TOOL BREAKAGE OR CHIPPING

The most frequent causes of breakage or chipping of the tool edges are:
1. Imperfect coaxiality with the part to be machined, in this case the tool is not damaged when it penetrates the pre-hole but in the succesive return phase, when the bending action due to the imperfect centering stops.
2. Insufficient pre-hole depth therefore the material removed during machining, and which is pushed downwards, does not permit the tool to reach the preset depth and therefore the edges are strongly strained against the build bottom.
3. Twisting of the machining when the pulling lever is not used, and also in this case the breakage occurs when returning, as the edges are located in a different position than when machining started.

MACHINING LARGE SIZED PROFILES

When machining square profile keep in mind that the quantity of material to be removed is more than double the amount for a hexagonal slot, for this reason the machine is stressed more, therefore these procedures normally require a very rigid and powerful machine.
When possible, and especially with a square greather than 20mm, a few measures can be implemented:
• The pre-hole must always be as large as possible.
• If the square section (S) must have four complete surfaces, the quality of material to be removed can be reduced by first making small holes (d) in correspondence of the four edges and then the central pre-hole (D).
• When possible round of the edges in order to remove the sharp edge, which is the most fragile point of the tool and also the section that tends to break or chip first. In this way, most of the material is removed and the slot can be made, also quicker, and with a better finish.
Of course, the same considerations apply to large sized hexagonal slots (usually above 30mm).
Taking the above into consideration, any polygonal slot can be machined such a stellar, grooved or involute, always providing that the quality of material to be removed lies within the permitted limits of the machine or machining times.