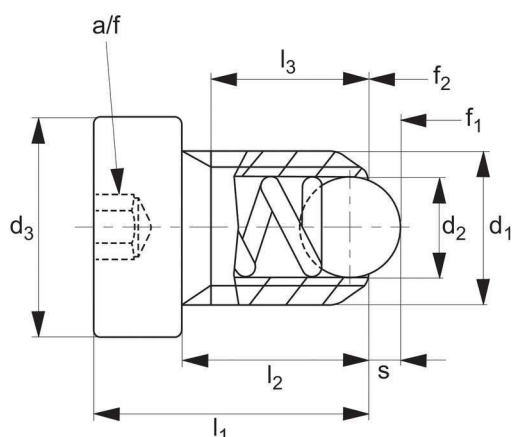


# Spring Plungers

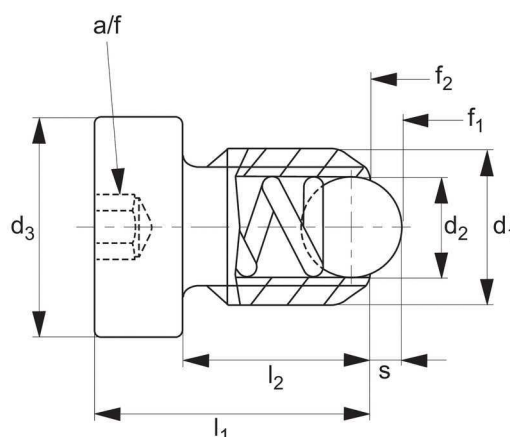
with ball end & hex. socket, headed - **stainless steel**



# 31420



size M4 and M5



size M6 and M12



## Material

### Free cutting steel type-

Body: free cutting steel, blackened.  
Ball: ball bearing steel 1.3505 (100Cr6) hardened.  
Spring: stainless steel.

### Stainless steel type-

Body: stainless steel 1.4305 (AISI 303).

Ball: stainless steel 1.3505 (100Cr6), hardened.  
Spring: stainless steel.

## Technical Notes

Max. temperature 250°C. Spring loads \* = statistical average. \*\* For M4 and M5 threads dimension  $l_3$  is max. screw in depth, i.e. there is no undercut.

For calculation of indexing resistance please refer to spring plunger technical pages.

## Tips

Used for locating, applying pressure or lifting off. Special types available on request.

## Important Notes

All metric Wixroyd spring plungers have a coarse thread, see appendix five for thread details.

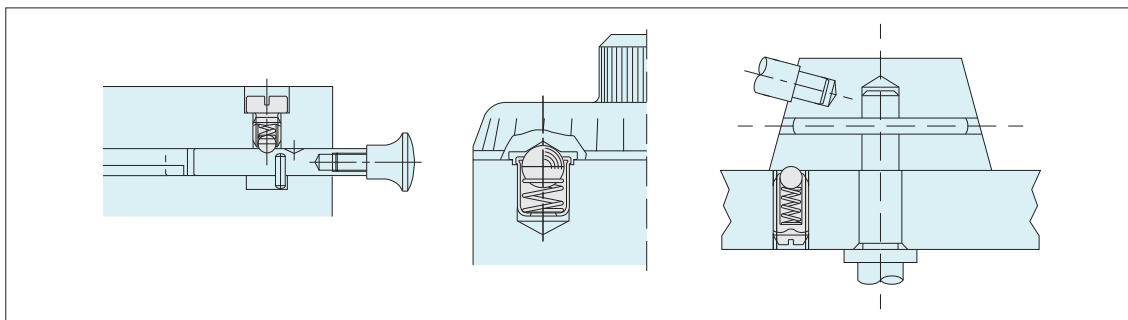
| Order No. Steel | Order No. Stainless | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> ** | s   | a/f | Spring load*<br>f <sub>1</sub><br>N | Spring load*<br>f <sub>2</sub><br>N | g    |
|-----------------|---------------------|----------------|----------------|----------------|----------------|----------------|-------------------|-----|-----|-------------------------------------|-------------------------------------|------|
| 31420.W0930     | 31420.W0940         | M 4            | 2,5            | 6              | 12             | 9,0            | 7,5               | 0,8 | 2,0 | 8                                   | 14                                  | 1,1  |
| 31420.W0931     | 31420.W0941         | M 5            | 3,0            | 8              | 14             | 10,0           | 8,2               | 0,9 | 2,5 | 8                                   | 14                                  | 2,3  |
| 31420.W0932     | 31420.W0942         | M 6            | 3,5            | 10             | 15             | 10,0           | -                 | 1,0 | 3,0 | 11                                  | 18                                  | 3,9  |
| 31420.W0933     | 31420.W0943         | M 8            | 4,5            | 13             | 18             | 12,5           | -                 | 1,5 | 4,0 | 18                                  | 31                                  | 7,8  |
| 31420.W0934     | 31420.W0944         | M10            | 6,0            | 16             | 23             | 17,0           | -                 | 2,0 | 5,0 | 24                                  | 45                                  | 14,0 |
| 31420.W0935     | 31420.W0945         | M12            | 8,0            | 18             | 26             | 19,0           | -                 | 2,5 | 6,0 | 26                                  | 49                                  | 21,0 |





