# RFId

## for the healthcare
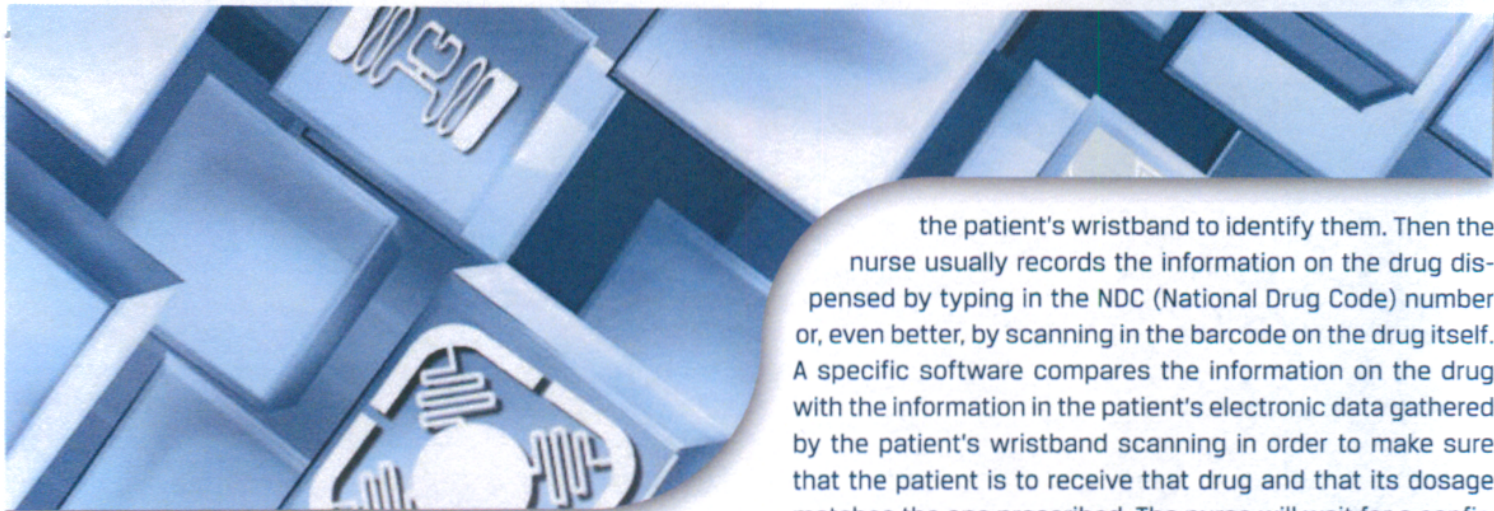### by

**THERMO**GRAFICA
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# RFId wristbands

- ◙ identification
- ◙ location
- ◙ access to therapies
- ◙ admittance to ER
- ◙ sample withdrawal
- ◙ trasfusions
- ◙ surgeries
- ◙ medication
- ◙ general traceability

Many healthcare providers worry about the always increasing number of patients who are misidentified before, during and after their medical course of treatment. Misidentifications can cause patients to be given an inaccurate amount of drug or to receive completely wrong treatments. Other errors related to patient misidentification could also lead to link lab test results to the wrong patient, which in turn would result in erroneous diagnoses and – consequently – in potentially harmful treatments.

Some hospitals are now employing RFId technology for the correct identification of patients and to prevent errors related to it from happening. Assigning each patient with a unique wristband with RFId technology in which their confidential information, medical history and treatments are encrypted, allows for qualified healthcare providers to unmistakably identify the patients, access their medical files, and update them.

## ▣ Wristbands with RFId microchips

Radio-Frequency Identification systems (RFId) are made up of passive tags containing a chip. The use of radio waves allows stored data detection and reading. In the case of writable tags, those data can also be modified or updated.

In order to function RFId systems need two elements: a tag and a reader. As in the case of barcodes, the data are associated with a database where the patient's data are stored. Tags for patients are hosted inside the wristband so as to avoid its in-/voluntary removal.

The main advantage of this technology is the fact that the data do not need to be visible to be collected. More importantly, the vast majority of the needed information (such as, blood group, possible allergies and the like) can be stored in the memory the chips are equipped with.

