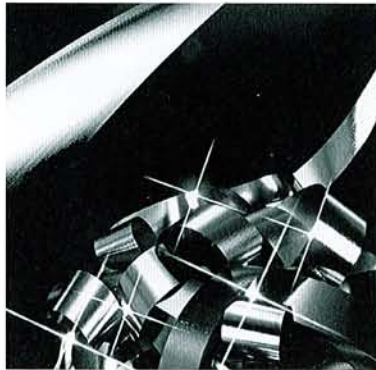


# Amorphous Magnetic Materials and their Applications

There is a magnetic metal material with very unique characteristics that does not have a crystalline structure. At Toshiba Materials, we focused on the excellent magnetic characteristic of this amorphous magnetic alloy and started research and development years ago, anticipating future applications and need for such a product. This Amorphous alloy was called "alloy of dreams" at the time when we started our research but in recent years, it has and is finding application in electrical products (desk top computer, copying machine, printer etc.) very close to you. Amorphous magnetic parts made it possible to reduce energy consumption, minimize electronic circuit noise for electrical products with a product considered environmentally friendly.



Amorphous Ribbon

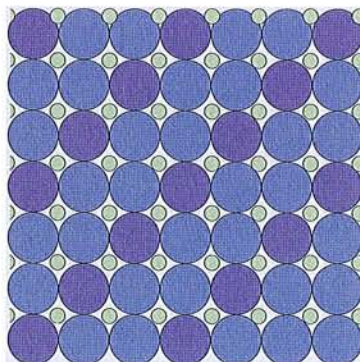
## Amorphous Alloy

Amorphous alloy is a general term for a metal with a non-crystalline structure of atoms.

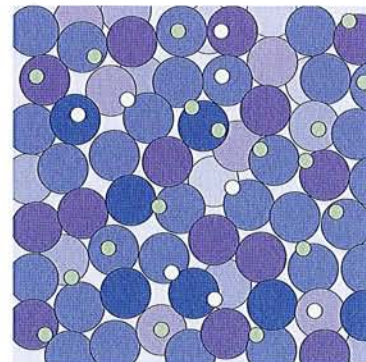
Regular alloys have a uniformly formed metallic crystalline structure, but for amorphous alloys, the atoms are distributed randomly. As a result of this random atomic distribution, the magnetic properties of amorphous alloys are anisotropic. Also, in addition to an increase of electrical resistivity, thin ribbons are directly made so that the eddy current losses will be small and the magnetic characteristics will be significantly improved.

At Toshiba Materials, we manufacture a Cobalt based amorphous alloy by the liquid rapid cooling method. This method of rapid cooling, at a rate of about 1 million degrees per second, prevents the metal from solidifying in an amorphous structure rather than in its normal ordered crystalline structure.

### Models of Atomic Arrangement



Regular Alloy  
(Crystalline Structure)



Amorphous Alloy  
(Non Crystalline Structure)