Concept 2020 – Roadmap for high volume RAIN tag manufacturing
Mühlbauer Group

Introduction

- Owner-managed independent group
- More than 3200 employees
- More than 400 engineers for R&D
- 32 sides worldwide

- Global company with market leadership in the fields of
  - Parts & Systems
  - Semiconductor Related Products
  - Document Solution Related Products
  - Tecurity® Solutions
The Story of 25 years RFID: 1995 - 2020
Experience drives Innovation

Mühlbauer Group

Concept 2020

RFID Market Update
  ► Growth in Size & Applications

Mühlbauer & RFID
  ► Your Partner for Smart ID
  ► Customer References

- TAL 1500
- TAL 4000
- TAL 5000
- TAL 10000
- TAL 15000
- FCM 20000
- DDA 20000
- DDA 40000

- Inlay
  - TAL 2000
  - TAL 5000
  - DDA 20000
  - DDA 40000
  - DDA 50000

- Strap
  - TAL 1000
  - TAL 5000
  - TAL 10000
  - TAL 15000
  - FCM 20000
  - DDA 20000
  - DDA 40000
  - DDA 80000

- FCM 10000
- DDA 20000
- DDA 40000
The Big Picture
… needs to be optimized

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<tr>
<th>High UPH</th>
<th>vs</th>
<th>High Speed</th>
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<td>Antenna Prod.</td>
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<td>Speed ↑</td>
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<td>Chip Prod.</td>
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<td>Flexibility ↑</td>
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<td>Simplification ↑</td>
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<td>Supply Chain Compression</td>
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<th>Weeks – around the world</th>
<th>vs</th>
<th>Minutes – within one room</th>
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Our Vision – in extreme Supply Chain Compression

Input: Blank Paper

Output: Personalized RFID Label

Cutting production costs to < 1/10
5 min / 5 m

The most efficient AUTOMATION for the most efficient PRODUCT DESIGN!
The Mühlbauer RFID Factory
The Basis for CONCEPT 2020
Our Vision:
Building Blocks for „CONCEPT 2020“

CONCEPT 2020

RFID Factory
Multi Row High Speed Cells
up to 100 000 UPH

RFID – LINE
Highest Efficiency
for dedicated applications

AMS + DDA + CL + PL
AMS + DDA + CL + PL
AMS + DDA + CL + PL

The Building Blocks

AMS
Antenna Manufacturing

DDA
Inlay Assembly

CL
Converting

PL
Personalization

Simplification, Quality, Integration
Inhouse Antenna Production  
… a milestone for „Concept 2020“

Why developing an Antenna System?

▸ Supply Chain Compression  
ship your new RFID label in 24 hours!

▸ Just in Time Production  
for rapid prototyping &  
high volumes up to 1 Billion / year

→ 50% cost reduction  
→ 75% time saving  
→ 100% environmental friendly
Antenna Printing: APS 100 / 350
… for a RFID pure paper label

► Save one layer

► Environmental friendly product
… pure paper!
**DDA - Direct Die Attach**
The revolution in flip chip die attach

SIMPLIFICATION IS THE ULTIMATE SOPHISTICATION!
Mühlbauer RFID Chip Attach Roadmap
The Future Potential of DDA
The Future Potential of DDA
Cost / Performance Roadmap

Reference:
UHF-Dipole, x-pitch 20 mm
CL Wide Web
RFID Converting Line for High Volume Label Production

- Highest flexibility
- Highest output
Small Footprint UHF Personalization Equipment
PL light – Reel-to-Reel

- Electrical & Graphical Personalization
- Secured data handling incl. validation
- Suitable for selected NFC and HF chips
Summary: Mühlbauer CONCEPT 2020
The Future of RFID Manufacturing

The most efficient AUTOMATION for the most efficient PRODUCT DESIGN!