Federation of European Explosives Manufacturers

November 2009

Guidance Note

FEEM European Explosives Code Structure

(Mod. 1, April 2013)

COMMISSION DIRECTIVE 2008/43/EC of 4 April 2008 & COMMISSION DIRECTIVE 2012/4/EU of 22 February 2012 amending Directive 2008/43/EC on Identification & Traceability of Explosives for civil uses

CONTENTS

1. INTRODUCTION

This FEEM Guidance document has been prepared to outline the method adopted by FEEM Members to achieve a harmonised system for the purpose of implementing the European Commission's Directives 2008/43/EC and 2012/4/EU to establish "A SYSTEM FOR THE IDENTIFICATION AND TRACEABILITY OF EXPLOSIVES FOR CIVIL USES", and the associated national legislation. The system being recommended is not binding on any FEEM members, but the adoption and adherence to it shall minimise logistical problems throughout civil explosives supply chains in Europe. It is also available for others to adopt should such as system be seen as beneficial.

The European Directive on Identification & Traceability of explosives came into effect on the 4th of April 2008. This Directive is intended to establish a harmonised system for the unique identification and traceability of all packaged explosives, detonators, reels of detonating cord, primers and other explosives used in civil applications across the European Union. The directive was adopted into the national legislation of each European Union member state on 5th of April 2009. An amendment to the Directive issued on 22nd February 2012 introduced a two phase approach and extended the period of implementation. With effect from 5th April 2013, all civil explosives manufactured as of that date and falling within the remit of the Directive must be labelled in a specified manner. As of 5th April 2015, all civil explosives falling within the remit of the Directive must be tracked. The requirements of the Directive apply to all explosives manufactured, used and imported into the European Union, with some exceptions.

The European legislation states that all packaged explosives for civil uses must be uniquely identified and tracked at every stage throughout its life cycle This requires every explosives cartridge, detonator, detonating cord (every 5 meters), reel of detonating cord, and primer to have a visibly readable unique number on a label, with a barcode or RFID tag, and an associated data capture / recording / reporting system. A FEEM Technical Guidance Document "Small Articles" identifies explosives which are too small to affix the unique product code and logistical information. It is also a requirement for the records of every uniquely identified article to be maintained and to be available for inspection for a period of 10 years.

2. IDENTIFYING AND TRACKING EXPLOSIVES

The most beneficial solution for identifying explosives items and tracking their location throughout a supply chain at this current time is bar-coding technology. FEEM has decided to loosely use the GS1 Standard (see Annex I). These technologies are therefore recommended to enable each individual explosives item to be allocated a unique number for the purpose of tracing that item throughout its life cycle. The traceability of each item shall be achieved by way of databases, maintained by each user of the explosives throughout the supply chain. If an item is misappropriated and later found with the identification still intact, the point of manufacture can be identified by the unique number and the item traced to the point at which the record ceases.

As there are many different manufacturers of explosives in Europe, (with others importing products), achieving a harmonised system of database management is essential for users in the supply chain to prevent a number of databases having to be used to maintain the records for each different

supplier. This has been achieved by designing and adopting a code structure that has sufficient flexibility to enable all companies use within existing IT systems. "Application Identifiers" (AI) are used within barcodes globally to provide code flexibility. FEEM has employed standard GS1 AI's. These enable codes to be flexible, with individual fields within any code being in different positions in the overall code, of various lengths and combinations on alpha, numeric and alpha-numeric characters. Application Identifiers are not normally visible within a code, but if they were, they are recognised by being two, three or four digit numbers within brackets. These AI's are incorporated within 1 dimensional and 2 dimensional barcodes, and provide the required flexibility for the various fields within a database.

The following table of CODE STRUCTURE ELEMENTS with ASSOCIATED APPLICATION IDENTIFIERS, assigned to achieve harmonisation of explosives coding is the **EUROPEAN STANDARD** for all FEEM members:

3. TABLE OF CODE STRUCTURE ELEMENTS

Field	Digits	Format	Application Identifier	AI Description	Length	Notes
Country & Production Site No.	5	Alpha-Numeric	(90)	Mutually agreed between trading partners	Variable but used as a fixed number to 5 digits	Mandatory to comply with Directive e.g. FR002 – France, 2nd site
Unique Item No. OR Logistical Unit No.	30	Alpha-Numeric	(250)	Secondary Serial No.	Variable up to 30 characters	Mandatory to comply with Directive
Determination of items and logistical units	2	Numeric	(20)	Product Variant	Fixed	Optional
Production Date	6	Numeric	(11)	Product Date (YYMMDD)	Fixed	Optional
Product Code	30	Alpha-Numeric	(240)	Additional Product Identification Assigned by Manufacturer	Variable up to 30 characters	Optional
Batch Number	20	Alpha-Numeric	(10)	Batch or lot number	Variable length	Optional
Trade Quantity	8	Numeric	(37)	Count of items contained in a logistic unit	Variable Length	Optional
Quantity	8	Numeric	(30)	Variable Count Collective number of individual items	Variable Length	Optional
Net Explosive Quantity	6	Numeric	(310n)	Product net weight in kgs	Fixed	Optional
Unit of Measure	6	Numeric	(311n-316n)	Specified units of measure e.g. length / volume etc.	Fixed	Optional
Gross weight	6	Numeric	(330n)	Gross weight - Kgs	Fixed	Optional
Internal Use	30	Alpha-Numeric	(91) – (99)	Company Internal Information	Variable length	Optional

