.00</td>
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<td>.156</td>
<td>.264</td>
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<td>.315</td>
<td>.091</td>
<td>.528</td>
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<tr>
<td>R/LU111.0046.00</td>
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<td>.528</td>
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<tr>
<td>R/LU111.0062.00</td>
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<tr>
<td>R/LU111.0094.00</td>
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<td>.264</td>
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<td>.091</td>
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<tr>
<td>R/LU111.0125.00</td>
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<td>.264</td>
<td>.421</td>
<td>.315</td>
<td>.091</td>
<td>.528</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

- ▲ on stock ▲ ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ◼ uncoated grades
- ◼ coated grades
- ◼ brazed/Cermet

Dimensions in inch

State R or L version

---

**Carbide grades**

- P
- M
- K
- N
- S
- H

---

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

**INSERT Type**

**111/U111**

- Depth of groove up to 0.091”
- Full radius 0.015 - 0.059”
- Cutting edge Ø Ds 0.528”

**for use with Milling shank**

- Type MU308
- M308
- M308.ST
- M308.ER
- M308.M

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>f</th>
<th>a</th>
<th>d</th>
<th>t_{max}</th>
<th>Ds</th>
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</thead>
<tbody>
<tr>
<td>R/L111.0004.08</td>
<td>0.031</td>
<td>0.016</td>
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<tr>
<td>R/L111.0006.12</td>
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<td>0.264</td>
<td>0.421</td>
<td>0.315</td>
<td>0.091</td>
<td>0.528</td>
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<tr>
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<tr>
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<tr>
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<td>0.031</td>
<td>0.156</td>
<td>0.264</td>
<td>0.421</td>
<td>0.315</td>
<td>0.091</td>
<td>0.528</td>
</tr>
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<td>0.047</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ▢ uncoated grades
- ▢ coated grades
- ▢ brazed/Cermet

Dimensions in inch

State R or L version

In the UNITED STATES call us toll free 1 - 888 - 818 HORN

A33
### GROOVE MILLING by circular interpolation

**INSERT Type 308**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>s</th>
<th>$t_{\text{max}}$</th>
<th>Ds</th>
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</thead>
<tbody>
<tr>
<td>308.0110.00</td>
<td>.043</td>
<td>.048</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
<tr>
<td>308.0130.00</td>
<td>.051</td>
<td>.056</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>308.0160.00</td>
<td>.063</td>
<td>.067</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ▲ on stock
- ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation

- □ uncoated grades
- ■ coated grades
- □ brazed/Cermet

**Carbide grades**

- MG12
- TN15
- Ti25
- AS45
- TF45

- P
- M
- K
- N
- S
- H

**Widths for circlip grooves DIN 471/472**

- Depth of groove up to .138"
- Width of circlip Nw .043 - .063"
- Cutting edge Ø .618"

Picture = right hand cutting version

**Type**
- MU308
- M308
- M308.ST
- M308.ER
- M308.M

**Dimensions in inch**

**For use with Milling shank**

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

INSERT Type 308/U308

Depth of groove up to .138”
Width of groove up to .125”
Cutting edge Ø Ds .618”

for use with Milling shank

Type MU308
M308
M308.ST
M308.ER
M308.M

Part number  w  r  s  tmax  Ds
308.0150.00  .059  -  .177  .138  .618
308.0200.00  .079  .008  .177  .138  .618
308.0250.00  .098  .008  .177  .138  .618
U308.0046.00  .046  .008  .177  .138  .618
U308.0062.00  .062  .008  .177  .138  .618
U308.0046.08  .046  -  .177  .138  .618
U308.0062.08  .062  -  .177  .138  .618
U308.0094.08  .094  .008  .177  .138  .618
U308.0125.08  .125  -  .177  .138  .618

▲ on stock ▲ 4 weeks
● main recommendation
○ alternative recommendation
□ uncoated grades
■ coated grades
△ brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

**INSERT Type**

**308**

machining of aluminium

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>308.0110.40</td>
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<td>.048</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
<tr>
<td>308.0130.40</td>
<td>.051</td>
<td>.056</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
<tr>
<td>308.0160.40</td>
<td>.063</td>
<td>.067</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
</tbody>
</table>

- Depth of groove up to .138"
- Width of circlip NW .043 - .063"
- Cutting edge Ø .618"

Widths for circlip grooves DIN 471/472

- Picture = right hand cutting version
- for use with Milling shank

<table>
<thead>
<tr>
<th>Type</th>
<th>MU308</th>
<th>M308</th>
<th>M308.ST</th>
<th>M308.ER</th>
<th>M308.M</th>
</tr>
</thead>
</table>

Dimensions in inch

Carbide grades

- P (on stock)
- M
- K
- N
- S
- H

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

**INSERT Type**

**308**

Machining of aluminium

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>( t_{\text{max}} )</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>308.0150.40</td>
<td>.059</td>
<td>-</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
<tr>
<td>308.0200.40</td>
<td>.079</td>
<td>.008</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
<tr>
<td>308.0250.40</td>
<td>.098</td>
<td>.008</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
</tbody>
</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- o alternative recommendation
- ▲ uncoated grades
- ▲ coated grades
- ▲ brazed/Cermet

Dimensions in inch

For use with Milling shank

Type: MU308, M308, M308.ST, M308.ER, M308.M

**Picture = right hand cutting version**

**Part number**

For use with Milling shank

**Type**

- MU308
- M308
- M308.ST
- M308.ER
- M308.M
## GROOVE MILLING by circular interpolation

### INSERT Type 308/U308

<table>
<thead>
<tr>
<th>Depth of groove up to</th>
<th>.138”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full radius</td>
<td>.031 - .047”</td>
</tr>
<tr>
<td>Cutting edge Ø</td>
<td>.618”</td>
</tr>
</tbody>
</table>

Milling shank

**Type**: MU308
M308
M308.ST
M308.ER
M308.M

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_max</th>
<th>Ds</th>
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</thead>
<tbody>
<tr>
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<td>.138</td>
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<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
<tr>
<td>U308.0047.94</td>
<td>.094</td>
<td>.047</td>
<td>.177</td>
<td>.138</td>
<td>.618</td>
</tr>
</tbody>
</table>

**Dimensions in inch**

- ▲ on stock ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- △ coated grades
- ▼ brazed/Cermet

**Carbide grades**

- MG12
- TN15
- Ti25
- AS45
- Ti45

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GROOVE MILLING by circular interpolation

INSERT Type 608

Depth of groove up to .138"
Width of groove up to .098"
Cutting edge Ø Ds .618"

for use with Milling shank

Type
- MU308
- M308
- M308.ST
- M308.ER
- M308.M

Part number  w  r  s  t_max  Ds
608.0150.00  .059  -  .008  .193  .138  .618
608.0200.00  .079  .008  .193  .138  .618
608.0250.00  .098  .008  .193  .138  .618

▲ on stock  ▲ 4 weeks
● main recommendation
○ alternative recommendation
■ uncoated grades
■ coated grades
■ brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free 1-888-818 HORN
Spline Milling

Example:
- Single tooth spline profile
- Carbide shank type M335

For further information, please contact HORN USA.
GROOVE MILLING by circular interpolation

MILLING SHANK type MU / M311
from bore Ø .709" (18.0 mm)
GROOVE MILLING by circular interpolation

MILLING SHANK Type

MU311
with through coolant supply

Cutting edge Ø

Ds .697"

Material of shank: Carbide - Giving a good vibration resistance

Type U311
311 611

Further sizes upon request

Dimensions in inch

Part number | \( l_1 \) | \( l_2 \) | \( d_1 \) | \( d \)
--- | --- | --- | --- | ---
MU311.0500.01B | 3.937 | 1.260 | .354 | .500
MU311.0500.02B | 3.937 | 1.772 | .354 | .625
MU311.0500.03B | 4.724 | 2.520 |
MU311.0625.01B | 3.937 | 1.260 |
MU311.0625.02B | 4.331 | 1.772 |
MU311.0625.03B | 5.118 | 2.520 |

