

An **Avery Dennison** White Paper



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Achieving Return on Investment using RFID for Jewelry Tracking

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Value Proposition

While some end uses search for a viable ROI in the use of RFID tracking, one application that has clear and immediate benefit is using RFID in jewelry tracking. Tracking jewelry inventory is uniquely suited to the use of RFID for several reasons.

Current Process

Currently, most jewelers track inventory on daily or weekly basis. This is often a completely manual process, which is very time-consuming, requires handling of each jewelry item, and is error-prone.

Designing the System

There are a number of different ways in which the RFID system can be deployed, each having varying levels of accuracy, but also costs and complexity to install and maintain.

Item Level Reader Systems

For jewelry applications, there are basically three options for RFID tracking of the jewelry items.

RFID Frequency

Most RFID jewelry tracking applications deploy one of two frequencies: UHF (860 – 960 MHz) or HF (13.56 MHz). Each offers specific benefits, but as this technology evolves, some of the differences will be minimized.

Tag Form Factors

There are several ways that the RFID inlay can be introduced into the jewelers tagging system.

Recommendations

For jewelers interested in pursuing a pilot for RFID Jewelry Tracking, it is critical to define the pain points as listed in the “Designing the System” section.

Achieving ROI using RFID for Jewelry Tracking

Value Proposition:

While some end users search for a viable ROI in the use of RFID tracking, one application that has clear and immediate benefit is using RFID in jewelry tracking. Tracking jewelry inventory is uniquely suited to the use of RFID for several reasons:

1. The high value of the jewelry items makes the loss of even one item potentially very expensive, thereby making it easy to quickly recognize an ROI.
2. Since many jewelry displays are set up daily and then stored in safes in the evenings, there is ample opportunity for loss of product.
3. Due to the fluctuation in jewelry value as the price of gold fluctuates; the insurance costs of inventory can vary. It is critical to maintain accurate inventory in order to maintain accurate insurance records.
4. For some stores, the jewelry inventory can be consigned inventory. Again, it is critical to maintain clear records of inventory as the value of the jewelry fluctuates.
5. Jewelry sales require one-on-one attention of the jewelry sales person who tends to be highly specialized. Any time a sales associate is not working on mundane tasks such as inventory tracking is time they have freed up to spend working with their customers.

Current Process:

Currently, most jewelers track inventory on daily or weekly basis. This is often a completely manual process, which is very time-consuming, requires handling of each jewelry item, and is error-prone. Some jewelers are using barcode, which still requires line-of site for reading and still leads to additional, unnecessary handling of the jewelry items. For some high-end jewelers, the use of barcodes on their tags contrasts with the high-end elite message they are trying to project with their item tags.

With RFID, an entire case of jewelry can be read in a matter of seconds with no need for line-of site or handling of the jewelry item. The RFID inlay can be hidden, thus not impacting the merchandising of the high-end jewelry tags.

Designing the System:

There are a number of different ways in which the RFID system can be deployed, each having varying levels of accuracy, but also costs and complexity to install and maintain. Before the final solution can be determined, the jeweler must first think through the current processes and the goals of the RFID tracking program.

1. What are the most significant pain-points the RFID solution needs to address? Is the main goal high inventory accuracy or is it saving time in the inventory process? Do you have current data on inventory accuracy, inventory time, and inventory shrinkage that provides measurable pain points?
2. Is the goal to increase accuracy for internal usage, or will this data be reported to business partners (i.e. insurance companies or consignees, etc.)
3. Are there currently known procedures or processes that the jeweler feels may be contributing to the inventory inaccuracy or shrinkage?
4. Is it critical to know exactly where each item is at every second throughout the day? Is daily inventory acceptable? Two times per day? Weekly?
5. Is 100% accuracy required or can the bulk of the issues be addressed if 98% accuracy is achieved?
6. How much time and money is the jeweler willing to invest in this system?

Item Level Reader Systems:

Once the programs goals have been established, the type of reading system can be designed. For jewelry applications, there are basically three options for RFID tracking of the jewelry items:

Shelf Readers:

Shelf reader systems can provide the most accurate inventory at each and every moment throughout the day. These systems involve installing a series of readers and antennas throughout the shelving system of the store. The advantage to this system is that it requires no sales associate intervention in order to read the RFIOD tags. It is very accurate and it continually reads the location of each item in inventory. However, the shelf reader system will be the most expensive and complex system to install.

