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**STUDY OF STRENGTH SCREW CUTTERS**

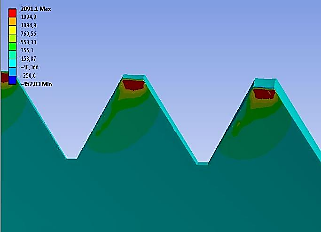
Using the finite element method in the package COSMOSWorks, carried out a comparative analysis of the stresses encountered when using thread mills. The influence of the strength of the cutter angle value rise helical groove (*w*, deg), value of the front face section angle (*g*t, deg), the value of the clearance angle in face section (*a*t, deg), cutter diameter (*d*, mm), pitch thread cutting (*p*), feed per tooth (Sz, mm/ tooth). Set the parameters in accordance with the plan assigned to the values indicated in the table

Table 1 - Values of geometrical parameters of mills.

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| --- | --- | --- | --- | --- | --- |
| Parameter | Value | | | | |
| w, deg | -30,00 | -15,00 | 0,00 | 15,00 | 30,00 |
| gt , deg | -16,00 | -8,00 | 0,00 | 8,00 | 16,00 |
| at , deg | 6,00 | 8,00 | 10,00 | 12,00 | 14,00 |
| d, mm | 5,00 | 10,00 | 15 | 20 | 25,00 |
| P, mm | 1,00 | 1,50 | 2,00 | 3,00 | 4,00 |
| Sz , mm/tooth | 0,05 | | 0,10 | 0,50 | |

For calculations assumed a position of the cutter, in which tooth is cut-largest chip thickness.

Measured value of the stress on the strength theory Mora for brittle materials with different tensile strength and compression, as well as lead-rank offset cutters.

Establish stress, dangerous section and identified the possible causes of the output instrument failure. Were plotted, officials stress and displacement of the above parameters.

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| Fig. 1. - The diagram of the distribution of the first primary voltage (in the case of *w*=15deg, gt=8 deg , at=10 deg , d=20mm, P=2mm, Sz=0.15 mm/ tooth) |

According to the results of modeling conclusions. With the increase in the helix angle, the pressure area on the front surface of the tool is reduced by gradually entering the tooth material. Also decreases the reactive force exerted on the tool by cutting forces. It should increase the helix angle of the groove to reduce cutting force, on the other hand a decrease of the total area of «w» pressure may result in an increase in a separate tooth profile. As the angle won milling cutters diameter increases the maximum under consideration originated, guides stress. This is due to redistribution of the area pressure at the front surface of the tool, namely the increase in pressure on the separate profiles rings, as well as in the inclined groove major portion of the pressure is asymmetrical thread profile, this results in increased load on the part of the profile (Fig. 1). Shifting decreases with increasing angle helical groove. Therefore it is necessary to reduce the angle of the grooves in order to reduce bias tool.

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