

***Round Fine Centering system
for the mold construction***

Innovative design – Patent pending



Advantages

- Durable: for mass production
- Play free for very precise mold alignment
- Shorter cycle times
- High initial load capacity at centering start
- No noticeable wear: can be used in clean rooms
- Lower total cost
- Excellent design freedom

Innovative Design offering Precision and Durability

Application

Round Fine Centering with preloaded roller units (patent pending) for demanding injection molding applications. Suitable for mass production and providing very precise mold tool alignment – the pre-centering enables to gently close the slides (synchronous closed), the injection-molded parts are removed from the mold without any damage.

Perfectly suited for clean room production environments and high precision multi cavity applications.

Depending on the application and space available, two or more units can be used. The unique concept of the Round Fine Centering units provides the design engineer with the freedom of choosing the arrangement and number of units to be used.

Maximum surface temperature difference between the two mold halves < 10°C, ideal < 5°C



Round Fine Centering

Cost comparison with conventional guide blocks

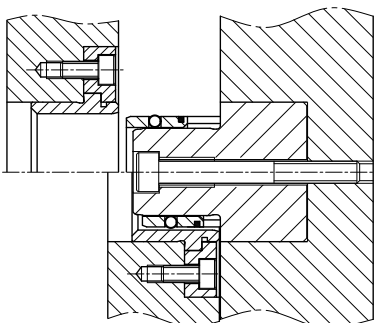
| Cost for first fitting | | | |
|--|----------------------------|----------------------------|----------------------------|
| Number of guide blocks compared to round fine centering | 4¹⁾ to 4 | 4¹⁾ to 2 | 4¹⁾ to 6 |
| Purchase price of the centering and machining costs for the location pockets | 93% approx. same size | 58% greater size | 118% smaller size |

100% = conventional guide block

¹⁾ Number of conventional guide blocks

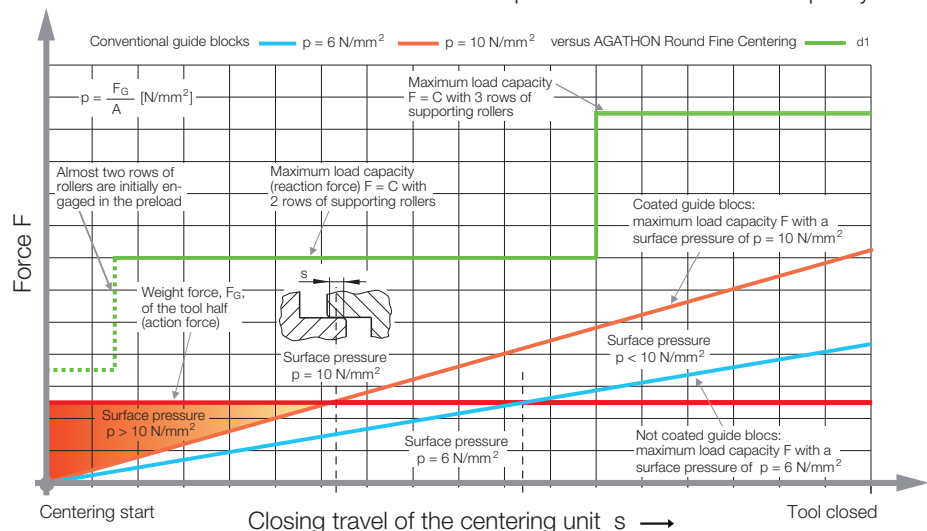
Advantages of the Round Fine Centering (AGATHON Standard 7990)

- Lower total cost, low manufacturing cost of the cylindrical location bore.
- Minimal maintenance, they can be used with or without lubrication, depending upon application.
- The Round Fine Centering system provides very precise axial positioning at the centering start because almost two rows of rollers are simultaneously engaged in the pre-load – this guarantees a high initial load capacity and a long cycle life. The initial load capacity with 2 rows of rollers engaged is equivalent to 16 rows of balls.



Status: open / closed

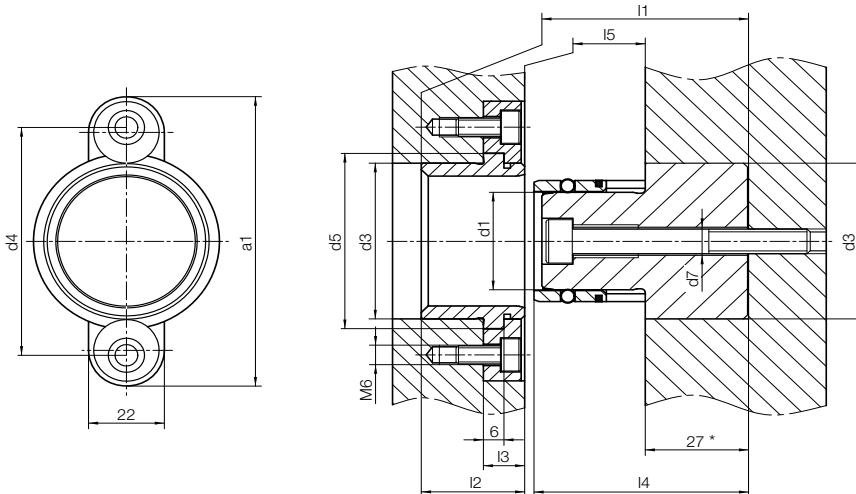
Comparison of maximum load capacity



- The conventional guide block system creates very high surface pressure during initial engagement (up to a sufficient overlap), this promotes rapid wear of the two centering surfaces. Especially at centering start (line contact), the surface pressure “p” exceeds the permissible value (p_{zul}) several times.
- The life span of the unit can be extended by rotating the centering unit by 120° each time.
- Can be used without lubricants, if required for clean room applications, due to its extremely low friction characteristics.
- Heat resistant up to approx. 150°C

