

# FORKARDT

**F+**

*Manual Chucks*



WORKHOLDING SOLUTIONS WORLDWIDE

This catalogue describes the key components of a power chucking system featuring the following FORKARDT manual chuck:

## **F+**

Should you require further information beyond the data contained in this catalogue, please contact FORKARDT.

The colleagues of our sales department will be pleased to help you.

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*As we are constantly striving to improve our products, the dimensions and specifications in this catalogue cannot always represent the latest state of the art; they are therefore given as an indication only and are not binding.*

# F+ manual wedge block chuck

*with open centre*

The wedge block principle, invented by FORKARDT, has for decades formed the basis of diverse workholding systems, all of which are indispensable in modern production technology today.

Over several generations, experts at FORKARDT have made ongoing improvements to the wedge block chuck and adapted it to advances in the machine tool construction sector.

The latest addition to the successful family of FORKARDT hand-operated chucks is the F+:

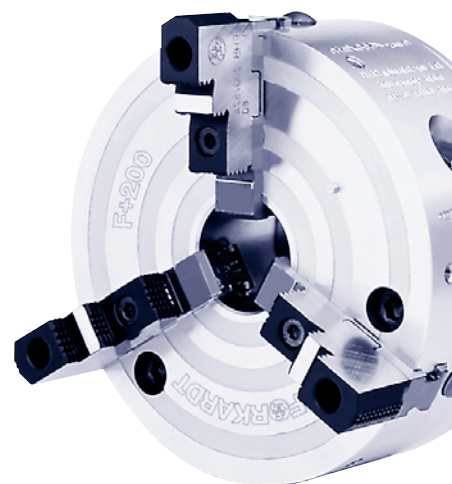
A new chuck with a long tradition, it combines all the advantages of the thoroughly tried and tested F chuck, and enhances them with new materials and modern production engineering expertise.

## Technical features:

- Hardened steel chuck body for high precision and long life performance.
- Internal components made of high-quality steels for maximum gripping force.
- Large through bore hole for bar work.
- F+ manual chucks are compatible with virtually all lathes.

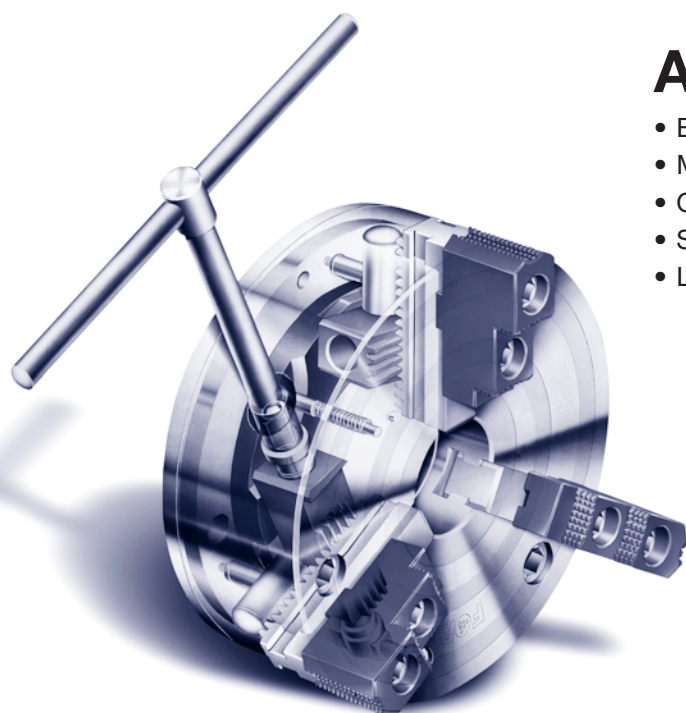
For non-standard spindle noses, special mounting parts are available on request.

- Tried and tested F jaw system in an unchanged design.
- Jaw types for diverse applications.
- Maximum repeat accuracy when reusing jaws.
- Easy use of existing sets of jaws.
- Wedge blocks moving transversely to the jaws allowing, after a short link out stroke, the jaws to be relocated, turned or changed.
- Maximum operating speeds due to low jaw weight.
- Single jaw locking device for safe handling.
- The gripping force is transmitted over generously dimensioned surfaces (no point or linear contact).

