



EUROPEAN UNION  
European Structural and Investing Funds  
Operational Programme Research,  
Development and Education



## PURCHASE CONTRACT

This purchase contract ("**Contract**") was concluded pursuant to the Czech Act no. 89/2012 Coll., Civil Code ("**Civil Code**"), on the day, month and year stated below by and between:

(1) **Institute of Physics of the Czech Academy of Sciences, public research institution**

with its registered office at: Na Slovance 2, Praha 8, PSČ: 182 21

registration no.: 68378271

represented by: RNDr. Michael Prouza, Ph.D. – director

registered in the Register of public research institutions

("Buyer"); and

(2) **OptiXs, s.r.o.**

with its registered office at: Křivoklátská 37, 199 00 Praha 9,

registration no.: 02016770,

represented by: Ing. Aleš Jandík, CEO

("Seller").

(The Buyer and the Seller are hereinafter jointly referred to as "**Parties**" and individually as "**Party**".)

### WHEREAS

- (A) The Seller's bid for the public contract entitled "*DUHA OPCPA Crystals TP21\_064*", funded from the Research, Development and Education Operational Programme managed by the Ministry of Education, Youth and Sports, whose purpose was to procure the Object of Purchase ("**Public Contract**"), was selected by the Buyer as the most suitable.

### IT WAS AGREED AS FOLLOWS:

#### 1. BASIC PROVISIONS

- 1.1 Under this Contract, the Seller shall deliver to the Buyer (4) four pieces of BBO crystals and (2) two pieces of LBO crystals as described in Annex 1 (*Technical Specification*) to this Contract in the quality and with the properties described therein ("**Object of Purchase**") and shall transfer to the Buyer ownership right to the Object of Purchase and the Buyer shall take over the Object of Purchase and shall pay the Seller the Purchase Price (as defined below), all under the terms and conditions stipulated in this Contract.
- 1.2 The Object of Purchase shall be new (not remanufactured).



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YOUTH AND SPORTS

## 2. **THE PLACE OF DELIVERY**

The place of delivery is the ELI Beamlines facility at the address Průmyslová 836, post code 252 41, Dolní Břežany, Czech Republic.

## 3. **THE TIME OF DELIVERY**

3.1 The Seller shall deliver the Object of Purchase within 20 weeks from the conclusion of this Contract.

3.2 At the request of the Seller, the fulfillment date will be extended by the time for which the Seller is unable to fulfill this Contract in time due to circumstances that occurred independently of its will and which are difficult to predict (e.g. measures in connection with covid-19). In the application, the Seller shall state the facts and attach documents (evidence) that are important for the assessment of whether the conditions for the extension are met, unless they are generally known facts or publicly available information.

## 4. **THE OWNERSHIP RIGHT**

The ownership right to the Object of Purchase shall pass to the Buyer upon the signature of the Acceptance protocol by the Buyer or when provision 7.4 of this Contract shall apply, ownership right to the duly delivered and accepted part of the Object of Purchase shall pass after signature of Partial acceptance protocol.

## 5. **PRICE AND PAYMENT TERMS**

5.1 The purchase price of Objects of Purchase excl. VAT is stated in Annex 2 (Price sheet) to this Contract ("**Purchase Price**"). VAT will be paid in accordance with the applicable legal regulations.

5.2 The Purchase Price cannot be exceeded and includes all costs and expenses of the Seller related to the performance of this Contract. The Purchase Price includes, among others, all expenses related to the manufacture and delivery of the Object of Purchase, costs of copyright, insurance, customs, warranty service and any other costs and expenses connected with the performance of this Contract with the exception of VAT payable in the EU.

5.3 The Purchase Price for the Object of Purchase shall be paid on the basis of a tax document – invoice, to the account of the Seller designated in the invoice. The Purchase Price shall be paid after signature of Acceptance protocol or when provision 7.4 of this Contract shall apply, part of the Purchase price, corresponding to the duly delivered and accepted part of the Object of Purchase (amount based on crystal unit price stated in annex 2) shall be paid after signature of the Partial acceptance protocol.

