Purchase Contract

pursuant to Section 2079 et seq. of Act No. 89/2012 Coll., the Civil Code, as amended (hereinafter the "**Civil Code**")

I. THE PARTIES:

1. Buyer:

Fyzikální ústav AV ČR, v. v. i.

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

with its principal office at Praha 8, Na Slovance 2, PSČ 182 00

represented by: RNDr. Michael Prouza, Ph.D., the Director

Registered in the Registry of public research institutions kept by the Ministry of Education, Youth and Sports of the Czech Republic

Id. No.: 68378271

Tax Id. No.: CZ68378271

(hereinafter the "**Buyer**")

and

2. Seller:

Manx Precision Optics ltd.

with its principal office at units 11 – 12A, the Freeport, Ballasalla, Isle of Man, IM9 2AP, British Isles

represented by: Dr Helmut Kessler, managing director

Id. No.: 127734C

Tax Id. No.: VAT number GB003857977

(Hereinafter the "**Seller**"; the Buyer and the Seller are hereinafter jointly referred to as the "**Parties**" and each of them individually as a "**Party**").

enter, on the present day, month and year, into this Purchase Contract (hereinafter the "**Contract**")

II. Fundamental Provisions:

2.1 The Buyer is a beneficiary of a subsidy granted by the Ministry of Education, Youth and Sports of the Czech Republic within the Operational Programme "Research, Development and Education".

2.2 The Seller has been awarded the public contract entitled "REISSUE_Coating of CIS mirrors TP20_105" (hereinafter the "**Public Contract**").

III. Subject of the Contract

3.1 Under this Contract the Seller shall:

i) **design and manufacture (including coating) two new substrates M7.5** as specified in this Contract (especially Annex No 1 Requirements Specification Document (hereinafter the "**RSD**") and

ii) **provide coating of four existing substrates (one piece each) M3, M7, OAP1 and OAP2** as specified in this Contract (especially in the **RSD**),

all under the conditions specified in this Contract.

The 2 new mirror substrates are hereinafter referred to also as the "**New Substrates**".

The 4 existing mirror substrates owned by the Buyer to be coated by the Seller are hereinafter referred to also as the "**Existing Substrates**".

Any of the New Substrates or of the Existing Substrates may also be hereinafter referred to each as the "**Substrate**" and together as the "**Substrates**".

3.2 The Buyer shall take over the newly manufactured and/ or coated Substrates with all the required documentation and pay the Purchase Price for the subject-matter of this Contract as specified in Art. V. hereof.

3.3 The Buyer shall deliver on its own cost and risk the Existing Substrates to the Seller.

3.4 The Seller shall deliver the newly manufactured and/ or coated Substrates to the Buyer under the Incoterms 2020 EXW term.

3.5 The Seller shall provide all needed assistance and advice regarding formal procedures related to receipt of the Existing Substrates

3.6 Additional terms and conditions set out in Annex No 2 hereto Additional Terms form integral part of this Contract. In case of conflict between Annex 2 hereto and any other part of this Contract, the terms of Annex 2 prevail.

IV. Risk of Loss and Ownership Title

The risk of loss or damage to the Existing Substrates to be coated shall pass to the Seller upon overtaking them from a carrier designated by the Buyer at the Seller´s site.

The Seller shall not be liable for any damage to the Existing Substrates caused by processing them at the Seller´s site except for the obligation to repolish and/ or re-coat as set out in Art. 8.2 hereof.

The Buyer shall retain the title to the Existing Substrates while processed by the Seller.

The ownership title to the New Substrates shall pass to the Buyer upon their hand over to the carrier designated by the Buyer.

V. Purchase Price and Payment Terms

5.1 The purchase price for the subject matter of this Contract (including a break down to individual items) is set forth in the following table (hereinafter the "**Purchase Price**"):

Description of the Item	Price in GBP excl. VAT
M7.5 - Manufacture and coating (2 pieces)	[redacted]
M3 fold - Coating	[redacted]
M7 leaky - Coating	[redacted]
OAP 1 - Coating	[redacted]
OAP 2 - Coating	[redacted]
Total price:	**£65 300**

5.2 All prices stipulated in this Contract are exclusive of VAT payable in the EU that will be paid by the Buyer in the Czech Republic.