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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<tr>
<td>MU311.0...</td>
<td>4.14T15P</td>
<td>T15PQ</td>
</tr>
</tbody>
</table>

Picture = right hand cutting version

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.
**GROOVE MILLING by circular interpolation**

**MILLING SHANK Type M311**

with through coolant supply

**Cutting edge Ø**

Ds 17.7 mm

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type U311

311

611

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>I₁</th>
<th>I₂</th>
<th>d₁</th>
<th>d</th>
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</tr>
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<td>16</td>
<td>E</td>
</tr>
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</table>

Further sizes upon request

w, Ds, l₂ see inserts

Dimensions in mm

**Ordering note:**

Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

**Spare parts**

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M311.001...</td>
<td>4.14T15P</td>
<td>T15PQ</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free

1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M311
with through coolant supply

Cutting edge Ø
Ds 17.7 mm

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type U311
311
611

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
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</tr>
</tbody>
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Further sizes upon request
w, Ds, \( t_{\text{max}} \) see inserts

Dimensions in mm

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
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<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
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<td>T15PQ</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free 1-888-818-HORN
**GROOVE MILLING by circular interpolation**

**MILLING SHANK Type**

**M311.ST**

no coolant supply

Cylindrical steel milling shank for collets Ds 17.7 mm

with cylindrical shank for CNC-lathes

for use with Insert

Type U311

311

611

---

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
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<th>( d_1 )</th>
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</table>

Further sizes upon request

\( w, Ds, t_{ram} \) see inserts

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

---

**Spare parts**

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
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<tr>
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<td>T15PQ</td>
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</tbody>
</table>

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A45
GROOVE MILLING by circular interpolation

SCREW-IN CUTTER Type M311.M
no coolant supply

Screw-in Cutter for basic holder type WFB.20

for use with Insert

Type U311
311
611

Picture = right hand cutting version

<table>
<thead>
<tr>
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Further sizes upon request
w, Ds, $l_{\text{max}}$ see inserts

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Spare part</th>
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</thead>
<tbody>
<tr>
<td>Screw-in cutter</td>
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<td>T15PQ</td>
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</tbody>
</table>

In the UNITED STATES call us toll free
1-888-818-HORN

A46
GROOVE MILLING by circular interpolation

BASIC HOLDER Type

WFB

Basic shank WFB.20 for screw-in cutter

for use with Screw-in cutter

Type

M306.M081...
M308.M081...
M311.M081...
M313.M081...
M328.M081...
M332.M081...

Part number | \(l_1\) | \(l_2\) | \(d_1\) | \(d\)
---|---|---|---|---
WFB.2012.M081.01 | 35 | 7 | 16 | 30

Further sizes upon request

Dimensions in mm

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A47
GROOVE MILLING by circular interpolation

MILLING SHANK Type **M311.ER**

Milling shanks for collet chucks DIN6499-A (8°) Ds 17.7 mm

with ER taper for CNC-lathes

for use with Insert

Type U311
311
611

**Part number** | **I₁** | **d₁** | **d** | **Clamping nut**
---|---|---|---|---
M311.ER11.02 | 22 | 9 | 11 | ER11.6499
M311.ER16.02 | | | 16 | ER16.6499/ERM...
M311.ER20.02 | | | 20 | ER20.6499/ERM...
M311.ER25.02 | | | 25 | ER25.6499

Further sizes upon request

w, Ds, tₜₚₑₛ see inserts

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

**Ordering note:**
Clamping nut is not combined with milling shank - separate order required!

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M311.ER...</td>
<td>4.14T15P</td>
<td>T15PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

INSERT Type 311

Depth of groove up to .138"
Width of circlip Nw .043 -.063"
Cutting edge Ø Ds .697"

Widths for circlip grooves DIN 471/472

for use with Milling shank

Type  MU311
        M311
        M311.ST
        M311.ER
        M311.M

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
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</tr>
</tbody>
</table>

▲ on stock  ▲ 4 weeks
* main recommendation
o alternative recommendation
■ uncoated grades
■ coated grades
■ brazed/Cermet

Dimensions in inch

Carbide grades

P  ●  ●
R  ●  ●
N  ●  ●
S  ●  ●
H  ●  ●

In the UNITED STATES call us toll free
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A49
GROOVE MILLING by circular interpolation

INSERT Type 311/U311

Depth of groove up to .138"
Width of groove up to .125"
Cutting edge Ø Ds .697"

for use with Milling shank

Type MU311
M311
M311.ST
M311.ER
M311.M

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_{max}</th>
<th>Ds</th>
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▲ on stock ▲ 4 weeks
● main recommendation
○ alternative recommendation
|
uncoated grades
coated grades
brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

INSERT Type 311
machining of aluminium

Depth of groove up to .138”
Width of circlip Nw .043 - .063”
Cutting edge Ø Ds .697”

Widths for circlip grooves DIN 471/472

for use with Milling shank

Type MU311 M311 M311.ST M311.ER M311.M

Part number Nw w s tmax Ds
311.0110.40 .043 .048 .226 .138 .697
311.0130.40 .051 .056 .226 .138 .697
311.0160.40 .063 .067 .226 .138 .697

▲ on stock △ 4 weeks
* main recommendation
o alternative recommendation
uncoated grades coated grades brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free 1-888-818 HORN

A51
**GROOVE MILLING by circular interpolation**

**INSERT Type**

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</tbody>
</table>

- ▲ on stock △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ▼ uncoated grades
- ▲ coated grades
- ▼ brazed/Cermet

Dimensions in inch

**for use with Milling shank**

Type:
- MU311
- M311
- M311.ST
- M311.ER
- M311.M

**Dimensions in inch**

- Carbide grades

**In the UNITED STATES call us toll free**

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GROOVE MILLING by circular interpolation

**INSERT Type** 311/U311

Depth of groove up to .138”
Full radius .031 - .062”, Ds .697”

![Diagram of insert type 311/U311](image)

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
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**Type**

- MU311
- M311
- M311.ST
- M311.ER
- M311.M

**Dimensions in inch**

- Carbide grades
- For use with Milling Shank

---

**Contact Information**

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A53
GROOVE MILLING by circular interpolation

**INSERT Type**

**611**

- Depth of groove up to 0.138"
- Width of circlip Nw 0.043 - 0.063"
- Cutting edge Ø Ds 0.697"

Widths for circlip grooves DIN 471/472

![Diagram of insert type 611](image)

Milling shank

- Picture = right hand cutting version

### Table:

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
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<td>.240</td>
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<td>.697</td>
</tr>
</tbody>
</table>

- ▲ on stock ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- △ coated grades
- ◆ brazed/Cermet

Dimensions in inch

Carbide grades
GROOVE MILLING by circular interpolation

INSERT Type 611

Depth of groove up to .138”
Width of groove up to .118”
Cutting edge Ø Ds .697”

for use with Milling shank

Type MU311
M311
M311.ST
M311.ER
M311.M

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
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<td></td>
</tr>
</tbody>
</table>

▲ on stock △ 4 weeks
● main recommendation
○ alternative recommendation
■ uncoated grades
□ coated grades
□ brazed/Cermet

Dimensions in inch

Carbide grades

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VDI Tool Adaptor and Square shank holder with through coolant

Direct cutting edge coolant

For further information, please contact HORN USA.
GROOVE MILLING by circular interpolation

MILLING SHANK type MU / M116
from bore
non rotating Ø .630" (16.0 mm)
rotating Ø .803" (20.4 mm)

Feed the tool through the bore with oriented spindle stop offset centreline
Back face milling
GROOVE MILLING by circular interpolation

MILLING SHANK Type  
MU116  
with through coolant supply

Cutting edge Ø  
Ds .803"  
Material of shank: Carbide - Giving a good vibration resistance

for use with Insert  
Type U116  
116

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
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<th>d₁</th>
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</table>

Further sizes upon request  
w, Ds, t_w see inserts  
Dimensions in inch

Note from Ø 16 mm:  
Only back face milling with oriented spindlestop offset of centerline.

