CONDITION MONITORING SOLUTIONS

FOR THE MINING INDUSTY

FLIR MINING SOLUTIONS

Ensure safety, efficiency, and profitability in mining operations with cutting-edge solutions from FLIR. With nearly 100 new mines set to open in 2024, demand for raw materials—from precious metals to essential minerals—continues to soar. Yet, maintaining uptime in these complex, self-contained environments presents unique challenges, from extreme temperatures to airborne dust that threaten both safety and productivity.

FLIR's advanced thermal and acoustic imaging technology helps mining professionals identify potential failures before they lead to costly downtime. Whether monitoring electrical infrastructure, detecting overheating components, or ensuring compliance with safety regulations, FLIR's predictive maintenance solutions reduce breakdowns by up to 70% and cut maintenance costs by a quarter.

Maximize efficiency and safeguard your workforce with FLIR.

TABLE OF CONTENTS

CONDITION MONITORING

High-Voltage Electrical Systems

Mining operations rely on extensive electrical infrastructure, including substations, transmission lines, and transformers. A single faulty voltage regulator or overheating connection can lead to unplanned outages, forcing expensive downtime and repair costs. This is even more of a problem when you consider the incredible extent of electricity usage at mining facilities: mining is the third most energy-intensive industry in the world, behind only bulk chemical and refining industries.* Thermal imaging cameras enable maintenance teams to detect overheating electrical components before they fail, while acoustic imaging helps identify partial discharge in high-voltage equipment, ensuring continuous and safe operation of power systems.

**Source: 2017 study by the U.S. Energy Information Administration.*

FLIR E96™

FLIR Si2-PD™

FLIR CM276™

FLIR T-Series™ with FlexView™ Dual FOV Lens

Heavy Equipment

Rope shovels, haul trucks, and conveyor systems are essential for material transport in mining, but continuous use puts immense strain on mechanical components. Failing bearings, overheating motors, and hydraulic leaks can all result in costly downtime and inefficiencies. With FLIR cameras, maintenance teams can quickly identify excessive heat buildup in bearings and motors, and pinpoint leaks in hydraulic systems before they cause operational failures. Proactively detecting these issues helps extend equipment lifespan and maintain peak productivity.

FLIR A500f/ A700f™

FLIR Si2-Pro™

To learn more about FLIR solutions for condition monitoring, visit www.flir.com/condition-monitoring

Coal Handling and Storage

Spontaneous combustion is a major risk in coal stockpiles, conveyor belts, and processing facilities. If left undetected, heat buildup can lead to catastrophic fires, damaging infrastructure and halting operations. Fixed thermal cameras continuously monitor coal piles and conveyor systems, identifying hotspots before ignition occurs. By integrating these cameras into automated fire prevention systems, operators can respond to early warning signs immediately, preventing hazardous situations and costly disruptions.

FLIR T1020™

FLIR E96™

FLIR A50/A70™ Smart Sensor

Compressed Air and Gas Systems

Mining facilities use compressed air and gas for drilling, ventilation, and processing, but leaks in these systems lead to energy waste, increased costs, and potential safety hazards. Acoustic imaging cameras can detect leaks in high-pressure air and gas lines by visualizing the ultrasonic sound they emit. Identifying and repairing leaks early helps lower energy consumption, reduce operational expenses, and maintain a safer working environment for miners.

FLIR GF77™

FLIR Si2-Pro™

FLIR G343™

Diamond Mining

Mining valuable resources brings with it security challenges—none more so than in the diamond industry, where theft is an ever-present concern. To protect high-value assets, mining operators must implement advanced surveillance and monitoring solutions that safeguard both production and profits.

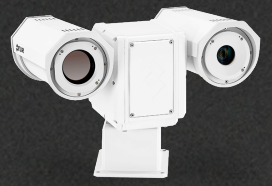
FLIR thermal imaging and AI-driven inspection systems provide real-time situational awareness, detecting intrusions, unauthorized activity, and overheating equipment. From aerial surveillance with thermal drones to AI-powered vehicle inspections that identify critical tire damage—such as rock cuts—FLIR technology ensures mining operations remain secure and efficient.