5.3 The Purchase Price includes all costs related to the performance of the subject-matter of this Contract of which the Seller knew or should have known including all design and manufacturing costs, packaging (where the package has not been already provided by the Buyer), any taxes applicable in the country of origin of the Seller

and any other direct or indirect costs needed to perform this Contract duly and in time (but excluding VAT payable in the EU). The Purchase Price for the subject-matter of this Contract is the maximum permissible price. The Purchase Price is independent of the development of prices and currency exchange rates.

5.4 The Purchase Price shall be paid based on tax documents – invoices, to the account of the Seller designated in the invoice.

The Seller is entitled to invoice the Purchase Price as follows:

- 30 % of the Purchase Price upon Qualified Design of the New Substrates approval;
- 70 % of the Purchase Price upon execution of the acceptance protocol for the last Substrate by the Parties (Art. 7.2 hereof).

5.5 Invoices shall be payable within thirty (30) days from their delivery to the Buyer (hereinafter the "**Maturity Period**"). If the Seller indicates any shorter maturity period in an invoice, such other period is deemed irrelevant and the period set out herein applies. Payment of the invoiced amount is considered executed on the date of its remitting to the Seller's account. In conformity with the applicable tax regulations of the Czech Republic, the tax documents – invoices issued by the Seller hereunder shall include particularly the following details:

a) the business name/designation and registered office of the Buyer
b) the tax identification number of the Buyer
c) the business name/designation and registered office of the Seller
d) the tax identification number of the Seller
e) the registration number of the tax document
f) the scope and object of the taxable supply
g) the date of issue of the tax document
h) the date of the supply or the date of acceptance of the consideration, whichever is earlier, if it differs from the date of issue of the tax document
i) the price of the supply
j) a declaration that the invoiced performance is provided for the purposes of the "Advanced Research Using High Intensity Laser Produced Photons and Particles" project, reg. No. CZ.02.1.01/0.0/0.0/16_019/0000789 or any other project in accordance with instructions provided by the Buyer in advance

and must also be in conformity with any double taxation treaties applicable to this Contract.

5.6 Invoices shall be submitted to the Buyer only in the electronic form to the email address: efaktury@fzu.cz

VI. Production Deadline

The Seller shall perform subject-matter of this Contract so that the last Substrate is ready (including all documentation needed for verification) for acceptance at the Seller´s site within 20 weeks from receipt of the Existing Substrates from the Buyer by the Seller.

VII. Production Phasing, Acceptance and Transport of the Substrates

7.1 Qualification of Design of the New Substrates

The Seller shall submit to the Buyer basic manufacturing drawings of the New Substrates for approval before manufacture of the New Substrates.

The Buyer shall provide a statement (approval or any comments) on the manufacturing drawings and related documentation and information submitted by the Seller within 10 business days from receiving them. Potential necessity of implementation of any comments of the Buyer does not postpone the production deadline stipulated hereby if the Buyer meets the 10-business-day deadline. Should the deadline for provision of the statement not be met by the Buyer, the production deadline extend accordingly.

7.2 Production and Acceptance

The Buyer shall accept the newly manufactured and/ or coated Substrates (or any Substrate separately) at the Seller´s site if the Substrates comply with all requirements stipulated herein and the results of the verification process are documented through documentation requested under this Contract. In such a case, the Buyer shall provide the Seller with an acceptance protocol and the Seller shall without undue delay pack the Substrates for transport.

VIII. Defects of the Substrates and Warranty Claims

8.1 A Substrate shall be deemed defective if it does not conform to the requirements stipulated herein. The Seller shall be liable for (i) any defects in the Substrates at the time of their acceptance and for (ii) defects that occur in the Substrates during the entire warranty period (quality guarantee).

8.2 If any defects in the New Substrates or in the quality of coating of the Existing Substrates are detected during the verification process at the Seller´s site, the Parties shall agree on a deadline for removing the defects. If no agreement is reached, the deadline shall be 2 months from the detection of the defect (hereinafter the "**Defect Removal Term**"). In case of the Existing Substrates, the obligation of the Seller to remove defects is limited to re-coat only. In the case of the Existing Substrates, the Defect Removal Term does not include the time needed for potential remanufacture or repair of the Existing Substrates by a third contractor and starts to run on the day the remanufactured or repaired Existing Substrate (s) are delivered by the Buyer to the Seller´s site for re-coating. If the Seller removes the defects within the deadline, the respective Substrate is deemed to be manufactured in time in accordance with art. VI hereof. If the Seller fails to remove the defects within the agreed deadline, the Seller is deemed to be in breach of art. VI hereof from the day the production deadline has expired.

