# MagWeb's MAGNETIC PROPERTY VISUALIZERS

Magnets have essential uses in a wide range of industries including automotive, aerospace, defense, telecommunication, and medical industries, to name a few. They are parts of the most important pieces of equipment and tools needed to carry out safe and smooth day-to-day operations. Examples include the motors, sensors, and actuators in electric vehicles, transformers in electrical distribution, pumps in the industry; the mission-critical components for manned and unmanned vehicles and missiles; the cellphones, switches, and connectors for fast and reliable communication; and the MRI scanners used to diagnose diseases. Choosing the best magnetic material available on the market is critical to meeting the application's stringent requirements.

MagWeb proudly presents its revolutionary interactive visualizer and database of magnetic properties of all grades of magnetic materials produced by diverse manufacturers around the world. Our SMAG and PMAG tools quickly show magnetic property curves of different magnetic materials, helping electrical engineers design machines and discover the best grade materials to be used. Read on to learn more about the amazing features of these tools.
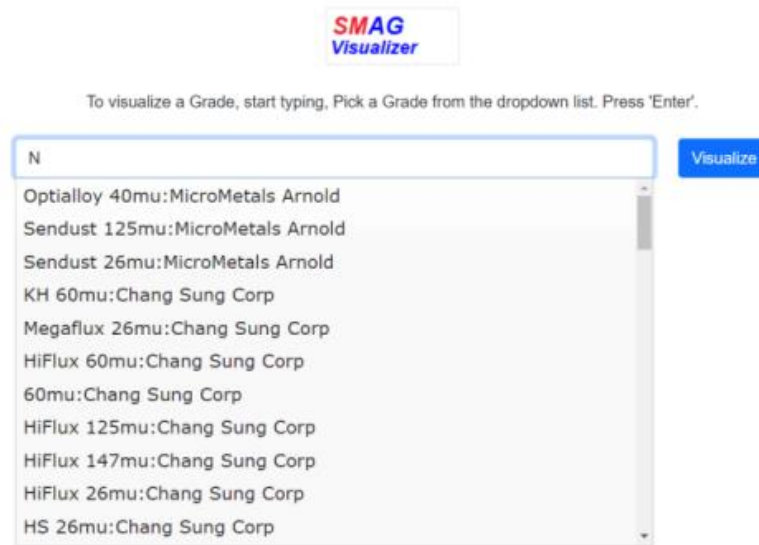
SMAG Visualizer

Core Loss Curves
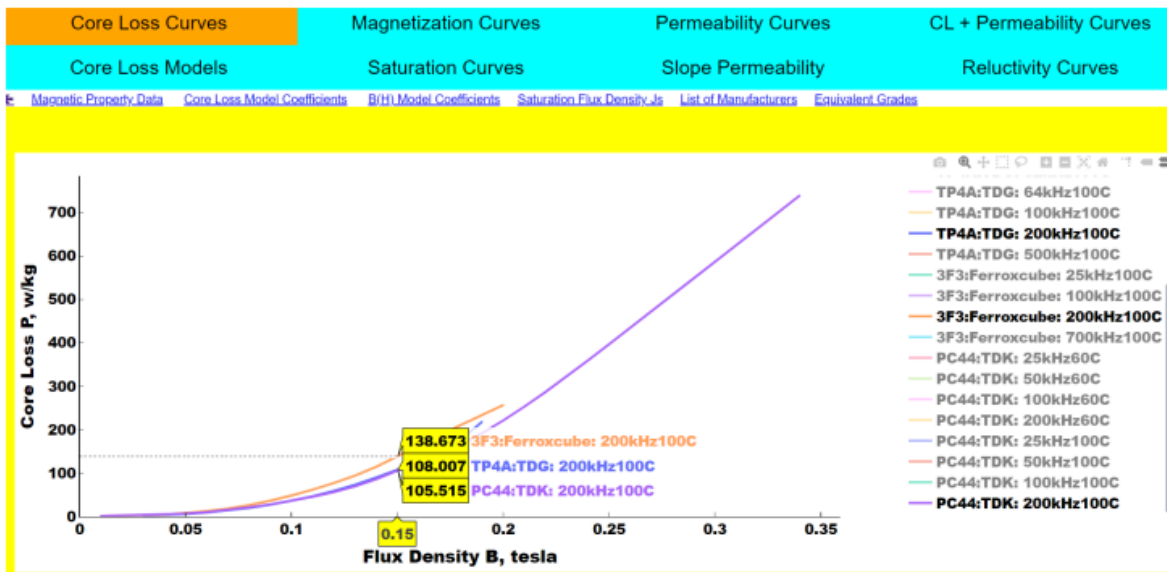
Core Loss Curves of Different Ferrite Cores

