TRENDS IN FASTENING SYSTEMS TOOLS SCULPTURAL SURFACE TREATMENT

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Abstract

This paper presents the study of different stiffness fixtures tool in spindle, as shown by comparison, usually fastening system ISO or CAT conical seating surface, two simultaneous clamping surfaces, hydraulic clamping device tool in tool holder and so on, as main features of the gripping chuck, hydraulic and thermal shrinkage seraj, fastening systems of the tool.

Key words: sculptures surfaces, system tools, grip extension, monolithic grip extension.

INTRODUCTION

Fastening systems of the tool

The total stiffness of the machine tool, the tool (and its device clamping spindle) and the song (and the grip on the machine table) are factors of influence over the life of the tool and the surface quality obtained by milling (Abrudan, 1996).

The drawing below shows a study on the stiffness of different fixtures in the tool spindle, is shown by comparison (fig. 2):

1. grip extension by seraj (thermal contraction);
2. conventional grip extension;
3. monolithic grip extension by seraj (Ganea, 2010).

MATERIAL AND METHOD

Aspects CAD CAM.Transfer

Programming can be divided into two parts: CAD involving construction or modeling and CAM, involving technology, with all its aspects, tools used, processing strategy, etc. There is a requirement for modern systems to be "open", mean to accept transfer of data from other systems, other providers, and to process the data. When the track geometry data were combined with technological data, produces a so-called schedule CLDATA or APT, which then must be passed through the post-processing to obtain CNC program codes G (www.selca.it, www.siemens.com). Since this phase is semi-automatic programmer can change technological parameters, eg. tools used, addressing a specific machining strategies in place to

another, etc., and in general this is even necessary for optimum results (Ganea, 2009) (fig. 1).

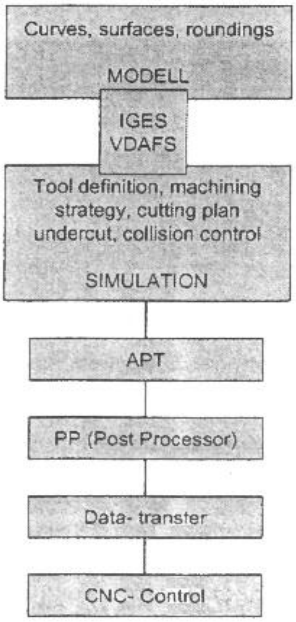


Fig. 1. Schema data transfer from CAD to CNC program

RESULTS AND DISSCUSIONS

The results show that monolithic extension is 3 times stiffer than conventional (Ganea, 2010).

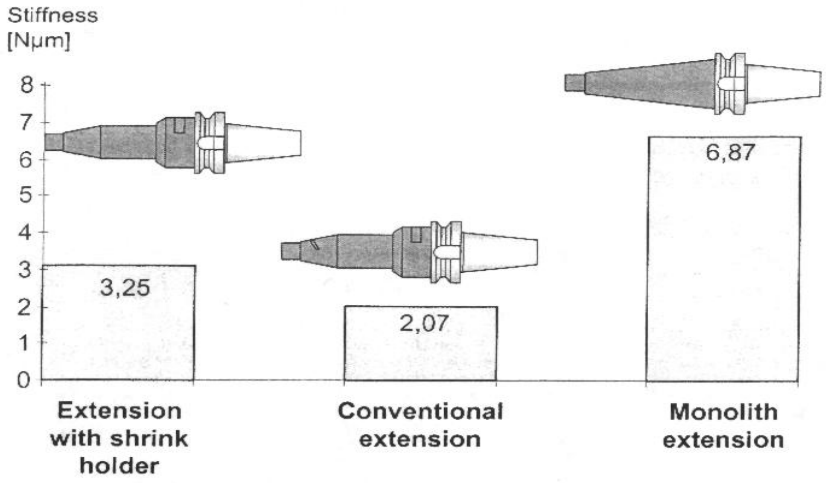


Fig. 2. The comparison of the rigidity of tools of various types of extensions

The usual mounting ISO or CAT conical seating surface has the

disadvantage that the high speed rotation, centrifugal force tends to broaden conical inner surface of the main shaft and axially advancing tool spindle inside even during processing, introducing errors of length tool (Botez, 1978).

In addition, stop spindle movement, release tool creates problems that arose due to tightness (www.heidenhain.com, www.renishaw.com).

This can be seen in the figure 3.

