

# OEC Elite™ CFD

Premium mobile C-arm

*This is just **INGENIOUS***

Einstein was more  
than just a scientist

Michelangelo was more  
than just an artist

This is more than just  
another C-arm







Now, a C-arm smart enough  
for you and your team.

**OEC Elite™ CFD**

Premium mobile C-arm





**Ingenious  
FD on Board**  
CMOS: The right mobile  
flat detector technology

**Data-Rich Imaging**  
See what you need to see:  
The power behind high IQ

**Intelligent Dose Control**  
Delivering on the promise of FD:  
High IQ at low dose

**Smart Flow**  
Ease and efficiency: Designed for  
a more intelligent workflow

**Platform for your Future**  
Build on a legacy of  
innovation



**OEC Elite™ CFD**  
Premium mobile C-arm





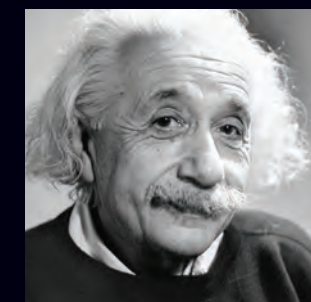


# INGENIOUS FD ON BOARD

The Right Mobile Flat Detector Technology

*"The definition of genius is taking  
the complex and making it simple."*

Albert Einstein





# INTRODUCING CFD: THE INGENUOUS CMOS FLAT DETECTOR

At last, a more efficient panel that delivers better image quality at low dose.

Flat panel detector (FD) technology has long promised IQ at low dose: the ability to deliver images that have the resolution, clarity, contrast, and lack of artifact, at the conscientious dose levels you and your patients demand. The ingenious flat panel detector available on board the OEC Elite CFD is an exclusive, high-efficiency CMOS flat detector (CFD). Combined with the advanced technology in our newest C-arm design, the CFD empowers you to go beyond the low dose imaging trade-offs that have characterized mobile FDs for a decade. The CMOS flat detector, specifically for full-size mobile C-arms, is exclusive to GE OEC and it's what you've been waiting for in a mobile FD C-arm.

**CMOS: the right mobile FD technology.**

## **ULTRA-EFFICIENT CRYSTALLINE STRUCTURE**

Puts an end to frame rate/resolution compromises.

## **SUPERIOR ELECTRON MOBILITY**

Improves clarity by eliminating visible lag.

## **ACTIVE PIXELS**

Eliminates the need for bulky amplification electronics, resulting in a small, compact detector.

## **IMPROVED SIGNAL TO NOISE RATIO**

Results in higher IQ in low dose conditions.