5.4 The Buyer shall realize the payment on the basis of a duly issued invoice within 30 days from its receipt. If the invoice stipulates different due period, such period is deemed irrelevant and the period stipulated herein applies. The invoice shall be considered to be



paid for on the day when the invoiced amount is deducted from the Buyer's account on behalf of the Seller's account. The invoice shall have only the electronic form and shall be submitted to the email address: [efaktury@fzu.cz](mailto:efaktury@fzu.cz).

5.5 The invoice issued by the Seller as a tax document must contain all information required by the applicable laws of the Czech Republic. The invoice shall contain in particular the following information:

- a) name and registered office of the Buyer,
- b) tax identification number of the Buyer,
- c) name and registered office of the Seller,
- d) tax identification number of the Seller,
- e) registration number of the tax document,
- f) scope of the performance (including the reference to this Contract),
- g) the date of the issue of the tax document,
- h) the date of the fulfilment of the Contract,
- i) Purchase Price,
- j) registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,
- k) declaration that the performance of the Contract was provided for the purposes of the project "Advanced Research Using High Intensity Laser Produced Photons and Particles", reg. number: CZ.02.1.01/0.0/0.0/16\_019/0000789.

5.6 In case that the invoice shall not contain the above mentioned information, the Buyer is entitled to return it to the Seller during its maturity period and this shall not be considered as a default. The new maturity period shall begin from the receipt of the supplemented or corrected invoice by the Buyer.

## 6. SELLER'S DUTIES

6.1 The Seller shall ensure that the Object of Purchase is in compliance with this Contract including all its annexes and applicable legal (e.g. safety), technical and quality norms.

6.2 During the performance of this Contract, the Seller proceeds independently. If the Seller receives instructions from the Buyer, the Seller shall follow such instructions unless these are in contradiction to this Contract, applicable law or norms. If the Seller finds out or should have found out if professional care was exercised that the instructions are for any reason inappropriate or illegal or in contradiction to this Contract, then the Seller must notify the Buyer.



## 7. **HANDOVER AND TAKEOVER OF THE OBJECT OF PURCHASE**

- 7.1 Prior to the delivery of the Object of Purchase to the Buyer, the Seller shall test the Object of Purchase in accordance with Annex 1 (*Technical Specification*) to this Contract.
- 7.2 The acceptance of the Object of Purchase shall be realized on the basis of an acceptance protocol (hereinafter “**Acceptance protocol**”) issued by the Buyer.
- 7.3 If the Object of Purchase (including required documentation) does not meet requirements stipulated in this Contract, the Buyer is entitled to refuse the acceptance of the Object of Purchase. The Buyer is entitled (but not obliged) to accept the Object(s) of Purchase despite the above mentioned deficiencies, in particular if such deficiencies do not prevent the Buyer from the proper operation of the Object(s) of Purchase. In such a case, the Seller and the Buyer shall list the deficiencies in the Acceptance protocol, including the manner and the date of their removal (remedy). If the Parties do not reach agreement in the Acceptance protocol regarding the date of the removal, the Seller shall remove the deficiencies within three (3) weeks.
- 7.4 Buyer is also entitled to takeover only part of the Object of Purchase, which will meet requirements of this Contract. In that case Buyer will issue partial acceptance protocol (hereinafter “**Partial acceptance protocol**”), where will be specified, which part of the Object of Purchase was delivered properly. Provisions 7.1-7.2 of this Contract apply with necessary modifications.

## 8. **WARRANTY**

- 8.1 The Seller hereby provides a warranty of quality of the Object of Purchase for the period of 1 year.
- 8.2 The warranty period shall begin on the day of the signature of the Acceptance protocol by the Buyer or when provision 7.4 of this Contract shall apply, warranty period to the duly delivered and accepted part of the Object of Purchase shall begin on the day of the signature of the Partial acceptance protocol. If the acceptance protocol lists any deficiencies, the warranty period shall begin on the day on which the last deficiency was removed.
- 8.3 If the Buyer ascertains a defect of the Object of Purchase during the warranty period, the Buyer shall notify such defect without undue delay to the Seller. Defects may be notified on the last day of warranty period, at the latest.
- 8.4 The Buyer notifies defects in writing via e-mail. The Seller shall accept notifications of defects on the following e-mail address: [service@optixs.cz](mailto:service@optixs.cz). The Seller shall confirm within 24 hours from the receipt of the notification.
- 8.5 In the notification, the Buyer shall describe the defect. The Buyer has the right to:
- a) ask for the removal of the defect by the delivery of a new Object of Purchase or its part, or



- b) ask for the removal of the defect by repair, or
- c) ask for the adequate reduction of the Purchase Price.

