What are they? They are amorphous solids materials derived (among others) used for technological applications in energy saving area.

What physical properties have? Its properties vary according to their composition:

- **Soft Magnetic Materials**
  - Fe₇₂S₁₈B₁₃
  - Fe₇₁S₁₈₂Ge₅B₁₄Cu₈
  - FINEMET-type alloys

- **Hard Magnetic Materials**
  - Nd₅Fe₇₇B₁₈
  - Nd₁₀Fe₈₀B₁₀
  - NdFe₁₈-xBₓT₃ₓ (x = 0, 4; y = 7, 8)

Due to its physical properties and its ease to be formed as thin films (~ 20 - 40 microns), these materials can be heat treated and crystallize in the nanometers arranged order structures, which makes applications having impact on Nano-Technologies. Then, this films may be ground to provide powder particles to generate complex 3D structures by powder metallurgical methods.

What applications are interesting?

- **Soft Magnetic Materials**
  - These materials are obtained by ultrafast cooling (melt spinning technique) from the liquid state.
  - Are available as ribbon, powders (~ microns).
  - Can be obtained in amorphous state.
  - Can be heat treated (~ nanometers)

- **Hard Magnetic Materials**
  - In the electronics industry it has been a permanent objective the development of ever more efficient and lighter components for typical applications.
  - The most common uses are permanent magnets to eliminate gearheads used in elevators, wind turbines and their applications in automotive engines.
  - Increased energy density stored is due to obtaining structures nanoscale that enhance the production to power.
  - Use of Nd as an integral the permanent magnet must be careful to prevent corrosive effects.

Conclusion:

Through a VOF model implemented in OPENFOAM®, for two non-isothermal, immiscible, and compressible fluids using computational techniques for the mathematical model with a hyperbolic tangent type (HTE) viscosity function previously assigned to the solver, has been recreated the necessary turbulence condition to explain the effects of the viscous forces are appreciable at 1200 °C and temperatures above 1300 °C. The surface tension effects almost triple, manifest the narrowing formation mechanism, which is consistent with those obtained by other authors [14], [10], [12], [7]. This effect reinforces the proposed hypothesis in the present work after the molten material pool formation. The transverse profiles solidification at cooling rates such as those described in laboratory tests of this work (~2700). The transverse profiles solidification at cooling rates such as those described in laboratory tests of this work (~2700) and the trapped gas pockets that influence in profile roughness are consistent with those obtained by other authors [12] [13] [15].

The exit temperature of the chill block melt (ºC) and the average width (mm) of Gap over the rotating copper chill block melt Spinning Solidification Process: A Comparative Analysis Using Open FOAM

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**Micro and Nanostructured Magnetic Materials:** Obtaining CBMS process parameters by numerical modeling and simulation. Pagnola, M. R., Barceló, F. & Useeche, J.