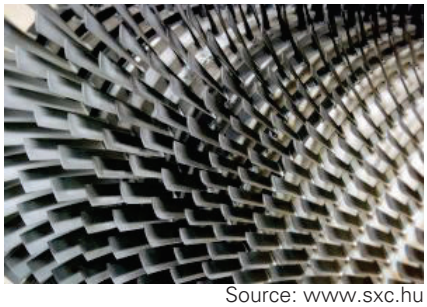
PROCESS FOR THE PRODUCTION OF ULTRAFINE GRAINED FERRITIC STEEL

"A low cost process that allows for the manufacture of stronger and tougher low-carbon and low-alloy steels."



Source: www.sxc.hu

Idea | Laboratory | Pilot scale | Scale-up | Industrial scale

► Process

Description

The technology consists of a process to manufacture ferritic steels with uniform ultrafine grains for application in the steel making and metallurgical industries. The thermomechanical process allows for the production of low-carbon and low-alloy steels with improved mechanical properties, such as greater strength and toughness, without requiring the addition of alloying elements.

Benefits

- The manufacture of low-carbon and low-alloy steels without the addition of alloying elements involves lower-density technology and reduces the cost of the process;
- Material of greater strength and toughness;
- Possibility of manufacturing thicker structures of light alloy, thus opening up a new niche in the steel market.

Problem

Low-carbon and low-alloy steel manufacturing includes a step involving the addition of alloying elements to the material, which is characterized as a high-density technology and high cost process. The process is also limited to the fabrication of thin sheet steel because it only reaches the surface layers of the material.

Market potential

The worldwide production of raw steel in 2009 was 1.2 trillion tons. In the same year, Brazil ranked ninth among the 10 largest worldwide steel manufacturers and first in Latin America, with a total production of 26.5 million tons, net sales of R$ 57.5 billion, and a balance of trade representing 7.5% of the country's total trade balance. The newly developed process is part of the steel laminates sector, with a national production of 21.2 million tons in 2009, export revenues of US$ 3.9 billion and imports of US$ 2.3 billion. The auto parts sector, which is the focus of this technology, represents 25% of the total consumption of the Brazilian steel industry.

Proposed solution

The proposed technology involves the manufacture of low-carbon steel by thermomechanical processing, increasing the strength and toughness of the material without requiring the addition of alloying elements. It also allows for the manufacture of higher gauge sheet steel, since it reaches the internal layers and the entire section of the materials.

Contact

UNESP Technology Transfer Office - AUIN
E-mail : paulo.carvalho@reitoria.unesp.br
Website: www.unesp.br/auin
Phone: +55 (11) 3393-7901 / 7909

Agência UNESP de Inovação

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