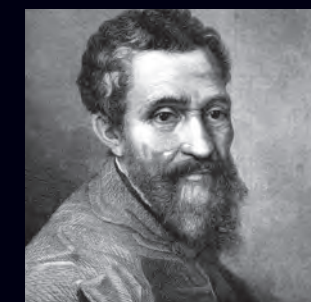


# DATA-RICH IMAGING

The Power Behind High IQ

*"A man paints with his brains and not with his hands."*

Michelangelo





# DATA-RICH IMAGING

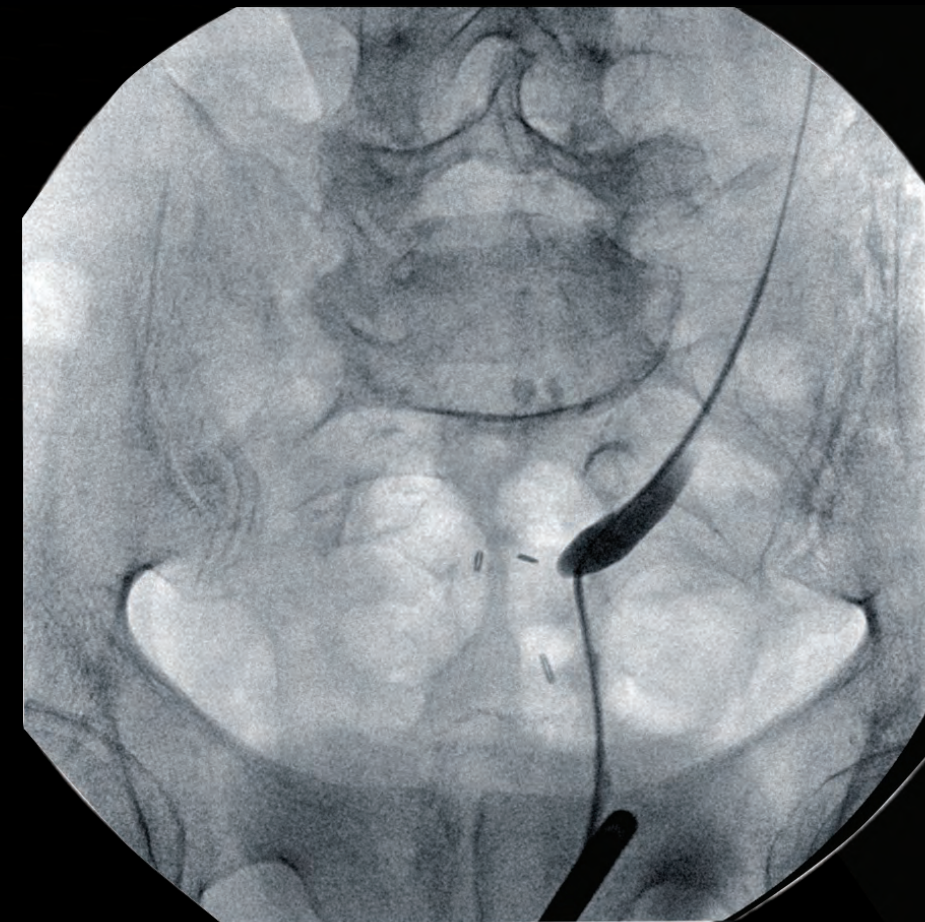
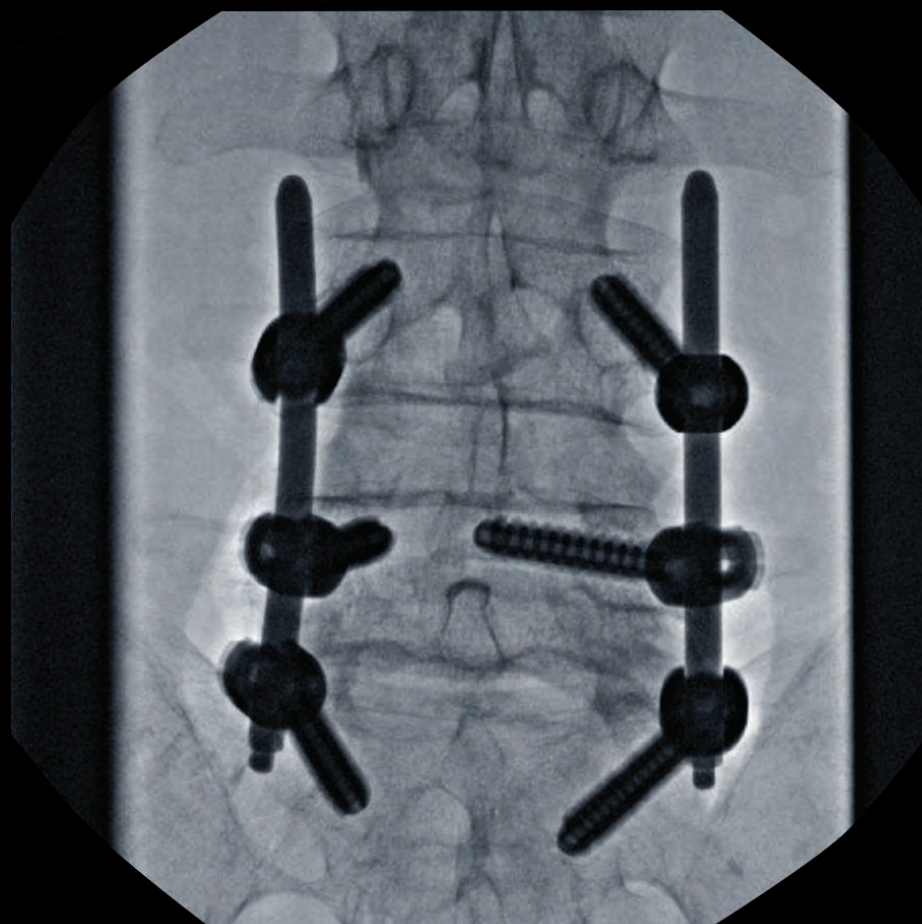
## MORE DATA. THE POWER BEHIND OEC ELITE CFD'S HIGH IQ.

More data translates to better image quality. It's that simple—and that complex.

Achieving OEC Elite CFD's high IQ takes an ingeniously efficient imaging chain that captures and retains more of the data critical to producing images with higher resolution, more dynamic range, and greater clarity.

Data-rich imaging begins with our exclusive CFD—the only flat detector with 1.5 k x 1.5 k resolution for 21 cm x 21 cm and 31 cm x 31 cm panels—and ends with distortion-free images that can dazzle your eye with superb anatomical detail.

**More data. Better image.  
It's what you need to deliver success.**



## AN INGENUOUSLY EFFICIENT IMAGING CHAIN: THERE'S MORE TO MEET THE EYE.

### DETECT MORE DATA

A highly sensitive CFD delivers flat panel resolution better than the low dose efficiency of an image intensifier.

- 1.5 k x 1.5 k image acquisition
- No binning—no reduction in resolution
- Higher DQE at low dose than amorphous silicon (a-Si) detectors
- TruView: see up to 22% more anatomy

### POWER MORE DATA

Only OEC Elite CFD can sustain FULL power (15 kW peak) at full frame rate (30 fps) and full resolution (1.5 k x 1.5 k).

- Exclusive battery-buffered generator technology
- Currents up to 75 mA for dense anatomy penetration

### PROCESS MORE DATA

Real-time data processing and transfer enable full resolution/full frame rates without visible stutter and lag.

- Adaptive dual-well pixel design
- Reduced noise
- Motion reduction technology
- Customized auto brightness/contrast control
- Real time ability to ignore metal artifacts

### DISPLAY MORE DATA

Enhanced image display viewing to see more than OEC 9900.

- 40% more pixels displayed
- Larger 27" anti-glare LCD color display
- Squircle image display retains 100% field of view when rotated

**BETTER  
IMAGE**





## MORE COMPLETE IQ: SEE WHAT YOU'VE BEEN MISSING

Data-rich imaging delivers visual information that you may have been missing with image intensifiers or competing flat panels including motion in between pulse frames, full resolution at full frame rates, and anatomic detail formerly lost in bloom, lag, or noise. OEC Elite CFD is designed to give you a more complete picture.

### AN END TO FULL RESOLUTION/FRAME RATE COMPROMISES.

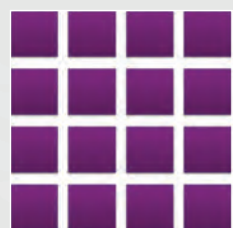
OEC Elite CFD is the only flat detector to offer you the continuous fluoroscopy capability you've relied on with your image intensifier—and it does it with higher resolution. The CFD's ultra-efficient crystalline structure processes and transfers data in real time to process full resolution images at full frame rate (30 fps).

