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DEPENDENCE OF DISK CUTTING PROCESS ON THE CONTORTION OF THE PLATFORM RACK PROFILE ON THE EXAMPLE OF PE «PSIUKIVSKYI O. Y. »

Natural stone processing is the one of the leading industries in Zhytomyr region. The region is characterized by surface location of raw material base and rich deposits of a quality block stone. It determines high profitability of production. Stone processing, in general, consists of successive operations, such as sawing, grinding, polishing, and slabs bordering [1, p. 24].

One of the main processes is sawing. The most important parameters of sawing operation is the diameter of the machine disk, its power and the value of the working feed [2, p. 10]. The last two parameters and the raw materials characteristics determine the mode of the process of sawing.

The following dependencies (Table 1) between the distortion of the rack path in the horizontal and vertical planes and the power of the machine at the specified stages of sawing the model block were established during the research conducted at the PE «PSIUKIVSKY O. Y.».

It should be noted that the study was carried out on a disk machine with a diameter of 2700 mm and operating capacity of 36 kW (nominal 55 kW). The planned cutting speed is within the range of 18-20 m / s with a cutting depth of 8-10 mm. The length of the track is 6100 mm; the measurements were made from the center of the platform with a frequency of 200 mm.

The conclusions can be made based on the obtained data. First, the distortion has a significant effect on the power of the machine. It follows that increasing the value of the distortion destabilizes the normative value of power and, in turn, worsens the optimality of the cutting process. Secondly, the growth of a positive deviation of power contributes to the increased power consumption of the machine. Thus, the economic losses of the enterprise increase.

To sum up, we can say that the effect of the platform distortion on the parameters of the blocks disk sawing is significant enough. This mainly affects the changes in the power of the machine during the stage of sawing which, in turn, negatively affects the optimality of the cutting process.

The way to solve this problem is to restore surface evenness by racks grinding. This operation eliminates the wavy run-out and short irregularities on the surface of rolling rack in order to reduce the vibrational impact of the platform on the track.

Table 1

Investigation results

Measuring №	Value X	Value Y	Deflection X	Deflection Y	Observed process	Amperage, A	Porwer, kW
1	2	3	4	5	6	7	8
1	34,9	5	0,1	-	Idling	35	23,1
2	34,85	5	0,15	-	First touch to stone	42	27,7
3	34,8	4,8	0,2	-0,2	Sawing on half dip	54,7	36
4	34,75	4,6	0,25	-0,4			
5	34,65	4,5	0,35	-0,5			
6	34,6	4,6	0,4	-0,4	Sawing on full dip	54	35,6
7	34,55	4,7	0,45	-0,3			
8	34,5	4,9	0,5	-0,1		57	37,6
9	34,45	5	0,55	-			
10	34,43	5,1	0,57	+0,1		56,2	37
11	34,44	5,3	0,56	+0,3			
12	34,59	5,4	0,41	+0,4			
13	34,63	5,2	0,37	+0,2	Sawing on half dip	50	33
14	34,64	5	0,36	-			
15	34,71	4,6	0,29	-0,4	Sawing on a quarter dip	45,3	30
16	34,75	4,7	0,25	-0,3			
17	34,82	5	0,18	-	Sawng on ⅛ dip	40	26,4
18	34,84	5	0,16	-	Idling	35	23,1

REFERENCES

1. Сычев Ю.И. Распиловка камня / Ю.И. Сычев, Ю.Я. Берлин – Москва: Стройиздат, 1989. – 320 с.

2. Коробійчук В.В. Технологія та механізація розпилювання каменю / В.В. Коробійчук, В.В. Котенко – Житомир: ЖДТУ, 2011 – 55 с