



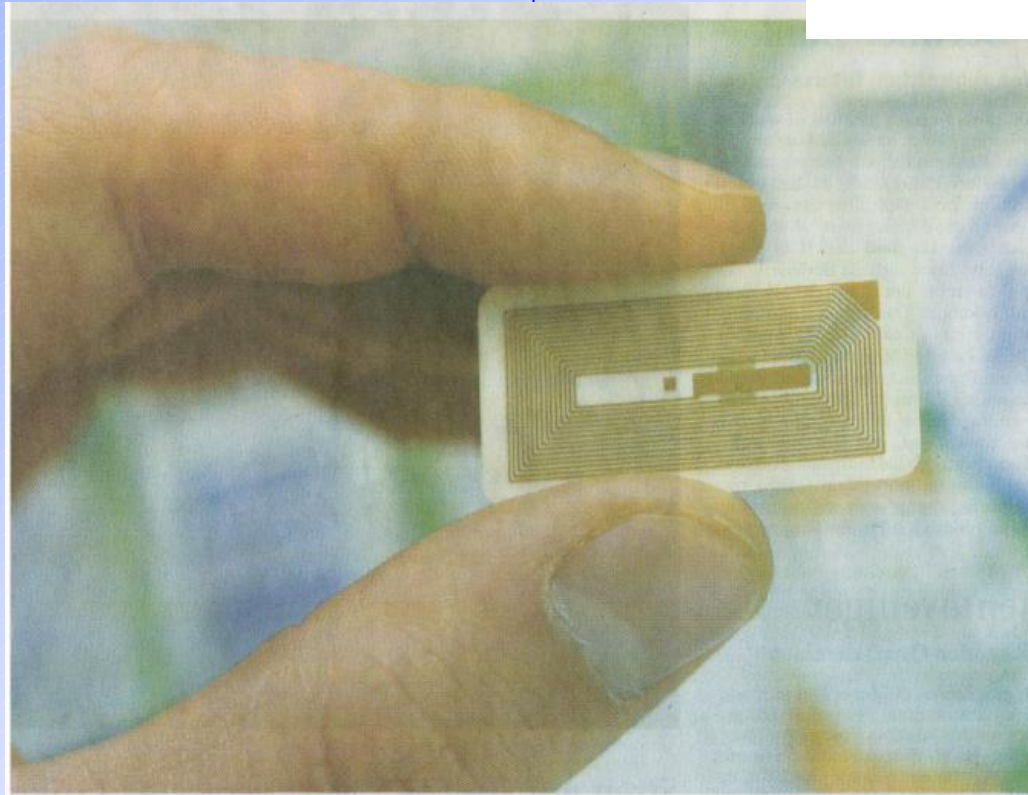
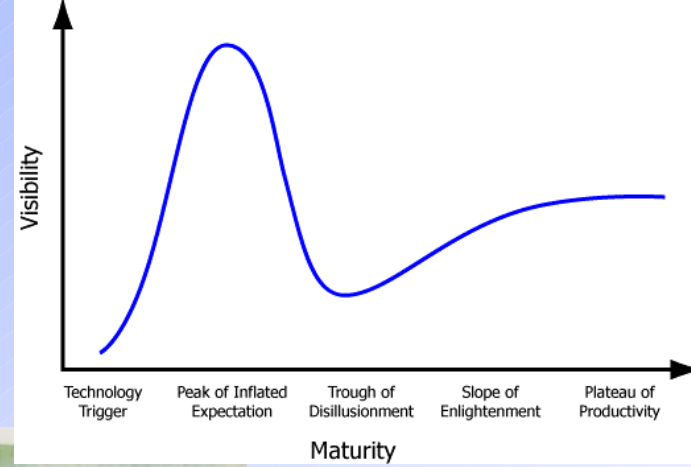
# RFID

**ISO RFID application standards  
published in 2006**

**+ benefits for users  
in various business sectors**

**Heinrich Oehlmann  
[www.EurodataCouncil.org](http://www.EurodataCouncil.org)**

# RFID applications now



# ODETTE LABEL & RFID



(1) Warenempfänger  
**Daimler Chrysler AG  
D 71059 Sindelfingen**

(2) Abladestelle - Lagerort - Verwendung

**650Z**

(3) Lieferschein-Nr. (N)  
**90199002**



(4) Lieferantenschrift, Werk-Nr, PLZ, Ort

**ebm-papst St.Georgen GmbH & Co.KG, 002, 7933**

(5) Gewicht netto

**20**

(6) Gewicht brutto

**97**

(7) Anzahl Packstücke

**4**

(8) Sach-Nr. Kunde (P)  
**A1112225555**



(9) Füllmenge (Q)  
**500**



(10) Bezeichnung der Lieferung

**TEST LLZ**

(11) Sach-Nr. Kunde für Packmittel (B)

**5010 Stahlpalette**



(12) Lieferanten-Nr. (V)  
**11503737**



(13) Datum

**D041110**

(14) Änderungsstand Konstruktion

(15) Packstück-Nr. (M)  
**199002004**



(16) Chargen-Nr. (R)

(17) ebm-papst St.Georgen GmbH & Co.KG Rheinhausenstrasse 17 D 79336 Herbolzheim/B  
Warenanhänger VDA 4902, Version 4



Warenempfänger <b>EKL AG</b> <b>DE-88299 Leutkirch</b>	Abladestelle - Lagerort <b>Nadlerstr. 10</b>		
Lieferschein-Nr. (M) <b>80185987</b>	Lieferantenanschrift (Kurzname, Werk, PLZ, Ort) <b>ebm-papst St. Georgen GmbH &amp; Co. KG Werk 2</b>		
	Gewicht (netto) <b>4,0</b>	Gewicht (brutto) <b>6,5</b>	Anzahl Packstücke <b>1</b> von <b>1</b>
Sach-Nr. Kunde (P) <b>13007100245</b>			

Polleenge (Q) <b>150</b>
Lieferanten-Nr. (V) <b>70500</b>
Packstück-Nr. (B) <b>323732</b>

(1) Warenempfänger <b>Daimler Chrysler AG</b> <b>D 71059 Sindelfingen</b>	(2) Abladestelle - Lagerort - Verwendung <b>650Z</b>	
(3) Lieferschein-Nr. (N) <b>90199002</b>	(4) Lieferantenanschrift, Werk-Nr, PLZ, Ort <b>ebm-papst St.Georgen GmbH &amp; Co.KG, 002, 7933</b>	
	(5) Gewicht netto <b>20</b>	(6) Gewicht brutto <b>97</b>
(8) Sach-Nr. Kunde (P) <b>A1112225555</b>	(7) Anzahl Packstücke	
(9) Füllmenge (Q) <b>500</b>	(10) Bezeichnung der Lieferung <b>TEST LLZ</b>	
	(11) Sach-Nr. Kunde für Packmittel (B) <b>5010 Stahlpalette</b>	
(12) Lieferanten-Nr. (V) <b>11503737</b>		
	(13) Datum <b>D041110</b>	(14) Änderungsstand Konstruktion
(15) Packstück-Nr. (M) <b>199002004</b>	(16) Chargen-Nr. (H)	
(17) ebm-papst St. Georgen GmbH & Co. KG Rheinhausenstrasse 17 D 79036 Herbolzheim/B		





(02)36487632636787(37)48

**SSCC**

**340211551866500005**

**Net weight:**

**283,24 kg**

**EAN No. 3648763263678**

**Batch:**

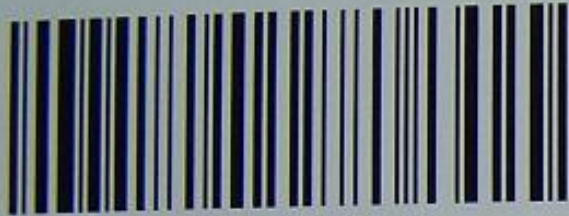
**Best before**

**3863**

**31.12.2004**

**Count:**

**48**



(15)041231(10)3863



(02)36487632636787(37)48



(00)340211551866500005

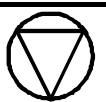
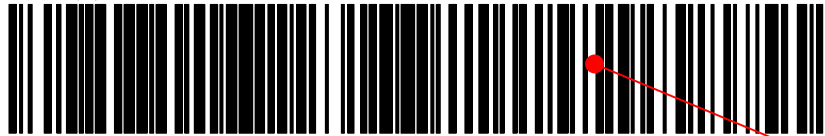
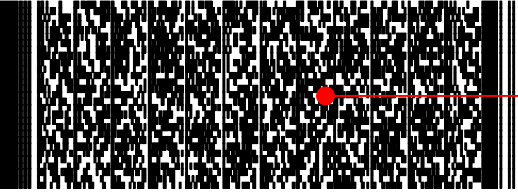


(15)041231(10)3863



(00)340211551866500005



<p>FROM: GENERAL MOTORS IS&amp;S 1155 BREWERY PARK DETROIT, MI 48207-7960 001.313.667.4781 MADE IN USA</p>	<p>TO: GENERAL MOTORS CORP ASSEMBLY PLANT RUESSELSHEIM, GERMANY PLANT/DOCK <b>12345 WWS</b></p>	<p><b>MASTER LABEL</b> 4 CONTAINERS</p>
<p>PART DATA <b>90347789</b></p>		
<p>WIRING HARNESS 4 @ 160 PCS EA TOTAL 640 PCS</p>	<p>MATERIAL HANDLING CODE <b>F10A10K</b></p>	<p>REFERENCE <b>A123</b></p>
<p>LICENSE PLATE (4J)  <b>UN 123456789 A2B4C6D8E</b></p>		<p>SHIPMENT ID/DATE <b>384859913</b> <b>11FEB1999</b> ROUTE #: <b>1234567</b></p>
<p>MASTER DATA </p>	<p>GROSS WEIGHT <b>40 KG</b></p>	