Ordering note:  
All milling cutter shanks can be used for right and left hand inserts type 116.

Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU116.0625.02B</td>
<td>5.13T20EP</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M116
with through coolant supply

Cutting edge Ø
Ds 20.4 mm

Material of shank: Carbide - Giving a good vibration resistance

Note from Ø 16 mm:
Only back face milling with oriented spindletop offset of centerline.

Ordering note:
All milling cutter shanks can be used for right and left hand inserts type 116.
Milling cutter shanks with damaged seating can be repaired by HORN.
For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
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Part number

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<td>16</td>
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Further sizes upon request
w, Ds, t_ref see inserts

Dimensions in mm

In the UNITED STATES call us toll free
1-888-818 HORN
**GROOVE MILLING** by circular interpolation

**INSERT Type**

**116/U116**

<table>
<thead>
<tr>
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<th>d</th>
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</table>

- ▲ on stock △ 4 weeks
- ● main recommendation
- ○ alternative recommendation

- □ uncoated grades
- ■ coated grades
- □ brazed/Cermet

Dimensions in inch

State R or L version

**for use with Milling shank**

Type MU116

M116
GROOVE MILLING by circular interpolation

### INSERT Type 116

- **Depth of groove up to** 0.169"
- **Width of circlip Nw** 0.043 - 0.063"
- **Cutting edge Ø** 0.803"

Widths for circlip grooves DIN 471/472

![Diagram of insert type 116](image)

R = right hand version shown
L = left hand version

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
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<th>d</th>
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</table>

- ▲ on stock ▲ 4 weeks
- ● main recommendation
- ▲ alternative recommendation
- ▲ uncoated grades
- ▲ coated grades
- ▲ brazed/Cermet

Dimensions in inch

State R or L version

---

For use with Milling shank

**Type** MU116 M116

---

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GROOVE MILLING by circular interpolation

**INSERT Type**

**116/U116**

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<td>.169</td>
</tr>
</tbody>
</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- △ coated grades
- ● brazed/Cermet

Dimensions in inch

State R or L version

R = right hand version shown  L = left hand version

**for use with Milling shank**

Type MU116
M116
GROOVE MILLING by circular interpolation

MILLING SHANK type MU / M313
from bore Ø .866" (22.0 mm)
Spare parts

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU313.0...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

Further sizes upon request see inserts

Dimensions in inch

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M313
with through coolant supply

Cutting edge Ø
Ds 21.7 mm

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type U313
313
313.D
613
713

Picture = right hand cutting version

Part number | l₁ | l₂ | d₁ | d | Form
--- | --- | --- | --- | --- | ---
M313.0012.01B | 100 | - | - | 12 | B
M313.0012.02B | 130 | - | - | 12 | B
M313.0016.01B | 100 | 42 | 12 | 16 | B
M313.0016.02B | 130 | 60 | 12 | 16 | B
M313.0016.03B | 160 | 85 | 12 | 16 | B
M313.0012.01E | 100 | - | - | 12 | E
M313.0012.02E | 130 | - | - | 12 | E
M313.0016.01E | 100 | 42 | 12 | 16 | E
M313.0016.02E | 130 | 60 | 12 | 16 | E
M313.0016.03E | 160 | 85 | 12 | 16 | E

Further sizes upon request
w, Ds, l₁ see inserts

Dimensions in mm

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M313.001...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type  

**M313**  
with through coolant supply

Cutting edge Ø  
Ds 21.7 mm

Material of shank: Carbide - Giving a good vibration resistance

Type U313  
313  
313.D  
613  
713

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
<th>( d )</th>
</tr>
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<tbody>
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<td>M313.0012.02A</td>
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<td>M313.0016.03A</td>
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<td>85</td>
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<td>16</td>
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</tbody>
</table>

Further sizes upon request  
w, Ds, \( t_{\text{max}} \) see inserts  
Dimensions in mm

**Ordering note:**  
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M313.001...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type

M313.ST
no coolant supply

Cylindrical steel milling shank for collets Ds 21.7 mm
with cylindrical shank for CNC-lathes

for use with Insert

Type U313
313
313.D
613
713

Part number | I₁ | I₂ | d₁ | d | Form
---|---|---|---|---|---
M313.ST10.01A | 60 | - | 11.3 | 10 | A1
M313.ST12.01A | 70 | 18 | 11.3 | 12 | A1
M313.ST13.01A | 70 | 26 | 11.3 | 13 | A1
M313.ST16.01A | 80 | 26 | 11.3 | 16 | A2
M313.ST12.01B | 70 | 18 | 11.3 | 12 | B

Further sizes upon request w, Ds, t₁, see inserts

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>M313.ST1...</td>
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<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

SCREW-IN CUTTER Type M313.M

no coolant supply

Screw-in Cutter for basic holder type WFB.20

for use with Insert

Type

U313 313 313.D 613 713

Spare parts

<table>
<thead>
<tr>
<th>Screw-in cutter</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>M313.M081.01</td>
<td>5.14T20P</td>
<td>T20PQ</td>
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</tbody>
</table>

Further sizes upon request
w, Ds, l₃ see inserts
Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

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GROOVE MILLING by circular interpolation

BASIC HOLDER Type

WFB

Basic holder WFB.20 for screw-in cutter

for use with Screw-in cutter

Type

- M306.M081...
- M308.M081...
- M311.M081...
- M313.M081...
- M328.M081...
- M332.M081...

Part number | l₁ | l₂ | d₁ | d
--- | --- | --- | --- | ---
WFB.2012.M081.01 | 35 | 7 | 16 | 30

Further sizes upon request

Dimensions in mm

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GROOVE MILLING by circular interpolation

MILLING SHANK Type M313.ER
no coolant supply

Milling shanks for collet chucks DIN6499-A (8°) Ds 21.7 mm
with ER taper for CNC-lathes

for use with Insert

Type U313
313
313.D
613
713

Part number | \( l_1 \) | \( d_1 \) | \( d \) | Clamping nut
---|---|---|---|---
M313.ER16.01 | 20 | 11.3 | 16 | ER16.6499/ERM...
M313.ER20.01 | 20 | | 20 | ER20.6499/ERM...
M313.ER16.02 | 30 | 11.3 | 16 | ER16.6499/ERM...
M313.ER20.02 | 30 | | 20 | ER20.6499/ERM...
M313.ER25.02 | 30 | | 25 | ER25.6499
M313.ER32.02 | 30 | | 32 | ER32.6499

Further sizes upon request

For torque specifications of the screw, please see Technical Instructions.

Ordering note:
Clamping nut is not combined with milling shank - separate order required!