The choice among the above mentioned rights belongs to the Buyer. However, the Buyer must not require the removal of the defect by the delivery of a new Object of Purchase or its part where the defect may be removed by repair and the defect has not occurred repeatedly.

- 8.6 The Seller shall remove defects that occur during the warranty period free of charge within 16 weeks from their notification, unless Parties due to the nature of the defect agree on the shorter or longer period of time.
- 8.7 Parties shall execute a protocol on the removal of the defect, which shall contain the description of the defect and the confirmation that the defect was removed. The warranty period shall be extended by a period of time that elapses between the notification of the defect until its removal if the defect removal prevented the Buyer from using the Object of Purchase for the intended use.
- 8.8 In case that the Seller does not remove the defect within stipulated time or if the Seller refuses to remove the defect, then the Buyer is entitled to remove the defect at his own costs and the Seller shall reimburse these costs within 10 days after the Buyer's request to do so.
- 8.9 The warranty does not cover defects caused by unprofessional manipulation or by the failure to follow Seller's instructions for the operation and maintenance of the Object of Purchase.

## 9. **PENALTIES**

- 9.1 If the Seller is in delay with the delivery of any part of the Object of Purchase, the Seller shall pay to the Buyer a contractual penalty in the amount of 0,05 % of that part of the Purchase Price (exl. VAT), which corresponds to the price of undelivered and unaccepted part of the Object of Purchase (amount based on crystal unit price stated in annex 2) for every (even commenced) day of delay.
- 9.2 If the Seller is in delay with the removal of a defect, the Seller shall pay to the Buyer a contractual penalty in the amount of 0,05 % of the Purchase Price (excl. VAT) for every (even commenced) day of delay.
- 9.3 The Seller shall pay contractual penalties within fifteen (15) days from the day, on which the Buyer enumerated its claims. The payment of contractual penalties shall not affect the right of the Buyer to damages to the extent to which such damages exceed the contractual penalty.
- 9.4 Total amount of contractual penalty for the timely delivery of the Object of Purchase that the Buyer is entitled to claim under this Contract shall not exceed 5 % of the Purchase Price.



9.5 The Buyer is entitled to unilaterally set off claims arising from the contractual penalty against the (even yet undue) claim of the Seller for the payment of the Purchase Price.

## 10. RIGHT OF WITHDRAWAL

10.1 The Buyer is entitled to withdraw from this Contract without any penalties, if any of the following circumstances occurs:

- a) the Seller is in delay with the delivery of the Object of Purchase and the delay lasts more than 6 weeks;
- b) The Object of Purchase during testing does not fulfil the requirements stipulated in this Contract, in particular in Annex 1 (*Technical Specification*) and the deficiencies cannot be remedied;
- c) the insolvency proceeding is initiated against the Seller; or
- d) the Buyer ascertains that the Seller provided in its bid for the Public Procurement information or documents that do not correspond to the reality and that this fact had or could have had impact on the result of the tendering procedure, which preceded the conclusion of this Contract.

## 11. ECOLOGICAL, SOCIAL AND INNOVATIVE ASPECTS OF THIS CONTRACT

The Buyer aims to conclude contracts with sellers that take into account and implement the principles of social responsibility, ecological sustainability and innovation. Therefore, the Seller shall ensure that:

- a) this Contract shall be fulfilled only by persons that are employed in accordance with the applicable legal regulations (no illegal or child workers);
- b) while performing this Contract, all applicable health and safety regulations and rules at work place are observed;
- c) all persons performing this Contract are employed under fair and non-discriminatory working conditions;
- d) if presented with different manners of fulfilling this Contract, the Seller shall select the solution/process that is in accordance with the principles governing nature conservation and nature protection, ecological sustainability and ecological waste management; and
- e) if presented with different manners of fulfilling this Contract, the Seller shall select the solution/process that is the most innovative.