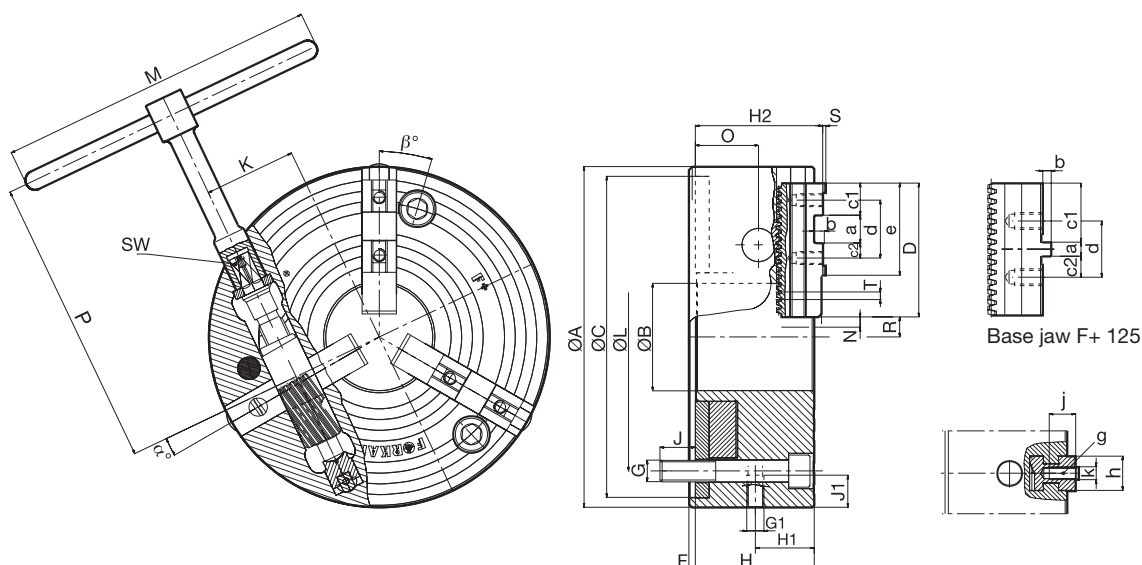


## Advantages at a glance:

- Backlash-free mechanism for maximum accuracy.
- Maximum loadability and wear resistance.
- Quick jaw change within seconds.
- Suitable for use on all types of lathes.
- Long service life.



# F+ manual chucks



## Chuck dimensions with cylindrical spigot mounting recess

| Chuck type F+                |                   |          | 125    | 160    | 200    | 250     | 315     | 400     | 500      | 630        |
|------------------------------|-------------------|----------|--------|--------|--------|---------|---------|---------|----------|------------|
| Chuck size                   | A                 | mm       | 125    | 161    | 206    | 255     | 318     | 400     | 500      | 630        |
| Bore                         | B <sup>+0.1</sup> | mm       | 35     | 45     | 55     | 75      | 100     | 130     | 180      | 270        |
| Centering - Ø                | C <sup>H6</sup>   | mm       | 115    | 145    | 185    | 235     | 300     | 380     | 460      | 580        |
| Jaw connection               |                   |          | F125   | F160   | F200   | F250    | F315    | F400    | F400     | F630       |
| Base jaw length              | D                 | mm       | 47     | 74     | 90     | 110     | 125     | 160     | 160      | 230        |
| Height of centering          | F                 | mm       | 4      | 5      | 5      | 6       | 6       | 6       | 6        | 6          |
| Mounting bolts               | G                 | mm       | 3xM8   | 3xM10  | 3xM12  | 3xM16   | 3xM20   | 3xM24   | 3xM24    | 3xM24      |
| Eyebolt thread               | G <sub>1</sub>    | mm       | -      | -      | -      | -       | M16     | M16     | M16      | M20        |
| Chuck height                 | H                 | mm       | 46.5   | 63     | 81.3   | 92      | 111     | 118     | 119      | 143        |
| Clearance                    | H <sub>1</sub>    | mm       | -      | -      | -      | -       | 55      | 55      | 55       | 70         |
| Clearance                    | H <sub>2</sub>    | mm       | 53.1   | 69     | 88     | 99      | 119     | 129     | 130      | 155        |
| Thread length                | J                 | mm       | 11     | 13     | 18     | 27      | 33      | 34      | 34       | 34         |
| Thread depth                 | J <sub>1</sub>    | mm       | -      | -      | -      | -       | 30      | 30      | 30       | 35         |
| Centre distance of chuck key | K                 | mm       | 33     | 43     | 54     | 67      | 86      | 111     | 153.5    | 196        |
| Hole circle - Ø              | L                 | mm       | 100    | 125    | 160    | 200     | 250     | 315     | 235*/400 | 330.2*/520 |
| Lever length                 | M                 | mm       | 150    | 200    | 280    | 450     | 500     | 600     | 600      | 710        |
| Jaw stroke                   | N                 | mm       | 4.8    | 6.3    | 6.8    | 7.5     | 9.6     | 12      | 12       | 14.1       |
| Clearance                    | O                 | mm       | 22.5   | 31.5   | 43     | 47      | 59      | 57.5    | 58.5     | 72         |
| Distance of lever            | P                 | mm       | 115    | 180    | 210    | 300     | 310     | 360     | 520      | 570        |
| Position of base jaw         | R min             | mm       | 9.2    | 12.1   | 13.2   | 14.8    | 18.7    | 24.7    | 41.6     | 33.4       |
|                              | R max             | mm       | 23.6   | 31.5   | 42.6   | 51      | 68      | 93.1    | 135.7    | 169.8      |
| Dimension                    | S                 | mm       | -      | 2.5    | 3      | 3       | 3       | 4       | 4        | 4          |
| Width across flats           | SW                | mm       | 8      | 10     | 12     | 14      | 16      | 19      | 19       | 24         |
| Serration pitch              | T                 | mm       | 3.6    | 4.8    | 4.8    | 6       | 7       | 8.5     | 8.5      | 8.5        |
| Angle α°                     |                   |          | 6°36'  | 6°36'  | 3°     | 4°30'   | 4°30'   | 4°30'   | 4°30'    | 4°30'      |
| Angle β°                     |                   |          | 21°36' | 21°36' | 18°    | 19°30'  | 16°30'  | 19°30'  | 14°30'   | 69°30'     |
| Sloth width                  | a                 | mm       | 5      | 18     | 20     | 20      | 26      | 30      | 30       | 40         |
| Sloth depth                  | b                 | mm       | 3      | 5      | 6      | 6       | 8       | 9       | 9        | 9          |
| Dimension                    | c1                | mm       | 21     | 19     | 23     | 26      | 30      | 35      | 35       | 52         |
| Dimension                    | c2                | mm       | 7.5    | 7      | 10     | 10      | 14      | 15      | 15       | 21         |
| Hole spacing                 | d                 | mm       | 20     | 32     | 40     | 40      | 54      | 60      | 60       | 82         |
| Length                       | e                 | mm       | 47     | 56     | 67     | 73      | 86      | 103     | 103      | 145        |
| Thread                       | g                 | mm       | M6     | M8x1   | M8x1   | M12x1.5 | M12x1.5 | M16x1.5 | M16x1.5  | M20        |
| Jaw width                    | h                 | mm       | 14     | 20     | 22     | 26      | 32      | 45      | 45       | 65         |
| Thread depth                 | j                 | mm       | 10     | 16     | 20     | 23      | 25      | 30      | 30       | 32         |
| Tongue                       | k                 | mm       | 14     | 8      | 10     | 12      | 12      | 18      | 18       | 24         |
| Chuck constant               | C1                | daNmm/Nm | 6,500  | 11,100 | 13,100 | 31,100  | 39,100  | 44,200  | 44,200   | 56,200     |
|                              | C2                | mm       | 165    | 260    | 320    | 390     | 440     | 570     | 570      | 820        |

