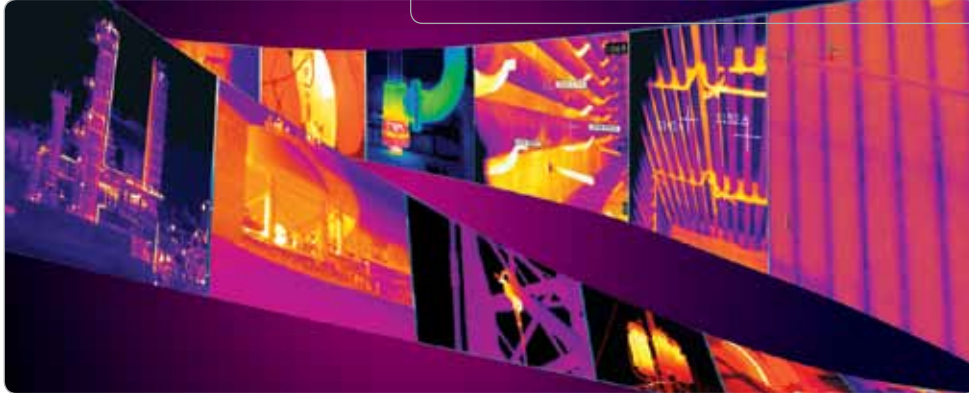


Infrared Cameras for Optical Gas & Through- Flame Imaging



VOC/Hydrocarbon Gas Detection

SF6 Detection

Through-Flame Furnace Inspection

Environmental Protection

Safety

Product Loss Prevention

Regulatory Compliance

Predictive Maintenance

Optical gas imaging cameras give you the power to see invisible gases escaping into the environment faster and more reliably than traditional “sniffer” detectors.

With a FLIR camera, you can see and document gas leaks and furnace problems that lead to lost product, lost revenues, fines, and safety hazards.



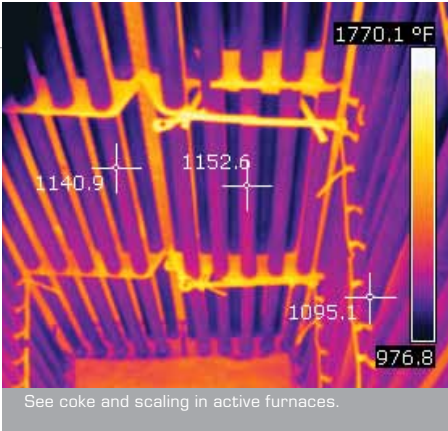
Volatile Organic Compounds & Hydrocarbons

Scan thousands of connections quickly to detect VOC and hydrocarbon gas leaks from a safe distance, avoiding regulatory violations and lost revenue from service down time.



SF6 Leaks

Detect even small SF6 leaks from gas-filled circuit breakers found in substations safely and quickly.



See coke and scaling in active furnaces.

Furnace Tube Inspection

See furnace issues like internal coking and external scaling on product furnace tubes.



Find ash, slag, and clinkers in boilers.

Boiler Inspection

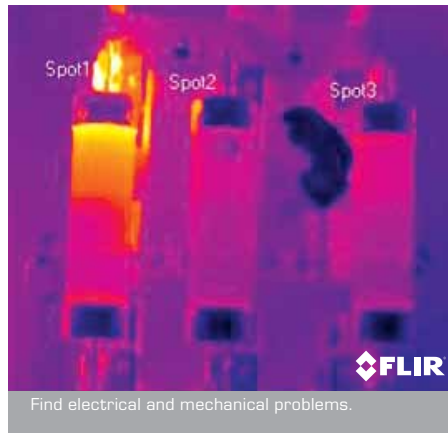
Discover issues like ash, slag, and clinker build-ups in coal-fired boilers without shutting them down.



Guard against product and revenue loss.

Product Loss

Companies have saved over \$10 million annually in lost product by using FLIR's optical gas imaging.



Find electrical and mechanical problems.

Predictive Maintenance

Scan large areas and hundreds of connections quickly and efficiently to prevent unexpected service outages and lost revenues.

Optical Gas Imaging Cameras

More than 80% of a facility's gas leaks will occur in less than 1% of inspected components. Inspectors spend over 99% of their time inspecting safe, non-leaking components. Not anymore.

