

# Next Generation Bar Codes For Small Package Labeling: Discussion Points



Authored by  
**Health Industry Business  
Communications Council**  
2525 E. Arizona Biltmore Circle  
Suite 127  
Phoenix, Arizona 85016 USA  
(01) 602.381.1091 Voice  
(01) 602.381.1093 Fax



## A Prescription for Healthcare

As the healthcare industry moves forward in its efforts to control costs and insure patient safety, the most consistent recommendation to emerge for achieving comprehensive reform is the integration of automated-identification technologies into the care giving environment. Perhaps the most critical element to this process reform is the labeling of medical products down to the unit-of-use level.

Unit-of-use identification, or source marking of products enables broad-based cost containment measures by providing the ability to determine actual utilization by a patient, generate exact billing for goods used and update hospital inventory in real-time. Source marking at an individual level also provides system safeguards to insure the correct product is being administered to the correct patient, as well as providing efficient tracking of products in the event of defect and recall.

In the past, the lack of usable 'real estate' on small and individual packages made labeling with traditional linear bar codes problematic. With the advent of the 'next generation bar codes' space constraints are no longer an obstacle. One of these new symbologies is Data Matrix.

### Data Matrix



Data Matrix, a 2-D matrix symbology, was designed to store an extensive amount of information in a space as small as 2mm x 2mm. The 'matrix code' as it is often referred to, can store between one and 3,116 numeric or one and 2,335 alphanumeric characters. Originally developed in conjunction with NASA as part of their component tracking system for the Space Shuttle program, Data Matrix is now part of the public domain.

Data Matrix differs from other small space symbols like RSS in its scalability and ruggedness. RSS, a reduced size linear symbol, is smaller than traditional linear bar codes and thus can accommodate some small package labeling needs. However, RSS is still a linear symbology, and as such, is subject to many of the same limitations of traditional bar codes.

### Data Matrix & RSS - A Comparison

Data Matrix's 2-D matrix technology provides clear advantages over small linear bar codes like RSS for individual source marking in critical environments such as healthcare.

- **Sizing**

Data Matrix symbols as small as 2mm can be accurately printed and read.

RSS will not fit on all unit-of-use packages. Approximately 10% of unit of use-packages are too small to accommodate an RSS symbol.

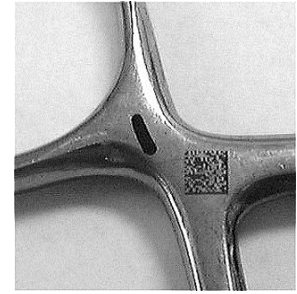
- **Print Quality**

Data Matrix can be decoded with as little as 20% contrast.

RSS, like all linear bar codes, requires a higher level of print quality and can lead to a greater degree of waste during the packaging run due to the diminished margins for error.

- **Readability**

Data Matrix can be marked directly on any surface, including reflective materials such as the foil packaging associated with some unit-dose blister packs. It is the only symbol that can be etched directly onto a device and read reliably. It is currently used for marking implantable devices and surgical instruments, providing a more durable and less costly alternative to traditional labeling.



RSS will not be readable on all unit-dose packaging materials and cannot be printed on reflective surfaces.

- **Error-Correction**

Data Matrix symbols employ Reed-Solomon error correction that protects encoded data. Data can be retrieved in its entirety even if the mark is as much as 30% damaged or obstructed.

RSS has no error-correction capability.

- **Accuracy**

Data Matrix has undergone rigorous testing and is a proven technology.

RSS has undergone only proof-of-concept trial runs and has not been subject to any formal studies that test its accuracy rate in a real world setting.

- **Applicability**

Data Matrix is scanned using digital camera technology and as such has multiple uses in a care giving setting: read/record signatures, text, pictures and faces. This diversity in application protects the technology from near-term obsolescence.

RSS is scanned using a technology that is not readily available and does not support the same diversity of applications.

- **Implementation**

Data Matrix has been adopted for critical applications by these major industries and their standards groups: Aerospace (NASA), Airline (ATA), Automotive (AIAG), Electronics (EIA), Healthcare (HIBCC), Military (US Dept of Defense), Product Packaging (ISO), Semiconductors (SEMI). Data Matrix has been implemented by global companies such as AMD, Hewlett-Packard, Intel, Motorola, Nokia, Siemens and Texas Instruments.

RSS has not been adopted for critical applications by any major industry.

## Ideal for Healthcare

Because of its robust and reliable design, Data Matrix has been widely implemented by industries that share with healthcare a concern for consumer safety and sensitivity to error. Data Matrix's scalability and diverse applicability make it especially well suited to the critical needs of a healthcare environment.

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*The Health Industry Business Communications Council (HIBCC) was founded in 1983 by leading U.S. health care associations: American Hospital Association (AHA), Pharmaceutical Research and Manufacturers Association (PhRMA), Health Industry Manufacturers Association (HIMA), National Wholesale Druggists Association (NWDA) and the Health Industry Distributors Association (HIDA). These associations determined that the existing bar code standards were inadequate for the specific applications and needs of a health care environment, as they were based upon the point-of-sale, “cash register” needs of retailers who did not have patient/consumer safety concerns.*

*HIBCC's mission was to design a specialized, yet fully interoperable, bar code labeling standard based upon the critical requirements of a health care environment. As a result, the Health Industry Bar Code Standards were developed.*

*HIBCC and the HIBC Standards are accredited by the American National Standards Institute (ANSI) and the European Committee for Standardization (CEN). The use of HIBC Standards are endorsed by EUCOMED, the Health Industry Distributors Association (HIDA) and the Medical Industry Association of Australia (MIAA).*

*HIBCC's mission is extended globally via IHIBCC, an international network of HIBCC offices..*