

**MARYLAND DEPARTMENT OF THE ENVIRONMENT**

1800 Washington Boulevard • Baltimore Maryland 21230  
 (410) 537-3193 • 1-800-633-6101 • http://www.mde.state.md.us

**MDE RX6**

**MACHINE DATA, RADIOGRAPHIC**

MDE Machine Number \_\_\_\_\_ Tube S.N. \_\_\_\_\_ Date Manufactured \_\_\_\_\_

Facility Registration No. \_\_\_\_\_ Facility Name \_\_\_\_\_

Begin Inspection \_\_\_\_\_ Inspector No. \_\_\_\_\_ Use/Purpose \_\_\_\_\_  
 mm dd yy (use RX 1 code)

Regulation Number	Requirements	Pass (P), Fail (F) Not Applicable (NA)
<b>F.6(a) + (g) Beam Limitation General Purpose Stationary and Mobile X-ray Systems</b>		
F.6(a)(1)(i)	Stepless adjustment shall be provided	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(1)(ii)	Method provided to visually define perimeter of x-ray field. Misalignment not to exceed 2% of source to center of field. Misalignment: Length ____% Width ____%	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(g)(4)(ii)	<u>Visibility of light localizer</u>  Light localizer with room light on minus room light must be at least 15 foot candles or 160 lux at 100 cm or maximum SID, whichever is less. Localizer plus room light _____ ft. candles Room light at the same location _____ ft. candles  Room illumination Outside window Y/N _____ Office hours in the day Y/N _____ Dark curtains Y/N _____ Dimmer switch Y/N _____  Parameters used: Time of test _____ Indicated SID _____	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(6)	<u>Source to Image Distance</u>  Measured SID _____ Indicated SID _____ (2% of SID if certified, 2 inches otherwise)	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(1)(ii)	<u>X-ray vs. Localizer Light</u>  Width error <2% Measured _____% Length error <2% Measured _____% Centering error <2% Measured _____%  Indicated SID _____ inches Image receptor size ____ X ____ inches	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A



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Regulation Number	Requirements	Pass (P), Fail (F) Not Applicable (NA)
F.6(a)(2)(i) F.6(a)(2)(ii) F.6(a)(2)(iii)	<u>Indicated vs. Measured Field Dimensions</u>  Width difference/SID _____ % Length difference/SID _____ % Centering error _____ % Machine parameters used by the inspector: Indicated SID _____ inches Image receptor size ____ X ____ inches	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(g)(4)(i)	<u>Additional Requirements for federally certified machines</u>  The field size can be adjusted to a size smaller than the image receptor	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(3)	<u>X-ray Systems designed for one image receptor size</u>  X-ray beam remains within the borders of the image receptor      Y/N _____  If yes, pass, if no, X-ray beam equal to or smaller than image receptor and centering error <2% of SID    Centering = _____ %	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(5)	<u>Special Purpose X-ray Systems</u>  Machine parameters used by the inspector: Indicated field size, length and width _____ inches Indicated SID _____ inches Does the x-ray beam extend beyond the edge of the image receptor?      Y/N _____ In no, pass. If yes, continue. Width error _____ % >2% Fail Length error _____ % >2% Fail Centering error _____ % >2% Fail	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(5)(i)	<u>Special Case Podiatry</u>  Beam diameter _____ in Image Receptor Diagonal _____ in Centering error _____ %	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A



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Regulation Number	Requirements	Pass (P), Fail (F) Not Applicable (NA)
F.6(a)(7)	<u>Positive Beam Limitation</u>	
F.6(a)(7)(i)	Width difference _____% Length difference _____% Not to exceed 3% of SID Sum of length and width differences _____% Not to exceed 4% of SID	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(a)(7)(ii)	Permanently mounted cassette. Image receptor length and width <50 cm. Axis of beam is within ± 3 degrees of vertical with SID 90 cm to 130cm inclusive, OR X-ray beam is within ± 3 degrees of horizontal with SID 90 cm to 205cm inclusive. Axis is perpendicular to image plane within ± 3 degrees.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A

