

The International Market for Brand Protection Solutions

PROVISIONAL
TABLE OF CONTENTS

**RFID meets BRAND
PROTECTION**
A Convergence of Fields

Opportunities and Markets

A techno-economic market report

by
Vandagraf International

2009

Authors:

James Bevan, Jeremy Plimmer and Brian Weeks

Vandagraf International Limited
Croffta House, Groes Faen, Mid-Glamorgan CF72 8NE, United Kingdom
Tel +44 (0) 1443 231 441. Fax +44 (0) 1443 223 876
email: info@vandagraf.com – www.vandagraf.com

©Vandagraf International – June 2009

Executive Summary

1. Introduction

- 1.1 Objectives
- 1.2 Scope of Report
- 1.3 Report Road Map & Deliverables

2. Types of Product Related Crime and Technology-Based Solutions

- 2.1 Types of Product Counterfeiting and Piracy of Branded Products
 - 2.1.1 Product Counterfeiting and Piracy - Forgery/Alteration Fraud
 - 2.1.2 Product Counterfeiting and Piracy - Parallel Trading, Grey Markets and Diversion
 - 2.1.3 Product Counterfeiting and Piracy - Unauthorised Distribution, Back Door Trading and Over-runs
 - 2.1.4 Product Counterfeiting and Piracy - Copy and Look-alike Products
 - 2.1.5 Product Counterfeiting and Piracy – Retail Theft
- 2.2 Types of Tampering
 - 2.2.1 Grazing (i.e: Sampling of Products in Store without Purchasing)
 - 2.2.2 Tampering for the Purpose of Obtaining Fraudulent Cash Refunds
 - 2.2.3 Pilfering i.e. Removal of Some product from its Container (Products are Vulnerable at all stages in the Entire Supply Chain)
 - 2.2.4 Malicious Criminal Tampering (Poisoning or Spiking of Products, often accompanied by Extortion Demands)
- 2.3 Global financial losses due to Product Related Crime

3. Brand Protection Technologies used to combat Counterfeiting and Product Piracy

- 3.1 High density 3D / Matrix bar codes and other coding technologies
- 3.2 Security Holographic Devices including Holographic Threads (OVIDS / DOVIDS)
- 3.3 Security Inks & Coatings
- 3.4 Security Materials / Substrates - Papers / Security Films
- 3.5 Tags & Taggants (Chemical and Molecular Coding), Nano-technologies

The International Market for Brand Protection Solutions

- 3.6 The Security Printing Industry – Brand Protection Applications
- 3.7 Tamper Evident Caps and Closures
- 3.8 Tamper Evident Labels
- 3.9 Other forms of Tamper Evident Packaging
- 3.10 EAS tags and systems
- 3.11 Types of RFID explained (Chip-based RFID Solutions, Printed Organic RFID Solutions, 1st Generation Chip-less Identification Solutions)
- 3.12 Types of RFID – Market Indicators and Segmentation (Market sizing and Growth Potential)
- 3.13 The potential role of RFID in Brand Protection – the ‘click and authenticate’ approach

4. The International Market for Brand Protection Solutions (2009 – 2015)

- 4.1. Actual / Potential Market for Brand Protection Solutions with Breakdown by Solutions Technology

5. Market Analysis – Selected End User Markets – Based on Applicability of RFID as a Brand Protection Technology

- 5.1 Pharmaceutical, Diagnostic, Veterinary Products, Alternative Medication and other Medicines and Medical Consumables
 - 5.1.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.1.2 Product Related Crime (*)
 - 5.1.3 Brand Protection (*)
 - 5.1.4 Opportunities for RFID as a Brand Protection Solution
- 5.2 Batteries (Rechargeables and one-time usage)
 - 5.2.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.2.2 Product Related Crime (*)
 - 5.2.3 Brand Protection (*)
 - 5.2.4 Opportunities for RFID as a Brand Protection Solution
- 5.3 Clothing and Footwear - Fashion / High Fashion wear and Sports Clothing – Men’s and Women’s), Footwear – Sporting and non-sporting - Men’s and Women’s