The following three fields may be used according to the GS1 definitions:

Field	Digits	Format	Application Identifier	AI Description	Length	Notes
Global Trade Item Number	14	Numeric	(01)	GTIN	Variable length	Optional
Serial Number	20	Alpha-numeric	(21)	Original Serial number for GTIN item	Variable length	Optional
SSCC	18	Numeric	(00)	Serialized Shipping Container Code	Fixed	Optional

4. APPLICATION IDENTIFIERS

The applied "APPLICATION IDENTIFIERS" will enable harmonisation by recognising the format of a database in which the information is being received in. This enables the explosives code structure to be flexible. Individual fields within the overall code at different positions with various lengths and combinations on alpha, numeric and alpha-numeric characters are possible. The Application Identifiers are not normally visible within a code, but if they were, they are recognised by being two, three or four digit numbers within brackets. AI may optionally be printed on the labels in order to make it easier for a human to read the label and to facilitate key entry in the event that the symbol cannot be scanned.

5. CODE STRUCTURE

The code structure is build up in such a way that it will achieve the requirements of the EC Directive on Identification & Traceability of explosive for civil uses (the mandatory part) as well as the requirements of the industry concerning logistical and product information.

The Mandatory Requirements are that it contains three fields, namely

1. Country

2. Production site number within the country where the explosives were manufactured

3. Unique item number associated with the country and site

The COUNTRY AND PRODUCTION SITE NUMBER must be the first fields on the readable section of a label applied to each explosives item.

The rational behind the identification (allocation a unique number to every explosives article) and traceability (establishing records of where every identified explosives article has been from point of manufacture to final use for a period of 10 years) is to identify an article that was illegally removed from the normal supply chain. On recovery of an explosives item, (presuming that the label is still attached) the regulatory / law enforcement authorities shall identify the country and production site

and commence their enquiries at that point, following the articles movements down the supply chain to the final point that information is available on it. This then fulfils the regulatory obligations.

However, as a system to achieve the mandatory requirements is being established, the opportunity to obtain associated benefits has been exploited by the members of the Federation. These arise from some of the following areas:

1. Security
2. Stock counting
3. Stock segregation (i.e. non conforming products)
4. Stock evaluation
5. Quality issues
6. Explosives Licence compliance (NEQ)
7. (SAP / MRP / ERP
8. Raw materials scheduling
9. Logistics

To enable these benefits to be realised, additional (optional) fields in a coding structure have been added. It would be for each FEEM member to decide whether they include these for their own purposes, or for the benefit of their down stream customers who would achieve business benefits by having this data available to them. HOWEVER, WHEN USING THE OPTIONAL FIELDS THE SAME AIS SHOULD BE USED.

6. MANDATORY FIELDS

1. COUNTRY & PRODUCTION SITE NUMBER

The EC Directive states that the first two digits of the unique number must be alpha characters and must represent the country of manufacture. The EC Directive also states that digits 3, 4 & 5 of the code must be numeric characters, to represent the production site within the country. This number will be allocated by the National Authority. In order to simplify this, the code structure combines these two requirements and assigned AI (90) which is defined within the global standards as "Mutually agreed between trading partners".

2. UNIQUE ITEM NUMBER

With the Country & Production Site Number on every explosives article, this enables each company to design a system of unique numbering to meet their individual requirements. Given companies existing systems, it is necessary to ensure that up to 30 characters are available for this field. The AI (250) has been assigned, which is known as a "Secondary Serial No." as this permits up to 30 alpha-numeric characters to be used. This Unique Item Number field would also be used for identification of LOGISTICAL UNIT NUMBERS, i.e. a bag, a case, a pallet, etc. providing identification & traceability at that level also.

3. IDENTIFICATION OF DISTRIBUTORS AND RE-PACKAGERS

The country and production site number stored in AI (90) will be assigned by NATIONAL AUTHORITIES only for MANUFACTURERS and IMPORTERS of explosives. But DISTRIBUTORS which repackage explosives shall also mark the packaging units with associated labels according to this Guidance Note. Logistical units like boxes or pallets should be marked to facilitate the data transfer in the supply chain. So undertakings without an official production site number shall also use AI (90) as a mandatory field to provide the uniqueness of the identification code.

