The Hologic DirectRay® digital image capture system uses an amorphous selenium (a-Se) coating on a non-tiled Thin-Film Transistor (TFT) matrix to capture full-size, high resolution radiographic images. DirectRay images have been proven equivalent to the highest quality screen-film images over the full range of general radiographic examinations.

The DirectRay detector captures x-ray photons and converts them directly into electronic signals without the use of intensifying screens or scintillators. The result is a spectacularly detailed image, uncompromised by light scatter. Light scatter is an inherent problem in computed radiography, screen-film and most digital image capture technologies. The DirectRay imaging system consists of the detector and a separate detector controller.

**Imaging system specifications**
- 3.6 cycles /mm Nyquist frequency DQE(0) > 45%
- Wide dynamic range
  - captures 14 bits
  - 0.05 to 20 mR linear response (70 kVp, 21 mm Al)

**Detective Quantum Efficiency (DQE)**

<table>
<thead>
<tr>
<th>Cycles per mm (normal diagnostic range)</th>
<th>DirectRay a-Se detector 139 µm pixel</th>
<th>Screen-film system 400 speed</th>
<th>Computed Radiography 14x17 in. cassette</th>
<th>Cal detector 143 µm pixel</th>
<th>Cal detector 200 µm pixel</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>46%</td>
<td>32%</td>
<td>15%</td>
<td>52%</td>
<td>62%</td>
</tr>
<tr>
<td>1.0</td>
<td>45%</td>
<td>29%</td>
<td>11%</td>
<td>43%</td>
<td>56%</td>
</tr>
<tr>
<td>1.5</td>
<td>42%</td>
<td>25%</td>
<td>7%</td>
<td>33%</td>
<td>49%</td>
</tr>
<tr>
<td>2.0</td>
<td>37%</td>
<td>22%</td>
<td>5%</td>
<td>22%</td>
<td>38%</td>
</tr>
<tr>
<td>2.5</td>
<td>32%</td>
<td>18%</td>
<td>3%</td>
<td>15%</td>
<td>25%</td>
</tr>
<tr>
<td>3.0</td>
<td>26%</td>
<td>15%</td>
<td>*</td>
<td>10%</td>
<td>*</td>
</tr>
<tr>
<td>3.5</td>
<td>20%</td>
<td>13%</td>
<td>*</td>
<td>7%</td>
<td>*</td>
</tr>
</tbody>
</table>

*Outside the limits of the detector*
Detected specifications

- Selenium (a-Se) semiconductor x-ray absorber coating over amorphous silicon (a-Si) Thin-Film Transistor (TFT)
- Non-tiled amorphous silicon (a-Si) TFT detector matrix
- X-ray energy range: medical to high energy applications
- Nominal active image area of 14 x 17 inches/35 x 43 cm. Rectangular format makes it easier to output soft and hard copy images without the need for minimizing or cropping
- Physical dimensions (WxHxD) of 18.4 x 18.4 x 1.7 inches/46.7 x 46.7 x 4.3 cm
- Solid state. No moving parts
- 19 lb/8.6 kg weight
- Detector pixel
  - 139 µm pitch
  - active element size of 129 µm x 129 µm
  - effective fill factor 100%
- Cable length to controller
  - maximum 95 feet/28.5 m with disconnect at 10 feet/3.0 m
- Detector exterior
  - scratch and wear resistant
  - dark finish resistant to 10% bleach solution, glutaraldehyde and other antibacterial cleaners
  - sealed from liquids and body fluids, but not submersible

Controller specifications

- Controller software
  - acquires and processes captured image data
  - calibrates detector and corrects for gain and offset variations
  - communicates with host system controller
- Built-in diagnostic software tracks error conditions in digital detector and controller reducing downtime and time to repair
- Timing specifications
  - Exposure window: 1 second (default) programmable
  - Preview time: approximately 12 seconds
- Physical dimensions (WxHxD) of 19.5 x 14.9 x 3.7 inches/49.5 x 37.8 x 9.4 cm
- 16.3 lb/7.3 kg weight
- Supports worldwide power standards

Recommended system environment

- Designed to operate under standard HVAC conditions
  - operating temperature range: 50 to 95°F (10 to 35 °C) with ambient airflow across the back surface
- Altitude (entire system)
  - maximum of 10,000 feet/3,000 m for operation
- From 10 to 80% non-condensing relative humidity
- Static load maximum of 39 lb/18 kg applied to the front surface over a nominal 4 x 4 inch/10 x 10 cm area
- Vibration maximum of 0.5 G RMS

Code compliance

- UL listed
- CE mark

The data in this publication are for illustration purposes only and do not necessarily represent standards or specifications which must be met by Hologic, Inc. Characteristics of the products described in this publication may be changed at any time without notice.

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