

The logo features the word "kromek" in a white, lowercase, sans-serif font. The text is centered and overlaid on a complex graphic of overlapping, semi-transparent colored squares in shades of teal, red, yellow, orange, brown, and light blue. To the right of the text, there is a small white square grid pattern. A small "TM" trademark symbol is located at the bottom right of the word "kromek".

kromekTM

White Paper

**LAGs verification capability for EU airport
transit area security – Oct 2009**

Executive Summary

The Kromek Bottle Scanner is a ready-for-market multispectral x-ray based product that would allow the passage of legitimate duty free items in EU transit terminals.

The current EU restrictions on carrying liquids, aerosols and gels (LAGs) on board aircraft are still in place, albeit there is a target to relax these restrictions by April 2010. Initially, the programme for relaxation is scheduled for the transit security points, thereby allowing passengers who have purchased bona fide items from duty free outlets to have these items assessed as to their acceptability for onward travel.

The present schedule requires the agreement of test protocols by the end of October 2009. These protocols will establish the basis for the equipment evaluation activities. Equipment evaluation may be required by each individual member country, although it is expected this will not be the case. It is assumed that equipment evaluation will involve the determination of identification and false alarm rates against a specified list of threat materials.

The Kromek Bottle Scanner uses a much simpler approach to the issue of LAGs screening by verifying an item's authenticity. It uses digital x-ray detectors and the Kromek ADMiT™ algorithm's to provide a fast and accurate comparison against a secure database.

The database contains signatures for duty free LAG's items ordered by the manufacturers' barcode. The scanner only passes items when the database and the items spectral signature match. In other words the Kromek Bottle Scanner can identify not only the presence of known threats but is also future proof to new threat development. The same scanner will also reject doctored items such as concealed narcotics in LAGs.

The Kromek Bottle Scanner has been independently evaluated in the UK against an internationally recognised list of liquid threats. These results contain sensitive information and may be made available on request.

“ACI calls for major rethink on LAGs' proposal”

By Doug Newhouse, 8 October 2009

ACI Europe told TREND this afternoon that it is 'very concerned' by the European Commission's proposal to change EU regulations governing LAGs' screening,.....

In a statement this afternoon, Olivier Jankovec, Director General ACI Europe said:

"We fully support the intention behind this proposal and we do share its goal: to improve and simplify the security experience for passengers travelling through Europe's airports.....

"We are actively reviewing possible alternatives. It is clear that we need more efficient and reliable detection technology to become available as soon as possible, if we are to successfully lift the current ban on LAGs."

The Kromek Bottle Scanner



Summary of benefits:

- Available now
- Low cost and small form factor
- Multi spectral x-ray scanning technology
- Easy to use
- Simple “Pass/ Fail” criteria – operator not required to make subjective decisions.
- Secure database is available and can be easily updated.
- Less than 30 seconds to scan an item.
- Verifies LAG's regardless of container shape.
- Effective with glass, plastic or metal containers.
- Non-invasive scanning
- No consumables
- No sample preparation
- Minimal operator training
- Trolley mounted desktop unit
- Independently validated against internationally recognised threat list
- Future proof technology

Background

1. The background to this paper is the present EU/worldwide requirement to relieve the restrictions on liquids being carried on board aircraft from (latest) April 2010 onwards. Also taken as a reference are the discussions at the ECAC Liquid Explosive Working Group meeting. Kromek understands, based on such discussions, that there is a planned phased approach to meeting current EU expectations of liquids being allowed to be carried through airports. We understand that initially this is likely to start with frequent checking of bottles being carried by passengers transiting through EU airports to another country, requiring passengers to give up their duty free liquids at the transit area.

“GLOBAL SALES SET TO FALL \$2BN IN 2009”
(The Travel Retail Business August/September 2009) Global duty free and travel retail sales will fall by \$2bn in 2009 and possibly equal the sales collapse caused by the intra-EU duty free abolition in 1999..

2. The objective of this white paper is to outline the suitability of the Kromek Bottle Scanner for the use in transit security checkpoints to screen LAG's. This scanner will enable EU airports to make qualitative decisions as to whether LAG's can be safely allowed through transit security points onto aircraft. Currently all LAGs with the exception of 3-1-1 bags are confiscated at EU transit checkpoints. LAG's passing through an EU transit checkpoints will have been bought at a duty free shop of another airport. The Kromek Bottle Scanner confirms whether the item still has the same contents as when originally purchased.