(1) Warenempfänger  
ELMICRON GmbH  
06618 Naumburg / Saale

(2) Abladestelle - Lagerort - Verwendung  
650Z

(3) Lieferschein-Nr. (N) 2121212121



(8) Sach-Nr. Kunde (P) 1234567890



(5) Füllmenge (Q) 0005645654



(10) Bezeichnung der Lieferung  
ELMISCAN NiceLabel

(11) Sach-Nr. Kunde für Packmittel (B) 4563



(12) Lieferanten-Nr. (V) 12345



(13) Datum  
D041110

(14) Änderungsstand Konstruktion  
-A

(15) Packstück-Nr. (S)  
199002035



(16) Chargen-Nr. (H)  
1234567890ABCDEFGH





(1) Warenempfänger <b>Daimler Chrysler AG</b> D 71059 Sindelfingen		(2) Abladerstelle / Lagerort - Verwendung <b>650Z</b>	
(3) Lieferschein-Nr. (I) <b>90199002</b>		(4) Lieferantenschrift, Werk-Nr, PLZ, Ort ebm-papst St.Georgen GmbH & Co.KG, 002, 7933	
(5) Gewicht netto <b>20</b>		(6) Gewicht brutto <b>97</b>	(7) Anzahl Packstücke <b>4</b>
(8) Sach-Nr. Kunde (P) <b>A1112225555</b>			
(a) Füllmenge (C) <b>500</b>		(10) Bezeichnung der Lieferung <b>TEST I LZ</b>	
(12) Lieferanten-Nr. (V) <b>11503737</b>		(11) Sach-Nr. für Packm. (B) <b>110 / Stahlplatte</b>	
(15) Packstück-Nr. (M) <b>199002804</b>		(13) Datum <b>D041110</b>	
(17) ebm-papst St. Georgen GmbH & Co. KG Rheinhautsontstraße 1 D-79336 Herbolzheim/B Warenkennzeichen VDA 4902, Version		(14) Ordnungssatz...strukturb...	

Where does

ISO

apply

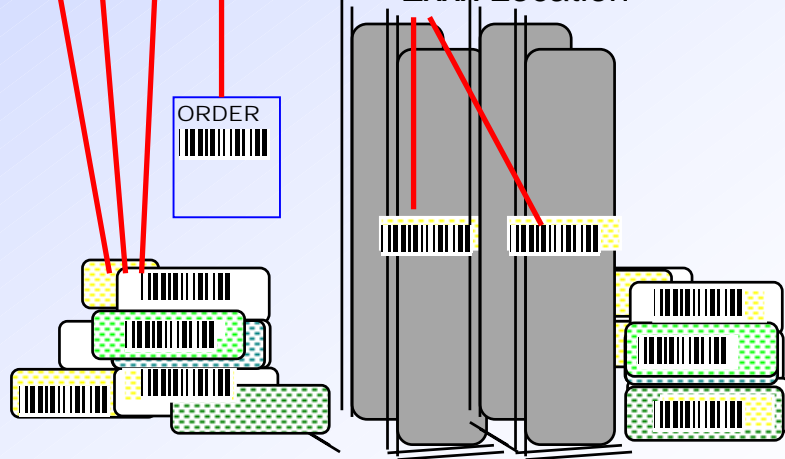
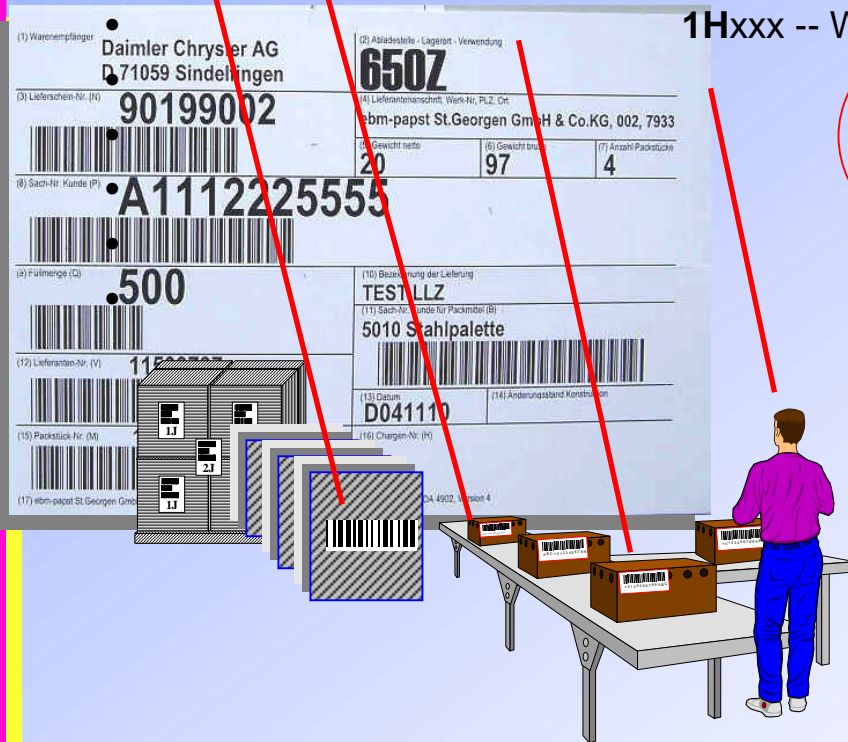
# ➤ ISO/IEC 15418 Identifiers for Unique Codes

ASC DI's & EAN AI's: Uniqueness for suppliers, supply chain .....

- **Jxxxx** (]C100xx with EAN-AI) Unique Transport Unit – **Agency/Company/Transport no.**
- **1Bxxx** – Returnable Container ID
- **Sxxx** -- Serial number ( oder 25S – **Agency/Company/Serial number**)
- **1Hxxx** -- Worker ID







- **25Pxxx** – **Agency/Company/Product** + 1Txxx Charge/Lot  
+xxx -- **Company/Product/expiry/Charge**
- **]C101xxx** – **Company/Product**
- **Kxxx** -- Referenze

**Lxxx** Location



<b>VDA</b>	<b>Vor- und Rückverfolgbarkeit von Fahrzeugteilen und Identifizierbarkeit ihrer technischen Ausführung</b>	<b>5005</b>
------------	--	-------------

**Tabelle 4 - Beschreibung der Seriennummer für Packstückkennzeichnung**

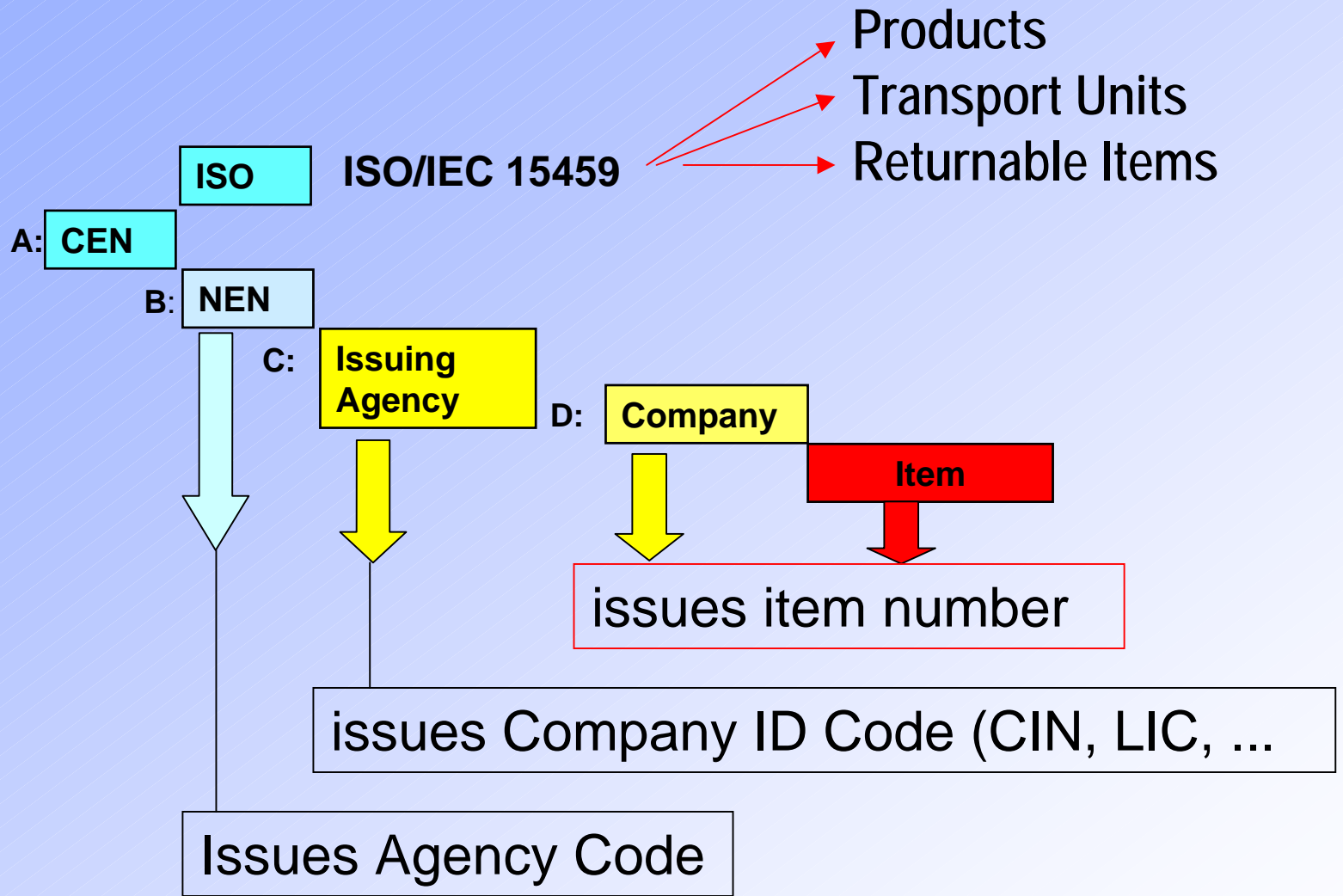
Datenfeld	Inhalt	DI	Datenfolge
(1) Warenempfänger Daimler Chrysler AG D 71059 Sindelfingen	(2) Abladestelle - Lagerort - Verwendung <b>650Z</b>		
(3) Lieferschein-Nr. (N) <b>90199002</b> 	(4) Lieferantenschritt, Werk-Nr, PLZ, Ort ebm-papst St.Georgen GmbH & Co.KG, 002, 7933	3S	3Sxxxxxx...
(8) Sach-Nr. Kunde (P) <b>A1112225555</b> 	(5) Gewicht netto: <b>20</b> (6) Gewicht brutto: <b>97</b> (7) Anzahl Packstücke: <b>4</b>	1T	1Tyyyyyy...
(2) Füllmenge (Q) <b>500</b> 	(10) Bezeichnung der Lieferung <b>TEST LLZ</b> (11) Sach-Nr. Kunde für Packmittel (B) <b>5010 Stahlpalette</b> 	1J oder 6J	1JUNzzzzzzzzzzkkkkkk... z=9..13 digits
(12) Lieferanten-Nr. (V) <b>11503737</b> 	(13) Datum <b>D041110</b> (14) Änderungsstand Konstruktion		
(15) Packstück-Nr. (M) <b>199002004</b> 	(16) Chargen-Nr. (F)		