To avoid confusion with official production site numbers of producers and importers AI (90) for those undertakings is FIXED TO 5 LETTERS, TWO FOR THE COUNTRY followed by THREE FOR THE REPACKING COMPANY. Since there is no legal obligation to mark packages for repacking companies those 3 letters company codes do not need to be agreed by national authorities. HOWEVER IT IS IMPORTANT TO MAKE SURE THESE CODES ARE UNIQUE IN EACH COUNTRY.

4. READABLE CODE ON LABELS

The EC Directive requires a readable number to be printed / attached on each explosives article. It is therefore mandatory (to enable any later traceability) and sufficient for the COUNTRY CODE, the PRODUCTION SITE NUMBER and the UNIQUE NUMBER to be displayed.

7. OPTIONAL FIELDS

1 DETERMINATION OF ITEMS AND LOGISTICAL UNITS

AI (250) can be used both for the unique identification of items but also for logistical units like packagings or pallets. The determination between these two types of identification codes is important during the whole supply chain. AI (250) is not immediately evident for downstream users if it relates to an item or to a packaging or logistical unit. AI (20) shall enable this determination during the whole supply chain.

CONTENTS OF AI (20)

00: Item
01: Inner packaging
02: Intermediate packaging
03: Outer packaging
04: Pallet
05: Container
09: Ad hoc

FURTHER LEVELS OF PACKING BEYOND 09 SHALL NOT BE USED.

If suitable additionally to the mandatory fields AI90 and AI 250 the following information may be added to the code in strict compliance with GS1 standard:

AI (00): SSCC
AI (01): GTIN
AI (21): SERIAL NUMBER

2 PRODUCTION DATE

The addition of the production date within the code captures the date on which the traceability of the unique number commenced. It may be used in association with the UNIQUE ITEM NUMBER, making the number unique by virtue of the date being incorporated. From the choice of "Date" fields available within the global standards, "Production Date" (11) was considered to be the most appropriate for the purpose for which it is being used. It would be displayed in the format of YYMMDD.

3 PRODUCT CODE / ARTICLE NUMBER

The addition of a "Product Code" within the structure introduces additional functionality for databases. Systems can report on products stored in locations, aged stock, valuation reports, etc. The global standard has a provision for "ADDITIONAL PRODUCT IDENTIFICATION" (240) with the capability of 30 variable alpha-numeric characters and hence meeting the requirements of all companies.

4 BATCH NUMBER

The EC Directive introduces a requirement of individual item level identification and traceability. This is evidently more stringent than batch-tracking, however some companies may desire to retain the capability to Batch track. This was therefore included in the code, with the global standard "Batch No." (10) being assigned. A total of 20 alpha-numeric characters can be used, with variable length of the field.

5 TRADE QUANTITY

While "Quantity" is not relevant at individual item level labelling (as it is always "1"), knowing the number of items contained within a bag or case, or number of cases on a pallet, etc. is beneficial. This would enable systems to be designed such that they count the number of LOGISTICAL or PACKAGING UNITS within the level below which the label has been applied to. As an example, on a pallet, it could be AI37 (40) which indicate 40 cases. On a case, it could be AI37 (100) – indicating 100 detonators. The "Trade Quantity" shall always be indicated by a variable length number up to a maximum of 8 digits and AI (37).

6 QUANTITY (VARIABLE COUNT)

This field enables the total number of items within the UNIT OF PACKAGING to be identified. It indicates the cumulative number of individual items. As an example, on a pallet containing 100 boxes, each containing 100 detonators, the AI30 would be (10,000) or on a box AI30 (100) as 100

detonators. The "Quantity" shall always be indicated by a variable length number up to a maximum of 8 digits and AI (30).

7 NET EXPLOSIVE QUANTITY (NEQ)

The NET EXPLOSIVES QUANTITY is widely used within the explosives industry for regulatory and management purposes. Incorporating this information into a barcode at item level enables the NEQ at any location to be available at all times when this system is being used. This could be in a manufacturing facility, a magazine or on a delivery truck, as examples. The global standard for "PRODUCT NET WEIGHT IN KILOGRAMS" (310n) enables this. Up to 6 numeric digits can be used to display this with the decimal place being repositioned as necessary.

8 UNITS OF MEASURE

Explosives articles may be marketed (and consequentially tracked) in a range of units of measure, i.e. weight, length, volume, etc. The global standards specify AIs (311n) to (316n) as UNITS OF MEASURE that can be applied and incorporated within the barcode (if applicable). The AI (311n) and up use always a PREDEFINED unit of measure, (e.g. meters for (311n), cubic meters for (316n), kg for (330n)).

Additional information about unit of measure like the UN/ECE codes can be used inside GS1 code in the customer specific fields AI(91) to (99).