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M313.ER...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

**INSERT Type 313/U313**

Depth of groove up to .098"
Width of circlip Nw .028 -.043"
Cutting edge Ø Ds .854"

Widths for circlip grooves DIN 471/472

![INSERT Diagram](image)

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>s₁</th>
<th>s</th>
<th>t_max</th>
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- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ▲ uncoated grades
- ▲ coated grades
- ▲ brazed/Cermet

Dimensions in inch

* For inserts U313... the tolerance w = +.0012

Carbide grades

Type MU313
M313
M313.ER
M313.M
Z313

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**GROOVE MILLING by circular interpolation**

**INSERT Type**

**313**

<table>
<thead>
<tr>
<th>Dimensions in inch</th>
<th>Carbide grades</th>
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</thead>
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</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation

- ▲ uncoated grades
- ▲ coated grades
- ▲ brazed/Cermet

For use with Milling shank:
- Type MU313
- M313
- M313.ER
- M313.M
- Z313

**Picture = right hand cutting version**

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GROOVE MILLING by circular interpolation

INSERT Type 313

Depth of groove up to .177”
Width of circlip Nw .051 - .203”
Cutting edge Ø Ds .854”

Widths for circlip grooves DIN 471/472

Type MU313
M313
M313.ER
M313.M
Z313

Picture = right hand cutting version

Part number Nw w r s t_max Ds MG12 TN35 AS45
313.0130.00 .051 .056 - .224 .177 .854
313.0160.00 .063 .067 - .224 .177 .854
313.0185.00 .073 .077 .008 .224 .177 .854
313.0215.00 .085 .089 .008 .224 .177 .854
313.0265.00 .104 .109 .008 .224 .177 .854
313.0315.00 .124 .128 .008 .224 .177 .854
313.0415.00 .163 .168 .008 .224 .177 .854
313.0515.00 .203 .207 .008 .224 .177 .854

▲ on stock ▲ 4 weeks
● main recommendation
○ alternative recommendation
■ uncoated grades
■ coated grades
■ brazed/Cermet

Dimensions in inch

Inserts 313.0415.00 and 313.0515.00 only with toolholder dimension l2 = max. 1.654”
## GROOVE MILLING by circular interpolation

### INSERT Type 313

**Depth of groove up to** 
.177" 

**Width of groove up to** 
.236" 

**Cutting edge Ø** 
.Ds .854"

---

**Picture = right hand cutting version**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_max</th>
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- **▲ on stock ** Δ 4 weeks
- **● main recommendation**
- **○ alternative recommendation**
- **□ uncoated grades**
- **□ coated grades**
- **□ brazed/Cermet**

**Dimensions in inch**

Inserts 313.0500.00 and 313.0600.00 only with toolholder dimension \( l_2 = \text{max} \, 1.654" \)

---

**for use with Milling shank**

**Type**
- MU313
- M313
- M313.E5
- M313.M
- Z313

---

In the UNITED STATES call us toll free
1 - 888 - 818 HORN
**GROOVE MILLING by circular interpolation**

**INSERT Type**

**U313**

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<th>Part number</th>
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- ▲ on stock △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

**Dimensions in inch**

Inserts **U313.0187.08 and U313.0250.08** only with toolholder dimension $l_j = \text{max. 1.654”}$

**for use with Milling Shank**

- **Type:** MU313, M313, M313.ER, M313.M, Z313

**Picture = right hand cutting version**
GROOVE MILLING by circular interpolation

**INSERT Type**

**313**

machining of aluminium

<table>
<thead>
<tr>
<th>Depth of groove up to</th>
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</thead>
<tbody>
<tr>
<td>Width of groove up to</td>
<td>.157&quot;</td>
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<tr>
<td>Cutting edge Ø</td>
<td>Ds  .854&quot;</td>
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![Image of insert type 313](image.png)

for use with Milling shank

<table>
<thead>
<tr>
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</table>

- ▲ on stock ▼ 4 weeks
- • main recommendation
- ○ alternative recommendation
- ▲ uncoated grades
- ▲ coated grades
- ▲ brazed/Cermet

Dimensions in inch

**Carbide grades**

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<td>MG12 T125</td>
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<td>313.0400.40</td>
<td>MG12 T125</td>
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</table>

**Picture = right hand cutting version**

Insert Type 313 is designed for the machining of aluminium and has been optimized for use with Milling shank Types: MU313, M313, M313.ER, M313.M, and Z313.

Insert Type 313 is available in different cutting edge versions: right hand cutting and left hand cutting.

The table above provides the specifications for various part numbers, including dimensions such as depth, width, and cutting edge radius, as well as the maximum tolerance (t_max) and diameter (Ds).

For more information or to order, please call toll-free: 1-888-818-HORN.
**GROOVE MILLING by circular interpolation**

**INSERT Type 313**

Machining of aluminium

- Depth of groove up to 0.177" (4.48 mm)
- Width of circlip Nw 0.051 - 0.203" (1.29 - 5.15 mm)
- Cutting edge Ø 0.854" (21.65 mm)

Widths for circlip grooves DIN 471/472

Picture = right hand cutting version

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>r</th>
<th>s</th>
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</table>

△ on stock △ 4 weeks
● main recommendation
○ alternative recommendation

- uncoated grades
- coated grades
- brazed/Cermet

Dimensions in inch

Inserts 313.0415.40 and 313.0515.40 only with toolholder dimension l<sub>2</sub> = max. 1.654"
GROOVE MILLING by circular interpolation

INSERT Type 313

Depth of groove up to .098"
Width of circlip Nw .043 - .163"
Cutting edge Ø Ds .854"

Widths for circlip grooves DIN 471/472

for use with Milling shank
Type MU313
M313
M313.ER
M313.M
Z313

with chamfering

Part number
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▲ on stock △ 4 weeks
● main recommendation
○ alternative recommendation

Dimensions in inch Carbide grades

Inserts 313.4120.55 and 313.4125.55 only with toolholder dimension l₂ = max. 1.654"

In the UNITED STATES call our toll free 1 - 888 - 818 HORN

A78
GROOVE MILLING by circular interpolation

INSERT Type 313/U313

Depth of groove up to .177"
Full radius r .020 - .125"
Cutting edge Ø Ds .854"

Picture = right hand cutting version

Part number w r s t_max Ds
313.0005.10 .039 .020 .224 .177 .854
313.0010.20 .079 .039 .224 .177 .854
313.0014.28 .110 .055 .224 .177 .854
313.0015.30 .118 .059 .224 .177 .854
313.0020.40 .157 .079 .224 .177 .854
313.0025.50 .197 .098 .224 .177 .854
U313.0031.62 .062 .031 .224 .177 .854
U313.0047.94 .094 .047 .224 .177 .854
U313.0062.125 .125 .062 .224 .177 .854
U313.0078.156 .156 .078 .224 .177 .854
U313.0094.188 .188 .094 .224 .177 .854
U313.0125.250 .250 .125 .272 .177 .854

Type MU313
M313
M313.ER
M313.M
Z313

Dimensions in inch
Carbide grades

Inserts 313.0025.50, U313.0094.188 and U313.0125.250 only with toolholder dimension l_1 = max 1.654"
GROOVE MILLING by circular interpolation

**INSERT Type**

**L313**

| Depth of groove up to | .177" |
| Width of circlip Nw | .051 - .203" |
| Cutting edge Ø | .854" |

Widths for circlip grooves DIN 471/472

---

**Part number**

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<tr>
<th>Part number</th>
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- ▲ on stock ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

Dimensions in inch

**Note:**

Inserts L313.0415.00 and L313.0515.00 only with toolholder dimension l₁ = max 1.654"

---

**Type**

- MU313
- M313
- M313.ER
- M313.M

---

**Milling shank**

**MU313**

**M313**

**M313.ER**

**M313.M**

---

**Carbide grades**

- P
- M
- K
- N
- S
- H
### INSERT Type L313

- **Depth of groove up to**: .177"
- **Width of groove up to**: .236"
- **Cutting edge Ø**: .854"

**for use with Milling shank**

**Type**
- MU313
- M313
- M313.ER
- M313.M

**Part number**

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<tr>
<th>Part number</th>
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</table>

- ▲ on stock  ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ✖ uncoated grades
- ◐ coated grades
- ✖ brazed/Cermet

**Dimensions in inch**

**Carbide grades**

**Note:**
Inserts L313.0500.00 and L313.0600.00 only with toolholder dimension l₂ = max 1.654"
GROOVE MILLING by circular interpolation

**INSERT Type**

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- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

Dimensions in inch

Carbide grades

for use with Milling shank

Type  
- MU313
- M313
- M313.ER
- M313.M

Picture = right hand cutting version

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
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<th>t_{max}</th>
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</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

