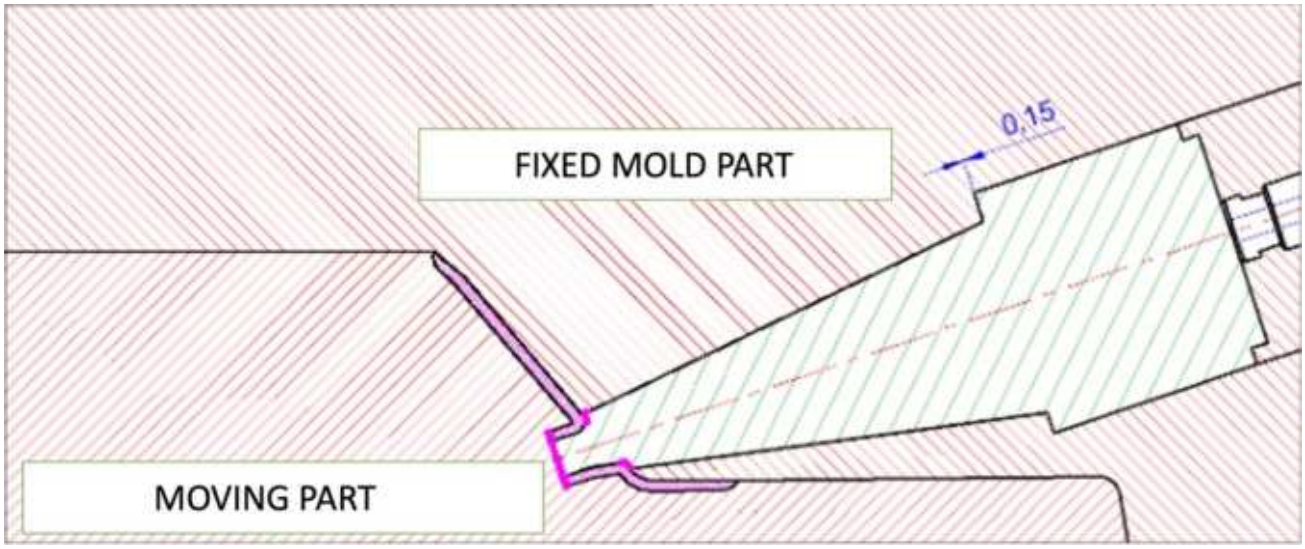
V270CG Flange 211E Preload Setting

WHAT IS PRELOAD

DEFINITION OF PRELOAD

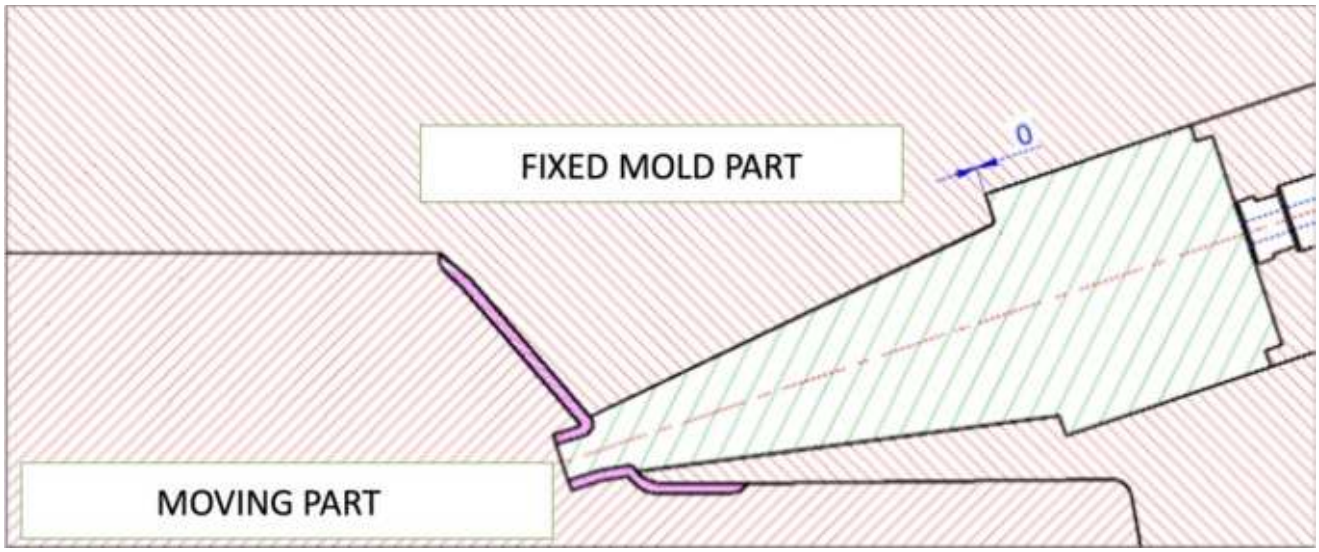
In physics, elasticity is the property that allows a body to deform under the action of an external force and to regain, if the deformations are not excessive, its original shape when the stress to which it is subjected (compressive or traction force) ceases. If the body, once the stress has ceased, resumes exactly the initial configuration, it is said to be perfectly elastic. Starting from the physical definition that each mechanical component, due to its elasticity, can compress by an X value depending on its size and on the force and reaction applied, in the specific case of the V270CG self-locking cylinder, the component subject to greater elastic shrinkage is the rod. In fact, given an axial force generated by the plastic injection pressure (which acts on the front surface of the plug / core) and a reaction of the mechanical locking system assisted by the hydraulic pressure, the rod, due to its initial length and surface, under these forces undergoes the largest shrinkage in absolute value.

In common applications on molds, for slides and plugs that close on the die, this could lead to material seepage (flashes or burrs) which, as a consequence, would force to reject the plastic product, both in terms of the aesthetic aspect but also functional, if such part has to be coupled with others.



