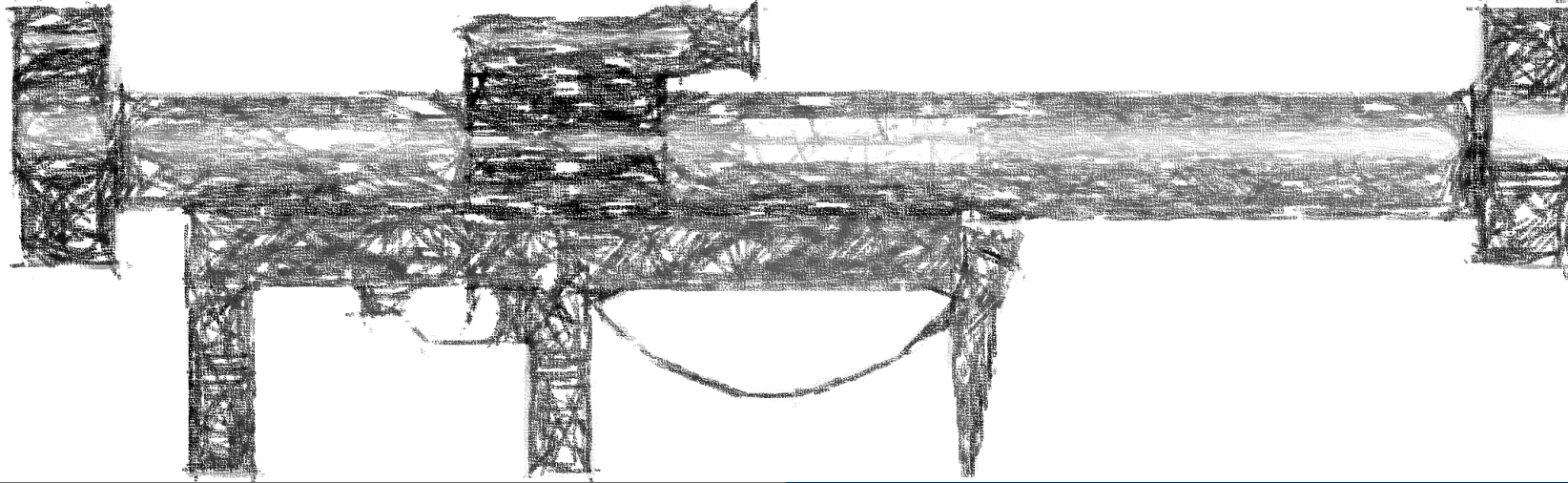


Dynamit Nobel Defence



Post-Shipment Control

Burbach, 26th April 2022

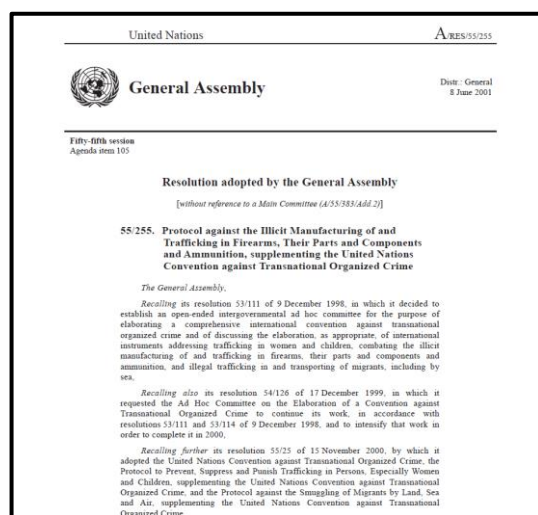


1. Motivation
2. Labeling technologies at DND
3. DND Post Shipment Control Software
4. Summary

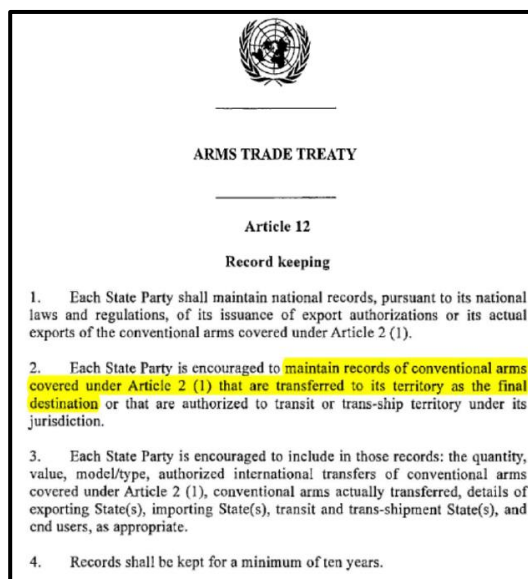


PART 5		
The International Tracing Instrument		
Theme	ITI paragraphs	Provisions
Marking	7, 8, 10	Ensure that marks are on an exposed surface, conspicuous without technical aids or tools, easily recognizable, readable, durable, and, as far as technically possible, recoverable, and ensure that essential or structural components of weapons have unique markings.
	8(a)	Require either (a) a unique marking that provides the name of the manufacturer, the country of manufacture, and the serial number, or (b) an alternative marking using simple geometric symbols in combination with a numeric and/or alphanumeric code, permitting ready