### SMOOTH MOTION WITHOUT GAPS BETWEEN FRAMES.

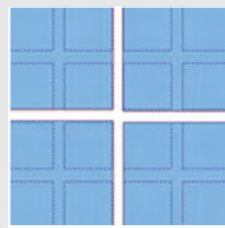
Only true continuous fluoroscopy (without pulsing) captures detailed anatomy without the distraction of the stutter, lag, or ghosting that characterizes "continuous pulse" fluoroscopy images. Only true continuous fluoroscopy gives you the confidence that comes from knowing you won't miss anything between frames when placing k-wires, retrieving kidney stones, or placing pins.

#### NO BINNING: THE KEY TO FULL RESOLUTION AT FULL FRAME RATE

Standard flat detector technology "bins" or consolidates pixel signals, reducing resolution to enable full frame rates. GE's exclusive CFD technology processes every pixel signal without binning, providing full resolution at full frame rate.



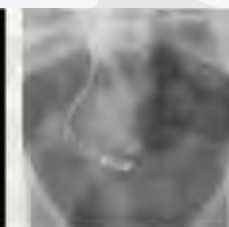
OEC Elite CFD  
No Pixel Binning



Standard FD  
2 X 2 Pixel Binning



WHAT  
ARE



YOU  
MISSING



BETWEEN  
PULSES?

**CONTINUOUS FLUORO VS. PULSE** Your eyes work continuously, shouldn't your imaging chain?\*

\*Clinical images generated by OEC 9900 Elite.

### HIGHER DYNAMIC RANGE. MORE ANATOMICAL DETAIL.

With a higher dynamic range at both high and low dose, the OEC Elite CFD captures more data, revealing precise anatomic detail of varying densities. By processing more than 65,000 shades of gray, you have the differentiation you need between lung, heart, and bone tissue when placing a guide wire in the chest.

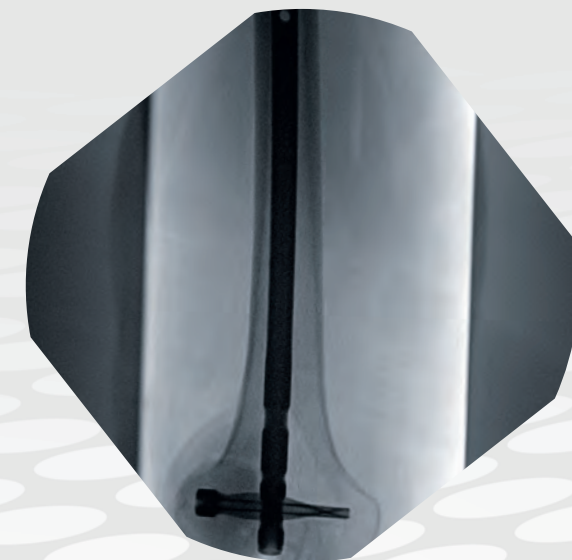


### RESPONSIVE SMART METAL. NO BLOOMING ARTIFACTS.

OEC Elite CFD's Smart Metal responds immediately to the introduction of metal to the field, maintaining a high dynamic range without the interruption of bloom.

### CLEAR IMAGES WITHOUT LAG OR GHOSTING.

With the CFD's superb electron mobility, OEC Elite CFD eliminates the lag between images (common with less efficient panels) that can cause anatomy from a previous image to "ghost" a current image.



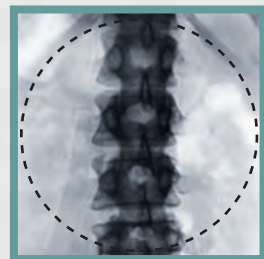
*"The Elite's ability to capture full resolution and process at full frame rate delivers exceptional detail in even the most challenging cases."*