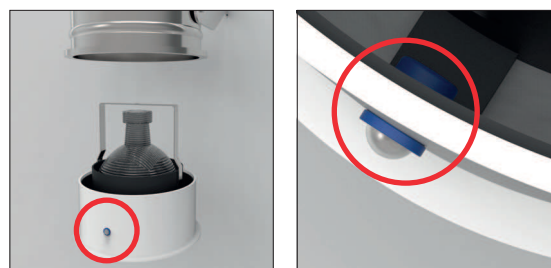
## Wixroyd Spring Plungers - A Range of Endless Possibilities

Made of high quality steel and stainless steel, Wixroyd's Spring Plunger range is proven to be reliable for millions of repetitions in securing, positioning, positive locking, indexing and quick release. Their application is limited only by the imagination!



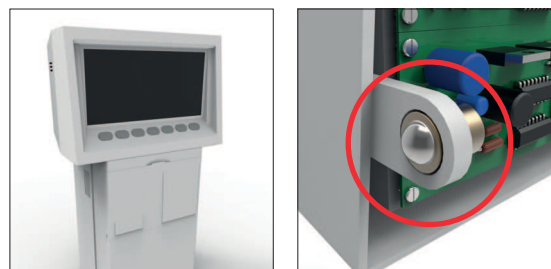
### Commercial lighting

Three push-fit spring plungers no. 32000 have been added to the design of this recessed commercial light fitting. The push-fit design of the plunger makes for easy assembly during production. Their use greatly simplifies the mounting and servicing of the units, reducing handling costs and saving valuable operator time.



### Medical applications

Used in conjunction with a simple hinge, Wixroyd spring plunger 32300 provides an easy and secure means to positively position and secure the back panel of a blood gas analysis machine. With both brass and stainless steel varieties, our spring plungers have a wide range of application in the medical, pharmaceutical, food and drink processing industries.



### Applications

#### Uses

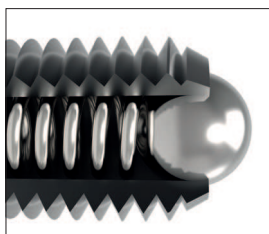
- For location, applying pressure and "lifting off".
- Securing and positioning.
- Positive locking and indexing.
- Quick release.

#### Industry Sectors

- Machine and fixture design.
- Measuring equipment.
- Electronic components.
- Lighting equipment.
- Medical, optics and orthopaedics.

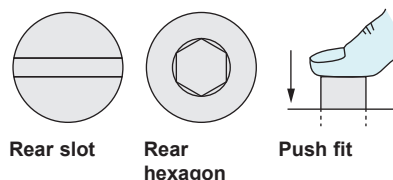
## Wixroyd Spring Plungers - Uses and Mounting Options