The GF-Series optical gas detection cameras let you find hydrocarbon, natural gas, and SF6 leaks quickly, accurately, and safely without shutting systems down for inspection.

Large petro-chemical facilities have thousands of connections and fittings that need to be inspected regularly. Older inspection techniques like "sniffers" are slow, and their results are far from precise.

FLIR's optical gas imaging cameras provide a number of benefits compared to traditional "sniffers," because they scan a broader area much more rapidly, and they can see into areas that are difficult to reach with contact measurement tools. Invisible to the naked eye, gas leaks look like smoke on infrared optical gas imaging cameras, making them easy to see.

Hydrocarbon/Natural Gas Imaging – GF-Series cameras allow you to survey large areas quickly and effectively, detecting small emissions within large complexes.

SF6 Gas Imaging – One pound of SF6 has the same global warming impact of 24,000 pounds of CO₂. Because of its long lifespan and high potency, even a relatively small amount of SF6 can have a significant impact on global climate change.

Safeguard the environment and meet environmental regulations with FLIR's optical gas detection cameras.

Optical Gas Imaging & Predictive Maintenance Thermography – By combining standard infrared imaging with the ability to see gas leaks, GF-Series cameras offer both optical gas detection and temperature measurement capabilities, dramatically enhancing your facility's maintenance program.

EPA Regulations – The EPA has recently included optical gas imaging as an accepted leak detection technique in the Method 21 Leak Detection and Repair Alternative Work Practice (Method 21 AWP), as well as the Green House Gas Reporting Rule.

Per EPA and API recommended testing guidelines, FLIR's GF-300 and GF-320 optical gas detection cameras can detect small leaks of these gases:*

- Benzene
- Butane
- Ethane
- Ethylbenzene
- Ethylene
- Heptane
- Hexane
- Isoprene
- Methyl Ethyl Ketone (MEK)
- Methane
- Methanol
- MIBK
- Octane
- Pentane
- 1-Pentane
- Propane
- Propylene
- Toluene
- Xylene

*GF-Series cameras see these gases and many more. Call for more details.

FLIR's GF-306 optical SF6 gas detection camera can detect small leaks of these gases:*

- Sulphur Hexafluoride
- Anhydrous Ammonia
- Ethyl Cyanoacrylate ("Superglue")
- Chlorine Dioxide
- Acetic Acid
- FREON-12
- Ethylene
- Methyl Ethyl Ketone (MEK)



Imaging Specifications



	VOC Gas Detection	SF6 Detection
	GF-300/-320	GF-306
Imaging Specifications		
Detector Type	Cooled InSb	Cooled QWIP
Spectral Response	3.2 - 3.4 μm	10.3 - 10.7 μm
Resolution	320 x 240	320 x 240
Total Pixels	76,800	76,800
Thermal Sensitivity	<0.025°C	<0.025°C
Accuracy	+/-2% or 2°C*	+/-2% or 2°C
Temperature Range	-40°F to 662°F (-40°C to 350°C)	-40°F to 932°F (-40°C to 500°C)
High Temp Option	x	
Lens Options	Standard: 24° x 18°; Optional: 14.5°, 6°	Standard: 24° x 18°; Optional: 14.5°
Zoom	1-8x Continuous Digital	1-8x Continuous Digital
Focus	Auto & Manual	Auto & Manual
Color LCD	4.3"; 800 x 480 Pixels	4.3"; 800 x 480 Pixels
Adjustable Viewfinder	800 x 480 Pixels	800 x 480 Pixels
Video Camera w/ Lamp	3.2 MP	3.2 MP
Laser Spot	x	x
Video Out	HDMI	HDMI
Analysis		
Spotmeters	10*	10
Area Boxes	5 (min./max./avg.)*	5 (min./max./avg.)
Profiles	1 live line (horiz. or vert.)*	1 live line (horiz. or vert.)
Delta T	x*	x
Annotation		
GPS	x	x
File Storage		
Radiometric JPG	x	x
MPEG Video Recording	x	x

*GF-320 only



Furnace Inspection Cameras

Specifically designed to see through flames, the new GF-309 is equipped with a special midwave “flame filter” engineered to see in the high temperatures (up to 1,500°C) encountered during industrial furnace and boiler inspections.