— Lori Burton, GE Senior Systems Architect





## SEE MORE ANATOMY: CAPTURE THE LARGEST FIELD OF VIEW



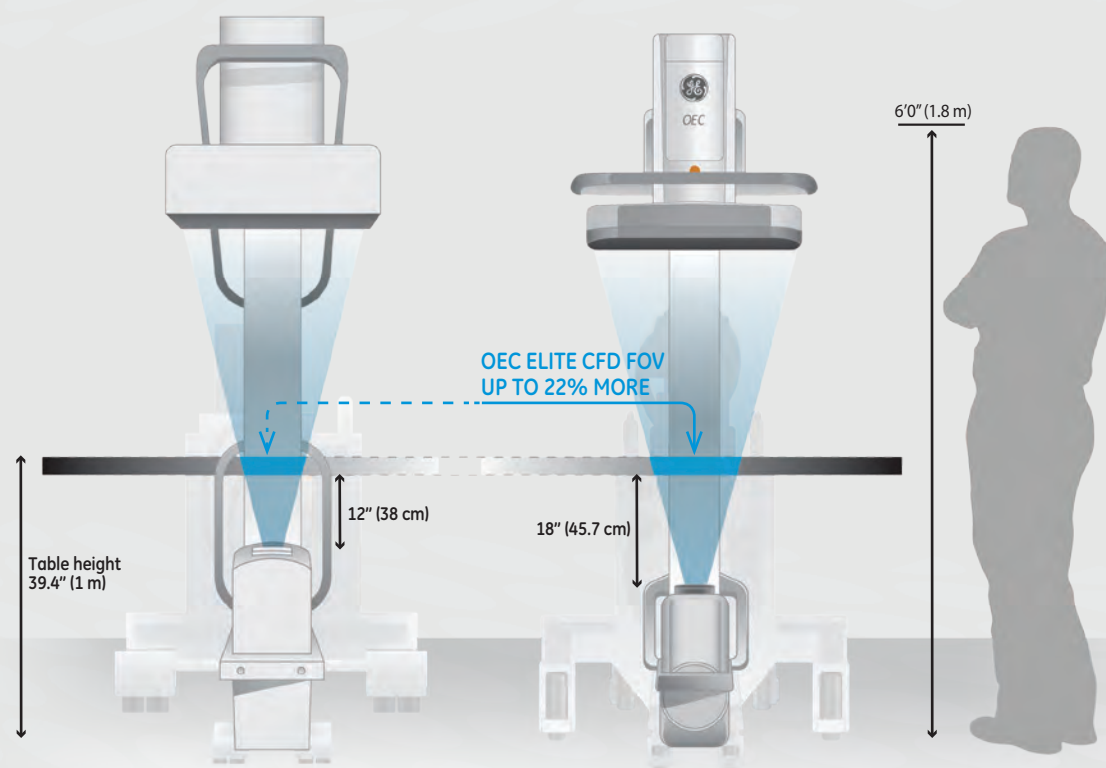
Mono-block System Image



OEC Elite CFD TruView Image

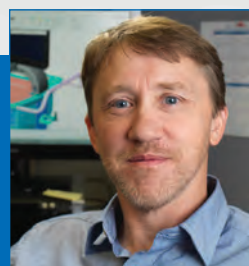
### OEC ELITE CFD VS. MONOBLOCK C-arm

OEC Elite CFD's low-profile X-ray tube housing allows the detector to be closer to the anatomy, giving you the TruView—more anatomy and more detail with less skin dose.



### TRUVIEW: SEE MORE ANATOMY.

You don't have to make a detector bigger to get more field of view, you just have to design it smarter. OEC Elite CFD's small, thin detector gets closer to the anatomy because its X-ray block is also small. In addition to yielding a larger field of view, placing the detector closer to the patient minimizes magnification, provides more detail, and results in less skin dose. To achieve the same benefits with a mono-block system, you'd need to raise the table height, resulting in a less ergonomic position for the surgeon and additional steps in your workflow.



*"Surgeons can become frustrated with flat detector systems shrinking or cropping their image when it's rotated. Elite's innovative squircle design displays 100% of the imaged anatomy even when rotated—unlike alternative methods."*

—Jan Bruening, GE Principal Mechanical Engineer

## AND PRESERVE IT

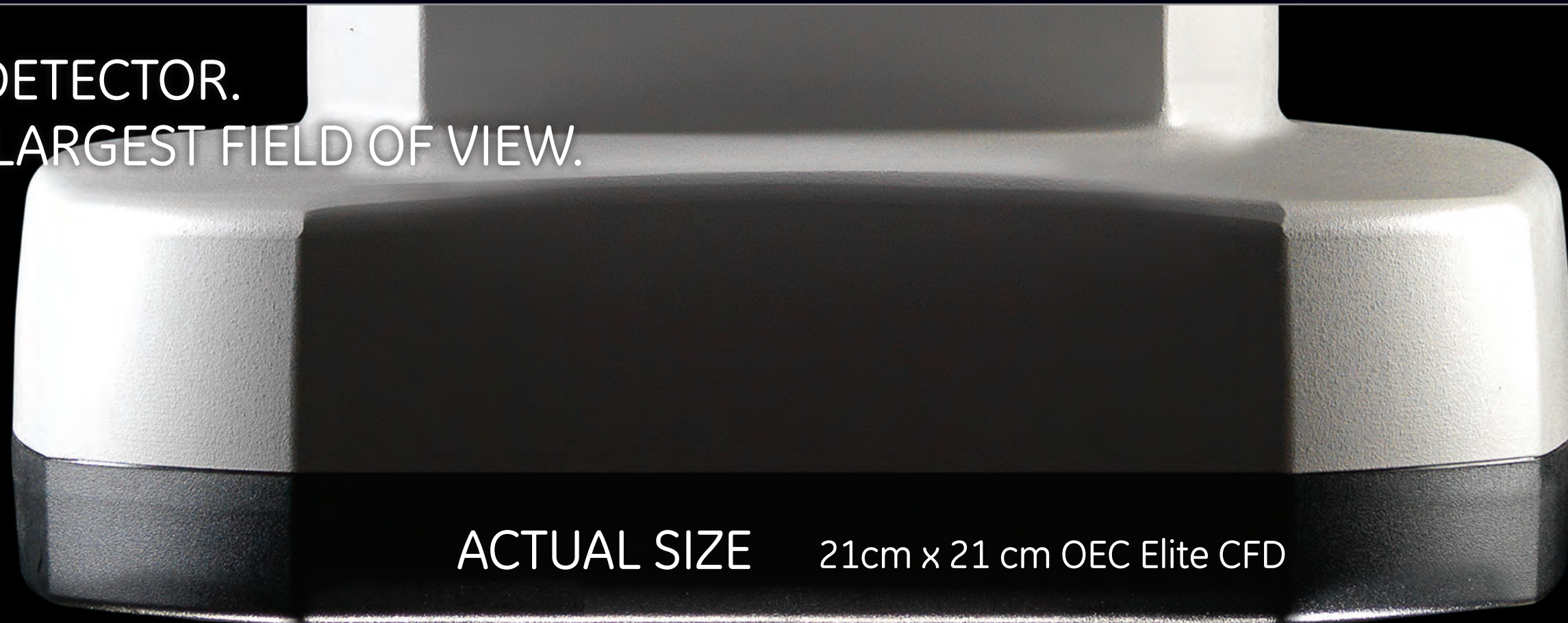
### SQUIRCLE PRESERVES 100% FOV EVEN WHEN ROTATED.

