

عنوان مقاله:

Improving the surface properties of hydraulic cylinders using magnetic abrasive particles

محل انتشار:

هفتمین کنفرانس بین المللی مهندسی مکانیک، مواد و متالورژی (سال: 1400)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

Reciprocating compressors are widely used in various industries. Increasing the efficiency of reciprocating compressors reduces their energy consumption. One way to increase the performance of reciprocating compressors is to improve the contact surface roughness between the cylinder and the piston. Reducing the surface roughness of the cylinder or piston to the nanometer level causes the piston to move more smoothly. There are several ways to improve the surface quality of cylinders and pistons. One of the methods that has been considered recently is the Maf method. In recent decades, materials engineering, especially the quality of surface methods, has opened new horizons in engineering. Among the surface properties, surface roughness is very effective in some applications such as hydraulic cylinders. Among the techniques for improving surface roughness, the method of using magnetic abrasive finishing (MAF) has recently been proposed. This method is one of the most important methods of polishing parts in nano-dimensions, which creates a very high level of smoothness. In this research, the effect of important parameters of MAF process on the improving of the surface roughness in cylinders made of aluminum has been studied. In this experiment, an attempt has been made to use abrasive particles, with different morphologies, to study their effect along with other parameters on the surface roughness of hydrolic cylinder. The experimental results show that the morphology of magnetic abrasive particles has the greatest effect on surface roughness and rod-shaped abrasive particles are much more effective than spherical particles. Also, surface roughness decreases with increasing speed of abrasive particles and polishing time

کلمات کلیدی:

magnetic abrasive finishing, hydrolic cylinder, aluminum, surface roughness morphology

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