Core loss refers to the energy dissipated by the changing magnetic flux field within a material. A material with a low core loss value generates less amount of heat, which is desirable. Machines designed with a magnetic material having low core loss are energy-efficient, maintain a low temperature, and have a longer service life. Engineers continuously strive to discover materials that will offer lower losses than their current designs, but so far their search efforts are hampered

by a lack of tools that can quickly compare core losses of several grades. SMAG Visualizer allows designers to compare the core loss of various grades of soft magnetic materials in a couple of clicks, which enables them to easily determine which is best to use. It can also display core loss in four ways: 1) core loss curves P(B,f), 2) core loss + permeability curves, 3) core loss models, and 4) core loss model coefficients. By simply typing the specific grade of the soft magnetic material in the *Search bar* and picking from the dropdown list, designers can compare as many grades, as shown below.

Search Page of the SMAG Visualizer

Permeability Curves
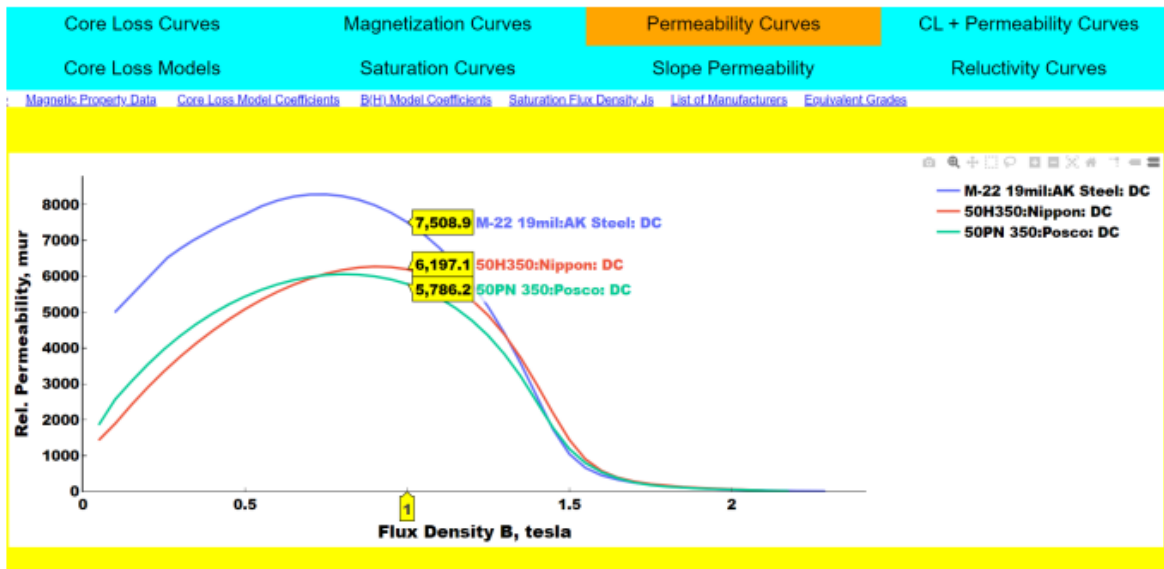
Permeability Curves of Equivalent Grades from Different Manufacturers

Magnetic permeability pertains to the ability of the material to become magnetized when exposed to a magnetic field. Magnetic materials with higher permeability are easier to magnetize. Generally, soft magnetic materials have higher permeability than hard magnetic materials. When looking for the best soft magnetic material to use, SMAG Visualizer helps to quickly determine which manufacturer produces the grade of magnetic materials that suit the application. Other magnetization curves SMAG Visualizer can display are 1) ferric flux density curves J(H,f), 2) slope permeability curves B'(B,f), and 3) reluctivity curves nu(B,f).