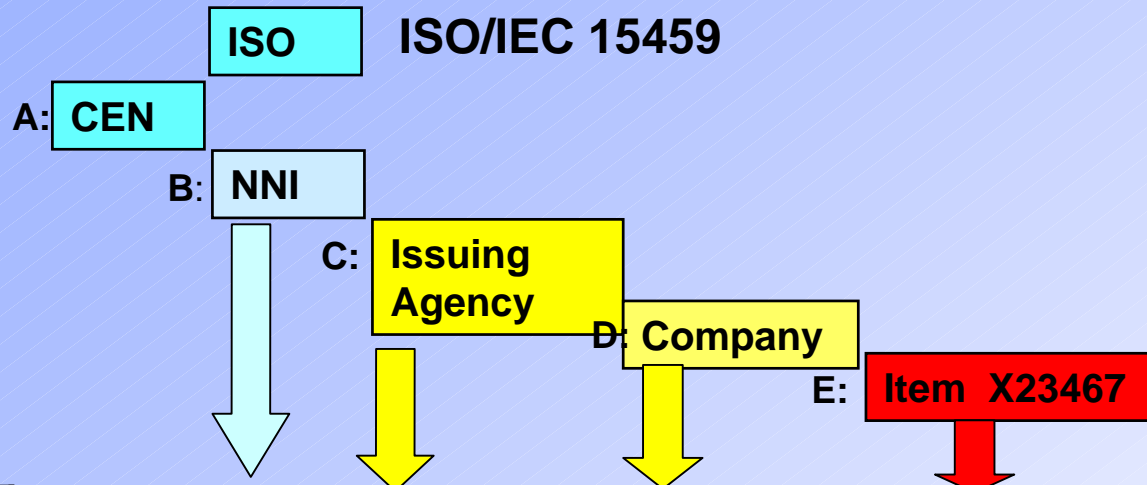


# Role of the CIN ISO/IEC 15459



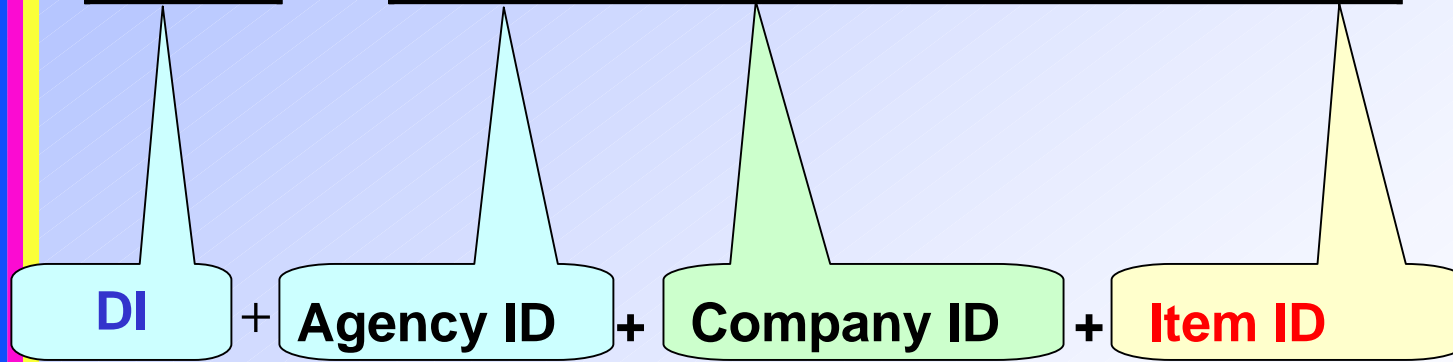


# Uniqueness by ISO

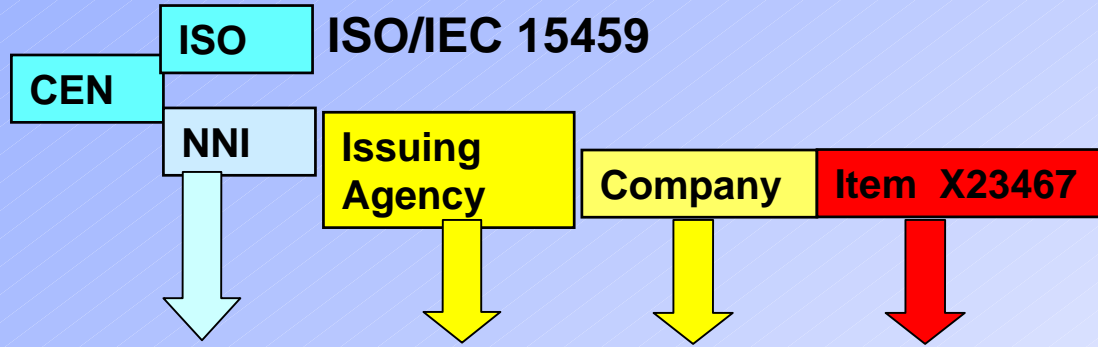


DI/AI
J
00

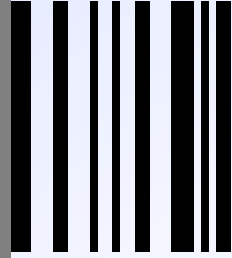
CEFIC	QC	CHEM	X23467 variable
DUN	UN	123456789	X23467 variable
EAN	00	1234567	1234567890 Fix



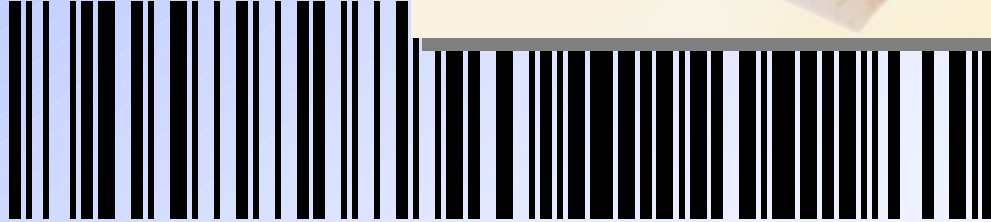
# Unique ISO License Plate



39X234567



7123456789



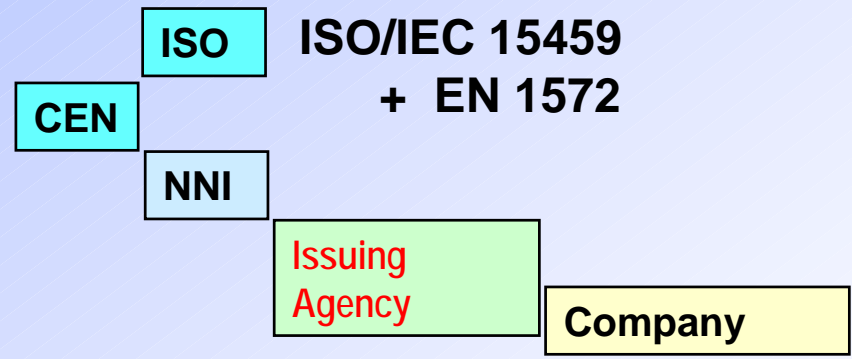
JQCCEMXX23457



**Registered Issuing Agencies Agency Code**

CEFIC-European Chemical Industry	QC
CEPE-Paper industries	PA
DUN-Dun&Bradstreet	UN
EAN International	0-9
EDIFICE-European Elektronik Industries	LE
EHIBCC-Health Care	LH
EuroExpress Logistics	UT
EUROFER-Steel Industrie	ST
FIATA-Transportation	LF
GD Express Worldwide NV	TN
IBM EMEA	VIB
NEDLLOYD-UNITRANS	ND
Norsk Edipro	KNO
ODETTE-Automotive Industries	OD
UPU-Universal Postal Union	J
PTT-NL Nederlands Post	NL
SIEMENS International	SI
VAN GENT&LOOS Intl.	VGL