There is no change in the field of view when OEC Elite CFD's unique squircle is rotated. None. Zero. The full image is rotated with no change in aspect, size, measurement, or cropping. Squircle enables you to view all of the imaged anatomy. For example, when you rotate an anterior hip image, you won't crop the acetabulum and will maintain a full-size view of all imaged anatomy. With squircle, what you see is what you get—no matter how you rotate it.

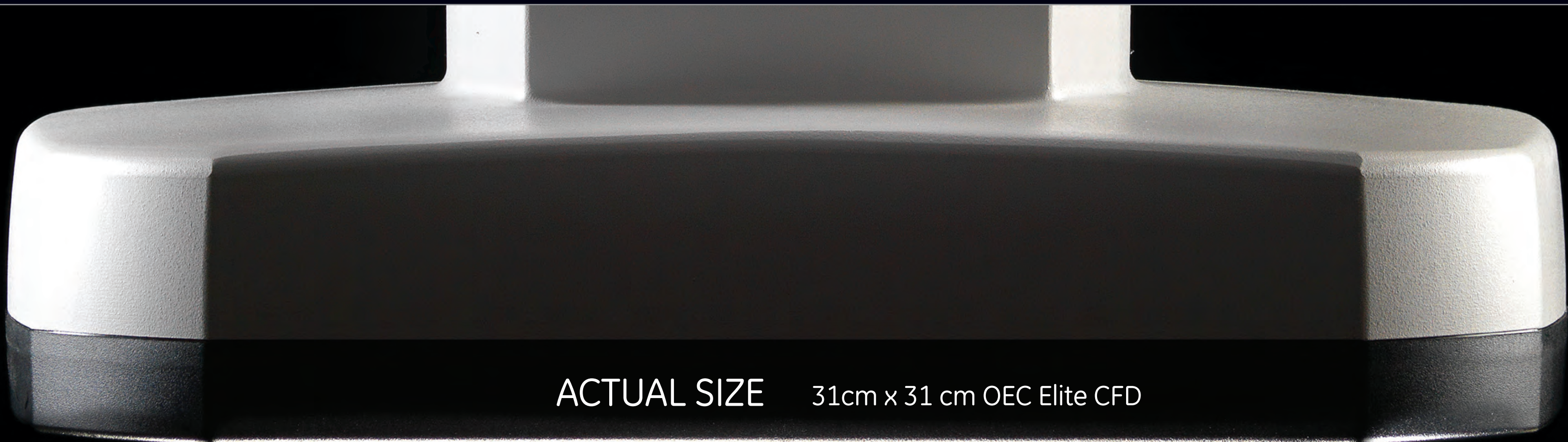




COMPACT DETECTOR.  
CAPTURES LARGEST FIELD OF VIEW.



ACTUAL SIZE 21cm x 21 cm OEC Elite CFD



ACTUAL SIZE 31cm x 31 cm OEC Elite CFD



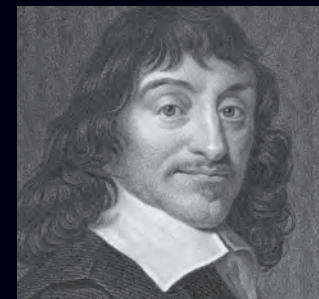


# INTELLIGENT DOSE CONTROL

Driven By You

*"It's not enough to have a good mind,  
the main thing is to use it well."*

Rene Descartes





## VERSATILITY AND CONTROL: EMPOWERING YOU TO OPTIMIZE DOSE AND IMAGE QUALITY

OEC Elite CFD introduces a new level of intelligent dose control. Intelligent because it puts more control in your hands: the person who best knows the priorities for each procedure, patient, and image. With a broad range of orthopedic and general surgery controls, OEC Elite CFD gives you the ability to manage dose and image quality independently—empowering YOU to choose the optimum balance.

### MORE CONTROL. MORE DOSE OPTIONS.

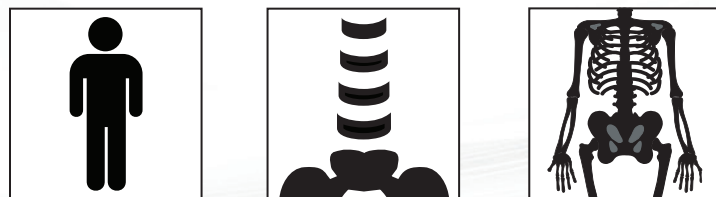
OEC Elite CFD offers five modes of dose control that can be used alone or in combination to give you the technique you need for each image.

**Digital Spot • High Level Fluoroscopy • Standard Fluoroscopy • Low Dose • Pulse**

Choice gives you control. For example, when performing urological procedures, in keeping with ALARP, you may select an acquisition using both low-dose and pulse modes. By using these two features in combination, an almost 90% reduction in dose rate is achieved<sup>1</sup>. For stone removal, you may require real-time imaging, for which, if the case allows, you may select low-dose mode for the continuous fluoroscopic acquisition. Selection of low-dose mode for producing uninterrupted imaging, results in a greater than 50% reduction in dose rate<sup>1</sup>.

### CONVENIENT PROFILES. INDEPENDENT CONTROL.

OEC Elite CFD's convenient selectable imaging profiles—general surgery, spine and orthopedics—are designed to automatically optimize imaging but leave dose control to you. OEC Elite CFD's dose settings do not automatically adjust up or down when changing profiles.



### BRILLIANT: DEVELOPING A STRATEGY FOR THE RIGHT IMAGE AT THE RIGHT DOSE.

The GE OEC Brilliant program is designed to help you reduce operator dose through education and innovative dose management tools. An effective dose management strategy is part of Intelligent Dose Control. Contact your GE OEC representative to learn more and download the OEC iguide radiation safety app from the App Store.

