Wear and Corrosion Resistant Bearing Steel Composite

INVENTION

This invention discloses a low cost method of preparing bearing steel composite with and without nickel coated cubic boron nitride (cBN). Bearing steel are widely used as cutting tools, moulds, die and extrusion tools fabrication due to their high dimensional stability and mechanical strength at high temperatures. The developed bearing steel/cBN nickel (Ni) composites possessed excellent wear and corrision properties due to the presence of cBN and Ni which enhanced the properties.

MARKET NEED

The market for bearing steel is steadily growing paving way for investors and commercialization. The market for the high speed steels used in cutting tools is projected to grow from USD 2.13 Billion in 2016 to USD 2.77 Billion by 2021, at a CAGR of 5.3% between 2016 and 2021. Increasing demand for cutting tools and working tools made of high speed steels from various end-use industries, such as automotive, steel cutting, and chemical plants, among others, is expected to drive the demand for high speed steels, thereby fueling the growth of the high speed steels market during the forecast period [Retrieved from https://www.marketsandmarkets.com].

APPLICATIONS

The newly developed cBN and Ni-coated cBN reinforced bearing steel composites can be used in ball bearings, cutting tools, spouts, nozzles, grinding tools and applications with high wear and fatigue resistance coupled with high thermal shock resistance requirements.

ADVANTAGES

This invention has the following main advantages over the existing ones:

- Harder than tool steel
- Economical
- Better anti-corrosion properties
- Better sustainability
- Easy to manufacture

PROJECT STATUS

This invention in its current form has been tested at laboratory scale. The laboratory validation includes:

- Thermal effusivity
- Thermal expansion
- Thermal conductivity
- Density
- Hardness

LOOKING FOR A DEVELOPMENT PARTNER

Although the invention has been proven at the lab scale, it needs to be tested for industrial usage. King Fahd University of Petroleum & Minerals (KFUPM) seeks an industrial partner for developing the material for industrial usage. KFUPM's ultimate objective is to license the intellectual property.

PATENT PROTECTION

A U.S. patent application 16/653,566 covers the invention. The intellectual property is owned by King Fahd University of Petroleum & Minerals (KFUPM).

ABOUT KFUPM

KFUPM is a leading educational organization for science and technology. KFUPM Innovation & Technology Transfer office is tasked with taking innovation from lab to market place.

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