Dimensions in inch

Carbide grades
### GROOVE MILLING by circular interpolation

#### INSERT Type 613

- **Depth of groove up to** .177"
- **Width of groove up to** .157"
- **Cutting edge Ø** Ds .854"

For use with Milling shank:

- Type MU313
- M313
- M313.ER
- M313.M

![Milling shank and insert](image)

**Picture = right hand cutting version**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_max</th>
<th>Ds</th>
<th>MG12</th>
<th>Ti25</th>
<th>AS45</th>
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<tbody>
<tr>
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<td></td>
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</tbody>
</table>

- ▲ on stock ▲ 4 weeks
- • main recommendation
- ◄ alternative recommendation
- □ uncoated grades
- △ coated grades
- ◄ brazed/Cermet

**Note:**

Insert 613.0400.00 only with toolholder dimension l_z = max 1.654"
GROOVE MILLING by circular interpolation

INSERT Type  

713

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
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<td></td>
</tr>
</tbody>
</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ▲  uncoated grades
- ▲  coated grades
- ▲  brazed/Cermet

Dimensions in inch

for use with Milling shank

Type   MU313
        M313
        M313.ER
        M313.M

Picture = right hand cutting version

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GROOVE MILLING by circular interpolation

MILLING SHANK type Z313

Double Groove Milling with inserts type 313 and 313.D from bore Ø .866" (22.0 mm)
GROOVE MILLING by circular interpolation

ADAPTOR Type

Z313

Adaptor for inserts type 313.D...

Material of shank: Steel

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l )</th>
<th>( l_2 )</th>
<th>( X )</th>
<th>( d_1 )</th>
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</thead>
<tbody>
<tr>
<td>Z.313.0011.057</td>
<td>9.9</td>
<td>3.7 - 5.7</td>
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<td>Z.313.0011.082</td>
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<td>5.7 - 8.2</td>
<td>0 - 2.5</td>
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</tr>
<tr>
<td>Z.313.0011.107</td>
<td>14.4</td>
<td>8.2 - 10.7</td>
<td>0 - 2.5</td>
<td>11.3</td>
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</table>

Further sizes upon request

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Adaptor</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z.313.0011.057</td>
<td>5.26T20P</td>
<td>T20PQ</td>
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<tr>
<td>Z.313.0011.082</td>
<td>5.28T20P</td>
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<td>Z.313.0011.107</td>
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**GROOVE MILLING by circular interpolation**

**INSERT Type**

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<td>313.D.0015.30</td>
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</tr>
</tbody>
</table>

- Depth of groove up to .177”
- Full radius r .020 - .059”
- Cutting edge Ø Ds .854”

For use with Milling shank:
- Type MU313
- M313
- Z313

Picture = right hand cutting version

**Dimensions in inch Carbide grades**

- Carbide grades
  - MG12
  - TN15
  - Ti25
  - AS45
  - P
  - M
  - K
  - N
  - S
  - H

**Carbide grade recommendations**

- Main recommendation
- Alternative recommendation
- Uncoated grades
- Coated grades
- Brazed/Cermet

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A87
GROOVE MILLING by circular interpolation

INSERT Type

313.D

Depth of groove up to .177"
Width of groove .059 - .118"
Cutting edge Ø Ds .854"

for use with Milling shank

Type MU313
M313
Z313

Part number w r s tmax Ds
313.D.0150.00 .059 - .004 .224 .177 .854
313.D.0150.01 .059 .008
313.D.0200.00 .079 .008
313.D.0250.00 .098 .008
313.D.0300.00 .118 .008

▲ on stock ▲ 4 weeks
● main recommendation
◦ alternative recommendation
■ uncoated grades
□ coated grades
□ brazed/Cermet

Dimensions in inch

Carbide grades

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## GROOVE MILLING by circular interpolation

### INSERT Type 313.D

<table>
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<th>Part number</th>
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<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
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</tbody>
</table>

- ▲ on stock △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- [ ] uncoated grades
- [ ] coated grades
- [ ] brazed/Cermet

Dimensions in inch

Widths for circlip grooves DIN 471/472

- Carbide grades

---

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If required, the connecting pieces Z.313.0011... can be reduced by the dimension "X" through hard turning or grinding. The screw will not change.
GROOVE MILLING by circular interpolation

MILLING SHANK type MU / M328
from bore Ø 1.102" (28.0 mm)
GROOVE MILLING by circular interpolation

MILLING SHANK Type

MU328

with through coolant supply

Cutting edge Ø

Ds .976 / 1.091 "

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type

U325

U328

325

328

628

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
<th>l₂</th>
<th>d₁</th>
<th>d</th>
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</thead>
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</table>

Further sizes upon request w, Ds, l₁ see inserts

Dimensions in inch

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU328.0...</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type

**M328**
with through coolant supply

Cutting edge Ø
Ds 24.8/27.7 mm

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type
U325
325
U328
328
628

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
<th>( d )</th>
<th>Form</th>
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<tbody>
<tr>
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<td>E</td>
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</table>

Further sizes upon request
w, Ds, \( l_{\text{max}} \) see inserts
Dimensions in mm

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M328.00...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type

M328

with through coolant supply

Cutting edge Ø
D = 24.8/27.7 mm

Material of shank: Carbide - Giving a good vibration resistance

Type

U325
U328
325
328
628

for use with Insert

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

Milling shank | Screw | TORX PLUS® Wrench
---|---|---
M328.00... | 5.14T20P | T20PQ

In the UNITED STATES call us toll free 1 - 888 - 838 HORN
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M328
no coolant supply

Cutting edge Ø
Ds 28.0 mm

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type
- U325
- U328
- 325
- 328
- 628

for inserts with increased milling depth

Picture = right hand cutting version

Part number | \( l_1 \) | \( l_2 \) | \( d_1 \) | \( d \) | Form
--- | --- | --- | --- | --- | ---
M328.0909.01A* | 120 | - | - | 9 | A
M328.0912.01A | 100 | 32 | 9 | 12 | A
M328.0912.01B | 100 | 32 | - | 12 | B

Further sizes upon request

\( w, D_s, l_{\text{max}} \) see inserts

Dimensions in mm

* = no through coolant supply!

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>M328.0909...</td>
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<td>T20PQ</td>
</tr>
</tbody>
</table>

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A95
GROOVE MILLING by circular interpolation

MILLING SHANK Type  
M328.ST  
no coolant supply

Cylindrical steel milling shank for collets Ds 24.8/27.7 mm
with cylindrical shank for CNC-lathes

for use with Insert

Type  
U325  
U328  
325  
328  
628

Part number  

<table>
<thead>
<tr>
<th>Part number</th>
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<th>d₁</th>
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<td>A1</td>
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<td>12</td>
<td>B1</td>
</tr>
</tbody>
</table>

Further sizes upon request  
w, Ds, l₁ see inserts

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>M328.ST...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

SCREW-IN CUTTER Type **M328.M**

no coolant supply

Screw-in Cutter for basic holder type WFB.20

for use with Insert

<table>
<thead>
<tr>
<th>Type</th>
<th>U325</th>
<th>U328</th>
<th>325</th>
<th>328</th>
<th>628</th>
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Part number | \( l_1 \) | \( l_2 \) | \( l_3 \) | \( d_1 \) |
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<td>14.3</td>
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Further sizes upon request

w, \( D_s \), \( l_{max} \) see inserts

Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Screw-in cutter</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
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<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

BASIC HOLDER Type  

WFB

Basic shank WFB.20 for screw-in cutter

for use with Screw-in cutter

Type  

M306.M081...
M308.M081...
M311.M081...
M313.M081...
M328.M081...
M332.M081...