PMAG Visualizer

Demagnetization Curves
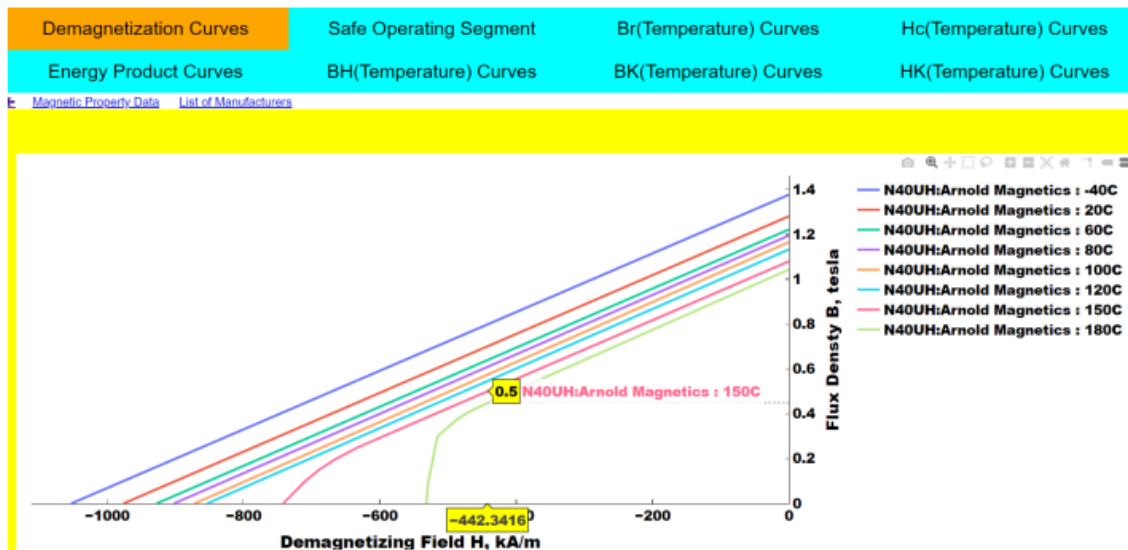
Demagnetization Curves of Selected Grade

Demagnetization curves are the most important property curves of permanent magnets such as alnico magnets, neodymium iron boron magnets, samarium cobalt magnets, and ferrite magnets. They show the temperatures and/or flux densities wherein permanent magnets beyond which they can be demagnetized (which degrades its magnetic properties). Knowing the better grade of permanent magnetic material and its manufacturer using PMAG Visualizer secures safe and continuous running of machines at worst operating conditions. PMAG Visualizer helps determine the optimum grade of permanent magnet suitable for different applications and the optimum operating conditions to employ.

Energy Product Curves
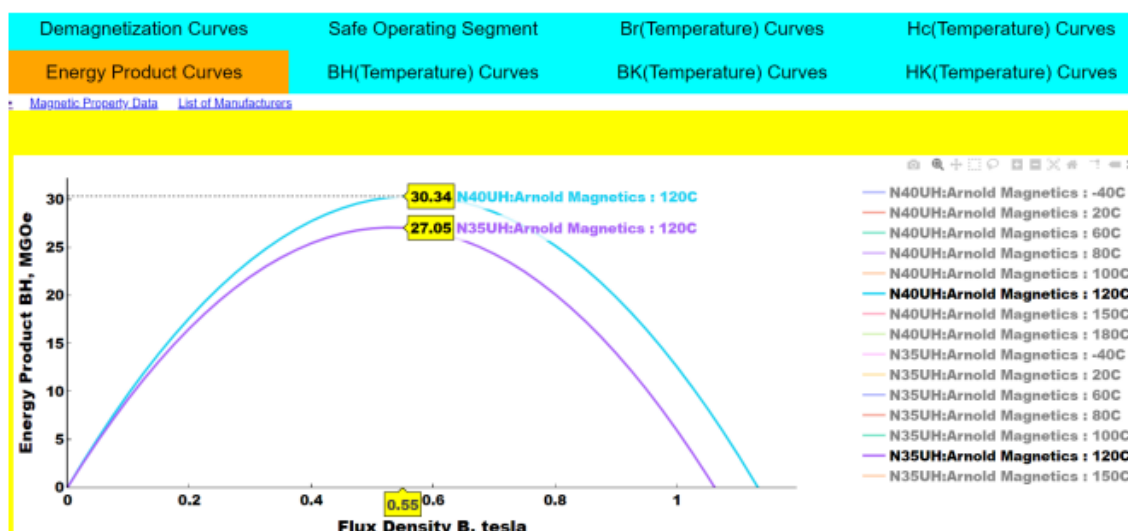
Energy Product Curves of Varying Grades

Energy products curves help in the selection of the size and grade of the permanent magnets to use. A grade label reflects the energy product, so the cost of a magnet highly depends on its grade. So it is important to determine which manufacturer produces the maximum energy required by the machines being designed. PMAG Visualizer allows for comprehensive cost analysis of different grades of permanent magnets by comparison of their energy product curves. Temperature-dependency curves of residual flux density $B_r(T)$, coercivity $H_{cb}(T)$, knee flux density $B_k(T)$, and knee field $H_k(T)$ can also be shown using PMAG Visualizer.

Access these incredible design features anytime, anywhere using phones, laptops, tablets, or computers by getting a subscription. Subscribers can also download data and compare as many grades. Use the Steel Selector or Magnet Selector if you do not know the specific grade of the magnetic material you want to analyze.

To get you started, we offer free access to SMAG Visualizer and PMAG Visualizer. Try it now and explore a limited number of grades.

For more questions, do not hesitate to contact us!