3. Kromek uses a separate technology to address the security needs for checkpoints, as they are different in nature. In this area Kromek's technology determines the presence of threats in containers against a predefined threat list. This technology for checkpoint security is currently undergoing test and validation in a number of countries.

“COMMERCIAL REVENUES AT EUROPE'S AIRPORTS INCREASINGLY EMBATTLED” *(ACI Communiqué Airport Business: Summer 2009)*
In the contemporary landscape of the airport industry, commercial revenues have become a vital part of the business
....

The Kromek Approach

1. The Kromek Bottle Scanner uses multispectral digital detectors and the Kromek ADMiT™ algorithm to provide a fast, accurate comparison of the spectral signature of a LAG item against a database. The Bottle Scanner will indicate to the operator via a very simple “Pass/Fail” display whether spectral signature of the item matches the signature stored. The bottle scanner will indicate “Fail” if the contents of the bottle has been either tampered with in any way or the contents has been partially or completely replaced by a hazardous liquid in any way. Tampering may consist of drugs being dissolved in the liquid. Contamination can be detected at levels from <100 gms of cocaine in a 70 cl bottle.

“Liquor struggles in harsh business climate”

By Generation Research, 11 August 2009
In the first quarter of 2009 the global retailer panel reporting to the TREND Beverage Index showed that sales dropped -16.6% as compared to the same quarter in 2008...In the first quarter of 2009 alone, the industry sold about US\$ 1.5 billion less duty free and travel retail merchandise – including some US\$ 300 million worth of liquor sales – to the world’s travellers as compared to the same quarter in 2008.

2. The Bottle Scanner is capable of determining the contents through glass (clear, coloured or patterned), metal cans and plastic bottles (clear or opaque) in sizes ranging from 100ml through to two litres.
3. The Bottle Scanner is a desktop inspection unit, which scans the LAG against an item database and gives a response within 30 seconds.
4. The Bottle Scanner does not need to identify specific threats; it compares the spectral signature of the item to its stored database signature and gives a “Pass/Fail” response. Updating the database is a quick and easy task and databases can be constructed to reflect the typical LAGs seen at transit areas. Updating the databases of a number of Kromek Bottle Scanners is achieved through transferable databases, which can be downloaded via a secure customer specific FTP site controlled by Kromek.

