



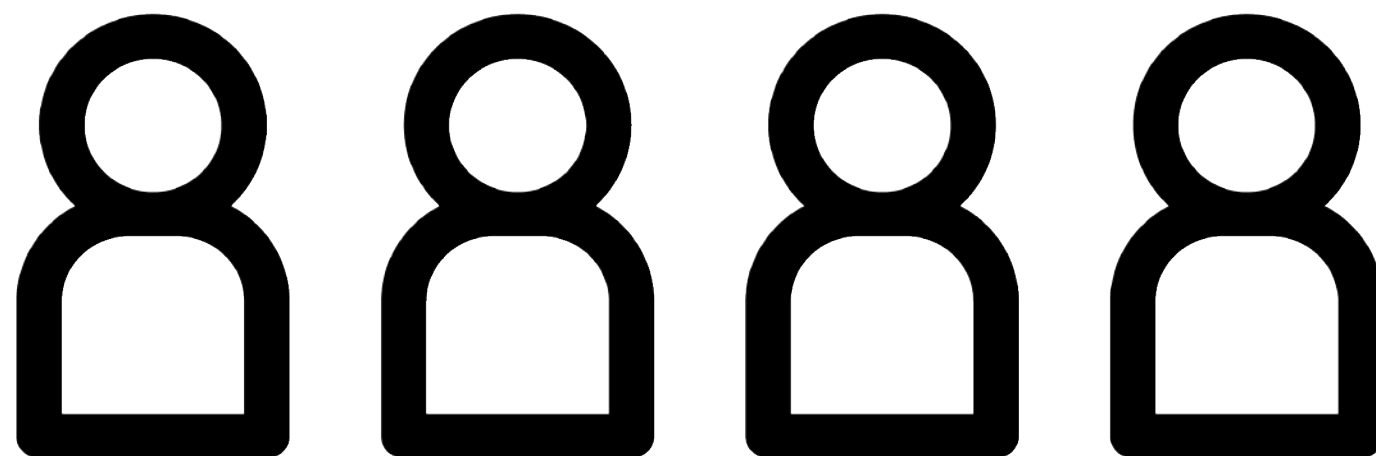
# IBNS

Intelligent Banknote Neutralization Systems

## *Introduction to Cash Protection*

## WHITE PAPER





*thank you !*

Thank you for requesting a copy of this White Paper which has been specially produced by Oberthur to identify the risks faced by ATM deployers and the Intelligent Banknote Neutralization systems measures that have been proven to successfully deter attacks.

If you would like further information on any of the issues associated with cash outlined in the white paper please contact Oberthur Cash Protection :

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# 1 WHAT IS INTELLIGENT BANKNOTE NEUTRALIZATION?

There is clear evidence that the number of ATMs attacks are increasing on a global basis. It is also recognized that upgrading the ATM's physical security such as with higher grade vaults, locking bars, enclosures etc. does not deter attacks. All that happens is that the criminals use even more powerful equipment such as heavy duty grinders, hydraulic jaws and eventually increased quantities of explosives to access the cash in the cassettes.

What has been proven to deter attacks as illustrated by evidence from Europe, Chile, Malaysia etc. is that removing the value of the stolen cash by degrading it with indelible high security ink means thieves quickly realize that the cancelled banknotes are not worth the risk of the attack so move to a softer target.

The 2019 paper written jointly by Europol, the EU's law enforcement agency and European Crime Prevention network, suggested that it was possible to combat ATM attacks by reducing the rewards. One of the measures proposed was 'making the money traceable by staining the stolen notes making it impossible to spend'.

There is a clear 24/7 consumer demand for cash from ATMs in a wide range of often potentially higher risk locations such as retail stores, malls, gas stations, rural areas, so deployers are looking to provide the service but reduce the risk of physical attack by explosives etc. With ATMs in these less secure locations it means in turn that there is an added risk for the cash replenishment organizations.

This document describes how Intelligent Banknote Neutralization Systems will give ATM deployers the confidence to provide customer service knowing that the cash in the ATM is secured at any time.



*"Smart technology can help to prevent violent high-volume cash crimes that affect neighborhoods where people live, play and work"*

## Intelligent Banknote Neutralization System : IBNS

IBNS cash protection solutions are available for all products in the cash distribution cycle - ATMs, Retail and Cash In Transit.