<sup>1</sup> use of these modes will affect image quality



*"To address today's compromises around IQ and dose we developed a custom-built CMOS flat detector for our new OEC Elite platform."*

—James Liu, GE Image Quality Principal Engineer





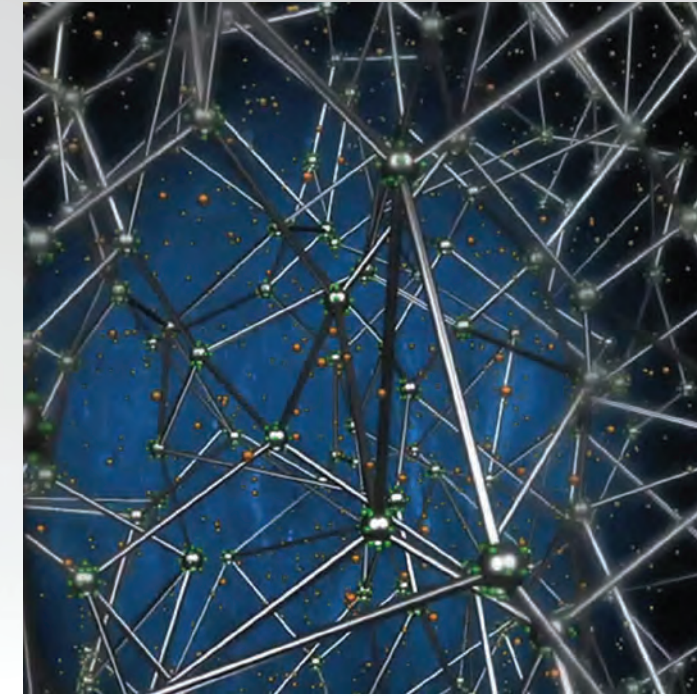
## DELIVERING ON THE PROMISE OF FD: HIGH IQ AT LOW DOSE.

OEC Elite CFD is the first premium mobile C-arm to deliver on the promise of FD technology: achieving high IQ at a low dose. With the increasing number of minimally invasive procedures that depend on high quality imaging, reducing dose to the patient and the surgical team has become even more important. OEC Elite CFD's exceptional performance comes from its Ingenious Flat Detector with CMOS technology—designed for mobile imaging.

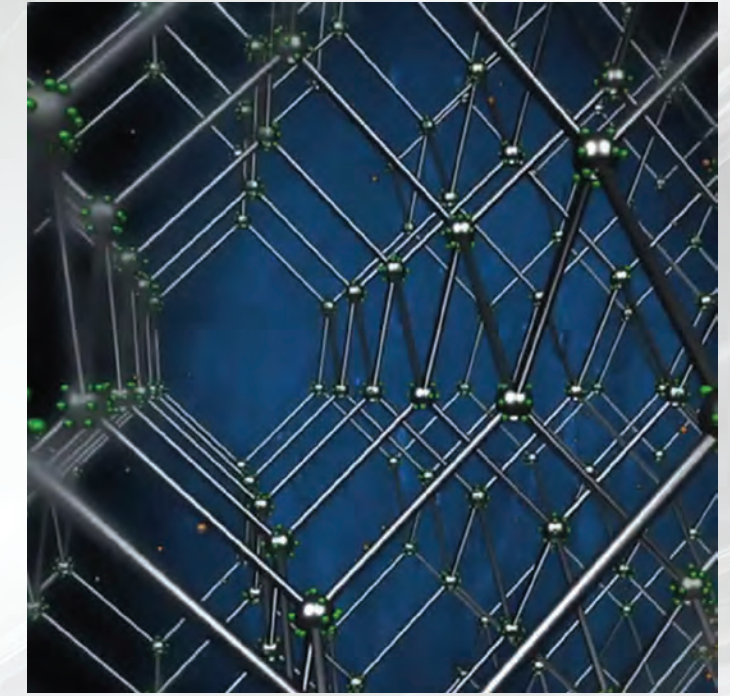
### EXCEPTIONAL LOW DOSE PERFORMANCE

OEC Elite's CFD is more efficient than other flat panels that use amorphous silicon (a-Si) FD technology. CMOS crystalline structure drives this efficiency, converting more X-ray photons into the electrons needed to create an image, and minimizing electronic noise. Because there is less electronic noise, OEC Elite CFD has a higher signal-to-noise ratio (SNR) even under low dose conditions.

Increased SNR yields higher detective quantum efficiency (DQE). Higher DQE means that the OEC Elite CFD gives more efficient imaging performance per unit of radiation dose and means you can get better image quality under low dose conditions. Images are brighter so you can see finely attenuated anatomy even in dense tissue without having to turn up the technique and increase dose.



AMORPHOUS SILICON STRUCTURE



CMOS STRUCTURE

Compared to the random molecular structure of amorphous silicon, the organized structure of CMOS's crystalline silicon is exceptionally efficient at moving the electrons generated by incoming X-ray photons. And, with on-pixel amplification, CMOS enables electrons to flow with more speed, requiring less power. Crystalline silicon also generates less electronic noise than a-Si. Combined, these advantages result in a high IQ at low dose.

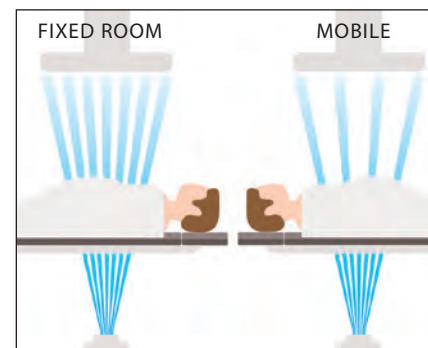
### HIGH DYNAMIC RANGE AT HIGH AND LOW DOSE

With the ability to capture both high and low intensity simultaneously, the OEC Elite CFD's dual-well pixel design gives high dynamic range. This high dynamic range delivers a full range of light and dark for every image no matter what level of dose. Even under low dose conditions you are able to visualize anatomy of varying densities simultaneously—bone, soft tissue, injected contrast and the skin surface.

