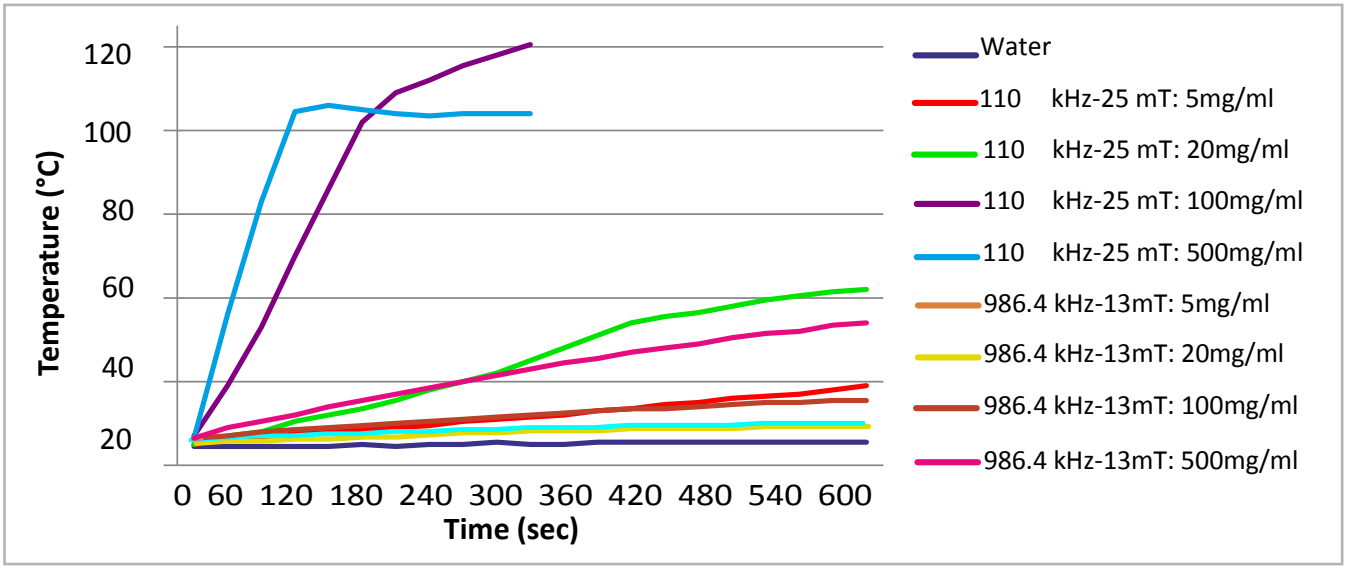
nanoTherics Limited

www.nanotherics.com

magneTherm™

The off-the-shelf, flexible and robust solution to measure thermal effects of magnetic nanoparticles

Heating property comparison between 1ml of different concentrations of Maghemite at AC Magnetic Fields:



- 10 Standard Frequencies
- Frequencies from *50 kHz to 1MHz
- Up to 25 mT field strength
- Variable field strength
- *In Vivo* capability
- Excellent Thermal Insulation
- Runs PCR vials, tubes (1mL to 50mL)
- 35mm Petri dishes (Biofilms/Cells/3D)
- Bench Top format
- No bulky cryo/refrigerant system

** Optional Extra*

- Amit P. Khandhar, R. Matthew Ferguson, Julian A Simon and Kannan M. Krishnan., 2012. Enhancing cancer therapeutics using size optimised magnetic fluid hyperthermia. *Journal of Applied Physics. 111, 07B306; doi: 10.1063/1.3671427.*
- Leisha M. Armijo, Yekaterina I. Brandt, Dimple Mathew, Surabhi Yadav, Salomon Maestas, Antonio C. Rivera, Nathaniel C. Cook, Nathan J. Withers, Gennady A. Smolyakov, Natalie Adolphi, Todd C. Monson, Dale L. Huber, Hugh D. C. Smyth and Marek Osiński, 2012. Iron oxide Nanocrystals for Magnetic Hyperthermia Applications. *Nanomaterials, 2, 134-146; doi:10.3390/nano2020134*
- Vallejo Fernandez, Gonzalo; Whear, Oliver; Gomez Roca, Alejandro; Hussain, Suzanna; Timmis, James; Patel, Vijay; and O'Grady, Kevin., 2013. Mechanisms of Hyperthermia in Magnetic Nanoparticles. *Journal of Physics D: Applied Physics 46, 043001; doi:10.1088/0022-3727/46/4/043001.*
- J. M. Byrne1, V. S. Coker, S. Moise, P. L. Wincott, D. J. Vaughan, F. Tuna, E. Arenholz, G. van der Laan,, R. A. D. Pattrick, J. R. Lloyd and N. D. Telling. 2013. Controlled cobalt doping in biogenic magnetite nanoparticles. *Journal of Royal Society Interface 10: 20130134; doi:10.1098/rsif.2013.0134.*