## 11. FINAL PROVISIONS

11.1 This Contract is governed by the laws of the Czech Republic, especially by the Civil Code.



- 11.2 All disputes arising out of this Contract or out of legal relations connected with this Contract shall be preferably settled by a mutual negotiation. In case that the dispute is not settled within sixty (60) days, such dispute shall be decided by courts of the Czech Republic in the procedure initiated by one of the Parties.
- 11.3 The Seller is not entitled to set off any of its claims or his debtor's claims against the Buyer's claims. The Seller is not entitled to transfer its claims against Buyer that arose on the basis or in connection with this Contract on third parties. The Seller is not entitled to transfer rights and duties from this Contract or its part on third parties.
- 11.4 All modifications and supplements of this Contract must be in writing.
- 11.5 If any of provisions of this Contract is invalid or ineffective, the Parties are bound to change this Contract in such a way that the invalid or ineffective provision is replaced by a new provision that is valid and effective and to the maximum possible extent correspond to the original invalid or ineffective provision.
- 11.6 This Contract is executed electronically with electronic signatures of the Parties.
- 11.7 An integral part of this Contract is Annex 1 (*Technical Specification*) and Annex 2 (*Price sheet*). If in Annex 1 (Technical Specification) is used term "Contracting Authority", it is meant Buyer and by term "supplier" is meant the Seller.
- 11.8 This Contract shall be valid on the date of the signature of both Parties and effective on the day, on which it was published in the register of contracts within the meaning of the Act no. 340/2015 Coll., on the Register of Contracts.

**IN WITNESS WHEREOF** attach Parties their handwritten signatures:

**Buyer**

Signature: \_\_\_\_\_

Name: RNDr. Michael Prouza, Ph.D.

Position: director

Date:

**Seller**

Signature: \_\_\_\_\_

Name: Ing. Aleš Jandík

Position: CEO

Date: 4.4.2022

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## **DUHA OPCPA Crystals TP21\_064**



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	<b>Position</b>	<b>Name</b>
<b>Responsible person</b>	Group leader of L2 DUHA	Jonathan Tyler Green
<b>Prepared by</b>	Group leader of L2 DUHA	Jonathan Tyler Green



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<i>Name (Approver)</i>	<i>Position</i>	<i>Date</i>	<i>Signature</i>
Jonathan Tyler Green	Group leader of L2 DUHA		<a href="#">Via TC</a>

### **Revision History / Change Log**

<i>Change No.</i>	<i>Made by</i>	<i>Date</i>	<i>Change description, Pages, Chapters</i>	<i>TC rev.</i>
1	J.T. Green	03.01.2022	Draft	A
2	J. Adamec	05.01.2022	Update of the RSD, version for internal review	B
3	J. T. Green	20.01.2022	Final version for author's approval	C
4	J. T. Green	21.01.2022	Re-released version after author's changes	D

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## 1. Introduction

### 1.1. Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints for the selection of 4 BBO crystals and 2 LBO crystals which will be used in a high energy optical parametric amplifier. They will be used to amplify light centered at 820 nm with a 100 nm total bandwidth (termed signal) via OPCPA with a 515 pump pulse (termed pump). As a byproduct of this amplification, light will be generated from 1250 nm to 1530 nm (termed idler) within the crystal. The average power transmitted through the crystals will be on the order of 50 W in the case of BBO and 500 W in the case of LBO, so all crystals should be coated with high average power handling in mind.

### 1.2. Scope

This RSD contains all of the technical requirements: functional, performance and design, delivery, safety and quality requirements for the following product (tender number: TP21\_064): **DUHA OPCPA Crystals** (further "Crystals").

The crystals will be in the L2 laser hall and will be a primary component of the high energy, high repetition rate OPCPA. The products are registered in the PBS database under the following PBS code: RA1.L2.L2\_1.OPA.OPA.S1.C.1, RA1.L2.L2\_1.OPA.OPA.S2.C.2, RA1.L2.L2\_1.OPA.OPA.S2.C.1, RA1.L2.L2\_1.OPA.OPA.S2.C.2, RA1.L2.L2\_1.OPA.OPA.S3.C, and RA1.L2.L2\_1.OPA.OPA.S4.C.

