

Technology to support the fight against illicit Tobacco products

Digital Coding and Tracking Association

Brian Lee

Technical Chair

Content



- DCTA overview
- Digital Technology - Codentify
- Digital Tax Verification
- Standards
- Track and Trace
- Demonstration

Digital Coding and Tracking Association

Who we are and what we do



Who we are

Formal Association, registered in Zurich. Membership open to any manufacturer of excisable products that is actively seeking to reduce illicit trade.

Current members:



What we do

Develop and promote global standards and cost effective solutions for Digital Tax Verification (DTV), Authentication and Track & Trace (T&T)

Why we do it

We want to ensure that the FCTC AIT and TPD2 protocols can be successfully implemented by all actors within the tobacco business, minimizing the number of country specific solutions and the cost associated with the implementation for the manufacturers and Governments

National Scope

Tax Evasion

Digital Tax Verification

- Licencing of manufacturers
- Apply eStamps
- Monitoring and controlling the manufactured and/or shipped volume to verify the correct taxes have been declared/paid

International Scope

Smuggling

Track & Trace

- Monitor the movement of products through international supply chains
- Trace products back to the point of diversion into illegal trade

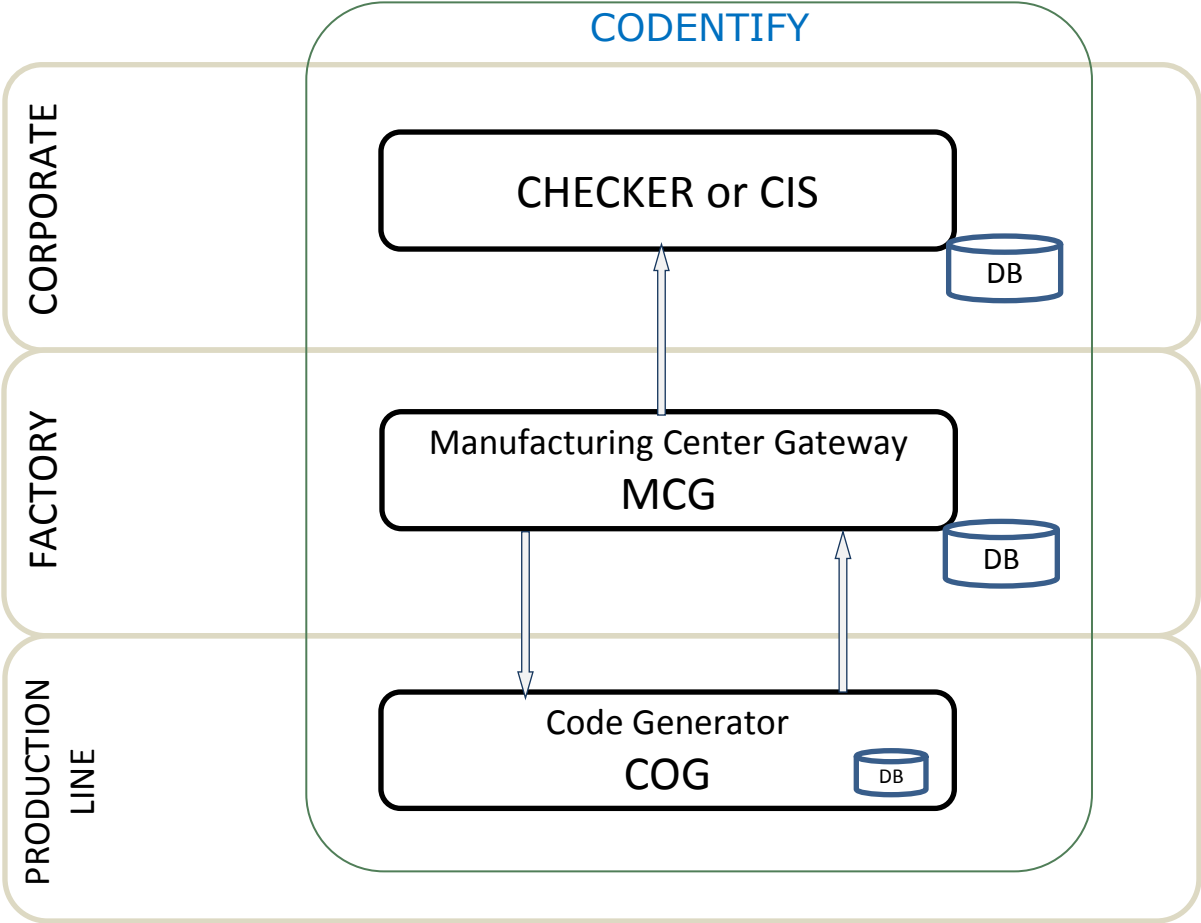
Counterfeit

Product Authentication

- Using **information based** and/or **material based** features to distinguish genuine and counterfeit products

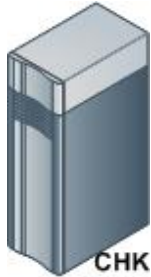
Digital Technology

What is Codentify?





- Codentify is a **scalable and secure serialization technology**. Codentify system generates a unique **12-digit alphanumeric code** (called **SUPI**) that can be **directly printed** on packs and cartons during manufacturing process.
- This unique code can be used for **tracing, product authentication, production volume control** and **excise tax verification** through fiscal markings.
- Printed code is **human readable** could be **validated by a call** to a call center, by using **SMS** or through the **Internet**.
- System confirms or denies **legitimacy of the product** and provides **additional information** like manufacturing facility, production line, production date and time.
- System **does not store any granular information** about packs and cartons, **uses encryption to produce the codes and decryption for information**



Checker (CHK) or CIS is the central component that:

- Manages public or private organizations who interact with CODENTIFY.
- Manages products (SKU) (*Government Checker*)
- Manages code generators (COG)
- Centralize production volume information.
- Obtain reports on production volume
- Verifies the validity of SUPI codes on user request.



Manufacturing Center Gateway (MCG) is a component that is installed at the Factory and provides the following functionalities:

- Secure communication with the Checker.
- Maintain a repository of the brands produced in the factory.
- Supervise the Code Generators (COG).



Code Generator (COG) is a component that **is installed on each machine packing cigarettes** and that generates the unique codes (SUPI). It is also responsible for transmitting the number of packs produced (counted by printers) for a given brand to the Checker through the Manufacturing Center Gateway. **Each COG has** an assigned to it **permanent ID that is globally unique** across all Codentify installations.



Coding Equipment (Printers) are used to mark the products (packs and cartons) with CODENTIFY codes and/or with any other type of information. Count number of prints that have been made during production and send this information to COG.

- Codes are securely **generated online** by algorithms
- Codes appear to be random from **2.38×10^{18} possible combinations**
- **Impossible to guess** sibling codes from one code
- Codes can only carry meaningful info if **generated by a pair of valid keys**
- Keys are activated through **two uncoupled processes**
- Additional **protection** for codes and keys is provided **by encryption**
- Codes are **not stored physically in a Database** after processing
- Information can only be **decoded through the Checker (CIS) server**



