



## Product and technical overview



# Tracing the untraceable

AmTag™ is an innovative traceability solution designed to monitor the diversion of ammunition and identify supply chain vulnerabilities. Developed to support the through-life management of ammunition, as elaborated in the UN Global Framework on Conventional Ammunition<sup>1</sup>, AmTag™ renders previously untraceable ammunition fully traceable.



<sup>1</sup> United Nations. 2023. *Final report of the open-ended working group to elaborate a set of political commitments as a new global framework that will address existing gaps in through-life ammunition management*. A/78/111. 16 June.

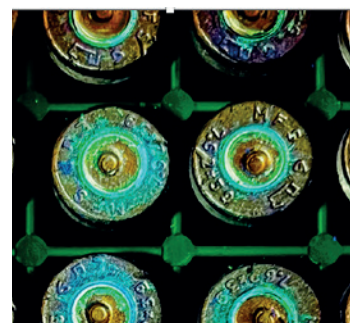
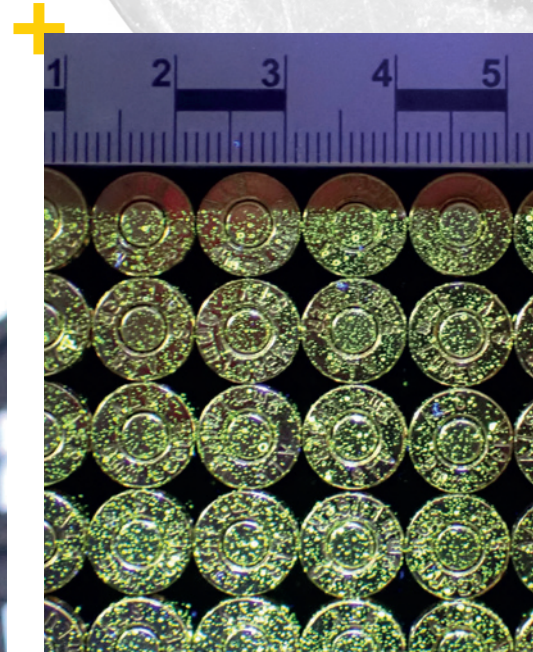


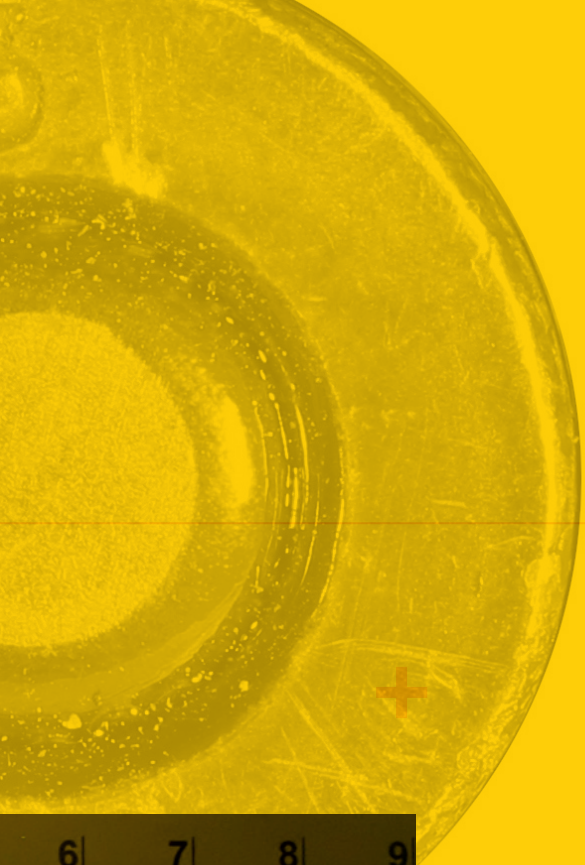
The AmTag™ Solution is applicable to any situation where national governments seek to enhance the traceability of ammunition.



# / The AmTag™ Solution

A chemical taggant, AmTag™ employs a cocktail of rare earth metals to generate a unique chemical batch code, which is assigned to the lawful end user. If the ammunition is diverted, and later seized or recovered, exposure to UV light reveals the presence of the taggant. The taggant is then swabbed and processed in a specialised laboratory to identify the batch code and the end user.