For ATM Cash Cassettes IBNS provides added security in the event of a physical attack by ram raid, pull out, grinder or explosives. With OCP's dual bar in-cassette system, when activated it will dye 100% of the notes by a minimum of 20% coverage; this potential degradation serves as a major deterrent against attacks.



Thieves are aware that inked notes even when attempting to wash them will have no value since the high security ink of the IBNS system cannot be removed without destroying the security features of the banknote.

Increasing physical protection e.g. CEN 3 vaults, only encourages criminals to increase their aggression and for instance use more explosives in their attempt to reach the cash.

*"Disabling the criminal by marking cash as stolen"*



Oberthur's IBNS solution, In Cassette Staining Device, ICSD, has been proven across Europe and globally. It has been certified by a number of authorities and organizations including those in France, Germany, Italy and The Netherlands. Meeting the stricter French standard is important as it means that all users will have the confidence that the ICSD will work effectively when required.

This is not always the case with some systems, as has been seen in Belgium where there is no such certification. Oberthur's 'air bag' technology will work effectively within 250 milli seconds even with explosive attacks where systems with gas bottle dispensing type technology from real world evidence shows do not.

Another important certification is PAS 40 from the British Standards Institute, this applies to the ink coverage of the note in the event of attack and how difficult it is to remove evidence that the note was inked. OCP fully meets the PAS 40 requirements.



Any IBNS system should be available on a range of ATMs so as to not restrict the choice of future ATM.

OCP's ICSD is available for a wide range of ATM makes and models - NCR, Diebold Wincor, GRG, NMD Hyosung as well as cash recyclers. This gives OCP users the confidence to incorporate additional ATMs into their estates with the same high level of protection.

Oberthur is the world's leading supplier of IBNS solutions, installing the world's first IBNS solution over 20 years ago. This IBNS technology is used to provide a range of solutions to meet the specific needs of ATM deployers and Cash in Transit organizations.



*"Available for a wide range of ATMs"*







OCP integrates the highest quality IBNS ink available in the market today manufactured by SICPA in Switzerland.

## High security ink

High security ink is the key component in IBNS which is used to permanently mark banknotes, this ink can be in various colors; however dark green is common and widely recognized to identify the note from being stolen. A critical feature of these inks is that they be removed from the banknote and any attempts to do so will result in severely damaging the banknote and its security features.

*"It must be guaranteed that ink dyes banknotes to the point of being easily identified as stained and recognised by the public as being stolen. It must also be guaranteed that the ink cannot be removed from the banknotes"*

Examples of degraded notes:



➤ Eurozone: 20 Euro



➤ Kingdom of Saudi Arabia: 500 Riyal



➤ USA: 1 US Dollar



**Homologated and Certified**  
Tested and approved by government and appropriate authority laboratories; successfully passed the most stringent international tests e.g. France's CNPP.

**Indelible**  
Cannot be removed from the banknotes, polymer or cotton/paper, extremely difficult to remove from clothes or skin.

**Non-hazardous**  
Compliant with EU and other safety standards.

**Fast**  
To be effective against explosive attacks, full activation within milliseconds.

**High-quality coverage**  
All PAS compliant IBNS protected banknotes (100%) will be stained to a minimum of 20% of the surface area of each banknote.

**Machine-detectable**  
Use an integrated IR marker so that automated readers such as counting, deposit, vending machines, etc. will detect it as a stolen note.

**Traceable**  
To connect stained notes to their owner or the crime scene, tracers (combinations of mineral powders known as Rare-Earth Elements) are added to the ink.

OBERTHUR CASH PROTECTION



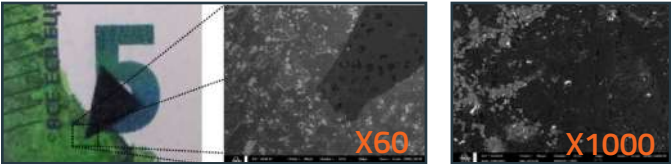
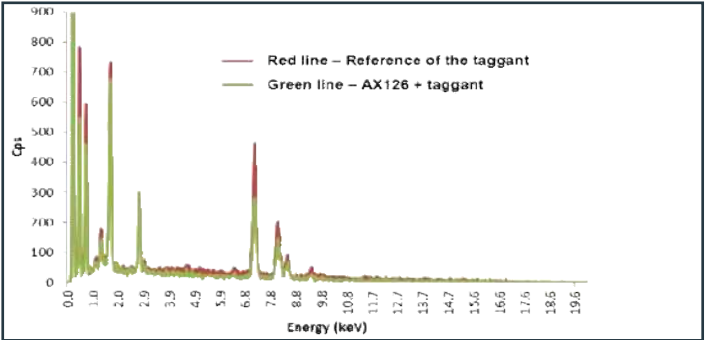
# Traceability : unique taggants



