



APPLICATION NOTE

Smarter Maintenance in Modern Cement Plants with Flir Acoustic Imaging

Flir acoustic imaging cameras uncover hidden leaks and inefficiencies in cement plants, helping teams reduce downtime, cut energy costs, and boost performance. With intuitive operation, precise leak detection—even in noisy or hard-to-reach areas—and smart reporting, maintenance becomes faster, safer, and more cost-effective than ever.

The global cement market was valued at \$361 billion in 2024 and is forecast to grow at a CAGR of 5.1% through 2025–2032. Rising demand for residential construction, particularly in Asia, has driven production from 600 million metric tons at the turn of the century to over 2 billion metric tons in 2023—a staggering increase in global demand.

With such rapid growth, unscheduled downtime is a major concern in the quarrying and cement industry. Maintenance was once viewed as a cost center, often limited to annual shutdowns and reactive repairs. Today, however, leading operators recognize that regular scheduled maintenance is essential for boosting profit margins. In a typical 1 million metric ton-per-year plant, a single day of unplanned shutdown can cost up to \$300,000.

Precision Leak Detection for Cement Plants

Regular maintenance does more than prevent catastrophic failure. Hidden inefficiencies in plant and machinery can persist for months or even years, quietly eroding profits and competitiveness. The challenge is identifying these issues—especially in high-energy systems like compressed air and industrial gases, where leaks are often small, hidden, or obscured for operational reasons.



FLIR Si2-LD™ Industrial Acoustic Imaging Camera for Pressurized Leak Detection and Mechanical Fault Detection



The FLIR Si2-LD delivers real-time analytics, including leak size and cost estimates, enabling immediate field insights to support efficient cement production operations.

It is for this reason that Flir has developed the **Si2-LD** handheld acoustic camera. Equipped with highly sensitive MEMS microphones, the camera pinpoints leaks in compressed air systems while displaying a 12 MP image on a 5-inch, 1280 x 720 color screen. For noisy environments, the camera's bandpass filtering allows users to isolate leaks with precision by manually selecting the frequency range, even in challenging industrial settings.

The **Si2-LD** detects sounds from 2–130 kHz, identifying even the smallest leaks. For example, a leak as tiny as 0.007 liters per minute can be detected from 2.5 meters away, and larger leaks can be located from up to 130 meters. This allows maintenance teams to safely inspect hard-to-access areas, including high-temperature zones, without risking personnel safety.

Fast, User-Friendly Operation and Reporting

Once an inspection is complete, the camera's onboard leak size quantification software helps prioritize repairs by potential energy loss, ensuring the most significant leaks are addressed first. Recognizing that plant environments often restrict external drives and Wi-Fi access, Flir provides a data cable accessory that connects the camera directly to a PC or laptop, allowing easy transfer of image files without network or security issues.

Engineers have also emphasized ease of use, noting that they often lack the time to become experts on every new piece of analytical equipment. Flir has designed the **Si2-LD** to be intuitive: a simple 'point and shoot' operation handles detection, quantification, and analysis with minimal training

required. The handheld device comes with a rugged carrying case to protect it in harsh environments such as quarries and cement works.

For more information or a demonstration of the Flir Si2 acoustic camera, please contact your local Flir agent or distributor.



To learn more about acoustic imaging cameras, please visit:
www.flir.com/instruments/acoustic-imaging



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