Technical Brief Series

How the New CARESTREAM Lux 35 Detector Improves Workflow and Patient Care

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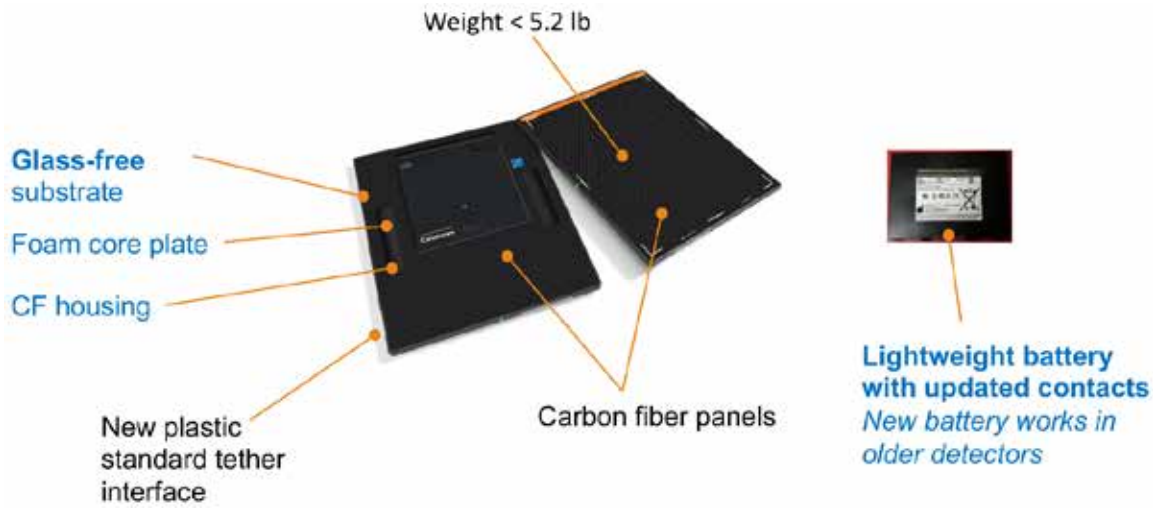
Introduction

The CARESTREAM Lux 35 Detector is a glass-free detector, following the success of our non-glass sensor detectors in the Non-Destructive Testing market. The overall weight of the Lux 35 Detector has been further reduced with the use of carbon-fiber housing, lighter-weight core materials and a new battery design. In addition to its new features and design, the Lux 35 Detector provides the features, image quality and other specifications that users of Carestream DR detectors have come to expect.

Lower-weight panel

The Lux 35 Detector is a lightweight panel for the medical market, weighing in at 4.7 lb (2.1 kg) without the battery and 5.2 lb (2.4 kg) with a new, lighter battery. The lighter detector provides a better overall experience for the radiographer and helps alleviate strain and stress from moving the detector, especially during mobile exams. In addition to weighing less, this new detector alleviates concerns about glass breakage inside its housing. Contributing to the weight reduction are new carbon-fiber shells that form the exterior of the detector. In addition to weighing less than the CARESTREAM DRX Plus Detector aluminum shells, the carbon fiber is more scratch-resistant. The Lux 35's new, lighter battery has a new latch and is backward-compatible with current DRX Plus Detectors. A larger, slightly heavier high-capacity battery is also available for the Lux 35 Detector.



Lux 35 lower-weight components

A deeper dive

Several factors in the design of the Lux 35 contribute to its lighter weight. First among these is the foam-core plate that provides structural support for external loads and absorbs impacts to the detector. Adding to the stiffness is a bridge that distributes load on the detector around the electronics. On the detector's perimeter are protective plastic bumpers with beveled edges and a heat-sink cap. These design elements make the detector more comfortable for the patient and easier to hold for the radiographer. The reinforced carbon corners provide extra protection in case of a detector drop.