Furnace Inspection – The GF-309 gives inspectors clear thermal imagery of fired product tubes, allowing them to distinguish between internal coking and external scaling, helping to avoid costly tube overheat failures. The ability to identify coking also allows for proper planning of unit shutdowns and de-coke procedures.

Burner Alignment – With the GF-309’s specialized filters, inspectors can accurately scan for proper burner alignment and check for flame impingement, identifying if the flame pattern is causing localized tube overheating.

Fire Box Inspection – Its wide temperature range makes the GF-309 well-suited for external firebox inspections, detecting the hot spots on the outside of a firebox that indicate a problem with the internal refractory bricks or insulating blankets.

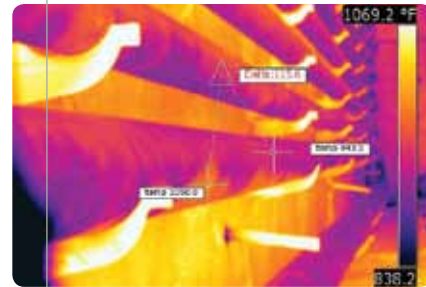
Coal-Fired Boilers – The GF-309 is ideal for identifying slag buildup that can potentially interfere with heat transfer, cause localized tube corrosion, and result in catastrophic mechanical failure when the slag “clinkers” fall.



Imaging Specifications



	Furnace/Boiler Inspection
	GF-309
Imaging Specifications	
Detector Type	Cooled InSb
Spectral Response	3.8 - 4.05 μm
Resolution	320 x 240
Total Pixels	76,800
Thermal Sensitivity	<0.025°C
Accuracy	+/-2% or 2°C
Temperature Range	-40°F to 2,732°F (-40°C to 1,500°C)
High Temp Option	x
Lens Options	Standard: 24° x 18°; Optional: 14.5°, 6°
Zoom	1-8x Continuous Digital
Focus	Auto & Manual
Color LCD	4.3"; 800 x 480 Pixels
Adjustable Viewfinder	800 x 480 Pixels
Video Camera w/ Lamp	3.2 MP
Laser Spot	x
Video Out	HDMI
Analysis	
Spotmeters	10
Area Boxes	5 (min./max./avg.)
Profiles	1 live line (horiz. or vert.)
Delta T	x
Annotation	
GPS	x
File Storage	
Radiometric JPG	x
Radiometric Video (15 Hz)	x
MPEG Video Recording	x



Reporting Software

Whether you're looking for VOC emissions, SF6 leaks, or furnace problems, FLIR cameras are powerful tools for finding a variety of problems in a variety of facilities. But your ability to document and report your findings is just as important as your ability to discover potential problems in the first place.

Your reports need to be easily customized for any situation and customer requirement; they need to reflect your professionalism and the quality of your work, and your recommendations for action need to be clear and well documented in order for others to complete repairs.

FLIR offers several reporting software products, some designed specifically for optical gas detection.

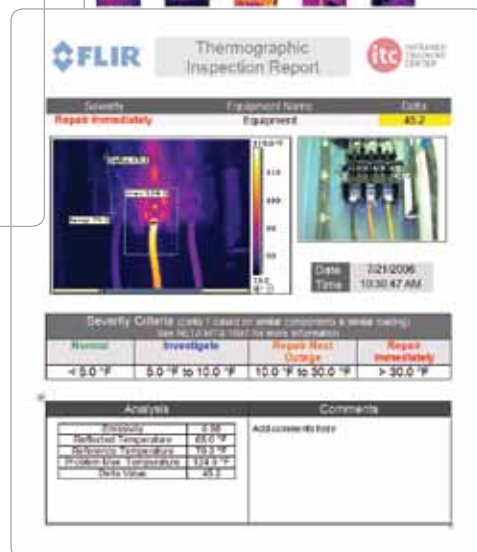
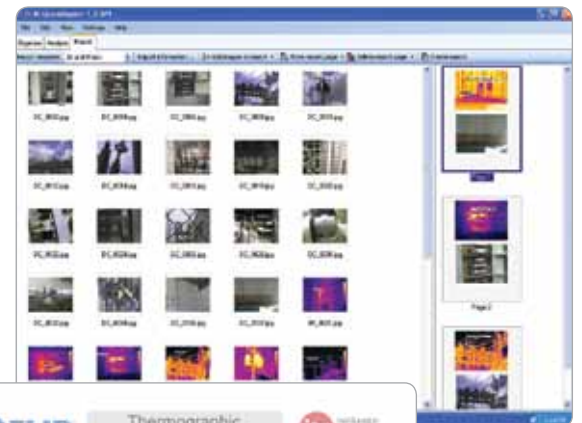
Reporter PRO