Inside the XML file they may be used at special field "UNIT OF MEASURE". For list of international UN/ECE codes and definitions refer to Annex III.

9 GROSS WEIGHT

Tracking of explosives articles shall be conducted at item, bag, case, pallet and container level as appropriate. At the larger logistical levels, the gross weight could be of importance. A provision for "Gross Weight" has therefore been included in the proposed code structure and the global standard of "Gross Weight" (330n) adopted.

10 COMPANY INTERNAL INFORMATION

AI's (91) – (99) are specified within the global standards for the purpose of "Company Internal Information" such as

- TYPE OF PACKAGING
- PRODUCTION MACHINE
- GROUP
- SHELF LIFE
- CODE STATUS AND OTHERS
- UNIT OF MEASURE

These AI's were deliberately avoided as some FEEM members are currently using these for their own purposes – as intended within the GS1 Standard.

Annex I contains a complete example, with all the necessary technical explanations, about how to encode following this FEEM criteria.

11 GTIN (AI 01)

A GLOBAL TRADE ITEM NUMBER (GTIN) is used to identify any item upon which there is a need to retrieve pre-defined information and that may be ***priced or ordered or invoiced*** at any point in any supply chain. A separate unique GTIN is required whenever any of the pre-defined characteristics of an item are different in any way that is relevant to the trading process (e.g. unit of measure).

12 SERIAL NUMBER (AI 21) – UNIQUE NUMBER

Serial number for GTIN identified item. The AI 21 is the standard serial number for items that are identified with a GTIN. The serial number will be the unique code assigned for the unique identification of each single unit. Although usually called a number, it may include letters, though ending with digits.

This Unique Item Number field would also be used for identification of LOGISTICAL UNIT NUMBERS, i.e. a bag or a case, etc. providing identification & traceability at that level also. For pallets it is an option, but usually the SSCC is used in international trading.

13 SSCC (AI 00) (SERIALIZED SHIPPING CONTAINER CODE)

The SSCC is the (GS1) Identification Key for an item of any composition established for transport and/or storage which needs to be managed through the supply chain. The SSCC is assigned for the life time of the transport. It is using Application Identifier (00).

8. SENDING INFORMATION BY ELECTRONIC MEANS

FEEM has also decided to use a XML format when the information has to be sent by electronic means; the ANNEX II contains an example of it.

9. ANNEXES

ANNEX I

THE ENCODING STRUCTURES

The FEEM code structure is loosely based on GS1 standards and it can be encoded with GS1 Data Matrix or GS1-128 symbols. This issue is for GS1 Data Matrix symbol, for GS1-128 linear barcode refer to the appropriate GS1-128 structure documentation.

The general version Data Matrix ECC 200 supports various encoding structures: ASCII, ISO/IEC 646, C40, Text, X12, EDIFACT and Base 256. The simplest solution, and the one mandated by the GS1 standards, is to **encode data using the subset of ISO/IEC 646 (equivalent to ASCII table 256)** for all the information.
When encoding data in accordance with the GS1 System using GS1 Data Matrix, three principle rules apply:

- The Data Matrix ECC 200 must have a leading FNC1 character in the first position to indicate that the symbol is GS1 Data Matrix. FNC1 is a special, non-printable, character. It is often inserted using a double-byte "Latch to extended ASCII" but this is system dependent.
- The GS1 Application Identifiers (or AIs) are used for all encoded.
- Only the characters contained in ISO 646 subset may be used. It should be noted that spaces cannot be encoded.

GS1 ELEMENT STRINGS

Although it is possible to encode any type of data in the general Data Matrix ECC 200, when using GS1 Data Matrix the data must be structured according to the rules of the GS1 System. Element strings begin with an Application Identifier which is then followed by the data that the AI denotes. The system can be characterized by:

- A standard format for encoding data and bar coding specifications.
- A symbol architecture that allows multiple data elements (item identification, production date, batch number, etc.) within a single bar code.

- **In FEEM CODE STRUCTURE only FEEM AIs can be encoded.**

FEEM AI

AI	Field	Digits	Format	Length	Notes
(90)	Country & Production Site No.	5	Alpha-Numeric	Variable but fixed (5)	Mandatory
(250)	Unique Item No	30	Alpha-Numeric	Variable	Mandatory
(20)	Determination of items and logistical units	2	Numeric	Fixed	Optional
(11)	Production Date	6	Numeric	Fixed	Optional
(240)	Product Code	30	Alpha-Numeric	Variable	Optional
(10)	Batch Number	20	Alpha-Numeric	Variable	Optional
(37)	Trade Quantity	8	Numeric	Variable	Optional
(30)	Quantity	8	Numeric	Variable	Optional
(310n)	Net Explosive Quantity	6	Numeric	Fixed	Optional
(311n-316n)	Unit of Measure	6	Numeric	Fixed	Optional
(330n)	Gross weight	6	Numeric	Fixed	Optional
(91) – (99)	Internal Use	30	Alpha-Numeric	Variable	Optional

