

INSTALLATION

All SELTER chucks leave the factory with the base and the top plate ground to a perfectly smooth finish, ready for use. To fit the chuck into the machine follow these instructions:

1. Check that the machine table is clean and free from nick and burrs.
2. Carefully clean the base of the chuck and check that it has not been damaged during transport.
3. Place the chuck on the machine table, in the work area. Check that it is well seated and that there is nothing between the table and the base of the chuck. Remember that the chuck lever must be accessible and it must be easy to turn (the lever has to be able to turn through 180°).
4. Fix the chuck in place with clamps on the ledges at the ends of the chuck.
5. If the chuck is mounted on a grinding machine, the chuck should be ground before starting work. In this case follow these instructions: Magnetise the chuck by rotating the lever or levers 180° (there are chucks with 2 levers). Grind the chuck surface to make it perfectly flat using abundant refrigerant during this process to avoid excessive heating.
6. In the situation of fitting a chuck on top of a bigger magnetic chuck that has already been ground and is perfectly flat, it does not need grinding.
7. When not using the chuck, apply a thin coat of grease or oil to its surface to prevent oxidation.
8. Due to the welding process used in the construction of the top plate of the chuck, it is possible that small amounts of the chemical substance used will be present, producing small marks on the surface of the chuck. These marks do not affect in any way either the quality or the performance of the chuck.

OPERATING INSTRUCTIONS

Before using the chuck read the section: Factors affecting the magnetic holding force.

1. The contact surfaces of the chuck and the pieces must be perfectly flat and clean.
2. Place the pieces on the chuck, distributing them uniformly and avoiding the edges. In the case of one piece only, place it in the centre of the chuck.
3. To magnetise, rotate the lever or levers 180° in a clockwise direction.
4. Check by hand that the pieces are firmly held in position before starting work.
5. Machine the pieces, using the end stop rules if needed (see section: Recommendations for use).
6. Once the chuck has been used, demagnetise by turning the key 180° anticlockwise.

MAINTENANCE

This chuck hardly needs maintenance. It is only necessary to grind the surface of the chuck periodically to avoid loss of holding force. The maximum thickness of material that can be removed from the surface of the chuck, which is 8 mm, should be taken into account. It is recommended that the surface of the chuck not be ground more than necessary so as to prolong its working life.

This chuck has oil in its interior for lubrication and damping the movement of the interior mobile plate. The chuck does not consume oil, although a loss could occur due to opening up the chuck, wear of the shaft or for other reasons. In this case add oil through the openings in the front of the chuck marked with the word "OIL". The chuck takes hydraulic type oil, for example SAE-10 or ISO-32. The chuck should not be overfilled. The correct level is up to the level of the openings when the chuck is in a horizontal position.

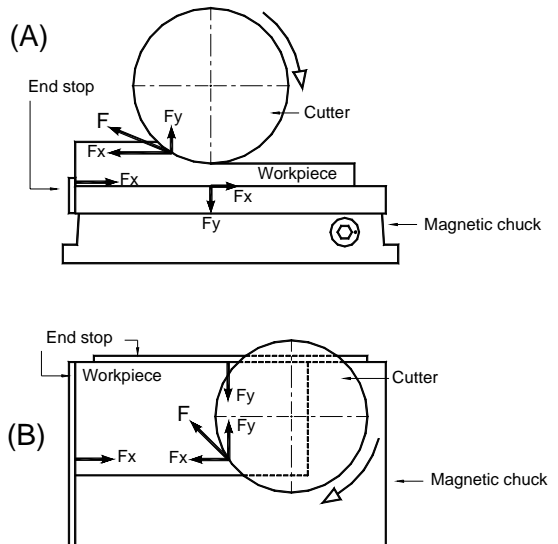
RECOMMENDATIONS FOR USE

This magnetic chuck has some end stop rules that can be used to support the pieces to be machined. For most grinding jobs, especially for large pieces, it may not be necessary; however, when grinding smaller pieces they should be used to achieve greater holding power and to work more safely.

Machining forces in milling machines are generally much higher than in grinding machines and the slipping force might be of an intermittent nature as each tooth or plate is tapped; also the direction of the forces change all the time. Magnetic slipping resistance is weaker than the forces of traction for which reason it is important to use the end stops. Sometimes it is necessary to place blocks between the piece and the end stop rules to maintain the piece in the centre of the chuck.

During machining with milling cutters (Fig. A) operations have to be carried out in such a way that the horizontal cutting forces coincide with the end stop, in this way the magnetic chuck supports the vertical forces, and only a part of the horizontal forces. In planing (Fig. B) the direction of advance of the table must be adjusted so that the cutting forces push the piece towards the end stops rules.

It is recommended that the manner of operation be fixed for each job (depth of cut, direction of advance, position of the piece, etc.) so that they are the optimum ones for maximum holding force and stability.



FACTORS AFFECTING THE MAGNETIC HOLDING FORCE

The holding force depends on the magnetic flux generated by the chuck, but certain factors which limit or impede the flow of the magnetic flux to the piece and reduce the holding capacity should be taken into account: 1. The contact area. 2. The thickness of the piece. 3. The contact surface conditions. 4. The material of the piece.

1. The contact area

The holding force is directly proportional to the contact area of the piece with the chuck. Large pieces with large contact surfaces offer sufficient resistance to the machining forces, however small pieces with small contact surfaces will not withstand certain types of machining. The piece should be placed on the chuck in such a way that it covers the largest possible number of poles (each steel strip is a pole).

2. The thickness of the piece

The magnetic flux needs a certain minimum thickness of material (iron) to be able to work. If the pieces are really thin and do not reach this minimum thickness, then they will not be able to absorb the magnetic flux generated by the chuck and the holding force will be lessened.

3. Contact surface conditions

To achieve good magnetic holding, the contact surfaces, both of the chuck as well as the piece, must be in optimum condition. Pieces that are not completely flat or with a rough finish have a worse holding capacity than those with a ground surface. It is important to maintain the surface of the chuck in good condition, grinding it when necessary.

<i>Level of surface finish</i>	<i>Holding force</i>
Ground	90-100 %
Fine milled	60-80 %
Rough milled	40-50 %
Cast finish	20-30 %

<i>Material</i>	<i>Holding force</i>
Non-alloy steel 0.1-0.3 % C	100 %
Non-alloy steel 0.4-0.5 % C	90 %
Nondistorting alloy-steel	80-90 %
Grey casting	40-60 %
Nondistorting alloy-steel hardened to 55-60 HRC	30-50 %
Austenitic stainless steel, brass, aluminium, copper	0 %

4. Material

The material of the piece is very important for good magnetic holding. Soft steels (low carbon content) present the best holding (100%). However, there are others with high percentages of carbon alloys of other materials, which lose their holding capacity. Also some heat treatments reduce the capacity of steels to be held by magnetic chucks. In general, the harder the steel, the worse they behave, and have a tendency to

retain magnetism once they have been removed from the chuck. Sometimes it can even be difficult to remove the piece from the chuck.