Example photo of a part produced without the preload

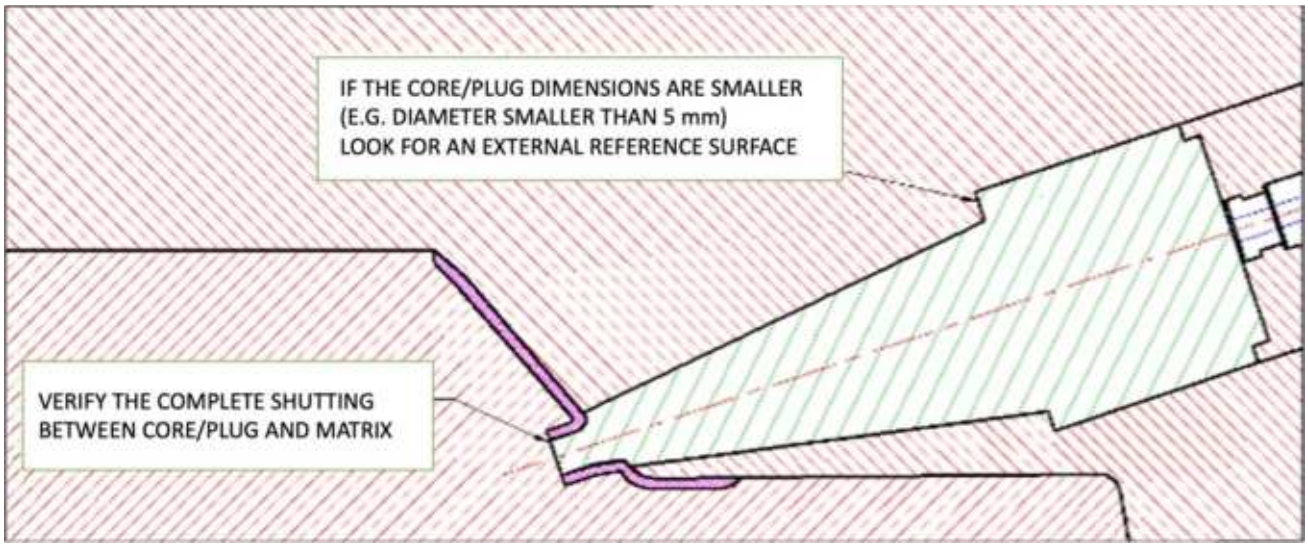
The preload function applied to the V270 cylinders allows the cylinder rod to be pre-compressed before the injection phase, to the extent that corresponds to the elasticity of the rod under the maximum value of the static locking force envisaged by the design (see table on page 4 of the V270 catalog).
For a correct functioning of the mechanical locking, the cylinder must necessarily complete both the outgoing stroke (rod fully extended) and also return one. (rod retracted) to allow proper operation of the position sensor.



Example 1

Example photo of a part injected using preload

It is advisable to forecast the preload operation in the design phase of the mold, ensuring a mechanical feedback of the plug / core (see example 1) which will subsequently also be used in the assembly phase to have a "0" starting point (plug perfectly closed) according to which the preload will then be applied.

