



## Potvrda o akreditaciji Accreditation Certificate

Ovime se utvrđuje da je  
This is to recognize that

**INSTITUT RUĐER BOŠKOVIĆ**  
**Sekundarni standardni dozimetrijski laboratorij**  
Bijenička cesta 54, HR-10000 Zagreb

osposobljen prema zahtjevima norme  
is competent according to  
**HRN EN ISO/IEC 17025:2007**  
(ISO/IEC 17025:2005+Cor.1:2006;  
EN ISO/IEC 17025:2005+AC:2006)  
za/to carry out

**Umjeravanje ionizacijskih komora u radioterapiji i detektora u području zaštite od zračenja**  
Calibration of ionisation chambers in the field of radiotherapy and detectors in the field of radiation protection

**u području opisanom u prilogu koji je sastavni dio ove potvrde o akreditaciji.**  
for the scope described in the annex which is the constituent part of this accreditation certificate.

**Br./No.:** 2624  
**Klasa/Ref.No.:** 383-02/19-80/007  
**Urbroj/Id.No.:** 569-02/4-19-21  
Zagreb, 2019-02-25

**Akreditacija istječe**•Accreditation expiry: 2024-02-24  
**Prva akreditacija**•Initial accreditation: 2013-10-31

**HAA je potpisnica multilateralnog sporazuma s Europskom organizacijom za akreditaciju (EA)**  
HAA is a signatory of the European co-operation for Accreditation (EA) Multilateral Agreement

**Ravnatelj:**  
Director General:  
Tihomir Babić, dipl. ing.



**Hrvatska akreditacijska agencija**  
Croatian Accreditation Agency

**PRILOG POTVRDI O AKREDITACIJI br.: 2624**

*Annex to the Accreditation Certificate No.:*

Klasa/Ref. No.: 383-02/19-80/007

Urbroj/Id. No.: 569-02/4-19-20

Datum izdanja priloga /Annex Issued on: 2019-02-25

**Norma: HRN EN ISO/IEC 17025:2007**

*Standard:(ISO/IEC 17025:2005+Cor.1:2006; EN ISO/IEC 17025:2005+AC:2006)*

**Akreditacija istječe: 2024-02-24**

*Accreditation expiry:*

**Prva akreditacija: 2013-10-31**

*Initial accreditation:*

**Akreditirani laboratoriji**

*Accredited laboratories*

**INSTITUT RUĐER BOŠKOVIĆ**

**Sekundarni standardni dozimetrijski laboratorij**

Bijenička cesta 54, HR-10000 Zagreb

**Područje akreditacije:**

*Scope of Accreditation:*

**Umjeravanje ionizacijskih komora u radioterapiji i  
detektora u području zaštita od zračenja**

*Calibration of ionisation chambers in the field of radiotherapy  
and detectors in the field of radiation protection*

Važeće izdanje Priloga dostupno je na web adresi: [www.akreditacija.hr](http://www.akreditacija.hr) /  
*Valid issue of the Annex is available at the web address: [www.akreditacija.hr](http://www.akreditacija.hr)*

**Ravnatelj:**

**Director General:**

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## PODRUČJE AKREDITACIJE / SCOPE OF ACCREDITATION

| Umjeravanje u laboratoriju / Calibration in laboratory |                                                                                                                                |                                      |                                                                        |                                                                                                                                                                                   |                                                                                                                                                        |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Br. No.                                                | Mjerna veličina / Mjerilo<br>Measurand / Calibration item                                                                      | Mjerno područje<br>Measurement range | Mjerna sposobnost*<br>Calibration and measurement capability*<br>(CMC) | Metode umjeravanja<br>Calibration methods                                                                                                                                         | Napomene<br>Remarks                                                                                                                                    |
| 1.                                                     | Kerma u zraku<br>Air kerma                                                                                                     | 10 mGy do/to 10 Gy                   | 1,21 %                                                                 | IAEA TRS 469:2009<br><br>HRN EN 60731:2012<br>(IEC 60731:2011, EN 60731:2012)<br>(metoda supstitucije/ method of substitution)                                                    | Ionizirajuće polje<br>Ionising radiation field -Co-60                                                                                                  |
| 2.                                                     | Brzina kerme u zraku/Detektor u području zaštite od zračenja<br>Air kerma rate/ Detectors in the field of radiation protection | 4,8 µGy/h do/to 50 mGy/h             | 3,09 %                                                                 | IAEA SRS:16:2000<br>Određivanje kalibracijskog faktora i odziva u poznatom polju zračenja<br>Determination of the calibration factor and the response in a known radiation field) | Određivanje kalibracijskog faktora i odziva u poznatom polju zračenja<br>Determination of the calibration factor and response in known radiation field |
| 3.                                                     | Brzina kerme u zraku/Ionizacijske komore u radioterapiji<br>Air kerma rate/Ionisation chambers in the field of radiotherapy    | 1,3 Gy/h do/to 10 Gy/h               | 1,21 %                                                                 | IAEA TRS 469:2009<br><br>HRN EN 60731:2012<br>(IEC 60731:2011, EN 60731:2012)<br>(metoda supstitucije/ method of substitution)                                                    | Ionizirajuće polje<br>Ionising radiation field -Co-60                                                                                                  |

| Umjeravanje u laboratoriju / Calibration in laboratory |                                                               |                                      |                                                                        |                                                                                                                                   |                                                       |
|--------------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Br. No.                                                | Mjerna veličina / Mjerilo<br>Measurand / Calibration item     | Mjerno područje<br>Measurement range | Mjerna sposobnost*<br>Calibration and measurement capability*<br>(CMC) | Metode umjeravanja<br>Calibration methods                                                                                         | Napomene<br>Remarks                                   |
| 4.                                                     | Apsorbirana doza u vodi<br>Absorbed dose to water             | 10 mGy do/to 10 Gy                   | 1,74 %                                                                 | IAEA TRS 398:2006<br><br>HRN EN 60731:2012<br>(IEC 60731:2011,<br>EN 60731:2012)<br>(metoda supstitucije/ method of substitution) | Ionizirajuće polje<br>Ionising radiation field -Co-60 |
| 5.                                                     | Brzina apsorbirane doze u vodi<br>Absorbed dose rate to water | 1,3 Gy/h do/to 10 Gy/h               | 1,74 %                                                                 | IAEA TRS 398:2006<br><br>HRN EN 60731:2012<br>(IEC 60731:2011,<br>EN 60731:2012)<br>(metoda supstitucije/ method of substitution) | Ionizirajuće polje<br>Ionising radiation field -Co-60 |

\* CMC (Calibration and Measurement Capability) je procijenjena kao proširena mjerna nesigurnost dobivena množenjem standardne nesigurnosti s faktorom pokrivanja  $k$ , koji odgovara razini povjerenja od oko 95 %. Uobičajeno i, ako nije drugačije navedeno, faktor  $k$  iznosi 2.  
CMC je izračunata u skladu s EA 4/02 M:2013 Evaluation of the Uncertainty of measurement in Calibration.

The CMC (Calibration and Measurement Capability) has been estimated as an expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor  $k$  corresponding to confidence level of about 95 %. Normally and unless stated otherwise, this factor  $k$  is 2.

The CMC has been determined according to the EA 4/02 M:2013 Evaluation of the Uncertainty of measurement in Calibration.