Standard system configuration:

17 Turn Coil
9 Turn Coil
5 Different Capacitor boxes
(A200, A88, B22, B11, B6.2)
Multimeter
(with thermocouple adapter)
Oscilloscope
Function Generator

Temperature probe (Type T Thermocouple)
DC Power Supply & Mains Connection cables
Sample tubes and spacers
Cooling water Tubes and connectors tubes
Inter-connection Cables
Screw drivers

Dimensions:

MagneTherm Enclosure	35cm (W) x 26cm (D) x 16cm (H)	Weight: 6kg
DC Power Supply:	24cm (W) x 32cm (D) x 13cm (H)	Weight: 6 kg
Function Generator:	22cm (W) x 29cm (D) x 10cm (H)	Weight: 2.8kg
Oscilloscope:	35cm (W) x 44cm (D) x 17cm (H)	Weight: 8 kg

Minimum Bench Footprint: 110cm (W) x 50cm (D)

Maximum Field Strengths:

Please note: All field strengths can be reduced from maximum to zero in mT steps if required by the operator

FREQUENCY	Maximum Field Strength (mT)	Maximum Field Strength (Oersted)	Maximum Field Strength (kA/m)
110	25	250	19.9
168	17	170	13.5
176	23	230	18.3
262	23	230	18.3
335	17	170	13.5
474	11	110	8.7
523	20	200	15.9
633	9	90	7.2
739	16	160	12.7
987	12	120	9.5

Power requirements: 85-264 V AC 5A/115V AC 2.5A/230V AC

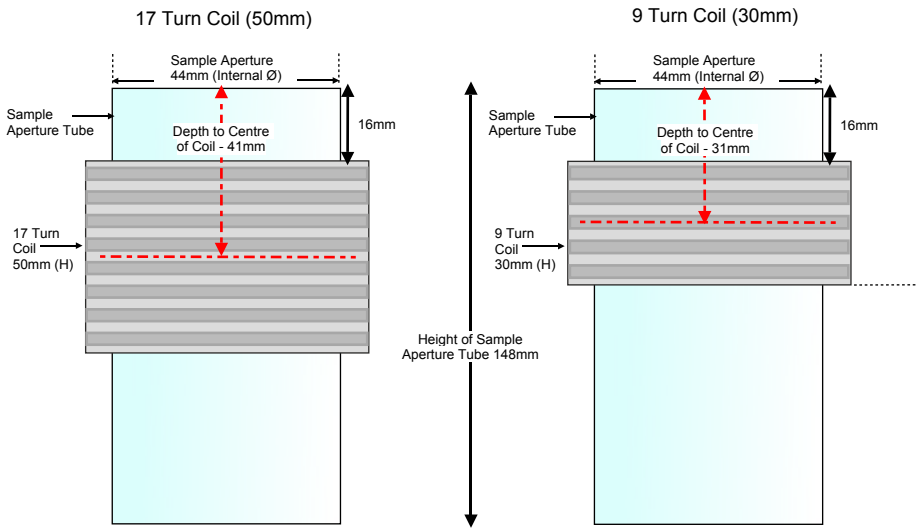
Standard Coils used: *(supplied as standard)*

9 Turn water cooled, copper coil 3 cm (H)
17 Turn water cooled, copper coil 5 cm (H)

Optional:

- Larger Sample Coil and Aperture (60mm)
- Water Jacketed Sample Aperture (typically used for in vivo applications)
- 2 Channel Fibre Optic signal processor and temperature probe.
- Lower Frequency 50 kHz
- Custom frequencies and Coils

Coil Geometry: *(Standard configuration)*



Contact details:

nanoTherics Limited
Innovation Centre 4,
Keele University Science Park
Staffordshire, ST5 5NL
United Kingdom

Tel: +44 1782 622112
Fax: +44 1782 7461919
E-mail:
enquiry@nanotherics.com
www.nanotherics.com