Tschudin + Heid

Precision + Partnership

Precision in
top quality –

LONGITUDINAL CYLINDER GUIDES

LONGITUDINAL CYLINDRICAL GUIDES

Backlash-free for use into space

Our renowned in-house products include not only blowing nozzles, but also LONGITUDINAL CYLINDRICAL GUIDES which are used as construction elements in machine, apparatus, tool and fixture construction. We manufacture these in complete packages consisting of a guide bush and column and the matching roller cage made of aluminium, bronze or plastic. (Further materials on request) The size depends on the respective requirements and is specifically adapted to the static or dynamic loads. These values are used to determine the dimensions of the roller cage with the load capacities per roller track.

During assembly, the lifting speed, load, preload value and moment forces play an important role. The surface finish of the shaft and bush should have a roughness of Rt 0.8 µm. The best possible cleaning of all guide elements is of great importance. When installed, the roller cage should always move within the bushing and column,

TOLERANCE GROUP IN µM

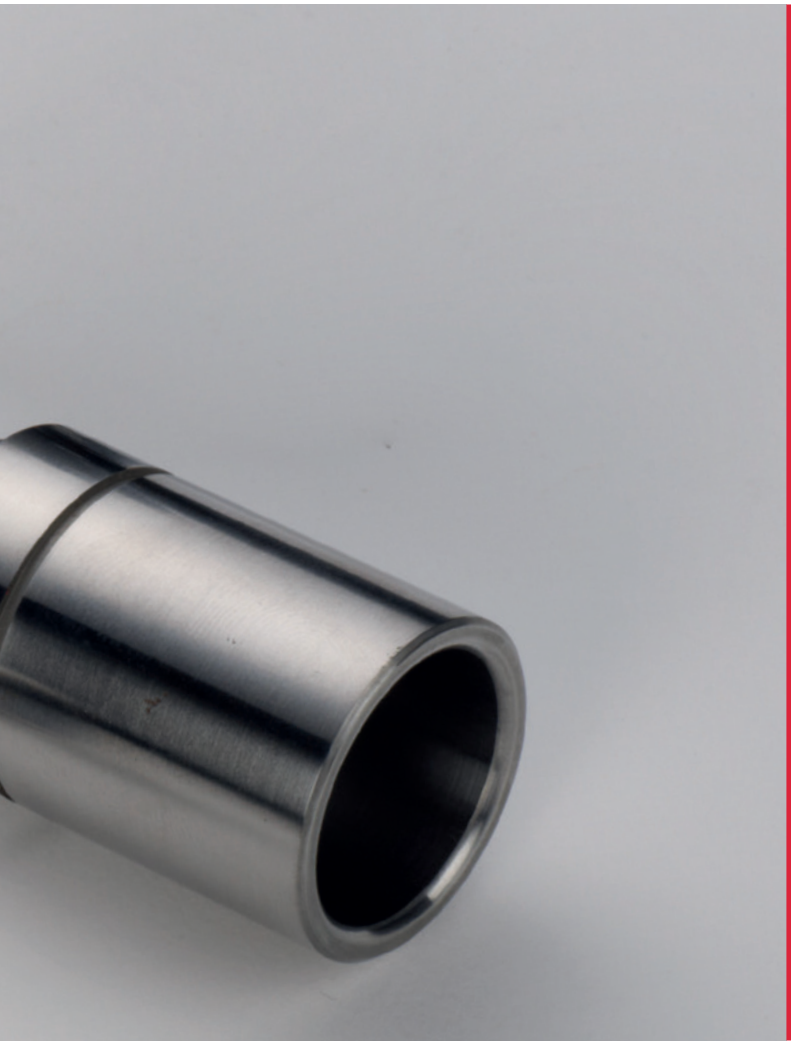
Group 1	+2/+1
Group 2	+1/0
Group 3	0/–1
Group 4	–1/–2
Group 5	–2/–3

keeping in mind that the roller cage only travels half of the way. In order to prevent possible axial mooving, the roller cage is secured by suitable thrust surfaces such as shaft shoulders or thrust washers.

The last decades have provided us with valuable experience in the in-house production of our longitudinal cylinder guides. Expert know-how, innovative technology and modern machinery provide us with optimum production conditions. We are therefore able to meet even the most complex customer requirements at the highest level of quality, flexibly and on schedule.