# Issuing Agency Codes



**GOOGLE:**  
**Issuing Agency Codes**  
**ISO/IEC 15459**  
**EN1572\_register.html**

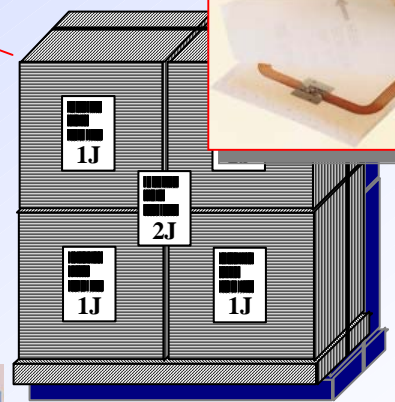




# Role of the CIN



Dispatch advise  
Company: Smith  
LIC: S321  
1 Wahser 265781  
3 Screws G95645  
9 Parts X2659711

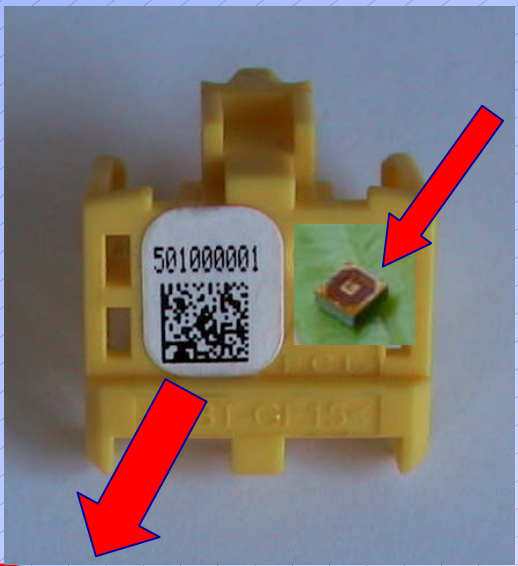


**SIEMENS**  
SIMATIC S5  
501000001  
(1P) 6ES5 441 - 8MA11  
(25S)LE SIE1320001R9  
0.2A PILOT DUTY, 0.5a  
5w TUNGSTEN MAX. 50 V, DC  
CAUTION: USE WIRES-  
SUITABLE FOR 75 °C  
Made in Germany

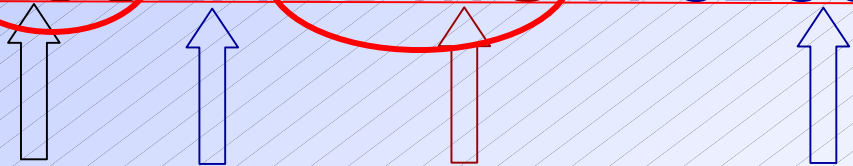
www.elmicron.de  
Seriennummer: 05050901  
(25S)QCELM105050901



# Unique by ISO



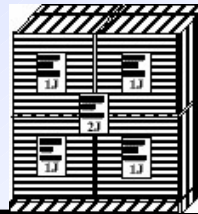
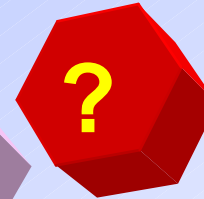
25SLHEDMG178256588



**ISO-DI+EHIBCC+Company+Serial number = UIM**



# ISO Data structures supplying uniqueness



ISO/IEC 15418	ASC Data Identifiers and EAN Application Identifiers	<b><u>STATUS</u></b> Stabil
ISO/IEC 15434	Syntax for High Capacity Media (2D-Code, RFID)	<b><u>Revision 2006</u></b>
ISO/IEC 15459	Unique Identifier for ITEMS (before just for Transport Units)	<b><u>Revision 2006</u></b>

**....just a number is a no name -1234567890123?**

EURODATA COUNCIL



# Other sectors, e.g.

## ELECTRONIC Industry



		91/329/FDIS	
		FINAL DRAFT INTERNATIONAL STANDARD PROJET FINAL DE NORME INTERNATIONALE	
Project number: 81/62080/Ed. 1		Numéro de projet: 81	
IEC/TC or SC / CEI/CC ou SC: 81		Secretariat / Secrétariat: Japan	
<input checked="" type="checkbox"/> Submitted for parallel voting in CENELEC Soumis au vote parallèle au CENELEC		Distributed on / Diffusé le: 2002-08-08	
Also of interest to the following committees Intéresse également les comités suivants		Supersedes document Remplace le document: 81/237-237A/CDV - 81/291/RVC	
Functions concerned Fonctions concernées			
<input type="checkbox"/> Safety Sécurité	<input type="checkbox"/> EMC CEM	<input type="checkbox"/> Environment Environnement	<input type="checkbox"/> Quality assurance Assurance de la qualité

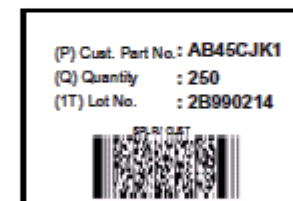
62080/FDIS @ IEC

- 20 -

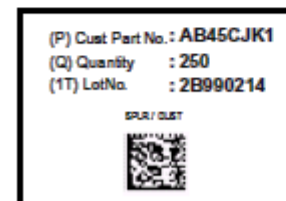
### 4.5.3 Examples of label and label layout



Figure 3 – Label with a linear bar code and human-readable information



PDF417



Data matrix



QR Code

Figure 4 – Label with a 2D symbol and human-readable information

# Sectors in the move: AERO SPACE

ISO TC 20 WG 13

DRAFT 202-03-27

## PRODUCT IDENTIFICATION – Integrated Data Processing Part Management

*Comments to:*

ATA AIR TRANSPORT ASSOCIATION OF  
AMERICA, 1301 PENNSYLVANIA AVE. N.W.  
PHONE: (202) 626-4039



Picture source: Michelin

### Permanent Bar Code Product / Parts Identification



In order that automated processes may be used to identify and facilitate "cradle to grave" tracking of product/ parts, an industry task force has defined a Permanent Bar Code Specification that uses Code 39, Code 128, and Data Matrix symbology. **Code 128 is the preferred symbology for permanent product/part Identification using labels, nameplates, and/or tags.** If space does not permit using Code 128, use Data Matrix symbology. **For direct part marking, Data Matrix is the preferred symbology.**



# Tire and Wheel Label and Radio Frequency Identification (RFID) Standard

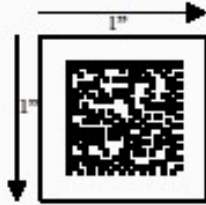


Figure 3. Rectangular Data Matrix Symbol with HRI



Rectangular Data Matrix  
 "X" = .020  
 0.040 quiet zone  
 (21S)W2CU\_XLT1101  
 (SN01)A (S)1234

Figure 4. Data Matrix Symbol with .040" Element Size



(21S)W2CU\_XLT1101  
 (SN01)A (S)00001

DataMatrix  
 "X" = 0.040  
 0.040" quiet zone  
 (21S)W2CU\_XLT1101  
 (SN01)A  
 (S)00001

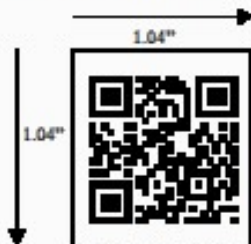
Figure 5. QR Code Symbol with .020" Element Size



(21S)W2CU\_XLT1101

QR Code  
 "X" = .020  
 0.080" quiet zone  
 ECC H  
 (21S)W2CU\_XLT1101  
 (SN01)A  
 (S)00001

Figure 6. QR Code Symbol with .040" Element Size



(21S)W2CU\_XLT1101  
 (SN01)A

QR Code  
 "X" = .040  
 0.160" quiet zone  
 ECC H  
 (21S)W2CU\_XLT1101  
 (SN01)A  
 (S)00001



Pictures: MICHELIN



**ISO/IEC JTC 1/  
SC 31  
Automatic Data  
Capture  
Barcode, 2D, RFID**





# Status: ISO/IEC JTC 1/SC 31/WG 4 RFID

## AIR Interface's ISO/IEC 18000er Series

ISO/IEC 18000-2	<135KHz	Ready
ISO/IEC 18000-3	13,56 MHz	Ready
ISO/IEC 18000-4	2,4GHz	Ready 04-09-29
ISO/IEC 18000-6	UHF 860-960MHz	Ready 04-09-29 + C 2006
ISO/IEC 18000-7	433MHz	Ready Verlag 04-09-29

## Data protocol ISO/IEC 1569x-Serie

ISO/IEC 15691	Data protocol: Application interface	Ready 04-10-27
ISO/IEC 15692	Data protocol: Data encoding rules and logical memory functions	Ready 04-10-27
ISO/IEC 15693	RFID - Unique identification for RF tags	Ready 04-09-29

