

High resolution infrared inspection for oil and gas applications

Application Note

Unscheduled downtime can cost millions. Professionals who work in the oil and gas industry know it is critical to maintain stable, continuous operations without sacrificing safety. They also know that regular maintenance, quick diagnosis of potential problems, and clear documentation are key to keeping production going smoothly and meeting regulatory requirements.

A multipurpose monitoring and troubleshooting tool for oil and gas applications

Infrared cameras offer the versatility, accuracy, and usability to address a wide variety of inspection and troubleshooting activities in the oil and gas industry. Whether used onshore or offshore, upstream or downstream, infrared cameras allow you to capture two-dimensional representations of the apparent surface temperatures of a wide variety of equipment and processes. You can collect heat signatures for process equipment, as well as for leaks in pipes and tanks, without touching those surfaces and without interfering with the process. The images and measurements from that inspection can help you quickly identify problems at an early stage.

However, not all thermal imagers are created equal. The new Fluke TiX1000, TiX660 and TiX640 infrared cameras—part of the Fluke Expert Series line—are ideal for oil and gas applications

because they allow you to collect significant information from a safe distance. That means you can often use these cameras to inspect equipment or trouble spots without interrupting production and without getting a hot work permit.

The standard 32x zoom and optional telephoto lenses on these Fluke Expert Series infrared cameras are powerful enough to produce high resolution images of targets over 100 feet away with a crisp level of detail so you can quickly pinpoint temperature anomalies.



Top TEN

Oil and gas inspection applications for Expert Series infrared cameras

1. Remote sites/compressor stations
2. Towers, stacks that are burning, and air scrubbers
3. Steam traps, leaks, cat cracker degradation
4. Horizontal flares on offshore rigs
5. Top drives
6. Tank level
7. Electrical systems
8. Equipment monitoring
9. Motors and drives
10. Bearings

Expedite inspection and troubleshooting

Oil and gas production environments can be extremely challenging. The hazardous nature of the products, the hot, moist, dusty and corrosive conditions, and less than optimal lighting, drive inspectors to complete their tasks quickly and leave the area. You need to have confidence that the infrared camera you're using can identify potential problems at an early stage, because you don't want to have to make a second trip, or deal with the fallout of imprecise imaging.

That's why the new Fluke Expert Series infrared cameras with their high resolution

imaging, long distance accuracy, thermal sensitivity, advanced focus systems, flexible viewing options, and other innovative features are so well suited to this environment. They let you work from a safe distance and still get ultra-high resolution images that provide detailed temperature information. Because they deliver this performance at such a long distance, they save a lot of climbing and allow you to inspect areas you wouldn't be able to get close enough to see otherwise without shutting down production.

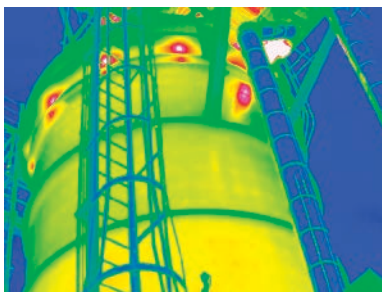
Here are just some of the inspection areas where these cameras can save you time, energy, and downtime:



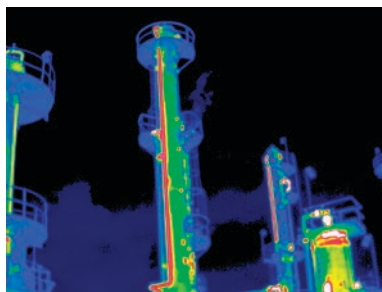
Gain inspection accuracy, versatility, and speed with the new Fluke Expert Series infrared cameras

- **More diagnostic information.** The more detail you can see in an infrared image, the more information you have to work with. These Fluke Expert Series infrared cameras give you both detail and information.
- **Super high resolution images.** Get four times the standard mode resolution and pixels (up to 3.1 million pixels on the TiX1000 and up to 1.2 million pixels with the TiX660) with Super Resolution mode for crisp images that deliver maximum detail.
- **Large 5.6 inch rotatable LCD display** lets you more easily inspect over, under, and around difficult-to-navigate equipment.
- **A tiltable LCoS color viewfinder display** with 800 x 600 pixel resolution provides great visibility in daylight applications.
- **Advanced focus systems** offer a choice of manual, auto focus and LaserSharp® Auto Focus and EverSharp multifocal recording features, for quick, accurate, in-focus image capture.
- **Maximum lens flexibility** with field replaceable optional lenses (2x and 4x telephoto lenses and two wide-angle lenses) gives you the ability to capture high-resolution images close up or at a distance, eliminating the need in many cases to climb a tower or stack.
- **Gray scale and full color imaging** serve a variety of applications.
- **Video capture with voice and text annotations** makes it easier to document trouble points.
- **Fluke Connect™ wireless compatibility** allows inspectors to send images and measurements to smartphones and iPads with the Fluke Connect® mobile app for team collaboration*.
- **Handheld versatility** and the included neck strap make it easy to carry if you do have to climb a ladder.

