**Background:**

Magnetic nanoparticles (MNPs) have applications in biomedicine, mechanical engineering and

environmental remediation. However, standards defining terminology, characteristics and

measurement procedures for MNPs are still missing. In 2015, ISO/TR 19807 liquid suspensions of magnetic nanoparticles, was registered as work item in ISO/TC229, but this is just a material specification.

Uwe Steinhoff from PTB conveyed the discussion at the Euromet meeting with regard to the ISO/TR 19807, it is a one off standard rather that a program of standards to see the wide scale adoption of MNPs. For example, there is no standard method to determine magnetic irradiance, which is crucial to magnetic particle hyperthermia.

**Magnetic nanoparticles standards:**

The importance of standards and especially regulated areas such as medical fields were made clear at the Euromet meeting. The standard/s should be developed for the end practitioner and this is why there is a focus on surveying the needs of any standards program.

[Euromet call](http://msu.euramet.org/current_calls/pre_norm_2016/SRTs/SRT-n02.pdf) is where BSI is looking for standards input. It involves developing standards for magnetic nanoparticle characterization, viability testing, non-contact monitoring, and stability over a period of two years.

The most widely used magnetic nanoparticles for hyperthermia consist of iron oxide nanoparticles. They are in the context of MRI called "Superparamagnetic Iron Oxide Nanoparticles", or SPION. This is just one example and the standards program would look to cover all MNPs in all applications.

There is a total of around 100 members with 30 directly in industry the rest being clinicians and universities. There are two existing user groups of magnetic nanoparticles in Radiomag and Nanomag. These have provided input into the papers thus far, together with academic institutions.

**Standards outcome:**

* Development of a roadmap for successful commercialisation of treatment using magnetic nanoparticles.
  + Surveying industry needs,
  + Uptake of the standard,
  + Feedback on application of the standard.
* Review of standards and other papers which can support the standards development within the area of magnetic nanoparticles.
* Keeping the members of Nanomag and radiomag informed of the standards development process.
* Verifying the metrology checklist.

As the Secretariat of ISO/TC229 and BSI being very active in the area, we should be in a good position to take this Euromet program forward.