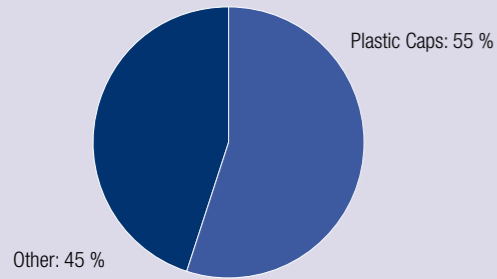


The predicted 2014 total market for caps and closures was 1.7 trillion units. 55 percent of them were closures made of plastic.



Source: The Freedonia Group



Pharmaceutical labelling

A Revolution for Pharmaceutical Labelling?

With an RFID inlay in the closing seal, the pharmaceutical supply chain is safer. Can a hybrid chip further improve customer interactions?

Cap seals are insignificant all-rounders. They are the icing on the cake of a product, in terms of design, safety and function. Whether in the food, cosmetics or pharmaceutical industry, closing seals keep ingredients fresh, clean and seal the container. Cap seals provide safety not only for the contents, but are an authenticity seal. 'RFID im Blick' talked to eAgile

CEO Gary Burns about how it works. With an RFID chip in the cap, the company wants to bring a security level into the pharmaceutical supply chain that has so far been impossible. They want at the same time to avoid extensive process changes or adaptations. eAgile focusses on supply chain improvements, on reducing counterfeit drugs and on improving service for end customers.

Gary Burns, CEO, eAgile, in interview with 'RFID im Blick'

The image of the pharmaceutical industry

The pharmaceutical industry is struggling with many challenges: counterfeiting, supply chain losses by illegal withdrawals and authentication problems for the end user. In 2010 eAgile sat down to focus on these challenges with a single RFID solution. "A bar code is a basic, effective solution for many processes in the supply chain, yet the optical label does have limits", says Gary Burns. "The main reason is that a bar code is always externally applied to the product or is sited on the packaging. This does make it possible, for example, for counterfeiters to copy the bar code – and fakes are just one of the numerous problems in the global pharmaceutical market."

"The 'eSeal' effectively prevents counterfeiting and illegal withdrawals in the supply chain, without changing the actual product or the packaging. Even more, it provides convenient benefits for the end user",

Gary Burns, CEO, eAgile



Starting with a simple cap seal

"Our approach to developing 'eSeals' was to increase the safety level in the entire supply chain – from production to end customer – which had not previously been possible", says Gary Burns, describing the start of the development in 2010. "The focus was on developing a high security solution with low integration costs. The goal was also that processes in manufacturing and distribution should not be affected. An easy-to-implement integration is known to be a crucial factor for success."

The tag in the cap seal

The focus of the eAgile solution is the 'eSeal', a cap seal with an integrated RFID inlay. "The idea may sound simple, but we think it is a solution that offers by far the most advantages for the supply chain", stated Gary Burns. The 'eSeal' consists of the actual plastic cap which is equipped with an aluminum antenna inlay placed on a PET carrier in the cap. Further seal components consist of various foils and paper inserts. "The

RFID frequency and the chip to be used can be selected depending on the benefits of the different combinations", Gary Burns says, explaining the flexible design options.

7,000 bottles registered in 2 to 3 seconds

After about five years of development, eAgile was for the first time in 2015 able to test the 'eSeal' solution at multiple pharmaceutical companies. The result was that the functionality is granted even at full production speed. "We can provide a complete system that does not disturb existing processes, but optimises them. RFID hardware has to be employed in the bottling production stages, but production can continue without any other changes. We can register more than 7,000 bottles at the pallet level in a maximum time of two to three seconds", says Gary Burns. The positive test results were the reason that one customer in the pharmaceutical industry has been using 2.5 million 'eSeals' since January 2016.

No need for re-approvals

Identification solutions that change the product packaging by enlarging it or adding labels require special approvals in most countries worldwide. "The 'eSeal' does not change packaging nor the product. The same materials are used in the seal caps that were used before the 'eSeal'. Drug manufacturers, for example, who want to use our solution, do not need complex and expensive re-approvals for the product packaging", explains Gary Burns, adding: "The 'eSeal' does not come in contact with the drug at any stage of manufacturing or the subsequent supply chain."

Secure serialisation included

Pharmaceutical products must be serialised to ensure traceable supply chains. "A bar code is perfectly suited for serialisation and for legal reasons an optically readable code is sufficient. If a copied bar code is applied to a counterfeit product, it can register in the regular sales", says Gary Burns, stating: "It is hardly possible to check and match serialised data for each of the wealth of products on the market worldwide. The information on the RFID 'eSeal' chip cannot be copied easily. We use similar cryptography as in the credit card industry."

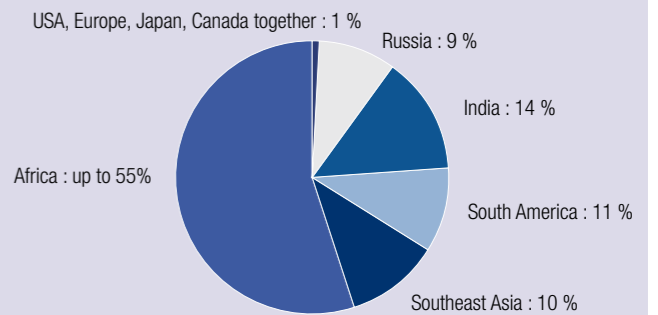
Smartphone verification

Although the 'eSeal' has been on the market since January 2016, there will be important updates released for a much wider range of functions this year, anticipates Gary Burns: "During the development of the RFID-cap, the idea came up that end customers with a smartphone could easily and safely check at home, for example, the authenticity of a medical product. NFC is ideal for this. However, for supply chain processes UHF is the primary resource to provide high read ranges and bulk reading of hundreds of products in a few seconds." The solution is a hybrid NFC/UHF chip. At the beginning of the development in 2010, it didn't yet exist. "We have spoken with chip manufacturers and EM Microelectronics was willing to develop such a chip", says Gary Burns. "A mature chip was introduced in the fourth quarter of 2015 and we will offer hybrid cap solutions later this year."

The global market for counterfeit pharmaceutical products is growing

The World Health Organisation estimates that approximately 10 to 30 per cent of pharmaceutical products are forgeries in worldwide circulation over a year. However, it is almost impossible to substantiate estimates, because by no means are all counterfeits detected. However, WHO estimates that the proportion of counterfeit medicines is less than one per cent in the industrial world. More than 60 per cent of all counterfeit products are in the markets of developing countries, such as on the African continent.

Counterfeit pharmaceutical products - a problem particularly in developing countries



Source: Compiled on the basis of estimates of the World Health Organization (WHO), International Federation of Pharmaceutical Manufacturers and Associations (IFPMA) and the Food and Drug Administration (FDA)

Almost infinite market potential

At first glance you might think caps are a niche market, but Gary Burns refutes this with the production figures. "In 2014, 944 billion caps were produced and sold worldwide. The demand is growing annually by about four per cent, so this market will get to about one trillion pieces in 2016. If the 'eSeal' from eAgile can reach only one per cent of this global market, the potential is ten billion RFID caps per year. This number is roughly equivalent to the total number of RFID transponders sold annually worldwide."

In 2016, eAgile will produce around 25 million RFID caps. "The number, however, can quickly increase to up to 50 million, as there is continued interest from the market. And not just from the pharmaceutical industry. 'eSeal' also offers the same advantages for the food industry or the cosmetic industry as it does for the pharmaceutical environment."