These products are Category B products according to the ELI Beamlines RSD categories. The category B is an Off-the-shelf Product with customization (e.g., product performance, dimensions and etc.) that does not require any design modifications of the product. All verification activities performed by a supplier shall be executed in accordance with the supplier's plan of outgoing inspection and tests. The verification of all specified parameters listed in this RSD shall be undertaken by the supplier before delivery to the ELI Beamlines facility and all items shall be furnished with a verification protocol and a declaration of conformity, to reflect their proper characteristics. Furthermore, all items may be subject to testing and verification upon delivery to the ELI Beamlines facility by qualified personnel. All non-conformances (if any) must be addressed by the supplier in a timely manner.

### 1.3. Terms, Definitions and Abbreviations

For the purpose of this document, the following abbreviated terms are applied:

Abbreviation	Meaning
ELI	Extreme Light Infrastructure
RSD	Requirements Specification Document
CA	Contracting Authority (Institute of Physics AS CR)
CAP	Clear aperture
PV	Peak to Valley
S1	Entrance crystal face through which the incident 515 nm and 820 nm light transmit
S2	Exit crystal face through which the generated 1400 nm idler, depleted 515 nm pump, and amplified 820 nm signal leave the crystal

### 1.4. References to standards

If this document includes references to standards or standardized/ standardizing technical documents the CA allows/permits also another equal solution to be offered. If a supplier offers another equal solution the CA shall not reject its bid, once the supplier by appropriate means in the bid proves that the offered supplies, services or works meet in an equivalent manner the requirements including references to standards or technical documents.

## 2. General requirements for the Crystals

REQ-033613/A

The Crystals shall meet the general requirements defined in Table 1 – Table 4. The requirements shall be met over the surface defined as clear aperture (defined in the 4<sup>th</sup> item of each table)

REQ-033614/A

The quantity of each type of crystal shall be as specified in table below.

Crystal #	Quantity	Type
1	2	BBO
2	2	BBO
3	1	LBO
4	1	LBO

REQ-033615/A

The coating technology used to coat the LBO crystals shall be electron beam deposition. The coating technology used to coat the BBO crystals can be either electron beam deposition or magnetron sputtering.

Table 1 Technical Parameters of crystal 1 (BBO)

#	Parameter (description)	Required value
1.1	<b>Crystal Cut (cut for broadband non-collinear type I phase matching of 820 nm signal light with a 515 nm pump)</b>	$\Theta = 24.5^\circ, \varphi = 90^\circ$
1.2	<b>Length (mm)</b>	$22 \pm 0.5$
1.3	<b>Height <math>\times</math> Width (mm)</b>	$14 \times 14$
1.4	<b>Clear Aperture (CAP)</b>	$>90\%$ of hard aperture
1.5	<b>Surface Quality S/D</b>	10/5
1.6	<b>Flatness (PV)</b>	$< \lambda/10$ @ 633 nm
1.7	<b>Transmitted Wavefront distortion (PV)</b>	$< \lambda/10$ @ 633 nm for central 60% of CAP, $< \lambda/6$ @ 633 nm for all CAP
1.8	<b>Maximum size of bubbles or defects within CAP volume (<math>\mu\text{m}</math>)</b>	0.5
1.9	<b>Coating Entrance face (S1)</b>	$R < 0.3\%$ @ 775 - 875 nm $0^\circ$ incidence, $R < 0.3\%$ @ 515 nm $0^\circ$ incidence
1.10	<b>Coating Exit face (S2)</b>	$R < 0.3\%$ @ 775 - 875 nm $0^\circ$ incidence, $R < 0.3\%$ @ 515 nm $0^\circ$ incidence, $R < 0.4\%$ @ 1250 nm - 1530 nm
1.11	<b>LIDT</b>	S1, S2: 10 J/cm <sup>2</sup> @ 1064 nm, 10 ns, 10 Hz, & 7 J/cm <sup>2</sup> @ 532 nm, 10 ns
1.12	<b>Wedge on S2 (deg)</b>	$0.3 \pm 0.1$
1.13	<b>Chamfer Width</b>	$< 0.5\text{mm} \times 45$ deg

