National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

CALIBRATION LABORATORIES **NVLAP LAB CODE 105020-0**

PACIFIC NORTHWEST NATIONAL LABORATORY / BATTELLE
Battelle Boulevard
P.O. Box 999
Richland, WA 99352
Mr. R. Kim Piper
Phone: 509-376-6187 Fax: 509-376-1992
E-Mail: kim.piper@pnl.gov
URL: http://cra.pnl.gov

NVLAP Code: 20/A01 ANSI/NCSL Z540-1-1994; Part 1 Compliant

This facility has demonstrated compliance with the NVLAP Criteria for Calibration Laboratories under the field of Ionizing Radiation for the following:

Calibration Category	*Radiation Type or Beam Code*	*Nominal Intensity Range*[note 3]	*Uncertainty of Reference Field (±)*[note 1,2]
CALIBRATION OF SURVEY INSTRUMENTS			
Gamma	^{241}Am	0.125 R/h	5.2%
	^{137}Cs	0.1 to 250 R/h	1.5%
	^{60}Co	4 to 60,000 R/h	1.5%
X-Ray	L40	4 to 740 R/h	1.5%
	L50	4 to 840 R/h	1.5%

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L80	5 to 1000 R/h	1.5%
L100	6 to 1200 R/h	1.5%
M30	3 to 500 R/h	1.5%
M40	3 to 500 R/h	1.5%
M50	3 to 700 R/h	1.5%
M60	3 to 600 R/h	1.5%
M100	3 to 600 R/h	1.5%
M150	4 to 800 R/h	1.5%
M200	4 to 650 R/h	1.5%
M250	4 to 500 R/h	1.5%
M300	2 to 175 R/h	1.5%
S60	1 to 230 R/h	1.5%
S75	4 to 880 R/h	1.5%
H30	0.06 to 12 R/h	1.5%
H40	0.02 to 5 R/h	1.5%
H50	0.05 to 10 R/h	1.5%
H100	0.02 to 3 R/h	1.5%

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H150	1 to 21 R/h	1.5%
H200	0.1 to 14 R/h	1.5%
H250	0.09 to 10 R/h	1.5%
H300	0.06 to 6 R/h	1.5%
HK30	1 to 300 R/h	1.5%
HK60	2 to 300 R/h	1.5%
HK100	2 to 400 R/h	1.5%
HK200	4 to 600 R/h	1.5%
HK250	6 to 800 R/h	1.5%
HK280	6 to 600 R/h	1.5%
HK300	7 to 700 R/h	1.5%
WS60	0.004 to 0.8 R/h	1.5%
WS80	0.06 to 12 R/h	1.5%
WS110	0.2 to 50 R/h	1.5%
WS150	0.6 to 100 R/h	1.5%
WS200	1 to 160 R/h	1.5%
WS250	1 to 160 R/h	1.5%

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WS300	1 to 170 R/h	1.5%
NS20	0.005 to 1 R/h	1.5%
NS25	0.01 to 2 R/h	1.5%
NS30	0.02 to 4 R/h	1.5%
NS40	0.04 to 7 R/h	1.5%
NS60	0.06 to 12 R/h	1.5%
NS80	0.08 to 5 R/h	1.5%
NS100	0.02 to 3 R/h	1.5%
NS120	0.02 to 4 R/h	1.5%
NS150	0.07 to 28 R/h	1.5%
NS200	0.06 to 8 R/h	1.5%
NS250	0.1 to 7 R/h	1.5%
NS300	0.06 to 6 R/h	1.5%
LK30	0.005 to 1 R/h	1.5%
LK35	0.005 to 1 R/h	1.5%
LK55	0.005 to 1 R/h	1.5%
LK70	0.005 to 1 R/h	1.5%