Part number  

<table>
<thead>
<tr>
<th>WFB.2012.M081.01</th>
<th>l₁</th>
<th>l₂</th>
<th>d₁</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35</td>
<td>7</td>
<td>16</td>
<td>30</td>
</tr>
</tbody>
</table>

Further sizes upon request

Dimensions in mm

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GROOVE MILLING by circular interpolation

MILLING SHANK Type M328.ER
no coolant supply

Milling shanks for collet chucks DIN6499-A (8") Ds 24.8/27.7 mm
with ER taper for CNC-lathes

for use with Insert
Type U325 325
U328 328
325 628

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
<th>d₁</th>
<th>d</th>
<th>Clamping nut</th>
</tr>
</thead>
<tbody>
<tr>
<td>M328.ER20.02</td>
<td>35</td>
<td>14</td>
<td>20</td>
<td>ER20.6499/ERM...</td>
</tr>
<tr>
<td>M328.ER25.02</td>
<td>35</td>
<td>14</td>
<td>25</td>
<td>ER25.6499</td>
</tr>
<tr>
<td>M328.ER32.02</td>
<td>35</td>
<td>14</td>
<td>32</td>
<td>ER32.6499</td>
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</tbody>
</table>

Further sizes upon request: w, Ds, l₁ see inserts
Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Ordering note:
Clamping nut is not combined with milling shank - separate order required!

Spare parts

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M328.ER...</td>
<td>5.14T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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**HEICAL MILLING OF BORES**

**INSERT Type**  

**325/U325**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>U325.0125.52</td>
<td>.125</td>
<td>.008</td>
<td>.197</td>
<td>.197</td>
<td>.976</td>
</tr>
<tr>
<td>325.0350.52</td>
<td>.138</td>
<td>.008</td>
<td>.224</td>
<td>.197</td>
<td>.976</td>
</tr>
</tbody>
</table>

- **Depth of cut up to**
- **Cutting edge Ø**
  - .197"
  - Ds .976"

- **for use with Milling shank**
  - Type MU328
  - M328
  - M328.ER
  - M328.M

---

**Picture = right hand cutting version**

- **Dimensions in inch**

---

**Carbide grades**

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GROOVE MILLING by circular interpolation

**INSERT Type 328**

<table>
<thead>
<tr>
<th>Depth of groove up to</th>
<th>.197”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of groove up to</td>
<td>.032”</td>
</tr>
<tr>
<td>Cutting edge Ø</td>
<td>Ds 1.091”</td>
</tr>
</tbody>
</table>

for use with Milling shank

Type
- MU328
- M328
- M328.ER
- M328.M

Picture = right hand cutting version

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.224</td>
<td>.197</td>
<td>1.091</td>
</tr>
</tbody>
</table>

▲ on stock  △ 4 weeks

- • main recommendation
- ● alternative recommendation

- P
- M
- N
- S
- H

Dimensions in inch

<table>
<thead>
<tr>
<th>Carbide grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>P  •  •</td>
</tr>
<tr>
<td>M  •  •</td>
</tr>
<tr>
<td>N  •  •</td>
</tr>
<tr>
<td>S  •  •</td>
</tr>
<tr>
<td>H  ▲  ▲</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
**GROOVE MILLING by circular interpolation**

**INSERT Type**

**328/U328**

- **Depth of groove up to** 0.256"
- **Width of groove up to** 0.394"
- **Cutting edge Ø** 1.091"

**for use with Milling shank**

**Type**
- MU328
- M328
- M328.ER
- M328.M

**Picture = right hand cutting version**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>( t_{\text{max}} )</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
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<td>.256</td>
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<tr>
<td>328.0300.00</td>
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<td></td>
<td></td>
<td>.224</td>
<td>.256</td>
</tr>
<tr>
<td>328.0350.00</td>
<td>.138</td>
<td>.008</td>
<td></td>
<td>.224</td>
<td>.256</td>
</tr>
<tr>
<td>328.0400.00</td>
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<td></td>
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<td>.224</td>
<td>.256</td>
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<td>.224</td>
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</tr>
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<tr>
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<tr>
<td>U328.0187.16</td>
<td>.187</td>
<td></td>
<td></td>
<td>.224</td>
<td>.256</td>
</tr>
</tbody>
</table>

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- ■ uncoated grades
- ♦ coated grades
- ▣ brazed/Cermet

Dimensions in inch

Carbide grades

Insert 328.1000.00 with staggered tooth (Z=1) and insert 328.0600.00 with chip divider!

Inserts 328.0400.00, 328.0500.00, 328.0600.00, 328.1000.00, U328.0157.08, U328.0157.16, U328.0187.08, and U328.0187.16 only with toolholder dimension \( l_y \) = max. 1.654"
### GROOVE MILLING by circular interpolation

**INSERT Type**

**328**

Machining of aluminium

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
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</thead>
<tbody>
<tr>
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<td>.224</td>
<td>.256</td>
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<td>.256</td>
<td>1.091</td>
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<td>.224</td>
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<td>1.091</td>
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<td>.224</td>
<td>.256</td>
<td>1.091</td>
</tr>
</tbody>
</table>

- ▲ on stock
- △ 4 weeks
- • main recommendation
- o alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

Dimensions in inch

Further sizes upon request

- Carbide grades

**Type**

- MU328
- M328
- M328.ER
- M328.M

**for use with Milling shank**

Type MU328
M328
M328.ER
M328.M

**Picture = right hand cutting version**

**INSERT Type 328**

Machining of aluminium

- Depth of groove up to .256”
- Width of groove up to .157”
- Cutting edge Ø Ds 1.091”

**mg12**

**TI25**

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GROOVE MILLING by circular interpolation

INSERT Type 328

Depth of groove up to .366"
Width of groove up to .098"
Cutting edge Ø Ds 1.102"

for use with Milling shank

Type M328.0909.01A
M328.0912.01A
M328.0912.01B

Picture = right hand cutting version

Part number w r s t max Ds
328.0110.2.00 .043 .008 .224 .366 1.102
328.0120.2.00 .047 .008
328.0132.2.00 .052 .006
328.0150.2.00 .059 .008
328.0160.2.00 .063 .008
328.0200.2.00 .079 .008
328.0250.2.00 .098 .008

▲ on stock ▲ 4 weeks
● main recommendation
○ alternative recommendation
uncoated grades
coated grades
brazed/Cermet

Dimensions in inch

Carbide grades
GROOVE MILLING by circular interpolation

INSERT Type

628

Depth of groove up to .256”
Width of circlip Nw .051 - .104”
Cutting edge Ø Ds 1.091”

Widths for circlip grooves DIN 471/472

for use with Milling shank

Type MU328
M328
M328.ER
M328.M

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>Nw</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_max</th>
<th>Ds</th>
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<td>628.0185.00</td>
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<td>.089</td>
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<td>.008</td>
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<td></td>
</tr>
</tbody>
</table>

▲ on stock △ 4 weeks
● main recommendation
○ alternative recommendation
■ uncoated grades
□ coated grades
△ brazed/Cermet

Dimensions in inch

Carbide grades

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GROOVE MILLING by circular interpolation

INSERT Type 628

Depth of groove up to .256"
Width of groove up to .157"
Cutting edge Ø Ds 1.091"

for use with Milling shank

Type MU328
M328
M328.ER
M328.M

Part number w r s tmax Ds MG12 T125 AS45
628.0250.00 .098 .008 .240 .256 1.091
628.0300.00 .118 .008 .240 .256 1.091
628.0350.00 .138 .008 .240 .256 1.091
628.0400.00 .157 .008 .240 .256 1.091

▲ on stock ▲ 4 weeks
• main recommendation
o alternative recommendation
□ uncoated grades
□ coated grades
□ brazed/Cermet

Dimensions in inch

Insert 628.0400.00 only with toolholder dimension l2 = 1.654"
**INSERT Type**

**628**

Depth of groove up to: .366"
Width of groove up to: .098"
Cutting edge Ø: Ds 1.102"

