Printing and Encoding
On-Metal Tags with an RFID Printer

Tag Constructions and Considerations, Printer Considerations
Personal Introduction

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RFID Subject Matter Expert

- 20+ years in the Auto ID industry
- Joined Printronix Auto ID in 2019
- Focused on RFID market and technologies
- Active member of RAIN RFID Alliance

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Agenda

- Basic Definitions
- On-Metal Tag Constructions and Considerations
- RFID Printer Considerations
Basic Definitions

1. Smart Labels
2. On-Metals
   (anti-metal, mount-on-metal, metal-mount)
Basic Definitions

3. RFID Printer

4. RAIN RFID
(UHF Passive, EPC Gen2 v2, ISO 18000-63)
On-Metal Tag Constructions and Considerations

- **Application:** Work with an on-metal tag manufacturer!
  - Chip requirements and specifications
  - Surface material
  - Sub-materials (aqueous, petroleum, air, other)
  - Curvature: Both axes
  - Read range
  - Temperature range
  - Other considerations? Check with the manufacturer.

Service yard asset tracking

IT asset tracking

Aviation parts marking, ATA Spec 2000
On-Metal Tag Constructions and Considerations

- Tag dimensions:
  - Width
  - Height
  - THICKNESS: 0.8 mm to 2.2 mm

- Traditional, non-RFID media considerations:
  - Facestock
  - Adhesive
  - Environment (UV, temperature, moisture, etc.)
On-Metal Tag Constructions and Considerations

- “Bridge” (“spacer”) between labels
On-Metal Tag Constructions and Considerations

- Different possible constructions: Which will work with which printer?
  - Check with tag and printer manufacturers
  - Standard, “stacked” design
  - “Wraparound” antenna design
  - Notched, Holes
RFID Printer Considerations

- Media thickness specifications
- Printer antenna location:
  - Below label-path (traditional design for standard smart labels)
  - Above label-path (best for on-metals)
RFID Printer Considerations

- Label/tag “Pitch”
- RFID Auto Calibration feature
- Printing/encoding sequence:
  - Print then encode
  - Encode then print
  - “Encode during print”
    - Minimizes backfeed and maximizes performance
    - Inlay placement with on-metals “is what it is”
- Support for high-memory chips
RFID Printer Considerations

- Media feed (test!):
  - Both feed and backfeed
  - Abrupt media edges
  - Robust feed mechanisms needed with on-metals
- Ability to handle both on-metals and standard smart labels
  - Simple, fast media changes
- Performance/speed
- Supported printer languages/”emulations”
RFID Printer Considerations

- **Print quality:**
  - Best ribbon choices: Check with tag manufacturer. Usually Resin or Wax/Resin
  - Best printer settings:
    - Speed
    - “Slew” speed
    - Intensity (“darkness”)
    - Printhead pressure
    - Graphics handling

- **Data-reporting functionality:** Return RFID and barcode data to host system

- **Troubleshooting tools and support**
Thank You