An important feature is to be able to identify the incident where a degraded note was stolen. This is made possible by using taggants within the ink which reference the note back to the very cash cassette that it was stolen from, greatly increasing the chances of successful prosecutions.

OCP uses rare earth taggants which are easily identified by using a Scanning Electron Microscope (SEM) equipped with Energy Dispersive X-ray analyzers (EDX), which are often found in police laboratories.

The bright points shown in the magnified image of the 5 Euro banknote are analyzed using the EDX, then compared to the Taggant specification list provided by OCP to identify the cassette that the ink came from.



➤ 60x and 1000x magnified by the Scanning Electron Microscope

➤ Taggant characterisation

# 2 | IBNS : APPLICATIONS

*“IBNS can be used to protect cash in all stages of the cash distribution cycle: ATM, Cash-in-Transit and Retail”*

## ATM

IBNS is used to protect ATM cash against physical attacks - mechanical, thermal or explosive.  
The example cash cassette shown here has had its lid upgraded with the OCP In Cassette Staining Device.  
With the controller and appropriate sensors this system can protect the ATM from all types of physical attack including explosives.

Ink protected cash cassette as part of the ICSD system. The technology is integrated in the cassette lid without reducing note capacity.



## Cash-In-Transit

Cash In Transit operators can also benefit from the use of IBNS to protect cash during transit - in vehicles as well as across the pavement.  
Used by Cash in Transit companies across the globe, IBNS containers are a proven deterrent against any physical attack.  
The IBNS container can be tracked in real-time by an integrated GPS facility and will neutralize all banknotes in the event of illegal access to the containers. IBNS always protects the cash as well as the security of the CIT personnel.

Secure cash movements across pavements, in vehicles.



## Retail

There is a growing demand for IBNS to protect cash in retail environments such as deposit machines, ticketing, gaming and vending machines.

Cash Deposit Machine equipped with IBNS



# BENEFITS OF IBNS

All evidence clearly shows that once IBNS is implemented the level of attacks falls noticeably. The true cost of ATM attacks is not just the money stolen but the all the collateral costs, even of unsuccessful attacks.



## Proven to be effective against all types of physical attacks

When implemented, statistics clearly show that the level of attacks drastically reduce. The true cost of ATM attacks is not just the cash that is stolen but all the (replacement) costs associated with the unsuccessful attacks, as well as collateral damage.



## Reducing collateral damage

As ATM physical security increases with stronger vaults, locking bars, enclosures etc., thieves are using even more aggressive methods of attack such as moving to the use of explosives or even large mechanical earth moving equipment. As a result it is increasingly common for buildings to be destroyed as a result of ATM attacks. It is not just property around the ATM installation but the negative impact on personal and customers that are at risk, plus those living above or close to the ATM.



## Cost savings

IBNS is less costly than traditional 'armored' protection, savings include insurance premiums and especially from adopting soft skin vehicles.



## Reducing the environmental impact

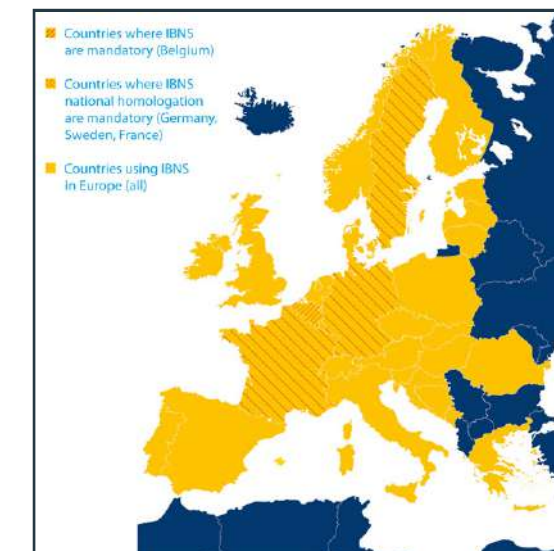
IBNS helps to reduce the environmental impact e.g. light weight soft skin CIT vehicles, no need for additional steel to protect ATMs.