FLIR Reporter PRO equips the busy professional thermographer with everything he needs to complete reports quickly and with total flexibility. Design your templates in Microsoft Word®, drag-and-drop your images onto the template, and generate your multi-page report automatically. Import all of your measurements, Delta T analysis, or personal formulas, even load your imagery and report data into Excel and PowerPoint!

Key Features

- Flexible report design and layout
- Fully integrated with Microsoft Word
- Powerful analysis tools include Delta T & Auto Hot-Spot
- Wizard-guided report generation
- TripleFusion Picture-in-Picture (movable, sizable, scalable)
- Predictive trend analysis functionality
- Automatically adds GPS coordinates to images

Visit www.flir.com to download trial versions of our powerful software tools.

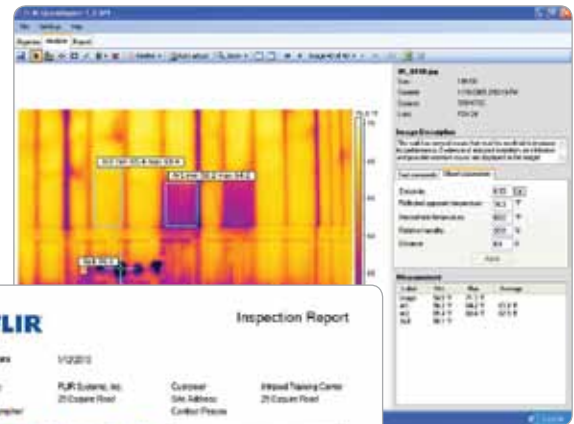


QuickReport

All FLIR cameras come with the powerful QuickReport analysis and reporting software that allows you to import your infrared and visible-light images into an easy-to-read report. You can measure, adjust, add notes, and send your reports to others for review in PDF format.

Key Features

- Adjust level, span, and color palette
- Change isotherm and temperature levels
- Create spot meters, lines, and areas
- E-mail images and reports in PDF format
- Alter parameters for dew point and insulation alarms
- Add your company logo to inspection reports
- Drag-and-drop images and preview report pages
- Digitally zoom and pan up to 8 times
- Manipulate Fusion images



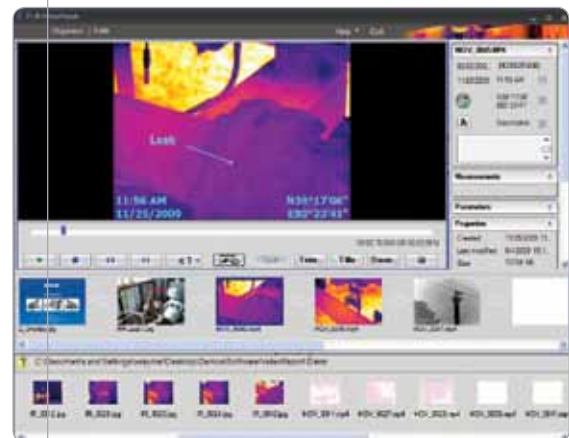
VideoReport

FLIR VideoReport is a software package specifically designed to provide an easy way to edit non-radiometric .mp4 video clips taken with FLIR GF-Series cameras.

VideoReport makes building reports with video clips easy. You can take the videos captured with your GF-Series cameras, select, and edit the video you want, and build your movie report with a few simple drag-and-drops.