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	LK100	0.005 to 1 R/h	1.5%
	LK125	0.005 to 1 R/h	1.5%
	LK170	0.005 to 0.8 R/h	1.5%
	LK210	0.005 to 0.7 R/h	1.5%
	LK240	0.005 to 0.6 R/h	1.5%
Beta	^{204}Tl	1.3 rad/h	3.3%
	^{90}Sr/^{90}Y	0.4 to 19 rad/h	3.3%
Neutron	^{252}Cf Bare	0.00013 to 4 rem/h	14.0%
	^{252}Cf Moderated	0.00003 to 1 rem/h	21.9%

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Calibration Category	*Radiation Type or Beam Code*	*Nominal Range*[note 3]	*Uncertainty of Delivered Quantity (±)*[note 1,2]
IRRADIATION OF PERSONNEL DOSIMETERS			
Gamma	^{241}Am	≥ 0.002 R	5.4%
	^{137}Cs	≥ 0.020 R	1.6%
	^{60}Co	≥ 0.025 R	1.6%
X-ray	L40	≥ 0.033 R	2.4%
	L50	≥ 0.033 R	2.4%
	L80	≥ 0.042 R	2.4%
	L100	≥ 0.050 R	2.4%
	M30	≥ 0.025 R	2.4%
	M40	≥ 0.025 R	2.4%
	M50	≥ 0.025 R	2.4%
	M60	≥ 0.025 R	2.4%
	M100	≥ 0.025 R	2.4%
	M150	≥ 0.033 R	2.4%

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M200	≥ 0.033 R	2.4%
M250	≥ 0.034 R	2.4%
M300	≥ 0.014 R	2.4%
S60	≥ 0.008 R	2.4%
S75	≥ 0.033 R	2.4%
H30	≥ 0.0005 R	2.4%
H40	≥ 0.0008 R	2.4%
H50	≥ 0.0008 R	2.4%
H100	≥ 0.0008 R	2.4%
H150	≥ 0.0008 R	2.4%
H200	≥ 0.0008 R	2.4%
H250	≥ 0.0008 R	2.4%
H300	≥ 0.0008 R	2.4%
HK30	≥ 0.008 R	2.4%
HK60	≥ 0.017 R	2.4%
HK100	≥ 0.017 R	2.4%
HK200	≥ 0.033 R	2.4%

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HK250	≥ 0.050 R	2.4%
HK280	≥ 0.050 R	2.4%
HK300	≥ 0.058 R	2.4%
WS60	≥ 0.001 R	2.4%
WS80	≥ 0.001 R	2.4%
WS110	≥ 0.002 R	2.4%
WS150	≥ 0.005 R	2.4%
WS200	≥ 0.008 R	2.4%
WS250	≥ 0.008 R	2.4%
WS300	≥ 0.008 R	2.4%
NS20	≥ 0.0001 R	2.4%
NS25	≥ 0.0001 R	2.4%
NS30	≥ 0.0002 R	2.4%
NS40	≥ 0.0003 R	2.4%
NS60	≥ 0.0005 R	2.4%
NS80	≥ 0.0007 R	2.4%
NS100	≥ 0.0002 R	2.4%

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NS120	≥ 0.0002 R	2.4%
NS150	≥ 0.0006 R	2.4%
NS200	≥ 0.0005 R	2.4%
NS250	≥ 0.0008 R	2.4%
NS300	≥ 0.0005 R	2.4%
LK30	≥ 0.00004 R	2.4%
LK35	≥ 0.00004 R	2.4%
LK55	≥ 0.00004 R	2.4%
LK70	≥ 0.00004 R	2.4%
LK100	≥ 0.00004 R	2.4%
LK125	≥ 0.00004 R	2.4%
LK170	≥ 0.00004 R	2.4%
LK210	≥ 0.00004 R	2.4%
LK240	≥ 0.00004 R	2.4%

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Beta	^{204}Tl	≥ 0.023 rad	3.6%
	^{90}Sr/^{90}Y	≥ 0.007 rad	3.6%
Neutron	^{252}Cf Bare	≥ 0.00008 rem	14.1%
	^{252}Cf Moderated	≥ 0.00002 rem	22.4%