\* Hole circle to ASA B 5.9

## Dimensions and Performance data

| Chuck-type | Max. gripping force<br>F <sub>sp</sub> at maximum<br>actuating torque | M <sub>0</sub> max<br>(maximum<br>force) | Maximum speed <i>n</i> <sub>max</sub> | Weight<br>(with jaws) | Mass moment<br>of inertia | Outside diameter | Bore | Spindle connection | Chuck with<br>undivided<br>stepped jaws | Chuck with<br>base and hard<br>false jaws | Chuck with<br>base jaws | Jaw width | Chuck height | Spindle square drive |
|------------|-----------------------------------------------------------------------|------------------------------------------|---------------------------------------|-----------------------|---------------------------|------------------|------|--------------------|-----------------------------------------|-------------------------------------------|-------------------------|-----------|--------------|----------------------|
|            | daN                                                                   | Nm                                       | 1/min                                 | kg                    | kgm <sup>2</sup>          | mm               | mm   |                    | Ident-No                                | Ident-No                                  | Ident-No                | mm        | mm           | mm                   |
| F+ 125     | 3,700                                                                 | 40                                       | 6,000                                 | 3.7                   | 0.0075                    | 125              | 35   | Z                  | D164662Z00B                             | -                                         | D164662Z00D             | 14        | 46.5         | 8                    |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J3                 | D164662J03B                             | -                                         | D164662J03D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J4                 | D164662J04B                             | -                                         | D164662J04D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J5                 | D164662J05B                             | -                                         | D164662J05D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D3                 | D164662D03B                             | -                                         | D164662D03D             |           |              |                      |
| F+ 160     | 8,000                                                                 | 80                                       | 5,200                                 | 8.6                   | 0.0325                    | 161              | 45   | D4                 | D164662D04B                             | -                                         | D164662D04D             | 20        | 63           | 10                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | Z                  | D164663Z00B                             | D164663Z00E                               | D164663Z00D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J4                 | D164663J04B                             | D164663J04E                               | D164663J04D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J5                 | D164663J05B                             | D164663J05E                               | D164663J05D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J6                 | D164663J06B                             | D164663J06E                               | D164663J06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D3                 | D164663D03B                             | D164663D03E                               | D164663D03D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D4                 | D164663D04B                             | D164663D04E                               | D164663D04D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D5                 | D164663D05B                             | D164663D05E                               | D164663D05D             |           |              |                      |
| F+ 200     | 12,000                                                                | 120                                      | 4,600                                 | 18.5                  | 0.1025                    | 206              | 55   | D6                 | D164663D06B                             | D164663D06E                               | D164663D06D             | 22        | 81.3         | 12                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D8                 | D164663D08B                             | D164663D08E                               | D164663D08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | Z                  | D164664Z00B                             | D164664Z00E                               | D164664Z00D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J4                 | D164664J04B                             | D164664J04E                               | D164664J04D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J5                 | D164664J05B                             | D164664J05E                               | D164664J05D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J6                 | D164664J06B                             | D164664J06E                               | D164664J06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J8                 | D164664J08B                             | D164664J08E                               | D164664J08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D4                 | D164664D04B                             | D164664D04E                               | D164664D04D             |           |              |                      |
| F+ 250     | 17,500                                                                | 190                                      | 4,000                                 | 32.5                  | 0.285                     | 255              | 75   | D5                 | D164664D05B                             | D164664D05E                               | D164664D05D             | 26        | 92           | 14                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D6                 | D164664D06B                             | D164664D06E                               | D164664D06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D8                 | D164664D08B                             | D164664D08E                               | D164664D08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | Z                  | D164665Z00B                             | D164665Z00E                               | D164665Z00D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J4                 | D164665J04B                             | D164665J04E                               | D164665J04D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J5                 | D164665J05B                             | D164665J05E                               | D164665J05D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J6                 | D164665J06B                             | D164665J06E                               | D164665J06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J8                 | D164665J08B                             | D164665J08E                               | D164665J08D             |           |              |                      |