## ▣ Main uses of wristband

### ▫ Dispensation of Drugs

One of the most effective methods to benefit from Rfid wristbands is to automate the drug delivery system. First, using a reader that interfaces with a laptop computer or the patient's bed the nurse performs the scan of the patient's wristband to identify them. Then the nurse usually records the information on the drug dispensed by typing in the NDC (National Drug Code) number or, even better, by scanning in the barcode on the drug itself. A specific software compares the information on the drug with the information in the patient's electronic data gathered by the patient's wristband scanning in order to make sure that the patient is to receive that drug and that its dosage matches the one prescribed. The nurse will wait for a confirmation or a warning from the software and act accordingly. Lastly, the nurse will scan in their ID tag to record the info on the nurse dispensing the drug.

Essentially, the system automates the control of the five points of correctness: by scanning the patient's wristband to check their identity, and by searching the database with the info on the drug to dispense to verify the other elements.

### ▫ Blood transfusions

The process to make sure the patient receive the right type of blood is very similar to the drug dispensation process. The blood bag is equipped with a bar code label and/or RFId tag with an identification number that facilitates the controls by a simple scan. The identification by RFId tag or barcode has already been in use for a long time in surgical operations. An improved version already applied to the tasks of collecting, managing, and distributing the blood bags explain why errors in blood transfusions are extremely lower than those in drug dispensing.

### ▫ Management of saples

Before taking a blood sample, the nurse can scan the patient's wristband and check on a laptop computer if blood sampling is really necessary or if it has already been taken. During blood sampling, a portable printer can automatically produce the label for the sample with its ID complete with the information retrieved from the previous scan of the patient's wristband and the order of blood sampling already on record. The label would immediately be applied on the sample container, thus significantly reducing the risk from wrong identification. As an alternative, a set of labels with barcode can be printed upon patient's admission and be kept handy in the patient's folder for a later use.

In analysis laboratories, the scanning of the barcode on the container of samples eliminates the tasks for technicians to type in the patient's data. The necessary tests could even be encoded in an RFId chip under the label of the container of samples, which will eliminate the risk of performing the wrong type of tests.

### ▫ Therapy

The scan of barcode wristbands for patient identification can help surgical teams, anesthetists, radiologists, phys-

1. *a device reads the data stored on the wristband*
2. *the data are sent to a server for processing*
3. *the server sends the device the collected data requested*

iotherapists and other staff to match the patient with the appropriate therapy or service to be given. According to a specific survey, "unrequired treatments" immediately follow "wrong dispensation of drugs" and are usually grounds for malpractice lawsuit: knowing how to avoid those errors allows great advantages in terms of safety and responsibility.

## RFId wristbands by Ceracarta

Wristbands by Ceracarta are a practical, precise and effective means for people identification, be them hospital in-patients or spectators at a sports event.

The information on the wristband - that is visible and provided with a barcode – makes it possible to carry out several different tasks, such as to record the medications dispensed, access control, transactions, in complete safety and with the smallest effort.

The exclusive radio-frequency identification system embedded in the latest models of wristbands allows for the most flexible operations of writing and reading of the data, so that they can be read even underneath the patient's clothes or bed sheets.

### *Materiali utilizzati*

Printing method, barcode symbology and information are useless if the wristband does not remain on the patient's wrist. Many studies on this topic suggest that the loss of wristband is the most frequently occurring error. Several of them have ascertained that at any given time between 2% and 10% of all hospital patients are without a wristband. Nowadays wristbands are available in several safe and long-lasting materials on which it is possible to print barcodes and texts directly.

Since wristband must be worn by patients during their entire hospitalization, it is important that the choice of material take into account all the conditions of use and exposure. As a matter of fact, humidity, washing with soap and detergents, temperature fluctuations and frequent use can lead to the deterioration of the stickers or the destruction of the wristband.

Our wristbands are made up of highly technological material. For instance, the tyvek layer in contact with skin makes wristband breathable and tear resistant at the same time. The top cover ensures washable thermal quality printing and durability.

The use of poor quality printers and materials can cause paper discoloration, scratches or wrinkling which can make illegible the barcodes on the wristbands. Whereas the wristbands with RFId chip are not affected by this problem, because the chip inside the wristband ensures a correct reading even if the external printing has faded.

## Project: patient identification

In order to cut back on clinical errors and improve health-care and safety for the patient we have identified the main features for a working project based on the use of our wristband for patient identification.

All in patients are given a wristband containing an RFId tag. A unique ID and other additional relevant information on the patient, such as blood type, are stored in the tag chip so as to automate access to treatment. For privacy reasons and to avoid divulging medical files unduly, any other data are not stored on the chip memory, whereas they are stored in a secured database where the patient's unique ID identifies them.

Healthcare providers will use a handheld device with an RFId reader to collect the data stored on the patient's wristband. Wireless LAN connection will enable Hospital staff to access patient's personal data, such as their medical file, and/or get information on patient's medication to be dispensed and the right drug dosage.