CALIBRATION OF REFERENCE-CLASS INSTRUMENTS

Calibration Category	*Radiation Type or Beam Code*	*Nominal Intensity Range*[note 3]	*Uncertainty of Reference Field (±)*[note 1,2]
Gamma	^{241}Am	0.125 R/h	5.2%
	^{137}Cs	0.1 to 250 R/h	1.5%
	^{60}Co	4 to 60,000 R/h	1.5%
X-Ray	L40	4 to 740 R/h	1.5%
	L50	4 to 840 R/h	1.5%
	L80	5 to 1000 R/h	1.5%
	L100	6 to 1200 R/h	1.5%

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M30	3 to 500 R/h	1.5%
M40	3 to 500 R/h	1.5%
M50	3 to 700 R/h	1.5%
M60	3 to 600 R/h	1.5%
M100	3 to 600 R/h	1.5%
M150	4 to 800 R/h	1.5%
M200	4 to 650 R/h	1.5%
M250	4 to 500 R/h	1.5%
M300	2 to 175 R/h	1.5%
S60	1 to 230 R/h	1.5%
S75	4 to 880 R/h	1.5%
H30	0.06 to 12 R/h	1.5%
H40	0.02 to 5 R/h	1.5%
H50	0.05 to 10 R/h	1.5%
H100	0.02 to 3 R/h	1.5%
H150	0.1 to 21 R/h	1.5%
H200	0.1 to 14 R/h	1.5%

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H250	0.09 to 10 R/h	1.5%
H300	0.06 to 6 R/h	1.5%
HK30	1 to 300 R/h	1.5%
HK60	2 to 300 R/h	1.5%
HK100	2 to 400 R/h	1.5%
HK200	4 to 600 R/h	1.5%
HK250	6 to 800 R/h	1.5%
HK280	6 to 600 R/h	1.5%
HK300	7 to 700 R/h	1.5%
WS60	0.004 to 0.8 R/h	1.5%
WS80	0.06 to 12 R/h	1.5%
WS110	0.2 to 50 R/h	1.5%
WS150	0.6 to 100 R/h	1.5%
WS200	1 to 160 R/h	1.5%
WS250	1 to 160 R/h	1.5%
WS300	1 to 170 R/h	1.5%
NS20	0.005 to 1 R/h	1.5%

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NS25	0.01 to 2 R/h	1.5%
NS30	0.02 to 4 R/h	1.5%
NS40	0.04 to 7 R/h	1.5%
NS60	0.06 to 12 R/h	1.5%
NS80	0.08 to 5 R/h	1.5%
NS100	0.02 to 3 R/h	1.5%
NS120	0.02 to 4 R/h	1.5%
NS150	0.07 to 28 R/h	1.5%
NS200	0.06 to 8 R/h	1.5%
NS250	0.1 to 7 R/h	1.5%
NS300	0.06 to 6 R/h	1.5%
LK30	0.005 to 1 R/h	1.5%
LK35	0.005 to 1 R/h	1.5%
LK55	0.005 to 1 R/h	1.5%
LK70	0.005 to 1 R/h	1.5%
LK100	0.005 to 1 R/h	1.5%
LK125	0.005 to 1 R/h	1.5%

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	LK170	0.005 to 0.8 R/h	1.5%
	LK210	0.005 to 0.7 R/h	1.5%
	LK240	0.005 to 0.6 R/h	1.5%
Beta	^{204} T1	1.3 rad/h	3.3%
	^{90} Sr/^{90} Y	0.4 to 19 rad/h	3.3%
Neutron	^{252} Cf Bare	0.00013 to 4 rem/h	14.0%
	^{252} Cf Moderated	0.00003 to 1 rem/h	21.9%

1. Values listed at the 95% confidence level.
2. Uncertainties are valid for nominal intensity range listed.
3. For calibration outside of the nominal intensity range shown, uncertainties would be determined commensurate with the parameters of the reference field calibration.

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