The International Market for Brand Protection Solutions

- 5.3.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
- 5.3.2 Product Related Crime (*)
- 5.3.3 Brand Protection (*)
- 5.3.4 Opportunities for RFID as a Brand Protection Solution
- 5.4 Drink Products – Wines, Spirits & liquors, Other
 - 5.4.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.4.2 Product Related Crime (*)
 - 5.4.3 Brand Protection (*)
 - 5.4.4 Opportunities for RFID as a Brand Protection Solution
- 5.5 Industrial Electrical, incl. Switchgear & Control Systems, Electrical Sub-assemblies
 - 5.5.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.5.2 Product Related Crime (*)
 - 5.5.3 Brand Protection (*)
 - 5.5.4 Opportunities for RFID as a Brand Protection Solution
- 5.6 Automotive Parts & Aeronautical Parts (incl. NASA & Defense)
 - 5.6.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.6.2 Product Related Crime (*)
 - 5.6.3 Brand Protection (*)
 - 5.6.4 Opportunities for RFID as a Brand Protection Solution
- 5.7 Beauty Products – Perfumes & Colognes, Cosmetics & Make-up
 - 5.7.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.7.2 Product Related Crime (*)
 - 5.7.3 Brand Protection (*)
 - 5.7.4 Opportunities for RFID as a Brand Protection Solution
- 5.8 Tobacco Products – Cigarettes & Cigars

The International Market for Brand Protection Solutions

- 5.8.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
- 5.8.2 Product Related Crime (*)
- 5.8.3 Brand Protection (*)
- 5.8.4 Opportunities for RFID as a Brand Protection Solution
- 5.9 Women's Fashion Handbags & Purses (incl. Men's Wallets)
 - 5.9.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.9.2 Product Related Crime (*)
 - 5.9.3 Brand Protection (*)
 - 5.9.4 Opportunities for RFID as a Brand Protection Solution
- 5.10 Imaging Supplies (for printers & copiers) – Ink Jet & Laser Toner Cartridges
 - 5.10.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.10.2 Product Related Crime (*)
 - 5.10.3 Brand Protection (*)
 - 5.10.4 Opportunities for RFID as a Brand Protection Solution
- 5.11 Helmets (Industrial, Sport, Motor cycle, Bicycle, Military)
 - 5.11.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.11.2 Product Related Crime (*)
 - 5.11.3 Brand Protection (*)
 - 5.11.4 Opportunities for RFID as a Brand Protection Solution
- 5.12 Power Tools
 - 5.12.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
 - 5.12.2 Product Related Crime (*)
 - 5.12.3 Brand Protection (*)
 - 5.12.4 Opportunities for RFID as a Brand Protection Solution
- 5.13 Software (Retailed Business & Games)

The International Market for Brand Protection Solutions

- 5.13.1 Market Overview (Market Sizing and Growth rates, Industry Structure, Leading Players & the Value Chain)
- 5.13.2 Product Related Crime (*)
- 5.13.3 Brand Protection (*)
- 5.13.4 Opportunities for RFID as a Brand Protection Solution
- 5.14 Other End User market sectors which could provide Potential Opportunities for RFID Enabled Brand Protection (e.g.: Sporting Goods, Fashion Accessories – Sunglasses, Watches & Jewelry, Telephones & Accessories, Shaving Products, Other)

(*) **incl. Relevant Case Studies**

6. Chip-based RFID Devices

- 6.1. High Frequency (HF) RFID Tags (13.56MHz)
 - 6.1.1. Near Field Communication (NFC) Chip-based RFID Tags
 - 6.1.2. Wireless-Based e-Pedigree Systems based on NFC enabled Mobile Phones
 - 6.1.3. Secure & Unclonable HF Chip-based RFID Tags
 - 6.1.3.1. Ask-intTag
 - 6.1.3.2. Atmel – CryptoRF Range
 - 6.1.3.3. Impinj
 - 6.1.3.4. Neocatena Networks
 - 6.1.3.5. Raflatac
 - 6.1.3.5. RFIDsec
 - 6.1.3.6. SecureRF
 - 6.1.3.7. ST Micro
 - 6.1.3.8. TI
 - 6.1.3.9. Veratag
 - 6.1.3.10. Verayo
 - 6.1.3.11. Others
 - 6.1.4. Verification Chip-based RFID Tags
 - 6.1.4.1. Friendly Technologies
 - 6.1.4.2. Others
 - 6.1.5. Printed Antenna for HF RFID Devices
- 6.2. Ultra High Frequency (UHF) RFID Tags (868 -920MHz)
 - 6.2.1. Far Field UHF RFID Tags
 - 6.2.2. The Hibiki Project
 - 6.2.3. Near Field UHF RFID Tags