# 3 | IBNS IMPLEMENTATIONS AROUND THE WORLD

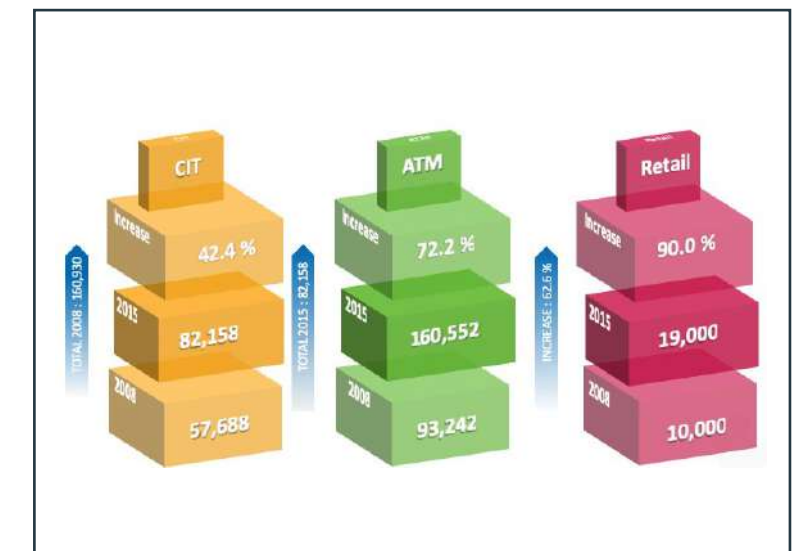
*"The 2016 study compiled by the European Intelligent Cash Protection Association, EURICPA, confirms that IBNS is utilized in all European countries, both for ATM and CIT protection as well as Retail operations."*

In 2015 approximately 260,000 IBNS systems were in operation across Europe. 75% of all IBNS systems in Europe were in France, Italy, Sweden, Belgium, Germany and The Netherlands.

The figures below clearly illustrate the growth of IBNS systems which reflects their effectiveness as especially seen with ATMs.



➤ IBNS systems deployed in Europe



➤ IBNS implementation in Europe



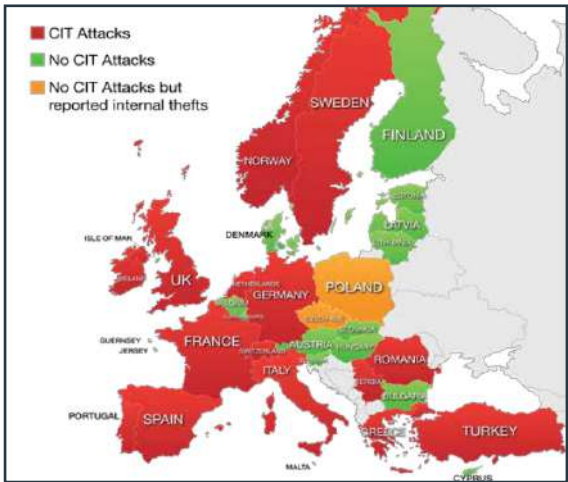
# CIT attacks in Europe



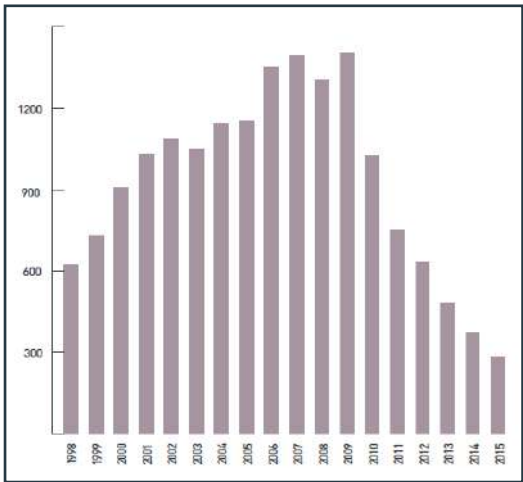
The bar chart clearly shows the positive impact that IBNS protection has on reducing attacks. The graph also shows that the introduction of IBNS related legislation has successfully contributed to the decrease in crime. In countries where IBNS protection is mandatory the reduction is even greater - in Belgium there were no CIT attacks for over 10 years after the introduction of IBNS by law.