Table 2 Required parameters of crystal 2 (BBO)

#	Parameter (description)	Required value
2.1	<b>Crystal Cut (cut for broadband non-collinear type I phase matching of 820 nm signal light with a 515 nm pump)</b>	$\Theta = 24.5^\circ, \varphi = 90^\circ$
2.2	<b>Length (mm)</b>	$15 \pm 0.5$
2.3	<b>Height <math>\times</math> Width (mm)</b>	$14 \times 14$
2.4	<b>Clear Aperture (CAP)</b>	$>90\%$ of hard aperture
2.5	<b>Surface Quality S/D</b>	10/5
2.6	<b>Flatness (PV)</b>	$< \lambda/10$ @ 633 nm
2.7	<b>Transmitted Wavefront distortion (PV)</b>	$< \lambda/10$ @ 633 nm for central 60% of CAP, $< \lambda/6$ @ 633 nm for all CAP
2.8	<b>Maximum size of bubbles or defects within CAP volume (<math>\mu\text{m}</math>)</b>	0.5

#	Parameter (description)	Required value
2.9	<b>Coating Entrance face (S1 surface)</b>	R < 0.3% @ 775 - 875 nm 0° incidence, R < 0.3% @ 515 nm 0° incidence
2.10	<b>Coating Exit face (S2 surface)</b>	R < 0.3% @ 775 - 875 nm 0° incidence, R < 0.3% @ 515 nm 0° incidence, R < 0.4% @ 1250 nm - 1530 nm
2.11	<b>LIDT</b>	S1, S2: 10 J/cm <sup>2</sup> @ 1064 nm, 10 ns, 10 Hz, & 7 J/cm <sup>2</sup> @ 532 nm, 10 ns
2.12	<b>Wedge on S2 (deg)</b>	0.3 ± 0.1
2.13	<b>Chamfer Width</b>	< 0.5mm × 45 deg

Table 3 Technical Parameters of crystal 3 (LBO)

#	Parameter (description)	Required value
3.1	<b>Crystal Cut (cut for broadband non-collinear type I phase matching of 820 nm signal light with a 515 nm pump)</b>	$\Theta = 90^\circ$ , $\varphi = 16.6^\circ$
3.2	<b>Length (mm)</b>	27 ± 0.5
3.3	<b>Height × Width (mm)</b>	45 × 45
3.4	<b>Clear Aperture (CAP)</b>	>90 % of hard aperture
3.5	<b>Surface Quality S/D</b>	10/5
3.6	<b>Flatness (PV)</b>	< $\lambda/10$ @ 633 nm
3.7	<b>Transmitted Wavefront distortion (PV)</b>	< $\lambda/10$ @ 633 nm for central 60% of CAP, < $\lambda/6$ @ 633 nm for all CAP
3.8	<b>Maximum size of bubbles or defects within CAP volume (µm)</b>	0.5
3.9	<b>Coating Entrance face (S1)</b>	R < 0.3% @ 775 - 875 nm 0° incidence, R < 0.3% @ 515 nm 0° incidence
3.10	<b>Coating Exit face (S2)</b>	R < 0.3% @ 775 - 875 nm 0° incidence, R < 0.3% @ 515 nm 0° incidence, R < 0.4% @ 1250 nm - 1530 nm
3.11	<b>LIDT</b>	S1, S2: 10 J/cm <sup>2</sup> @ 1064 nm, 10 ns, 10 Hz, & 7 J/cm <sup>2</sup> @ 532 nm, 10 ns
3.12	<b>Wedge on S2 (deg)</b>	0.3 ± 0.1
3.13	<b>Chamfer Width</b>	< 0.5mm × 45 deg

