PRINTED SMART PACKAGING

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ANYWHERE & ANYTIME

• Influence on packaging

• Control and monitor packaged goods and their characteristics
• Multifunctional elements
• Directly to packaging

MORE & MORE

intelligent / active and interactive components

SMART
SMART PACKAGING
SMART PACKAGING

Time-temperature indicators
SMART PACKAGING

Time-temperature indicators

Freshness indicators
SMART PACKAGING

Temperature sensors

Freshness indicators

Time-temperature indicators
SMART PACKAGING

- Time-temperature indicators
- RFID tags
- Temperature sensors
- Freshness indicators
SMART PACKAGING

- Temperature sensors
- RFID tags
- 2D codes
- Time-temperature indicators
- Freshness indicators
SMART PACKAGING

- Temperature sensors
- RFID tags
- 2D codes
- Time-temperature indicators
- Freshness indicators
- Thermochromic displays
SMART PACKAGING

Temperature sensors
RFID tags
2D codes
Thermochromic displays

Freshness indicators
Time-temperature indicators
SMART PACKAGING

- Temperature sensors
- RFID tags
- 2D codes
- Thermochromic displays
- Time-temperature indicators
- Freshness indicators
Auto ID
Protection
Authentication
Decoration
Applied to cardboard packaging

TRADITIONALLY
(label, etching)
or

DIRECT PRINTING

additional information & added value
Purpose

ANALYSE

- Important for understanding
- Undisturbed activity

- Possibilities & limitations
- Cardboard packaging
2D CODES

- Data: X & Y direction
- Smaller size
- Numerical and alphanumerical data
- Line-of-sight
- Additional information about the product
2D CODES

Smart phones

Printed packaging

Web

RESEARCH
- Lowest raster tone value
- Multi-colored codes on different paper substrates
- Successful reading
RFID TAGS

- Identification: radio waves
- Without line-of-sight
- Greater distances
- Identification
- Brand protection
- High production cost of conventionally etched antennas

PRINTED ANTENNAS

More ecological, economical & rapidly produced
RFID TAGS

RESEARCH
• Optimization of printing process
• Printing on cardboard
• Comparison printed vs. commercially available
• Analysis of some effects

WORKING
UHF RFID tags with screen printed antennas
On cardboard & recycled paper
THERMOCHROMIC DISPLAYS

- Traditional information & low cost printed electronics
- Printed displays - new functions in packaging technology

Thermochromic displays → Thermochromic ink
             Conductive pattern

RESEARCH
- Thermochromic and conductive ink
- To adjust the conductive pattern

low electrical power & discoloured thermochromic ink
PACKAGING WITH PRINTED RFID TAGS
PRINTED THERMOCHROMIC DISPLAY

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FUNCTIONAL ELEMENTS ON PACKAGING

Additional information about the product

Added value of the product
PRINTED SMART PACKAGING

Graphic technology
THANK YOU FOR YOUR ATTENTION!
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