

RSO, Inc.
P.O. Box 1450
Laurel, MD 20725
(301) 953-2482

RSO Job No. 11262

Certificate of Calibration

ISSUED TO: MID DELAWARE IMAGING
710 SOUTH QUEEN STREET
DOVER, DE 19904

INSTRUMENT: LUDLUM
MODEL: 14C
TYPE: SURVEY METER
SN: 95073

CONTACT: MICHELLE COURTS
PHONE: (302) 734-9888

PO NO: CC

RSO, Inc. certifies that on 02/10/2015 the above described instrument was calibrated in a known radiation field using 137 Cs (662 keV) beam calibrator (J.L. Shepherd Model 28-6A, S/N 10056). Electronically pulsed using Ludlum 500, S/N 24783.

The results are tabulated below. Calibration is traceable to NIST.

		Calibration Data					
	RANGE	EXPECTED	OBSERVED		C.F.	NOTE	
X	0.1	0.05	0.05	mR/hr	1.00	*	
		0.15	0.15	mR/hr	1.00	*	
X	1	0.5	0.5	mR/hr	1.00		
		1.5	1.36	mR/hr	1.10		
X	10	5	5.4	mR/hr	0.93		
		15	14.1	mR/hr	1.06		
X	100	50	48	mR/hr	1.04		
		150	136	mR/hr	1.10		
X	1000	500	510	mR/hr	0.98		
		1500	1400	mR/hr	1.07		
					C.F. AVERAGE	1.03	

Notes

* Electronically pulsed.

Probe type(s)		Probe1: PANGM			Probe2:		Probe3:	
MODEL	SER#	WINDOW	GEOMETRY	VOLT	ISOTOPE 1 EFF.(%)	ISOTOPE 2 EFF.(%)	ISOTOPE 3 EFF.(%)	ISOTOPE 4 EFF.(%)
44-9	PR092754	FIXED	FRONT	899				
		NONE	FRONT					

Note: "As Found" condition +/- 10% of Expected values unless indicated.

INSTRUMENT CHECKS

BATTERY CHECK: NORMAL
CHECK SOURCE 1: Cs137 READING: 1.2 mR/hr
CHECK SOURCE 2: N/A READING:

ENVIRONMENTAL

TEMP: 22°C
PRESS: 764 mmHg
HUMID: 26 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 02/10/2016

Calibrated By:

Dorsey Austin
Dorsey Austin

Reviewed By:

KmW

Cal Date: 02/10/2015

Maryland License MD-33-021-01

16322

RSO, Inc.
P.O. Box 1450
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RSO Job No. 11168

Certificate of Calibration

ISSUED TO: MID DELAWARE IMAGING
710 SOUTH QUEEN STREET
DOVER, DE 19904

INSTRUMENT: LUDLUM
MODEL: 14C
TYPE: SURVEY METER
SN: 86210

CONTACT: MICHELLE COURTS
PHONE: (302) 734-9888

PO NO: PO# 1450 CREDIT CARD

RSO, Inc. certifies that on 11/21/2014 the above described instrument was calibrated in a known radiation field using 137 Cs (662 keV) beam calibrator (J.L. Shepherd Model 28-6A, S/N 10056). Electronically pulsed using Ludlum 500, S/N 24783.

The results are tabulated below. Calibration is traceable to NIST.

		Calibration Data				
	RANGE	EXPECTED	OBSERVED		C.F.	NOTE
X	0.1	0.05	0.05	mR/hr	1.00	*
		0.15	0.15	mR/hr	1.00	*
X	1	0.5	0.5	mR/hr	1.00	
		1.5	1.6	mR/hr	0.94	
X	10	5	5.5	mR/hr	0.91	
		15	14.5	mR/hr	1.03	
X	100	50	50	mR/hr	1.00	
		150	165	mR/hr	0.91	
X	1000	500	520	mR/hr	0.96	
		1500	1400	mR/hr	1.07	
					C.F. AVERAGE	0.98

Notes

- Electronically pulsed.

		Probe type(s)	Probe1: PANGM	Probe2: GM	Probe3:			
MODEL	SER#	WINDOW	GEOMETRY	VOLT	ISOTOPE 1 EFF.(%)	ISOTOPE 2 EFF.(%)	ISOTOPE 3 EFF.(%)	ISOTOPE 4 EFF.(%)
RS1-P	2220	FIXED	FRONT	900				
INTERNAL		NONE	FRONT	900				

Note: "As Found" condition +/- 10% of Expected values unless indicated.

INSTRUMENT CHECKS

BATTERY CHECK: NORMAL
CHECK SOURCE 1: Cs137 READING: 1.5 mR/hr
CHECK SOURCE 2: N/A READING:

ENVIRONMENTAL

TEMP: 22°C
PRESS: 774 mmHg
HUMID: 28 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 11/21/2015

Calibrated By: Richard Emmons Reviewed By: [Signature]
Richard Emmons

Cal Date: 11/21/2014

Maryland License MD-33-021-01

16038

MID DELAWARE IMAGING
710 SOUTH QUEEN STREET
DOVER, DE 19904
302-734-9888

WIPE REPORT: EFFICIENCY AND LLD

DATE: Jun 05, 2015

TIME: 08:38

DETECTOR: WELL GEOMETRIC EFFICIENCY: 85 %

ISOTOPE SETUP:

ISOTOPE	GAIN	LEFT ROI KEV	RIGHT ROI KEV	DETECTOR EFFICIENCY %
Co-57	12	103	158	93
Tc-99m	12	119	162	82
I-123	8	134	183	76
Cs-137	2	561	761	10

WIPE COUNT TIME:	RESTRICTED AREA AND SEALED SOURCE:	30 Seconds
	UNRESTRICTED AREA WIPE COUNT TIME:	30 Seconds
WIPE RECOUNT TIME:	RESTRICTED AREA AND SEALED SOURCE:	30 Seconds
	UNRESTRICTED AREA WIPE RECOUNT TIME:	30 Seconds
LAB BACKGROUND COUNT TIME:		60 Seconds

BACKGROUND RESULTS:

ISOTOPE	BKG.	BKG. RATE	BKG. DPM	LOWER LIMIT OF DETECTION DPM	
	COUNTS	CPM	Equiv.	Restricted	Unrestricted
Co-57	19	19	24	24	24
Tc-99m	15	15	21	25	25
I-123	15	15	23	27	27
Cs-137	21	21	247	239	239

Technologist: Michelle Costo

Comments: _____

S/N 3885101 D4.4/M4.0