The following three fields may be used according to the GS1 definitions:

(01)	GTIN	14	Alpha-Numeric	Variable	Optional
(21)	Serial Number for GTIN items	20	Alpha-Numeric	Variable	Optional
(00)	SSCC – Serialized Shipping Container code	18	Numeric	Variable	Optional

Each AI and its associated data can be encoded into a GS1 Data Matrix symbol in the same way and using the same logical rules as encoding data in the linear bar code symbol GS1-128 This is achieved by putting parentheses around Application Identifiers in the Human Readable Interpretation under the symbol. **The parentheses are not part of the data and must not be encoded in the bar code.**

FUNCTION 1 SYMBOL CHARACTER (FNC1)

GS1 Data Matrix uses a special start combination to differentiate the GS1 Data Matrix symbol from the other Data Matrix ECC 200 symbols. This is achieved by using the Function 1 Symbol Character (FNC1) in the first position of the data encoded. It enables scanners to process the information according to the GS1 System Rules. The FNC1 is encoded in two separate ways within GS1 Data Matrix:

- **Start character (ASCII 232)**
- **Field Separator (ASCII 29: <GS>)**
    - When used as part of the special combination – use ASCII 232
    - When used as a field separator (see *Concatenation*,) - ASCII 29 : <GS>

CONCATENATION

Using GS1 Data Matrix, it is possible to concatenate (chain together) DISCRETE APPLICATION IDENTIFIER (AIs) and their data into a single symbol. When the AI data is of pre-defined length, no field separator is required when the next Application Identifier and data are concatenated immediately after the last character of the previous AI data. Where the AI data is not of pre-defined length, it must be followed by a field separator when concatenating more AIs. The FNC1 character acts as field separator. The FNC1 is the character that has the ASCII value 29 (or group separator <GS>). A FNC1 separator is not required after the last AI and last data encoded in the symbol independent of whether the field is of pre-defined length or not.

PRE-DEFINED LENGTH VS. FIXED LENGTH ELEMENT STRINGS

A common mistake is to believe that any GS1 Application Identifier with a fixed data field is never followed by a FNC1 separator when concatenated. In fact, there is a table which defines the fixed data fields. This table of that shows every GS1 Application Identifier was published when they were first introduced.

For all GS1 AIs that start with two digits that are not included in this table, it is mandatory to follow the data with the field separator FNC1 if it is not the last data encoded in the symbol.

First 2-digits of the GS1 Application Identifier (AI)	Number of digits (AI and Data Field)	First 2-digits of the GS1 Application Identifier (AI)	Number of digits (AI and Data Field)
00	20	17	8
01	16	18	8
02	16	19	8
03	16	20	4
04	18	31 FEEM	10
11 FEEM	8	32	10
12	8	33 FEEM	10
13	8	34	10
14	8	35	10
15	8	36	10
16	8	41	16

HUMAN READABLE INTERPRETATION

Application Identifiers (AIs) may be visible within the Human Readable Interpretation to facilitate key entry in the event that the symbol cannot be scanned.

This is achieved by putting the AI between parentheses. The parentheses are not part of the data and are not encoded in the symbol. This is in clear contrast to the use of the FNC1 which must be encoded in the symbol, when used as a start or separate character, but never appears in the Human Readable Interpretation.

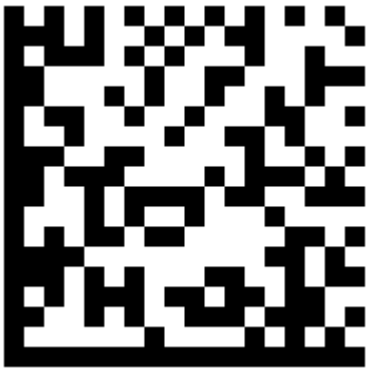
*** In FEEM code structure only AIs 90 and 250 are mandatory for human readable interpretation.**

FEEM Code Examples

Example 1: Mandatory data (AIs 90 and 250)

String to encode: <FNC1>90AT001<GS>25009E310120000001

Alpha Explosives GmbH



(90)AT001 (250)09E310120000001

Alpha Explosives GmbH

AT001
09E310120000001

Alpha Explosives GmbH

AT001

09E310
120000001

Alpha Explosives GmbH

Example 2: Mandatory data (AIs 90 and 250), production date (11), product code (240) and quantity (37).

String to encode:

<FNC1>90AT001<GS>25009E310120000001<GS>11090131240PRODUCT_CODE<GS>37500

* Production date (11) is not ended by <GS> because it has a pre-defined length.

