EXPERIMENTAL RESEARCHES CONCERNING BEHAVIOUR ON CUTTING BY TURNING OF STEELS FOR MAGNETS, NDFEB BASED

Melania Tămaș, Doina Ene; Mariana Antonescu

e-mail: melaniat2@yahoo.com; doinaene@ymail.com;maryana_antonescu@yahoo.com.

Abstract: *This paper presents experimental research concerning the behavior on cutting by turning of steels for magnets NdFeB based. In this context, cutting by rough turning of steels magnet neodymium and ferrite boron based were performed. Turning processing with the values of the cutting parameters recommended by European Union and Sandvik Coromant company rules, taking into account the chemical composition of the processed material and cutting tool were performed. The tables have been drawn up with the values of cutting forces. By comparing these data it can be concluded that steels for permanent magnets, NdFeB based have acceptable behavior, the process by rough turning. A full assessment of the optimization of the cutting by turning process of steels for permanent magnet, NdFeB base will result from subsequent experimental research that will take into account the wear of cutting tools and quality (roughness) of processed surface.*

Keywords: *NdFeB magnets, metallographic structure, cutting by rough turning, thermal film*

1. Introduction

The Neodymium (Nd), a main magnets component has been first commercially used in 1927 as glass dyes, especially for laser lens and today it remain a popular such additive due reddish-purple color, which confer fluorescent effects, capable to change in accordance with the type of lights [1]. Also this has extremely high power applications, such as experiments in inertial confinement fusion.

Neodymium, not found naturally in metallic form or unmixed with other rare earth lanthanide type elements represent one of the most important element due to it's contribution for „neo" alloys for magnets since first 1982, and commercially available in 1984 [2, 3]. Nevertheless, 3.6 billion years can be considered the beginning of rock-forming meteorite found in Antarctica, which may contain traces of fossil life on Mars. One of these meteorites is ALH 84001, (fig. 2), discovered in 1984, contains, among others, neodymium (Nd) and wolfram / tungsten (W).

Figure 1: *Martian meteorite rock containing neodymium and tungsten [4]*

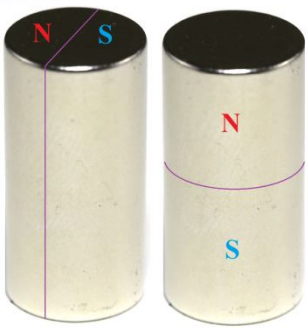

Figure 2: *Rare earth magnets, NdFeB based*