How NFC can help pharmaceutical brands ensure patient safety
According to the EUIPO, counterfeit products account for 3.3% of all world trade, and the pharmaceutical industry suffers the most from the rise in grey markets. Billions of counterfeit medicines are traded around the world, harming thousands of people every year, especially in developing countries. It is therefore crucial to find solutions to increase patient safety and security.

**INCREASING PATIENT SAFETY USING NFC TECHNOLOGY**

What are the benefits of using NFC technology?

NFC (Near Field Communication) is a wireless connectivity technology based on RFID (Radio Frequency Identification) enabling contactless communication between a reader and a tag. A tag is a small electronic component that can be embedded in the packaging of medical supplies, such as medicine, vaccines or drug samples, to add wireless connectivity. Implementing NFC allows pharmaceutical brands to track their products around the world, ensure their authenticity, and create a direct two-way communication channel with consumers via their smartphone, used as an NFC reader.

How does it work?

The NFC tag embeds several advanced features like the memory protection of its content and authenticity verification (TruST25*), thereby helping both brands and patients differentiate authentic medical products from counterfeit ones.

The tag also embeds a user memory, which allows a company to store different types of information, such as product provenance or product information (expiry date, recommended dosage etc).

For example, a link to a tutorial can be configured into the tag, and by simply "tapping" the NFC-enabled object with their smartphone (bringing the mobile phone and the tag in close proximity), patients can read more information on how to take their medication properly. By opting for NFC, pharmaceutical brands offer patients a digital experience that helps them follow their treatment in a safe and secure way.

Specifically designed to enable these applications, ST offers the **ST25 Tag IC product line**, available now.

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* is a registered and/or unregistered trademark of STMicroelectronics International NV or its affiliates in the EU and/or elsewhere.

NFC technology offers pharmaceutical brands many other advantages, as the same tag can be used for several applications, such as:

**TRACEABILITY**

By embedding NFC tags into their products, pharmaceutical companies can easily verify that the goods have followed the entire supply chain flows as expected.

Thanks to their unique identifier (UID) coupled with other information coming from the application (e.g., timestamp, etc), pharmaceutical products can be geolocated by using an NFC reader or an NFC-compatible mobile phone.

By setting several check points throughout the supply chain, goods can be localized at any time, improving inventory management, patient safety, and much more. In addition, the status of each tagged item can be easily accessed and updated by pharmaceutical suppliers. This high level of visibility helps the entire industry maximize production flows.

This is also an efficient and secure way to fight against grey markets and unauthorized channels by knowing what product is where at any time.

**HOW CAN NFC IMPROVE SUPPLY CHAIN MANAGEMENT?**

- Track supply chain flows
- Easy access to item provenance
- Locate items anywhere, at any time
- On-shelf localization

**AUTHENTICATION**

Because confidentiality and safety remain the pharmaceutical industry's top priority, the data stored in a tag can be personalized during the production phase. The data can also be protected with a password or a permanent lock. To enable authentication at the item level, each tag embeds a unique identifier.

NFC tags provide tamper detection to help fight against counterfeiting. This feature lets pharmaceutical stakeholders and patients know if a product has been opened and tampered with.

NFC tags can be used in compliance with the GDPR (UE) by supporting privacy modes.
PATIENT ENGAGEMENT

Today, more than 70% of smartphones worldwide are equipped with NFC⁴, making it easier for companies to implement NFC-based solutions. Certified by the NFC Forum, ST25 NFC tags are fully interoperable with all NFC-enabled devices.

Patients can instantly read product information on their phones without the need to install an app. All it takes is a simple tap from their smartphone.

NFC tags can be used to deliver strategic patient-centered information to various stakeholders, from healthcare practitioners to patients.

NFC tags can help smooth the patient journey and increase safety. By using their smartphone to read the content of the NFC tags embedded in the packaging of the medication, patients interact with medical products in a more engaging way, increasing the overall adherence to medication.

ROBUSTNESS & INTEGRATION

The NFC tag’s small form factor allows it to be hidden when necessary, depending on what the NFC tag will be used for. If a company wants to use the tag for traceability purposes, the tag can be fully integrated into the goods and be made invisible to the outside world. In fact, NFC tags do not need to be visible to be read.

Resistant to various environmental factors, including extreme temperatures from -40°C to +85°C and water, ST25 NFC tags come with different package options depending on the application in use. For additional robustness, the tag can even be molded into the product.

Because the pharmaceutical industry has additional constraints, NFC technology can support a wide range of materials, including metals and liquids.

BENEFITS OF USING NFC IN PHARMACEUTICAL PRODUCTS

<table>
<thead>
<tr>
<th>BRAND</th>
<th>PATIENT</th>
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<tbody>
<tr>
<td>Supply chain visibility</td>
<td>Easier access to product information</td>
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<tr>
<td>Create direct digital relationship with patients</td>
<td>Improved adherence to treatment</td>
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<tr>
<td>Build trust</td>
<td>Access to certified medication (avoid counterfeit products)</td>
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<tr>
<td>Educate patients about medications</td>
<td>Possibility to re-order samples</td>
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<td>Fight against counterfeiting</td>
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Source: 1: ABI research: Wireless Connectivity Technology Segmentation and Addressable Markets - 1Q 2023
ST provides semiconductor technologies and supports companies in the implementation of NFC technology.

With over 20 years of experience in the design of NFC readers and tags and an active member of organizations like the ISO and the NFC Forum, ST has strong expertise in NFC technology, and will create a complete and customized solution addressing your needs and challenges.

Leveraging our network of recognized partners, ST's team of NFC experts will help you break down barriers to NFC adoption. Depending on your needs, requirements, and location, we will suggest the ideal business partners (inlay makers, tag integrators, certified laboratories, etc) for your project.

Once we have defined together how your company can benefit from NFC technology, we will provide a customized solution, based on ST's portfolio of ST25 NFC readers and tags.

In practice, the successful integration of NFC technology in consumer products involves multiple stakeholders and requires technical expertise, time, and resources, especially if you are new to NFC technology.

The ST25Connect program is a service provided by ST to ensure the best product integration and implementation of NFC technologies.

With ST25Connect, you can benefit from ST’s technological expertise and our network of trusted partners. In direct contact with ST’s experts, you will be provided with personalized advice and the NFC technology you need to grow your business.

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**ST25Connect program**

**Helping brands grow their business with NFC**

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**From NFC technology...**

- STMicroelectronics
- ST25 NFC chip
- Inlay maker
- Tag/system integrator
- Software house
- Web/app solution
- Your factory and warehouse
- Connecting with your customer

...to product digitalization

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**Contact our team of experts**

to learn how we can help you move forward