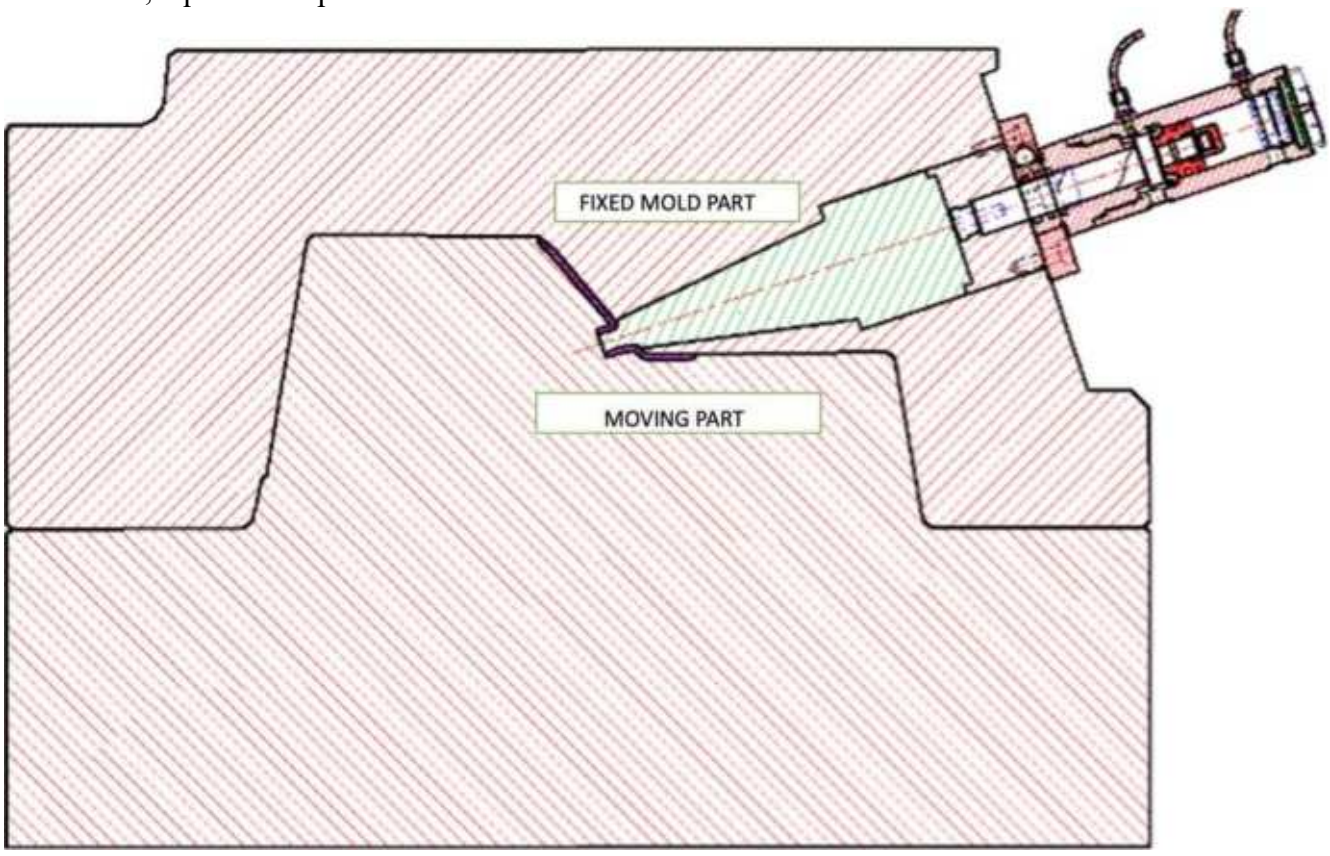


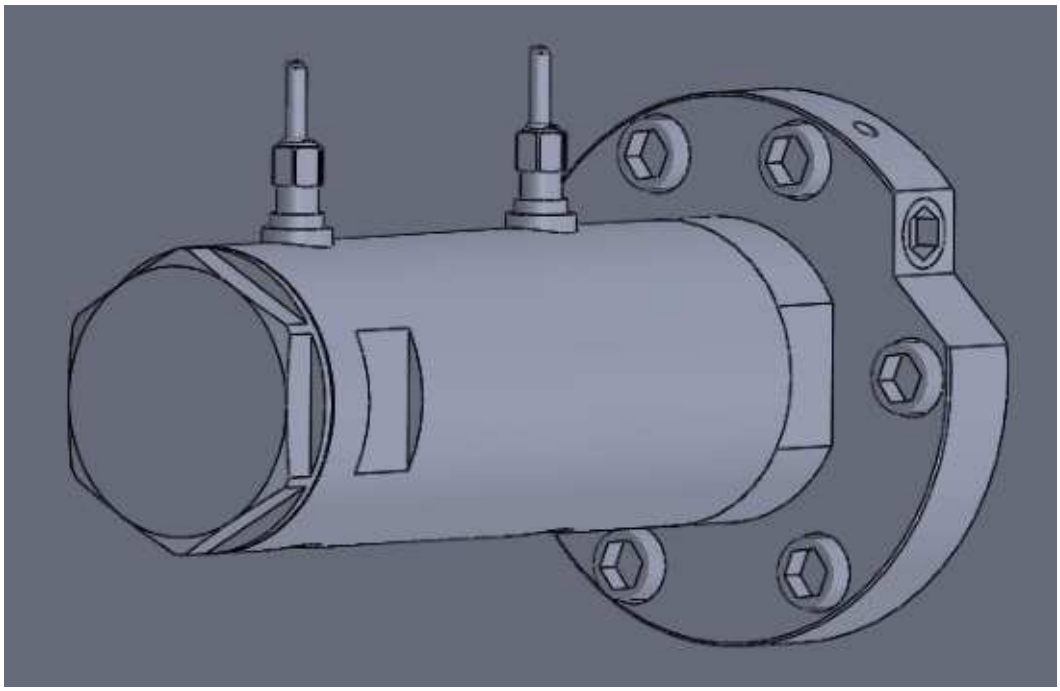
In case of a cylinder applied with a non-adjustable flange (RF ... 271C), the application of the preload must necessarily be performed by grinding the flange (side in contact with the mold) or alternatively (even if not recommended) insert a shim between the accessory and the rod end equal to the maximum preload value indicated in the table.
This operation is not always feasible in the mold testing phase.

Cylinder Bore	Cylinder Stroke	Max Preload mm
30	30	0,2
	60	0,25
	90	0,31
	120	0,36
36	35	0,1
	70	0,13
	100	0,15
	120	0,17
45	45	0,15
	90	0,19
	120	0,22
	150	0,25
56	50	0,15
	100	0,19
	120	0,2
	150	0,23
71	60	0,2
	120	0,26
	150	0,28
84	75	0,2
	150	0,26
	200	0,3

The values shown in the table take into account the elasticity / compression of the rod, as explained on page 1. The elasticity of the slide / core or other component connected to the cylinder rod must also be taken into account.
The practical and immediate solution that we recommend is the use of the flange with preload adjustment / adjustment system (RF ... 211E)
With this type of flange, adjustment can be made with the mold in the press as long as the cylinders are installed in accessible positions and with sufficient lateral space to make it easier for the operator to work with the mold at temperature.

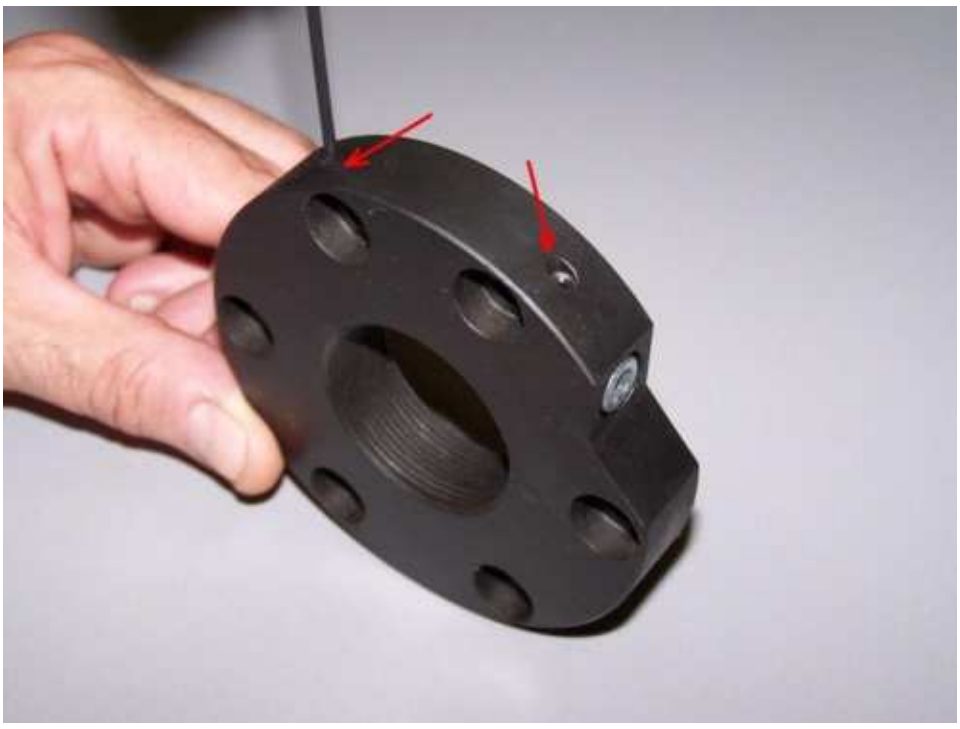
The adjustment of the flange will involve a rotation of the cylinder with respect to the position defined by the project and consequently also the position of the oil inlet ports (as well as of the hydraulic hoses) and of the sensors with their cables.
Should the change in the position of the inlets generate interference of the fittings / pipes with other components of the mold, it is necessary to opt for the insertion of a spacer between the rod and the slide / core, equal to the preload value indicated in the table.