| F+ 315     | 21,500                                                                | 210                                      | 3,200                                 | 62                    | 0.8125                    | 318              | 100  | J11                | D164665J11B                             | D164665J11E                               | D164665J11D             | 32        | 111          | 16                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D4                 | D164665D04B                             | D164665D04E                               | D164665D04D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D5                 | D164665D05B                             | D164665D05E                               | D164665D05D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D6                 | D164665D06B                             | D164665D06E                               | D164665D06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D8                 | D164665D08B                             | D164665D08E                               | D164665D08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | Z                  | D164666Z00B                             | D164666Z00E                               | D164666Z00D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J6                 | D164666J06B                             | D164666J06E                               | D164666J06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J8                 | D164666J08B                             | D164666J08E                               | D164666J08D             |           |              |                      |
| F+ 400     | 23,400                                                                | 260                                      | 2,200                                 | 102                   | 2.2                       | 400              | 130  | J11                | D164666J11B                             | D164666J11E                               | D164666J11D             | 45        | 118          | 19                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D6                 | D164666D06B                             | D164666D06E                               | D164666D06D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D8                 | D164666D08B                             | D164666D08E                               | D164666D08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D11                | D164666D11B                             | D164666D11E                               | D164666D11D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D15                | D164666D15B                             | D164666D15E                               | D164666D15D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | Z                  | D164668Z00B                             | D164668Z00E                               | D164668Z00D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J8                 | D164668J08B                             | D164668J08E                               | D164668J08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J11                | D164668J11B                             | D164668J11E                               | D164668J11D             |           |              |                      |
| F+ 500     | 23,400                                                                | 260                                      | 1,500                                 | 159                   | 5.5                       | 500              | 180  | J15                | D164668J15B                             | D164668J15E                               | D164668J15D             | 45        | 119          | 19                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D8                 | D164668D08B                             | D164668D08E                               | D164668D08D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D11                | D164668D11B                             | D164668D11E                               | D164668D11D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D15                | D164668D15B                             | D164668D15E                               | D164668D15D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | Z                  | D164669Z00B                             | D164669Z00E                               | D164669Z00D             |           |              |                      |
| F+ 630     | 28,000                                                                | 315                                      | 1,000                                 | 293                   | 17.5                      | 630              | 270  | J11                | -                                       | D164669J11E                               | D164669J11D             | 65        | 143          | 24                   |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | J15                | -                                       | D164669J15E                               | D164669J15D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D11                | -                                       | D164669D11E                               | D164669D11D             |           |              |                      |
|            |                                                                       |                                          |                                       |                       |                           |                  |      | D15                | -                                       | D164669D15E                               | D164669D15D             |           |              |                      |

# **F+ manual chuck with integral adaptor and mounting flange for short taper mounting**

**Chuck with integral mounting flange for bayonet-type fastening according to DIN 55027, ISO 702/III, ASA B 5.9 B**

| Spindle nose size | Chuck size | 125     | 160     | 200     | 250     | 315      | 400      | 500L      | 630      | Backplate J |
|-------------------|------------|---------|---------|---------|---------|----------|----------|-----------|----------|-------------|
| 3                 | Type       | F125-J3 |         |         |         |          |          |           |          |             |
|                   | C1         | 59.5    |         |         |         |          |          |           |          |             |
| 4                 | Type       | F125-J4 | F160-J4 | F200-J4 |         |          |          |           |          |             |
|                   | C1         | 59.5    | 75.3    | 93.3    |         |          |          |           |          |             |
| 5                 | Type       | F125-J5 | F160-J5 | F200-J5 | F250-J5 |          |          |           |          |             |
|                   | C1         | 66.5    | 79.3    | 95.3    | 107     |          |          |           |          |             |
| 6                 | Type       |         | F160-J6 | F200-J6 | F250-J6 | F315-J6  |          |           |          |             |
|                   | C1         |         | 85.3    | 97.3    | 108     | 128      |          |           |          |             |
| 8                 | Type       |         |         | F200-J8 | F250-J8 | F315-J8  | F400-J8  | F500L-J8  |          |             |
|                   | C1         |         |         | 108.3   | 110     | 130      | 138      | 138       |          |             |
| 11                | Type       |         |         |         |         | F315-J11 | F400-J11 | F500L-J11 | F630-J11 |             |
|                   | C1         |         |         |         |         | 133      | 138      | 138       | 165      |             |
| 15                | Type       |         |         |         |         |          |          | F500L-J15 | F630-J15 |             |
|                   | C1         |         |         |         |         |          |          | 145       | 167      |             |

