Magnet types and properties

In general, there are four families of magnets available commercially. Factors such as operating temperature, demagnetizing effects, field strength, environmental characteristics, and available space for movement etc. need to be considered before selecting a magnet for a reed switch or reed sensor application. An overview of each of the families of magnets is given below.

NdFeB

Highest energy product
Very high remanance and coercivity
Relatively low priced
Mechanically stronger than SmCo
Can be used up to 200°C
Not recommended in Hydrogen atmosphere
Bonded types can be machined but not tapped

SmCo

High energy product
Suitable for high performance applications
High resistance to demagnetization
Excellent thermal stability
High corrosion resistance
Most expensive magnet
Can be used up to 300°C
Prone to chipping - should not be used as a structure

AlNiCo

Cheaper than rare earth magnets
Highest working temperature of 550°C
Lowest temperature coefficient
Low coercivity when compared to other types
High induction levels

Ferrites

Brittle
Poor thermal stability
Cheapest of all types
Can be used up to 300°C
Needs grinding to meet tight tolerances
High corrosion resistance

Selection Guide

Cost	Ferrite	AlNiCo	NdFeB	SmCo
Energy	Ferrite	AlNiCo	SmCo	NdFeB
Operating Temperature	NdFeB	Ferrite	SmCo	AlNiCo
Corrosion Resistance	NdFeB	SmCo	AlNiCo	Ferrite
Resistance to Demagnetization	AlNiCo	Ferrite	NdFeB	SmCo
Mechanical Strength	Ferrite	SmCo	NdFeB	AlNiCo
Temperature Coefficient	AlNiCo	SmCo	NdFeB	Ferrite

Conversion Table

Property	CGS Unit	SI Unit	Conversion Factor
Magnetic Flux	Maxwell	Weber	1 Weber = 10^6 Lines
Flux Density (B)	Gauss	Tesla	1 Tesla = 10^4 Gauss
Magneto motive force	Gilbert	Ampere-turn (AT)	1 Gilbert = 0.796 AT
Magnetizing force field (H)	Oersted	Ampere-turn / metre	1 Oersted = 79.577 AT / m

Please contact us for more information

www.rre.in

27 December 2013