OPERATING INSTRUCTIONS FOR USING THE FLANGE WITH PRELOAD ADJUSTMENT

For correct installation and adjustment, it is recommended to strictly follow the directions in these operating instructions.

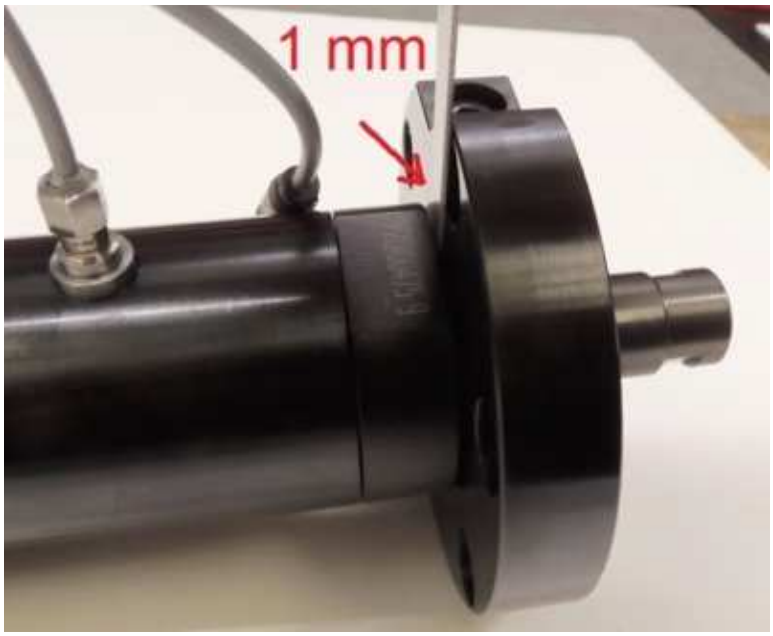


1) Partially loosen the securing grub screws for the locking bushings

2) Loosen the flange / cylinder fixing screw

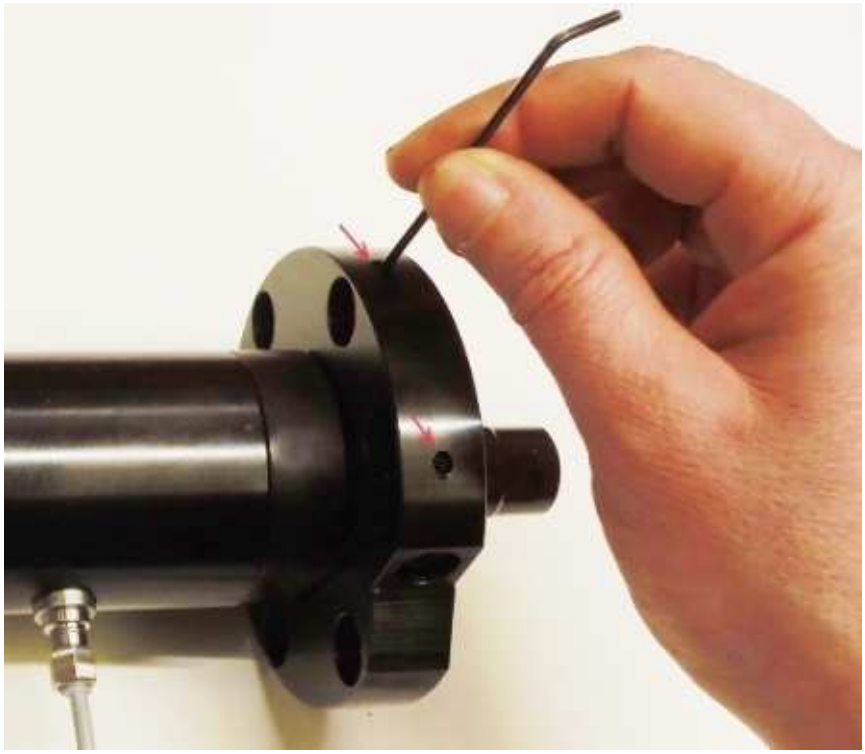
3) Widen the locking bushings apart using a screwdriver

