

# CERTIFICATE OF CALIBRATION

## MODEL CAL2600 GAMMA STANDARD

Radionuclide: Na-22                      Activity: 4.014 kBq (108.5 nCi)  
Serial Number: 129741                      Reference Date: 1200 PDT July 1, 2008  
Half Life<sup>(1)</sup>: 2.602 ± 0.002 years

### PRINCIPAL EMISSIONS<sup>(1)</sup>

Type	Energy (keV)	Intensity (%)
gamma	1274.53	99.937
annihilation gamma	511	178.8

### SOURCE DESCRIPTION

Active Diameter: 1 mm                      Backing: 1 mm plastic  
Overall Diameter: 25.4 mm                      Cover: 1 mm plastic  
Thickness: 3.2 mm

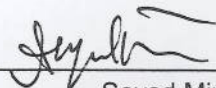
### METHOD OF CALIBRATION

The source was calibrated on a high purity germanium detector using a Na-22 efficiency at 1274.53 keV. This efficiency was established and verified through ongoing intercomparisons with the National Institute of Standards and Technology. This standard is indirectly (implicitly) traceable to the National Institute of Standards and Technology.

North American Scientific, Inc. participates in the Radioactivity Measurements Assurance Program conducted by the National Institute of Standards and Technology in cooperation with the Nuclear Energy Institute.

### TOTAL UNCERTAINTY (99% Confidence Level)

Systematic uncertainty	3.00%
Random uncertainty	0.81%
Total uncertainty (quadratic sum)	<u>± 3.11%</u>



Seyed Miri  
Calibration Laboratory Manager

July 2, 2008

Date

### REFERENCES

(1) Table of Radioactive Isotopes, 7th edition, 1986.

• LEAK TEST CERTIFICATION ON REVERSE •

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