## / Countering ammunition diversion

AmTag™ can be employed in various ways to suit national requirements, including integration into the ammunition manufacturing process or via post-production application (whether to the ammunition itself or to its packaging) throughout the supply chain. It is best employed as one component in a suite of measures designed to enhance ammunition traceability, including the reduction of ammunition lot sizes by means of sub-lotting and the consistent use of ammunition lot and AmTag™ batch numbers in all production, sales, transfer, and national inventory records.

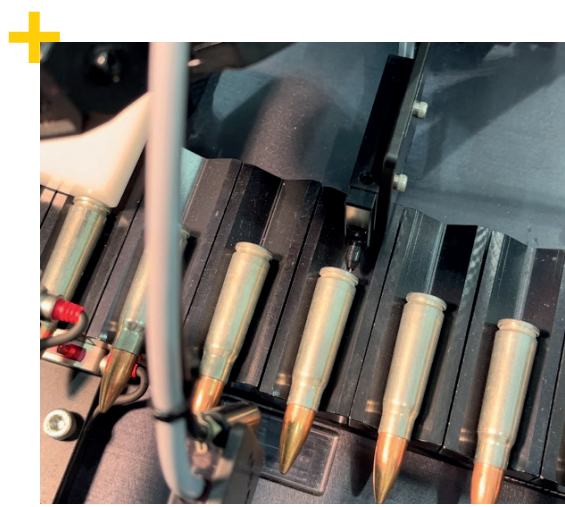
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## / Factory integration

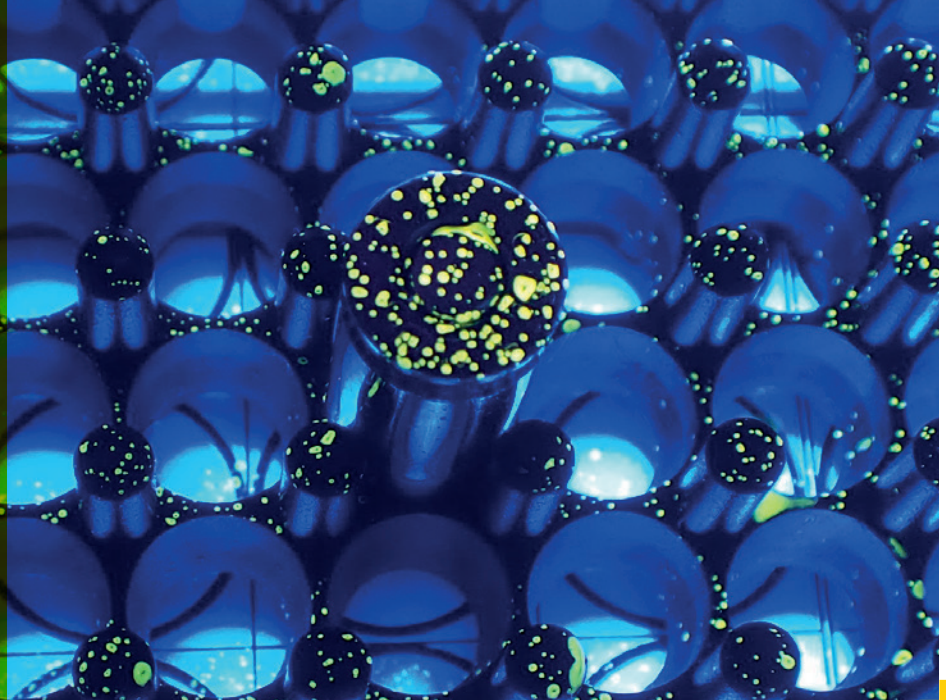
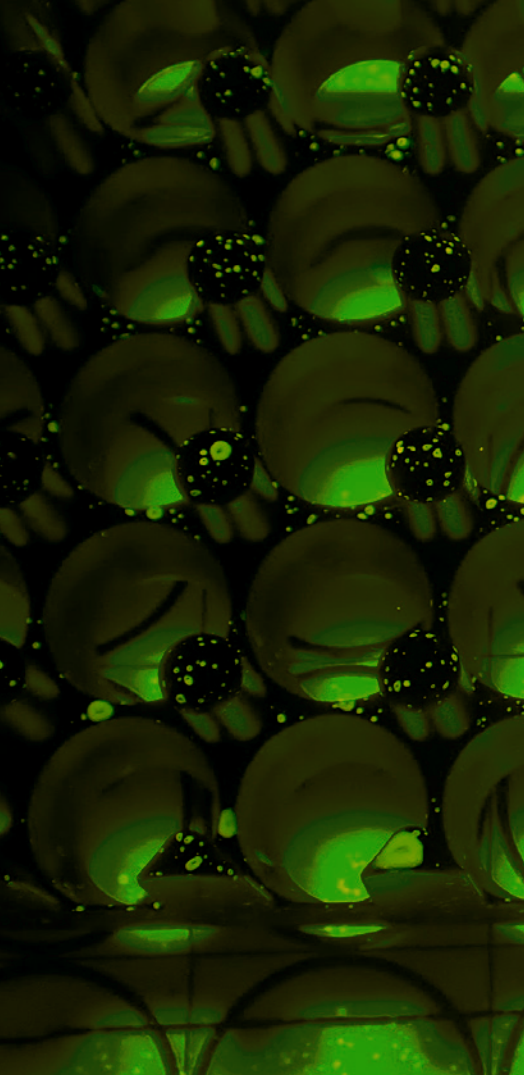
AmTag™ is incorporated into the primer sealant. This process employs existing sealant application processes, does not require additional production or processing machinery (unlike, for example, laser marking), and is therefore an extremely cost-effective solution to apply traceability at the mass production stage. Differing batch sizes can be assigned a unique batch code, depending on a national government's requirements. Smaller batch sizes enhance traceability.



