

# ZEROMAG News

## Aluminium smelting - a magnetic horror!

One area where Zeromag has had good success is in aluminium smelting plants. Here, the magnetic field generated by the huge currents used in the smelting process are induced into all magnetic material in the vicinity. So when the time came to repair the crane gantry - it could not be done!

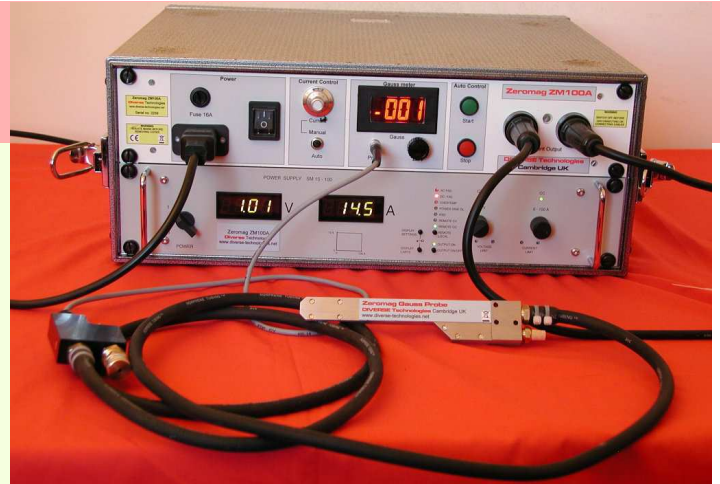
Diverse are the designers and manufacturers of Zeromag, the world's only, dynamic demagnetiser. Zeromag solves the magnetism and arc welding problem by measuring and neutralizing magnetic fields which may be present in the weld preparation region of mating steel components.

A consultant from Diverse travelled to the (remote) plant, and following a magnetic site survey, used Zeromag to null the field to a point where welding could be carried out. For the team at the smelter this was an unexpected result as they had believed that this problem

was insurmountable without switching off the smelting process. As a result, Zeromags are now part of their standard gear to outcome arcblow in the plant. It does not stop there; Diverse consultants remain in close touch with the team to ensure that issues arising from the various problem geometries can be overcome.

Zeromag has been supplied to the world's welding professionals and has **ALWAYS** been successful in solving difficult arcblow problems. See the article about arc blow for more information about the symptoms and causes of the problem at <http://www.diverse-technologies.net/gateway/arcblow.htm>

Zeromag is suitable for manual or automated welding processes. In operation, Zeromag can be used in the demagnetisation process either manually or automatically. Zeromag demagnetisers are compact, portable and ruggedly constructed for use in typical welding site environments. Simple and rapid to deploy, Zeromag will greatly assist productivity, reducing welding times while minimising weld repairs and downtime associated with magnetic arc blow.



## Clam coils .. for a fast application

DIVERSE has been approached by a number of its customers to produce a clam coil system for Zeromag. The idea is to 'wind' multiple coils around the pipe using a single action, rather like the closing of an aquatic clamshell.

Our new design can be connected to any standard Zeromag, has typically 20 turns and is of modular construction. The design allows the customer to specify the form of the wrap, for example 10x2 or 5x4 etc. This allows the right product to be specified for a particular job, for example a 5x4 might be used for a pipe end, a 10x2 would be used for a long I-beam. This new product has already proved its popularity and is used by customers in Australia and France.

The clam coils can be used singly or in groups of up to 4, depending on the diameter of the wrap.

One area where the clam coil has proved useful is where there is no stub to add or remove the coils. In this case the demagnetizing coils have to



be laboriously wound and unwound at each step. This is ok for large utility pipes, but for beams in a steel structure working many metres from the ground the clam coils are the best solution.

## CASE STUDY: LNG tank

This case study focuses on a solving magnetic problems that can occur in the construction of large tanks. In this case it was a tank to hold liquefied natural gas or LNG; the tank was about 100m diameter and 30m high and lined with plate steel.

To start the work a consultant from Diverse undertook a magnetic site survey to determine the level, sign and direction of the magnetic fields that were causing the problems. The survey revealed levels of magnetism over 20x that which would cause arc blow, so it was clear what the problem was and that drastic action was required to solve it.

The tessellation of the steel plates resulted in areas where the plates could not be welded at all due to magnetism. The combination of the magnetism in each plate and the geometry of their positions resulted in a 'focusing' of the magnetism problem in areas where 2 or 3 plates abutted.

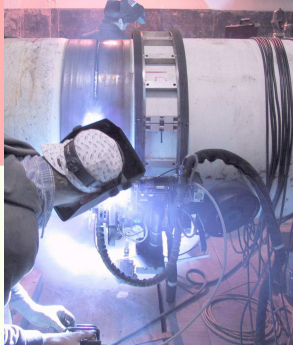
Diverse defined a special framework to hold the demagnetizing coils. On site, this framework was wound with demagnetizing coils in such a way that the magnetism in the plates could be controlled



by Zeromag. The production procedure was then simply to use Zeromag with its probe in the weld prep to reduce the magnetic field to zero. The probe was then removed and the welder able to proceed without magnetic hindrance.

## Nuclear melt down

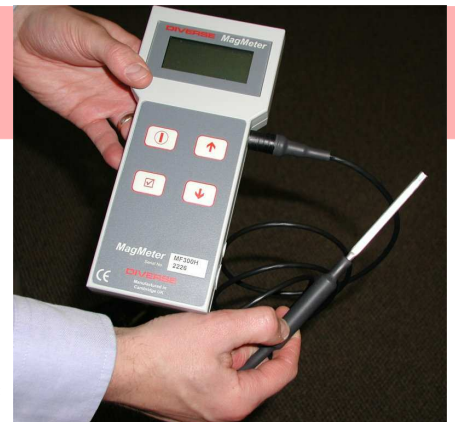
Our specialist magnetism busting team recently completed a project at a UK nuclear power plant. The plant was down for routine maintenance when, high up on in the generator hall, it was found that the repairs to the cooling system could not be completed because of magnetism.



Diverse were on site within 24 hours, undertook a magnetic site survey within an hour and had the welding finished by lunchtime! Downtime of an expensive plant, or delay of a large team caused by magnetism requires fast reaction time. Diverse consultants are available every working day and travel to all parts of the globe bringing a **guaranteed** solution to seemingly intractable magnetic problems.

## Site survey - use Magmeter

If you understand the problem then you have the chance to solve it. That's why a site survey is an important part of finding a solution to the magnetism problem. Our consultants use the Diverse Magmeter MF300H which is a field use Gaussmeter. It is a robust instrument that can measure magnetic field from the very low levels right up to the point where magnetic materials saturate. It is supplied with a slim but robust stainless steel probe ideal for measurement in pipe weld preps.



With smart autoranging as standard over any of the user selected measurement units, Magmeter is very simple to use. It is calibrated against standards validated by the National Physical Laboratory (NPL) thus Magmeter provides accurate measurements with confidence.

Applications include measurement in weld prep, magnetic measurements for magnetic dye inspection and other magnetic NDT tests.

For more information see:

[www.diverse-technologies.net/gateway/magneticproducts.htm](http://www.diverse-technologies.net/gateway/magneticproducts.htm)

[www.diverse-technologies.net/layer2/proddid.htm](http://www.diverse-technologies.net/layer2/proddid.htm) for the data sheet

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