**Chuck with integral mounting flange for camlock fastening according to DIN 55029, ISO 702/II, ASA B 5.9 D1**

| Spindle nose size | Chuck size | 125     | 160     | 200     | 250     | 315      | 400      | 500L      | 630      | Backplate D |
|-------------------|------------|---------|---------|---------|---------|----------|----------|-----------|----------|-------------|
| 3                 | Type       | F125-D3 |         |         |         |          |          |           |          |             |
|                   | C1         | 66.5    |         |         |         |          |          |           |          |             |
| 4                 | Type       | F125-D4 | F160-D4 | F200-D4 |         |          |          |           |          |             |
|                   | C1         | 67.5    | 85.3    | 99.3    |         |          |          |           |          |             |
| 5                 | Type       |         | F160-D5 | F200-D5 | F250-D5 |          |          |           |          |             |
|                   | C1         |         | 87.3    | 101.3   | 112     |          |          |           |          |             |
| 6                 | Type       |         | F160-D6 | F200-D6 | F250-D6 | F315-D6  |          |           |          |             |
|                   | C1         |         | 103.3   | 106.3   | 117     | 146      |          |           |          |             |
| 8                 | Type       |         |         |         | F250-D8 | F315-D8  | F400-D8  | F500L-D8  |          |             |
|                   | C1         |         |         |         | 122     | 138      | 143      | 143       |          |             |
| 11                | Type       |         |         |         |         | F315-D11 | F400-D11 | F500L-D11 | F630-D11 |             |
|                   | C1         |         |         |         |         | 143      | 148      | 148       | 170      |             |
| 15                | Type       |         |         |         |         |          |          | F500L-D15 | F630-D15 |             |
|                   | C1         |         |         |         |         |          |          | 153       | 175      |             |

**Chuck with cylindrical spigot mounting recess, with adaptor flange for mounting on spindle nose according to DIN 55026, ISO 702/I, ASA B 5.9 A1 and A2**

| Spindle nose size | Chuck size | 125         | 160         | 200         | 250         | 315         | 400         | 500L        | 630         | Adaptor flange ZWF |
|-------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|
| 3                 | Type       | F125-A3     |             |             |             |             |             |             |             |                    |
|                   | C1         | 64.5        |             |             |             |             |             |             |             |                    |
|                   | Ident. No  | D1076104000 |             |             |             |             |             |             |             |                    |
| 4                 | Type       | F125-A4     | F160-A4     | F200-A4     |             |             |             |             |             |                    |
|                   | C1         | 64.5        | 81.3        | 110         |             |             |             |             |             |                    |
|                   | Ident. No  | D1070764001 | D1070418002 | -           |             |             |             |             |             |                    |
| 5                 | Type       |             | F160-A5     | F200-A5     | F250-A5     |             |             |             |             |                    |
|                   | C1         |             | 81.3        | 110         | 110         |             |             |             |             |                    |
|                   | Ident. No  |             | D1070419002 | D1070417002 | D1070352002 |             |             |             |             |                    |
| 6                 | Type       |             |             | F200-A6     | F250-A6     | F315-A6     |             |             |             |                    |
|                   | C1         |             |             | 112         | 112         | 136         |             |             |             |                    |
|                   | Ident. No  |             |             | D1070421002 | D1070353002 | D1070363002 |             |             |             |                    |
| 8                 | Type       |             |             |             | F250-A8     | F315-A8     | F400-A8     | F500L-A8    |             |                    |
|                   | C1         |             |             |             | 117         | 136         | 148         | 154         |             |                    |
|                   | Ident. No  |             |             |             | D1070424002 | D1070376002 | D1070427102 | D1070754002 |             |                    |
| 11                | Type       |             |             |             |             | F315-A11    | F400-A11    | F500L-A11   | F630-A11    |                    |
|                   | C1         |             |             |             |             | 143         | 150         | *)154       | 183         |                    |
|                   | Ident. No  |             |             |             |             | D1070375002 | D1070428002 |             | D1070431002 |                    |
| 15                | Type       |             |             |             |             |             |             | F500L-A15   | F630-J15    |                    |
|                   | C1         |             |             |             |             |             |             | 159         | **)167      |                    |
|                   | Ident. No  |             |             |             |             |             |             | D1070755002 |             |                    |

\*) With register cover F500/700-J11

\*\*) With register cover F630/400-J15

**Chuck with integral adaptor plate for mounting on spindle nose according to DIN 55026, ISO 702/I, ASA B 5.9 A1 and A2**

| Intermediate plate ZWS                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Mounting plates for mounting F+ manual chuck on spindle noses according to DIN 55026 and ISO 702/I available on request!</b></p> |

# Calculations for manual chuck Type F+

## Dynamic gripping force

The dynamic gripping force  $F_{sp}$  is thus calculated as:

$$F_{sp} = \frac{C1}{C2 + a} \times Md \pm 0.0008 \times \frac{(G \times Ra \times i)}{1000} \times n^2 \quad [\text{daN}]$$

