

APPLICATION STORY



FLIR GF320 THERMAL CAMERA OFFERS RELIABLE GAS LEAK DETECTION IN BIOGAS FACILITIES

Extensive field testing in recent years has revealed that a majority of biogas facilities in Germany experience methane leaks that pose significant threats to the environment, employee safety, and profits. However, with affordable gas finding technology like the FLIR GF320 thermal imager, there is a growing awareness of the effectiveness of thermal imaging for inspecting facilities and finding hidden gas leaks before they cause significant harm.

PREVENTING BIOGAS LEAKS

Expanding the use of renewable energy sources has become a major policy issue for Europe countries looking to reduce their dependency on fossil fuels and mitigate the effects of climate change.

The production of biogas (methane), in particular, is expected to play a larger role in the next decade. In Germany, for example, bioenergy represents approximately five percent of the country's current energy production, and the government hopes to double that percentage by 2020, according to official reports.

However, methane is a greenhouse gas that can harm the environment if not contained properly during the production process. Biogas producers face strict regulations regarding how they trace, document, fix, and report leaks of volatile gasses.

IBS GmbH, headquartered in Bremen, Germany, specializes in gas leak detection and analysis at major biogas facilities. The company recently purchased the FLIR GF320 thermal imager to provide its clients with the highest quality gas detection. IBS GmbH learned about using thermography to detect leakage of organic gasses at a trade fair.

"We then had a FLIR representative who is also an experienced consultant and [GF320] user demonstrate the technology for one of our customers," said Ibeling van Lessen, one of IBS GmbH's managing directors.

The engineer has been using the FLIR GF320 for the past two years, and has examined more than 150 biogas plants to date. The GF320 is part of FLIR's family of non-contact Gas Detection cameras, which can detect dozens of volatile organic



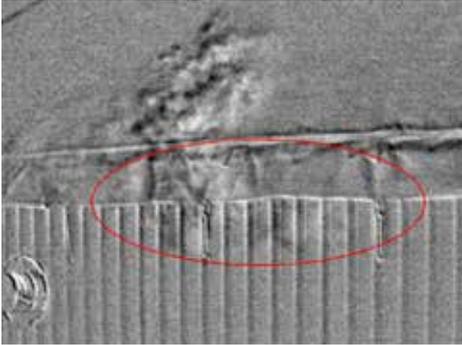
Engineer Ibeling van Lessen looking for gas leaks, which is possible from a safe distance and unusual angles using the FLIR GF320.

compounds in multiple types of facilities, including oil refineries, petrochemical plants, and gas-fired power stations.

"If gone undetected, even the smallest gas leaks can cause serious financial damage over time," van Lessen said.

CONVENTIONAL GAS DETECTION MEASURES ARE OFTEN IMPRACTICAL

The sheer size of Biogas facilities can make detecting gas leaks a real challenge. They include huge pieces of equipment, with hundreds of components that need testing. Conventional gas detection involves using leakage spray and gas sensors, known as "sniffers," but these



Gas leak on the terminal strip of the air-supported roof of a fermenter in the visible light spectrum - and in an infrared image made by the FLIR GF320.

methods are time-consuming, especially in hard-to-reach places. For example, a fermenter roof contains an inner gas membrane, eyelets for submersible mixers, and holes in the tank walls—all of which are difficult to access.

As a result, van Lessen was looking for a non-contact method for detecting small leaks from a distance. The FLIR GF320 fit the bill. It was compact and mobile, and can identify small gas leaks from several meters away, and big leaks from hundreds of meters away without requiring equipment be shutdown.

“The camera is so compact that it can be easily carried, even when using ladders,” said van Lessen.

Escaping gasses appear like smoke on the camera’s LCD viewfinder in real time and can be recorded in the camera for easy

archiving. Once a leak is detected from a safe distance, users can move closer and quantify the gas concentration using a secondary method.

INTERPRETING GAS LEAK FOOTAGE REQUIRES SKILL

The clarity of the GF320’s thermal video is due to FLIR’s integrated and patented image analysis software. However, it does take some interpretive skill to analyze black and white JPEG images of escaping gas, which is why van Lessen found the user training by the specialist company ITEMA GmbH particularly helpful. He received precise instructions from qualified personnel on how to handle and operate the camera.

“Some experience in image interpretation is necessary to perform reliable leakage localization and assessment,” said van Lessen.

FLIR Tools software also comes in quite handy when producing inspection reports. The software allows for sophisticated documentation and is easy to learn in a short period of time. Found leaks can be marked directly in the image and also recorded as a video sequence inside the program. Based on detailed reports, damaged areas can be subsequently repaired by the customer, and then tested again to confirm the leak is fixed.

GF320 ALLOWS FOR MAXIMUM MOBILITY

The decision to acquire the FLIR GF320 was relatively easy for IBS GmbH, because the camera has no real competition in terms of compact size and portability. The GF320 is also less expensive than competing thermal cameras. Finally, the GF320 detects not only methane, but a total of 20 gasses, including butane, propane, and benzene.



Explosion protected areas can be investigated from a safe distance with the FLIR GF320.

The GF320 is a versatile tool at each step of the biofuel production process, from the fermentation of agricultural byproduct to the generation of power at combined heat and power (CHP) plants. The GF320 can also detect petrol or diesel fumes, as well as exhaust leaks on the turbocharger. And due to its rugged design, the camera can be used in conjunction with an explosion meter in explosive environments.

“Its light weight allows for ergonomic working in any position, and the ease of use rounds off the gas camera’s design,” said van Lessen.

CONCLUSION: ADDED VALUE FOR USERS AND CUSTOMERS

The key success factors for bioenergy facilities continue to be safety, efficiency and profitability. When carrying out gas detection, it is of vital importance that inspectors obtain as complete a picture as possible of the condition of a given plant. A FLIR infrared camera like the FLIR GF320 is an extremely important tool for tracking down potential gas leaks. The FLIR GF320 has certainly provided significant added value for IBS GmbH and its customers, ensuring optimized operation and safety.



The FLIR GF320 thermal imager.

For more information about thermal imaging cameras or about this application, please visit

www.flir.com/ogi

The images displayed may not be representative of the actual resolution of the camera shown. Images for illustrative purposes only.