Discrete Fixed Readers:

With discrete fixed readers deployed throughout a store, the jewelry can be inventoried when the items pass through given point within the store. For example, the jewelry can be read as it passes in to and out of the vault. The jeweler may choose to deploy a reader at the point of sale. For example, one such system places jewelry items on trays that are read whenever the trays are carried into and out of the vault. They also have trays with antennas enabled throughout the store. Whenever an associate shows a piece of jewelry, the items are place in an RFID enabled tray. This allows the jeweler to track how often a given item is handled or demonstrated to a customer. This discrete reader system will only work if the jewelry is passing through discrete read points. It also allows for inventory typically only once per day. However, is can provide very accurate reads at the time that the items are actually read.

Handheld or Portable Readers:

Handheld readers involve the associate passing a battery-powered reader over the sales merchandise at discrete times throughout the day. Inventory can be taken multiple times throughout the day and one handheld reader can be used to support an entire store. While

this solution offers probably the lowest implementation cost and least complex system, it will typically be the least accurate solution and require more employee involvement. Having said this, the handheld reader can still offer significantly more reliable inventory than manual or barcode systems and also provide significant timesavings. Many jewelers choose this as the first step in deploying RFID system with plans to migrate to more elaborate systems as the technology evolves.

Ultimately, the installed system may include a combination of one or more of the reader technologies. It is critical to work with a knowledgeable RFID partner to guide you through the reader options.

RFID Frequency:

Most RFID jewelry tracking applications deploy one of two frequencies: UHF (860 – 960 MHz) or HF (13.56 MHz). Each offers specific benefits, but as this technology evolves, some of the differences will be minimized.

Most of the earlier RFID tracking systems used the HF frequency, mostly because it was the more mature and readily available system at the time that these systems were deployed. The benefits of HF tags are that they are currently available with higher memory and more security features. With the rapid development of new UHF chips however, this is just a temporary situation. On the con side, HF tags will have very short read ranges. With the size tags one would deploy in jewelry tracking it would not be unusual to have HF tags with read ranges of just a few inches.

By contrast, with UHF tags, one can expect reads of 12” – 18” with the small tags one would use for jewelry marking. In addition, UHF tags currently are less than half the cost of HF tags. There are many UHF tags under development that will provide increased memory and security.

The final choice of frequency will ultimately depend upon the process and goals of the RFID tracking program.

Tag Form Factors:

There are several ways that the RFID inlay can be introduced into the jewelers tagging system.

RFID Jewelry Labels:

RFID inlays can be imbedded into the RFID jewelry label. Benefits to this method include that it requires no additional labels or tags be applied to the jewelry and it also does not disturb the aesthetics of the jewelry labels as the RFID inlay is ‘hidden’ within the label. Additionally, these labels can be printed and encoded in an RFID printer encoder that prints the human readable and barcode data (if required) and also encodes the RFID data to

the tag. These are available in a number of form factors and sizes. These are typically made with synthetic label stock so that the tag cannot be removed by tearing.



RFID Jewelry Tags:

RFID inlays can also be imbedded into tags. Some higher end jewelers attach high-quality preprinted tags to the jewelry item using strings. For these jewelers, there are two options. The RFID inlay can be imbedded in the tag at the time of manufacture. Or a small RFID labels can be printed and encoded and then applied to the jewelry tag. Again, with both of these options, the RFID label or tag can be printed and encode in an RFID printer/encoder, thereby assuring quality and accuracy.





RFID Hard Tags

Finally, the RFID inlay can be imbedded in a plastic RFID tag. The advantage of this tag is that it offers the highest security as it can be made very difficult to remove. However, these tags offer a bulky, non-pleasing aesthetic. They can also get in the way of the consumer trying on a piece of jewelry. These must be open-air encoded (the least reliable method of encoding) and do not support human readable and barcode data. These tags tend to be the most expensive options, although they can be re-used.



Recommendations:

For jewelers interested in pursuing a pilot for RFID Jewelry Tracking, it is critical to define the pain points as listed in the 'Designing the System; section above. It is especially important to try to define measurable goals so that any improvements recognized with RFID can be measured.

The next step is to choose a strong RFID partner that understands the unique challenges of item level tagging of high-end retail products. Ideally, the partner should provide both UHF and HF solutions and have a strong understanding of RFID tags, readers, and processes as well as experience implementing RFID at the item level for in-store applications.

Avery Dennison has been a provider of item level tagging solutions to retailers for over 115 years. As the provider of the largest deployment of RFID item level retail tagging in the world, Avery Dennison understands the challenges of installing RFID for in-store applications. Avery Dennison offers RFID jewelry tags in a variety of form factors – both HF and UHF. Avery Dennison offers free consultative services to our RFID customers to help design the most cost effective and robust solution. Avery Dennison partners with the leading RFID hardware and software partners to provide RFID pilot systems that are scalable to full RFID implementation throughout a jeweler's enterprise.

**For more extensive details on
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