8.3 The Buyer is also entitled based on its discretion to accept the Substrates despite there are defects in them without removing the defects if the Parties agree on an adequate price discount.

8.4 Acceptance of the Substrates does not prevent the Buyer from making a later claim for removal of a hidden defect (that was present in a Substrate at the time of acceptance but could not have been detected during the acceptance procedure due to the nature of the verification methods). In such a case, Art. 8.6 – 8.8. hereof apply.

Warranty (Quality Guarantee)

8.5 The Seller provides the warranty of quality for each Substrate for the period of 6 months from the date of acceptance of the Substrate. The Buyer shall raise a warranty claim against the Seller without undue delay after detecting a defect, but not later than on the last day of the warranty period, by means of a written notice sent to the Seller's authorised representative for technical matters set out herein. The limitation of the obligation of the Seller regarding the Existing Substrates to remove defects only by re-coating them set out in Art. 8.2 hereof applies also on the removal of the warranty defects.

8.6 The Seller shall carry out the defect removing works to which it is obliged under this Art. 8 free of charge.

8.7 The Seller undertakes to remove any defect within a deadline agreed with the Buyer. If the Parties do not reach an agreement, the Seller shall remove the defect within two months from the receipt of the warranty claim.

8.8 The Parties shall execute a record on removal of the defect, in which they shall confirm that the defect has been removed.

8.9 The warranty shall not apply to defects caused by non-compliance with written rules of operation and maintenance of the Substrates provided by the Seller, manipulation errors or by normal wear and tear.

IX. Penalties, vis major circumstances and liability limitation

Penalties

9.1 If the Seller is in delay with finalization of production of any of the Substrates within the production deadline stipulated in Art. VI hereof, the Seller shall pay to the Buyer a contractual penalty for delay in the amount of 0,05% of the Purchase Price (without VAT) per each delayed Substrate for every (even commenced) day of delay.

9.2 The total contractual penalty for delay with finalization of manufacturing of the Substrates shall not exceed 5% of the Purchase Price (without VAT).

9.3 If the Seller is in delay with the removal of a defect in case of hidden defects (Art. 8.4) or a warranty claim (Art. 8.7), the Seller shall pay to the Buyer a contractual penalty for delay in the amount of 0,01 % of the Purchase Price (without VAT) for every (even commenced) day of delay.

9.4 The total contractual penalties for delay with removal of defects under this Contract shall not exceed 2% of the Purchase Price (without VAT).

9.5 The Seller shall pay contractual penalties within fifteen (15) days from the day, on which the Buyer enumerated its claim. The payment by the Seller of contractual penalties for delay to which the Buyer is entitled under this Art. IX hereof shall be the sole indemnification due by the Seller to the Buyer because of such delay. The Buyer has the right to terminate the present Contract for default of the Seller in application of the Art. 10.2 iii) hereof.

9.6 The Buyer is entitled to unilaterally set off claims arising from the contractual penalties against the claim of the Seller for the payment of the Purchase Price (or any part of it) after agreement by the Parties on the amount of penalties due by the Seller. The Buyer is not obliged to take into account objections of the Seller raised against the enumeration of the contractual penalties should the Seller fail to document, within 30 days from receipt of the notice of penalties, that the application of penalties is groundless or that it is not liable for the delays.

Vis major circumstances

9.7 Circumstances constituting vis major shall be deemed to have been constituted by such circumstances / obstacles which arose independently of the will of the obliged Party, and which prevent fulfilment of that Party's obligation, provided that it could not be reasonably expected that the obliged Party could overcome or avert this obstacle or its consequences, and furthermore that such Party could foresee such obstacle when it entered into the respective covenants. Vis major shall not be constituted by obstacles that arose only after the obliged Party was in default with fulfilment of its obligations, or which arose in connection with its economic situation.