4) Screw the flange onto the cylinder



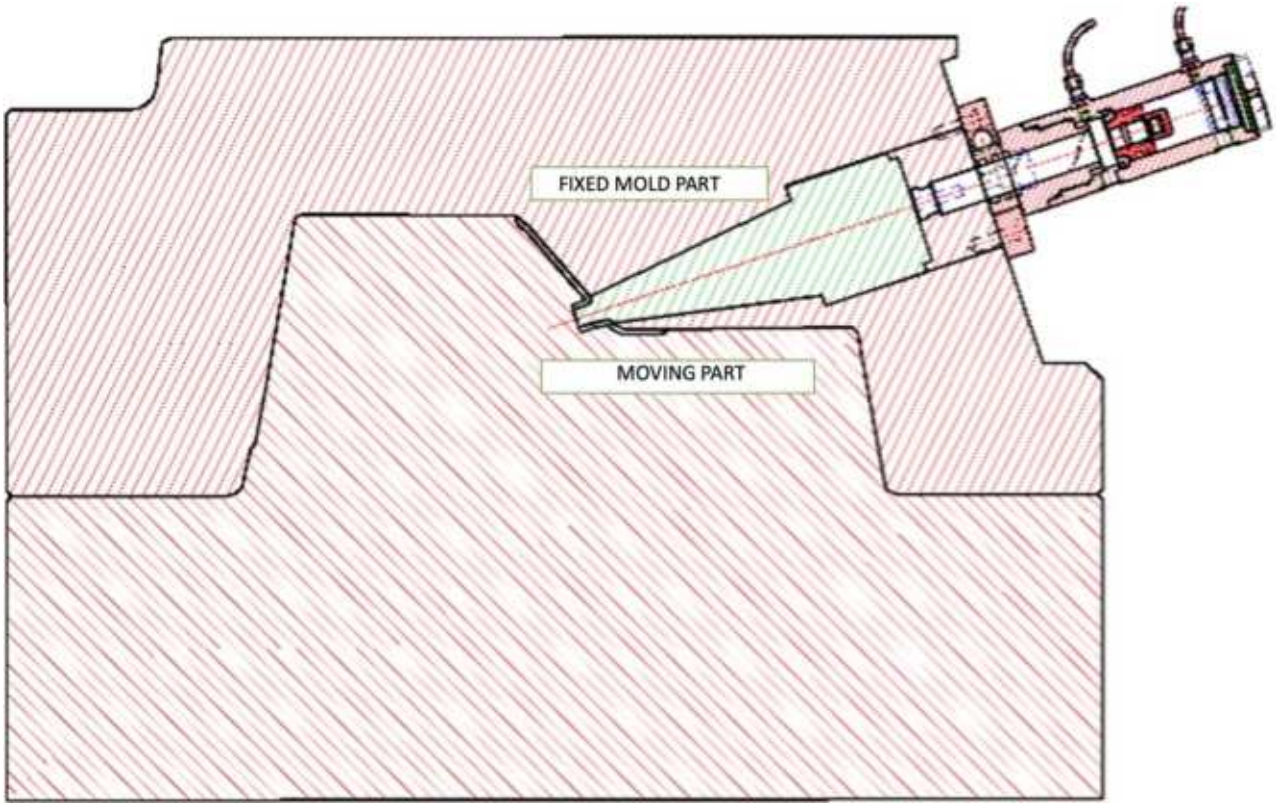
5) Leave 1 mm of space between the flange and the perpendicular plane of the cartridge, checking with special adjustment flat shims (not supplied by Vega).

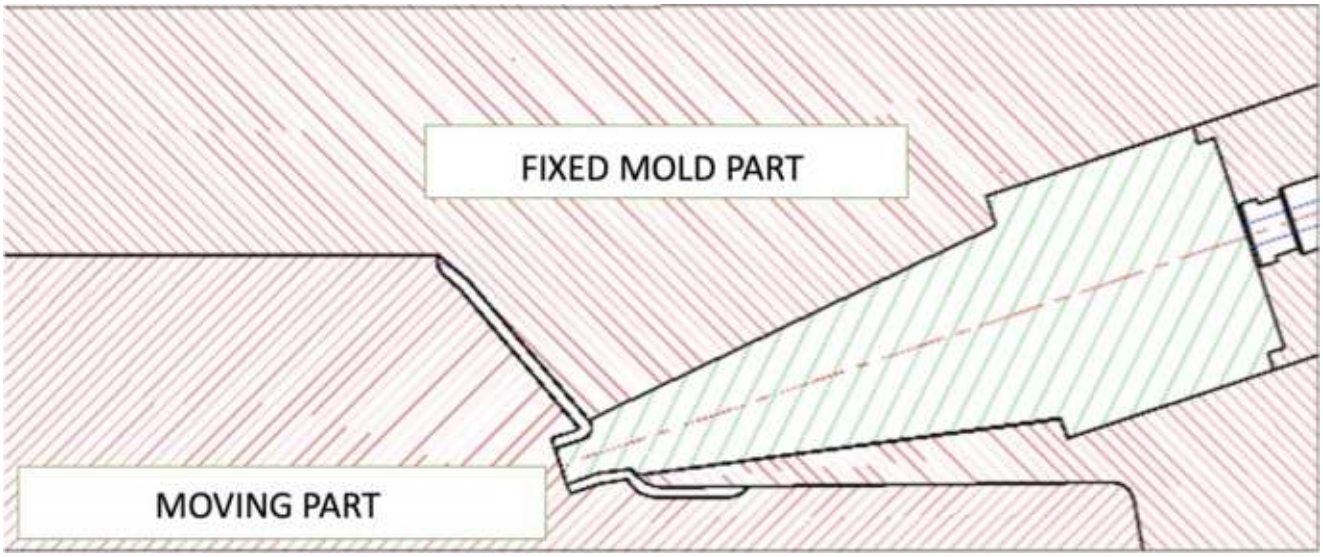
6) Screw and tighten the flange / cylinder fixing screw.



