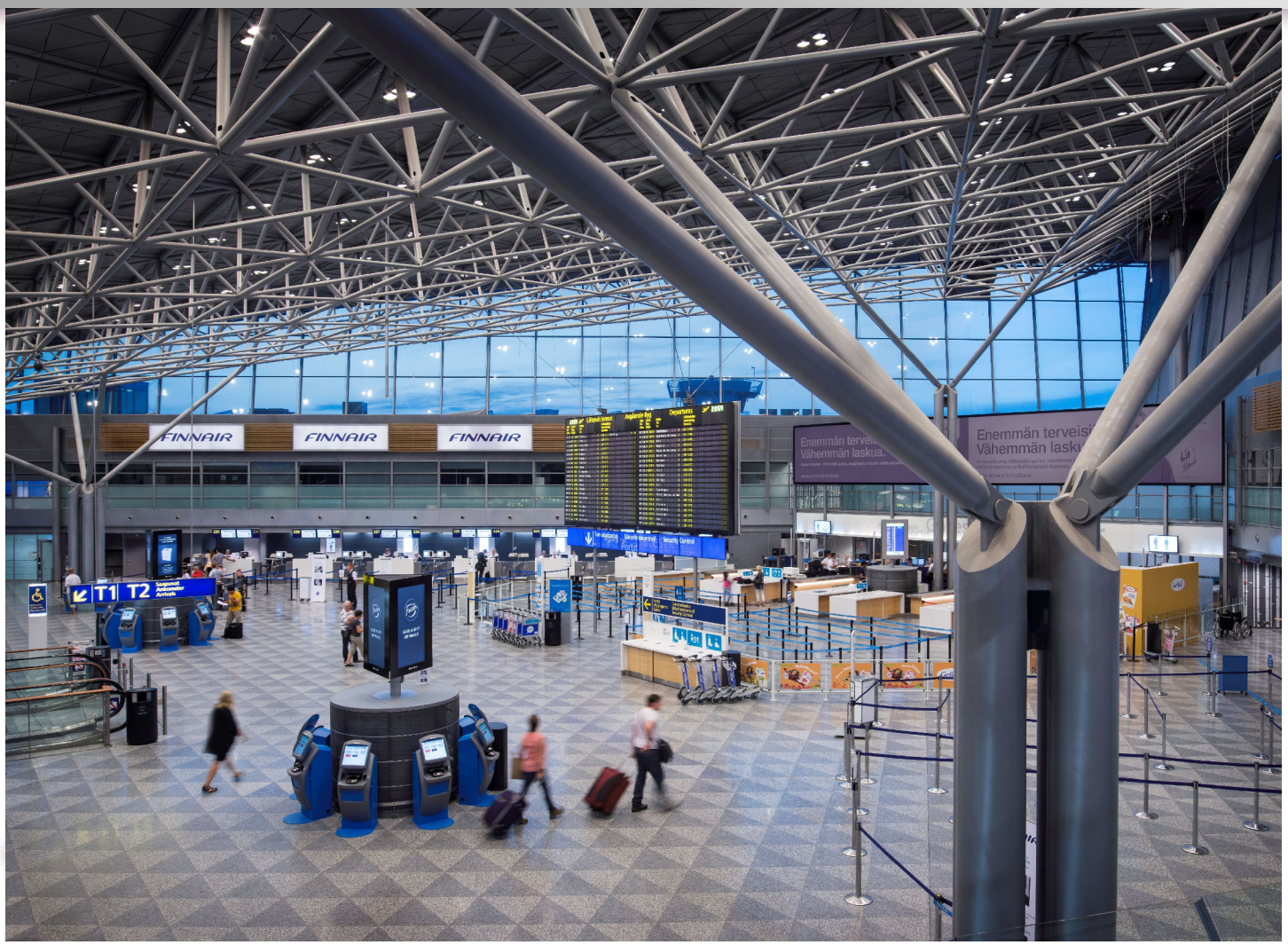
Finavia Pilots 1st Detect's Mass Spec ETD to Improve Availability, Threat Detection and Passenger Throughput