Moreover, patients themselves will be able to go through their medical file by simply scanning their wristbands from special computer workstations.
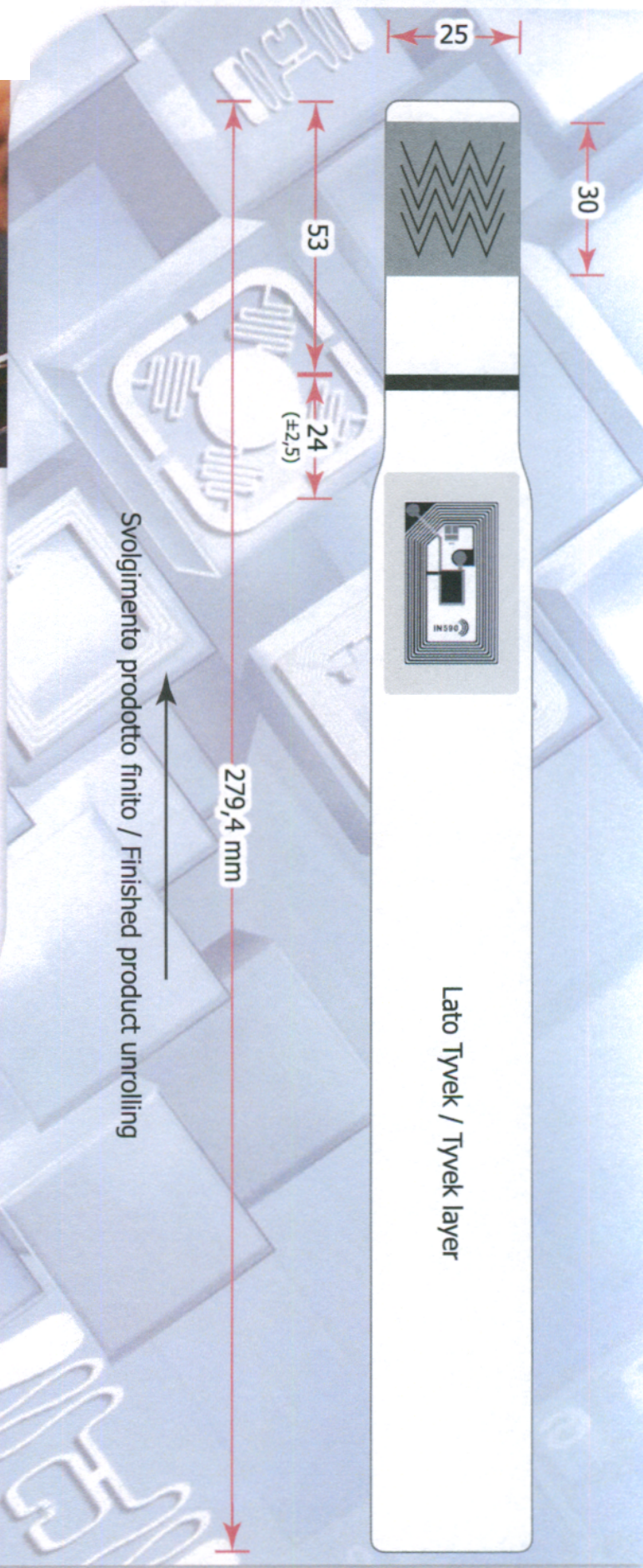
**25** — **30**

**53** **24** (±2,5)

Svolgimento prodotto finito / Finished product unrolling

**279,4 mm**

Lato Tyvek / Tyvek layer

IN590

### ▣ Physical characteristics

| | |
|---|---|
| **Item:** | *RFId wristband* |
| **Dimensions:** | *30 x 279,4 mm* |
| **Antenna:** | *22 x 38 mm* |
| **Upper layer:** | *Thermal PP* |
| **Lower layer:** | *Tyvek* |
| **Characteristics:** | *Direct thermal printable complete with adhesive closure* |
| **Thickness:** | *350 µm* |
| **Print:** | *Black mark on the Tyvek layer* |

### ▣ Electric characteristics

| | |
|---|---|
| **Microchip:** | *NXP I-Code SLIx-S* |
| **Frequency:** | *HF 13,56 MHz (UHF upon request)* |
| **Standard:** | *ISO 15693* |
| **Antenna:** | *Aluminum* |
| **Memory:** | *UID 64 bit, user memory 160 bytes* |

PATIENT ID

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