### Ball Type

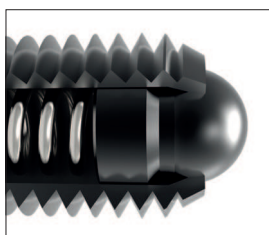


- 31400
- 31420
- 31500
- 32000
- 32100
- 32102
- 32280
- 32300
- 32302
- 32350

#### Mounting Options

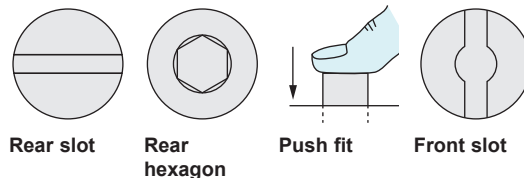


### Pin Head Type



- 31000
- 31600
- 32150
- 32200
- 32220
- 32282
- 32400
- 32420

#### Mounting Options





## Quality products every time

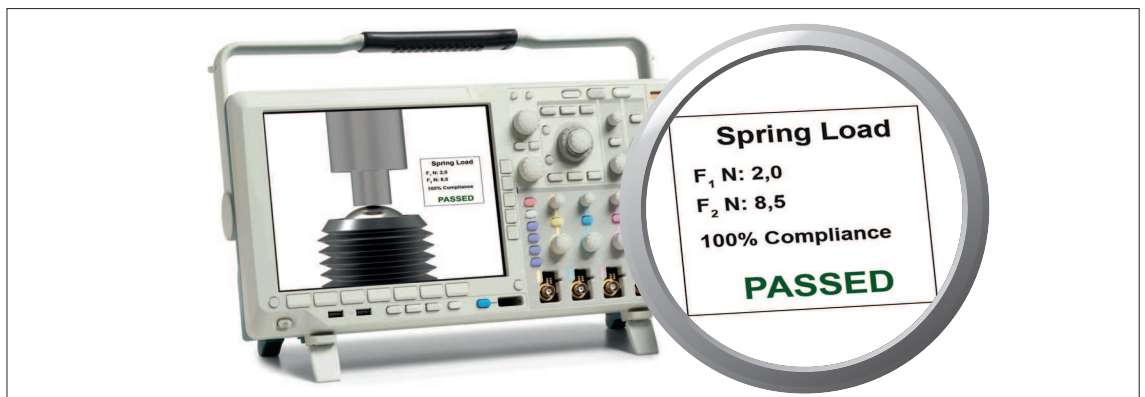
### 100% testing

- Every spring plunger that is produced on the Wixroyd assembly line is individually tested. That is how we guarantee the quality of our products.
- A Wixroyd spring plunger is tested against four key criteria during manufacture.

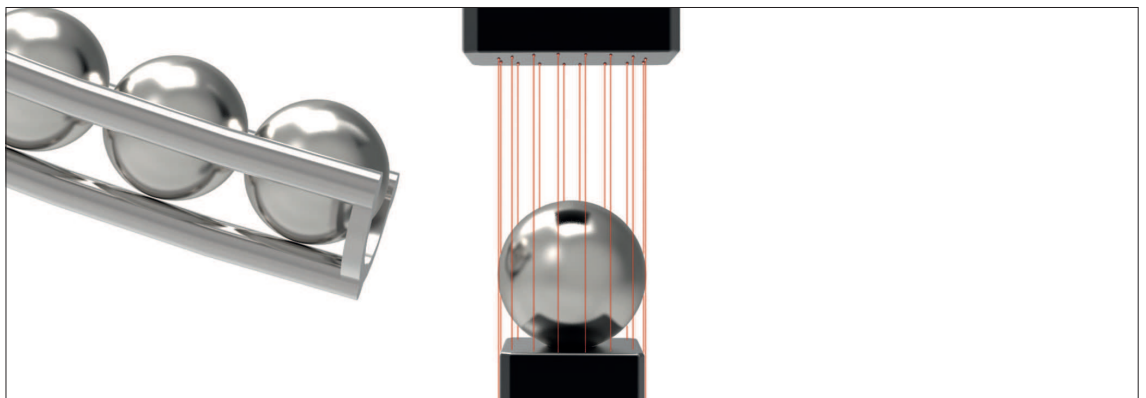
### Accuracy of 'S' stroke/ spring range



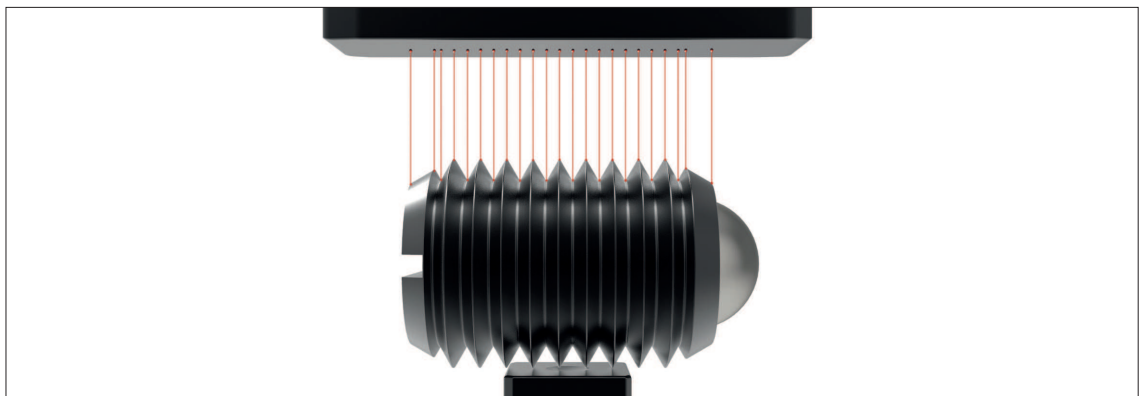
### Accuracy of $f_1$ and $f_2$ spring forces



