

PR-162

INFLUENCE OF CONSTRUCTION AND ROTATION FREQUENCY OF THE MIXING DEVICE ON THE CONSUMED STIRRING POWER

Khomyakov A. P., Mordanov S. V., Naskina D. R., Khomyakova T. V., Petsura S. S.

Ural Federal University of the first President of Russia B. N. Yeltsin.

19 Mira St., Yekaterinburg, 620002, Russia

E-mail: dilay1909@mail.ru

Abstract. In the course of the study, the dependences of the mixing power on the rotation frequency were obtained for various designs of mixing devices. In the calculation, the following designs of mixing devices were used: two-tier three-bladed with a diameter of 1000 mm, a single-tier three-bladed with a diameter of 1000 mm, a single-tier six-bladed with a diameter of 1000 mm, a single-tier three-bladed with a diameter of 250 mm, and a single-tier three-bladed with a diameter of 400 mm.

The power was calculated according to 1, 2. The following conditions were accepted for carrying out: the diameter of the reactor is 2400 mm, the height of the shell is 3800 mm, the density of the medium is taken as 1200 kg / m³. The dependence of power on the rotational speed of a mixing device of various designs is shown in Figure 1.

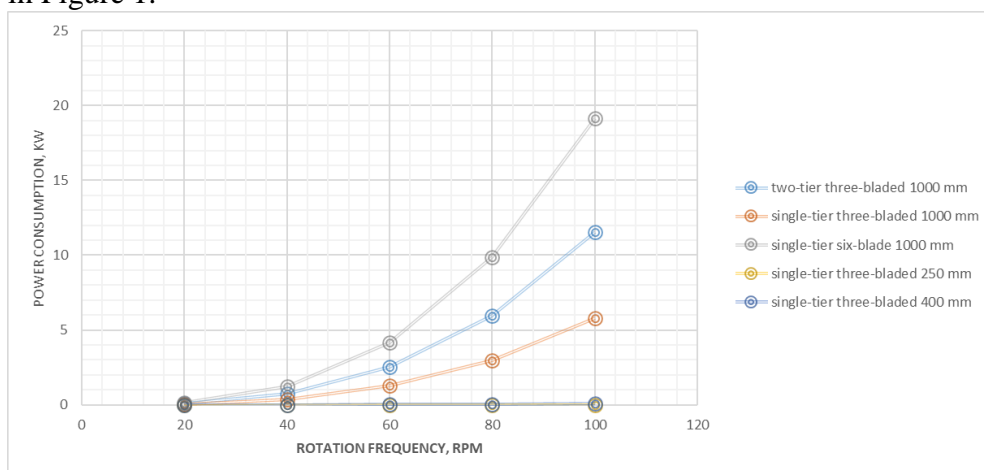


Figure 1. Dependence of power on speed.

Application will be acceptable: two-tier three-blade 1000 mm stirring device at 20, 40, 60 rpm; single-tier three-blade 1000 mm mixing device at 20, 40, 60, 80 rpm; single-tier six-blade 1000 mm mixing device at 20, 40 rpm. The selection of a suitable agitator design and rotational speed was based on limiting the engine power to 3 kW and previous research on reducing reactor residence times by redesigning the agitator.

References

1. Rukovodyashchiy normativnyy dokument. Mekhanicheskiye peremeshivayushchiye ustroystva, metod raschota: RD 26-01-90–85. Vved. s 01-01-1986. L.: RTP LenNIIkhimmasha, 1985.
2. Domanskiy I. V. Mashiny i apparaty khimicheskikh proizvodstv: Primery M38 i zadachi. Ucheb. posobiye dlya studentov vtuzov, obuchayushchikhsya po spetsial'nosti «Mashiny i apparaty khimicheskikh proizvodstv» / I. V. Domanskiy, V. P. Isakov, G. M. Ostrovskiy i dr.; Pod obshch. red. V. N. Sokolova. L.: Mashinostroyeniye, Leningr. otdeleniye, 1982. 384 p.