+ for internal chucking | - for external chucking

Where the gripping force at standstill  $F_{sp0}$  (at spindle speed  $n = 0$ ) is:

$$F_{sp0} = \frac{C1}{C2 + a} \times Md \quad [\text{daN}]$$

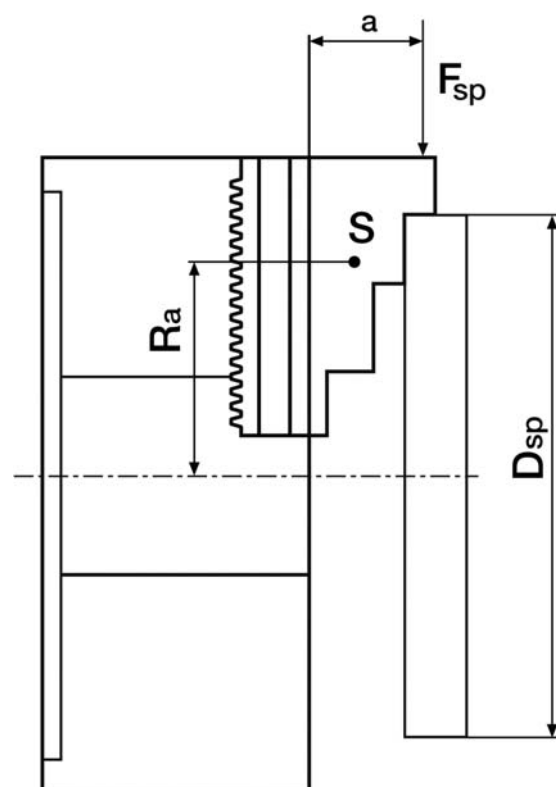
Please choose the maximum torque of the chuck in question for this formula.

and the loss of gripping force  $\Delta F_{sp}$  at spindle speed  $n$  is:

$$\Delta F_{sp} = \pm 0.0008 \times \frac{(G \times Ra \times i)}{1000} \times n^2 \quad [\text{daN}]$$

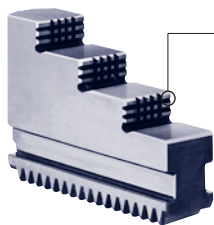
### Terms used in the formula:

- $F_{sp}$**  = dynamic gripping force [daN],  
the total gripping force of all the jaws in rotation  
+ for internal chucking  
- for external chucking
- $C1, C2$**  = Chuck constants
- $Md$**  = Torque generated with chuck key [Nm]
- $n$**  = spindle speed [ $\text{min}^{-1}$ ]
- $a$**  = Jaw overhang [mm]  
(front edge of chuck to clamping position)
- $G$**  = Weight of the jaw set [kg]  
(e.g. one-piece stepped jaw FSTB)
- $i$**  = Number of jaws
- $Ra$**  = Distance of centre of gravity from chuck centreline [mm]
- $D_{sp}$**  = Gripping diameter [mm]



# Jaws

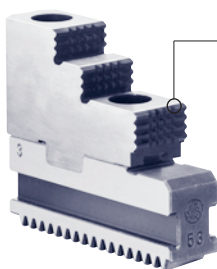
F+ manual chucks are available either with FGB base jaws and FHB hard top jaws, or with one-piece FSTB stepped jaws. Further jaw types and special jaws are available on request.



• One-piece stepped jaws

**FSTB**

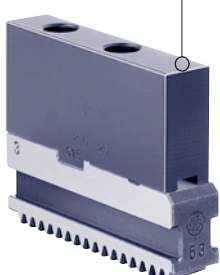
- Hardened, one-piece gripping jaws for universal application
- Gripping jaws can be reground in the chuck.
- Increased driving force due to multiple teeth
- Reground in the chuck when delivered with a FORKARDT chuck
- Maximum stability



• Hard top jaws

**FGB + FHB**

- Hardened top jaws for universal application
- Gripping jaws can be reground in the chuck.
- Increased driving force due to multiple teeth
- Reground in the chuck when delivered with a FORKARDT chuck



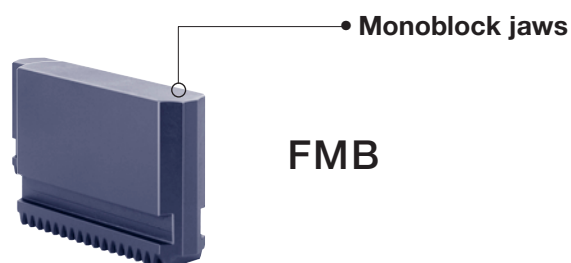
• Soft top jaws

**FGB + FWB**

- Hardened base jaws with soft top jaws for clamping finished machined workpieces
- High precision for finish-machining and precision work
- Internal turning of the chucking diameter in the chuck under clamping pressure

# Jaws

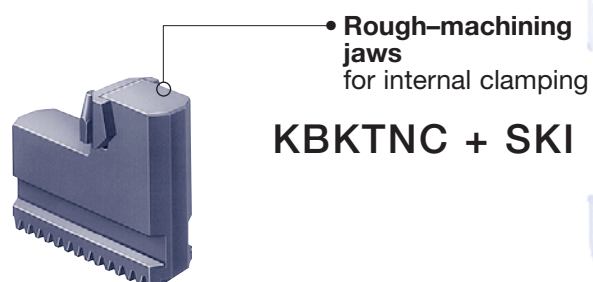
F+ manual chucks are also available either with FMB monoblock jaws and KBKTNC + SKA rough-machining jaws, or KBKTNC + SKI rough-machining jaws. Further jaw types and special jaws are available on request.