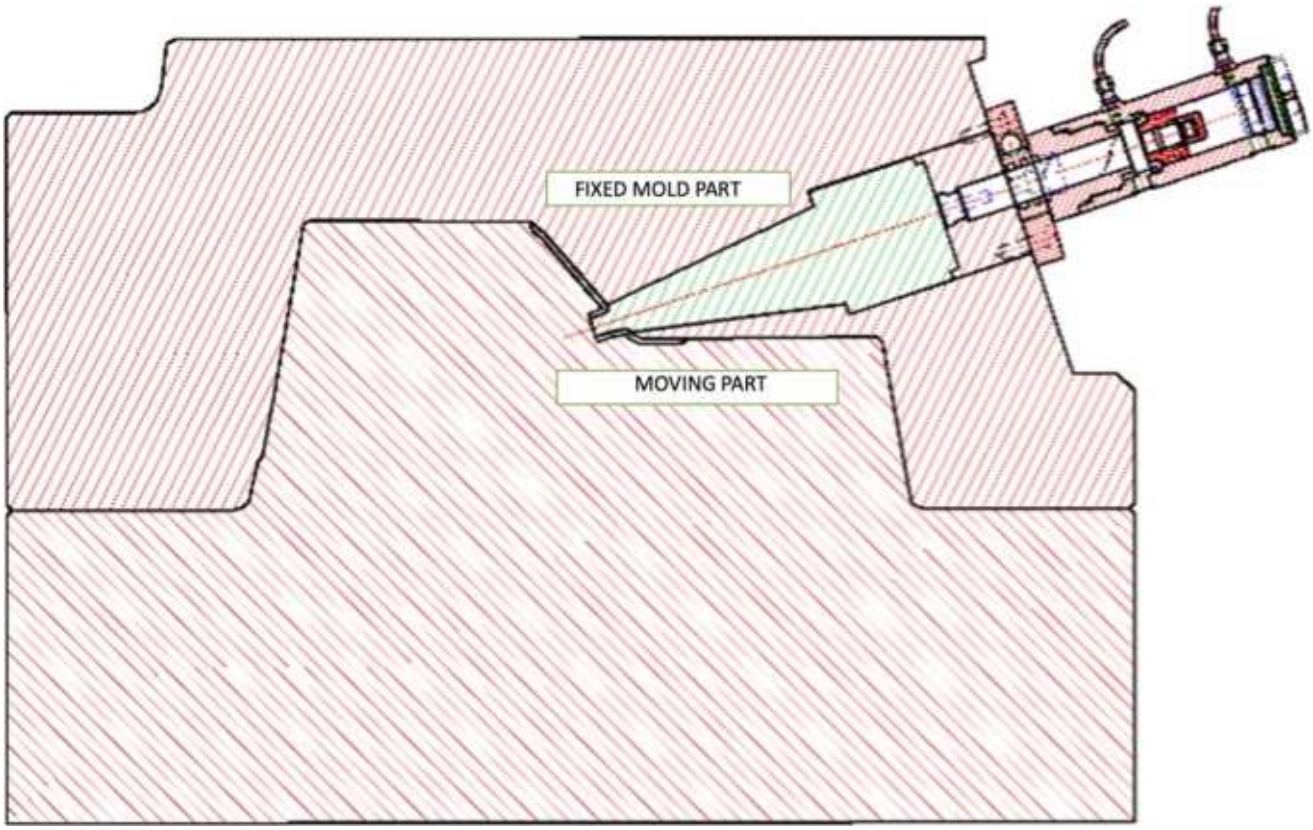
7) Tighten the grub screws for the locking bushings.

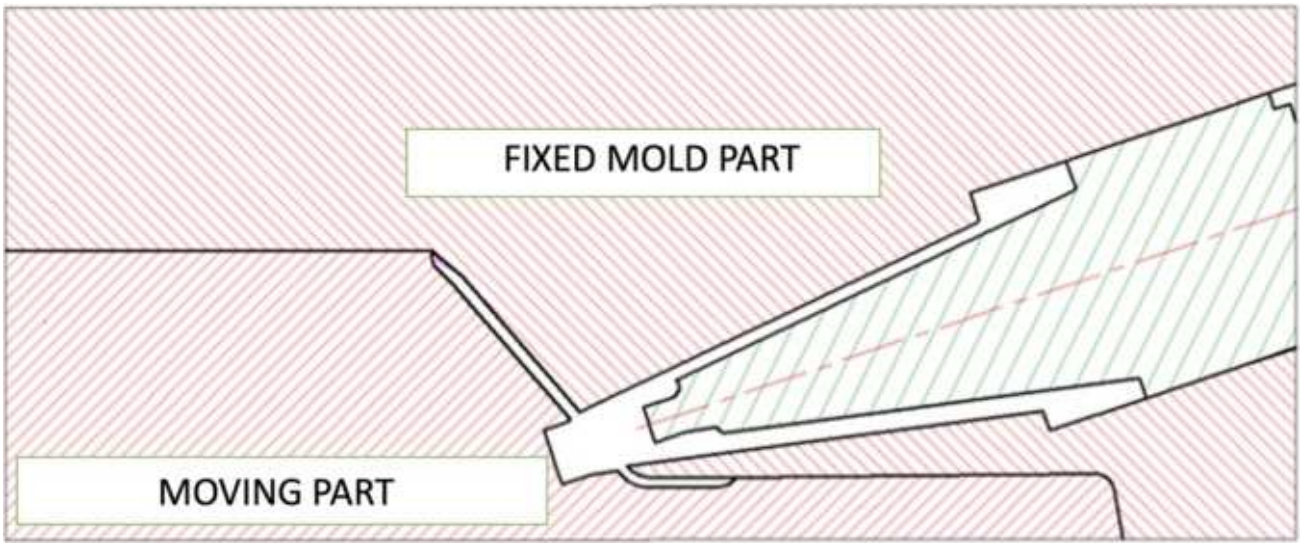
8) Fix the flange with the cylinder on the mold using the special screws supplied.