Digital Tax Verification

Giving Governments Control

Digital Tax Verification

Objectives

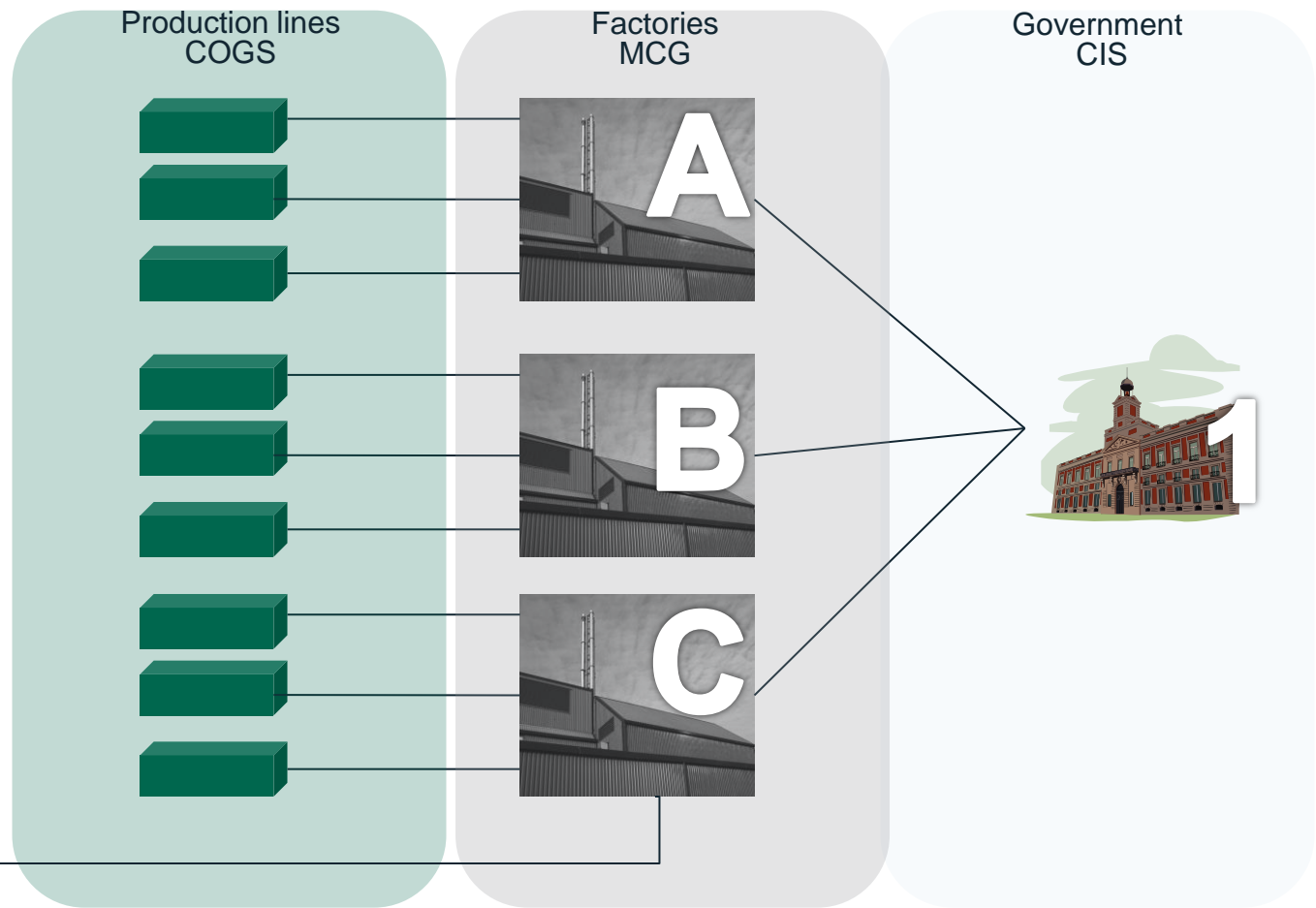


- Control
 - It will allow Governments to choose how tightly they want to control production from authorizing products to the purchasing and approval of eStamps
- Transparency
 - Give Governments visibility, in near real time reporting of production for their market whether it takes place in their territory or not
- Security
 - Using the latest technology for verification by authorities and if required by consumers, no need for expensive proprietary equipment
- Independence
 - The whole DTV solution is run either by a government authority or by an independent 3rd party of their choosing
- eGovernment
 - Replacing paper tax stamps with a eSolution removing the logistics and administration surrounding in some case extremely expensive paper tax stamps

Digital Tax Verification

High level process flow

- Every production line, every factory, every product has to be registered and approved before any production can start
- The system is robust internet connectivity can be lost but production can continue



Digital Tax Verification

CIS (Central Information system)



Before any Manufacturer can produce with valid codes the following actions need to be undertaken:

1. Create a factory
2. Register MCG
3. Register COG
4. Create Product
5. Optionally purchase eStamps

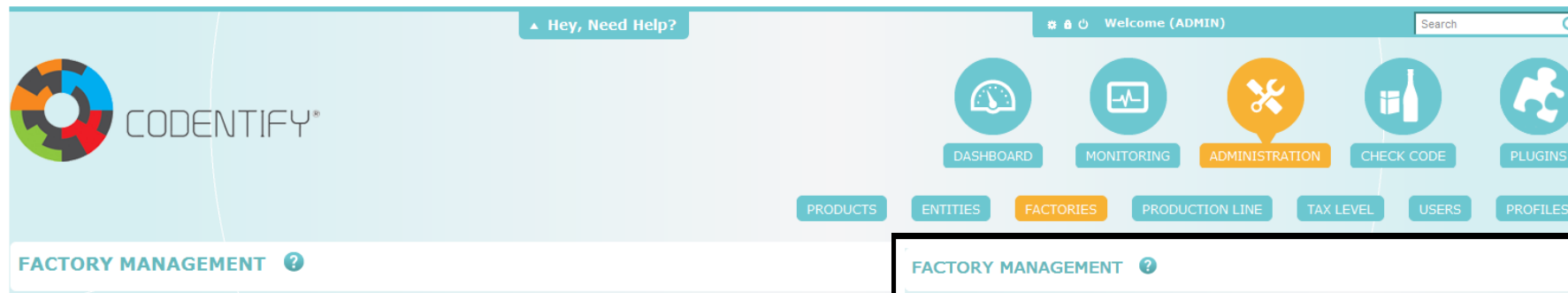
In effect the government authority is licensing every step of the process

Digital Tax Verification

CIS Functionality

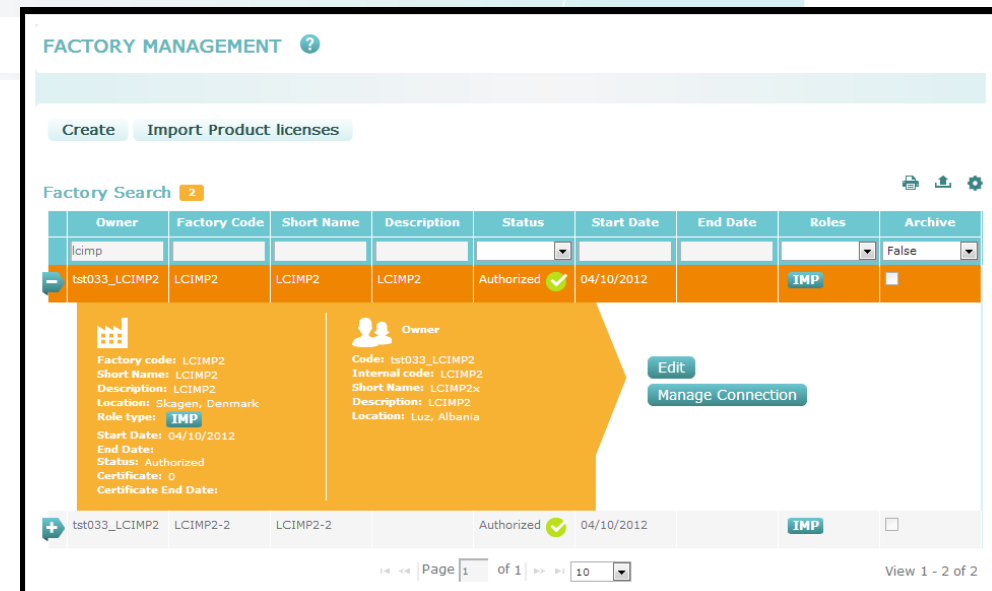
Create Factory:

Only the Government or 3rd party are able to create a factory within the CIS



A factory has the following attributes:

- Owner
- Status
- Validity period
- License All Products (Implicit Product licensing)