---

**Picture = right hand cutting version**

---

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t(_{\text{max}})</th>
<th>Ds</th>
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<tbody>
<tr>
<td>628.0120.2.00</td>
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<td></td>
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</tr>
</tbody>
</table>

**Carbide grades**

- MG12
- TN15
- Ti25
- AS45

- ▲ on stock  △ 4 weeks
- ● main recommendation
- ○ alternative recommendation

- ■ uncoated grades
- ◼ coated grades
- △ brazed/Cermet

Dimensions in inch

---

**for use with Milling shank**

- Type M328.0909.01A
- M328.0912.01A
- M328.0912.01B

---

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---
SOLUTIONS PLUS Program

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GROOVE MILLING by circular interpolation

MILLING SHANK type M332

from bore Ø 1.260" (32.0 mm)
GROOVE MILLING by circular interpolation

MILLING SHANK Type MU332
with through coolant supply

Cutting edge Ø Ds 1.248" Material of shank: Carbide - Giving a good vibration resistance

Type 332 632 636 for use with Insert

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
<th>l₂</th>
<th>d₁</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU332.0625.01B</td>
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<td>.563</td>
<td>.625</td>
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<td>.750</td>
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<tr>
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<td>3.346</td>
<td>.563</td>
<td>.750</td>
</tr>
<tr>
<td>MU332.0750.01B</td>
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<td>1.654</td>
<td>.563</td>
<td>.625</td>
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<tr>
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<td>2.362</td>
<td>.563</td>
<td>.750</td>
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<td>3.346</td>
<td>.563</td>
<td>.750</td>
</tr>
</tbody>
</table>

Further sizes upon request w, Ds, l₁ see inserts Dimensions in inch

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU332.0...</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type

**M332**
with through coolant supply

Cutting edge Ø

Ds 1.248" (31.7 mm)

Material of shank: Carbide - Giving a good vibration resistance

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
<th>( d )</th>
<th>Form</th>
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</thead>
<tbody>
<tr>
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<td>14.3</td>
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<td>M332.0020.02A</td>
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<td>160</td>
<td>85</td>
<td>14.3</td>
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<td></td>
</tr>
</tbody>
</table>

Further sizes upon request

w, \( D_s \), \( t_{max} \) see inserts

Dimensions in mm

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M332.00...</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free
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GROOVE MILLING by circular interpolation

MILLING SHANK Type M332
with through coolant supply

Cutting edge Ø Ds 1.248" (31.7 mm)

Material of shank: Carbide - Giving a good vibration resistance

Type 332
632
636

for use with Insert

for inserts with increased milling depth

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
<th>l₂</th>
<th>d₁</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

Further sizes upon request w, Ds, t₁, see inserts Dimensions in mm

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M332.001...</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M332.ST
no coolant supply

Cylindrical steel milling shank for collets Ds 31.7 mm

with cylindrical shank for CNC-lathes

for use with Insert

Type
332
632
636

Note:
Milling shanks M332.ST12.2.01A, M332.ST12.2.01B and M332.ST13.2.01A are usable for inserts with increased milling depth!

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M332.ST...</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free 1 - 888 - 818 HORN
GROOVE MILLING by circular interpolation

SCREW-IN CUTTER Type M332.M
no coolant supply

Screw-in Cutter for basic holder type WFB.20

for use with Insert

Type
332
632
636

Part number |  l₁ |  l₂ |  l₃ |  d₁
---|---|---|---|---
M332.M081.01 | 37 | 15 | 25 | 14.3

Further sizes upon request
w, Dₛ, lₑ

Spare parts

<table>
<thead>
<tr>
<th>Screw-in cutter</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M332.M081.01</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

BASIC HOLDER Type

WFB

Basic holder WFB.20 for screw-in cutter

for use with Screw-in cutter

Type
M306.M081...
M308.M081...
M311.M081...
M313.M081...
M328.M081...
M332.M081...

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
<th>( d )</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFB.2012.M081.01</td>
<td>35</td>
<td>7</td>
<td>16</td>
<td>30</td>
</tr>
</tbody>
</table>

Further sizes upon request

Dimensions in mm
GROOVE MILLING by circular interpolation

MILLING SHANK Type M332.ER

no coolant supply

Milling shanks for collet chucks DIN6499-A (8°) Ds 31.7/35.7 mm
with ER taper for CNC-lathes

for use with Insert

Type 332 632 636

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( d_1 )</th>
<th>( d )</th>
<th>Clamping nut</th>
</tr>
</thead>
<tbody>
<tr>
<td>M332.ER20.02</td>
<td>35</td>
<td>14.3</td>
<td>20</td>
<td>ER20.6499/ERM20.6499</td>
</tr>
</tbody>
</table>

Further sizes upon request \( w, Ds, l_{max} \) see inserts
Dimensions in mm

For torque specifications of the screw, please see Technical Instructions.

Ordering note:
Clamping nut is not combined with milling shank - separate order required!

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M332.ER20.02</td>
<td>5.17T20P</td>
<td>T20PQ</td>
</tr>
</tbody>
</table>

In the UNITED STATES call us toll free
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GROOVE MILLING by circular interpolation

**INSERT Type 332**

- Depth of groove up to .327"
- Width of groove up to .157"
- Cutting edge Ø Ds 1.248"

![Image of insert type 332]

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_{max}</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>332.0200.00</td>
<td>.079</td>
<td>.008</td>
<td>.224</td>
<td>.327</td>
<td>1.248</td>
</tr>
<tr>
<td>332.0250.00</td>
<td>.098</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>332.0300.00</td>
<td>.118</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>332.0350.00</td>
<td>.138</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>332.0400.00</td>
<td>.157</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ▲ on stock △ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- △ coated grades
- ■ brazed/Cermet

Dimensions in inch

**Carbide grades**

- MG12
- TN55
- TI25
- AS45

For use with Milling shank

- Type MU332
- M332
- M332.ER
- M332.M

**Picture = right hand cutting version**

In the UNITED STATES call us toll free 1 - 888 - 818 HORN

A117
GROOVE MILLING by circular interpolation

INSERT Type 332

Depth of groove up to .394"
Width of groove up to .118"
Cutting edge Ø Ds 1.248"

for use with Milling shank

Type M332.0012.2.01A
M332.0016.2.01A
M332.ST12.2.01A
M332.ST12.2.01B
M332.ST13.2.01A

Picture = right hand cutting version

increased milling depth

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_max</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>332.0150.2.00</td>
<td>.059</td>
<td></td>
<td></td>
<td>.394</td>
<td>1.248</td>
</tr>
<tr>
<td>332.0160.2.00</td>
<td>.063</td>
<td>.008</td>
<td>.224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>332.0200.2.00</td>
<td>.079</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>332.0250.2.00</td>
<td>.098</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>332.0300.2.00</td>
<td>.118</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

▲ on stock ▲ 4 weeks
● main recommendation
○ alternative recommendation
-
uncoated grades
-
coated grades
-
brazed/Cermet

Dimensions in inch

Carbide grades

In the UNITED STATES call us toll free
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GROOVE MILLING by circular interpolation

**INSERT Type 632**

- Depth of groove up to: 0.327”
- Width of groove up to: 0.157”
- Cutting edge Ø: 1.248”

![Diagram](image)

**Part number**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>632.0200.00</td>
<td>.079</td>
<td></td>
<td></td>
<td>.327</td>
<td>1.248</td>
</tr>
<tr>
<td>632.0250.00</td>
<td>.098</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>632.0300.00</td>
<td>.118</td>
<td>.008</td>
<td>.240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>632.0400.00</td>
<td>.157</td>
<td></td>
<td></td>
<td>.327</td>
<td></td>
</tr>
</tbody>
</table>