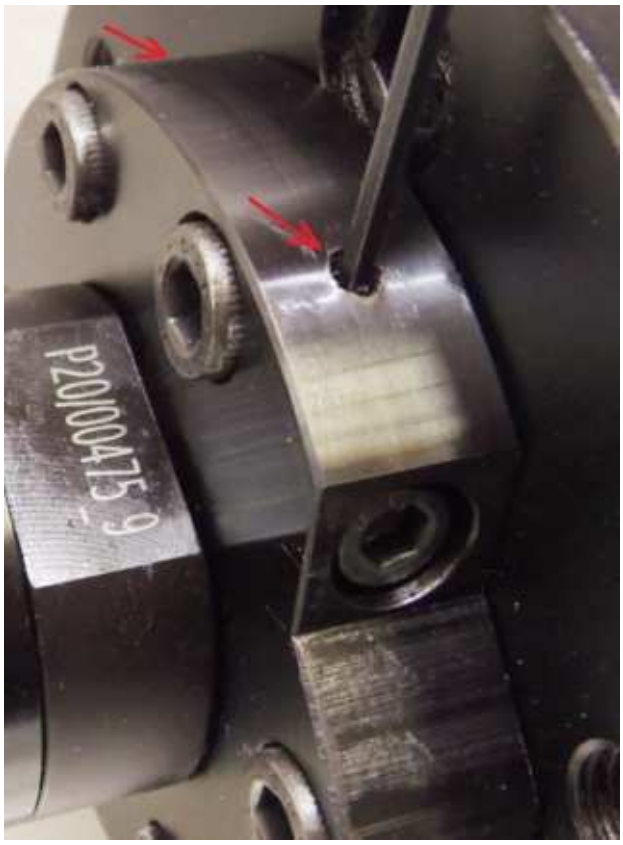


9) Place the cylinder with the rod fully extended and check that the plug / core is closing on the die also called point "0".
For this operation, use the blue ("Prussian Blue") test paste commonly used in mechanics to check the couplings.
If there is a dimensional error with respect to what was defined in the design phase, it will be necessary to check the components.