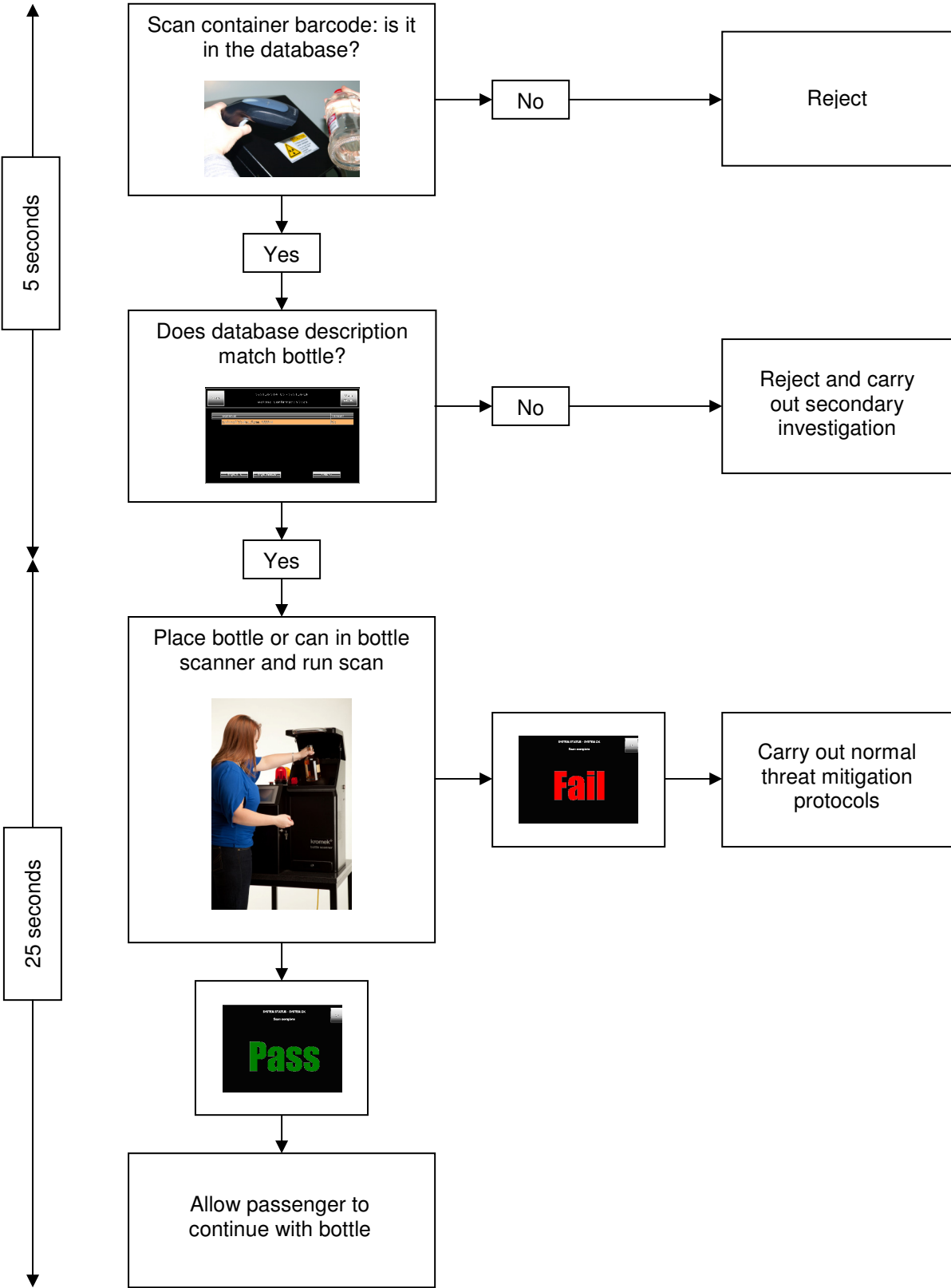


5. The international construction and integrity of the Bottle Scanner database is undertaken by Kromek. Specific product information is entered into a Kromek centrally controlled database and provides reference signatures against country-specific duty free LAGs – such data will then be provided to airports typically receiving transit passengers from those countries and will also take account of new products being introduced in duty free environments in third party airports. So, for example, database activity in Japan for new types of Sake could be made available to London Heathrow or Paris Charles de Gaulle users through database updates.
6. The Kromek Bottle Scanner has been successfully piloted in the UK under a Department for Transport initiative. Results from the pilot activity can be discussed upon request as can the results from the independent validation against the internationally recognised threat list.
7. The Kromek Bottle Scanner is a low-cost solution which provides greatly added capacity to current security protocols. The scanner has a small form factor when compared to the currently deployed x-ray systems, and is designed to fit in with current work flow in airports.

Frequently asked Questions

Ref	Issue	Recommendation
1	How can this technology provide threat identification where conventional x-ray technology cannot be applied?	The Kromek Bottle Scanner uses multi spectral x-ray technology together with the Kromek ADMiT™ algorithm to match LAG items to their stored spectral signatures. Single energy or dual energy x-ray does not contain enough information to separate different liquids.
2	Will the x-rays damage the contents of the bottle?	No.
3	What is the availability of the Kromek Bottle Scanner?	The equipment is commercially available immediately.
4	How comprehensive is the current liquids database?	The 500 top selling liquids as classified by World Duty Free is available now. This covers 65% of LAG sales at EU airports.
5	How does the airport update its database?	Kromek provides a simple database update service.
6	Does the Kromek Bottle Scanner have other applications?	This system can also detect the presence of contamination such as narcotics in a bottled liquid. This can be applied in EU Border Agency security programmes.
7	Does the Kromek Bottle Scanner identify specific chemical threats?	The inclusion of any threat liquid in a data based LAG item will ensure that the item will “Fail”. The Bottle Scanner does not need a specific list of threats.

Bottle Scanner: Process Flow



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