

“Zero error”: Tyre marking with outgoing goods inspection

Tyre manufacturer Continental implements EU marking directive with the Weber Marking Systems Legi-Air Tyre

Old news for fridges: The energy label giving the energy efficiency class of the apparatus. This is based on the interest the European Union has in promoting the sale of products that use resources sparingly. It works for electrical apparatus and should also work for tyres. This is the background to the EU Tyre Labelling Regulation EU 1222/2009 that entered into force towards the end of 2012. To implement this regulation, Continental Reifen Deutschland GmbH, together with labelling specialist Weber Marking Systems in Rheinbreitbach near Bonn, developed a plant to label tyres fully automatically.

Virtually one in three cars in Europe is supplied with tyres by Continental. This success story started with the foundation of the “Continental Caoutchouc- und Gutta-Percha-Compagnie” in Hanover, 150 years ago. Although mainly horse buggies and bicycles needed tyres back then, Continental developed the first profile tyres for automobiles in 1904 already. The range of products manufactured by the company has today extended beyond the production of tyres: With its manufacture of braking and drive systems and various vehicle electronics solutions, Continental is today also contributing to driving safety and protection of the global climate.

EU Tyre Labelling Regulation

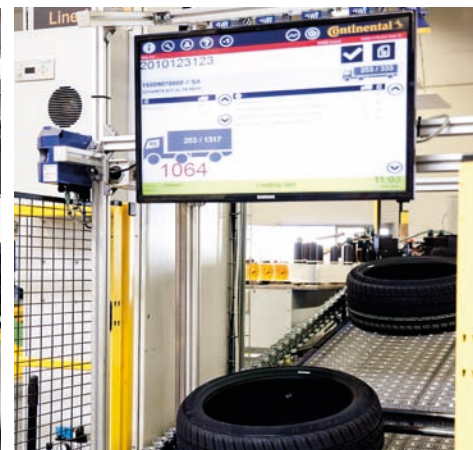
It is therefore not surprising that Continental welcomed the EU development of a labelling regulation to promote user education and the sale of vehicle tyres that use resources more effectively. The regulation mandates that passenger and utility vehicle tyres shall bear labels stating fuel effectiveness, wet grip and rolling noise. Continental tyres have met these criteria for many years already and easily so. The regulation will be implemented by means of a 75 x 100 mm sticker applied to the tread of every tyre. The design is strongly reminiscent of the energy label. Continental, together with Weber Marking Systems, started with the development of a fully auto-

matic labelling facility soon after the publication of key regulatory requirements and this has by now been taken into operation at many European factories of the Group.

Label: Challenge and opportunity

Apart from linking the controller hardware and software to the SAP system deployed at the company, even the selection of the actual material for the label proved particularly challenging in this instance: Because labels will inherently stick poorly to rubberised surfaces. The manufacture of tyres will also unavoidably leave behind residues of chemicals and separating agents. The Weber Label Production Department therefore coated the labels with a powerful natural rubber adhesive that sticks to rubber particularly well. To ensure that the labels will be simple to punch, print and process in a labelling facility despite their specific properties, Weber Marking Systems and its raw material supplier developed a sophisticated solution to the challenge of label material and adhesive.

Although product labelling poses challenges, it also has significant benefits: Continental realised that labelling will render production and consignment steps transparent, potentially making an important contribution to quality assurance: 33 000 different vehicle tyres are produced daily at the Sarreguemines works in France alone.



1 000 workers process in excess of 650 different articles. This is why Continental and Weber Marking Systems developed the labelling facility to not only label tyres arriving in chaotic order, but to simultaneously also record them and prepare them for the Outgoing goods department. "We called the system "ALOC facility", explains Alain Hoff, Sarreguemines Plant Operation Manager: "This stands for Automatic Labeling and Outbound Check – tyre labelling with outgoing goods inspection. This facility processes 10.5 million tyres per year and reduces our errors during consignment and dispatch to zero."