## WHY CMOS IS THE RIGHT TECHNOLOGY FOR MOBILE:

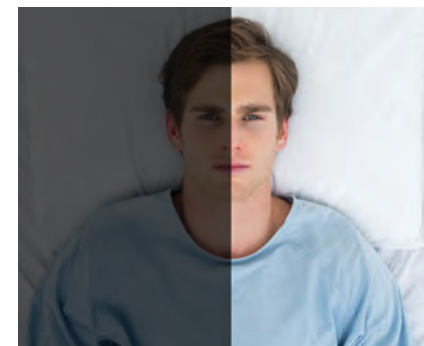
### 1 MOBILE C-ARMS ARE PHOTON STARVED

With a fixed-room system, more of the radiation produced reaches the detector because a hardened X-ray beam passes through the patient with little absorption or scatter. A mobile C-arm, without the benefit of three-phase power and additional filtration, is unable to produce a hardened beam, and thus, less radiation reaches the detector. The mobile detector is starved for radiation photons.



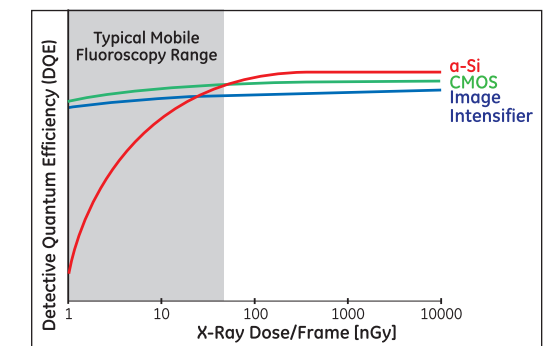
### 2 MOBILE FLAT DETECTORS ARE LIKE CAMERAS SHOOTING IN LOW LIGHT

In a photon-starved environment, a flat detector must be highly efficient to make the most of every photon. It's similar to a camera's performance in a low-light environment. If the camera isn't sensitive enough to get a quality image, you use a flash. If a flat detector isn't sensitive enough to get the image you need, you must increase dose to get more photons to the detector.



### 3 CMOS IS ENGINEERED FOR GREATER SENSITIVITY

a-Si has sufficient efficiency for fixed-room systems, but its random molecular structure may be challenged by mobile's characteristically photon-starved environment. GE's CFD was designed for performance in the mobile environment. Its crystalline structure has superb sensitivity, resulting in a higher DQE at low dose.





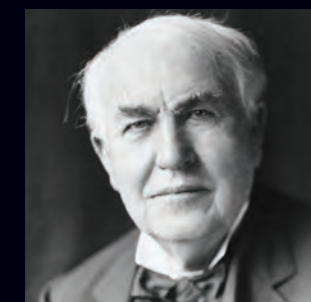


# SMARTFLOW

A More Intelligent Workflow

*"If we all did the things we are really capable of doing,  
we would literally astound ourselves."*

Thomas Edison





## DESIGNED FOR A MORE INTELLIGENT WORKFLOW

Since creating the first OEC C-arm, we've supported thousands of surgical teams worldwide, gaining unique insight into what helps high-performing teams complete procedures more efficiently.

### **OPEN DESIGN. BETTER COMMUNICATION.**

We've learned that at the center of a smarter workflow is clear communication. OEC Elite CFD's lean workstation and streamlined CFD are part of an insightful, open design that can minimize obstructions and improve line of sight in even the smallest O.R.s. Your team—both in and out of the sterile field—is better able to visually connect with you and anticipate your needs. This can lead to more efficient procedures.

### **COMPACT DETECTOR. IMPROVED EFFICIENCY.**

The compact detector also creates a more ergonomic environment—with less to get in your way. Whether it's better access to anatomy that enables faster positioning, or better access to your work area—OEC Elite CFD's small, thin CFD makes it easier for you and your team to work efficiently.



*"Clinicians told us that positioning around the patient presents some of the biggest workflow challenges. That's what inspired Elite's open design and small profile to more easily maneuver in tight places."*

—Brian Calderbank, GE Clinical Product Development Leader





## THE SYSTEM THAT MOVES— SO YOU DON'T HAVE TO

Crowded O.R.s can make re-positioning a challenge. That's why OEC Elite's positioning capabilities and Super C overscan range are designed to enable you to capture difficult, optimal angle views with fewer positioning adjustments. The versatile movements of OEC Elite's articulating monitor arm give you greater flexibility when it comes to positioning the workstation.

### ARTICULATING MONITOR. COMFORTABLE VIEWING.

OEC Elite's articulating arm brings the monitor closer to you by extending, tilting, and rotating to enable comfortable viewing from all four sides of the workstation.



### 55° OF OVERSCAN. EASY ROLLOVER VIEWS.

OEC Elite CFD's Super C design offers 55 degrees of overscan, positioning easily for oblique spine angle views needed for procedures such as placing pedicle screws.



## EASE AND MANEUVERABILITY FOR AGILE TEAMS

Years of GE OEC observational research revealed that agile teams work smarter. So, the goal with OEC Elite CFD was to make it possible for your team to move faster and with less effort. With a lighter-weight workstation, SmartConnect, and a simple user interface, OEC Elite is designed to contribute to your team's agility.



### SIMPLIFIED INTERFACE. RECOGNIZABLE GE OEC SEQUENCES.

Inspired by smart tablet design, the intuitive interface includes features such as active icons and auto-complete to minimize keystrokes and speed your progress through recognizable GE OEC sequences.