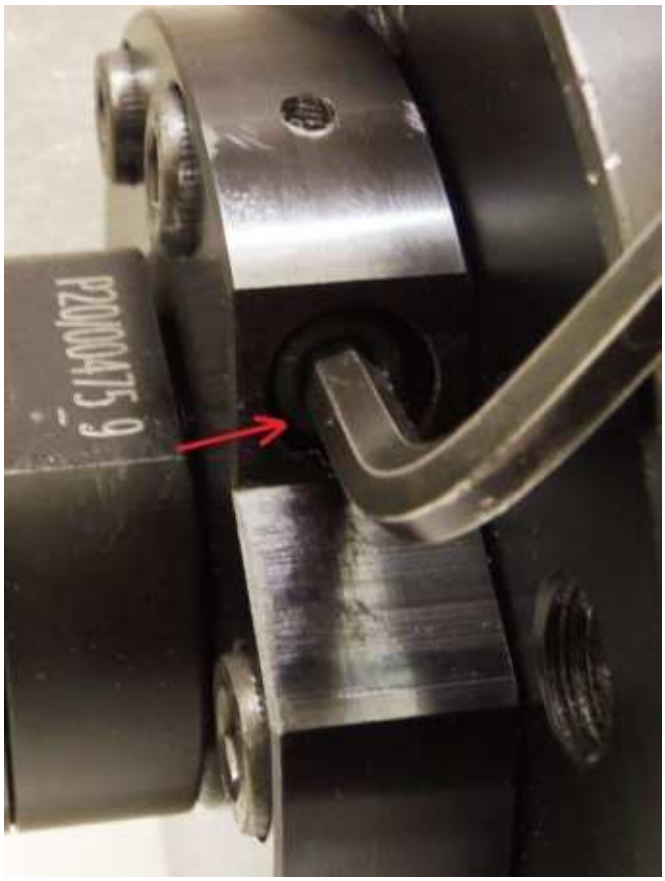




10) Place the cylinder with the rod retracted

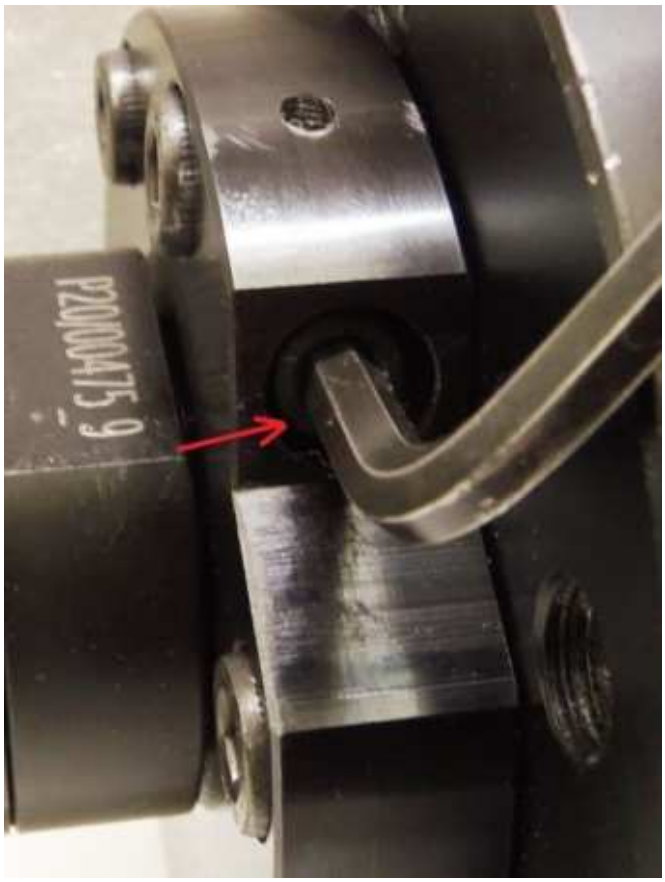


11) Loosen the grubscrews behind locking bushings

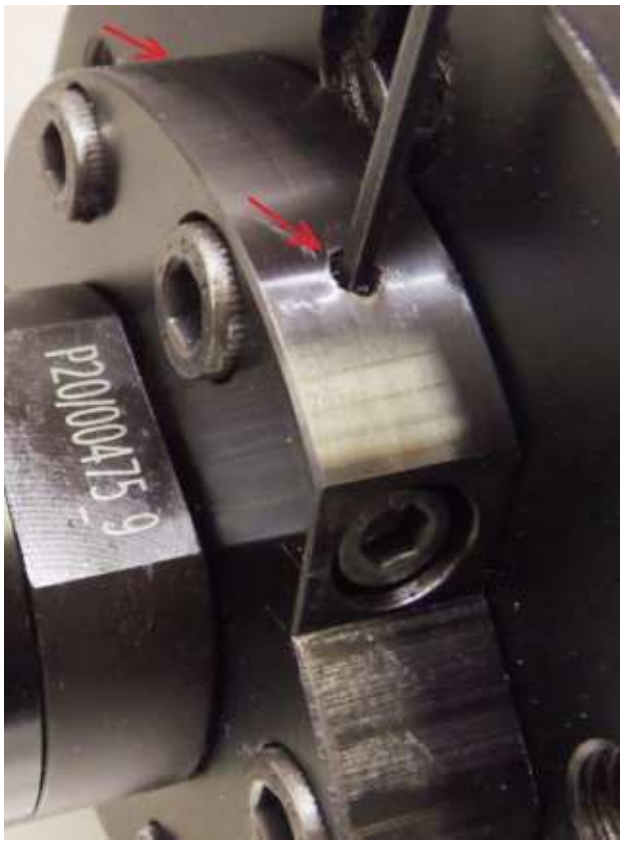


12) Loosen the flange / cylinder fixing screw

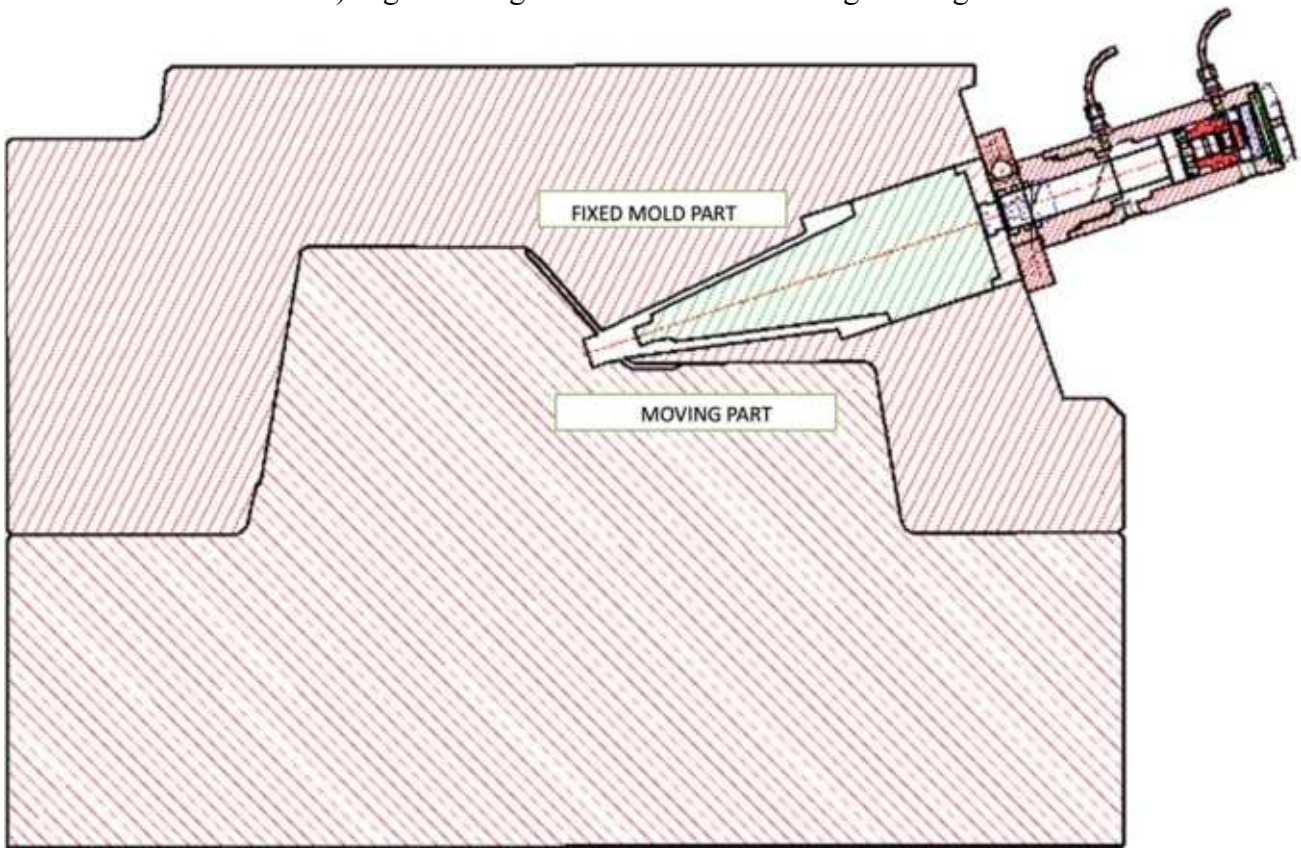
13) Rotate the cylinder clockwise and using special adjustment flat shims (not supplied by Vega), increase the preload to the extent shown in the table on pg. 3.
Example: Considering the space of 1mm as indicated in point 5 and having to achieve a preload of 0.15 mm, it is necessary to insert a flat thickness of 0.85 mm and slowly rotate the cylinder (using the appropriate fixed key) until the flat thickness does not gets stuck between the perpendicular plane of the cartridge and the flange.



14) Lock the flange / cylinder fixing screw



15) Tighten the grub screws for the locking bushings.



16) Place the cylinder with the rod fully extended and carry out the first molding shots, verifying if there are defects / burrs caused by material seepage, or not.
If the plastic piece is not up to quality standard, repeat the procedure from point 9 to 14 by increasing the preload according to the amount of the burr present on the piece and repeat the molding operations.

In the event that increasing the preload also increases the amount of the burr proportionally, it is possible that the preload is excessive and therefore it must necessarily be reduced by rotating the cylinder counterclockwise, with respect to what is indicated in point 13.
The preload excess may not only prevent the correct locking function but can also jeopardize the proper unlocking with the block / punch locked in the figure.

NB: For a proper functioning of the mechanical locking system and to fully use the cylinder performance to the maximum, a constant pressure value of 120 bar must be kept (in push) for the entire injection phase. If this is not possible, it is necessary to use a pilot operated check valve (see VR accessories catalog) to be installed directly on the cylinder, by using a nipple or other rigid fitting. Do not use hoses to connect the valve to the cylinder.
After installation and before proceeding with use, purge the cylinder and valve to vent possible air bubbles trapped in the oil circuit.

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