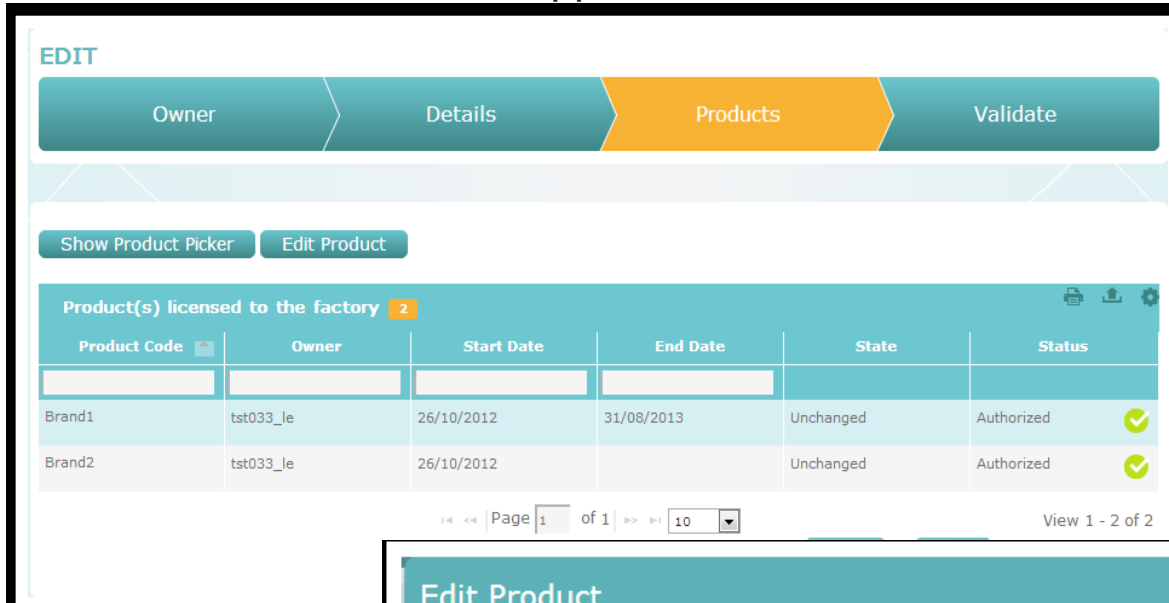


Digital Tax Verification

CIS Functionality

Create Product:

Registered on the CIS for Government approval



EDIT

Owner Details Products Validate

Show Product Picker Edit Product

Product(s) licensed to the factory 2

Product Code	Owner	Start Date	End Date	State	Status
Brand1	tst033_le	26/10/2012	31/08/2013	Unchanged	Authorized
Brand2	tst033_le	26/10/2012		Unchanged	Authorized

Page 1 of 1 10 View 1 - 2 of 2

A product has the following attributes:

- Owner
- Status
- Validity period
- Authorization
- Tax level



Edit Product

Actor Code: tst033_LC-LE1

Product Code: LC20

Product Description: LC20

Start Date*: 20/09/2012

End Date:

Status: Authorized

Validate or Cancel

Track and Trace

Through the supply chain

The Terminology



Tracking:

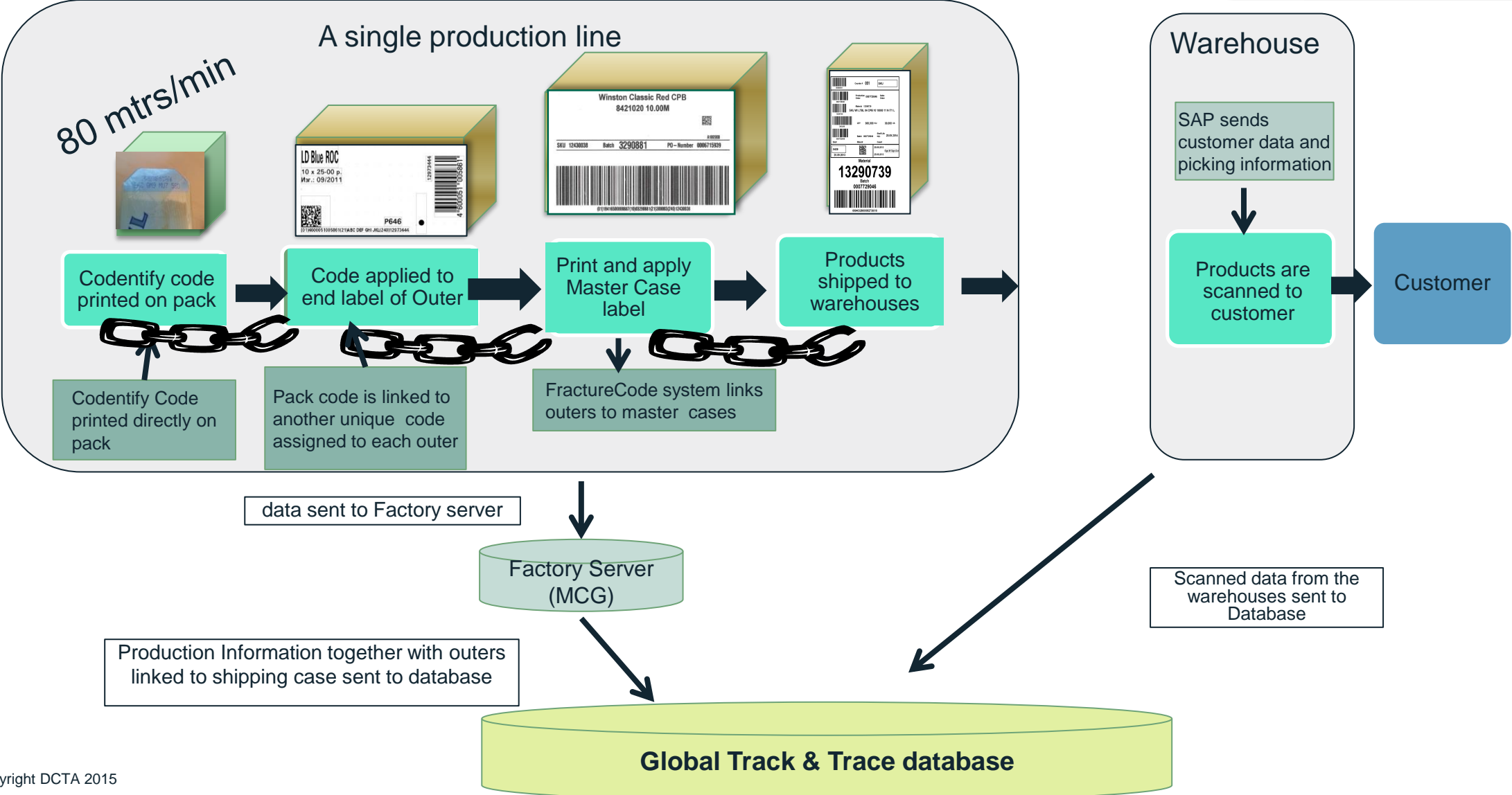
Monitor the movement of Master Cases, Cartons and in the future Packs of tobacco products, from the factory through the distribution chain to the First Purchaser (customer) and extended to subsequent customers on an as needed basis

Tracing:

Recreate the route taken by Master Cases, Cartons and Packs of tobacco products, to the point where they may have been diverted into illegal trade channels