Alpha Explosives GmbH

(90)AT001 (250)09E310120000001

Alpha Explosives GmbH
(240)PRODUCT_CODE (37)500

(90)AT001 (11)090131
(250)09E310120000001

Example 3: Mandatory data (AIs 90 and 250), production date (11), product code (240), batch number (10) and net quantity (310n)

String to encode:

<FNC1>90AT001<GS>25009E310120000001<GS>11090131240PRODUCT_CODE<GS> 3103000152 10AB123/09

* Production date (11) and net quantity (3103) are not ended by <GS> because they have a pre-defined length.

Alpha Explosives GmbH
(240)PRODUCT_CODE (3103)000152

(90)AT001 (11)090131
(250)09E310120000001
(10)AB123/09

Alpha Explosives GmbH

AT001
09E310120000001

Example 4: Small items (GS1-128)

Encoded: Mandatory data (AIs 90 and 250) Human Readable: AIs 90 and 250

Encoded: Mandatory data (AIs 90 and 250) Human Readable: AI 90

Encoded: AI 90 Human Readable: AI 90

* The maximum data length to encode on a GS1-128 symbol is 48 characters including the AI numbers and group separator characters.

This document has been prepared on the basis of the document "GS1 Data Matrix an introduction and technical overview of the most advanced GS1 Application Identifiers compliant symbology" by GS1.

ANNEX II

XML File

XML provides a standardized and predictable structure for electronic business messages, enabling business partners to communicate business data rapidly, efficiently and accurately, irrespective of their internal hardware or software types.

FEEM strongly recommends the provision of data about shipment content and the packaging hierarchy to all entities of the supply chain. Since every undertaking has to collect and store information about every single item these data are needed.

This is a XML structure example to transmit FEEM code data to anyone; two examples are developed below.

Field	Mandatory	GS1 AI	Element/ Attribute (single/ multiple)	Definition Description	Level	Format	Example
Shipment	**Yes**		**E (s)**	**Main root element**	**XML-Header**	**complex type**	
FileCreator	**Yes**		**A (s)**	**Program used to create XML file**	**XML-Header**	**string**	**"Software-123"**
FileType	**Yes**		**A (s)**	**Format of XML always FEEM-Std**	**XML-Header**	**string**	**"FEEM-Std"**
FileVersion	**Yes**		**A (s)**	**Version of Format**	**XML-Header**	**string**	**"1.0"**
Hash	**Yes**		**A (s)**	**MD5 hash code to ensure safety**	**XML-Header**	**string**	
MessageID	**Yes**		**E (s)**	**Unique ID of the XML message**	**Header**	**string**	**"MSG-000-000-000"**
MessageTime	**Yes**		**E (s)**	**Date/Time the message was created**	**Header**	**xs:dateTime**	**2013-05-30T09:30:10+06:00**
MessageType	No		E (s)	Type of message	Header	string	shipment
DeliveryNoteNumber	**Yes**		**E (s)**	**Supplier unique delivery note number**	**Header**	**string**	
ExpectedDeliveryDate	No		E (s)		Header	xs:date	2013-05-30
Receiver	No		E (s)		Header	Address (see below)	
Shipper	No		E (m)		Header	Address (see below)	
Sender	No		E (s)		Header	Address (see below)	
DeliveryComment	No		E (s)		Header	string	
ShipmentNumber	No		E (s)	Supplier shipment number	Header	string	
Shipment Date	No		E (s)	Date of shipment	Header	xs:date	2012-07-31
PurchaseOrderNumber	No		E (s)	Customer Purchase Order number	Header	string	
Summary Items	No		E (s)	root of summary item elements	Header	string	
Summary Item	No		E (s)	a summary item element	Header	string	
Units	No		E (s)	Root of all packaging unity	Header	list	
Items	No		E (s)	root of all items	Header	list	