A better experience for radiographer and patient with a new, ergonomic design

In addition to its lighter weight, the Lux 35's design includes several new ergonomic features. Recessed finger grips on three sides of the back make the detector even easier for the radiographer to hold and position. These also help to minimize slips and accidental drops, which is particularly beneficial for out-of-bucky exams. Lighter weight also makes it easier to grip and hold this detector for longer periods and at various angles, for less stress and strain on the radiographer. This has proven especially helpful for mobile exams, when the radiographer is moving from patient to patient.

The Lux 35 is an ISO4090-compliant detector so that it fits into ISO-compatible bucky applications. Included in the design are rounded corners and beveled edges to provide a more comfortable exam for each patient. These features not only allow radiographers to position the detector more easily under patients, but also allow for a smoother removal of the detector, especially for bedridden patients.

The new, lighter battery for the Lux 35 features a new latch and redesigned battery contacts for longer life. The battery is also backward-compatible with current DRX Plus Detectors. During Trade Trials, radiographers specifically mentioned the Lux 35's light weight compared to other detectors, and how much easier it was to handle and position.

Lux 35 user experience features

Less downtime and faster workflow

The Lux 35 was designed with two key test measures in mind. First of these is the IP57 ingress rating. The 5 rating means the detector is protected against access to hazardous parts dust. The 7 rating means the detector is protected against the effects of temporary submersion in water (30 minutes at 1 meter depth). This offers a high level of protection against various fluids that come in contact with a DR detector in medical settings such as the Emergency Room.

The second measure is the Mil-Std-810G drop-test rating. While all electronic devices have limits on destructive usage, the Lux 35 has been successfully tested to this US Military drop-test standard. It requires successful operation after multiple drops from a height of 36 in. (91.4 cm).

Faster workflow is enhanced with the Lux 35's lighter weight and ergonomic design, providing for smoother handling to speed imaging and minimize radiographer strain, stress and fatigue.

Easy-to-read detector status

Two new features on the Lux 35 are the LEDs on the edges of the detector and the Graphical User Interface on the back side. Both features assist with detector status. The LEDs provide immediate feedback on the operating status of the Lux 35, according to color and blink pattern. The GUI shows the battery power level, the wireless radio strength and the detector number. In addition, the GUI allows service personnel or advanced key operators (under direction from Carestream) to identify a deeper level of diagnostic status.

Additional new features

The Lux 35 can also be used as an Access Point, allowing greater range and accessibility for imaging applications. New, low-noise electronics provide improved imaging capability. In addition, a new supercapacitor supplies temporary backup power for efficient shutdowns.

New Feature	Added Capability
AP Mode Capability	Greater range and accessibility
Low-Noise Electronics	Improved image quality
Dual Energy	More capability, fewer procedures
Supercapacitor	Lighter backup power source

Specifications comparison

The Lux 35 has retained the specifications and features from the DRX Plus in wide use today. These charts summarize the DRX Plus and Lux 35 specifications:

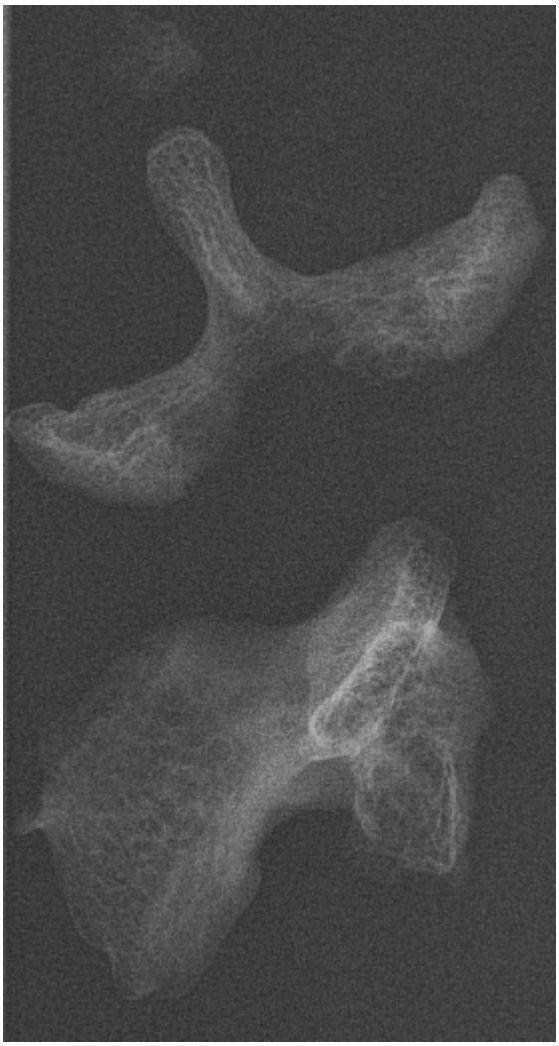
Feature	DRX Plus 3543C	Lux 35
Weight	6.99 lb	5.2 lb
External Dimensions	38.35 x 45.95 x 1.47 cm	38.35 x 45.95 x 1.47 cm
Pixel Size	139 um	139 um
Scintillator	Cesium Iodide (TI)	Cesium Iodide (TI)
High DQE	Yes	Yes
X-Factor Support	Yes	Yes