The following was supplied by European Cash Management Companies Association, ESTA, it illustrates the wide spread attacks across Europe.

➤ CIT attacks in 2015



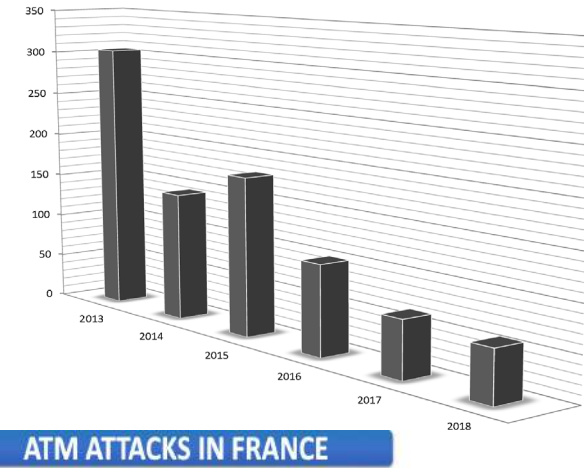
Source: Currency News / ESTA: July 2016



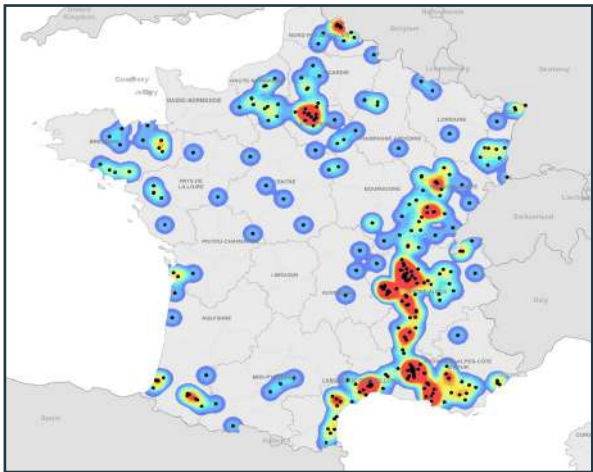
➤ CIT attacks in Europe

# ATM attacks in France

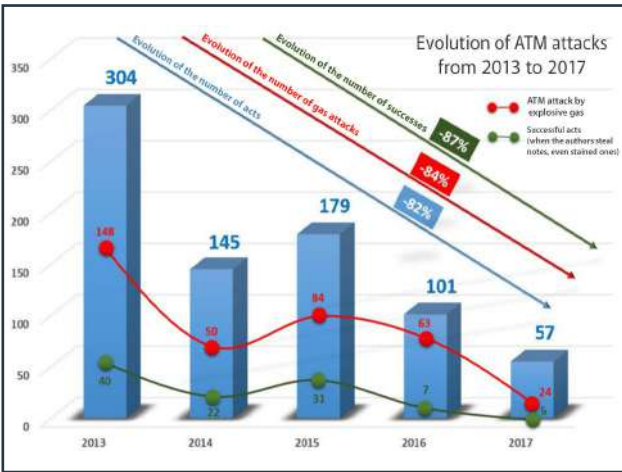
With regard to ATM attacks and prevention methods, we will take France as an example to go into a little more detail. Due to the significant increase of ATM attacks in recent years, the use of IBNS in France has become mandatory by law. Therefore, France and French commercial banks have become a major user of IBNS technology and a good example to examine the positive effects of IBNS on crime prevention.



France is a good example to show how the introduction of regulations to enforce the use of IBNS has resulted in a reduction in the number of attacks.



Source : Gendarmerie



Source : Gendarmerie



# IBNS regulations in Europe

Regulation EU No. 1214/2011 - Article 4 illustrates the importance given to IBNS:

*“With a view to improving CIT security for both the CIT security staff involved and the public, use of the intelligent banknote neutralization system (IBNS) should be encouraged and, after a thorough analysis of the potential impacts by the Commission, should be capable of being developed in a manner entailing harmonization of IBNS among the participating Member States, without prejudice to the rules set out in this Regulation on applicable transport arrangements.”*



Each EU Member country has a domestic policy which coordinates the internal rules and protocols for the exchange of stained Euro bank notes by the Central Bank in each country.