In addition and for the sake of clarity, the Parties agree that any particular effects or impacts on the Seller or his performance under this Contract of the Covid-19 epidemic that meet the conditions set out above in this Art. 9.7 will be considered as vis major cases despite the fact of the existence of the epidemic outbreak on the date of the signature of this Contract.

9.8 Should a situation occur, which a Party could reasonably consider to constitute vis major, and which could affect fulfilment of its obligations hereunder, such Party shall as soon as possible notify the other Party and attempt to continue in its performance hereunder in a reasonable degree. Simultaneously, such Party shall inform the other of any and all its proposals, including alternative modes of performance, however, without consent of the other Party, it shall not proceed to effect such alternative performance.

9.9 If a situation constituting vis major occurs, the deadlines imposed hereunder shall be extended by the period of the documented duration of the said vis major. The obliged Party shall properly document to the other Party the start and the finish of the vis major period.

X. Termination of the Contract

10.1 This Contract may be terminated by withdrawal from the Contract on the grounds stipulated by law or in the Contract.

10.2 The Buyer is entitled to withdraw from the Contract without any penalty from Seller in any of the following cases:

i) material breach of the Contract is committed by the Seller and the Seller has not remedied such breach within 6 weeks (or another longer period agreed to by the Buyer if to remedy the breach in 6 weeks is impossible for reasons documented by the Seller) following the sending of a written notice by the Buyer;

ii) insolvency proceedings are initiated against the Seller's assets;

iii) the Seller is in delay with the delivery of any Substrate by more than 3 months.

10.3 The Seller is entitled to withdraw from the Contract without any penalty from Buyer in the event of material breach of the Contract by the Buyer.

10.4 Either Party is entitled to withdraw from the Contract without any penalty in case of a vis major event (Art. 9.7 hereof) that lasts more than six months.

XI. Representatives, Notices

11.1 The Seller has appointed the following authorised representative for communication with the Buyer in technical matters:

[redacted]

[redacted]

11.2 The Buyer has appointed the following authorised representative for communication with the Seller in technical matters:

[redacted]

11.3 Unless this Contract stipulates otherwise, any and all notices that are to be or may be made between the Parties under this Contract must be made in writing and delivered to the other Party by an internationally renowned courier service (Federal Express, DHL, etc.), in person (with written confirmation of acceptance) or by registered post.

XII. Choice of Law and disputes resolution

12.1 This Contract and all the legal relationships arising out of it shall be governed by the laws of the Czech Republic.

12.2 The Parties acknowledge and note that the provisions of the Czech Civil Code shall apply in matters that are not explicitly regulated by this Contract.

12.3 Any and all disputes arising out of this Contract or the legal relationships connected with the Contract shall be resolved by the Czech courts.

XIII. Final provisions

13.1 The Buyer hereby declares that it is not with respect to the subject hereof an entrepreneur and that the subject of the Contract doesn´t fall within the scope of any of its entrepreneurial activities.

13.2 The Contract represents the entire and comprehensive agreement between the Buyer and the Seller.

13.3 In the event that any of the provisions of this contract shall later be shown or determined to be invalid, ineffective or unenforceable, then such invalidity, ineffectiveness or unenforceability shall not cause invalidity, ineffectiveness or unenforceability of the Contract as a whole. In such event the Parties undertake without undue delay to replace after mutual agreement such invalid, ineffective or unenforceable provision of the Contract by a new provision, that in the extent permitted by the laws and regulations of the Czech Republic, relates as closely as possible to the intentions of the Parties to the Contract at the time of creation hereof.

13.4 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.

13.5 This Contract may be changed or supplemented solely by means of numbered supplements in writing, furnished with the details of time and place and signed by duly authorised representatives of the Parties.

13.6 The following Annexes form an integral part of the Contract:

Annex No. 1: Requirements Specification Document (RSD)

Annex No. 2: Additional Terms

13.7 The contract is executed in 4 counterparts, each Party shall receive two of them. The Parties, manifesting their consent with its entire contents, affirm the Contract with their signature.

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In Prague on _____

For: Fyzikální ústav AV ČR, v. v. i.

_____
Name: RNDr. Michael Prouza, Ph.D.
Title: Director

In _____ on _____

For: Manx Precision Optics ltd.