**Data information: ISO/IEC 15418, 15459**

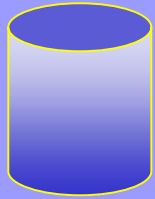
**Information**

# Systemhouse – RFID manufacturer

**APPLICATION**

**INTERROGATOR**

**RF TAG**



Data information

Application Program Interface

DEVICE  
COMMANDS

APPLICATION  
COMMANDS  
APPLICATION  
RESPONSES

DEVICE  
RESPONSES

Decoder

Encoder

Command /  
Response  
Unit

Logical Memory

DATA PROTOCOL  
PROCESSOR

Tag  
Driver  
and  
Mapping  
Rules

PHYSICAL  
INTERROGATOR

COMMANDS

RESPONSES

Tag Memory

Logical  
Memory  
Map

Daten&Syntax

ISO/IEC 15418  
ISO/IEC 15459  
High Capacity  
ISO/IEC 15434

Option: ISO/IEC 15963  
TAG ID

ISO/IEC 15961

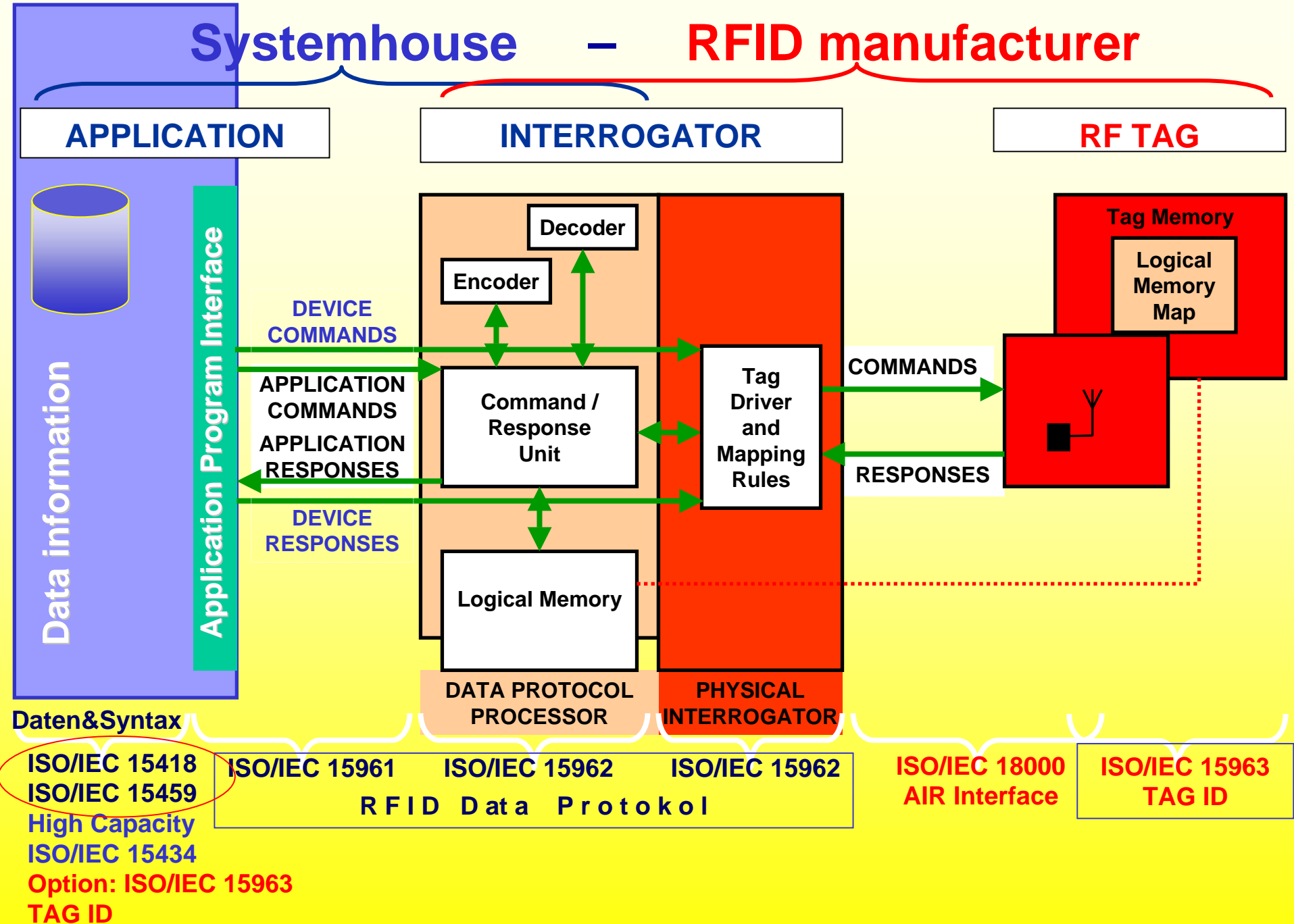
ISO/IEC 15962

ISO/IEC 15962

RFID Data Protokol

ISO/IEC 18000  
AIR Interface

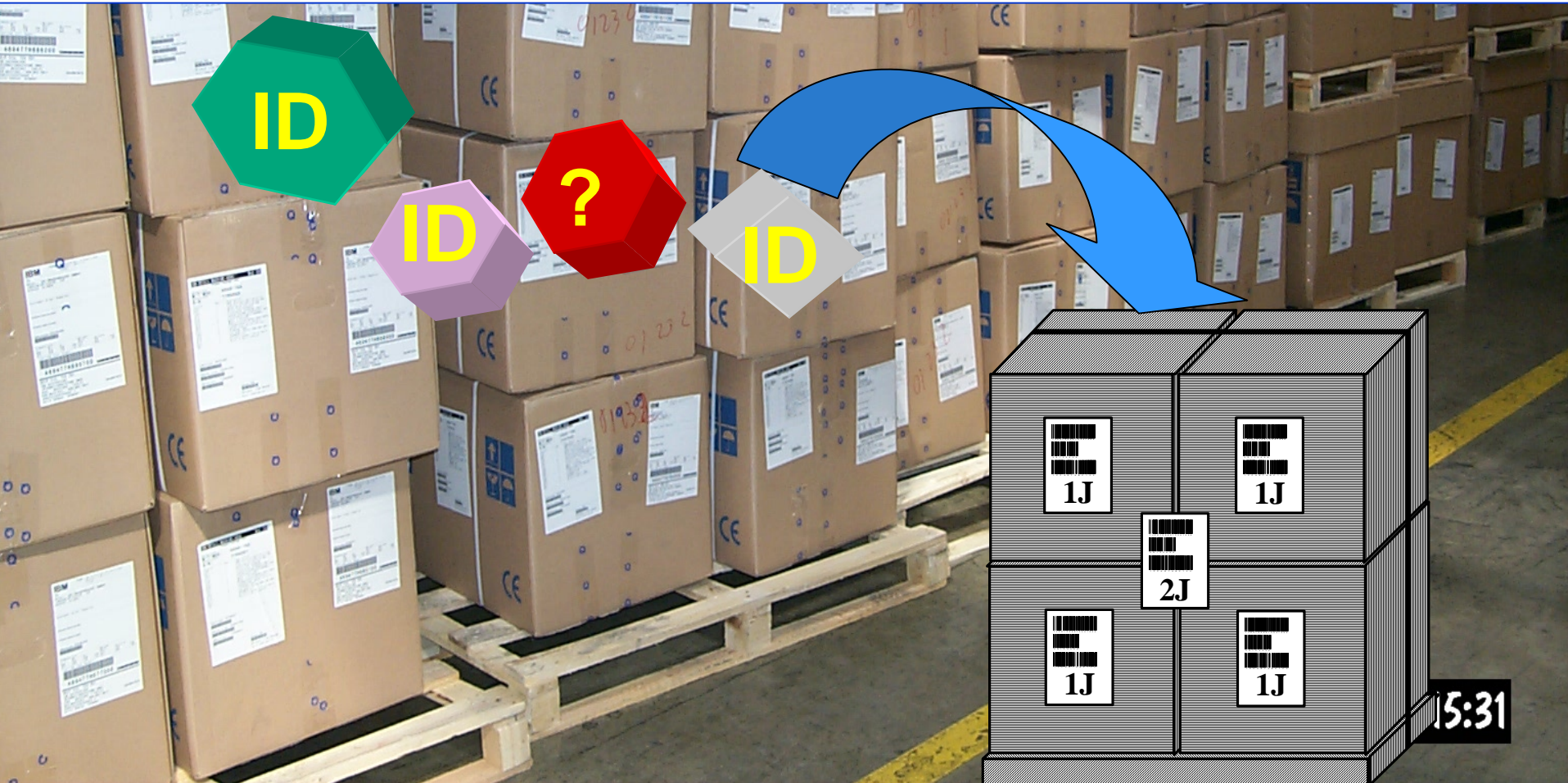
ISO/IEC 15963  
TAG ID





Where are the

# Application Standards



ID

ID

?