- ▲ on stock
- ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

Dimensions in inch

**Carbide grades**

- MG12
- TN35
- Ti25
- TA45
- AS45

For use with Milling shank:
- Type MU332
- M332
- M332.ER
- M332.M

*Picture = right hand cutting version*
**INSERT Type 632**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>( t_{\text{max}} )</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>632.0150.2.00</td>
<td>.059</td>
<td></td>
<td>.008</td>
<td>.240</td>
<td>.394</td>
</tr>
<tr>
<td>632.0160.2.00</td>
<td>.063</td>
<td></td>
<td>.008</td>
<td>.240</td>
<td>.394</td>
</tr>
<tr>
<td>632.0200.2.00</td>
<td>.079</td>
<td></td>
<td>.008</td>
<td>.240</td>
<td>.394</td>
</tr>
<tr>
<td>632.0250.2.00</td>
<td>.098</td>
<td></td>
<td>.008</td>
<td>.240</td>
<td>.394</td>
</tr>
<tr>
<td>632.0300.2.00</td>
<td>.118</td>
<td></td>
<td>.008</td>
<td>.240</td>
<td>.394</td>
</tr>
</tbody>
</table>

- **\( w \)**: Width of groove up to .118" (on stock for 4 weeks)
- **\( r \)**: Cutting edge Ø .394" (on stock for 4 weeks)
- **\( s \)**: Depth of groove up to .118"
- **\( t_{\text{max}} \)**: Cutting edge Ø .394"
- **Ds**: Diameter of the shank 1.248"

---

**Carbide grades**

- **MG12**, **TN35**, **TiC2**, **Ta45**, **AS45**

**Type**

- M332.0012.2.01A
- M332.0016.2.01A
- M332.ST12.2.01A
- M332.ST12.2.01B
- M332.ST13.2.01A

---

**Picture = right hand cutting version**

**for use with Milling shank**

**increased milling depth**

---

Dimensions in inch
GROOVE MILLING by circular interpolation

INSERT Type 636

Depth of groove up to 0.402"
Width of groove up to 0.118"
Cutting edge Ø Ds 1.406"

for use with Milling shank

Type MU332
M332
M332.ER
M332.M

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_{max}</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>636.0150.00</td>
<td>.059</td>
<td>.004</td>
<td>.240</td>
<td>.402</td>
<td>1.406</td>
</tr>
<tr>
<td>636.0200.00</td>
<td>.079</td>
<td>.008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>636.0250.00</td>
<td>.098</td>
<td>.008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>636.0300.00</td>
<td>.118</td>
<td>.008</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

▲ on stock △ 4 weeks
● main recommendation
○ alternative recommendation
■ uncoated grades
□ coated grades
□ brazed/Cermet

Dimensions in inch

Carbide grades

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A121
### INSERT Type 636

**Depth of groove up to**: .472"
**Width of groove up to**: .098"
**Cutting edge Ø**: Ds 1.406"

**Picture = right hand cutting version**

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>t_max</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>636.0150.2.00</td>
<td>.059</td>
<td>.004</td>
<td>.008</td>
<td>.240</td>
<td>.472</td>
</tr>
<tr>
<td>636.0200.2.00</td>
<td>.079</td>
<td>.008</td>
<td>.008</td>
<td>.240</td>
<td>.472</td>
</tr>
<tr>
<td>636.0250.2.00</td>
<td>.098</td>
<td>.008</td>
<td>.008</td>
<td>.240</td>
<td>.472</td>
</tr>
</tbody>
</table>

- **on stock**: ▲ 4 weeks
- **main recommendation**: ●
- **alternative recommendation**: ○
- **uncoated grades**: ▲
- **coated grades**: ▲
- **brazed/Cermet**: ▲

**Carbide grades**

- MG12
- TN35
- Ti25
- TA45
- AS45

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Reducing of tool change from Ø .709” (18 mm)

Pregrooving and Chamfering

Finishing

For further information, please contact HORN USA.
PCD-tipped insert

Carbide milling cutter shanks offer excellent antivibration properties, resulting in greater rigidity, ideally suited for holding PCD tipped inserts.

PCD tipped inserts of the 306, 308, 311, 313 and 328 range are manufactured according to customers requirements. Intermediate widths as well as complicated forms are all part of our product range.

Cutting data calculated from our HCT program guarantees both optimum and economical performance of the HORN groove milling tools.
GROOVE MILLING by circular interpolation

MILLING SHANK type M335
from bore Ø 1.378" (35.0 mm)
### MILLING SHANK Type

**MU335**
with through coolant supply

<table>
<thead>
<tr>
<th>Part number</th>
<th>( l_1 )</th>
<th>( l_2 )</th>
<th>( d_1 )</th>
<th>( d )</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU335.0750.01B</td>
<td>3.937</td>
<td>1.575</td>
<td>.689</td>
<td>.750</td>
</tr>
<tr>
<td>MU335.0750.02B</td>
<td>5.118</td>
<td>2.362</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MU335.0750.03B</td>
<td>6.299</td>
<td>3.346</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Further sizes upon request

### Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

### Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU335.0750.01B</td>
<td>6.17T25P</td>
<td>T25PQ</td>
</tr>
</tbody>
</table>
GROOVE MILLING by circular interpolation

MILLING SHANK Type

M335
with through coolant supply

Cutting edge Ø
D1 1.366" (34.7 mm)

Material of shank: Carbide - Giving a good vibration resistance

for use with Insert

Type 335

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>I1</th>
<th>I2</th>
<th>d1</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>M335.0020.01A</td>
<td>100</td>
<td>40</td>
<td>17.5</td>
<td>20</td>
</tr>
<tr>
<td>M335.0020.02A</td>
<td>130</td>
<td>60</td>
<td>17.5</td>
<td>20</td>
</tr>
</tbody>
</table>

Further sizes upon request
w, Ds, tmax see inserts

Dimensions in mm

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>M335.0020.0...</td>
<td>6.17T25P</td>
<td>T25PQ</td>
</tr>
</tbody>
</table>

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GROOVE MILLING by circular interpolation

MILLING SHANK Type M335
with through coolant supply

Cutting edge Ø Ds 1.366" (34.7 mm)

Material of shank: Carbide - Giving a good vibration resistance

Picture = right hand cutting version

<table>
<thead>
<tr>
<th>Part number</th>
<th>l₁</th>
<th>l₂</th>
<th>d₁</th>
<th>d</th>
<th>Form</th>
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<tbody>
<tr>
<td>M335.0020.01B</td>
<td>100</td>
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<tr>
<td>M335.0020.02B</td>
<td>130</td>
<td>60</td>
<td>17.5</td>
<td>20</td>
<td>E</td>
</tr>
</tbody>
</table>

Further sizes upon request

Ordering note:
Milling cutter shanks with damaged seating can be repaired by HORN.

For torque specifications of the screw, please see Technical Instructions.

Spare parts

<table>
<thead>
<tr>
<th>Milling Shank</th>
<th>Screw</th>
<th>TORX PLUS® Wrench</th>
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</thead>
<tbody>
<tr>
<td>M335.0020.01B</td>
<td>6.17T25P</td>
<td>T25PQ</td>
</tr>
</tbody>
</table>

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## GROOVE MILLING by circular interpolation

### INSERT Type 335

<table>
<thead>
<tr>
<th>Part number</th>
<th>w</th>
<th>r</th>
<th>s</th>
<th>$t_{max}$</th>
<th>Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td>335.0200.00</td>
<td>.079</td>
<td>.008</td>
<td>.343</td>
<td>.315</td>
<td>1.366</td>
</tr>
<tr>
<td>335.0300.00</td>
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<tr>
<td>335.0400.00</td>
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<tr>
<td>335.0500.00</td>
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<td>.236</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

- **▲** on stock  ▲ 4 weeks
- ● main recommendation
- ○ alternative recommendation
- □ uncoated grades
- □ coated grades
- □ brazed/Cermet

Dimensions in inch

---

**Carbide grades**

- P
- M
- K
- N
- S
- H

---

For use with Milling shank: Type M335, MU335

**Picture = right hand cutting version**

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