_____
Name: : Dr Helmut Kessler
Title: Managing Director

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Annex No. 1 Requirements Specification Document (RSD)

Confidentiality Level	*BL - Restricted for internal use*	**TC ID / Revision**	00273621/D
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PBS code	*RA1.L4.CMP1.CIS*		
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[RSD product category C]

Coating of CIS mirrors

TP20_105

Keywords

N/A

	Position	Name
Responsible person	Chief Optical Designer of Laser Technology	[redacted]
Prepared by	Chief Optical Designer of Laser Technology	[redacted]

RSS TC ID/revision	RSS - Date of Creation	RSS - Date of Last Modification	Systems Engineer
021212/A.001	01.06.2020	01.06.2020	Denisa Hanusková
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Reviewed By

Name (Reviewer)	Position	Date	Signature
[redacted]	Scientific Coordinator of Laser Technology (RP1)	17/6/2020	
	Chief Engineer, RP4	NOTICE	
	Senior Physicist L4	17/6/2020	
	Facility Manager	NOTICE	
	Safety Coordinator	NOTICE	
	SE & Planning group leader; Quality Manager	NOTICE	

Approved by

Name (Approver)	Position	Date	Signature
[redacted]	Scientific Coordinator of Laser Technology (RP1)	17/6/2020	

Revision History / Change Log

Change No.	Made by	Date	Change description, Pages, Chapters	TC rev.
1	[redacted]	18.05.2020	RSD draft creation	A
2		05.06.2020	RSD version for review	B
3		17.06.2020	Author`s final version approval	C
4		17.06.2020	Final version for procurement	D

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1. Introduction

1.1. Purpose

This Requirements Specification Document (RSD) lists the technical requirements and constraints on products applying in RA1 program of ELI project. This leads to the identification of interfaces with the ELI science-based technology. This RSD also acts as the parent document for the technical requirements that need to be addressed in lower level design description documents (see chapter 1.4).

1.2. Scope

This RSD contains functional, performance and design, cleaning, packaging and delivery, safety and quality requirements for the following products (tender number: TP20_105): **Coating of CIS mirrors** within RA1 / L4.

The scope of the delivery is production and coating of **2 new substrates M7.5** and **coating of existing substrates** (one piece of each) **M3, M7, OAP1, OAP2.**

In addition to the requirements specified in this RSD, the CIS mirrors substrates shall comply completely with the requirements given in the Reference documents (see **RD-01**; chapter 1.4).

The products are integral parts of the L4 laser system and will be used in the L4b and L4c Laser halls at the ELI Beamlines facility. These products are registered in the PBS software under the following PBS code: *RA1.L4.CMP1.CIS*.

1.3. Terms, Definitions and Abbreviations

For the purpose of this document, the following abbreviations apply:

Abbreviation	Meaning
CA	Contracting Authority (Institute of Physics AV CR, v. v. i.)
CIS	Compressor Imaging System
ELI	Extreme Light Infrastructure
LIDT	Laser Induced Damage Threshold
I	Inspection (as a verification method)
NCR	Nonconformity Report
OAP	Off Axis Parabola
QR	Quality report
R	Review (as a verification method)
RA1	Research activity 1
RD	Reference Documents
RMS	Root Mean Square
RSD	Requirements Specification Document
T	Test (as a verification method)
VCD	Verification Control Document

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1.4. Reference documents

Number of document	Title of Document/ File
RD-01	*00198698-A_3.4_ES_DW_Drawings_for_CIS_mirrors_coated_TP20_105.rar*
RD-02	*Uncoated Substrate drawings*

Detailed list of drawings included within **RD-01 archive**:

Drawing Name	File Name	Sheets	File format
M3 fold mirror	M3c_B_rev01	1	PDF
M7 leaky mirror	M7-3c_B_rev01	1	PDF
M7.5 fold mirror	M7p5-c_rev00	1	PDF
OAP1	OAP1-2c_rev02	2	PDF
OAP2	OAP2-1c_rev02	2	PDF

Detailed list of drawings included within **RD-02 archive**:

Drawing Name	File Name	Sheets	File format
M3 fold mirror	M3_2	1	PDF
M7 leaky mirror	M7_4	1	PDF
OAP1	OAP1_2	2	PDF
OAP2	OAP2_2	2	PDF

1.5. 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. Functional, Performance and Design requirements

Functional, performance and design requirements for the **CIS mirrors substrates** are summarized within reference drawing **RD-01** (see chapter 1.4).