**Table 4 Required parameters of crystal 4 (LBO)**

#	Parameter (description)	Required value
4.1	<b>Crystal Cut (cut for broadband non-collinear type I phase matching of 820 nm signal light with a 515 nm pump)</b>	$\Theta = 90^\circ$ , $\varphi = 16.6^\circ$
4.2	<b>Length (mm)</b>	$15 \pm 0.5$
4.3	<b>Height × Width (mm)</b>	45 × 45
4.4	<b>Clear Aperture (CAP)</b>	>90 % of hard aperture
4.5	<b>Surface Quality S/D</b>	10/5
4.6	<b>Flatness (PV)</b>	$< \lambda/10$ @ 633 nm
4.7	<b>Transmitted Wavefront distortion (PV)</b>	$< \lambda/10$ @ 633 nm for central 60% of CAP, $< \lambda/6$ @ 633 nm for all CAP
4.8	<b>Maximum size of bubbles or defects within CAP volume (<math>\mu\text{m}</math>)</b>	0.5
4.9	<b>Coating Entrance face (S1 surface)</b>	R < 0.3% @ 775 - 875 nm 0° incidence, R < 0.3% @ 515 nm 0° incidence
4.10	<b>Coating Exit face (S2 surface)</b>	R < 0.3% @ 775 - 875 nm 0° incidence, R < 0.3% @ 515 nm 0° incidence, R < 0.4% @ 1250 nm – 1530 nm
4.11	<b>LIDT</b>	S1, S2: 10 J/cm <sup>2</sup> @ 1064 nm, 10 ns, 10 Hz, & 7 J/cm <sup>2</sup> @ 532 nm, 10 ns
4.12	<b>Wedge on S2 (deg)</b>	$0.3 \pm 0.1$
4.13	<b>Chamfer Width</b>	$< 0.5\text{mm} \times 45 \text{ deg}$

REQ-033616/A

Metrology shall be performed by the Supplier and results shall be supplied to CA giving values of measured parameters from Table 1, Table 2, Table 3, and Table 4 (excluding damage threshold).

### 3. Safety Requirements

REQ-033617/A

The Supplier shall ensure that the delivered products are safe and fulfill European standards, if relevant.

## 4. Delivery requirements

REQ-033618/A

The transportation to the final destination shall be conducted by the Supplier.

*NOTE 1: The bid price will be considered by the CA as the final price, including transportation cost.*

## 5. Quality requirements

### 5.1. General quality requirements

REQ-033620/A

The Supplier shall provide information of outgoing check of the Product. At least this information shall comprise a report about execution of outgoing check and fulfillment of the technical requirements defined by the product RSD, and completeness of the product.

*NOTE: Alternatively the Supplier might provide the CA the information detailed enough to prove meeting all requirements stipulated herein (e.g.: catalogue/technical data sheets, product manuals or other similar documentation).*

REQ-033623/A

When delivering the Crystals, the Supplier shall provide verification reports outlining the results of all the tests executed on these Crystals to confirm they fulfill the specified requirements (see Chapt. 2).

*NOTE: The content of the verification reports shall be agreed with the CA.*

REQ-033621/A

The Supplier shall establish and maintain a nonconformity control system compatible with ČSN EN ISO 9001 (equivalent to EN ISO 9001).



## 6. Acceptance

Acceptance will be carried out by the CA upon delivery and final verification of the Crystals at ELI Beamlines premises. The basis for acceptance will be verification reports summarizing the overall verification results together with relevant documentation supporting the verification.

In case of successful acceptance phase, the CA will provide to the Supplier signed acceptance protocol. In case of unsuccessful acceptance stage, the CA will provide to the Supplier Nonconformity Report (NCR) and process in accordance with REQ-033621/A will be applied.

REQ-033622/A

The Acceptance phase shall demonstrate the following:

- The Crystals have been successfully verified by the Supplier and the results of this process have been documented in an appropriate way through verification reports (see REQ-033623/A)
- All detected nonconformities have been solved in accordance with REQ-033621/A;
- The crystals are free of fabrication errors and are ready for the intended operational use.

### Price Bid Table - DUHA OPCPA Crystals TP21\_064

Crystal # (see REQ-033615/A of the Technical Specification)	Type	Quantity	Crystal Unit Price (USD, excl. VAT)	Crystal(s) Price (USD, excl. VAT)
1	BBO	2	13 175,00	26 350,00
2	BBO	2	9 155,00	18 310,00
3	LBO	1	43 050,00	43 050,00
4	LBO	1	27 055,00	27 055,00
<b>Total Bid Price (USD, excl. VAT):</b>				<b>114 765,00</b>