

Study on the Polishing Characteristics of the Magnetic Abrasives Finishing to the Slender Pipe

Y. Chen ^{1,a}, F.Yan ^{1,b} and C.Q. Zhu¹

¹Department of Mechanical Engineering, University of Science and Technology Liaoning,
114051, China

^acy1234cy@yahoo.com.cn, ^byf65@sina.com

Keywords: Magnetic abrasive finishing, Magnetic flux, Magnetic abrasive particles and Slender pipe

Abstract. Polishing the inner surface of slender pipe is very difficult. Because a usual tool cannot into the inner surface of the slender pipe, and automation do not achieved easily; the eye is unable to see, even if handmade is also very difficult. Utilize the characteristic of the magnetic force line may penetrate the non-magnetic material, may using the magnetic abrasive finishing (MAF) method complete to the inner surface of the slender pipe precise polishing is a preferable method and already obtained the good processing effect through the experiment. Therefore, this paper analysis and explanation the finishing principle and experiment device as well as collocation position of magnetic poles etc best experimental condition.

Introduction

Recent years, high precision pipe appeared in medical instrument, astronautics industry and so on. Because transporting mediums is the high-purity gas or the liquid, the lower roughness is requested in internal surface for guaranteed the transportation unobstructed, avoids the pollution and the corrosion, and enhances the duct service lifetime. Because of the placed environment limit, very many ducts are slender pipe, use the ordinary tool is very difficult to machining, even by the handwork is difficult to complete too.

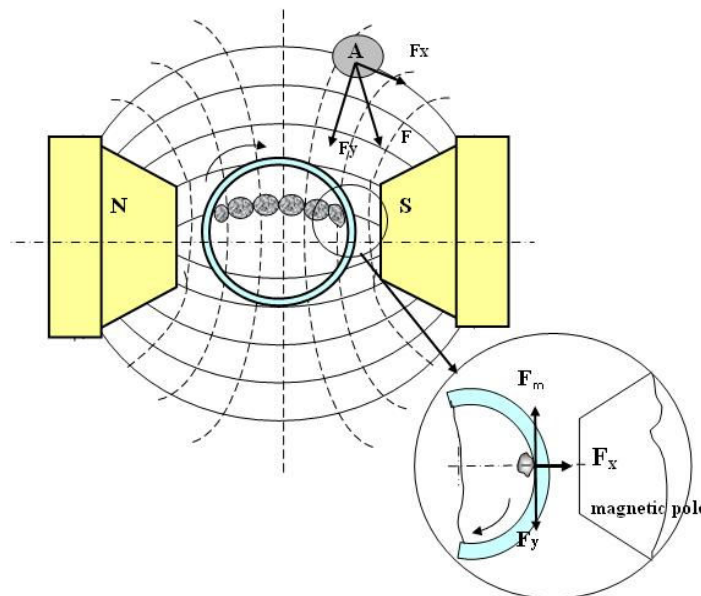


Fig. 1 Principle of magnetic abrasive finishing

The magnetic abrasive finishing may be a preferable solving method to polishing the inner surface of slender pipe for the fact mentioned above. The magnetic abrasive finishing is a method that the magnetic field (magnetic force lines) is used to precisely polish the surface of the workpiece. When