

**UTILISATION OF THE DIAMONDED DISKS AT THE THREADS ACHIEVING
WITH FINE PITCH ON WORK - PIECES FROM TITANIUM ALLOYS
FOR MAXILLA-FACIAL REPARATION**

Mihai GHIȚĂ¹, Aurel BREȘȚIN², Florin STOICOIU³, Mihaela NISTORAN-BOTIȘ⁴, Claudia DÎRPEȘ⁵

ABSTRACT:

This paper is referred to some aspects about adaptation on a lathe for fine mechanic, of the supplementary elements that from cinematic point of view permits the achieving of screw threads with pass under 0,5 mm on semi-products with diameters under 2 mm and lengths greater than 10 mm. Beginning from the aspects of low rigidity of the semi - products it was projected a boring bar device on which is installed the diamonded disk and which has the possibility to adjust correctly depending on the axis of the future thread. For obtaining of the required quality of the thread surface it was established the optimal passing and the corresponding splintering depth.

Keywords: *Diamonded disks, alloys, titanium*

1. INTRODUCTION

In maxilla - facial surgery for reparations at the level of jaw or mandible are used devices for a proper positioning of the bones fragments and plates with holes in which are introduced the screws for consolidations of the fragmented bones [3] [4]. The screws have small diameters (under 2 mm) and have a thread with fine pitch (0,3-0,5 mm) on lengths greater than 10 mm.

Because threads processing can be achieved by the classical methods there were used diamonded disks.

Taking into account that the thread profile has a connection ray at the cavities bottom between two spires it was chosen from the diamonded disks the option with synthetic disk electrochemically deposited on a metallic support with the smallest thickness and the smallest diameters [1].

As a result of the auto-sharpening process of the diamonded disk the ray at the base of profiles thread remains unchanged. For a rotation with optimal splintering speed of the diamonded disk it was installed in the elastic sleeve of a broach with variable rotation between 5...35000 rot/min.

2. ADAPTATION POSSIBILITIES AND DESCRIPTION OF THE CHOSED SOLUTION

Beginning from the existed possibilities of the material basis was chosen the alternatives: bench lathe and normal lathe for fine mechanics.

Because of the advanced degree of wearing of the lathe of fine mechanics and of the low rigidity of the elastic technological system of this, the surfaces quality of the flanks of threads is not adequate and the wearing of the diamonded disk is very great.

During processing, the maintaining of the adjusted quota at the depth level of splintering is random that presumes the achieving of supplementary passing.

Adaptation on the normal lathe of fine mechanics permitted not only the removing of the drawbacks because of the lack of rigidity, but also using of the diamonded disks in conditions of optimal durability. The scheme of adaptation on the normal lathe is presented in figure 1.

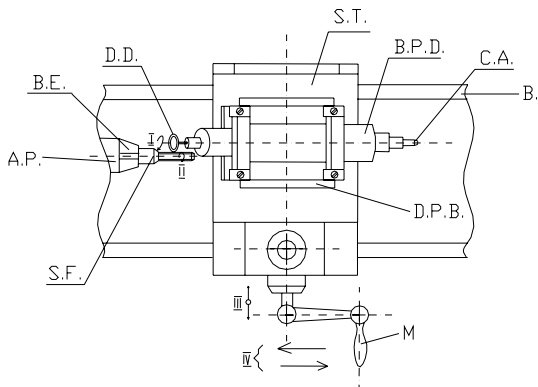


Figure 1. The adaptation scheme of the dispose for thread, on normal lathe

The diamonded disk DD is installed by fixation in the elastic sleeve of the broach port-disk BPD, that gearing it in a splintering motions I. Semi-product SF is fixed in an elastic sleeve BE of the main shaft AP and it is rotated with the smallest rotation II.

BPD is installed in the port-broach device DPB that permits its positioning so that the median plane of DD will be tangential at the thread flank that is processed.

The port-broach device DPB is fixed on the transversal sledge of the lathe and together with this can be transversally adjusted (motion III) for achieving of the required height of the thread respectively longitudinal (motion IV) together with the scale of lathe by the leading screw by which is transmitted the selected value from the threads box and advances for the desired path.

After running of the threads length after the execution design it is removed DD (motion III) is inversed the rotation motion II, it returned to the initial position, it penetrated with another passing (motion III) and it is continued the processing until is obtained the nominal height of the thread.

During threading in the interaction zone DD-SF it is brought liquid for cooling and oiling.

For threads diameters under 2 mm, very good results of the processing were obtained by achieving of three passing of which percentage is 50%, 40% and 10% from the thread height.

The surface quality of the flanks of threads is dependent on the granulation size of the diamond fixed on the disk. The roughness size expressed by parameter R_a is situated between $6,3...25 \mu\text{m}$, values recommended for threads with such destinations.

3. CONCLUSIONS

In the specifically conditions that have been mentioned, the process efficiency is almost six screws/hour (processing of the diameter for threading, processing of the screw's head, threading, drilling of the screw's head and notching).

Adding the acquisition costs of the semi-product and the cost of the screw's processing results that these can be achieved cheaper than that is from importations [2].

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AUTHORS

1. Prof.dr.eng.Ghiță Mihai, University Politehnica from Timisoara, Romania, 0256/403591;
- 2.. Prof.dr.eng.Aurel Breștin, University Politehnica from Timisoara, Romania, 0256/403591;
- 3.Dr.eng.Florin Stoicoiu
- 4.Prof.assist.dr.eng.Nistoran-Botis Mihaela, University Politehnica from Timisoara, Romania, botis.mihaela@gmail.com, 0256/403591
- 5.Eng.Claudia Dîrpeș, University Politehnica from Timisoara, Romania, 0256/403591;