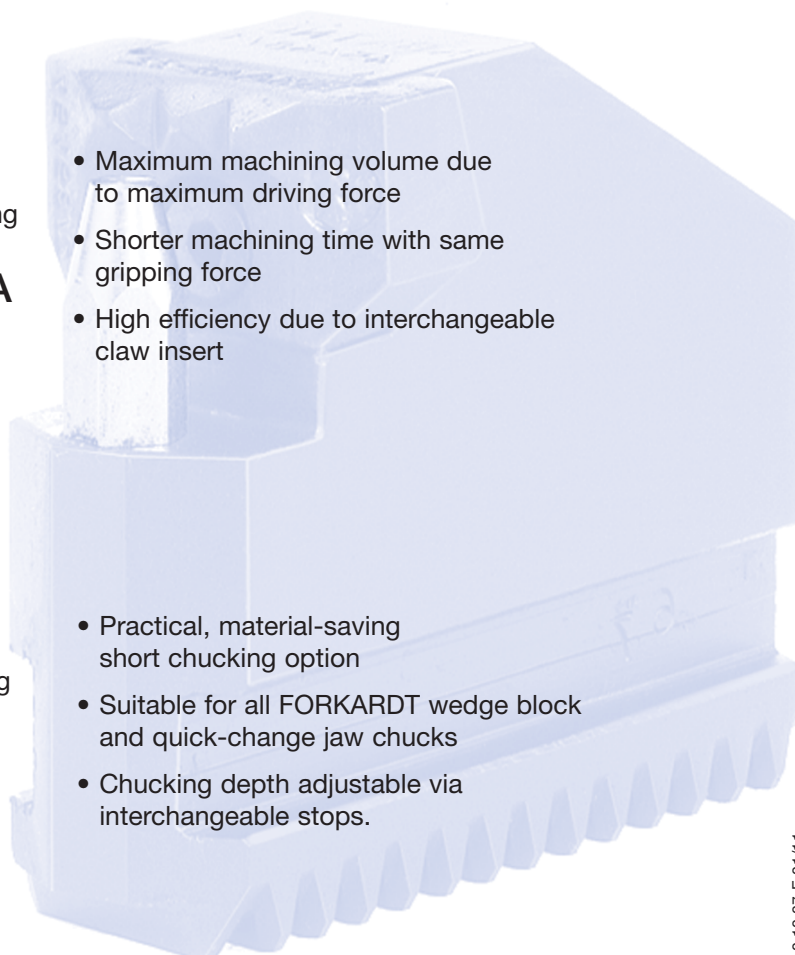
- Soft monoblock jaws for finish-machining
- High stability
- Greater use of jaw volume (no mounting bolts)
- Lower jaw centrifugal force through possible weight reduction
- Work pieces can be clamped closer to the chuck



- Maximum machining volume due to maximum driving force
- Shorter machining time with same gripping force
- High efficiency due to interchangeable claw insert



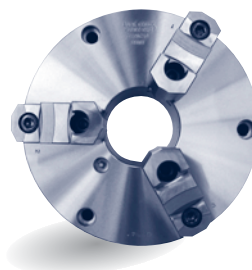
- Practical, material-saving short chucking option
- Suitable for all FORKARDT wedge block and quick-change jaw chucks
- Chucking depth adjustable via interchangeable stops.



# Further manual chucks

## ATSC

- Universal scroll chuck for conventional machines
- Suitable for diverse chucking tasks in small-series production
- DIN and USA types
- Steel body
- Patented adjusting device *Ajust-Tru*®
- High-precision machine spindle alignment
- Good repetitive accuracy



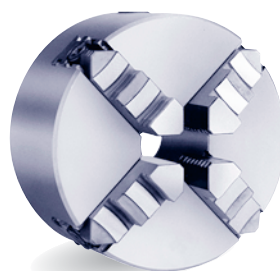
## Bilsing independent chucks

- Four independently adjustable jaws for clamping round and irregular workpieces
- Suitable for numerous medium to heavy machining tasks
- Hardened die-cast steel body for long service life
- Quick-change jaws, easy changing from inside to outside chucking



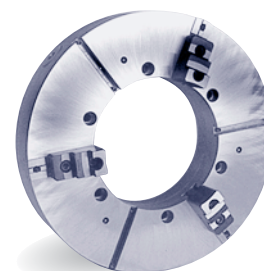
## Wescott scroll chuck system

- 3 and 4-type jaw scroll chuck
- Centric chucking and additional individually adjustable jaws
- Suitable for virtually all turning operations and work piece shapes
- Standard sizes from 160 to 1600 mm



## Hand operated cam-type chuck P with large bore

- 3, 4 or 6-jaw chuck for virtually all turning operations
- High loadability and repeat accuracy for clamping large and heavy workpieces
- Chuck diameter from 700 to 1250 mm
- Extremely large centre hole for machining, e.g. long tubes