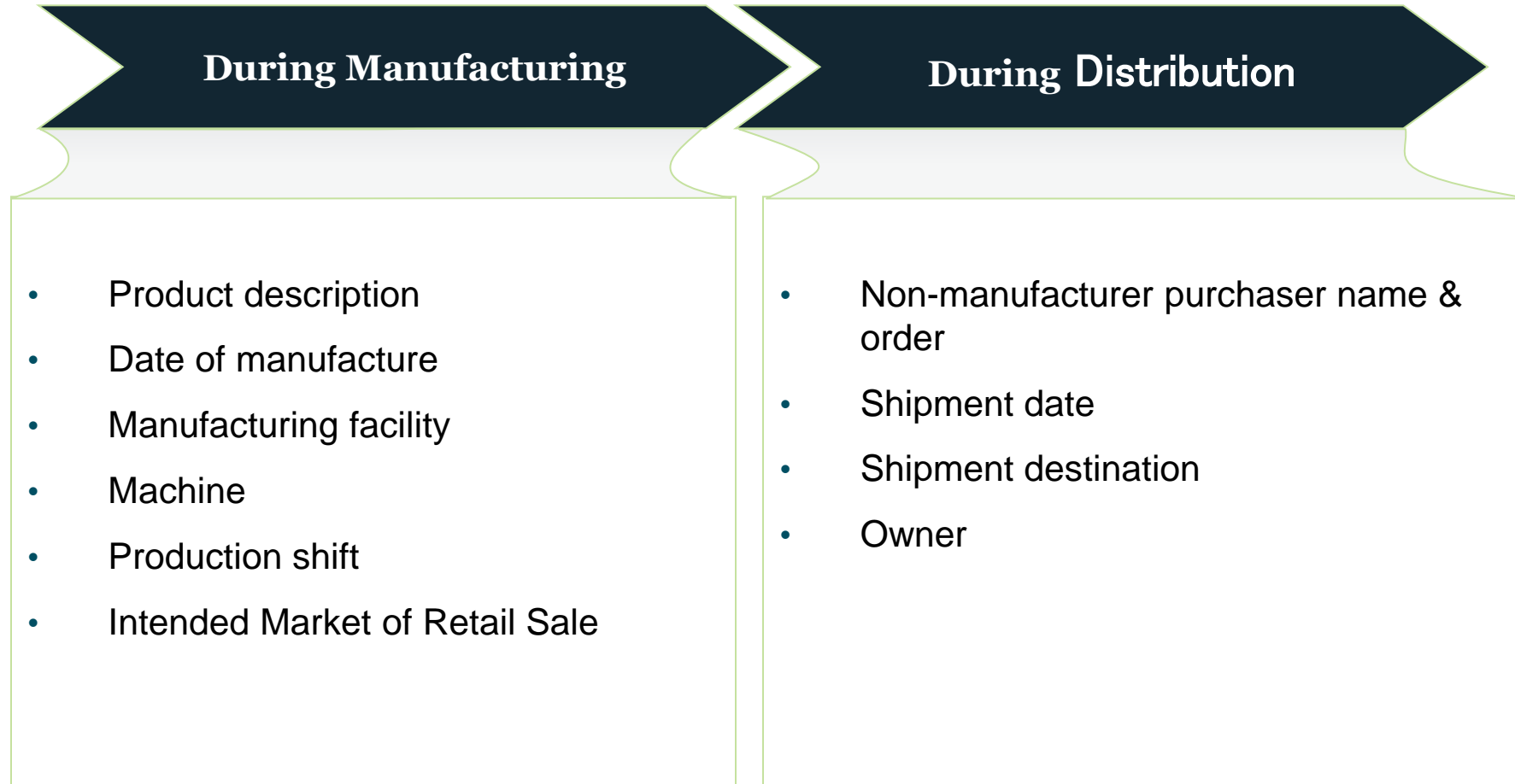
Track & Trace

The Process



Track and Trace Data

Typical Information kept in the Track & Trace repository



Track and Trace

DCTA standards

Pack Coding

DCTA Codentify standard

Position of print box shown in photograph (clear of pack creases however print box right to the right edge of pack)

- Free zone between print box and pack creases, then print box right to the edge of the right hand side of pack, no risk of colour overspill

Minimum size of print box, size of Dotcode, size of SUPI, quite zones using both Inkjet and laser

- Print box size 21mm x 8mm (for two lines)
- A = 2.0 +0.5 mm (due to print variation)
- B = 1.0 +0.2 mm (required for quite zone between Dotcode and SUPI)
- C = 1.0 +0.5 mm (due to print variation)
- Dotcode – 1.7 -0.1 mm high
- SUPI – 1.7 -0.1 mm high



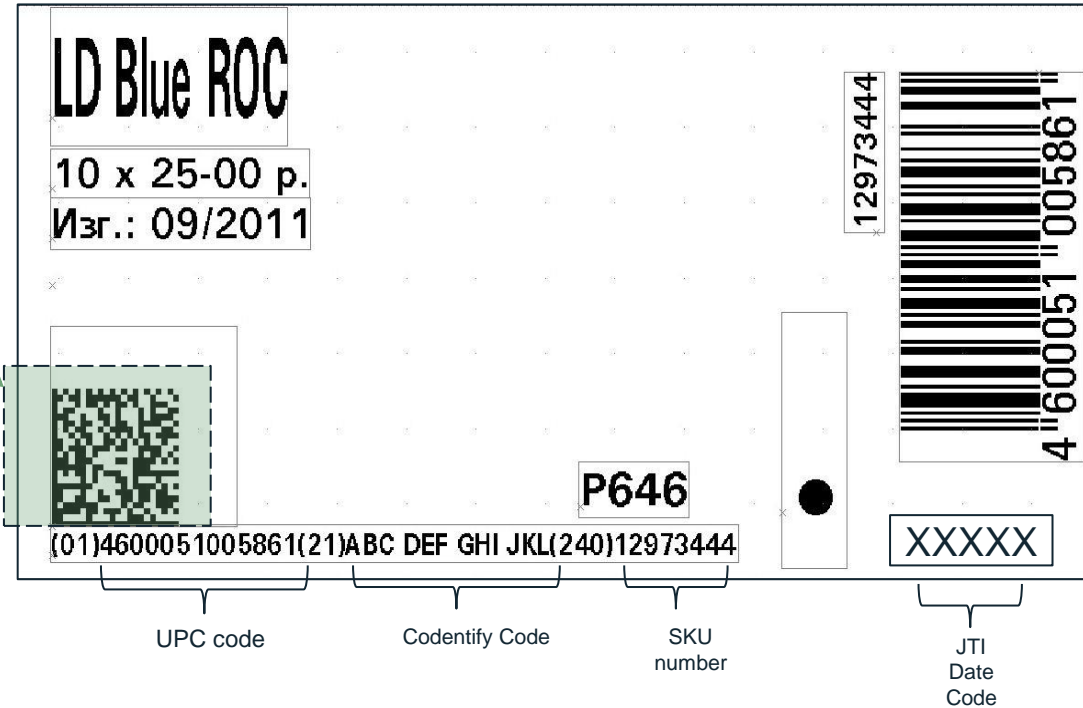
Outer/ Carton coding

label design

The 2D bar code contains the following information

- UPC – Universal Product Code
- CODENTIIY – A unique number
- SKU – Stock Keeping Unit

These numbers are also printed in human readable format



GS1- SGTIN 2d bar code
(Serialized Global Trade Identification Number)


Other design elements may vary from market to market however the T&T code always remains in the same position

Master case/ Shipping Case Coding

label design

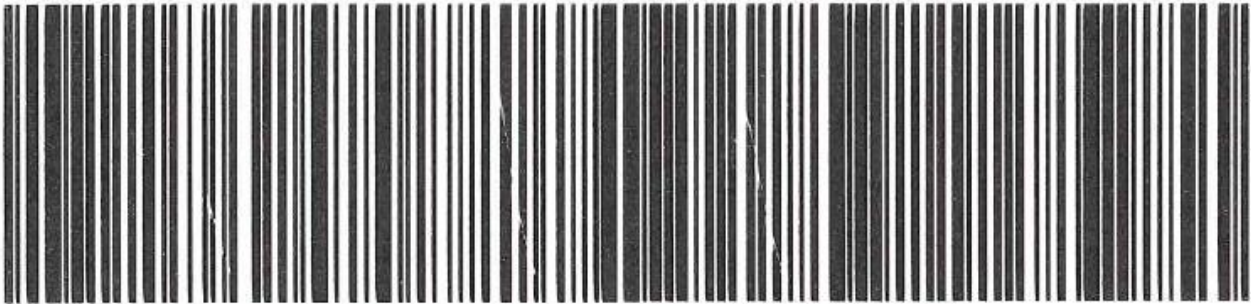


Winston Classic Red CPB
8421020 10.00M



A18E908

SKU 12430038 Batch 3290881 PO – Number 0006715939





(01)18416500800887(10)03290881(21)300003(240)12430038

GS1 SGTIN - 128 1d barcode
(Serialized Global Trade Identification Number)

UPC code Batch Code Shipping Case ID SKU number

Pallet coding

Label design

 0000051	Counter # 051	SKU
 0007729046	Production Order 0007729046	Sales Order
 13290739	Material 13290739	SKU WI LTBL 84 CPB 10 10000 11 N IT1 L
 300,000	QTY 300,000 KU	30,000 CS
 0007729046	Batch 0007729046	Shelf Life exp. 20.09.2014
Silo#	Maker#	Case#
8439		25.09.2013
25.09.2013		Sign-IN Sign-Out
		25.09.2013
Material 13290739 Batch 0007729046		
 00940328000052739318		