### Accuracy of ball diameter



### Accuracy of thread



# Wixroyd Spring Plungers

metric thread



**31000  
-32420**

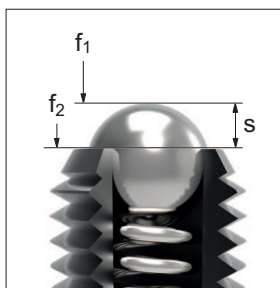
## ISO metric coarse threads (mm)

| O. dia. (D) | 3    | 3,5  | 4    | 4,5  | 5    | 6    | 7    | 8    | 10   | 12   | 14   | 16   | 18   | 20   | 22   | 24   |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Pitch       | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 1,00 | 1,00 | 1,25 | 1,50 | 1,75 | 2,00 | 2,00 | 2,50 | 2,50 | 2,50 | 3,00 |

## Thread details

All Wixroyd metric spring plungers have a coarse thread.

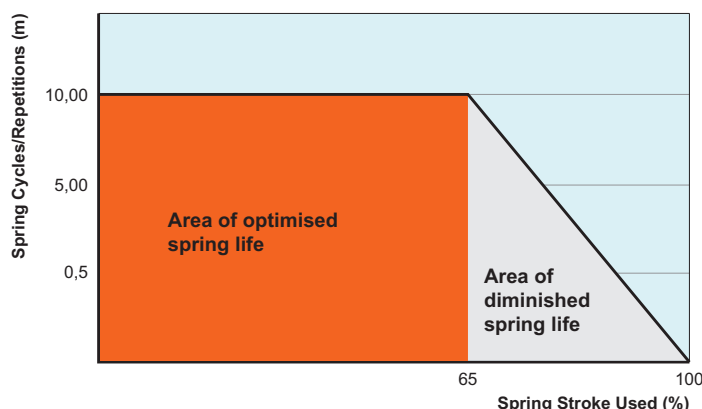
- s** Stroke, or movement of plunger's ball or pin.
- f<sub>1</sub>** The force required in Newtons (N) to overcome the static strength of the spring and achieve initial movement of the plunger's ball or pin.
- f<sub>2</sub>** The force required in Newtons (N) to fully compress the spring until the ball or pin is fully depressed against the plunger's body.



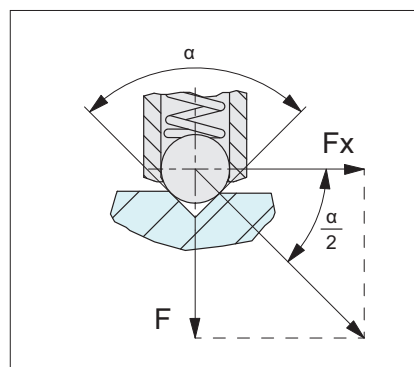
## Spring loads

Although dependent upon a number of application specific factors, we are able to give the following guide relating to the maximum number of spring repetitions or cycles of our spring plungers.

- 100% or full stroke "s" used: approx. 300,000 cycles.
- 65% of stroke "s" used: approx 10,000,000 cycles.



## Typical spring repetitions



We are able to provide the following formula as an approximation of the pull or push force (N) required to 'release' a ball plunger from its indexing counterpart.

$$F_x = \frac{F}{\tan \frac{\alpha}{2}}$$

$F_x$  = pull or push force (N)

$F$  = plungers spring force (see relevant product table)

$\alpha$  = angle of the indexing counter part face

### For example:

For Spring plunger 31500.W0010;

$F = 24\text{N}$  (see product table)

If  $\alpha = 90^\circ$

$$F_x = \frac{24}{\tan \frac{90}{2}} = 24\text{N}$$

If  $\alpha = 60^\circ$

$$F_x = \frac{24}{\tan \frac{60}{2}} = 41,5\text{N}$$

If  $\alpha = 120^\circ$

$$F_x = \frac{24}{\tan \frac{120}{2}} = 13,8\text{N}$$

## Calculating indexing resistance

**Important Note: This is only an approximation formula. For more accurate calculation the roughness of the counterpart surface as well as any variation in the plungers spring force (due to age or high repetitions) should be considered.**

We are often asked the electrical conductivity of our spring plungers, unfortunately we are unable to provide any reliable information related to this as there are many factors in an application. We recommend you study the specific material properties of the spring plunger's component parts to make your own calculations, alternatively if in doubt make a test application.

## Electrical conductivity

Manufacturing exactly to your specific requirements is also our strength. If you need a variation in spring pressure, plunger body or pin design we can assist with a special design item for volumes as low as 1,000 units. For further information, or to request a quotation, please call our sales office on 0845 26 66 577.

## Specials to your own design