Unit	No		E (m)	a unit	Units	Unit type	
Item	**Yes**		**E (m)**	**a item**	**Items**	**Item type**	
PSN	**Yes**	**AI90**	**A (s)**	**Production Site Number**	**Item**	**a2n3**	**CH123**
UID	**Yes**	**AI250**	**A (s)**	**Unique Item Number (Serial Number)**	**Item**	**an30**	
SID	No		A(s)	Summary Item Number			
PurchaseOrderLineNumber	No		E (s)		Item	string	
DeliveryNoteLineNumber	No		E (s)		Item	string	
ProducerProductCode	No	AI240	E (s)	Recommended	Item	an30	
ProducerProductName	No		E (s)	comprehensive product name	Item	string	
ItemQuantity	No	AI30	E (s)	Recommended	Item	an8	
CountOfTradeUnits	No	AI37	E (s)	Recommended	Item	n8	
CustomerProductCode	No		E (s)		Item	string	
PackagingLevel	No	AI20	E (s)	Recommended	Item	n2	see section 7.1
BatchNumber	No	AI10	E (s)		Item	an20	
ProductionDate	No	AI11	E (s)		Item	xs:date	2012-07-31
NEW	No	AI310n	E (s)	Kilograms	Item	n6	(3104)002250
Length	No	AI311n	E (s)	meters	Item	n6	(3112)000001
Width	No	AI312n	E (s)	meters	Item	n6	(3125)123456
DepthThickness	No	AI313n	E (s)	meters	Item	n6	(3123)000125
Area	No	AI314n	E (s)	square meters	Item	n6	(3145)123456
NetVolumeLitre	No	AI315n	E (s)	Litre	Item	n6	(3150)000001
NetVolumeCubic	No	AI316n	E (s)	Cubic meters	Item	n6	(3160)999999
GrossWeight	No	AI330n	E (s)	Kilograms	Item	n6	(3301)000001
ItemComment	No		E (s)		Item	string	
UnitOfMeasure	No		E (s)	See ISO code tab	Item	string	
UNNumber	No		E (s)		Item	string	
TunnelCode	No		E (s)		Item	string	
RiskIdentification	No		E (s)		Item	string	
Code	**Yes**		**E (s)**	**For producer, can be AI90. Must be unique in the system**	**Address**	**string**	**PL001**
Name	**Yes**		**E (s)**	**Name of the business partner**	**Address**	**string**	**Company Name with ...**
Name2	No		E (s)	additional space for business partner name	Address	string	.. many characters
AddressCode	No		E (s)	Unique address code	Address	string	FGS-a2323
Address	No		E (s)	Street and Streetnumber	Address	string	Dynamite Plaza 15
Address2	No		E (s)	Street and Streetnumber	Address	string	Building 2
ZipCode	No		E (s)	Postal code	Address	string	PL-12099
City	No		E (s)	City name	Address	string	Warsaw
Country	No		E (s)	Name of the country	Address	string	Poland
State	No		E (s)	county or subdivision of Country	Address	string	Warsaw

THE FOLLOWING THREE FIELDS MAY BE USED ACCORDING TO THE GS1 DEFINITIONS:

Field	Mandatory	GS1 AI	Element/ Attribute (single/ multiple)	Definition Description	Level	Format	Example
SSCC	No	AI00	E (s)	Serialized Shipping Container Code	Item	string	
GTIN	No	AI01	E (s)	Global Trade Item Number	Item	string	
Serial number	No	AI21	E (s)	Serial number for GTIN identified item	Item	string	000123456789

ANNEX III

SUMMARIZED LIST OF INTERNATIONAL UN/ECE CODES AVAILABLE FOR LOGISTICS USE WHICH ARE RELEVANT FOR FEEM USE IN ADVANCED SHIPPING NOTIFICATION FILES

(Sources - UN/ECE Recommendation No. 20 Annex II / III*, Recommendation No21 Annex V)
Annex II & III are identical but sorted by description (II) and code (III)

Code	Description	
BG	Bag	Annex II, V
BB	Bobbin	Annex V (superceded Annex II)
BX	Box	Annex II, V
C62	One	Annex II to be used in conjunction with One / Piece / Units*
CN	Container	Annex V
CMT	Centimeter	Annex II
CR	Crate	Annex II, V
CS	Case	Annex II, V
CT	Carton	Annex II, V
DR	Drum	Annex II, V
EA	Each	in Annex II
GRM	Gram	in Annex II
KGM	Kilogram	in Annex II
KMT	Kilometer	in Annex II
LTR	Liter	in Annex II
MTR	Meter	Annex II
PA	Packet	Annex II, V
PCE	items	Optional (old code for Piece) or use C62
PF	Pallet	Annex II
PK	Pack / Package	Annex II, V
RL	Reel	Annex II, V
RO	Roll	Annex II, V
SO	Spool	Annex II, V
TNE	Tonne (1000 kg, metric)	Annex II

