

P-7

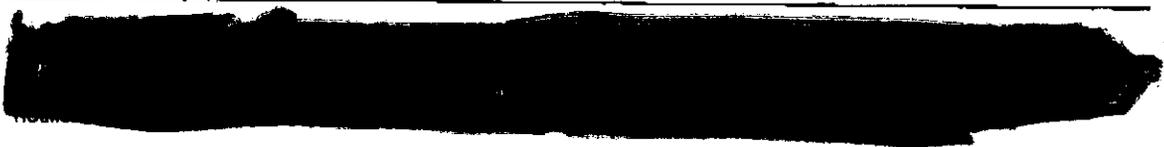
**Medical Imaging-
CAMC**

47-15473-02 MD
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Fax

To: Thomas Thompson From: Kim Lane
 Fax: 610-337-5269 Pages: 4
 Phone: 610 337-5303 Date: 8/21/09
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Comments:



Eckert & Ziegler

Isotope Products

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661-309-1010
Fax 661-257-8303

General

FLOOD SOURCE EVALUATION REPORT

Isotope:	Co-57	Model Number:	3709.AD.010M.N
Serial Number:	1338-178	Activity:	10 mCi (370 MBq)
Reference Date:	1 Aug 09	Half Life:	271.77 days
Impurities: Less than 0.12% combined Co-56 and Co-58 impurities on reference date.			

Source Field Uniformity Measurement

Source uniformity measurement of the 122/136 keV gamma emission was performed using a gamma camera scanning system. An array of 0.91 cm² "unit cells" comprising approximately 80% of the source was measured over the useful region to calculate the uniformity data shown below.

Coefficient of Variation:	0.62%	Overall Dimensions:	638mm x 454mm (25.2" x 17.9")
Integral Non-Uniformity:	2.09%	Active Region:	610mm x 419mm (24.0" x 16.5")
Differential Non-Uniformity:	1.86%	Useful Region:	584mm x 393mm (23.0" x 15.5")

Nuclide	Half-Life ⁽¹⁾	Decay Characteristics		% Abundance
		Decay Mode	Photon Energy keV ⁽¹⁾	
Co-57	271.77 d	e.c.	14.412	9.54
			122.0612	85.5
			136.4730	10.69
			691.982	0.158
			Fe K x-rays (6.391-7.058)	54.7

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

Recommended Use

Eckert and Ziegler Isotope Products offers a complete line of Co-57 Flood Sources designed to determine gamma camera field uniformity performance and assist in evaluating possible camera malfunctions which could interfere with diagnostic procedures. The Co-57 Flood Source should be measured with the energy window set to include the 122 keV gamma emission. Narrower window settings (130-150 keV) may provide data which could result in a faulty image. For many of the newer more sensitive gamma cameras this is especially critical.

Leak Test Certification

Leak test information is on the reverse side.

Key Specifications

1. Coefficient of Variation (Percent Standard Deviation): Defined by the Standard Deviation of the distribution of the measured values by the mean of measured values, expressed as a percentage.
2. Useful Region: Defined as the central region, 12.7mm (0.5") in from the active border.
3. Integral Non-Uniformity: Ratio $(Max_i - Min_i)/(Max_i + Min_i)$, where Max_i represents the largest measurement and Min_i represents the smallest measurement in the useful region.
4. Differential Non-Uniformity: Ratio $(Max_D - Min_D)/(Max_D + Min_D)$ represents the largest deviation between a central value and the eight surrounding measurements.

LAB BOOK PAGE: 1315-35-4

 | 30-Jun-09
SIGNATURE | DATE

ISO 13485 CERTIFIED

Medical Imaging Laboratory

24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504



Eckert & Ziegler

Isotope Products

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Valencia, California 91355

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WFC

FLOOD SOURCE EVALUATION REPORT

Isotope:	Co-57	Model Number:	3706.AD.010M.N
Serial Number:	1372-060	Activity:	10 mCi (370 MBq)
Reference Date:	1 Apr 09	Half Life:	271.77 days
Impurities: Co-56: 0.0703 %; Co-58: 0.0149 % on 1 Apr 09.			

Source Field Uniformity Measurement

Source uniformity measurement of the 122/136 keV gamma emission was performed using a gamma camera scanning system. An array of 0.91 cm² "unit cells" comprising approximately 80% of the source was measured over the useful region to calculate the uniformity data shown below.

Coefficient of Variation:	0.80%	Overall Dimensions:	508mm (20.0") diameter
Integral Non-Uniformity:	2.25%	Active Region:	470mm (18.5") diameter
Differential Non-Uniformity:	1.97%	Useful Region:	445mm (17.5") diameter

Nuclide	Half-Life ⁽¹⁾	Decay Characteristics		
		Decay Mode	Photon Energy keV ⁽¹⁾	% Abundance
Co-57	271.77 d	e.c.	14.412	9.54
			122.0612	85.5
			136.4730	10.69
			691.982	0.158
			Fe K x-rays (6.391-7.058)	54.7

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LAB BOOK PAGE: 1315-21-11

 | 19-Mar-09
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Industrial Gauging Laboratory

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**Isotope Products
Laboratories**

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OPIL

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An Eckert & Ziegler Company

NOMINAL SOURCE DATA SHEET

NUCLIDE: Na-22

ACTIVITY: 10 μ Ci (370 kBq) each

SOURCE #: 1190-66-7 thru 12

CATALOG NO.: MMS05-022-10U

COVER: Glassfilled Teflon

ACTIVE DIAMETER: 0.039" (1mm)

NATURE OF ACTIVE DEPOSIT: Sodium Chloride in ceramic matrix.

QUANTITY: 6

REFERENCE DATE: 1 Aug 06

CAPSULE: A1931-2

BACKING: Epoxy

ACTIVE LENGTH: 0.039" (1mm)

LEAK TEST INFORMATION IS ON THE REVERSE SIDE.

IMPURITIES: None detected.

Notes: U.S. Patent # 6,927,406

LAB BOOK-PAGE: 1190-66

John [Signature] | 15-Jul-06
SIGNATURE | DATE

ISO 9001 CERTIFIED

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