# Some other products by FORKARDT

## Gripping force meter

- Electronic/mechanical compact unit for the routine testing of clamping devices
- Increases the safety of production processes
- Designed in C-MOS technology



SKM

## Power chucks

- Highly developed universal chuck
- With open centre, centrifugal force compensation and integrated lubricant reserve
- Precise finish-machining at maximum speeds
- Chuck variants for diverse applications
  - type QLC/KS with extremely large bore
  - type QLC/LS with very long clamping stroke
  - type QLC/AG for compensating clamping
  - type QLC/KT the solid version for highest standards



3 QLC/K family

## Special chucking systems

- Specially designed and manufactured to customer requirements
- Combined centering and clamping function for precise driving
- Example: Axle chuck for car body parts
- Sealed and oil-filled for continuous duty



Special chucks

## Precision power chucks for grinding and hard turning

- Hermetically sealed, with permanent lubrication for freedom from maintenance and wear
- Chucking repeat accuracy < 0.0025 mm
- Jaw changing without loss of accuracy



High-precision chucks

## Expanding mandrels/Collets

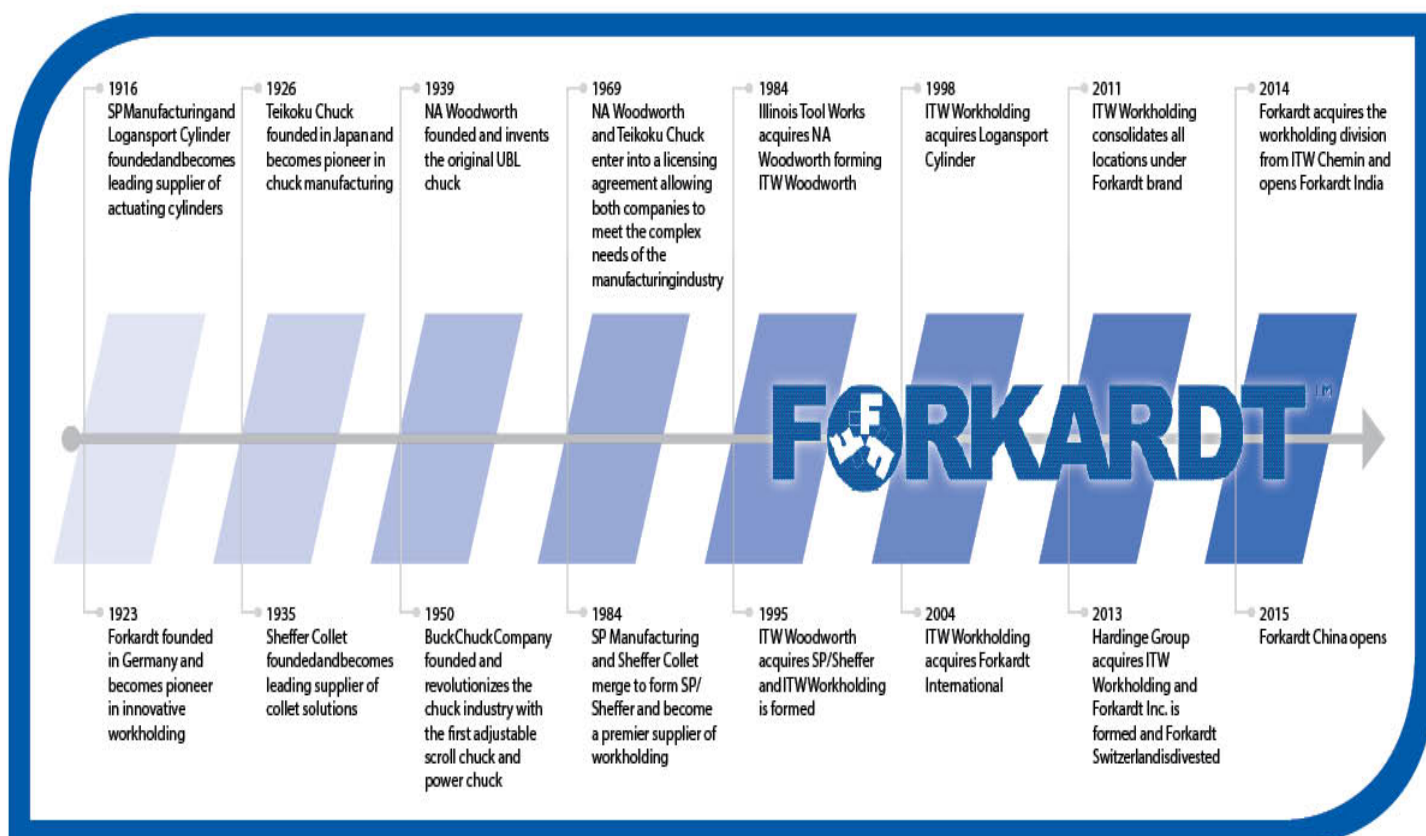
- Clamping range between 12.5-178.0 mm
- Double angle collet system with split sleeves
- Variable range for the development of optimal clamping systems
- Ground to customer requirements



EM



## OUR HISTORY



Innovative Technology by **FORKARDT**

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