Feature	DRX Plus 3543C	Lux 35
Dynamic Imaging	Yes	Yes
Beam Detect Mode	Yes	Yes
Onboard Calibrations	Yes	Yes
Battery Life (Images/3 hours)	340	490
AP Mode	Yes (Carestream Transportable Lite)	Yes (Carestream Transportable Lite)
Battery Hot Swap	Yes	Yes
Fluid Ingress	IP57	IP57

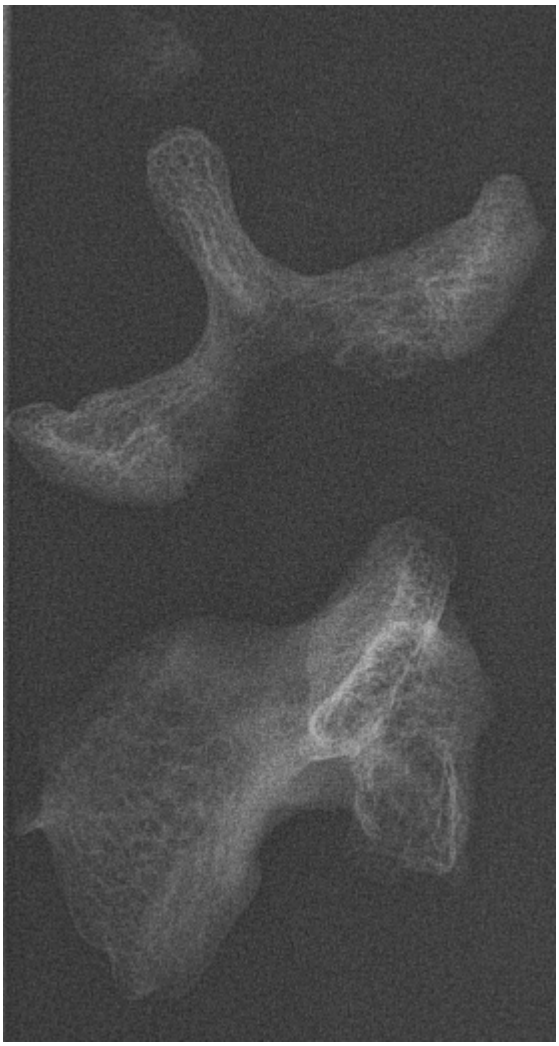
Appendix

Image quality

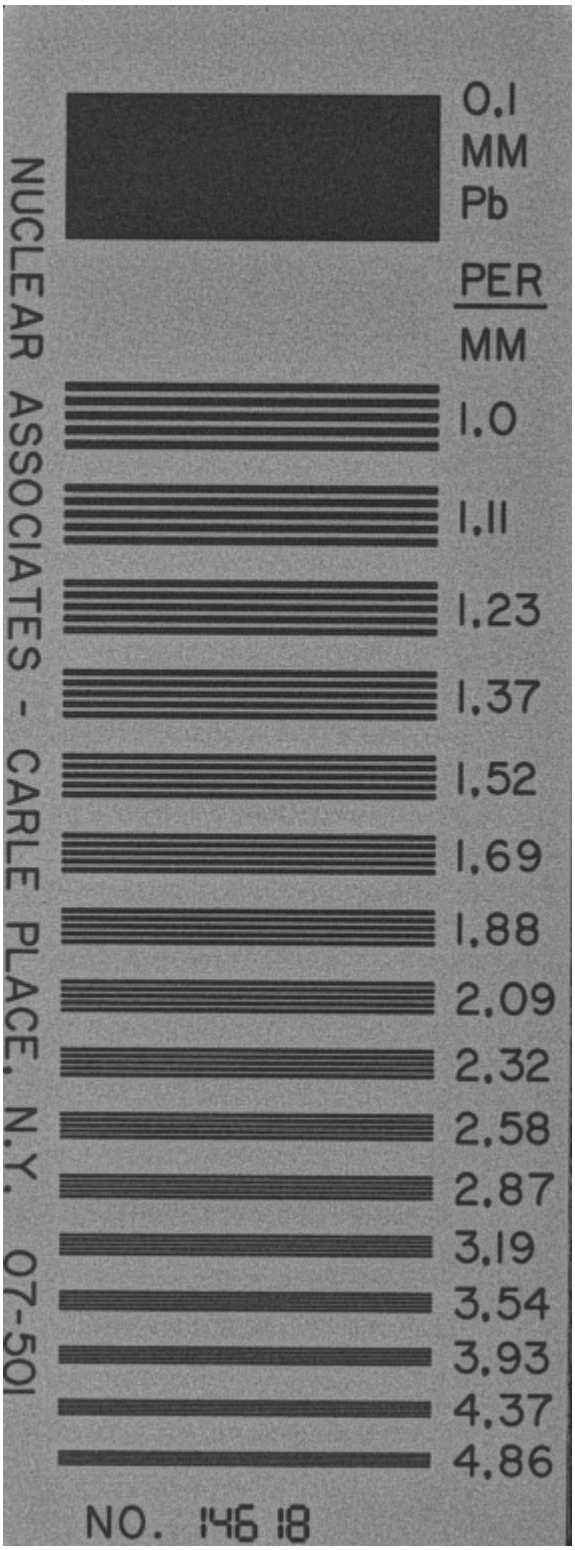
This device is registered with the US FDA via 510k submission. The Lux 35 produces substantially equivalent image quality when the DRX Plus is used as the predicate device. Below are comparison images from the 510k that display the DRX Plus predicate device and the Lux 35.



