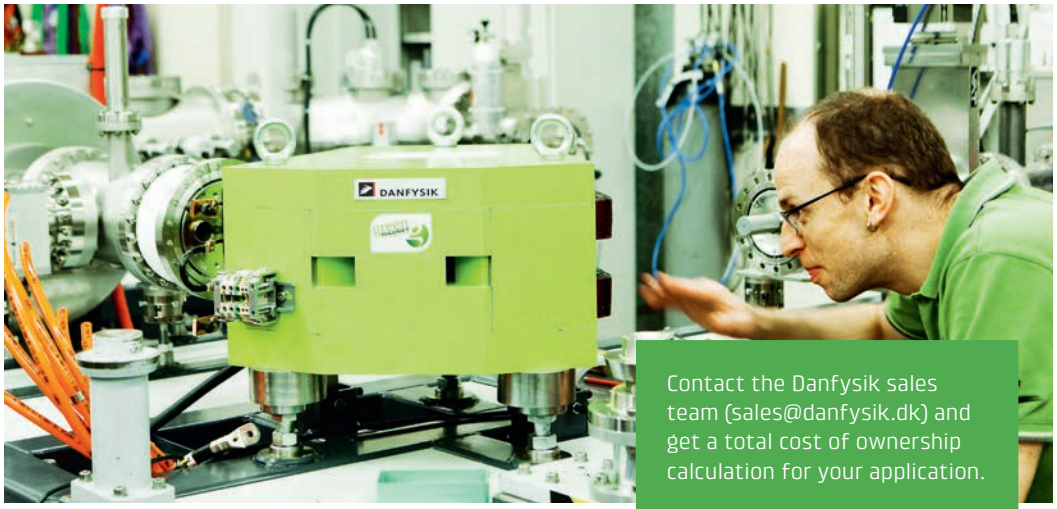
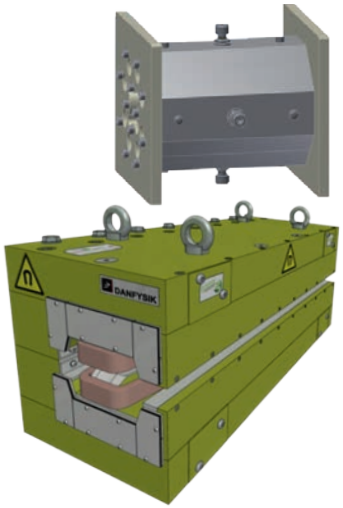


Contact the Danfysik sales team (sales@danfysik.dk) and get a total cost of ownership calculation for your application.

Green Magnets® for your fixed magnetic field application

Danfysik is currently designing and building Green Magnets® in the 1 T field range, making them suitable for a number of applications, like for storage rings and for synchrotron light sources.

Compact permanent magnet-based quadrupole magnets have been designed and manufactured for calibration purposes. The magnets are being used for test measurements on the new MAX IV magnet systems currently being built at Danfysik. The temperature stability of the calibration quadrupoles is better than 20 ppm/°C around ambient temperatures. The higher harmonic field error terms are well below 0.01% of the main gradient.



Company Adress
Danfysik A/S
Gregersensvej 8
DK-2630 Taastrup
Denmark

Phone +45 7220 2400
Fax +45 7220 2410
Email: sales@danfysik.dk
www.danfysik.com

DANFYSIK

GREEN MAGNETS®
save energy, space, and cost

green® MAGNET TECHNOLOGY

Green Magnets®
save energy, space and cost

Are you worried about growing electric bills? Would you prefer to use your accelerator grant for science and R&D, rather than for water cooling plants, electrical power installations, and large and costly power supplies? Do you have an application where you dream of reducing the footprint of your accelerator drastically, instead of taking up all your lab space?

Energy saving Green Magnet® technology from Danfysik typically reduces the total lifetime cost of an accelerator magnet by a factor of four. Due to the compact and low-power design, Green Magnets® save laboratory space on bulky power or water cooling installations. And, last but not least, they help protect our environment and our natural resources.

Green Magnets®
are based on mature technology

Decades of experience with applied permanent magnet technology were a sound basis for Danfysik to make Green Magnets® a reality. Together with our Danish partners at universities and in industry, we removed all obstacles on the road to reliable and cost-effective Green Magnets®, like temperature drift of permanent magnet material, field inhomogeneities, and the use of expensive materials, by finding optimized technological solutions.

Green Magnets®
for your particle accelerator application

Green Magnets® are ideal for all near fixed field applications, like for instance in:

- Ion beam applications
- Carbon dating
- Ion implantation
- Synchrotron radiation
- Free electron lasers
- Energy recovery linacs
- Calibration magnets

Many more applications benefit from Green Magnet® technology.
Green Magnets® are now available for dipole and quadrupole applications.

Visit the Danfysik website www.danfysik.com or send your inquiry directly to the sales team (sales@danfysik.dk).

Compact carbon dating system with Green Magnet® technology

The first fully temperature compensated Green Magnet® for a compact carbon dating system is running at the ETH in Zürich. We use passive temperature compensation, which stabilizes the magnetic field to better than 20 ppm/°C at 25°C ± 5°C. The dipole magnet is more compact than its electro-magnetic predecessor.

Tuning coils permit field adjustments within ± 2 % powered by an 11 W power supply. The cost saving potential depends on the price for electricity and on the existing installations. At an electricity cost of € 0.12/kWh, the saving potential for 20 years of operation is more than 70 %, not taking into account the cost savings on installations, maintenance, and operation of water cooling plants.

AMS Green Magnet® specifications

Parameter	Specification	Obtained
Deflection angle	90°	90°
Pole gap	38.5 mm	38.51 mm
Radius of curvature	250 mm	250 mm
Magnetic length	393 mm	394 mm
Center field	0.4267 T	0.42673 T
Operating range	0 - 2 %	0 - 3 %
Field homogeneity	$< 1{\cdot}10^{-3}$	$< 0.8{\cdot}10^{-3}$
Fringe field shim angle	28.52° ± 0.1°	28.45°
Thermal stability, 20-30°C	< 50 ppm/°C	< 20 ppm/°C

“ –"The Green Magnet® is running in our MICADAS. We have had no problems tuning the system with the new magnet and operating the system in this configuration since then. From our measurements, we can conclude that the magnet is performing very nicely, and we can achieve a very similar performance to that of the conventional magnet"

Hans-Arno Synal from ETH, Zurich