A Case Study from 1st Detect



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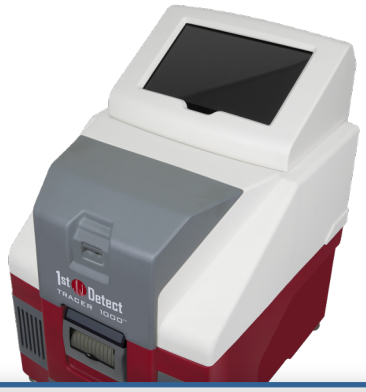
*"We were excited to be the first international airport to do an operational trial with the Tracer 1000. The system is easy to use with **100% uptime** ...the low false alarm rate and throughput will help keep on-time departures and avoid security delays. The Tracer 1000 also allows us to be prepared for the future as new threats emerge."*

--Tuomo Kivikari,Senior Adviser Risk Manager Finavia Corporation



The Tracer 1000 Mass Spec ETD from 1st Detect

Executive Summary

In February 2019, Helsinki Airport, one the world's leading global airport operators, conducted a live passenger trial of the first EU approved Mass Spectrometry (Mass Spec) Explosive Trace Detection (ETD) security screening solution, the Tracer 1000^{tm} from 1st Detect Corporation.

The Tracer 1000 demonstrated 100% operational availability with no random calibrations or bake-outs-- a massive improvement over Finavia ETD systems that use Ion Mobility Spectrometry (IMS).

It was judged by security operators as easy-to-use, and delivered superior threat detection and a far lower false alarm rate than Finavia's IMS-based systems. Airports, airlines and global regulators seeking to improve security, reduce costs and enhance passenger experience now have a powerful new solution available to them.

The Customer: Finavia Corporation

Finavia is one of the world's leading airport operators, responsible for over 20 airports in Finland, including Helsinki International, which serves over 20 million passengers per year and has become a major transit hub for Asian travelers to Europe.

Finavia is an innovation leader, at the forefront of the use of new technology to improve security and passenger experience. It is currently investing over 1 billion euro's in a major expansion of Helsinki airport, adding new baggage handling systems, checkpoint security lanes and automated passport control systems.

The Problem: IMS Explosive Trace Detection Technology

Like other major European airport operators, Finavia is required by EU regulations to use Explosive Trace Detection (ETD) systems as part of its passenger security screening operations. In one common scenario, these systems are used on randomly selected passengers at the security checkpoint to detect traces of explosives. The passenger's hands are swabbed by security and the swab is analyzed by the ETD system.

Many ETD systems deployed at EU airports use technology called Ion Mobility Spectrometry (IMS). Once "state-of-the-art", IMS ETD systems have drawbacks, most importantly a ***high rate of system downtime due to random calibrations and system bake-outs.***

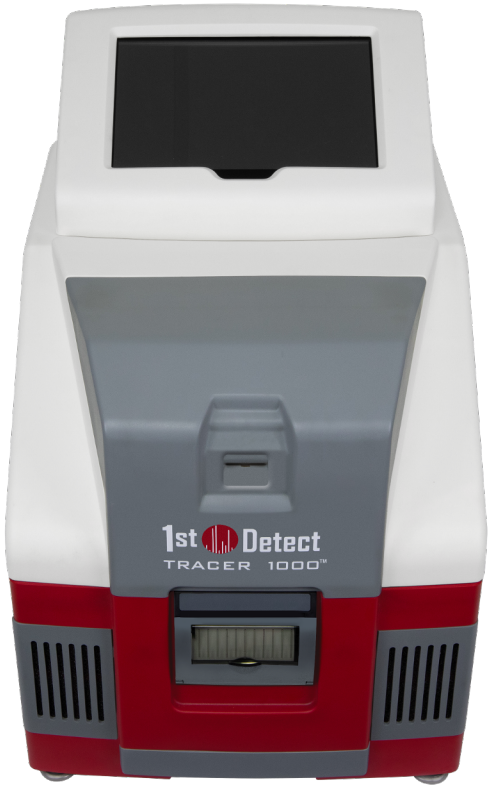
40% Downtime! IMS Explosive Trace Detection systems deployed by Finavia had system downtime of up to 40%, due to random calibrations and system bake-outs.

