



RELIABLE LEAK DETECTION IN INDUSTRIAL GAS PRESSURE-RELIEF STATIONS

Belgian inspection company The Sniffers has always been an early adopter of advanced inspection technology. We followed the company as it tested the FLIR GF77 uncooled optical gas imaging camera during a leak detection job at one of Belgium's leading chemical groups.

Tessenderlo Kerley International is a chemical group that supplies value-added liquid, soluble, and solid plant nutrition for agriculture applications. At its production unit in Ham, Belgium, Tessenderlo Kerley focuses on the production of potassium sulfate, which is predominantly used as a fertilizer for flowers, fruits, and vegetables.

GAS OVENS

An essential part of the potassium sulfate production process involves combining raw materials in a furnace that is heated above 600° Celsius, creating a reaction between potassium chloride and sulfuric acid. In 2018, Tessenderlo Kerley decided to make a serious investment to reduce its carbon footprint and to convert nearly thirty oil-fired ovens into natural gas ovens. The entire conversion operation is expected to take about ten years.

Natural gas is now supplied to the site in Ham via a brand-new pipeline that branches off to the different furnaces. Since employee safety and environmental care are high on the company's agenda, these gas pipelines are inspected for leaks on a regular basis. For this highly specialized inspection work, Tessenderlo Kerley relies on third parties like Belgian inspection company The Sniffers.

As an independent service provider, The Sniffers specializes in identifying leaks in pipelines and installations in the oil and gas, petrochemical, and chemical industries. The company also provides advice on how to reduce emissions and energy losses, and maintain pipeline network integrity.

"A company like Tessenderlo Kerley cannot afford to have leaks in its pipelines, so reliable inspections are a must," said Philip Schraeyen, team leader of Special Projects at The Sniffers. "Our go-to toolset for these inspections always includes optical gas imaging cameras from FLIR, so it only made sense to thoroughly test the GF77 camera."

PRESSURE-RELIEF STATIONS

Schraeyen and Jan Van Hout, project leaders at The Sniffers, took FLIR to the Tessenderlo Kerley production site in Ham for a routine inspection with the FLIR GF77. We inquired about their first impressions.

Schraeyen and Van Hout described the situation at the site: the pressure of the natural gas that arrives in the oven station is too high (about 65 Bar) to be used in the combustion chamber. Therefore, the pressure is first reduced to 5 Bar in a pressure-relief station. It's exactly that station that needs to be monitored thoroughly for leaks. The station has about 150 potential leaking sources; gas leaks tend to become visible at weak points such as valves and other connections.

"One of the biggest differences between using optical gas imaging cameras versus other devices is speed," said Schraeyen. "With a Flame Ionization Detector or FID for example, this inspection job would take longer. With a FLIR camera, like the GF77, we can inspect the entire station in two minutes."



"The GF77 rotating optical block makes it easier to inspect areas that are high up or difficult to reach," said Jan Van Hout with The Sniffers



Philip Schraeyen and Jan Van Hout of The Sniffers using the GF77 camera to inspect for methane leaks

VISUAL POWER

An FID or other contact-based device requires the inspector to carefully hold the sensor very close to the leak source. This can be a time-intensive task, especially when potential leaking sources start to run into several hundreds. But this can also cause a safety hazard, having to be close to or even inside the gas cloud to identify the leak. Optical gas imaging cameras allow inspectors to scan for leaks from a distance without the need for an aerial platform.

In contrast to FIDs, optical gas imaging cameras provide a visual image of the leak. "This says so much more than numbers," said Schraeyen. "If you need to report to your customer, then an image is much more convincing, and it offers more appreciation for your work as well." The gas that needs to be detected at Tessenderlo Kerley Ham is CH₄ (methane). The FLIR GF77 is the first uncooled infrared camera from FLIR to visualize these methane emissions in real-time.

CAMERA ERGONOMICS

The first thing that stands out is the product's compact form factor and 180° rotating optical block. The camera is much smaller than the cooled GF-Series units, and much easier to carry around, especially during lengthy inspections. It is clear that this camera was built for intensive use and with the goal of making leak inspections as comfortable as possible.

"The rotating optical block also makes it easier to inspect areas that are high up or difficult to reach," said Van Hout. When using an OGI camera ergonomically made for every job, like the GF77 from FLIR, an operator can easily inspect over railing and underneath components without strain or uncomfortable positioning.

RELIABLE IMAGE QUALITY

Just like the cooled cameras in the GF-Series, the GF77 has three imaging modes: IR, visual, and the FLIR proprietary High Sensitivity Mode (HSM), which accentuates plume movement to make tiny gas leaks more visible.

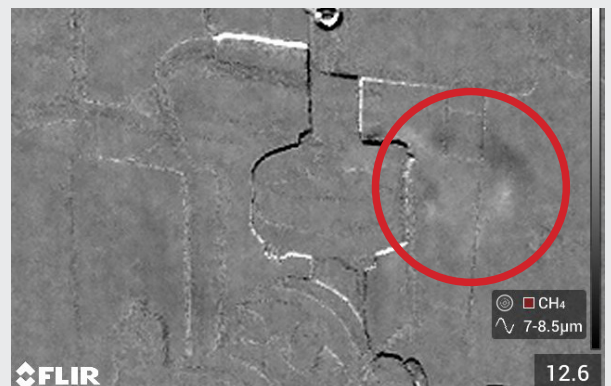
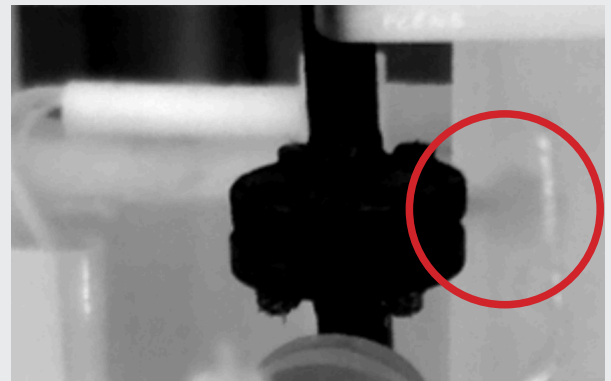
During a thorough inspection of one of the pressure-relief stations, Van Hout and Schraeyen were able to find a leak at one of the connections. "The gas leak is clearly visible in the HSM image and the image quality is surprisingly good for such a compact, cost effective camera," said Van Hout.

Both inspectors also made good use of the GF77's 1-Touch Level/Span functionality. This feature allows users to choose a small area of interest in a gas image—with one touch of the screen—enabling the camera to auto-adjust the level and span based on the contrast at that spot in the image.

"All in all, the FLIR GF77 is a reliable and highly ergonomic camera for leak detection jobs," said Schraeyen. "And it's an ideal camera for inspections at industrial companies like Tessenderlo Kerley that want to reduce safety risk or prevent product loss."



Close, contact-based inspections, like those performed with an FID, can be time-intensive and can create safety hazards as the operator is often in the gas leak when locating the faulty component.



A methane leak detected with the FLIR GF77 (visual mode – IR mode – HSM mode)

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