



CERCA LEA

LEA Laboratoire Etalons d'Activité
Site du Tricastin
B.P. 75 - 26701 Pierrelatte Cedex
Tél. : (33) 04 75 96 56 00
Fax : (33) 04 75 96 56 40
Internet : www.lea-cerca.com
CERCA, filiale de AREVA NP

CHAINE D'ETALONNAGE

RAYONNEMENT IONISANT
IONIZING RADIATION

LABORATOIRE D'ETALONNAGE ACCREDITE
ACCREDITED CALIBRATION LABORATORY

ACCREDITATION N° 2-1529
PORTEE DISPONIBLE SUR WWW.COFRAC.FR
ACCREDITATION DETAILS ON WWW.COFRAC.FR

CERTIFICAT D'ETALONNAGE CALIBRATION CERTIFICATE N° CT/140175/14/0268

Délivré à : **SERVIZI NUCLEARI s.n.c.**
Issued for : **15030 CONZANO (AL) ITALIE**

Commande : **1/CER/2014**
Order :

INSTRUMENT ETALONNE CALIBRATION INSTRUMENT

Désignation : **Etalon multigamma Eu152**
Designation : **Standard source multigamma Eu152**

Constructeur : **LEA**
Manufacturer :

Référence : **EU152EGMA20**
Product code :

Identification : **50266**
Serial number :

Ce certificat comprend **3** pages
This certificate includes **pages**

Date d'émission : **26/02/2014**
Date of issue : **day/month/year**

LE RESPONSABLE DU LABORATOIRE
THE HEAD OF THE LABORATORY

Horner Alain

LE COFRAC EST SIGNATAIRE DE L'ACCORD MULTILATERAL DE EA ET D'ILAC DE RECONNAISSANCE DE L'EQUIVALENCE
DES CERTIFICATS D'ETALONNAGE
THE COFRAC IS SIGNATORY TO THE MULTILATERAL AGREEMENT OF EA AND ILAC RECOGNITION OF EQUIVALENCE
OF CALIBRATION CERTIFICATES

LA REPRODUCTION DE CE CERTIFICAT N'EST AUTORISEE QUE SOUS LA FORME DE FAC-SIMILE PHOTOGRAPHIQUE INTEGRAL
THIS CERTIFICATE MAY NOT BE REPRODUCED OTHER THAN IN FULL BY PHOTOGRAPHIC PROCESS



Calibration certificate N° CT/140175/14/0268		Page 2/3
Product code EU152EGMA20	Serial number 50266	Radionuclide ¹⁵²Eu

1 MEANS AND METHODS

Type of calibration	Activity	Impurity rate
Unit	Bq	%
Detector used	Nal(Tl)	Semi-conductor GeHP (N)
Reference of the measurement equipment	CCINal-5	CSGHP1
Method employed	Full scale counting	γ-ray spectrometer

The environmental conditions have not influence on the results of the measurement.

2 NOMINAL CHARACTERISTICS DELIVERED STANDARDS

Ring thickness	3mm
External diameter	25mm
Substrate	Plastique foil
Active diameter	3mm
Sealed source classification	C11111 (according NF M61-002 / ISO 2919)

We certify that this kind of sealed source complies with the national and international rules requirements
NF M61-002 and ISO 2919

3 RESULTS

3.1 Total activity

Activity	4317E+2 Bq		
Reference date at 12h U.T.C	25/02/2014		
Extended relative uncertainty (% k=2)	± 1,7		
Daughter product(s)	/		
Impurities γ (% at the reference date)	¹⁵⁴Eu:0,99 ; ¹⁵³Gd:< 0,01		
Leak test (*)	Wipe test :	OK	25/02/2014
No surface contamination (*)	Wipe test :	OK	25/02/2014
Technician measures	Ludovic RATTON		

(*) According to NF M61-003 / ISO 9978.

Calibration certificate N° CT/140175/14/0268			Page 2/2
Product code EU152EGMA20	Serial number 50266	Radionuclide ¹⁵²Eu	

3.2 Calculated flux

Energy kev (*) (k=1)	Number of photons per 100 disintegration (*) (k=1)	Flux $\gamma.s^{-1}$ in 4π sr	Extended relative uncertainty (%-k=2) (8)
121,7817 ± 0,0003	28,41 ± 0,13	1,226E+05	2,0%
244,6974 ± 0.0008	7,55 ± 0,04	3,259E+04	2,1%
295,9387 ± 0,0017	0,442 ± 0,003	1,908E+03	2,2%
344,2785 ± 0.0012	26,59 ± 0,12	1,148E+05	2,0%
367,7891 ± 0,0020	0,862 ± 0,005	3,721E+03	2,1%
411,1165 ± 0,0012	2,238 ± 0,010	9,66E+03	2,0%
443,965 ± 0,003	3,12 ± 0,028	1,347E+04	2,5%
488,6792 ± 0,002	0,4139 ± 0,0024	1,783E+03	2,1%
563,990 ± 0,007	0,457 ± 0,013	1,973E+03	6,0%
678,623 ± 0,005	0,470 ± 0,004	2,029E+03	2,5%
688,670 ± 0,005	0,841 ± 0,006	3,631E+03	2,3%
778,9045 ± 0,0024	12,97 ± 0,06	5,60E+04	2,0%
867,380 ± 0,003	4,243 ± 0,023	1,832E+04	2,1%
919,337 ± 0,004	0,429 ± 0,005	1,852E+03	2,9%
964,079 ± 0,018	14,50 ± 0,06	6,26E+04	1,9%
1005,272 ± 0,0017	0,665 ± 0,023	2,871E+03	1,9%
1085,837 ± 0,010	10,13 ± 0,06	4,373E+04	2,1%
1089,737 ± 0,005	1,73 ± 0,01	7,47E+03	2,1%
1112,076 ± 0,003	13,41 ± 0,06	5,79E+04	2,0%
1212,948 ± 0,011	1,416 ± 0,009	6,11E+03	2,2%
1299,142 ± 0,008	1,633 ± 0,009	7,05E+03	2,1%
1408,013 ± 0,003	20,85 ± 0,08	9,00E+04	1,9%
1457,643 ± 0,011	0,498 ± 0,004	2,150E+03	2,4%

() See instruction note

(*) Values recommended by the LNH (<http://www.radionuclide.org>)

The extended uncertainties mentioned are those corresponding to two uncertainty composed type. The uncertainties types have calculated taking into account the different uncertainties components reference standards : means of calibration, environmental conditions, the data of the calibrated instrument, repeatability ...

The delivery of a certificate calibration with logotype COFRAC guarantees the traceability of the calibration results according to the international unity system.

Only the original copy is valid.