In Finavia's experience, ***IMS-based ETD's were often unavailable to screen passengers for as much as 40% of normal checkpoint operational times***. This was due to frequent, sometime random calibrations of the IMS systems and the need for the systems to go through a time-consuming "bake-out" to clear the results of a prior detection event. This high level of downtime had obvious security and cost implications. Other IMS shortcomings drawbacks include a limited number of detectable threats, and a high false alarm rate because, with IMS, items such as perfume can be mistaken for explosives. This results in false alarms and passenger delays, unnecessary screening costs, and decreased confidence in ETDs. **For Finavia, IMS based ETD's were becoming inadequate given both emerging terrorist threats and the need to improve system uptime and passenger experience.**

Perfume or PETN? Many IMS ETDs struggle to distinguish explosives from cologne, leading to high false alarms rates.

The Solution: EU Approved Mass Spec ETD from 1st Detect Corporation

The technology that solved Finavia's problem is a new ETD solution from US-based 1st Detect Corporation, ***the Tracer 1000***. The Tracer 1000 uses mass spectrometry (commonly referred to as "Mass Spec") technology. First developed for scientific applications by NASA, mass spec has been recognized as superior to IMS in terms of sensitivity, range of threats it can detect, and low false alarm rate. However, it had not been incorporated into an "airport-friendly" platform – until 1st Detect launched the Tracer 1000. Crucially, the Tracer 1000 is certified for airport use by the European Civil Aviation Commission (ECAC), making it the world's first and to date only Mass Spec ETD that can be used by any airport in the EU.



The Trial: Tracer 1000 Is Tested At Helsinki International Airport

While becoming the first Mass Spec ETD to receive ECAC certification was a critical milestone for the Tracer 1000, it was important to prove its superior performance in a live airport trial with Finavia. These trials lead the way for broader adoption of new aviation security technologies such as Mass Spec ETD. The Finavia trial was conducted in February 2019 at Helsinki International Airport, Terminal 1, screening live passengers. The trial results were impressive, especially compared to legacy IMS ETDs:

> *Tracer 1000 had a **100% operational availability rate** during the trial.*

- The Tracer 1000 had a **100% operational availability rate**, with no bake-outs, forced calibrations, or preventative maintenance delays. ***This compared to a 40% downtime for IMS ETD systems***.
- Screeners and Finavia management found the system to be easy to use. In terms of "sample-to-sample time", the Tracer 1000 operated at least as fast as Finavia's legacy ETD systems.
- The system achieved an average false alarm rate significantly lower than with legacy IMS. Once 1st Detect enhanced the algorithm using trial data, the **false alarm rate for the Tracer 1000 was 0% on many days of the trial** – an extraordinary level of accuracy for an ETD system.

Conclusion: A Breakthrough in Explosive Trace Detection

> *The **false alarm rate was 0%** on many days of the Finavia trial.*

The combination of its successful certification by ECAC as the first approved Mass Spec ETD and its successful live airport trial at Finavia's Helsinki Airport marks an important milestone for aviation security. Airports which have long relied on ETD systems that have limited threat detection capabilities, and high false alarm rates now have a far better option. 1st Detect's Tracer 1000 is proven, has an outstanding return on investment for airports, and is available for delivery today.

About 1st Detect

1st Detect Corporation, a subsidiary of Astrotech Corporation (NASDAQ: ASTC), develops, manufactures, and sells explosives and narcotics trace detectors for use in the air transport and other security markets. 1st Detect produces the most capable field deployed Explosive Trace Detector (ETD) and Narcotic Trace Detector (NTD) available for airport and port-of-entry use today. The TRACER 1000™ is a breakthrough technology that has taken the most sensitive chemical detector technology, mass spectrometry, from the laboratory to the field. **For more information, visit 1stdetect.com.**