The International Market for Brand Protection Solutions

- 6.2.4. Secure & Unclonable UHF Chip-based RFID Tags
 - 6.2.4.1. Alien Technology
 - 6.2.4.2. Others
 - 6.2.5. Printed Antenna for UHF RFID Devices
 - 6.2.5.1. Focused Field Deposition (FFD)
 - 6.2.5.2. Conductive Inkjet Technologies
 - 6.2.5.3. Leonhard KURZ
 - 6.2.5.4. Mu-Gahat
 - 6.2.5.5. Meco
 - 6.2.5.6. Others
 - 6.3. Microwave RFID Tags (2.45GHz)
 - 6.3.1. Hitachi "μ-chip" (or mu-chip)
 - 6.3.2. HP Memory Spot
 - 6.4. Combination EAS- RFID Devices
 - 6.5. Security of Data Stored on Chip-based RFID Devices
 - 6.6. RFID Viruses & Security Threats
 - 6.6.1. RFID Security Alliance
 - 6.7. Surface Acoustic Wave (SAW) RFID Devices (50 – 2500MHz)
 - 6.8. Future Research Trends: Chip-based RFID Devices
7. **Printed 'Organic' RFID Devices**
- 7.1. Fully Printed Passive RFID Devices
 - 7.1.1. Ink Stripes
 - 7.1.1.1 Printed Systems GmbH
 - 7.1.1.2 Acreo
 - 7.1.1.3 Panipol
 - 7.1.1.4 Mennipos
 - 7.1.1.5 Others
 - 7.1.2. Thin Film Transistor Circuits (TFTCs)
 - 7.1.2.1 PolyIC
 - 7.1.2.2 Kovio
 - 7.1.2.3 OrganicID
 - 7.1.2.4 Others
 - 7.1.3. Printed Radar Arrays
 - 7.1.3.1 SAR/Inksure
 - 7.2. Printing Complete Passive RFID Devices Directly onto Products or Packaging

The International Market for Brand Protection Solutions

- 7.3. Brand Protection using Fully Printed Active RFID Devices
 - 7.3.1. The Compliers Group
 - 7.4.2 Others
- 7.4. Future Developments & Research Trends
 - 7.4.1. The PRISMA (Printed Smart RFID Labels Consortium)
 - 7.4.2. PARIFLEX Consortium)
 - 7.4.3. Others
- 8. **Other Competing Technologies - Chip-less Identification Devices**
 - 8.1. Electromagnetic, Inductive & Capacitor Array Chip-less Identification Devices
 - 8.2. Future Prospects for the Development of Chip-less Devices
 - 8.2.1. Oxonica
 - 8.2.2. TruTags
 - 8.2.3. Molecular Computational Identification (MCID) Devices
 - 8.2.4 Others
- 9. **Incorporating RFID & Other Types of Device into Packaging, Labels & Products**
 - 9.1. Labels & Film
 - 9.2. Carton & Board
 - 9.3. Direct Printing Methods
 - 9.4. Future Trends
- 10. **Selecting Optimum RFID Tag Types / Technologies for Brand Protection Applications**
 - 10.1 Systems Selection & Implementation Criteria
 - 10.2 Effective Exploitation of Key RFID Attributes e.g. encryption, anti-clone tamper evidence, EAS & time temperature indicators
 - 10.3 Selecting Systems based on NFC enabled mobile phones
 - 10.4 Benchmarking RFID against Conventional Brand Protection Technologies

APPENDICES

- APPENDIX 1 Glossary of Terms
- APPENDIX 2 Near Field Communication (NFC): What it is & How it Works
- APPENDIX 3 Device & Supplier Profiles: Chip-based RFID Devices
- APPENDIX 4 Device & Supplier Profiles: Printed Organic RFID Devices
- APPENDIX 5 EU Funded Projects on RFID in Brand Protection & Related Applications
- APPENDIX 6 Further References & Web Links

ABOUT VANDAGRAF INTERNATIONAL LIMITED

The International Market for Brand Protection Solutions

AUTHOR PROFILES

ACKNOWLEDGEMENTS