Data sheet for Standard 7990

Material of the guide elements: 100Cr6 – 1.3505; hardened 62 - 64 HRC,
 $d1 \leq 25\text{mm}$: 16MnCr5 hardened 61 - 63 HRC.



a1 = Installation space required for the clamps, alternative arrangement: 120°

d7 = Center hole for mounting the guide pillar, including auxiliary thread for easy removal

I1 = Nominal length of the centering unit in the fully closed position

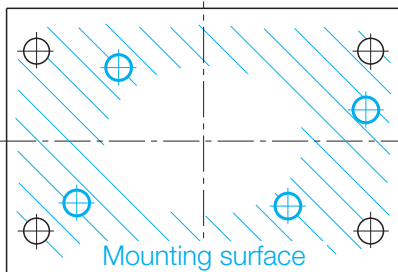
I2 = Total length of the centering bush, tolerance -0.1/-0.3

I3 = Installation depth of the centering bush (counter bore), tolerance +/- 0.1

I4 = Total length of the centering pillar

I5 = Total working length of the guide

* delivered with tolerance -0.1/-0.3



d1 = Centering pillar, diameter tolerance ISO h3, superfinish ground

d3 = Outer diameter of the centering pillar and flanged bush to fit js4/H5(H6)

d4 = Reference diameter for clamps (clamps A-8001.000.001), mounting thread: M6x18

d5 = Outer diameter of the flanged bush

Excellent design freedom

| Article | d1 | d3 | d4 | d5 | a1 | d7 | I1 | I2 | I3 | I4 | I5 | C, Co [kN] - Indicative value |
|--------------|----|----|----|----|----|-----|------|------|----|------|-----|--------------------------------------|
| 7990.015.049 | 15 | 28 | 52 | 36 | 69 | 6.8 | 49.5 | 22.5 | 12 | 51.5 | ~14 | Entry (C): 1.4 Closed (Co): 4.7 |
| 7990.025.054 | 25 | 40 | 64 | 48 | 81 | 8.5 | 54 | 27 | 12 | 55.5 | ~18 | Entry (C): 2.15 Closed (Co): 10.8 |
| 7990.032.057 | 32 | 48 | 70 | 54 | 87 | 8.5 | 57 | 30 | 12 | 59.5 | ~20 | Entry (C): 2.75 Closed (Co): 13.8 |

C = dynamic load rating in kN – Initial load capacity

Co = static load rating in kN – Tool fully closed

Fitting accuracy, machining the mounting holes

Position accuracy: Mounting holes for pillar and bush must be within a maximum position deviation of 0.005mm. The coordination of the slide elements must be accordingly performed in closed tool, so that no radial forces influence on the centering.

Perpendicularity: Bush and pillar axis must be within a maximum position deviation of 0.005mm per 100mm, to the mold split line.

Installation depth: The flatness of all axis bearing surfaces of the holes for the centering unit should not vary by more than 0.05mm.

Performance characteristics

Offset:

The Round Fine Centering system (AGATHON Standard 7990) can correct an offset within the mold of up to 0.15mm. However it is advisable to prealign the mold halves to within < 0.05mm, using the main sliding guides / pillars.

Temperature differences:

Mold tools which run both halves at the same temperature show very small differences in surface extension and an overloading of the Round Fine Centering system will be avoided. The potential of different tool expansion in homogenous tempered tool halves is small – and are ideal applications for Round Fine Centering units.

Centering units:

Centering bush and centering pillar are manufactured to very accurate tolerances and matched to one another. It is important that the two are always installed together as a pair.

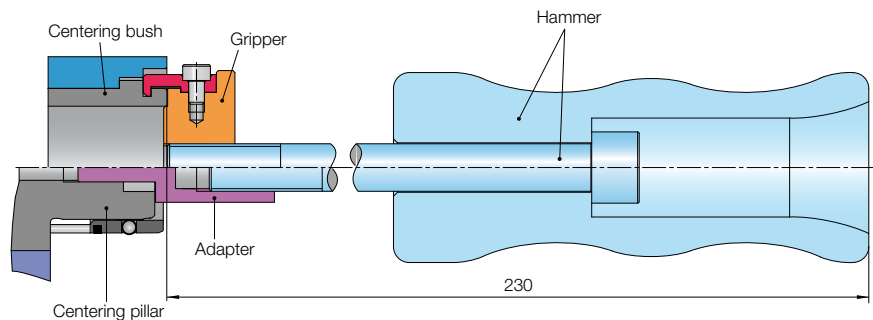
Solutions for multi-component tools on request.

Removal

The centering pillar can be easily removed using conventional extractors or a sliding hammer, by means of the auxiliary thread.

Using the AGATHON extractor kit, available for all sizes, the centering pillar and centering bush can be removed as shown on the illustration beside.

AGATHON extractor kit for bush (gripper) and centering pillar (via adapter), including hammer:



Extractor kit

| Article: | Kit description |
|--------------|---|
| 8020.000.000 | Case with 3 grippers, 2 adapters and 1 hammer |

Agency close to you:

<http://www.agathon.ch/en/standard-parts/agencies/agencies.asp>

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