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## **Experimental Results for the Cutting Forces on a Considering Piece**

*The paper presents the results for the cutting forces. There are illustrated some diagrams where the corelation between the cutting forces and  $Ra$  are presented. The diagrams for the roughness of the piece wich has been cutted having the cutting speed 100[m/min], 200[m/min] and 400[m/min].*

### **1. Introduction**

The feed rate is the cutting parameter that has the highest physical as well statistical influence on surface roughness ( $Ra$ ). The diagrams for the roughness of the piece wich has been cutted having the cutting speed 100[m/min], 200[m/min] and 400[m/min].

### **2. The results for the cutting forces**

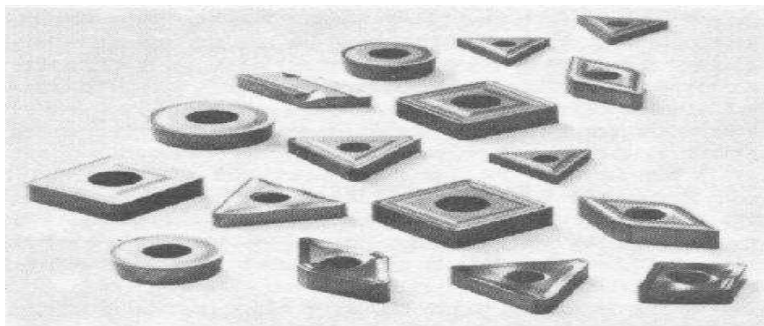


Fig.1. Pieces of diferent sizes.

The correlation between the cutting forces and Ra is presented in the next diagrams:

**Table 1**

Ra	Average	Fz		
		100 [m/min]	200 [m/min]	400 [m/min]
1,973	13,780	10,510	15,080	15,75
2,447	14,707	13,160	15,120	15,84
3,490	14,987	13,820	15,220	15,92
5,390	15,327	14,650	15,330	16
6,523	15,527	14,960	15,400	16,22

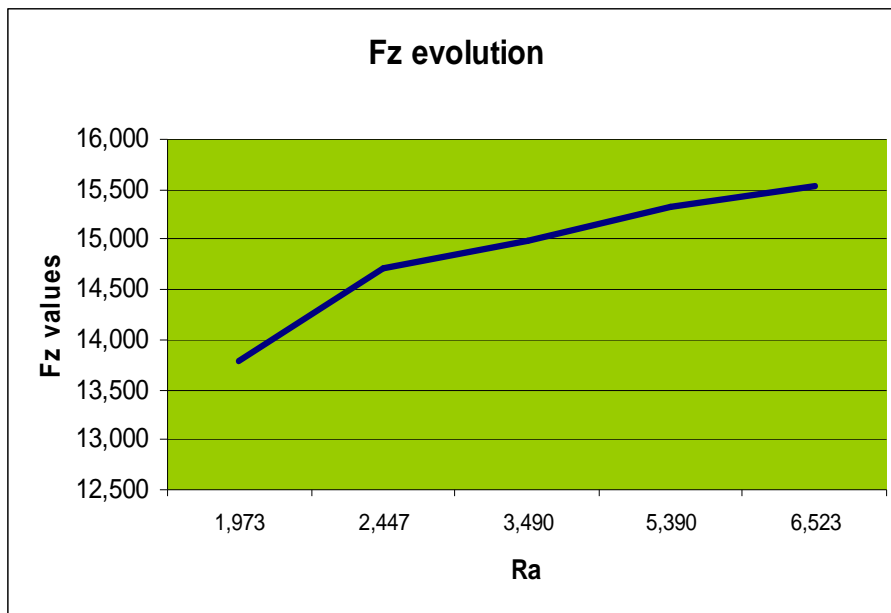


Fig.2. The correlation between the  $F_z$  cutting forces and Ra radial forces diagram.

**Table 2**

Ra	Average	Fx		
		100 [m/min]	200 [m/min]	400 [m/min]
1,973	12,910	5,970	14,960	17,8
2,447	14,910	10,910	15,200	18,62
3,490	15,993	12,720	16,110	19,15
5,390	16,577	13,320	16,410	20
6,523	17,603	14,880	16,600	21,33