THE ADVANTAGES OF A ROLLER GUIDE AT A GLANCE:

- Exact positioning accuracy due to the elongated shape of the profiled rollers
- High load capacity: 12 times higher than a ball of the same size
- Durability due to line contact with the roller body
- Smooth running due to optimum rolling action
- Backlash-free and rigid guidance with minimum preload

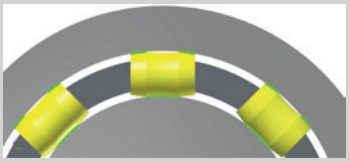


RUNNING QUALITY, RESILIENCE AND FUNCTIONALITY IN MOVEMENT TECHNOLOGY

Roller guide versus ball guide

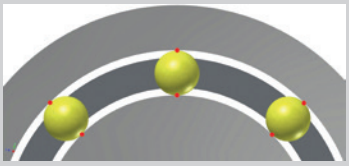
The material 100Cr6 is characterised by its tempering stability, toughness and low deformation under heat treatment. Due to these properties, the material is is excellently suited for the standard production of profile rollers. Stainless materials on request. However, it is not only high-quality material that is decisive for a top result, but also the correct use.

Compared to a ball bearing guide with a conventional point contact a highly complex roller guide can shine with decisive advantages: These include a high load capacity, high bearing accuracy, long service life and backlash-free guidance with minimal preload. Especially in TH profile roller stands out from its competitors, especially in terms of load capacity, a profile roller can withstand 12 times the load of a ball of the same size. In addition, the line contact with the roller body causes significantly less wear.



T+H roller guide
Bushing, column

LINE CONTACT



Ball bearing guide
Bushing, column

POINT CONTACT

PRELOAD

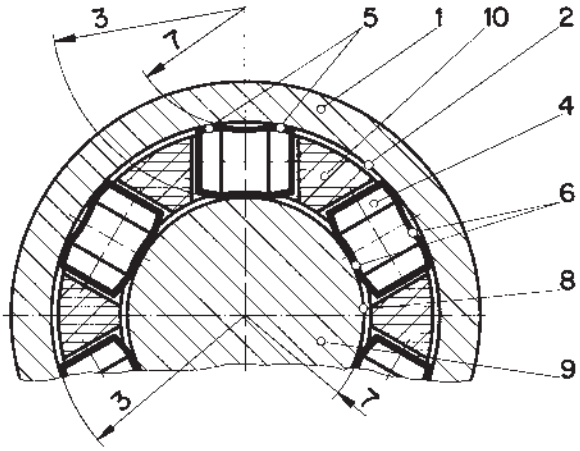
The preload (V) is the difference between the dimensions of the two radially positioned profile rollers which make contact on the guide shaft and guide bush. V = Dw + 2R - Di. The preload values, depending on the load and shaft diameter, can be found in the following table. They can be obtained by selecting the corresponding tolerance group of the profile rollers.

For dynamic load				
V in µm	1 – 2	2 – 3		2 – 4
Dw in mm	10 – 18	19 – 30	32 – 55	72 – 92

For static load				
V in µm	1 – 2	2 – 3	3 – 5	2 – 4
Dw in mm	10 – 18	19 – 30	32 – 55	72 – 92

CONSTRUCTIONAL CONSTRUCTION

In the cross-section, the line contact of the profiled roller with its saddle barrel shape. The complete longitudinal guide consists of the guide bushing (1), on whose concave guide track (2) the profile rollers (4) roll. The rolling takes place on the outer profile roller running surfaces (5), which have approximately the same radius (3) as the guide bush. The inner running surface (6) of the same roller (4) rolls on the convex guide track (8) of the guide shaft (9). The saddle-shaped running surface (6) is approximately the same radius (7) as the radius (7) of the guide shaft (9). In order to prevent contact and canting of the profile rollers (4), the profile rollers (4) are held in a plastic or metal cage (10).



INSTALLATION GUIDELINES

The type of installation is mainly determined by the functional requirements on the longitudinal guide. Basically it should be noted that at low lifting speeds (1-10 m/min) and a heavy load, the higher pretension value should be used. Loads and moment forces, resulting from the acceleration that occurs, must be taken into account. When fitting the roller cage, it is an advantageous to first manufacture the guide shaft to the appropriate dimension with a diameter tolerance of ISO h4. The hole of the guide bush can then be adjusted by honing. When installing the guide bushing, make sure that it is not too tight a press fit. Depending on the type of application, it can also be glued or cast in. A light sliding fit with lateral stops is also possible, depending on the construction. With multiple bearing or multiple column frames, exact alignment is of great importance, as otherwise jamming can occur. For optimum running properties we recommended our special grease. Dry running is not recommen.