Key Features

- Use Storyboard to cut, edit, combine, and re-order clips
- Save a frame
- Add text
- Play clips at different speeds
- Add digital photos and thermal images to video clips
- Add GPS location to video clips
- Review file properties and information about the camera type, lens, and serial number
- Add markers (circle or arrow) as overlay graphics to any video clip



Infrared Training Center

Make the most of your investment in FLIR technology, and advance your career

Your professionalism drives you to know everything you can about your business; that's why you'll want to get the most of your thermal camera.

FLIR cameras are easy to use and intuitive, but only expert training will give you the knowledge and skills to wring every last bit of capability from your investment. Professional photographers get extensive training, and it shows in their work. The same is true for your craft as a thermographer, and we can help: an Infrared Training Center certificate is proof of your expertise in operating your camera and interpreting the thermal information it provides.

The Infrared Training Center, the premier educational and training resource for infrared camera application professionals, offers a wide variety of infrared courses from entry level to advanced thermography infrared training.

ITC courses provide:

- Industry-leading, high-quality interactive instruction
- Most qualified international instructors
- Most extensive hands-on laboratories
- ISO 9001 registered
- On-line training courses are also available

Infrared courses include:

- Level I, Level II, and Level III
- Building Diagnostics
- Building Science certificate
- Weatherization & Energy Audits
- Commercial Roof IR Inspections
- Commercial Electrical IR Inspections

Attend classes at our training center, locally at one of our regional classes, or in your facility with our on-site service.

For full course descriptions, updated schedules, and more information, visit the ITC website at www.infraredtraining.com or call 1.866.872.4647.



Try them first!

Not sure which FLIR is right for you? Rent or lease the model you think fits your needs first and take it for a test drive!

Rent

FLIR's rental program is a great way to make sure you are getting the model, performance, and features you need. Our rental department has all the current models in stock, and we are ready to help.

Lease

Leasing is a great way to minimize your initial expense, and there may be tax advantages for you to lease. FLIR has several options for those interested in starting or upgrading your program. Give us a call and we can help.

Trade Up

FLIR offers trade-in value for many existing cameras. Contact your FLIR representative our trade-in program, and check into our stock of Pre-Owned cameras while you're at it.



About FLIR

All infrared cameras are not created equal, because infrared camera manufacturers are not all the same. FLIR stands above the rest.

The largest commercial infrared company in the world, FLIR has nearly 50 years of experience building and integrating high-performance infrared cameras, giving us a command of these specialized technologies that no one else can touch.