ID

1J

1J

2J

1J

1J

15:31



# Application Standards 2006

<u>BARCODE &amp; 2D</u>		<u>RFID</u>
ISO 22742	Product & Package  Product/Items	ISO 17966 ISO 17967
ISO 15394	Transport Units Returnable Transport Items	ISO 17965 ISO 17964
-	Fraight Containers	ISO 17963

# ISO TC122/TC104



Layer 5 (5.8-5.9 GHz)  
 ISO TC 204  
 ISO 15627 - Data Link Layer  
 ISO 15628 - Application Layer  
 ISO 18253 - DSRC Res Mgr

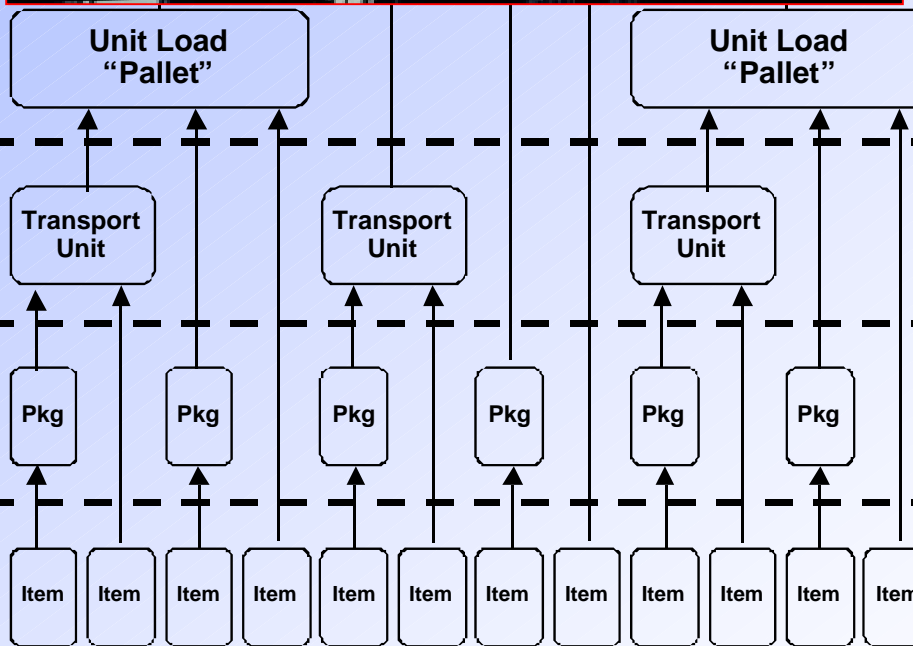
Layer 4  
 ISO TC 104 (ISO 10374)  
 ISO TC 104 (ISO 18185)  
 ISO TC 104 (ISO 23389)

Layer 3  
 ISO TC 122 (TBD)  
 ANSI MH10.8.4  
 AIAG (TBD)  
 EIA (TBD)  
 EAN.UCC GTAG

Layer 2  
 ISO TC 122 (TBD)  
 ANSI MH10.8.8  
 AIAG (TBD)  
 EIA (TBD)

Layer 1 (None)  
 ISO 22742, ....

Layer 0 (None)  
 ISO 15459, .....



Vehicles, Airplanes

Freight Containers  
 ISO 17363  
 activ 433MHz  
 passiv UHF

Returnable Cont's  
 ISO 17364  
 UHF + 13,56

Transport Units  
 ISO/WD 17365  
 UHF + 13,56

Product Packaging  
 ISO/WD 17366  
 13,56 + UHF

Product Tagging  
 ISO/WD 17367  
 13,56 & LF



**UHF 860-960MHz**

---

**13,56 MHz**



# Reasoning for 13,56 MHz



***In order to make the series of ISO 1736x applicable world-wide, it is essential to include the 13.56 MHz frequency range in the standards.***

***The following aspects are the basic considerations for this:***

- The UHF, frequency spectrum in Region 1 (865.6 – 867.6MHz) is presently not allowed in many European countries and will not be in future. The same in many countries of Asian area. Therefore it will not be possible to use RFID globally on a large scale.
- HF 13.56 MHz can be used world wide without such restrictions. In addition to this, HF has advantages because it offers a homogeneous field of interrogation (without reflections) resulting in a clearly defined reading area and therefore provides a higher read reliability and read rates.
- Concerning privacy aspects, UHF requires careful consideration because of the possibility of long distance eavesdropping (up to several kilometers), which is not the case with 13.56 MHz.





## RF ID Frequencies for Supply Chain applications

Supply chain	LF <135KHz 18000-2	13,56 MHz 18000-3, M1	433 MHz 18000-7	UHF 18000-6C
17363 FreightContainer			YES	
17364 Returnable Transport Item	Yes, with trade partner agreement	Yes, with trading partner agreement	Yes, with partner agreement	YES
17365 Transport Unit		Yes, with trading partner agreement -where UHF is not available, 13.56		YES
17366 Product Package		YES		Yes, with trading partner agreement
17367 Product	Yes, with trade partner agreement	YES		





Layer 5

Vehicle

Layer 4

ISO 17363

Freight Container

Layer 3

ISO 17364

Returnable Transport Item

Layer 2

ISO 17365

Transport Unit

Layer 1

ISO 17366

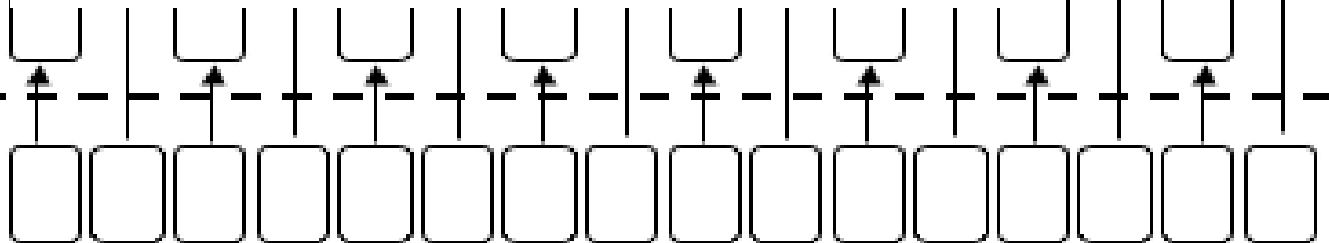
Product Package

Layer 0

ISO 17367

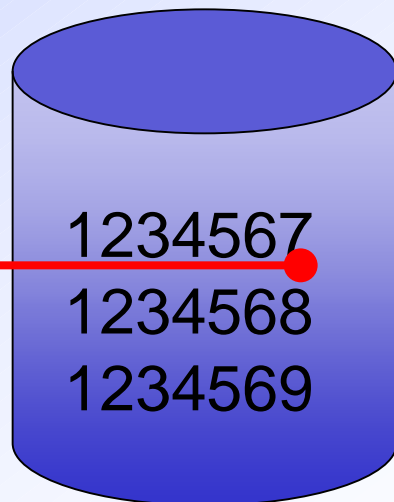
Product

*Next meeting  
26 July 2006,  
BELLVUE-  
Washington*

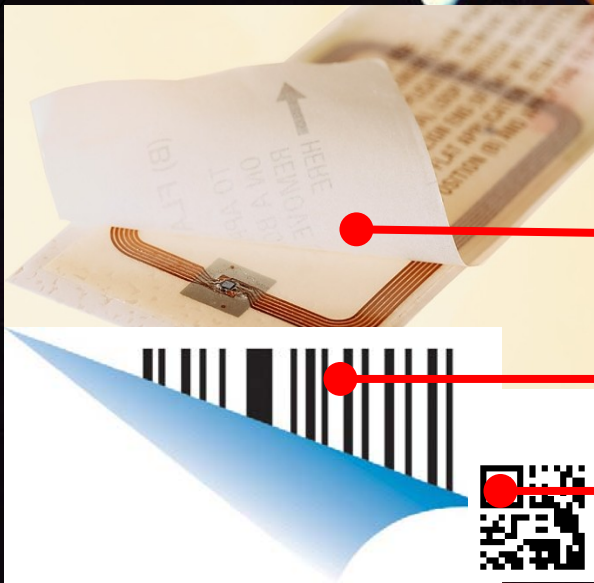


# Achievement:

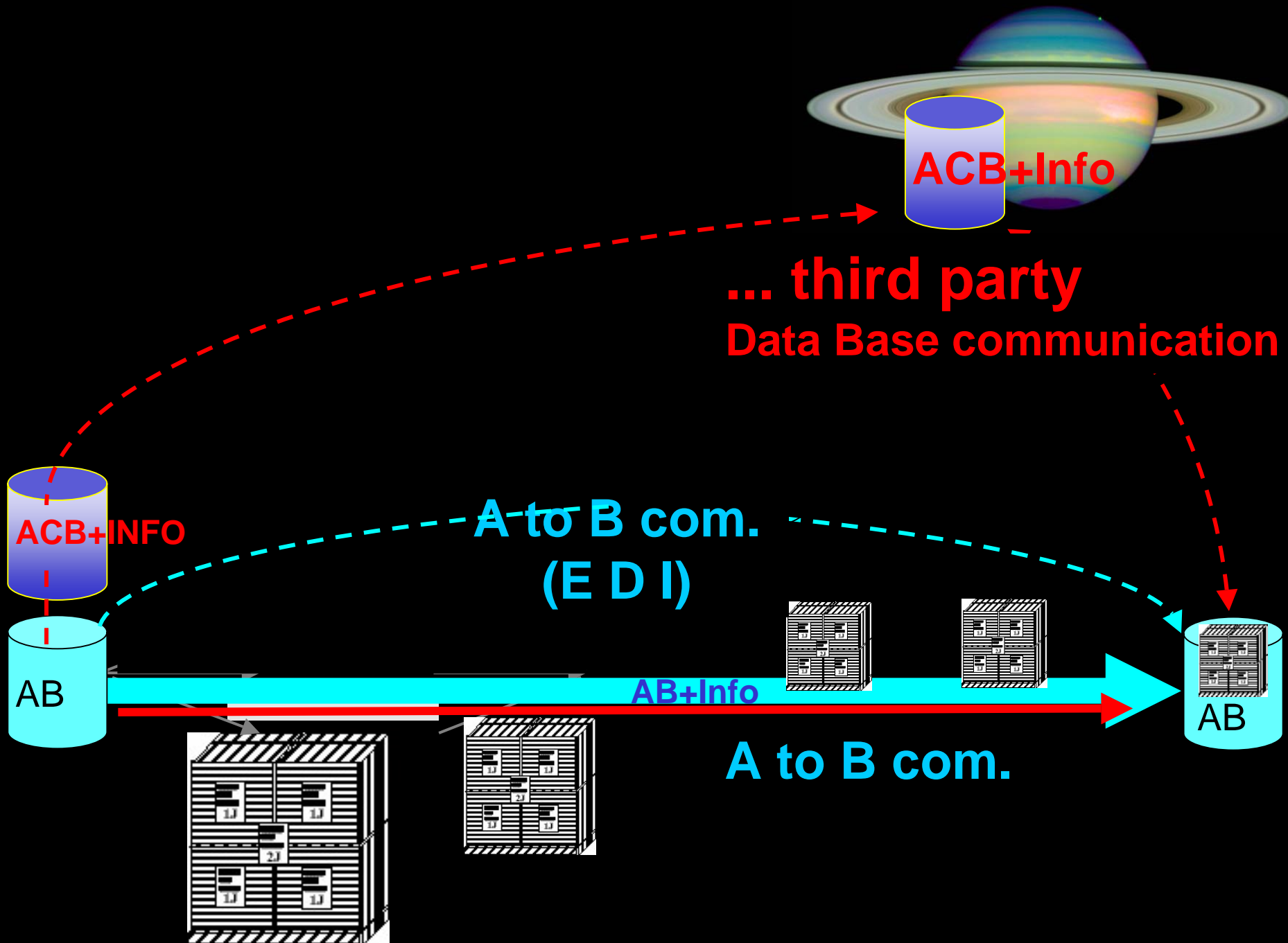
## ISO enables interoperability between Barcode & RFID



