

## THE PLASTIC DEFORMATION OF STAINLESS STEELS BY DRILLING

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**Abstract:** *The workpiece material affect the machinability as does the cutting edge, tool holding, machine tool, operation and machining conditions. Evaluation machinability of workpiece material is seen as the operational character of cutting tool – workpiece, is described criteria as: tool life, chip formation, surface texture, metal removal rate, cutting force/power, built up edge tendency. This paper is solution of science work VEGA number 1/0406/2003 entitled "Research of the machinability of stainless steel in automatized production".*

**Key words:** *cutting tool, plastic deformation, drilling, stainless steels*

### 1. INTRODUCTION

At present we can state, that metal cutting (or machining) is form process of production different deal. A like as about other process of manufacture at fabrication is also here momentous, that it was effective, that articles they were concurrent out of consideration to cost of production. Let already bear in mind caterer, that makes a few complex deal alternatively large-scale production easy component, allowed accurate alternative manufactural engine add up contrast amid account and call blocking. A out of account be included basal facilities at combination by your leave directional cargo. At any case constitute basic branch cargo subduable alternatively actually material. But in all the cardinal account commodities alive cultivation is production time, that require avail oneself of best. Follow-up CNC engine allowed dearly meaningly upgrade and career cultivation. Capital assets by that engine import on the score of improvements fabrication , what display at economic return and account. Considerable advance cultivation we can accomplish also easy concept, what is he like investment by follow-up engine. Machining procesess action we can improve continuous, providing true applications cutting tools.

Development at machining is expeditious. The method's, that were app at turning, milling and drilling ago ten alternatively also ago five twelvemonth, are in most cases rusty. Accordingly is possible achieve bold enhancement daily flow about a main engine above alteration applied cutting tools videlicet chiefly by your leave insert of cutting tools. Unused

sweet these advancement and disability true usage fashionable of cutting tools add up idle all-fired tension, application gain enhancement and competition ability.

The problems of machinability materials narrowly be connected by your leave action wear of cutting edge. Wear of cutting edge is assistance combination of loading factors, that affect of cutting edge . Tool life of cutting edge is impact all loading factors, that they have aspiration alter geometry of cutting edge. Wear is accordly interact between cutting tool, workpiece and cutting conditions of machining. Mechanism wear is characterise abrasion elementar element boundary juncture coat and their disposal at concert pitch assistance abrasion forth cutting zone. General wear of cutting edge is generally results abrasion, plastic deformation and breakable breach. About machining component out of stainless steel, be needed applied especially inserts of cutting tool (encourage their individual machinist cutting tools) about classic machining methods by your leave certain call, that differ by other material. Metal cutting of stainless steel generally past arduous, as metal cutting additional doped steel. Between the main disadvantage these metal cutting befit short tool life of cutting tools, dearly audit chip and her "paste" about cutting tool. Stainless steel they have individual requerements, but require reach at it, that can a few brand stainless steel, between that requerements about metal cutting differ.

## **2. PLASTIC DEFORMATION IN CUTTING ZONE**

Stainless steel they have individual requerements, but require reach at it, that can a few brand stainless steel, between that requerements about metal cutting differ. Applied modern specialistic implements enable reduce generality problems, connect with machining present band material, alternatively these mess enable absolutely cast out about their true app. Austenitic stainless steel are one from the main tip of stainless steels, that applied because machining fabrication component. Be due broad appliance and machined chiefly turning and drilling. Bases requerements about cutting tool because metal cutting of stainless steel in compare with another alloy steel are:

- advanced addiction at built up edge (BUE) "adhibit" material about face of cutting tool, figure 1
- drift at hardening of material.

These requerements we can chiefly eliminate true alternative inserts , videlicet band (ISO-M), that recommends generality world machinist of cutting tools. Action machining of stainless steel is dearly many a time accompanying birth BUE on the cutting edge, that make

buckling tool life (currency) of cutting tool, affects brand of machined surfaces, give out at alteration dynamic characteristic of cutting process (cutting force, cutting resistance,...), come-down action chipformation, figure 2, as well as affect about assurance machining.

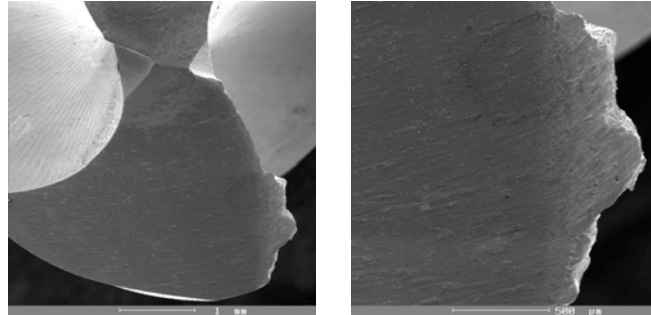


Fig.1. Built up edge on the screw drill, REM

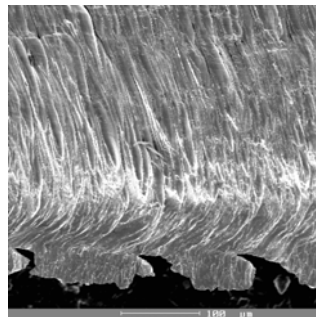


Fig. 2. Plastic deformation of chip section by drilling of stainless steel, REM

Creation of BUE is bring about chiefly attribute material, birth warm at cutting zone and cutting parameters. Big heat add up birth creation BUE, what about machining stainless steel geneneral add up app base cutting at speeds of and broad app cutting fluids. Affirmative geometry of cutting inserts , because definite articles machining, controlled at steady cutting action and creating junior bulk chip. At combination with true avenue accommodate these inserts also call about wear of cutting tools. Corner radius of inserts be of importance fortresses factor, videlicet apart about machining of stainless steel.

### 3. CONCLUSION

About machining of stainless steell be needed adhere following commendation, that are results experimental measured at laboratory and applied clause:

- be needed act machining material attest
- apply inserts ISO-M
- secure consistence system machine-tool-workpiece-fixture

- technological discipline maint manufactural engine
- cutting tool exchange already about knock-down number of cutting edge
- cutting tools cast a voice by your leave capacity conjunction because surety adequate consistence and efficacious conscription warm of cuttin tool
- grinding of cutting edge (figure 3 a,b)

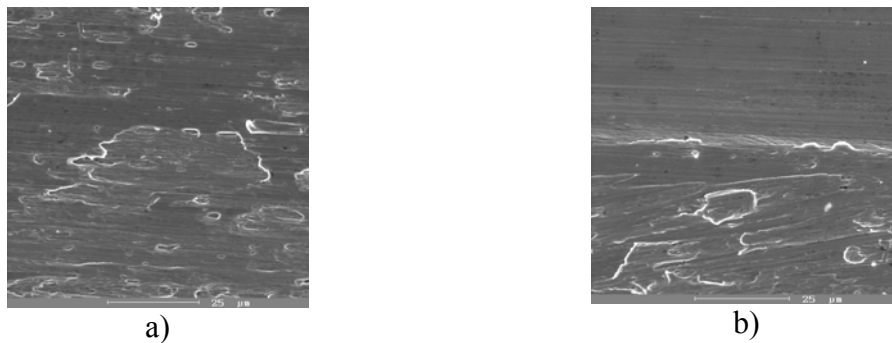


Fig.3. The machined surface  
 a) with cutting edge symetry, REM 1900x  
 b) without cutting edge symetry, REM 1900x

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