## IBNS in the America's

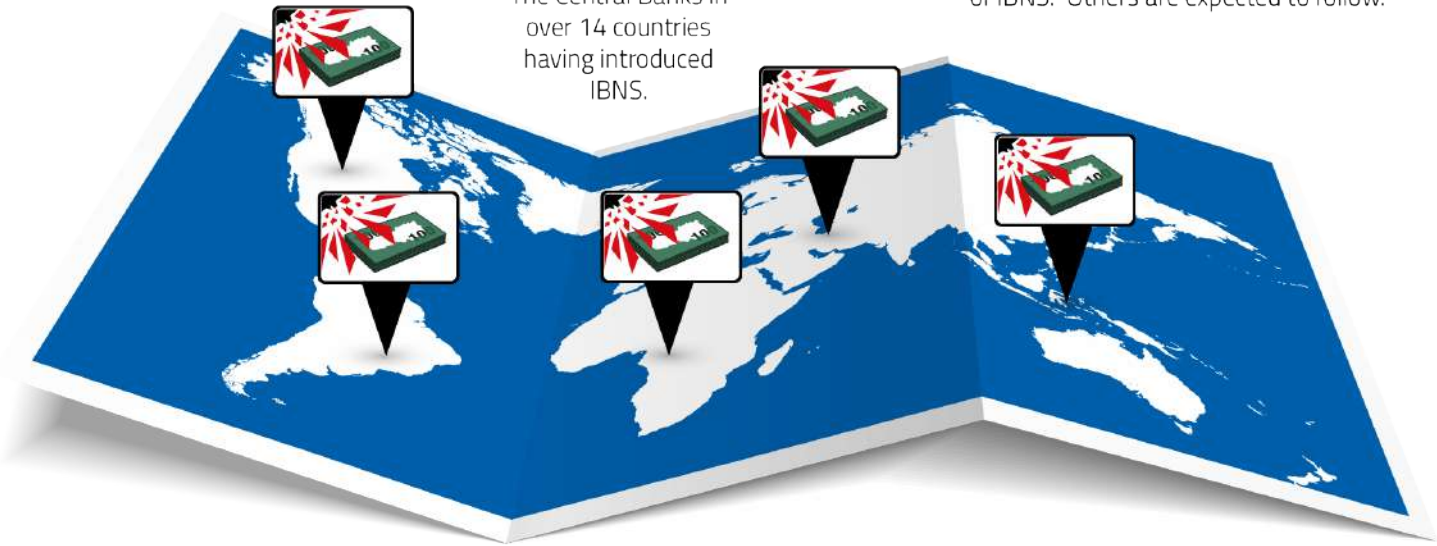
Various countries in this region have adopted IBNS, such as USA, Brazil, Chile, Mexico etc. In the US where the early level of IBNS technology – dye packs are widely used. Any inked dollar note must be returned to the Bank for exchange.

## IBNS in Africa

The Central Banks in over 14 countries having introduced IBNS.

## IBNS in the Middle East and Asia

The Malaysian Central Bank, Bank Negara Malaysia, together with the Central Bank of Saudi Arabia, SAMA, are the first institutions to mandate the use of IBNS. Others are expected to follow.



## IBNS regulations in general

There is a wide range of IBNS regulations which vary from country to country such as Saudi Arabia where the staining and exchange of notes is strictly regulated to the UK where there are no regulations in place.



# 4 | GUIDELINES : INTRODUCING AND SELECTING AN IBNS SYSTEM

## Regulations

The following gives an overview of the various activities that can be considered when introducing an IBNS Cash Protection system be it into a country or ATM estate.

As there are wide range of regulations in force across the world regarding banknotes not all of these steps may apply to any one country.

### ➤ [Agreement to neutralize banknotes](#)

Ranges from where no regulatory authorization is required such as the UK to others where specific authorization from Central Banks is required e.g. India or Saudi Arabia.

### ➤ [Examples of where Central Banks have mandated the use of IBNS](#)

Central Banks and Governments have mandated the use of IBNS protection e.g.

- Off-site ATMs;
- Cross pavement transactions);
- Cash in transit vehicles for point to point cash movement.

