RFID Technologie in The German Automotive Industry

Presented by:
Dr. Rüdiger Meier
Manager Logistics
RFID expert in automotive applications
ITA-RFID project leader

Volkswagen AG
Logistics Brand Volkswagen
At the end of a lecture, ....

A female student came to A. Einstein and said:

Mr. Einstein, the questions for our homework, we´ve just got from you, are the same we´ve got two years ago …

Yes, A. Einstein said after a moment, but I´ve change the answers, …
Innovations in the Automotive Industry

Logistic and Computer Integrated Manufacturing (CIM)

Logistics (order related): horizontal data integration

Supplier

Purchasing Department

MRP II

Production planning and controlling, inventory management, capacity calculation

PPS, FFS, BDE

Distribution

MRP II

Customer

Computer-Aided automation in production and logistics

CAM, CNC, FTS

Development, Construction, Production Technic, Process Engineering

CAD, CAE, CAP

CIM (product related): vertical data integration

Quelle: Roos
Innovations in the Automotive Industry
Manufacturing of Connections between different Materials

Joint Technologies
- Welding
- Splicing
- Crimping
- Clinching
- Clip

Material
- High strength plates
- Aluminium
- Magnesium
- Carbon fiber
- Plastics

Quelle: Volkswagen
Innovations in the Automotive Industry

RFID-Technology in the Car Manufacturing Process – screwdriver controlling / TOURAN-Production in Wolfsburg

Quelle: Volkswagen/Schreiner
The way is the aim, 
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....create with Standards ?!
Standards Organisations

International
- International Organization for Standardization (ISO)
- International Electrotechnical Commission (IEC)
- International Telecommunications Union (ITU) (United Nations)
- United Postal Union (UPU) (United Nations)
  - TC 122 Packaging
  - TC 104 Freight Containers
  - TC 204 Road Informatics
  - ISO/IEC Joint Technical Committee 1 (JTC 1)
    - SC 31 Automatic Data Capture
      - WG 1 - Symbology
      - WG 2 - Data Content
      - WG 3 - Conformance
      - WG 4 - RFID
    - SC 17 IC Cards
  - ITU-T (fka CCITT) Telecommunications
  - ITU-R (fka CCIR & IFBR) Radio-frequency Issues
  - ITU-D (fka BDT) Telecommunications Development

Regional
- Comité Européen Normalisation (CEN)
- ECMA
- Comité Européen Normalisation Electrotechnique (CENELEC)
- Comité Européen Postal & Telegraph (CEPT)
  - ODETTE

National
- Standards Australia (SAA)
- British Standards Institution (BSI)
- AFNOR
- ANSI
  - Deutches Institut fur Normung (DIN)
- JISC
  - MHI
  - AIM
  - UCC
  - EIA
  - IEEE
  - INCITS
  - Other

Industry
- CompTIA
- ATA
- EIA
- AIA
- HIBCC
- AIAG
- UCC
- Other
  - VDA

Other
- IEEE INCITS
- International Electrotechnical Commission (IEC)
- International Telecommunications Union (ITU) (United Nations)
- United Postal Union (UPU) (United Nations)
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RFID Focussed ISO Standards

International Standards Organization (ISO)

Technical Committee (TC) 122 (Packaging)

ISO/IEC Joint Technical Committee 1 (JTC 1) - IT

ISO/IEC JTC 1 Subcommittee 31

WG 1 Data Carrier

Convener: S. Ackley (US)
- Code 39
- ITF
- Maxi/Code
- Data Matrix
- EAN/U.P.C.
- Code 128
- PDF417
- QR Code
- Symbology Identifiers

Convener: E. Boonet (BE)
- DAI
- Data Syntax
- License Plate

Convener: C. Swindin (UK)
- Linear Print Quality
- 2D Print Quality
- Printing Specs
- Test Specs BC Printers
- Test Specs BC Readers
- Test Specs BC Verifiers
- RFID Performance
- RFID Conformance

WG 2 Data Structure

WG 3 Conformance

WG 4 RF Tags

WG 7 (Package Labels)

Technical Advisory Groups (TAG)

Secretariat Uniform Code Council (UCC)

National Body (NB)

U.S. TAG Administrator MHI

Shipping Labels

Product Package Marking

Dimensions & Layout

Symbology Recommendations (Linear & 2D)

Print Quality Level

Label Materials

License Plate Recommendations

Database / EDI Issues

Supply Chain Applications of RFID

Technical Committee (TC) 104 (Freight Containers)

Volkswagen AG

Markenlogistik

Folie 18

Dr. Rüdiger Meier

März 06
Transponder systems (RFID systems)
Initial Situation in the automotive Industry

Modern material flow systems require an information flow

- redundancy-free
- trouble-free
- and constantly faster and faster

In this respect, up to the present day labels have been highly significant as physical information carriers

- Barcode labels as information store
- barcode readers (scanner checkout...) as identification tool
Transponder systems (RFID systems)
Initial Situation in the automotive Industry

**Target:**

The primary target in logistics, apart from the trend to automation of logistics sequences, is the coupling of material and information flows with

- autonomous data storage

**Requirements:**

All relevant data and information that accompanies a consignment of parts is organised consistently for all participants

- useful
- changeable (partly) - without physical intervention such as label changing and pasting over
Transponder systems (RFID systems)
Initial Situation in the automotive Industry

**Limits:**
Meeting these requirements - use of information content throughout the logistics chain - is beyond the capacity of barcodes.

**Solution:**
Transponder technology (RFID systems)
Parts are identified contact-free and without a direct visual connection by means of electromagnetic fields.
Information flow in logistics chain supplier - forwarder - customer (1)

**Supplier**

- **Production**: Control data
  - Item number
  - Unit count
- **Company transport**: Storage area travel route
- **Floor storage**: Allocation of travel route
- **Company transport**: Procurement warehouse
Information flow in logistics chain supplier - forwarder - customer (2)
Transponder systems (RFID systems)
Scenarios and Feasibility Studies in the automotive Industry

Container Tracking in CKD-processes for over sea plants

Feasibility Studies were done in 2003 / 2004 by OEM’s (DC / Volkswagen) corporately with Logistic Service Providers, Inhouse Logistics and IT-Solution Integrators under co-ordination by the Association of the German Automotive Industry (VDA) and IT-Association (ITA)
Volkswagen AG
Markenlogistik

Inland Haulage

Supplier

Standard (oneway) Packaging

Packaging in Small Moduls

Packaging in End Models

Direct Container

OEM

Over Sea Transport

30 %

5 %

50 %

15 %
Identification of Small Load Container i.e. the VDA-KLT

Best and Worst Case Scenarios (Single and Bulk Reading) were described and some pilot tests with Metal and Plastic Containers with active and passive transponders were done.

3-Ebenen GaReCo Gate from TBN
Identification of metal container i.e. for special metal parts

Worst Case Scenarios (Single and Bulk Reading) were described and some pilot tests with Metal Containers with passiv transponders were done.
Gate:
- ~ 4,10 m height
- ~ 7,00 m width
- 4 Deister Reader (two per site)
  UHF (868 MHz)
- Transponder UHF passiv
Parts: engine hoods, 20 parts per container

Special metal tag, atmel chip, tagidu protocol, 4 tags per container
(one on each site only for testing not for further application)
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