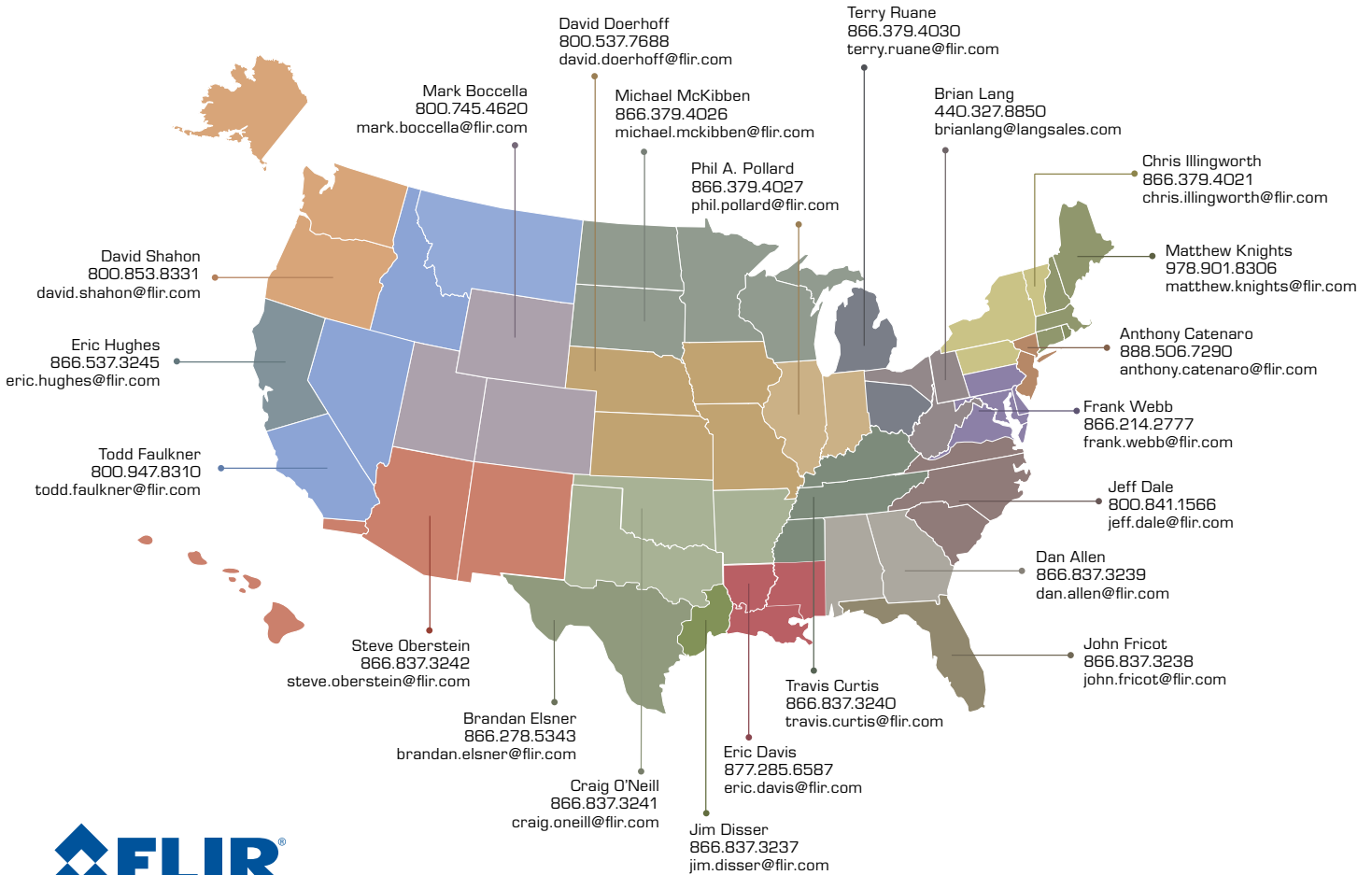
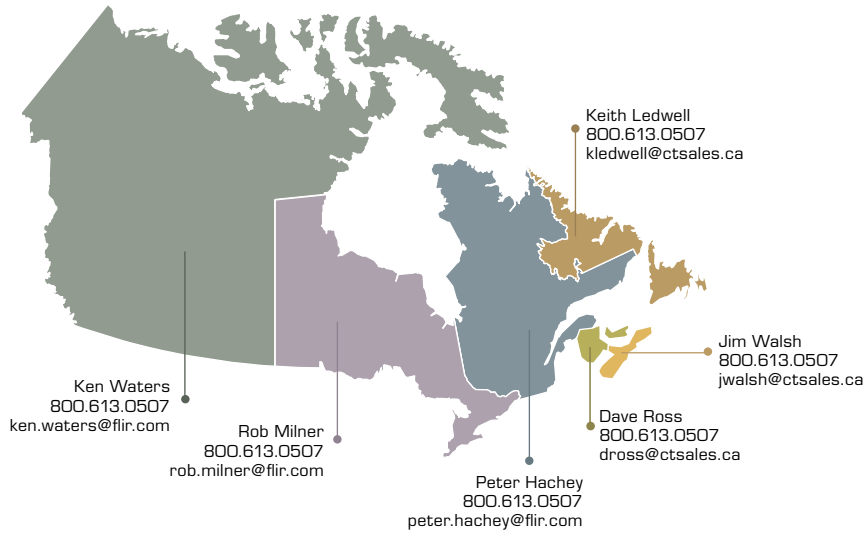
FLIR's products are at work every day saving lives, protecting our troops overseas, and helping to keep borders and facilities safe.

Now, FLIR's cameras are available for your personal use, too. You can have a FLIR on your boat, your car, or even as a home security camera. The same FLIR technology in your maintenance camera is in Audi and BMW cars as a pedestrian detection system. And if you enjoy hunting and outdoor activities, there's an inexpensive FLIR for you too. You might not know FLIR by name, but you have been seeing our products at work since the 1960's.

If you are looking for infrared camera products, you've come to the right place.



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