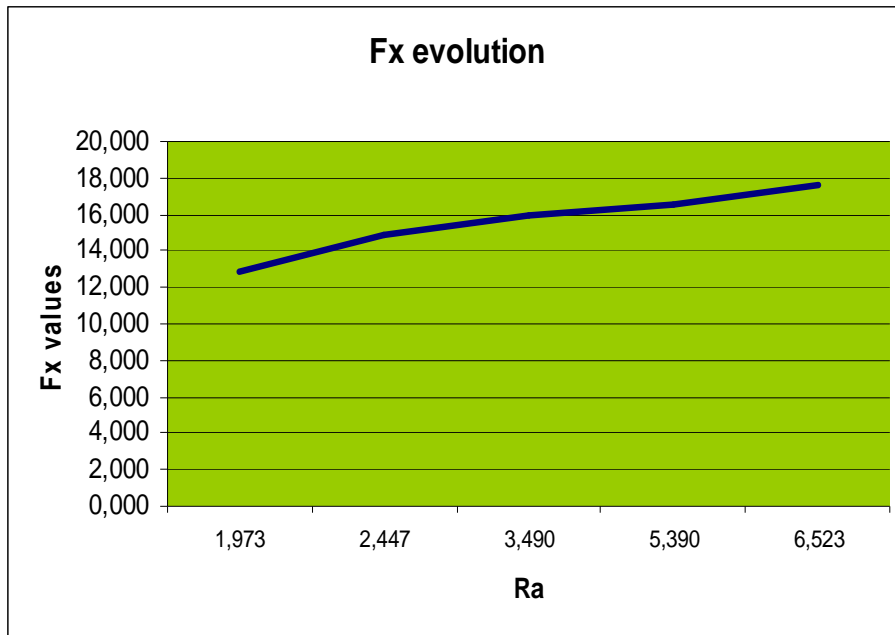


Fig.3. The correlation between the  $F_x$  cutting forces and Ra radial forces diagram.

**Table 3**

Ra	Average	Fy		
		100 [m/min]	200 [m/min]	400 [m/min]
1,973	6,507	2,520	7,920	9,08
2,447	7,567	5,150	8,050	9,5
3,490	8,200	6,190	8,170	10,24
5,390	8,767	6,550	8,380	11,37
6,523	9,333	7,500	8,600	11,9

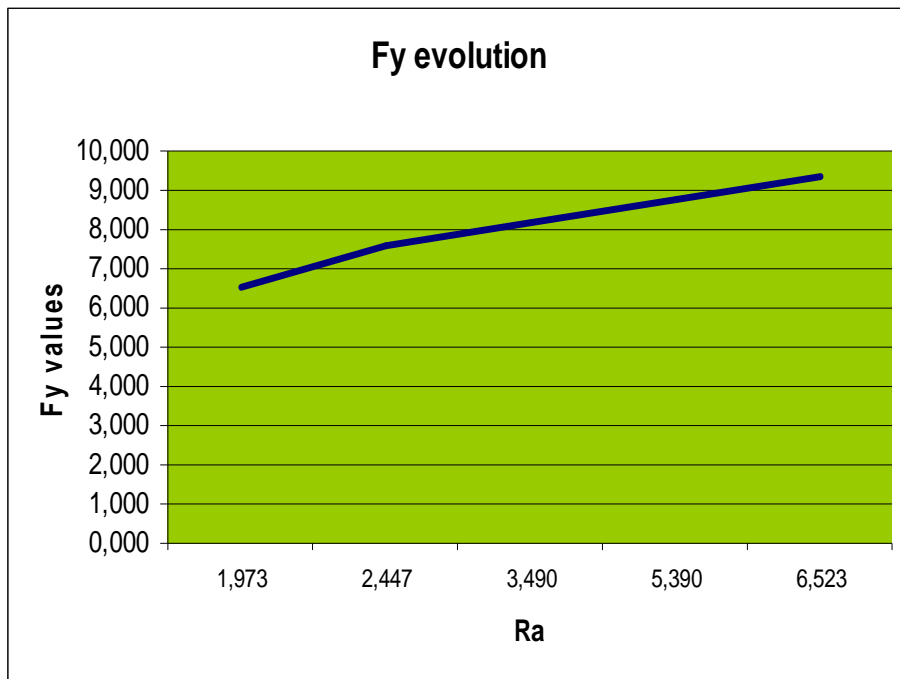


Fig.4. The correlation between the  $F_y$  cutting forces and Ra radial forces diagram.

From the diagrams, we can deduce that the forces  $F_y$ ,  $F_x$  and  $F_z$  increase with increase on of roughness.

### 3. Conclusions

The feed rate is the cutting parameter that has the highest physical as well statistical influence on surface roughness ( $R_a$ ). From the diagrams we can concluded that the forces  $F_y$ ,  $F_x$  and  $F_z$  increase with increase on of roughness. The diagrams for the roughness of the piece wich has been cutted having the cutting speed 100[m/min], 200[m/min] and 400[m/min].

The tool bit should be clamped in the tool holder with minimum overhang. Otherwise, tool chatter and a poor surface finish may result. In the use of carbide, ceramic, or coated carbides for mass production work, throwaway inserts are used; these can be purchased in great variety of shapes, geometrics (nose radius, tool angle, and groove geometry), and sizes.

### References

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