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# Get up to scratch on marking

Steed Webzell takes a look at latest developments

**T**he demand for traceability and marking is showing no sign of fading. In fact, international regulations and standards dictate that requirements for component marking now extend well beyond the traditional arenas of aerospace and automotive.

The construction sector, for example, is among the latest to take a hard look at marking technology. Why so? Well, 1 July 2014 marked the point from when all fabricated structural steelwork has to meet the harmonised European standard BS EN 1090 and carry the CE mark.

CE marking is common on a range of consumer products and provides a guarantee of safety, which is now being applied to the steel construction industry. Originally introduced in 1991, the Construction Products Directive was never seen as mandatory in the UK, but in 2013 the new Construction Products Regulations were released, making CE marking compulsory. The main difference being that, unlike a directive, a European Regulation must be upheld by all member states and is enforced by criminal law.

Likewise, the medical device industry is also having to sit up and take note of traceability requirements. Since the Food and Drug Association (FDA) adopted a new rule for the identification of medical products, and made the marking of all devices with a unique device identifier (UDI) mandatory, the majority of medical device products and parts sold into the US require marking. Similar standards have been launched or are being introduced in the EU, Canada and Japan.

To ensure traceability, regulatory compliance and authenticity, marking



An automotive part gets the FOBA data matrix treatment

requirements range from simple alphanumeric content, such as serial numbers, dates and batch numbers, through to complex data matrix and QR codes. Sectors such as medical require marks that are permanent and traceable, legible and readable, high in contrast, counterfeit-proof, sterilisation-resistant and smooth to hinder bacterial growth.

With this in mind, laser marking has become a leading choice for marking medical devices, largely because it's a contact-free process that does not affect product surfaces. While many different laser markers are available, FOBA, represented in the UK by TLM Laser (0845 260 2220), says it is one of the few to provide turnkey and closed-loop solutions.

## MEDICAL DEVICE MARKING

For instance, FOBA's HELP (holistic enhanced laser process) is a three-stage, closed-loop medical device marking system. Parts are validated prior to marking and, with the help of a TTL (through-the-lens) vision system and IMP (intelligent mark positioning), the correct mark is applied in the correct position on the correct part. Marking content can then be verified using OCV (optical character verification), while codes can be read back with the part still in the machine. According to FOBA, this is indispensable for compliance

with the FDA's UDI.

FOBA offers many medical component examples, such as marking a data matrix code on a stainless steel scalpel blade in 8.83 seconds using a fibre laser, or producing QR codes on 3 mm diameter stainless steel bone screws where the marking area is very restrictive. Here, IMP is used to identify the screw-head location and mark it accurately.

Another type of medical component marking encountered frequently by FOBA is banding marks on hypodermic needles, catheters and tubes – the marks act as depth indicators that show surgeons how far the device is inserted into the patient's body. Cylindrical devices can be marked while they are rotating at a constant speed: marking is applied by moving the laser along the length of the part, while the rotating part generates the equivalent of cross-motion.

Also claiming to offer turnkey laser marking solutions is Laser Lines (01295 672500), which says "more recently, there has been a move towards direct part marking of metal components, removing the requirement for additional labelling or consumable inks".

Laser Lines can provide Class 1 laser systems to suit customer requirements, whether it's an off-the-shelf or bespoke solution. As a laser system provider, the

company often partners with other technology providers, allowing customers to purchase full turnkey solutions. This might be to conform with health and safety requirements, such as the use of extraction or eye protection, or part location on a production line, for example.

Another notable trend in the traceability arena is the requirement for portable marking. Here, the recently introduced TruMark 5010 mobile marker from Trumpf (0844 482 0188) makes use of a handheld marking head – the operator need only place it on the component to prepare for marking under manual control. This makes for quick and easy marking even of larger components, such as automotive B pillars, says Trumpf.

When the operator positions the marking unit on the workpiece, a vacuum is created, hermetically sealing any gap between the lip and the component. If the inscribing head is not positioned properly, this is recognised by integral sensors and the laser will not be triggered.

A fibre laser producing adequate mean power in the infrared spectrum forms the heart of the TruMark 5010. The laser is installed on a mobile frame, as is the service unit, comprising the laser and safety controls, and the suction system. The TruMark 5010 mobile marker has been graded as Laser Safety Class 1, with a lip on

### Add sparkle to jewellery marking

The new EasyJewel IV from Rofin-Baasel (01327 701100) is designed for engraving rings or bracelets (internally or externally) made from gold, silver or platinum, or from the fashion alloys of titanium and stainless steel. At the heart of the system is a 20 W fibre laser source, the PowerLine 20F, but optionally the power can be increased to 30 or 50 W to provide faster engraving for higher throughput. Rofin sources are all air cooled, avoiding the need for any internal water circuits.

The EasyJewel IV features a ring marking module and software, which allow ease of positioning and a dry run (with vision) to avoid engraving over existing hallmarks or other undesirable areas. When marking internally, the software recommends the angle of tilt to be applied.

the handheld marking head keeping laser light from escaping and causing harm.

Technifor (01926 884422) is another laser marking machine manufacturer that has been busy in the R&D department over recent months. For example, the TF450 is a 50 W fibre laser that is said to offer contrast marking at twice the speed of Technifor's existing 30 W model. Furthermore, the 50 W beam of the TF450 vaporises material to create new opportunities for deeper engraving, especially in metals. This is a particularly useful feature for marks that must remain legible after applying a coat of paint or surface treatment.

Other recent Technifor innovations include the TG400 green laser ([www.machinery.co.uk/61135](http://www.machinery.co.uk/61135)). Featuring a 532 nm wavelength, the

solution permits the marking of materials that do not interact well with conventional laser sources such as Nd:YAG, YVO4, fibre or CO<sub>2</sub>. Particularly suitable for reflective metals, such as copper, the TG400 enables surface marking with a reduced heat-affected zone, thus avoiding material damage or distortion.

### UP TO THE MARK ON NETWORKS

Finally, Technifor has also announced the arrival of the PROFINET communication protocol in its laser marking equipment ([www.machinery.co.uk/62690](http://www.machinery.co.uk/62690)). With the implementation of PROFINET I/O, Technifor's permanent marking machines can be connected directly to industrial networks, without the need for any additional devices.

At Electrox (01462 472400), recent R&D emphasis has led to the launch of a high speed, on-the-fly CO<sub>2</sub> coding laser for the industrial goods and packaging markets. The laser, which is said to provide a clear and superior mark, in comparison with the traditionally favoured inkjet marking process, is available in 10 and 30 W versions ([www.machinery.co.uk/62323](http://www.machinery.co.uk/62323)).

Last, but not least, from a service provision perspective, the recent purchase of a state-of-the-art fibre laser at Fimark (01932 245226) has seen the company undertake extensive environmental tests on the marking of anodised aluminium used for outside applications.

Using careful selection of beam parameters, Fimark says that the new marking technique does not damage the component's surface in any way – the mark is below the surface of the anodic layer. As a result, Fimark is now able to offer smooth black marks on anodised aluminium. ■

Laser Lines' FH Flyer Marking Head