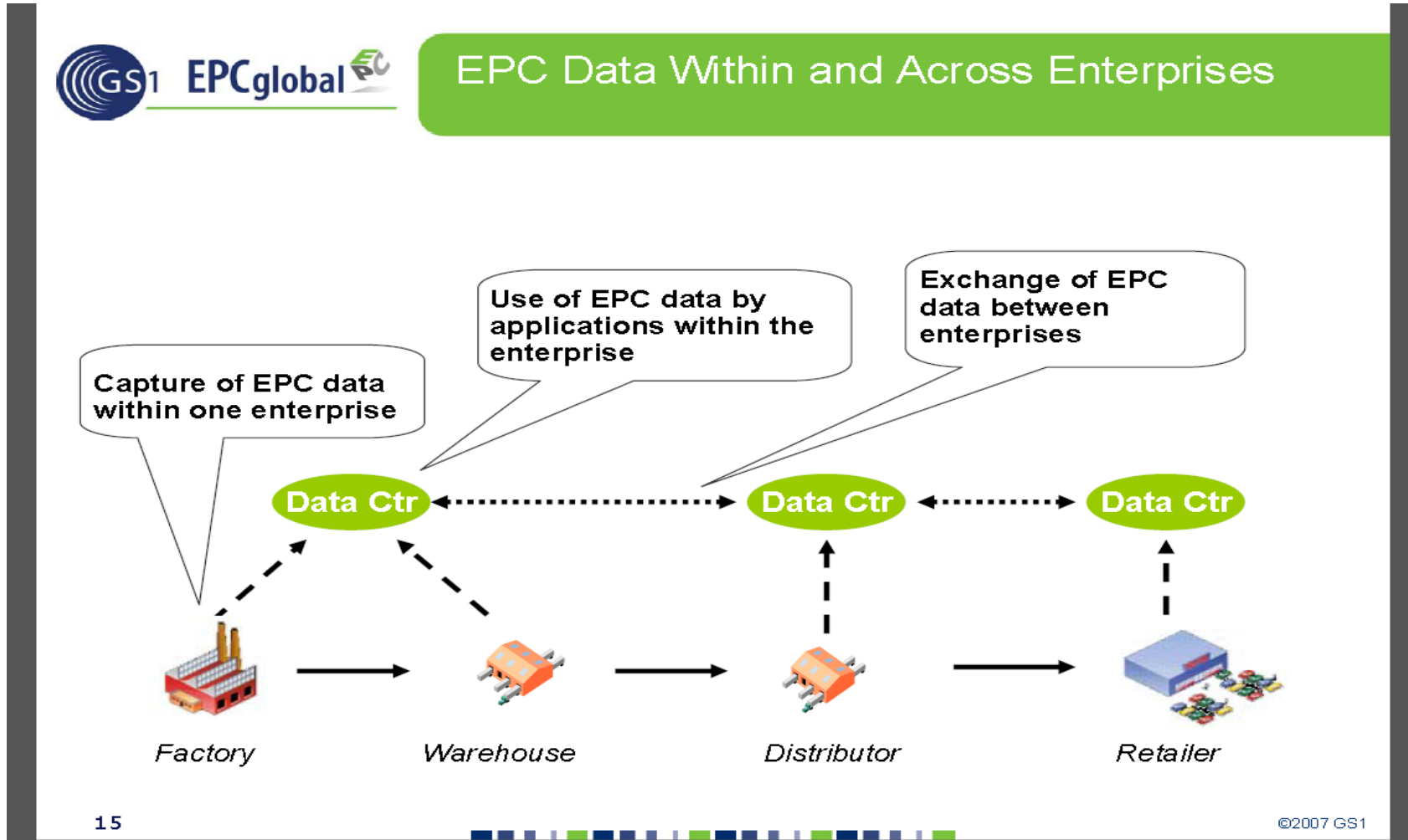
GS1- 128 barcode Serialized Shipping Container Code (SSCC)

Note: The ssc is fully compatible with ISO/IEC 15459 - Part 1: Unique identifiers for transport units. This is often referred to as the ISO license plate and is a pre-requisite for tracking and tracing logistic units in many international supply chains.



Data Communication standard

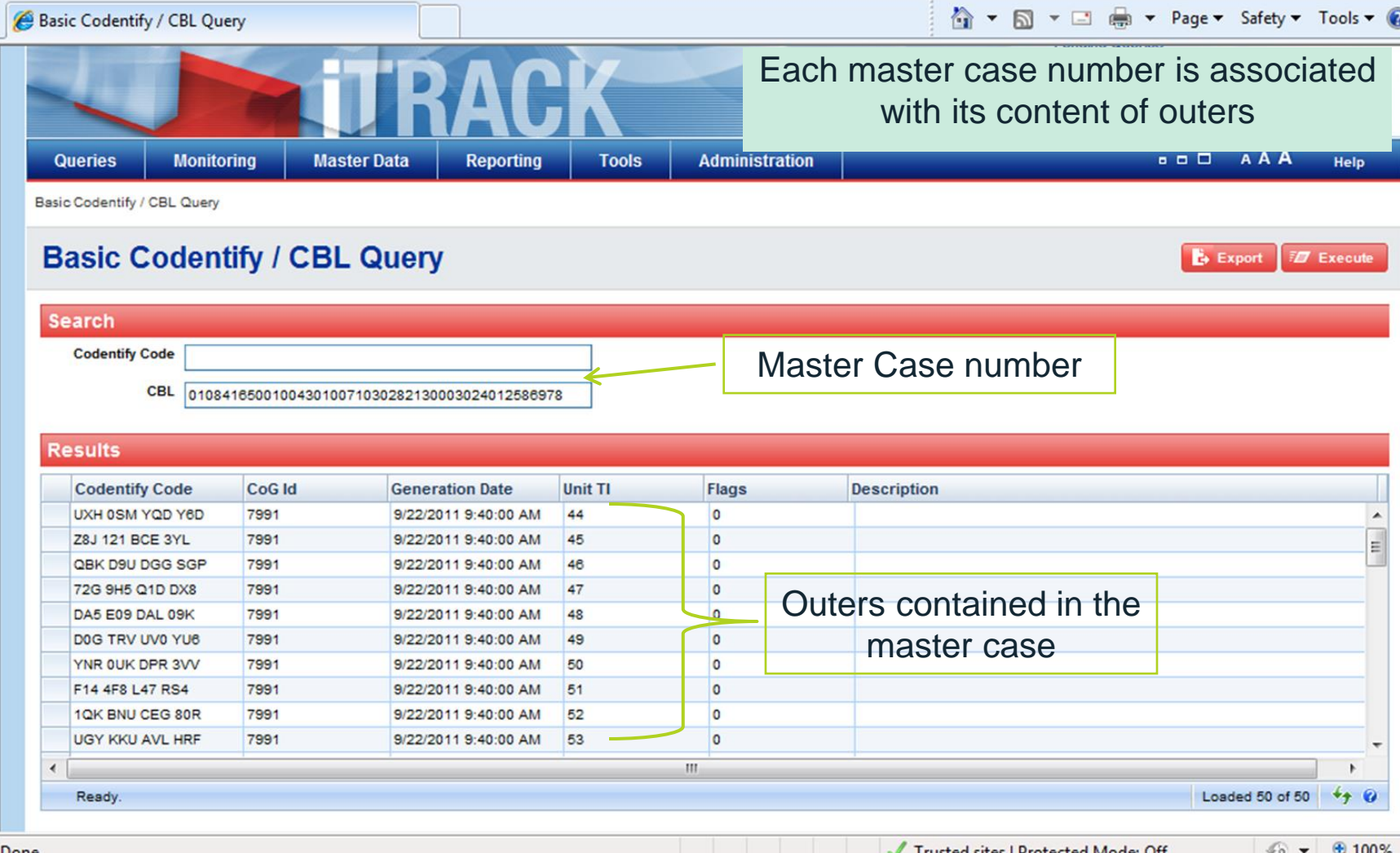
GS1 – EPCIS (Electronic Product Code Information Service)