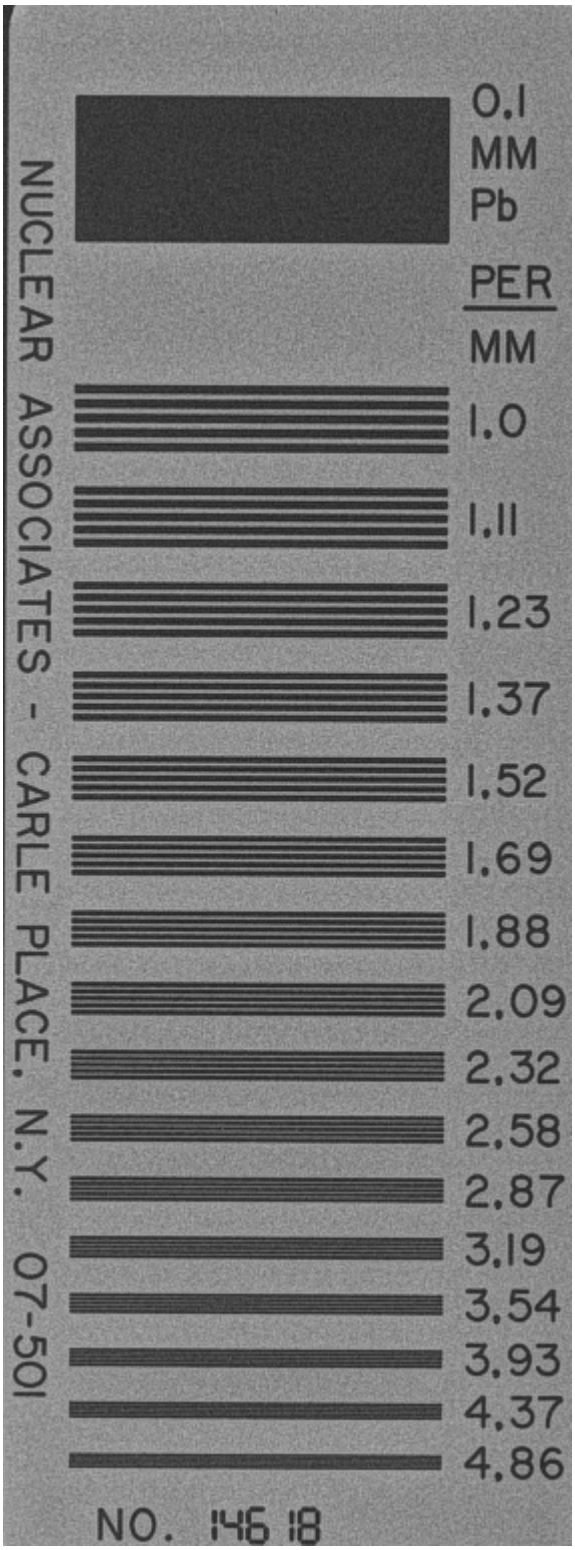
Bone fragments: DRX Plus



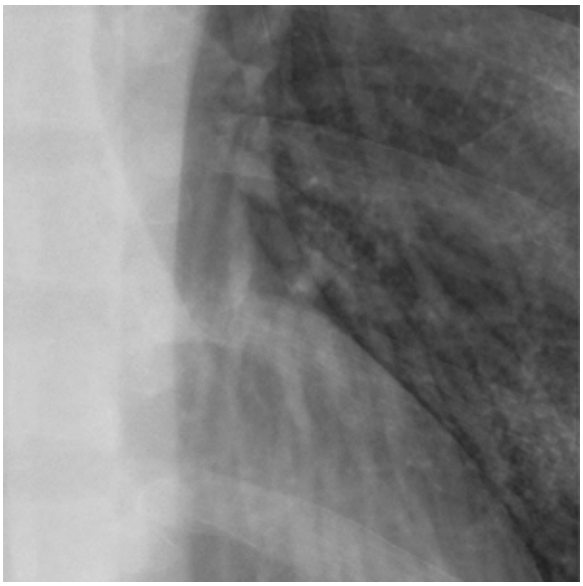
Bone fragments: Lux 35



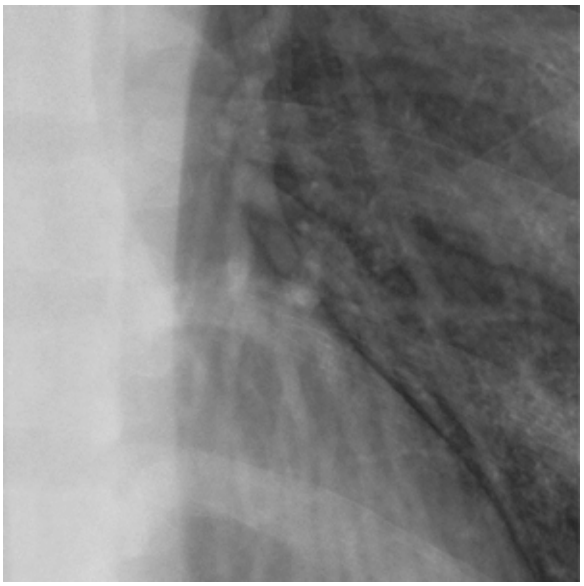
Resolution chart: DRX Plus



Resolution chart: Lux 35



Chest image: DRX Plus



Chest image: Lux 35

References

US Mil-Std-810G: http://everyspec.com/MIL-STD/MIL-STD-0800-0899/MIL-STD-810G_12306/

Lux 35 510k: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K203159

DRX Plus brochure: https://www.carestream.com/en/us/medical/dr-systems/detectors/drx-plus-detector

"Rx only"

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