identification of the country of manufacture, and, wherever possible, mark additional information such as the year of manufacture, weapon type/model, and calibre.
	8(e)	Encourage manufacturers to develop measures against the removal or alteration of markings.

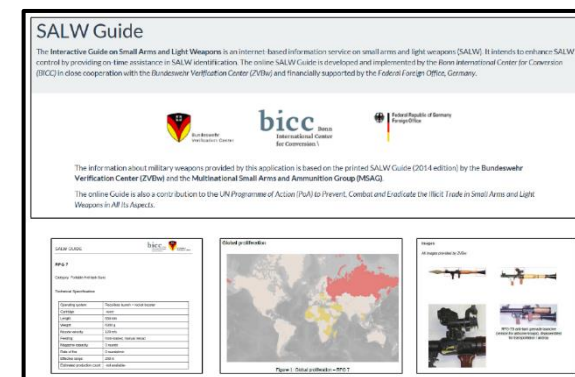
The International Tracing Instrument



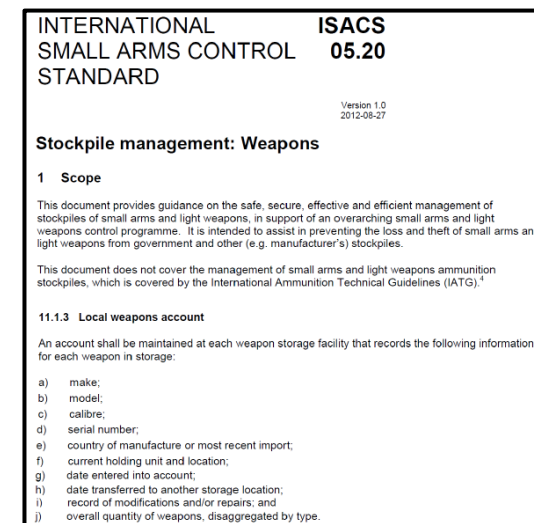
UN Fire arms protocol



Arms Trade Treaty



Small Arms and Light Weapons Guide



International Small Arms Control Standard



Marking of weapons due to political, military or logistical requirements

Granting a machine-readable identification for all logistical processes
Ensuring a continuous, transparent flow of information and goods



Labeling & serialization
of materials



Preventing, eradicating illicit trafficking in
small arms and light weapons (SALW)
and related ammunition



ATT/ SALW/ ITI (Action program of
the UN and the state governments)

