

Alnico Magnets 101

Alnico magnets consist of alloys: Al (aluminum) Ni (nickel) Co (cobalt), hence Al-ni-co, with additional alloys, iron, copper and titanium and other elements to enhance heat treatment in magnetic properties. They were developed in late 1930's and commercially available in the early 1940's.

To produce cast Alnico magnets conventional methods are used: casting in resin bonded molds. Each process produces Isotropic and Anisotropic magnets. Isotropic Alnico magnets are produced with no orientation and without exposure to electromagnetic field and can be magnetized in any direction. On the other hand, the Anisotropic Alnico magnet castings are heated above their Curie temperature, and then cooled at a controlled temperature rate with an electromagnetic field applied in a specific direction to achieve the desired improved properties.

Anisotropic or Oriented Alnico magnets can only be magnetized in the direction of orientation. The most common of these for guitar pickups are Alnico 5, ceramic 8, Alnico 8's and 9's.

Isotropic magnets with no orientation, Hence Un-Oriented guitar magnets are most common in Alnico 2,3,4, and Un-oriented Alnico 5 also Un-oriented Ceramic.

Oriented magnets tend to be the stronger magnets. The magnetic field from the magnet is expands out to the guitar strings. The amount of magnetic pull to the strings affect the sustain and vibration of the guitar strings, which affect tone, harmonics, sustain, feedback. This whole effect can be changed with the magnetic strength of the magnet, whether fully magnetized or partially magnetized, and whether A2,3,4,5,8,9 or ceramic. Have fun!