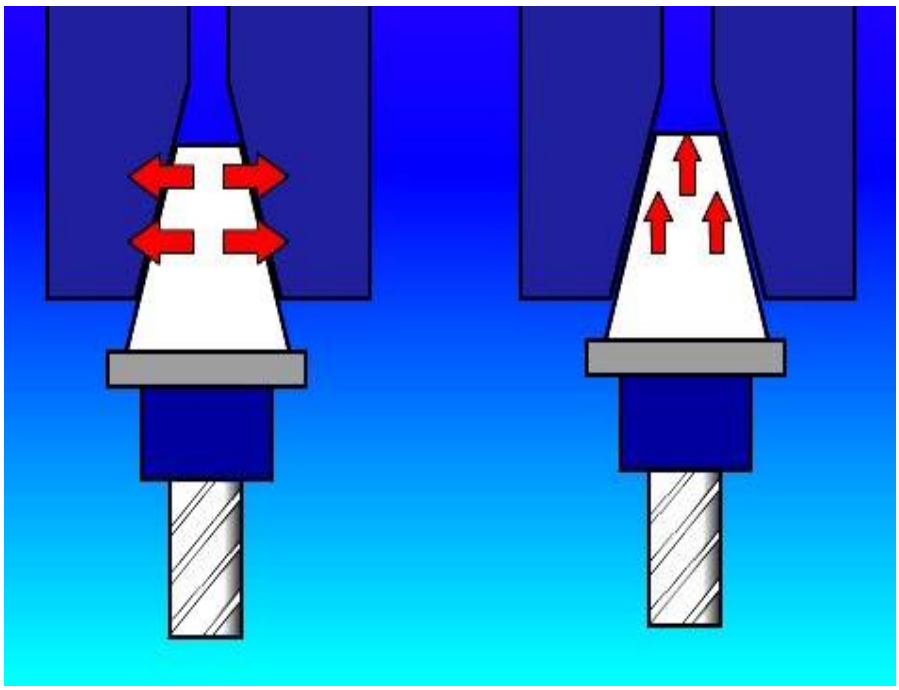


Fig. 3. The downside trapping cone ISO or CAT tool

Therefore, the speeds exceeding 10,000 RPM generally uses a different type of grip, HSK, which props up the tool on two surfaces, one tapered and one flat, as shown in the following figure (Vickers, 1993) (fig. 4).

There are other alternatives to HSK, simultaneous fastening two surfaces, but HSK is the most widespread (Ganea, 2003).

Another type of gripping tool is hydraulically (Marciniak, 1991). With a screw, a small piston is moved axially increasing or decreasing the pressure of tightening tool in the device (Ganea et al., 2000).

This is shown in the figure 5.

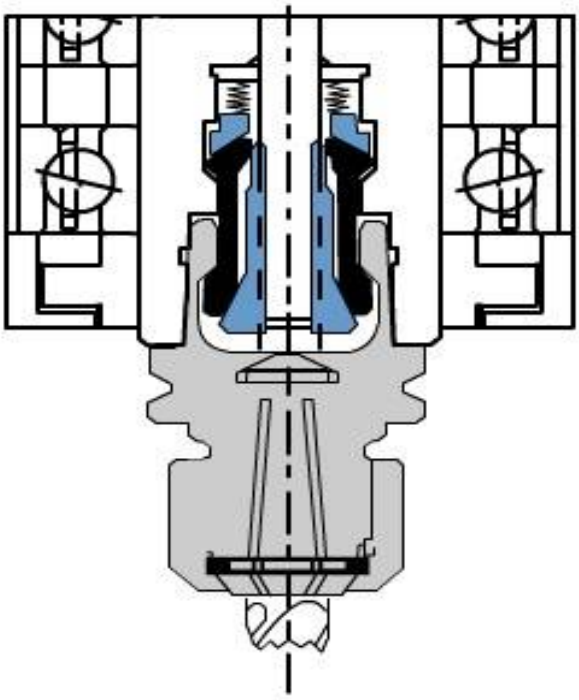


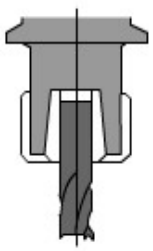
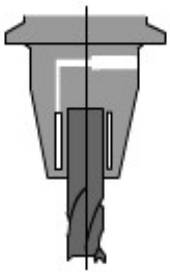
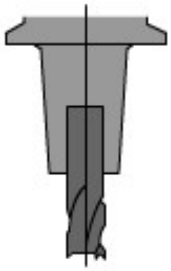
Fig. 4. Tool holding cone type HSK

Fig. 5. Attach hydraulic tool in tool holder device

The following table shows the main characteristics of the gripping chuck, hydraulic and thermal shrinkage seraj (CATIA- 2002, COSMOS Edge, VERICUT- 2002).

Table 1

The main features of fixtures

	Grips	Hydraulic	Seraj heat
			
Total	The best choice for companies that are turning to HSC	A good choice for limited applications HSC	The most expensive, but worth the investment for companies that use throughout the HSC
Radial beat	10μm	5μm	4μm
Rigidity	Good	Fair	Excellence
Balance	Good	Fair due to asymmetric design	Very smooth, symmetrical construction
Ease of use	Poor accuracy depends on the operator	Good, good repeatability precision	Very good
Cost	Normal	More expensive	The most expensive

CONCLUSIONS

Another aspect of the gripping tool is concentricity and balance, or the degree of dynamic balancing. A tool can be perfectly concentric with the main shaft and the grip, but it can be unbalanced and vibrate at high speeds, and conversely, that a tool can be balanced at high speeds but not concentric. None of these phenomena is not desirable, because it leads to chipping tools used in HSC, which are more fragile than normal.

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