- *AmTag™ applied with a primer sealant applicator during production*

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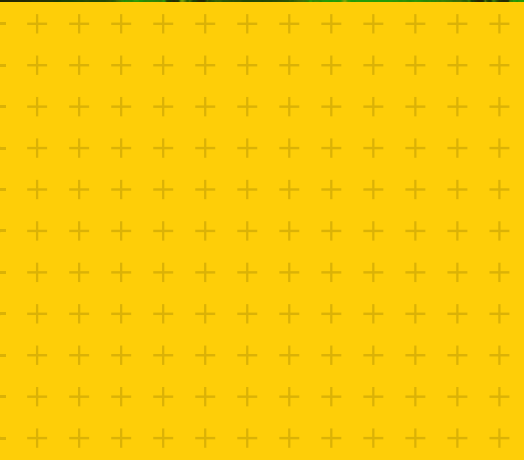


## / Post production application

AmTag™ is designed to be applied at any stage in the supply chain. This includes during ammunition reprocessing (prior to packaging) and the manual application of AmTag™ using a small, field-deployable sprayer (applied to the ammunition itself or to its packaging) to enhance the traceability of operational ammunition.

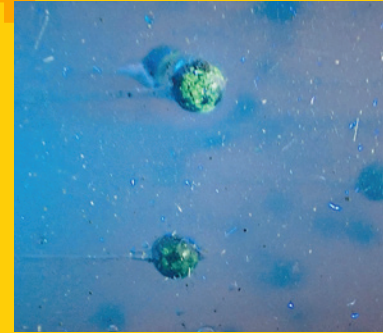
Manual AmTag™ application trials indicate that more than 30,000 rounds of ammunition can be tagged with only 50 ml of AmTag™ solution (test results for 7.62 x 39 mm ammunition).

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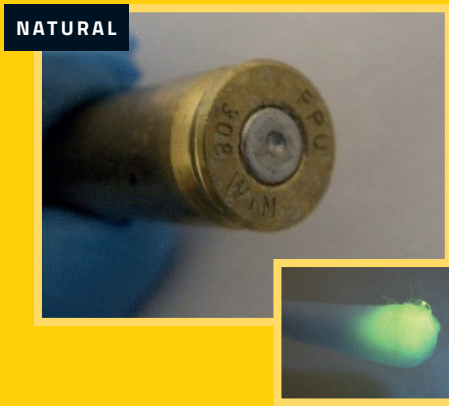
# / Testing and resilience

AmTag™ has been subject to live-fire function testing in gas- and recoil-operated firearms<sup>2</sup>, environmental and abrasion<sup>3</sup> testing on small-calibre ammunition under a variety of simulated field conditions, industrial application testing, and third-party scientific research since 2020. AmTag™ creates no observable effect on the performance of ammunition or firearms, or to the safe storage, use, and long-range accuracy of ammunition.