Chemical Leaks

In many mining operations, toxic chemicals like cyanide and sulfuric acid are used in the extraction process. A leak from overworked, malfunctioning, or damaged components can result in devastating consequences for workers, infrastructure, and the surrounding environment.

Traditional leak detection methods often fall short—but FLIR automation cameras provide a non-contact, real-time solution. Used extensively in gold mining, these thermal imaging systems detect chemical leaks by measuring heat emissivity and temperature variations, allowing operators to act immediately to contain hazards before they escalate.

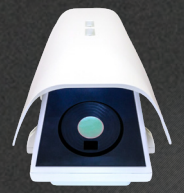
SIRAS™ with FLIR Vue® Pro R Payload



FLIR PT-Series HD™

FLIR E8 Pro™

FLIR ADGiLE™



FLIR A500f/ A700f™

FLIR T-Series™ with FlexView™ Dual FOV Lens

While most of FLIR's infrared thermal imaging devices are intuitive and easy to use, operators can benefit from specialist training to optimally explore every function. Sign up for scheduled infrared thermography training courses offered through the Infrared Training Center (ITC). To learn more, visit www.flir.com/support-center/training/thermography-training/itc/

TRUSTED BY THE WORLD'S LEADING ALLUVIAL DIAMOND MINER

FLIR thermal imaging cameras play a vital role in securing Namdeb Diamond Corporation's diamond mining operations in Oranjemund, Namibia, where diamond theft is a constant concern. To protect these valuable assets, FLIR's advanced surveillance technology provides 24/7 monitoring, detecting unauthorized activity even in total darkness and harsh weather conditions.

The FLIR thermal imaging cameras are deployed across critical areas, including active bedrock mining sites, entrance and exit points, and a high-security zone known as the "no-man's land." Security personnel closely monitor all footage from a centralized control room in Oranjemund, even for sites located over 200 km away.

Mr. Freddie Groenewald, Security Chief Technician at Namdeb, Oranjemund, explains, "One of the ways in which people are trying to get diamonds out of the mining area is by shooting crossbow arrows over the 'no-mans land.' The arrows are hollow and the inside is filled with diamonds. An accomplice picks up the arrows on the other side. Thanks to the FLIR security cameras, we can now monitor, in total darkness and also in foggy conditions, what is happening alongside the fence. If we see people approaching and suspect illegal activity we send out a patrol."

"Thermal imaging cameras have proven their worth here in Oranjemund.", continues Mr. Groenewald. "They are an excellent tool for spotting activity in total darkness and in harsh weather conditions. Thermal imaging provides us with other options as well. At Namdeb we are trying to work in an ecological friendly way. If a mining area is mined out, we rehabilitate the area to its original state. Although sometimes fences are necessary, we try to avoid them as much as possible. We are investigating thermal imaging to further assist us with perimeter protection. This may reduce the civil works cost for expensive fencing options."

FLIR PT-Series HD™

FLIR FH-Series™ PTZ

FLIR FC-Series AI™

ABOUT FLIR

FLIR designs, develops, manufactures, markets, and distributes technologies that enhance perception and awareness. We bring innovative sensing solutions into daily life through our thermal imaging, visible-light imaging, video analytics, measurement and diagnostic, and advanced threat detection systems.

FLIR offers a diversified portfolio that serves a number of applications in government & defense, industrial, and commercial markets. Our products help first responders and military personnel protect and save lives, promote efficiency within the trades, and innovate consumer-facing technologies. FLIR strives to strengthen public safety and well-being, increase energy and time efficiency, and contribute to healthy

Specifications are subject to change without notice

FLIR Condition Monitoring for the Mining Industry (A4)
RH25-0068-INS
(Revised March 2025)

FLIR®