# Alternative idea's?



1234567  
1234568  
1234569



ACB+Info

... third party  
Data Base communication

ACB+INFO

A to B com.  
(E D I)

AB

AB+Info

AB

A to B com.

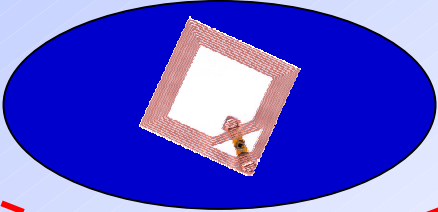


# One ISO RFID - different numbers



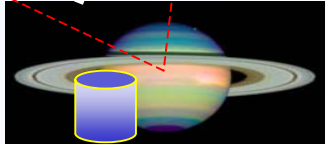
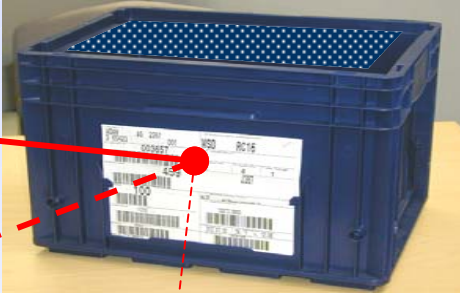
Industry numbers  
with variables

ISO



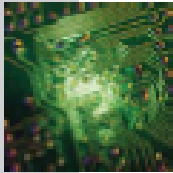
EPC

EAN numbers  
without variables

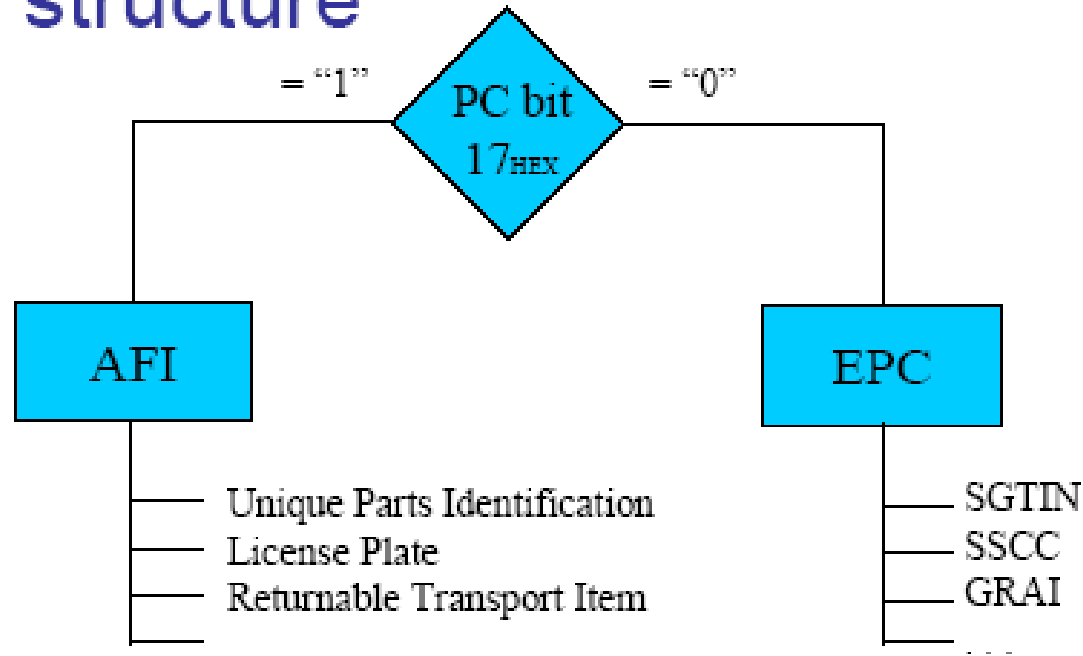


Info by third party





# Basic RFID user information structure



# (open) RFID Systems

**open systems**



## ISO RFID TAG

+ compatible to current Barcode Solutions

+ „license free“ for every CIN holder:

CEFIC, Dun&Bradstreet, Ehibcc, Edifice,  
EAN, FIATA, ODETTE, STEEL, UPU, ....

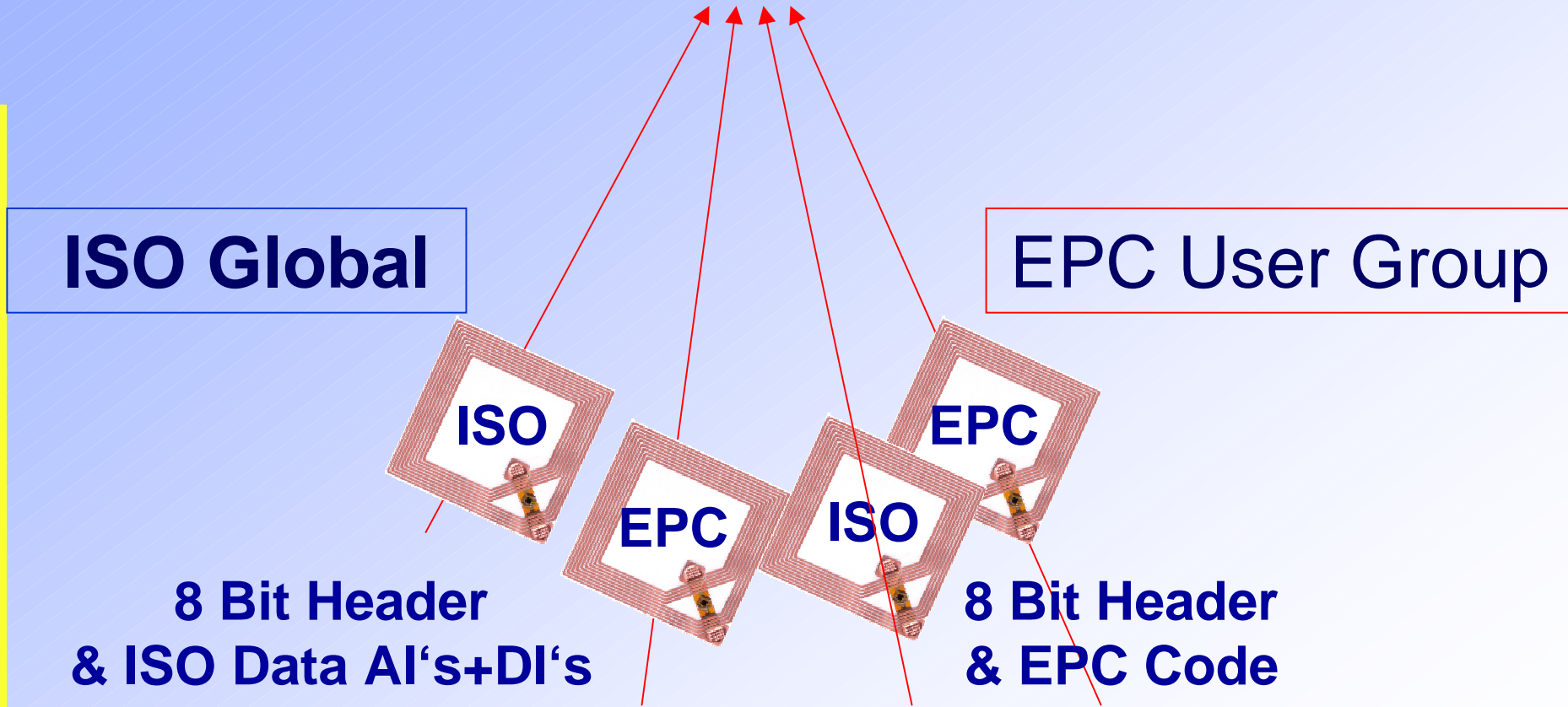
**EPC** Electronic Product Code  
a „REFERENCE TO“ concept  
„**licensed** by EAN/UCC“  
(copyright EPC Global)

