

PAIRING CLASSIFICATION

SLIDING GUIDE (SINTERED FERRITE)

ROLLER BEARING

Recommendation for pairing selection:

Cutting clearance	Sliding guide	Ball bearing guide	Description	Recommendation
small	small	large	Piece parts with small tolerances, closely specified cut edge properties and contours – also parts from thin material	Pairing 1
medium	medium	medium	Piece parts from sheet thicker than 1 mm – also preferably for progression dies	Pairing 2
large	large	small	Where demands on edges and burrs are not stringent; note that large die clearances require smaller shearing forces	Pairing 3

Selection of punch-matrix clearance is largely determined by piece part characteristics: percentage of sheared land versus breakaway, but also by demands on burr formation.

Further criteria are the part piece material, as well as the type and condition of the tooling and the press.

Combination possibilities guide pillars, cages and bushings:

	Sliding guide				Ball bearing guide			
	Guide pillar		Guide bushing		Guide pillar		Guide bushing	
	Colour	Order No.	Colour	Order No.	Colour	Order No.	Colour	Order No.
Pairing 1	yellow	.10	yellow	.10	yellow	.10	red	.30
	green	.20	yellow	.10	yellow	.10	green	.20
					green	.20	red	.30
Pairing 2	green	.20	green	.20	yellow	.10	yellow	.10
	red	.30	yellow	.10	green	.20	green	.20
	yellow	.10	green	.20	red	.30	red	.30
Pairing 3	red	.30	red	.30	green	.20	yellow	.10
	green	.20	red	.30	red	.30	green	.20
	yellow	.10	red	.30	red	.30	yellow	.10

Identification for tolerances with colour dots on the outside of the guide pillars and bushings.

Selection Criteria: die clearance – stock thickness – material

Note for 4-pillar die sets:

Please be aware that tight bushing clearances or high preloads are generally unsuitable for 4-pillar die sets.

Deviation from the bore geometry and from the perpendicularity requires a pairing classification of pairing 2 or even better pairing 3. The pairing classification does not signify any difference in quality, rather a selection of the optimum bushing clearance in the case of guide pillars or the optimum preloading in the case of ball bearings (see also chart next page).

Ordering Code (example):

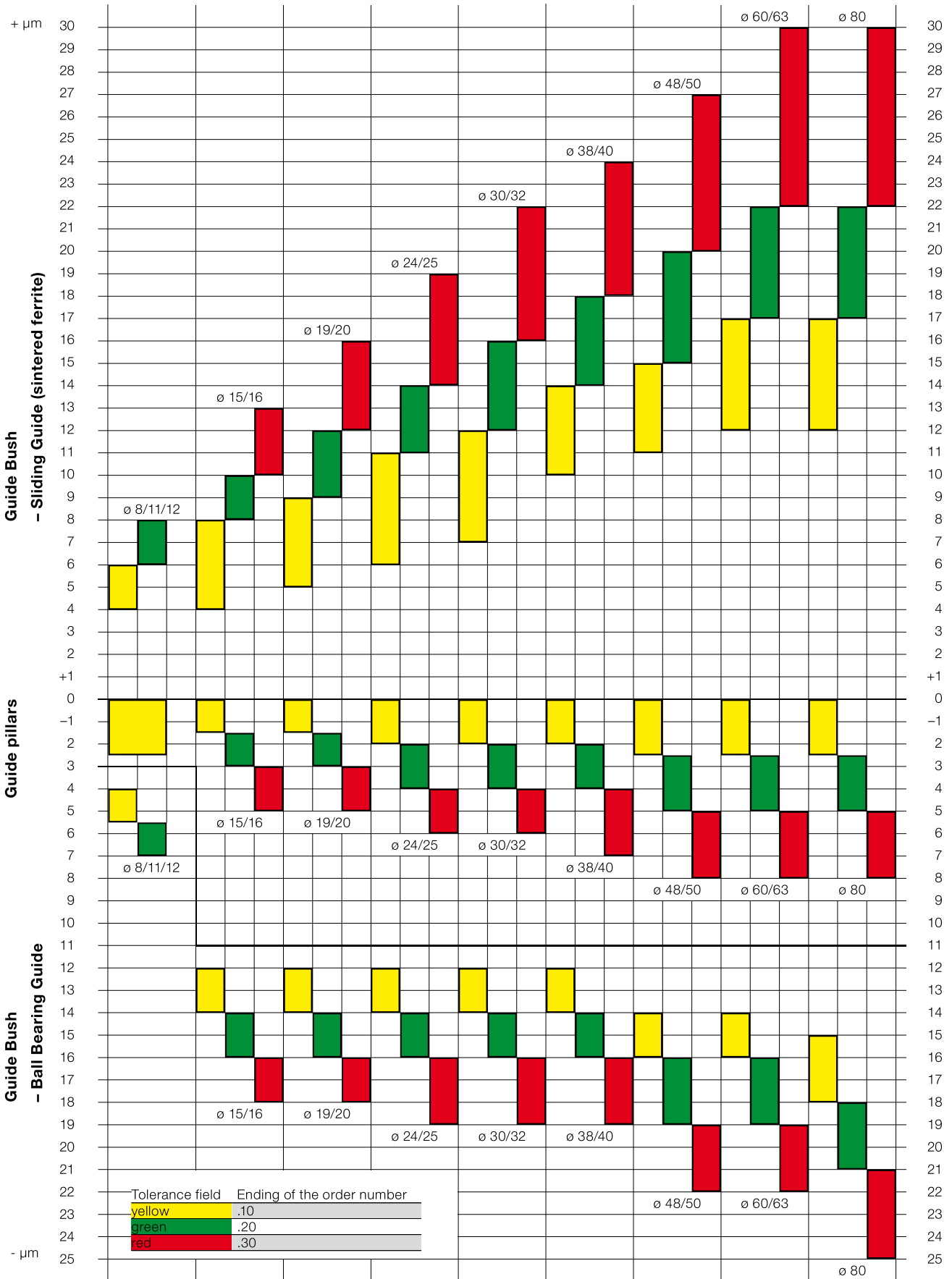
Guide pillar in tolerance code yellow = 202.19.040.260.10