Back Up

Master case to outer association

Shown in global data base iTrack



Basic Codentify / CBL Query

Each master case number is associated with its content of outers

Queries Monitoring Master Data Reporting Tools Administration

Basic Codentify / CBL Query

Export Execute

Search

Codentify Code

CBL 010841650010043010071030282130003024012586978

Results

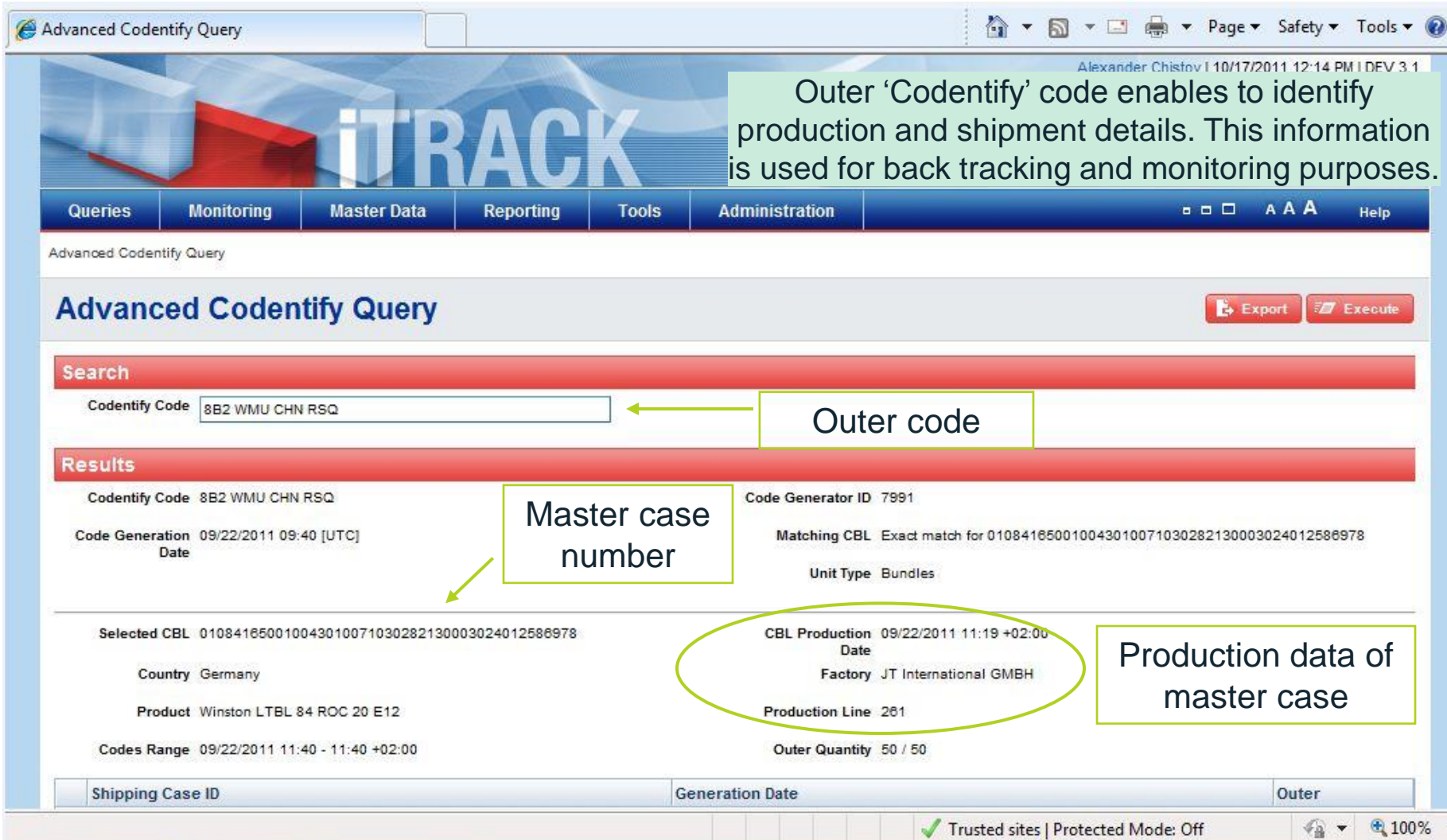
Codentify Code	CoG Id	Generation Date	Unit TI	Flags	Description
UXH 0SM YQD Y6D	7991	9/22/2011 9:40:00 AM	44	0	
Z8J 121 BCE 3YL	7991	9/22/2011 9:40:00 AM	45	0	
QBK D9U DGG SGP	7991	9/22/2011 9:40:00 AM	46	0	
72G 9H5 Q1D DX8	7991	9/22/2011 9:40:00 AM	47	0	
DA5 E09 DAL 09K	7991	9/22/2011 9:40:00 AM	48	0	
D0G TRV UV0 YU6	7991	9/22/2011 9:40:00 AM	49	0	
YNR 0UK DPR 3VV	7991	9/22/2011 9:40:00 AM	50	0	
F14 4F8 L47 RS4	7991	9/22/2011 9:40:00 AM	51	0	
1QK BNU CEG 80R	7991	9/22/2011 9:40:00 AM	52	0	
UGY KKU AVL HRF	7991	9/22/2011 9:40:00 AM	53	0	

Ready. Loaded 50 of 50

Trusted sites | Protected Mode: Off 100%

Carton to master case association

Shown in the global data base iTrack



Alexander Chistov | 10/17/2011 12:14 PM | DEV 3.1

Outer 'Codentify' code enables to identify production and shipment details. This information is used for back tracking and monitoring purposes.

Queries | Monitoring | Master Data | Reporting | Tools | Administration | Help

Advanced Codentify Query

Advanced Codentify Query [Export] [Execute]

Search

Codentify Code: 8B2 WMU CHN RSQ ← Outer code

Results

Codentify Code: 8B2 WMU CHN RSQ
Code Generator ID: 7991
Code Generation Date: 09/22/2011 09:40 [UTC]
Matching CBL: Exact match for 010841650010043010071030282130003024012586978
Unit Type: Bundles

Selected CBL: 010841650010043010071030282130003024012586978
Country: Germany
Product: Winston LTBL 84 ROC 20 E12
Codes Range: 09/22/2011 11:40 - 11:40 +02:00

CBL Production Date: 09/22/2011 11:19 +02:00
Factory: JT International GMBH
Production Line: 261
Outer Quantity: 50 / 50

Production data of master case

Shipping Case ID	Generation Date	Outer

Trusted sites | Protected Mode: Off | 100%

Warehouses

267 Warehouses - Scanning in 32 markets



- Additional 26 markets

Tracking Product

Master cases - volumes by region by Country

Tracking Location View

► Dimension Filters

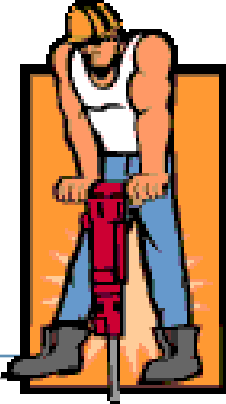
Unit of Measure: Cases | Event Type: Shipment; | Stock Owner Co. Group:

2005-2014 > 2013 ⏪

Tracking Location	January	February	March
⊕ Central Europe	246,690	227,889	245,077
⊕ CIS			
⊕ MENEAT			
⊕ Western Europe			

2005-2014 > 2013 ⏪

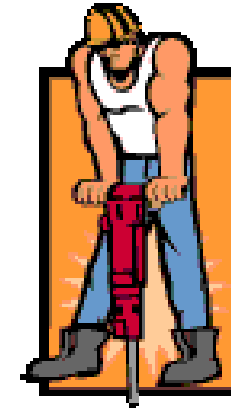
Tracking Location	March	WK 9	WK 10	WK 11	WK 12	WK 13
⊖ Western Europe	287,903	34,849	74,769	84,030	48,873	45,382
⊕ AD - Andorra	4,363	76	679	828	1,346	1,434
⊕ BE - Belgium	40,591	331	11,602	7,882	10,270	10,506
⊕ ES - Spain Mainland	11,729	118	986	1,432	3,204	5,989
⊕ GB - United Kingdom	190,846	31,951	53,224	64,481	24,795	16,395
⊕ IE - Ireland	7,712	241	1,730	1,743	1,908	2,090
⊕ LU - Luxembourg	8,023	30	1,382	2,378	1,699	2,534
⊕ NL - Netherlands	24,639	2,102	5,166	5,286	5,651	6,434
Total	287,903	34,849	74,769	84,030	48,873	45,382



