



Eighth Biennial Meeting of States to Consider the Implementation of the Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects
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Working paper submitted by Belgium

Recent developments in the production, technology and design of small arms and light weapons (SALW)

The need to recommend the establishment of an open-ended technical expert group

1. New developments regarding small arms and light weapons (SALW)

The way small arms and light weapons are designed and manufactured has changed over the last 30 years. While SALW were originally made of steel and wood, more and more SALW components are now made of polymer which is lighter and can be easily molded and painted. The design of weapons has also changed with the emergence of modular weapons, i.e. weapons that can be converted from one caliber to another or that can be re-configured by using different components, e.g. different barrels with variable length. Both these developments present challenges for the application of the International Tracing Instrument.

Besides these developments on the industrial side, the unlicensed manufacture of durable small arms and light weapons using increasingly cheap and reliable additive manufacturing processes ('3D printing') create special challenges for the unique identification of firearms required under the International Tracing Instrument (ITI).

2. Challenges to the International Tracing Instrument (ITI)

a. Use of polymer

The use of polymer in the design of SALW has increased since the 1970's. At first limited to parts such as the handguard or the buttstocks, highly resistant polymer is now widely used for the entire frame of weapons.

What is the impact of this evolution on the ITI? Para. 7 of the ITI specifies that *“all marks required under this instrument are on an exposed surface, conspicuous without technical aids or tools, easily recognizable, readable, durable and, as far as technically possible, recoverable.”* Markings on a polymer surface are relatively easy to alter or remove in comparison with markings on metal. Manufacturers will therefore need to take appropriate measures to ensure that markings on polymer-frame weapons meet ITI requirements.

This issue is particularly important for countries that practice import markings. The marking of imported weapons with the year and country of import, as the ITI recommends and the Firearms Protocol requires, greatly facilitates the tracing of seized weapons. Some technologies exist to mark polymer frame weapons (laser engraving, dot-peen/micro-percussion), but they are not widespread and could cause a problem for importing countries due to the cost of acquisition and training.

Another solution would be to adopt either the use of windows that make it possible to read inscriptions on metallic parts situated under a polymer element or the use of metallic inserts in the polymer frame to host the markings. Regarding the metallic insert, it should be inserted in a way that its removal would render the weapon unusable. For countries marking the weapons at import, there is a need for additional specifications since the metal tag should be long enough to host the additional import markings.



Metal tag

Example of the metal tag approach (© FN America)



Example of the “window to metal frame approach” (© Beretta)

b. Modular weapons

Since the early 2000’s new designs of small arms were developed to render them adaptable to different operating environments. This led to the introduction of ‘convertible’ or ‘re-configurable’ weapons with different calibers and interchangeable parts and components.

The content of the marking will have to be adapted since art. 8a of the ITI recommends the marking of type, model and caliber. Yet type and caliber can be changed on fully modular weapons.

Moreover, the ITI’s requirement to mark an ‘essential or structural component’ (§10 of the ITI) of the weapon such as the frame and/or receiver requires further consideration in the case of a modular weapon with a split receiver. A common understanding regarding which part of the split receiver (upper or lower) is the core component of the weapon would allow for common practices on the markings in line with the ITI.



Example of a modular weapon with a split receiver (© FN America)

c. 3D-printed weapons

While the legality of 3D-printed small arms and light weapons and their components varies from one country to another, the diffusion of affordable additive technologies and the free availability of weapon design files online makes 3D printing attractive for unauthorized end-users who are not able not acquire weapons on the legal market. There is therefore a great chance that additive manufacturing techniques could be used for unlicensed production of small arms and light weapons which would run against key provisions of the Programme of Action (e.g. the obligation by states to exercise effective control over the production of small arms and light weapons (Para II, 2)) and the ITI's provisions under Section III covering the unique identification of all firearms manufactured. 3D-printed weapons present particular challenges for the ITI since there is a high risk of seeing an increase in cases of unmarked and untraceable weapons. Even in the case of a licensed production, since most 3D-printers use different types of polymer for the manufacture of components, the challenge regarding the durability, non-removability and recovery of markings applies in the same way as polymer weapons produced at a bigger industrial scale. There is also the challenge of enforcing any marking requirements given that additive manufacture occurs almost exclusively in the domain of unlicensed production.



Prototype of 3D-printed FGC-9 made by its designer, JStark1809. (© JStark1809 / Deterrence Dispensed)

3. Why is a discussion necessary on this topic at BMS8?

Polymer framed, modular and 3D-printed weapons present challenges to the ITI. In the case of polymer weapons, the risk is to have markings on polymer that are less durable than what is prescribed by the ITI. The metal tag and “window frame” approaches can provide a solution to this issue but should be standardized (notably the length of the tag or the fact it should not be easily removable) if importing countries need to apply import markings. Regarding modular weapons, if different manufacturers of the same model chose different locations on the weapons where they put the serial number, guns without any serial number or bearing two different serial numbers could make their appearance which will render tracing operations much more difficult than they are today. 3D-printed weapons increase the risk of illicit manufacturing, easier access to weapons for unauthorized end-users and untraceable weapons.

BMS7 Outcome Document stated that: “ *[States resolve] To continue exchanging views on recent developments in small arms and light weapons manufacturing, technology and design, in particular polymer and modular weapons, and on ways of addressing them and to consider the proposal of an open-ended technical expert group at the Eighth Biennial Meeting of States, inter alia mandate, funding, time frame and modalities that could develop action-oriented next steps agreed by consensus that*

address challenges and opportunities of such technologies to the marking, tracing and record-keeping of such weapons.”

BMS8 is therefore the perfect opportunity to discuss the modalities of such an open-ended technical expert group and to recommend the establishment of such a group at RevCon 4. Belgium supports the proposal of language made by a State during the informal consultations led by the chair of the BMS8:

“To recommend the establishment of an open-ended technical expert group to develop agreed recommendations to ensure the full implementations of the International Tracing Instrument and the Programme of Action in light of recent developments in small arms manufacture technology and design, including 3D printing, modular and polymer weapons. The group, to be composed of governmental subject matter experts, should begin its work as soon as possible.”

The focus put on the inclusion of subject matter experts in this body is important due to the highly technical nature of the issue being discussed.

4. Is this a new issue?

The issue of new technologies and their impact on the ITI has been raised by several state parties to the PoA since BMS4 in 2010. The issue was acknowledged in the reports of BMS 5 (Part II, §19) and BMS6 (Part II §79 and Annex § 6). Two Meetings of Governmental Experts were convened, one in 2011 (MGE1) and the next in 2015 (MGE2). A report of the Secretary General was presented on this topic at BMS 5 as well. The third RevCon of the PoA discussed the issue of new technologies and requested a report of the UN Secretary-General on this issue before the end of 2018. This report was published under reference A/74/187. End of 2019, the General Assembly adopted Resolution 74/60 entitled “The illicit trade in small arms and light weapons in all its aspects” which recalled the need to address this issue in a timely manner. In the absence of progress in the framework of the UN PoA, a number of individual countries or groups are examining national/regional standards for the marking of polymer framed and modular weapons in order to keep the tracing of modern weapons practicable. This could lead to a variety of national/ regional standards. The ITI being a universal instrument, discussions on a way to address the issue of new technologies in an open-ended technical working group would guarantee an inclusive process among all stakeholders and might lead to recommendations on common methods and standards to ensure that developments in technology and design do not render the International Tracing Instrument less effective.