Political principles of the federal government for the **export of war weapons**



Post-Shipment Control



Bundesministerium
für Wirtschaft
und Energie



Bundesamt
für Wirtschaft und
Ausfuhrkontrolle





DataMatrix-Code



Post-shipment control, weapon storage and administration



UHF-RFID (passiv)



Forensic Marking



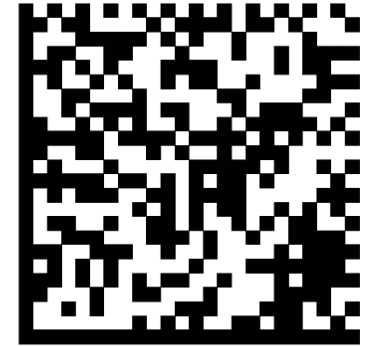
Post-Mortem
Analysis



- Widespread 2D barcode
- High fault tolerance
- Can be read in any position

Stored data according to international standards

- GTIN (item number)
- S/N (serial number)
- CoO (country of origin)
- Ship to (recipient country)
- Caliber



GTIN(01):	04057533008696
S/N(21):	050215134004
CoO(422):	276
Ship to(421):	48455640
Caliber(3323):	000060



Concept

- Possibility to check inventory
- Label attached to each box
- Proven technology
- Easy, quick reading
- Equipment required: scanners

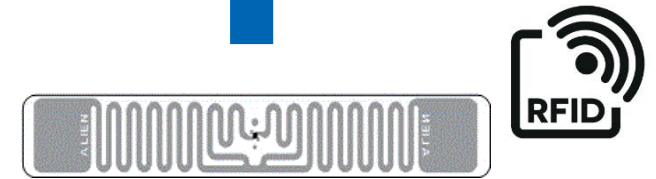


GTIN(01): 04057533008696
S/N(21): 050215134004
CoO(422): 276
Ship to(421): 48455640
Caliber(3323): 000060



Concept

- Integration of a passive UHF-RFID in the weapon
- RFID tags are not removable without damaging weapon
- Stored information identical to label
- Equipment required: RFID reader
- Contactless identification & localization
- No batteries required
- Robust against environmental influences
- Simultaneous detection of several transponders



RFID = radio-frequency identification



GTIN(01):	04057533008696
S/N(21):	050215134004
CoO(422):	276
Ship to(421):	48455640
Caliber(3323):	000060