Integration of data into SAP

Different labels will allow this: After manufacture, Continental issues each tyre with an individual barcode label. When an order is received, staff generates a delivery slip on the PC, including the information on both the ordered articles and the vehicle that will deliver the finished product. SAP then sends all the required data and information to the labelling facility, informing it of which tyres to label in which position and with what labels and also naming the delivery vehicles to later load with the specific tyres.

The colleagues in the meantime fetch the ordered tyres from the warehouse by forklift and place them on the labelling facility conveyor. The articles first pass under a bridge with ten camera scanners to record the barcode of each tyre. Should a barcode not be clearly identifiable, the facility will automatically park the particular tyre at a defined location where staff will check the barcode and scan it in by hand. The tyre may then pass through the facility again. The system uses the barcodes to assign each tyre to its specific order. Should there be no matching order, the tyre will pass through the facility without further processing, finally to be ejected. If the corresponding order is found, the labelling facility will automatically adjust to satisfy many different variables:

Variable 1: Correct labels and correct information

The EU regulation mandates that every tyre label shall give individual values of fuel efficiency, wet grip and rolling noise. As with the energy label, fuel efficiency and wet grip will be rated based on a scale from A to G. The rolling noise will be identified by a volume bar with a decibel scale. Weber Marking Systems prints the Continental labels compliant with EU regulations to the point where the facility will need to print only the individual figures, type designations, article numbers and EAN 13 barcodes, each in their specified fields.

The so-called Legi-Air 5300 Tyre labeller is used for printing and labelling: The system will, immediately following the original barcode scan, determine the required data, transform these to print data and transmit the information to the integrated Novexx print module. This module has corner-edge printing technology allowing it to print complicated configurations onto the labels, fast and pin-sharp.

The required identifications may vary, depending on the recipient. The tyres will in some cases, for instance, receive up to four additional decorative labels in addition to the EU tyre label. Four unwinding units were for this reason added to the ALOC facility to keep the various labels ready. The internal control software of the facility will select the labels and automatically coordinate the labelling process. The unwinding rolls are arranged to allow application of the labels by a common dispenser tongue. A specifically developed sophisticated logistics chain ensures that labels will always be in stock.

Variable 2: Optimal labelling position

Not only will the Continental tyres always receive the correct labelling material, but the labels will also be consistently placed centralised on the tyre. A 135 mm tyre for a small electric vehicle will therefore require a label-



Link to video



ling position that is different from that of a 355 mm wide high performance sports tyre. Apart from the heights, the diameters of the tyres will also vary, of course, thereby varying the distance to the labeller. The dispensing arm of the labeller can extend up to 100 mm within milliseconds. Since tyre diameters determine the distance that a dispensing head must extend before applying the label, the individual tyre dimensions were therefore stored in the system.

Type "Alpha Compact" dispensers use the wipe-on method to apply labels to the tyres. The label will here be evenly peeled off the backing after printing, vacuumed up and transported forward via conveyors on the applicator plate at high speed. It will be pushed forward until it protrudes over the applicator edge by a few millimetres to then be automatically "wiped onto" the tyre passing by at high speed. A new tyre can in this way be individually labelled every two and a half seconds. Because every tyre passing through the facility is unique.

Variable 3: Correct order in the correct truck

Additional sensors thereafter use the attributes for the specific customer to check whether labelling is correct. Camera sensors also establish whether the quantity ordered by the customer can now be loaded in the correct sequence. Continental staff will finally stack the orders onto the different trucks – secured with much finesse. Tyres that have been loaded are automatically logged by Outgoing goods. The current order status is constantly displayed on several large screens.

"The development of the ALOC facility presented us all with a major challenge. This is why we needed only professionals as partners. The Legi-Air 5300 Tyre solution developed in collaboration with Weber Marking Systems has been adapted to perfectly suit our specific demands!" enthuses Alain Hoff. "Having had the opportunity of testing the facility in practice for quite a while, we can now say that it has absolutely proven itself and we look forward to gradually implementing it at our global locations as well."

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European Headquarter