### ➤ [Central Bank exchange procedures for stained banknotes](#)

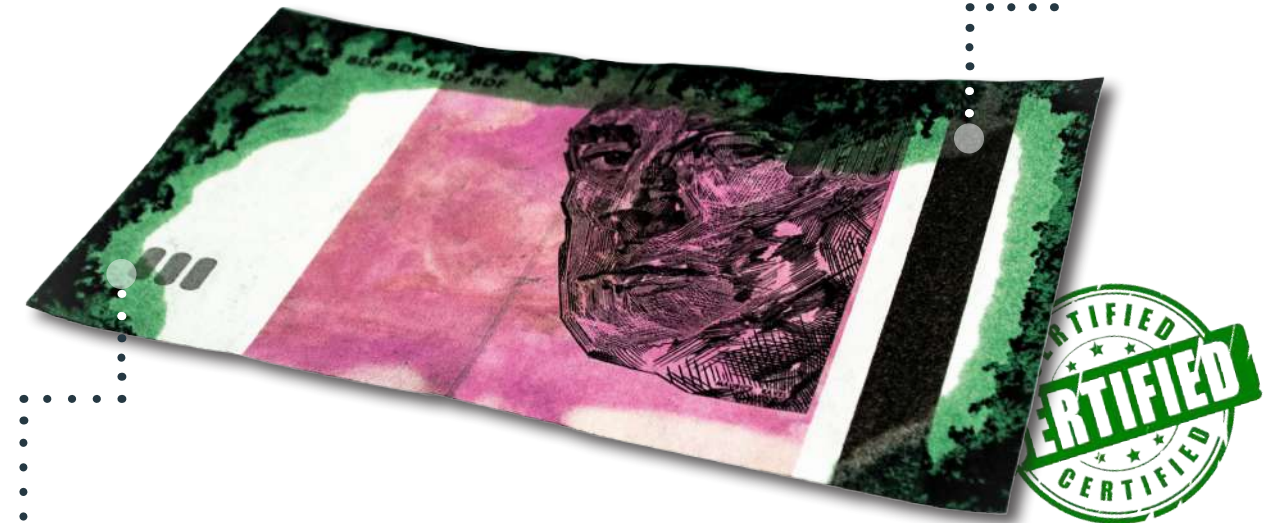
It is important that users of IBNS systems are able to recover the value of any notes that have been legally degraded. For that reason its common that a Central Bank issues a banking law or so called regulation that explains and approves the use of IBNS systems and the procedure to follow for the exchange and reclaiming of currency value of IBNS stained notes.

## Minimum IBNS specifications

Based on the various regulations and certifications around the world the following are suggestions that should be considered when introducing regulations or purchasing an IBNS system.

### Staining coverage

At least 20 % coverage on 100% of the banknotes.



### Degradation Ink

The choice of ink is important – suggested selection criteria include:

- Certified by an independent, accredited and reputable laboratory.
- Indelible, cannot be removed from the banknote after staining.
- Integrated machine readable features e.g. Infra-Red marker so stained notes can be rejected by automatic banknote readers etc.
- Nontoxic and non-hazardous.
- Equally effective on cotton, polymer or hybrid banknotes.
- Traceable to the owner to assist with the criminal investigation.

### Minimal technical requirements :

-Certified by an independent and reputable testing / certification authority to confirm the reliability and effectiveness of the solution.

-Use of explosive material, pre-pressurized gas deploying mechanisms should be discouraged on grounds of safety and too slow activation speeds.



# Communications

One of the most important steps when introducing IBNS is to make the public aware that an inked note is a stolen note and that a cash protection system is installed on the ATM.



Examples of how this can be achieved are below.



# About Oberthur Cash Protection



Established in 1985, OBERTHUR CASH PROTECTION is a pioneer in the design and manufacture of intelligent cash protection solutions protecting cash for the Cash-In-Transit, ATM & Retail markets throughout the world. Oberthur Cash Protection solutions provide safe and reliable security systems for the protection of valuables, using technology to detect an attempted attack or theft, by indelibly marking all valuable media as stolen rendering it valueless. This will not only foil the theft but also act as a deterrent against further attacks.









[www.oberthurcp.com](http://www.oberthurcp.com)



If you have any questions, feel free to contact us: [ocp@oberthurcp.com](mailto:ocp@oberthurcp.com)

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