Tracking Product

Scanning by location, giving master cases numbers

Location	WK 20	Mon 13	Tue 14	Wed 15	Thu 16
Europe	59,928	13,740	10,496	11,921	13,533
Andorra	305	154	87	15	17
Belgium	7,409	2,953	1,069	1,280	1,737
- Market WH Belgium WWDF BE01 - Antwerp					
- Market WH Belgium BE03 - Londerzeel	6,534	2,569	852	1,203	1,649
_01 - BE Market distributor - Trendy Foods - Petit-Rechain	25			8	17
_02 - BE market distributor - Lyfra - Wommelgem	162	80	41	7	14
_03 - BE market distributor - Vermeulen - Heuvelland/Wulvergem					
_04 - BE market distributor - Lekkerland - Poperinge	20			20	
_05 - BE market distributor - Vandoorne - Ledegem	41				4
_07 - BE market distributor - Cobeltab - Poperinge	278	43	167	20	7
_08 - BE market distributor - Conway - Temse	223	197	4	6	16
_09 - BE market distributor - Sitagro - Drongen	64	34		11	15



Event DateTime	Event Type	Tracking Location	Destination	Sold-To	# Tracked I...
16/05/2013 13:56:07	Shipment	BE03_13 - BE market distributor - Volkaert-Soetens	87 - 87 VIERSTRAETE JOS BVBA	87 - 87 VIERSTRAETE JOS BVBA	9
16/05/2013 16:13:58	Shipment	BE03_13 - BE market distributor - Volkaert-Soetens	103 - 103 JERRYS CIGAR BAR BVBA	103 - 103 JERRYS CIGAR BAR BVBA	2

Item List

Item ID	ODM	Product	Prc	PL	Prod. DateTime
(01)05010175809181(10)07648463(21)504393(240)13248811	BE1	13248811	GBP3	TP01	22/04/2013 03:14:02
(01)05010175809181(10)07648463(21)504394(240)13248811	BE1	13248811	GBP3	TP01	22/04/2013 03:15:10

Shipping case numbers

Tracking Product

Production details of master case with bundle codes



Item: (01)05010175809181(10)07648463(21)504394(240)13248811

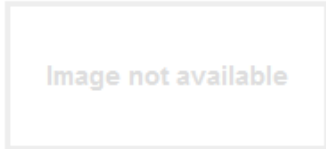
General Information

Item Type JTI ShippingCase

Packaging Level Shipping Case

Item ID 010501017580918110076484632150439424013248811

Item UID 1304220811000002173



Related Content

Flag Information

Production Information

Production Center GBP3 - Gallaher Limited

Production Code LDC21C01

Production DateTime 22/04/2013 03:15:10 +02:00

Production Line TP01

Product Information

Product Variant 13248811 - Amber Leaf FFHR 0 PCH 50 BE1

Product Description Amber Leaf FFHR 0 PCH 50 BE1

ODM BE1 - Belgium Domestic

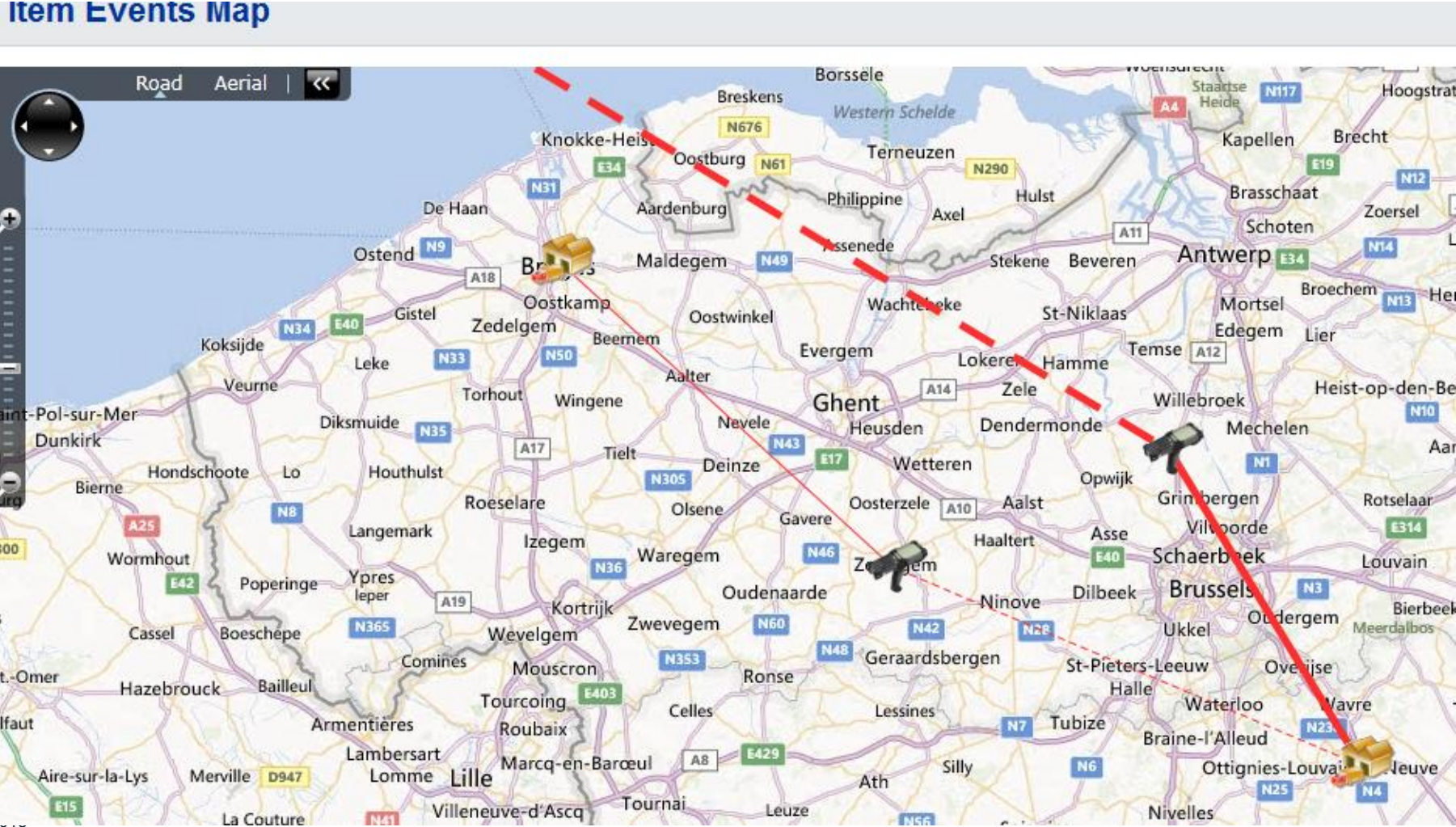
Filiation / Relationship

Codentify Code	CoG Id	Generation Date
05S Z44 JH3 THS	6405	22/04/2013 01:04:00
VL9 084 NLU CRF	6405	22/04/2013 01:04:00
RLC H86 A8S 60L	6405	22/04/2013 01:04:00
UVE XQR R5C 6YK	6405	22/04/2013 01:04:00
X0H R5X UB8 4WZ	6405	22/04/2013 01:04:00
HE8 NGE UNH Q8P	6405	22/04/2013 01:04:00
CFU WUR 015 Z0H	6405	22/04/2013 01:04:00
51T CVU M2M G1N	6405	22/04/2013 01:04:00
K8K 0G1 MBA MQH	6405	22/04/2013 01:04:00
AU2 TCF SFQ 4TX	6405	22/04/2013 01:04:00
P8V RVG 2N6 YGX	6405	22/04/2013 01:04:00
D3Q 9JR NSL GNG	6405	22/04/2013 01:04:00

- Individual bundle codes

Route Map

Master case - 010501017580918110076484632150439424013248811



Integrated Codentify solution

eLicensing

eLicensing

Secure
Marking

Real Time
Control

Product
Tracking

Digital
Tax & Volume
Verification

Product
Authentication
and Tracing

Codentify allows Government Bodies or appointed independent 3rd parties to electronically:

- Establish the secure connection between Codentify components
- Grant and revoke licenses for production lines
- Grant and revoke licenses for products
- Approve ordered volumes for eStamp generation

regardless whether products for their market are manufactured in their own jurisdiction or abroad.