AmTag™ treated shotgun pellets fired into ballistic gel, demonstrating firing and impact survivability.

## AmTag™ under different lighting conditions



AmTag™ is indelible and creates no observable effect on the performance of ammunition or firearms.

<sup>2</sup> Including 9 x 19 mm Glock 17 pistol, 5.56 x 45 mm SA80 A2 (British Army service rifle), 7.62 x 39 mm Type 56-1 Norinco rifle (AK-pattern), and 12g proof test barrel.

<sup>3</sup> Resilience testing on brass and steel small-calibre cartridges, using automated abrasion testing in industrial case-tumblers filled with walnut husk media, demonstrate that typical case cleaning processes cannot remove all traces of AmTag™.





# / Six steps to ammunition security

**Training** / As an AmTag™ customer, once the taggant solution has been applied to a stockpile, you will receive training on AmTag™ identification and sampling, and if required, on post-production application of AmTag™.

**Security** / The administration of AmTag™ codes and their processing is conducted confidentially, maintaining data security, and ensuring that only authorised entities are informed of cases of diversion. The information associated with unique AmTag™ codes remains compartmentalised.

**Detection** / Detecting diversion, in all cases, requires that competent national authorities screen all seized and recovered ammunition for the presence of AmTag™ by exposing it to UV light. National authorities subsequently swab any AmTag™ taggant identified and send samples to the AmTag™ laboratory.

**Identification** / The AmTag™ laboratory returns the taggant batch number to the competent national authorities, which enables authorities to identify the lawful end user in production, sales, transfer, and national inventory records. This enables competent national authorities to identify the ammunition's last legal custodian and investigate the circumstances of diversion.



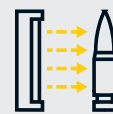
01



## Training

Competent national authorities trained on AmTag™ ID and sampling

02



## Screening

UV screening of all seized and recovered ammunition

03



## Sampling

Competent national authorities take AmTag™ swabs

04



## Identification

AmTag™ laboratory identifies the batch number from swabs

05



## Provision

Batch number provided to competent national authorities

06



## Tracing

Competent national authorities identify user and point of diversion

# / Traceability

The AmTag™ Solution allows traceability to a level of granularity never experienced before in ammunition production, supply, and management. Prominent use of the AmTag™ logo in ammunition storage facilities and on ammunition packaging acts as a strong deterrent to diversion.

- *AmTag™ treated shotgun pellets fired into ballistic gel, demonstrating firing and impact survivability.*

## SERVICE OPTIONS

To enquire about deploying The AmTag™ Solution to your existing or future ammunition stockpiles:

Visit

[www.amtag.tech](http://www.amtag.tech)

Email

[sales@amtag.tech](mailto:sales@amtag.tech)

# / About AmTag™

## Partnership

The AmTag™ Solution was conceived and developed by Conflict Armament Research (CAR). AmTag™ is operated by Torchlight Technologies Ltd. The AmTag™ trademark is owned by CAR, the majority shareholder of Torchlight Technologies Ltd.

AmTag™ partners with DeterTech UK Ltd for the production and analysis of AmTag taggant and maintains industry partnerships with entities associated with the ammunition manufacturing industry.

## Accreditations

AmTag™ uses technologies that conform to British Security Industry Association (BSIA) PAS 820 of Group A, which guarantees that taggants remain detectable for a minimum of 5 years after application.

The taggants and associated data management are certified and registered with BSIA PAS 820 of Group A, BSIA 10121-1:2022, ISO/IEC 17025:2017, ISO/IEC 27001:2013, ISO 9001:2015, and Forensic Science Regulators Codes of Practise V7.