ANNEX IV

STANDARD XML STRUCTURE EXAMPLE

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<Shipment Hash="e4d909c290d0fb1ca068ffaddf22cbd0" FileCreator="TTE-Trustcenter"
FileType="FEEM-Std" FileVersion="1.000"
          xmlns:xsi=http://www.w3.org/2001/XMLSchema-instance
          xsi:noNamespaceSchemaLocation="FEEM-Std.xsd">
  <MessageID>1</MessageID>
  <MessageTime>2012-12-22T13:06:49.000+01:00</MessageTime>
  <MessageType>Shipment</MessageType>
  <ShipmentNumber>SNR-3</ShipmentNumber>
  <DeliveryNoteNumber>DLNR-1</DeliveryNoteNumber>
  <PurchaseOrderNumber>PON-5</PurchaseOrderNumber>
  <ExpectedDeliveryDate>2012-12-22</ExpectedDeliveryDate>
  <Sender>
    <Code>3745-d785</Code>
    <Name>Import/Export GmbH</Name>
    <AddressCode>236784B</AddressCode>
    <Address>Dynamite Plaza 15</Address>
    <Address2>Building 2</Address2>
    <Zipcode>01099</Zipcode>
    <City>Dresden</City>
    <Country>Germany</Country>
    <State>Saxony</State>
  </Sender>
  <Shipper Order="1">
    <Code>FGS-3s3454</Code>
    <Name>Meyer Transport GmbH</Name>
  </Shipper>
  <Shipper Order="2">
    <Code>FGS-a2323</Code>
    <Name>International Transport Ltd.</Name>
  </Shipper>
  <Receiver>
    <Code>DE999</Code>
    <Name>Coal Ltd.</Name>
    <Name2>Blasting Dep.</Name2>
    <Address>Mining Street 23</Address>
    <Address2>South end</Address2>
    <Zipcode>04123</Zipcode>
    <City>Warsaw</City>
    <Country>Poland</Country>
    <State>Warsaw</State>
  </Receiver>
  <DeliveryComment>Sample Delivery</DeliveryComment>
  <SummaryItems>
    <SummaryItem SID="S1" PSN="DE123">
      <ProducerProductCode>testproduct1</ProducerProductCode>
      <PurchaseOrderLineNumber>1</PurchaseOrderLineNumber>
      <DeliveryNoteLineNumber>1</DeliveryNoteLineNumber>
      <PackagingLevel>00</PackagingLevel>
      <ProductionDate>2012-07-20+02:00</ProductionDate>
      <NEW>0.001</NEW>
    </SummaryItem>
```

```
  <SummaryItem SID="S2" PSN="DE123">
    <ProducerProductCode>testproduct2</ProducerProductCode>
    <PurchaseOrderLineNumber>2</PurchaseOrderLineNumber>
    <DeliveryNoteLineNumber>2</DeliveryNoteLineNumber>
    <PackagingLevel>00</PackagingLevel>
    <ProductionDate>2012-07-20+02:00</ProductionDate>
    <NEW>0.001</NEW>
  </SummaryItem>
</SummaryItems>
<Units>
  <Unit PSN="DE123" UID="XYZ-001000000000">
    <ItemQuantity>240</ItemQuantity>
    <CountOfTradeUnits>6</CountOfTradeUnits>
    <PackagingLevel>04</PackagingLevel>
    <Units>
      <Unit PSN="DE123" UID="XYZ-001001000000">
        <ItemQuantity>40</ItemQuantity>
        <CountOfTradeUnits>4</CountOfTradeUnits>
        <PackagingLevel>03</PackagingLevel>
        <Units>
          <Unit PSN="DE123" UID="XYZ-001001001000">
            <ItemQuantity>10</ItemQuantity>
            <CountOfTradeUnits>10</CountOfTradeUnits>
            <PackagingLevel>01</PackagingLevel>
            <Items>
              <Item PSN="DE123" UID="XYZ-001001001001" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001002" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001003" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001004" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001005" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001006" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001007" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001008" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001009" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001001010" SID="S1"/>
            </Items>
          </Unit>
          <Unit PSN="DE123" UID="XYZ-001001002000">
            <ItemQuantity>10</ItemQuantity>
            <CountOfTradeUnits>10</CountOfTradeUnits>
            <PackagingLevel>01</PackagingLevel>
            <Items>
              <Item PSN="DE123" UID="XYZ-001001002001" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002002" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002003" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002004" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002005" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002006" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002007" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002008" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002009" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001002010" SID="S1"/>
            </Items>
          </Unit>
          <Unit PSN="DE123" UID="XYZ-001001003000">
            <ItemQuantity>10</ItemQuantity>
            <CountOfTradeUnits>10</CountOfTradeUnits>
            <PackagingLevel>01</PackagingLevel>
```

```
            <Items>
              <Item PSN="DE123" UID="XYZ-001001003001" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003002" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003003" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003004" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003005" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003006" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003007" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003008" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003009" SID="S1"/>
              <Item PSN="DE123" UID="XYZ-001001003010" SID="S1"/>
            </Items>
          </Unit>
```

...

```
          <Unit PSN="DE123" UID="XYZ-002006004000">
            <ItemQuantity>10</ItemQuantity>
            <CountOfTradeUnits>10</CountOfTradeUnits>
            <PackagingLevel>01</PackagingLevel>
            <Items>
              <Item PSN="DE123" UID="XYZ-002006004001" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004002" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004003" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004004" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004005" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004006" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004007" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004008" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004009" SID="S2"/>
              <Item PSN="DE123" UID="XYZ-002006004010" SID="S2"/>
            </Items>
          </Unit>
        </Units>
      </Unit>
    </Units>
  </Unit>
</Units>
</Shipment>
```