### INDEPENDENT WORKSTATION. TURNOVER EFFICIENCY.

With a live connection that allows you to disconnect and reconnect the C-arm and workstation, SmartConnect makes OEC Elite's workstation operationally independent and can improve room turnover and productivity.



### LIGHTER WEIGHT. MOVES EASILY.

OEC Elite CFD is more maneuverable than current GE OEC systems. The workstation is 100+ lbs (45+ kg) lighter and has low resistance wheels. The C-arm requires 30% less force to steer.





# PLATFORM FOR YOUR FUTURE

Built on a Legacy of Innovation

*"If I have seen farther than others, it is because  
I was standing on the shoulders of giants..."*

Sir Isaac Newton





## ADVANCING SURGICAL CONFIDENCE...TOGETHER. OEC ELITE CFD.

When you see the most delicate guide wires, tiny stones or fractures during your first procedure with OEC Elite CFD, you'll see more than your patient's anatomy with clarity: you'll see the future of mobile surgical imaging. A future where your team's performance can be smarter and more efficient, and your facility's productivity can increase with better throughput and uptime. A future where you'll know that you've made the right choice with OEC Elite CFD.



### LONG LIFE. HIGH VALUE.

GE's OEC systems are built to last. More than 23,000 OEC C-arms remain hard at work, averaging close to 15 years after their first procedure. That remarkable reliability contributes to the industry's highest residual value: Averaging over 200%\* higher trade-in value than industry average. From beginning to end, your GE OEC investment performs.

### TOP-RANKED RELIABILITY. UPTIME PERFORMANCE.

MD Buyline's 2015 User Satisfaction studies ranked GE OEC mobile C-arms #1 in reliability. OEC Elite CFD's engineered simplicity—including its one-brain architecture—is designed to reduce maintenance requirements further, giving you the confidence to book tight surgical schedules and meet your patients' expectations of on-time treatment.

### ELITE PERFORMANCE. EFFICIENT O.R.

Now, with OEC Elite CFD's smart interface, SmartConnect feature, and communication-enhancing design, your elite-performing teams can save even more time every day. When shorter procedures become the norm, you can add procedures to increase revenue and patient satisfaction.

### EXPERT SUPPORT TEAMS. OUTSTANDING COVERAGE.

Your GE OEC Clinical, Service, and Sales experts are committed to helping you get the most out of your OEC Elite CFD with comprehensive training programs, ongoing clinical support, and service guarantees.

### VERSATILE MODELS. SCHEDULING IMPACT.

There's a model to fit the specific needs of your Spine, Advanced Orthopedics, Urology, General Surgery and Pain Management teams. Regardless of model, OEC Elite CFD's superb imaging and simplicity make it the go-to C-arm, providing you with scheduling flexibility.

\* Residual value calculated with a comparative value calculator. Represented equipment values in this tool were determined based on GE Healthcare's periodic assessment of market value as of July 2016. The values are provided for illustration purposes only and not an offer to purchase. Actual values will vary and you are invited to independently verify any information provided. Industry average includes comparable competitive C-arms.





# INGENIOUS IS IN THE DETAILS

- CRISP**  
High-bright LCD 27" Display
- ERGONOMIC**  
Articulating Monitor Extends Up To 27"  
With Full Range of Motion
- SIMPLE**  
Intuitive OEC User Interface
- CONTINUOUS FLUORO**  
Your Eyes Work Continuously,  
So Should Your Imaging Chain
- SQUIRCL**  
Preserves 100% of FOV Even When Rotated
- MANEUVERABLE**  
Lightweight Slim Design Workstation  
100+ lbs (45+ kg) Lighter Than Current OEC System
- ACCESSORY/STORAGE BAY**  
Convenient location for printers or other accessories
- PRODUCTIVITY ENHANCING**  
SmartConnect – Disconnect and Reconnect  
C-arm Without Rebooting



- DESIGNED FOR MOBILE**  
Proprietary CMOS Flat Detector (CFD)
- COMPACT**  
Small Form Factor Panel
- LARGE FOV**  
21 cm x 21 cm and 31 cm x 31 cm CFD Options
- CLEAR**  
Full 1.5 k x 1.5 k x 16 Bit  
Image Processing at 30 fps
- PRECISE**  
Integrated Laser Aimer to Position the  
Detector Over the Anatomy of Interest
- DOSE CONSCIOUS**  
Removable Anti-Scatter Grid to  
Minimize Dose For Smaller Patients
- CONVENIENT**  
TechView Monitor
- MORE FREE SPACE/ACCESS**  
Deep C-arm With 55° Overscan
- AGILE**  
30% Less Force for Easy  
Steering and Positioning  
Around Patient
- COOL**  
Advanced Cooling Technology
- LEAN**  
Low Profile X-ray Tube

ELITE PERFORMANCE IN A VARIETY OF CLINICAL APPLICATIONS TO MEET YOUR SPECIFIC NEEDS

ORTHOPEDIC SPINE GENERAL SURGERY UROLOGY PAIN MANAGEMENT



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GE OEC Medical Systems, Inc., a General Electric company, going to market as GE Healthcare.

Some clinical images in this brochure were taken with an OEC 9900 Elite system.

Molecular images courtesy of Teledyne DALSA, Inc.

**GE Healthcare,  
Surgery — Americas**  
Phone: 801-328-9300

**GE Healthcare — Europe**  
Paris, France  
Fax: 33-1-30-70-94-35

**GE Healthcare — Asia**  
Tokyo, Japan  
Fax: +81-452-85-5490

384 Wright Brothers Drive  
Salt Lake City, UT 84116  
USA