Sintered ferrite bushing with tolerance code green = 2081.31.040.20

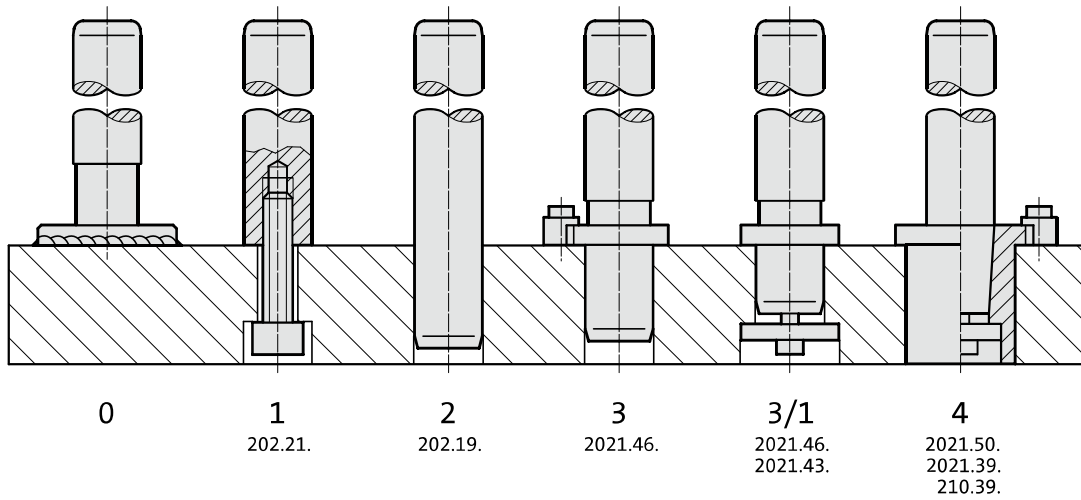
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DEFLECTION OF PILLARS AND BENDING EQUATION

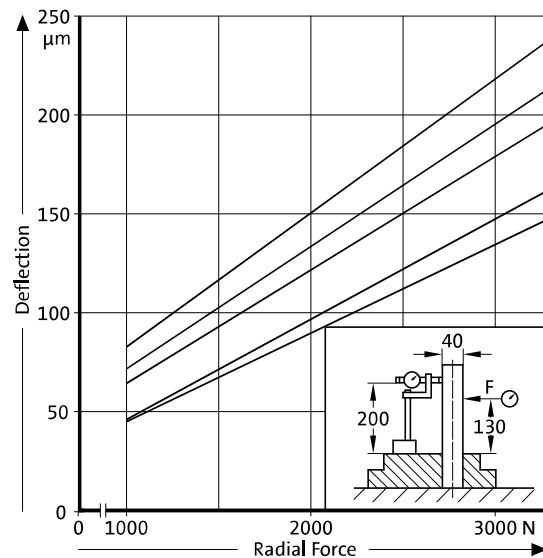


Deflection of Pillars

The practical use of this type of screw-on column with the technical advantages of bending stiffness shown requires a rethink in the design of the tool.

Mounting Instructions:

The friction surfaces of the screw connections (bearing surface and thread) must be lubricated with Molykote paste. To compensate for the setting of the screws, the connection should be loosened at least twice and tightened again with a torque wrench (see tightening torque in table).



Bending equation

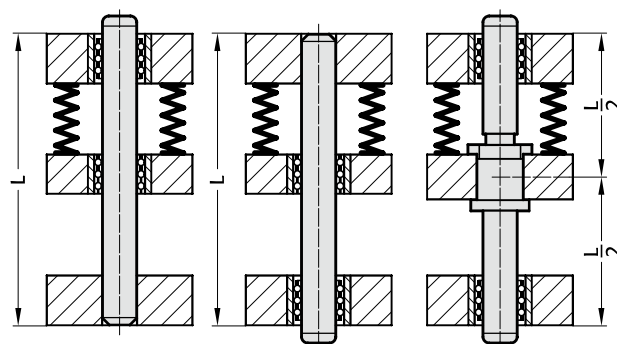
The transverse load resistance to tool guides is greatly influenced by the position of the guide pillar fixing.

For a tool with a spring-mounted die guide plate and pillar fixing at the top or bottom of the tool, the deflection and pillar bending values do not differ when the load is applied at the side since the distance (L) from the point of application of the force is the same.

Significantly better pillar bending values can be achieved by fixing the guide pillars in the guide plate, i.e. in the centre of the pillar.

Since the distance (L/2) between the point of application of the force and the fixing surface is thus halved, the load-bearing capacity is increased by eight times.

At stroke rates > 500 strokes/min., increased mass acceleration values arise due to the larger plate weight of the stamp guide plate (incl. weight of the guide pillars). To counteract this negative effect, these guide pillars are designed as hollow pillars.



Bending Equation
 $f = \frac{F \cdot L^3}{3 \cdot E \cdot J}$

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 $f = \frac{F \cdot (\frac{L}{2})^3}{3 \cdot E \cdot J}$