DEFINITION OF THE ROLLER CAGE DIMENSIONS

The size of a longitudinal cylinder guide depends on the requirements. It is therefore necessary to know the total load, i.e. the data of the statically or dynamically acting forces. Based on these values, the dimensions of the roller cage can be determined using the load capacities per roller track. For the application we recommend that sufficient safety is taken into account.

Dimensionen		Roller cage material		
Dw	Di	Plastic	Aluminium	Bronze
10	16	✓	✓	✓
12	18	✓	✓	✓
14	20	✓	✓	✓
15	21	✓	✓	✓
16	22	✓	✓	✓
17	23	✓	✓	✓
18	24	✓	✓	✓
19	25	✓	✓	✓
20	26	✓	✓	✓
21	27	✓	✓	✓
24	30	✓	✓	✓
25	31	✓	✓	✓
24	32	✓	✓	✓
30	38	✓	✓	✓
32	40	✓	✓	✓
38	46	✓	✓	✓
40	48	✓	✓	✓
42	50	✓	✓	✓
48	56	✓	✓	✓
50	58	✓	✓	✓
52	60	✓	✓	✓
55	63	✓	✓	✓
60	68	✓	✓	✓
63	71	✓	✓	✓
72	80	✓	✓	✓
80	92	✓	✓	✓
92	100		✓	✓
100	112		✓	✓
120	132		✓	✓
130	142		✓	✓
140	152		✓	✓
150	162		✓	✓
160	172		✓	✓
180	192		✓	✓
200	212		✓	✓

REFERENCES

That‘s what sets us apart!

Logistics solutions customised for you, such as KanBan, quantity or framework contracts, in combination with professional packaging, for example in special trays or boxes, guarantee that your goods arrive undamaged at their destination. We deliver on time and flexibly to customers, nationally and internationally, from a variety of different industries, ranging from building automation to pneumatics specialists and medical technology to the aerospace industry. Specially manufactured lubricating greases can be used for these demanding applications. You will find our products in use all over the world and they even successfully withstand stress tests in space.

APPLICATION AND EXAMPLES OF USE:

- Toolmaking
- Punching and pressing machines
- Length compensation of milling spindles
- Use in paper machines
- Use in cylindrical grinding machines

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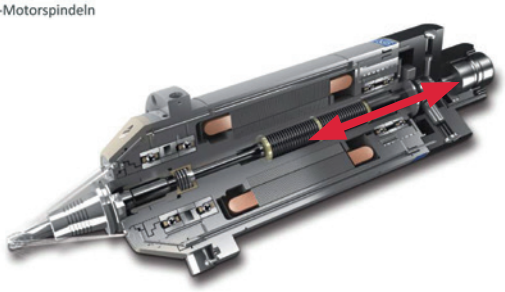
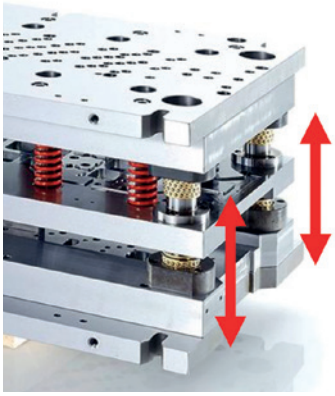


Length compensation
of milling spindles

HAULICK ROOS

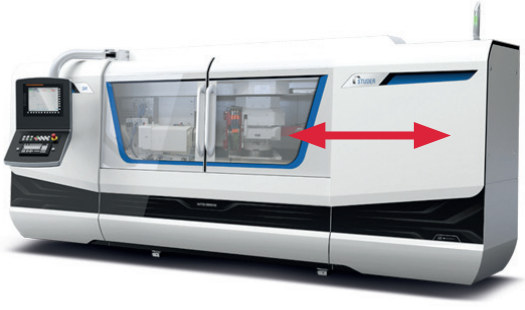
Punching and pressing
machine guides

STEINEL®



Use in toolmaking
(punching and bending
machines)

STUDER



Use in cylindrical grinding machines
(quill guide in tailstock)