Integrated Codentify solution

Secure marking

- eLicensing
- Secure Marking**
- Real Time Control
- Product Tracking
- Digital Tax & Volume Verification
- Product Authentication and Tracing

12 digit Codentify codes provide sufficient capacity to mark all tobacco products worldwide with unique codes for a period of 10 years, without any risk of duplicate use.

Codentify generates secure, non predictable codes directly at the production line, without transfer over the internet.

Data such as product description, destination market, price, tax level, factory, work center, manufacturing date/time can be encrypted into the Codentify code.

Can be applied to virtually any product



Integrated Codentify solution

Real time control



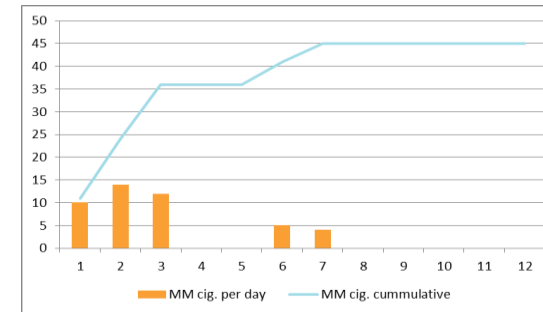
- eLicensing
- Secure Marking
- Real Time Control**
- Product Tracking
- Digital Tax & Volume Verification
- Product Authentication and Tracing

The Codentify Central Information System ensures that valid Codentify codes can only be printed with **licensed work centers** on **approved products** and in the **approved quantity**.

Produced volumes are reported to the Central Information System in **real time** for all manufacturers using Codentify and regardless of the country where factories are located.

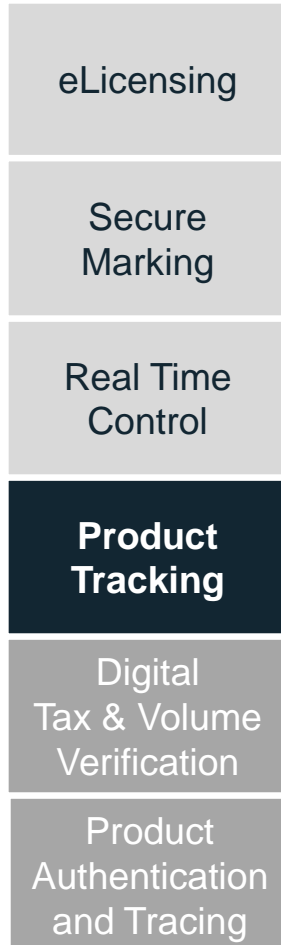
Reports can be defined according to Government Specific needs.

Million Cig.			week						
Company	City	Country	1	2	3	4	5	6	7
A	Paris	FR	1	4	10	0	1	30	1
A	London	UK	5	0	1	20	5	0	4
A Total			6	4	11	20	6	30	5
B	Dublin	IE	2	7	8	0	8	12	2
B	Bern	CH	3	1	3	3	2	0	0
B Total			5	8	11	3	10	12	2



Integrated Codentify solution

Product tracking



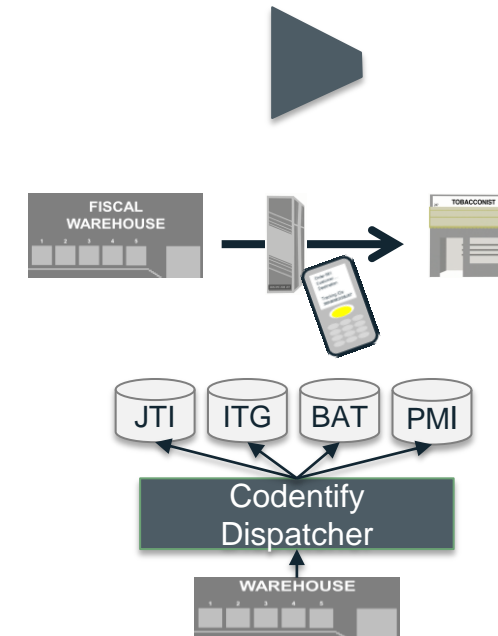
Aggregate during manufacturing

- packs to cartons
- cartons to master cases
- master cases to pallets

Compresses aggregation information to code ranges

Tracks movements of unique items

Splits tracking information from multi manufacturer warehouses by brand owner and transmits it to the correct tracking repository



Integrated Codentify solution

Digital Volume Verification



- eLicensing
- Secure Marking
- Real Time Control
- Product Tracking
- Digital Tax & Volume Verification**
- Product Authentication and Tracing

Retrieves and stores monthly reports/declarations about production, import, receipts, export, domestic shipments, destruction, inventory ...

Facilitates automatic verification of declarations with the ability to filter and drill down from aggregated information to details

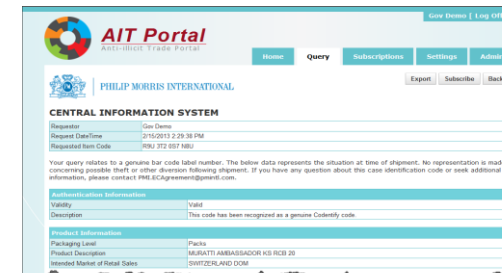
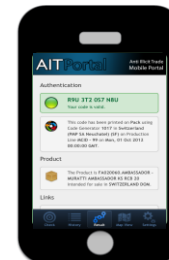
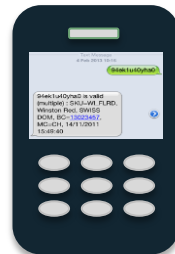
Transaction	Month	Jan 2012	Feb 2012
(XSTO - 1) Current Month Opening Inventory			
(IPRD - 2a) Inbound from Production for Domestic Market			
(PEXP - 2b) Inbound from Production for Export Market			
(IIMP - 6) Inbound from Import			
(IRTN - 7) Inbound from Returns (still sellable products)			
(ADIP - 9b) Positive Inventory Discrepancies			
(AMVI - 8b) Special Movements with stock increasing			0,000
Total Opening Inventory and Stock Increase	Total Opening I		
(OTAX - 3) Outbound to Domestic Market			
(VAO1) VAO1 (Value added Offer)		0,000	0,000
(VAO2) VAO2 (Value added Offer)		0,000	0,000
(OEXP - 5) Outbound To Export			
(RPRD) Return to production		0,000	0,000
(ASAM - 8c) Sampling (QA & Others)		0,000	0,000
(ASCP - 8a) Scrap / Destroy with authorization DGD		0,000	
(ADIS - 9a) Negative Inventory Discrepancies			0,000
(AMVT - 8b) Special Movements with stock decreasing		0,000	0,000
Total Stock Decrease	Total Stock Dec		
(XSTE - 1) Current Month Closing Inventory			
Total Month Closing Inventory	Total Month Clo		
Discrepancies	Discrepancies	0,000	0,000

Integrated Codentify solution Codentify Portal

- eLicensing
- Secure Marking
- Real Time Control
- Product Tracking
- Digital Tax & Volume Verification
- Product Authentication and Tracing**

Codentify Portal

- Hosted by a Government or their appointed independent 3rd party
- Central access point for authentication and tracing information from various manufacturers/countries
- Able to provide tracing information on request to the Central Information Sharing Focal Point located at WHO
- Can be queried by SMS, smartphone app or web browser



Integrated Codentify solution

Codentify Portal

- eLicensing
- Secure Marking
- Real Time Control
- Product Tracking
- Digital Tax & Volume Verification
- Product Authentication and Tracing**