**EAN System**



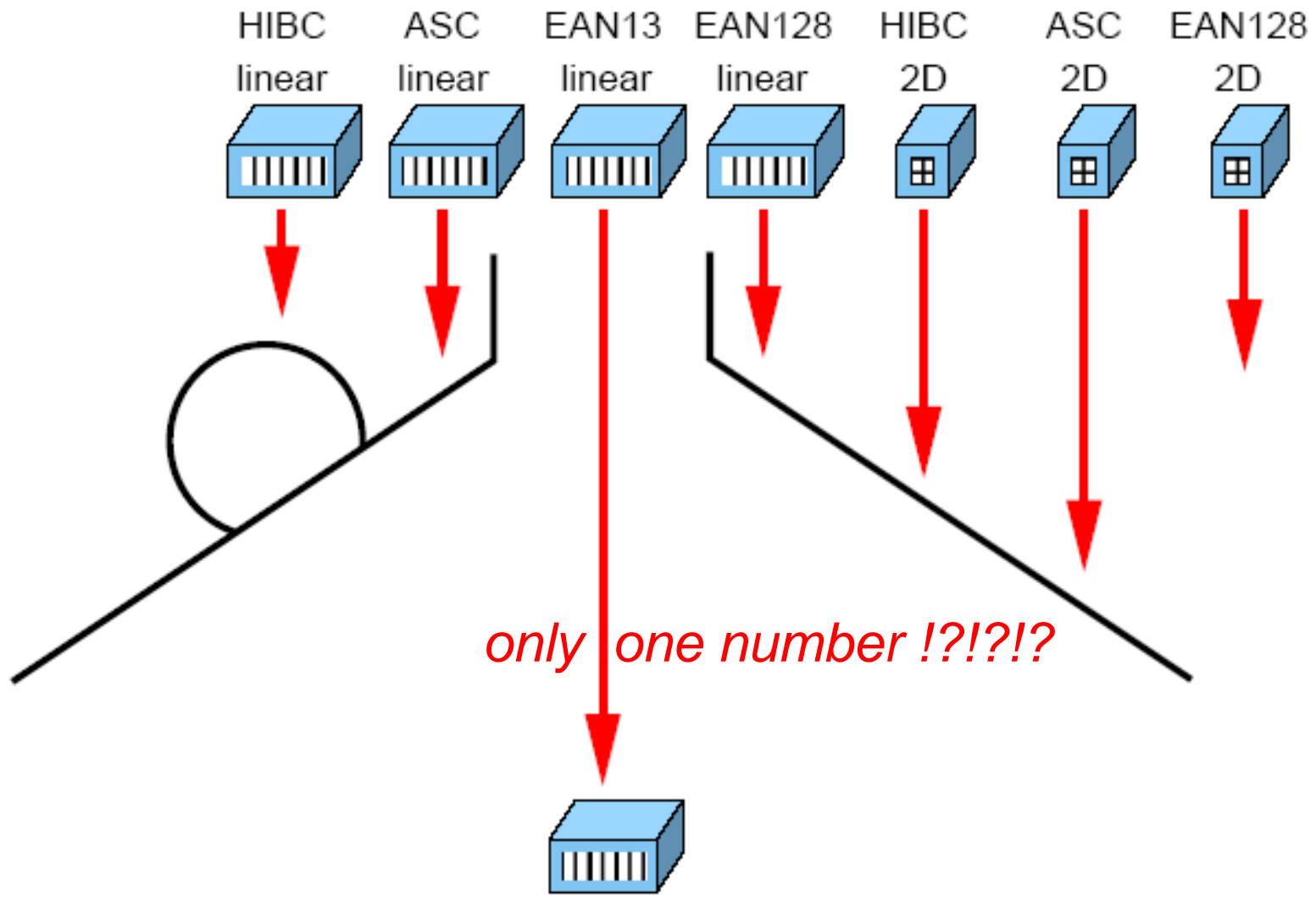


# Chance: Interoperability



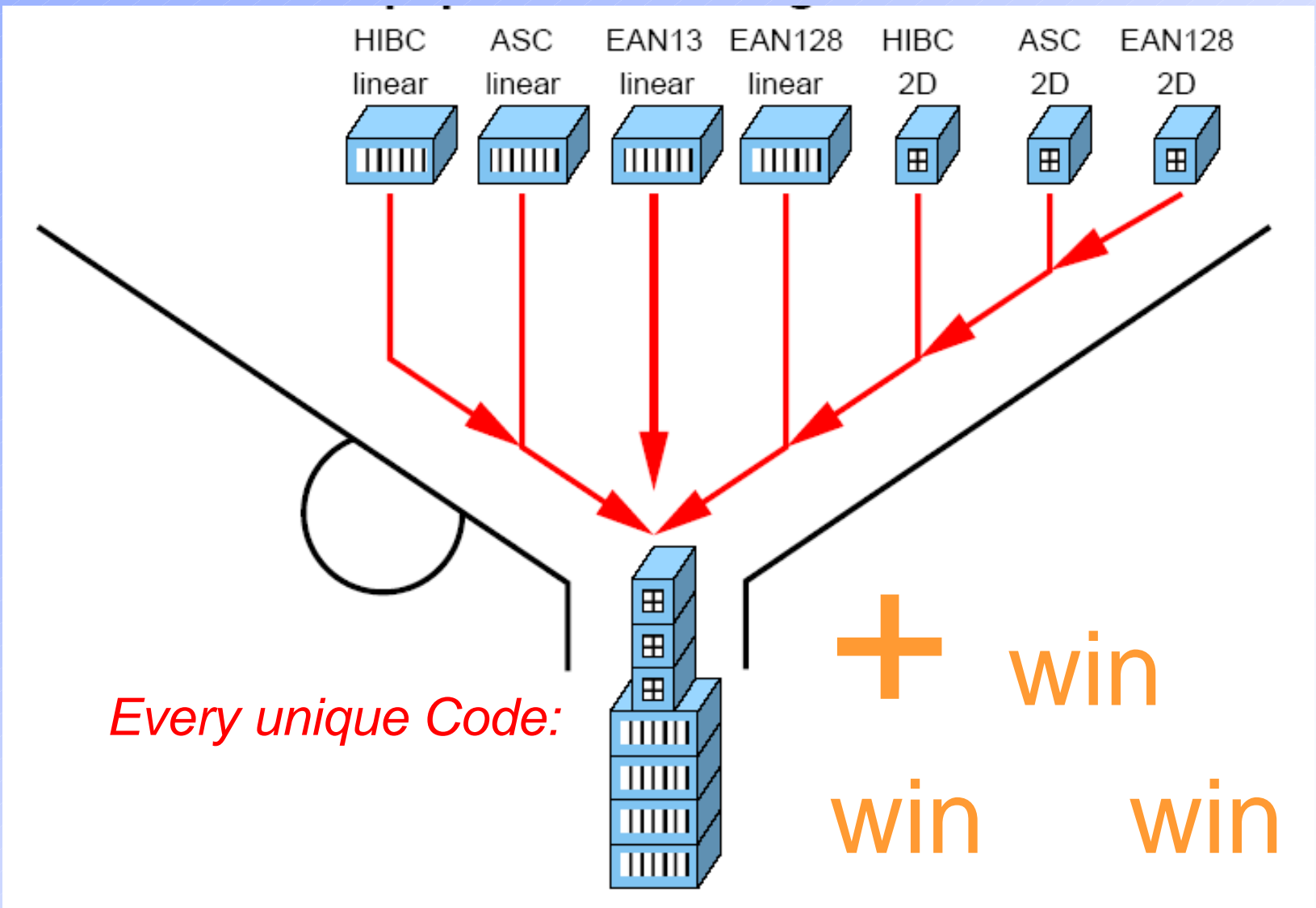


# Restriktions ???



Funnel up side down, why ...

# ...why not going the ISO way:



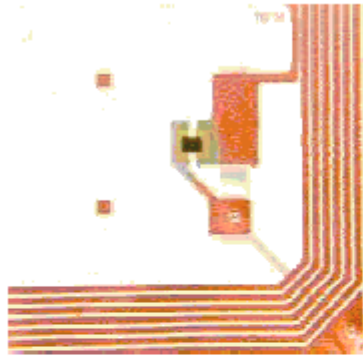


# The benefits of using ISO standards

- **Enables Uniqueness around the world by unique ID's**
- **Enables tracking and tracing through different sectors**
- **Enables interoperability Barcode & RFID**
- **Cost efficient compatibility with existing infrastructure**
- **Just integration - No need to change systems**
- **Open and no charge options**
- **Accepted by all ISO member countries**



# ISO powered RFID TAG



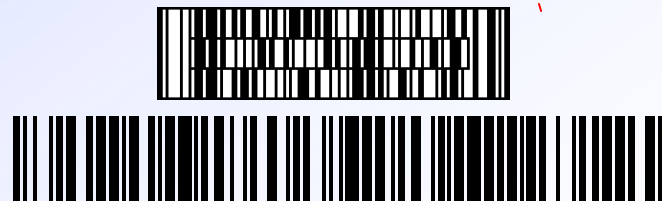
**ISO-RFID eTAG-x**  
**The ISO powered solution**  
**for item tracking using RFID Tags**  
in compliance with ISO/IEC standards for Barcode.

*Source: [www.EurodataCouncil.org](http://www.EurodataCouncil.org)*





Where is  
the power .....



JUN123456789X234567





# RFID

# Thank You

**Heinrich Oehlmann**  
**[www.EurodataCouncil.org](http://www.EurodataCouncil.org)**