SCAN DATAMATRIX

SCAN RFID

UHF-RFID

DMC

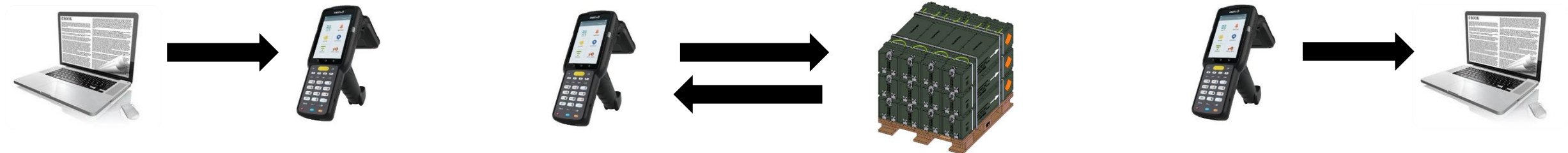


INVENTORY

Mobile handheld computer with DND PSC App



	A	B	C	D	E	F	G	H	I	J	K
1	GTIN(01;14 digits)	SNr. (21;12 digits)	CoO (422; 3 digits)	Ship to (421;8 digits)	Caliber (3323;6 digits)	Time	Sought	Read		Name	Location
2											
3	4057533013874	27032024C078	276	37631021	60	2021-06-17 14:10	true	true			
4	4057533013874	27032024C079	276	37631021	60	2021-06-17 14:10	true	true			
5	4057533013874	27032024C081	276	37631021	60	2021-06-17 14:10	true	true			
6	4057533013874	27032024C083	276	37631021	60	2021-06-17 14:10	true	true			
7	4057533013874	27032024C085	276	37631021	60	2021-06-17 14:10	true	true			
8	4057533013874	27032024C086	276	37631021	60	2021-06-17 14:10	true	true			
9	4057533013874	27032024C088	276	37631021	60	2021-06-17 14:10	true	true			
10	4057533013874	27032024C089	276	37631021	60	2021-06-17 14:10	true	true			
11	4057533013874	27032024C091	276	37631021	60	2021-06-17 14:10	true	true			
12	4057533013874	27032024C094	276	37631021	60		true	false			
13	4057533013874	27032024C095	276	37631021	60		true	false			
14	4057533013874	27032024C098	276	37631021	60		true	false			
15	4057533013874	27032034C001	276	37631021	60		true	false			
16	4057533013874	27032034C002	276	37631021	60		true	false			
17	4057533013874	27042012C001	276	37631021	60		true	false			
18	4057533013874	27042012C002	276	37631021	60	2021-06-17 14:10	true	true			
19	4057533013874	27042012C003	276	37631021	60		true	false			
20	4057533013874	27042012C004	276	37631021	60		true	false			
	-----	-----	---	-----	--			--			



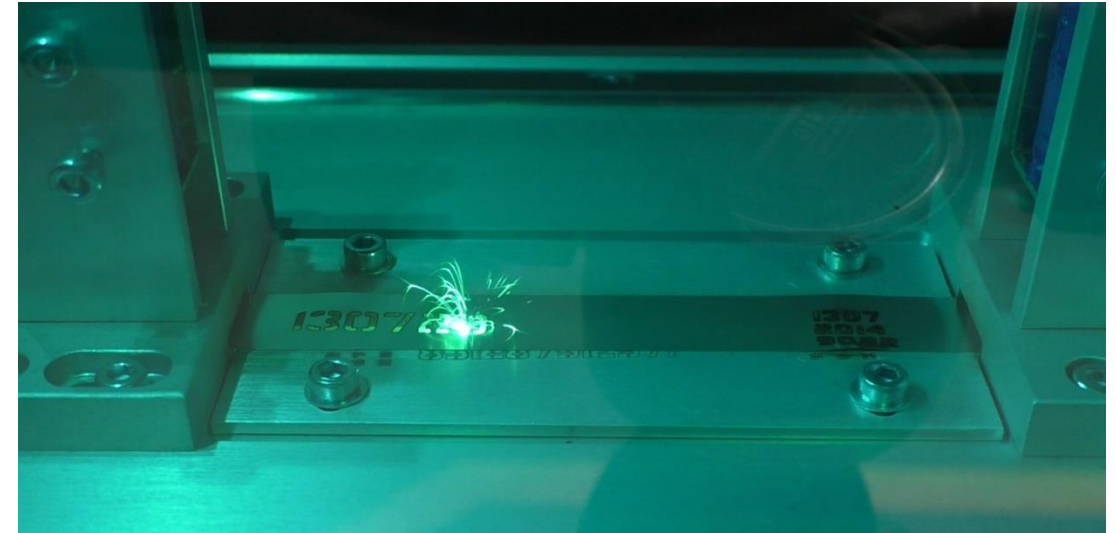
Requirements

- Traceability of found weapons
- Tamper-proof integration
- Externally not visible
- Minor intervention in the production process
- Can be visualized in the X-ray image



Solution

- Lasered labels with serial numbers
 - Labeling redundant
 - Single line
 - Three lines
- DMC
- Removing the tag will make the weapon inoperable
- Required equipment: X-ray device





DMC (DataMatrix-Code)

- On transport box



DMC Scanner

Post-shipment control, weapon storage and administration



UHF-RFID (passiv)

- In Firing device



RFID Reader



Laser marking

Implementend in launch
tube



X-Ray Device

Post-Mortem Analysis