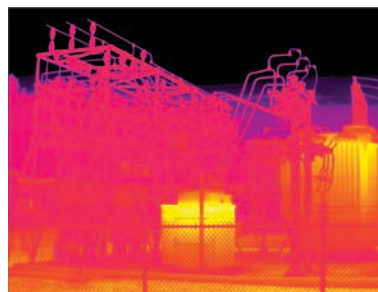
*Within providers wireless service area.



Evaluate corrosion or structural integrity of storage tanks.



Easily inspect stacks and flares from the ground.



Monitoring of large electrical infrastructures that support oil and gas facilities.

- **Remote sites/compressor stations.** These remote sites are linked to regional operational centers via freeway and cellular towers that constantly transmit data on their operating conditions. Rather than having to climb 180-foot towers to check for loose connections and other weak links, technicians can use the 32x zoom on these TiX Series infrared cameras or a telephoto or super telephoto lens to examine these areas from the ground, quickly, safely, and accurately.
- **Towers, stacks that are burning or steaming, and air scrubbers** can be easily scanned from the ground to evaluate their performance.
- **Steam traps, leaks in hard-to-reach areas such as cement kilns, or degradation of fluid catalytic crackers "cat crackers"**. You can point these infrared cameras at a hard-to-reach targets and swivel the large 5.6 inch articulating LCD display into a position where you can see the image.
- **Horizontal flare inspection on an offshore rig.** With the high resolution and zooming capabilities at long distances, you can inspect an offshore flare either from the rig or from a helicopter. The high frame-refresh capabilities,

helps you spot sudden rapid temperature changes, that might indicate that the flare is about to burn out.

- **Top drive inspection.** Rather than have to climb up an oil drilling rig, you can inspect the top drive from the ground using the 32x zoom capability. The tiltable color viewfinder provides a clear view of the image even in sunlight.
- **Tank level inspection.** Using a wide angle lens with the high definition capabilities of the Fluke TiX1000 infrared camera, you can quickly scan tank levels from a distance. Offloading or onloading fuel. You can use these Expert Series cameras at a distance to scan the pipes.

In addition to long distance exterior inspections, you can use these Fluke TiX series infrared cameras to troubleshoot the standard equipment in a refinery from a safe distance so you may not have to secure a hot work permit or get closer to high voltage.

- **Inspecting electrical systems.** These infrared cameras help pinpoint potential problems with loose and corroded connections, electrical imbalance, failing transformers and switchgear and faults in motor control centers. You can

clearly view the image in less than optimal light conditions on the large 5.6-inch backlit display.

- **Monitoring.** Helps identify problems in refractory-lined equipment, heaters, boilers, furnaces, heat exchangers, steam lines and traps, process and safety valves, steam turbines, process lines and mechanical rotating equipment—both in the plant and in the field.
- **Checking motors and drives.** You can use these Fluke TiX infrared cameras for regular inspections to:
 - See if the motors and associated panels and controls are operating too hot
 - Track down specific failed components
 - Check for phase imbalance, bad connections, and abnormal heating on the electrical supply
- **Inspecting bearings.** Capture two-dimensional high resolution infrared images of bearing and housing temperatures, to compare current operating temperatures to benchmarks and detect potential failures in time to prevent them.



Multiply your resources with Fluke Connect® wireless capabilities

With the Fluke Connect mobile app you can transmit images and measurements from Fluke Expert Series infrared cameras in real-time to any smart phone that has the Fluke Connect mobile app. That makes it easy to share results with team members because everybody on the ShareLive™ video call can see the same images and measurements remotely that you're seeing on site. That can help you get questions answered or get approvals on the spot and expedite repairs.

You can also save images and measurements from your smart phone to EquipmentLog™* history in secure Fluke Cloud™ storage for easy access by all authorized users. In that way you can compare real time measurements to baseline data to identify problems and make better decisions faster.



You can also use SmartView® software included with all Fluke infrared cameras to document your findings in a report that includes thermal images, visible light images, and blended images to communicate problems you find and to suggest repairs.

Fluke Connect™ is not available in all countries.
*Within providers wireless service area.

See what you're missing

The common requirements for all of these applications are clear image resolution, temperature detail and accuracy, speed, and flexibility to get images in areas that may be hard to reach. Those are the very capabilities that set these Fluke infrared cameras apart.

To find out more about how these versatile, high resolution, high accuracy cameras can help you keep your production processes moving smoothly, consult your Fluke sales representative or visit www.fluke.com/TiX1000 for more information.

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