**Radiation Exposure Control Devices, Timers**

F.6(b)(1)(i)	<u>Time Duration Accuracy</u>  Time duration accuracy _____%  Parameters used by inspector: Time set _____ mSec, mA _____, kVp _____	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(1)(ii)	Not possible to make exposure when timer is set to "zero" or "off" position.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(1)(iii)	Automatic reset after termination of exposure.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A



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Regulation Number	Requirements	Pass (P), Fail (F) Not Applicable (NA)
F.6(b)(2)	<u>X-Ray Control</u>	
F.6(b)(2)(i)	Exposure can be terminated by operator at any time except for exposures of $\leq 0.5$ seconds or serial radiography.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(2)(ii)(a)	Stationary systems (and portable/mobile systems used in the same location for more than 1 week) should have a permanently mounted control in protected area.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(2)(ii)(b)	Mobile/portable systems used for more than 1 hour but less than 1 week at the same location should meet F.6(b)(2)(ii)(a) or operator shall be protected by 6.5 ft high or greater protective barrier that intercepts direct and scatter radiation.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
	Mobile/portable systems used to make an exposure at the use location shall meet F.6(b)(2)(ii)(a), or F.6(b)(2)(ii)(b), or the operator shall be at least 12 ft from tube housing during exposure.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(2)(ii)(c)	Means provided so that operator can view patient during exposure.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(2)(ii)(d)	Visual indication of exposure, and audible signal for exposure termination.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(2)(iii)	Means provided to terminate exposure within 10% of preset value for non certified systems.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(3)	<u>Automatic Exposure Controls</u>	
F.6(b)(3)(i)	Mode of operation indicated on control panel.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(3)(ii)	For tube potentials $\geq 51$ kVp, minimum exposure time $\leq 2$ pulses.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(3)(iii)	For tube potential $< 51$ kVp, minimum exposure time $\leq 1/60$ second or time to deliver 5 mAs, whichever is greater.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(3)(iv)	Product of peak x-ray tube potential, current, and exposure time shall not exceed 60 kW per exposure. OR Product of x-ray tube current and exposure time shall not exceed 600 mAs per exposure.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
	If x-ray tube potential is $< 51$ kVp, product of x-ray tube current and exposure time shall not exceed 2000 mAs per exposure.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
F.6(b)(3)(v)	Visible signal to indicate exposure termination.	<input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A



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F.6(b)(4)	<p><u>Timer Reproducibility</u></p> <p>The average exposure, Tavg _____mSec                      5 (T<sub>max</sub> - T<sub>min</sub>)(must be &lt;Tavg) _____mSec</p> <p>Parameters used by inspector:                      Time set _____mSec, mA _____, kVp _____</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>
F.6(c)	<p><u>Source-to-Skin Distance</u></p> <p>Mobile/portable systems provided with means to limit SSD to ≥30 cm.</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>
F.6(d)	<p><u>Exposure Reproducibility – Uncertified</u></p> <p>The average exposure, Eavg _____mR                      5 (E<sub>max</sub> - E<sub>min</sub>)(must be &lt;Eavg) _____mR</p> <p>Parameters used by inspector:                      Time set _____mSec, mA _____, kVp _____</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>
F.6(g)(1)	<p><u>Exposure Reproducibility – Certified</u></p> <p>Coefficient of variation _____ ≤0.05=pass                      Mean _____mR                      Number of values measured _____</p> <p>Parameters used by inspector:                      Time set _____mSec, mA _____, kVp _____</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>
F.6(b)(5) or F.6(g)(2)	<p><u>Linearity</u></p> <p>Y<sub>1</sub> or X<sub>1</sub> = _____mR/mAs (≤0.20 X sum)                      Y<sub>2</sub> or X<sub>2</sub> = _____mR/mAs (≤0.10 X sum)</p> <p>Note: Checked all mA stations (____ - ____)</p> <p>Parameters used by inspector:                      mA1, mA2, kVp _____, _____, _____</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A  <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>

**Beam Quality**

F.4(e)(1)(i)	<p><u>Half – Value Layer</u></p> <p>Measured half-value layer _____mm Al</p> <p>Parameters used by inspector:                      Time set _____ mSec, mA _____, kVp measured _____</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>
F.6(e)	<p><u>kVp Accuracy</u> (uncertified, ≤10%)</p> <p>kVp set _____, kVp measured _____</p>	<p><input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A</p>