2.1. General requirements – coating of substrates provided by CA

REQ-030069/A

The parameters of the **OAP1** coated mirror shall correspond to the requirements given in the reference drawing **RD-01** (OAP1-2c_rev02; see chapter 1.4).
Verification method: R - review, T - test (QRs – I, II, III; see REQ-030078/A)

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REQ-030070/A

The parameters of the **OAP2** coated mirror shall correspond to the requirements given in the reference drawing **RD-01** (OAP2-1c_rev02; see chapter 1.4).
Verification method: R - review, T - test (QRs – I, II, III; see REQ-030078/A)

REQ-030071/A

The parameters of the **M7 leaky** coated mirror shall correspond to the requirements given in the reference drawing **RD-01** (M7-3c_B_rev01; see chapter 1.4).
Verification method: R - review, T - test (QRs - I, II, III; see REQ-030078/A)

REQ-030072/A

The parameters of the **M3 fold** coated mirror shall correspond to the requirements given in the reference drawing **RD-01** (M3c_B_rev01; see chapter 1.4).
Verification method: R - review, T - test (QRs - I, II, III; see REQ-030078/A)

2.2. General requirements – polishing and coating of additional substrates

REQ-030073/A

The parameters of the **M7.5** coated mirrors shall correspond to the requirements given in the reference drawing **RD-01** (M7.5-c_rev00; see chapter 1.4).
Verification method: R - review, T - test (QRs - I, II, III, IV, V; see REQ-030078/A)

3. Environmental requirements

REQ-030074/A

The Supplier and the CA shall agree on the cleaning methods to clean coated mirrors without decreasing the coating properties and to avoid contamination of clean space.
NOTE: The cleaning methods may use high gas flow (dry air, CO2) and specialized chemical cleaning liquids (i.e. detergent, isopropyl alcohol, deionized water).
Verification method: R – review

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4. Cleaning, Packaging and Delivery requirements

4.1. General requirements

The transportation to the final destination of the coated CIS mirrors from the Supplier´s site will be conducted by the CA.

REQ-030076/A

All the coated mirrors shall be cleaned and packaged in a clean environment of class 6 according to ČSN EN ISO 14644 (or equivalent, e.g. EN ISO 14644) or cleaner.
NOTE: Regarding the referred to standard/s or technical documents the CA allows/permits also another equal solution to be offered.
Verification method: R - review, I - inspection

REQ-030077/A

Each coated mirror shall be placed in a PET-G container delivered by the CA together with the existing CIS mirrors substrates or newly procured for the additional substrates. The Supplier shall clean the containers to assure compatibility with class 6 clean room. The PET-G containers shall be placed in appropriate packaging with sufficient padding suitable for transport. The innermost wrapping has to be compatible with class 6 clean room handling.
Verification method: R - review, I - inspection

5. Quality control

5.1. Quality Reports (QRs)

REQ-030078/A

The Supplier shall perform following tests of product quality and provide corresponding **specific quality reports (I - IV)** if listed in chapter 2.1:

I. S-D/cosmetic quality report showing the main defects;
II. Reflectivity curve at s and p polarization;
III. LIDT report unless data are provided for an equivalent coating type. LIDT testing of fused silica 2" witness samples can be agreed with CA;
IV. Reflected wavefront error over at least 12" aperture and transmitted wavefront error if allowed by the coating
V. Substrate material report stating at least the supplier, bubble and homogeneity class, batch number;

Verification method: R - review, I – inspection

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5.2. Witness samples

REQ-030079/A

The Supplier shall provide at least one 2" witness sample for each coating run. The material shall be UV grade fused silica.
Verification method: I - inspection

5.3. Documentation and data control

REQ-030080/A

For each coated substrates, the Supplier shall provide a Declaration of Conformity (or the equivalent document) with technical requirements defined by the product RSD and ensure completeness of the products.
Verification method: I - inspection

REQ-030081/A

The Supplier shall use the following data formats:

- *.dat (Zygo binary file format for interferograms)
- *.JPG, *.PDF/A, *.HTML
- CAD 2D: *.dwg
- CAD 3D: *.stp; *.ste; *.step or other 3D CAD formats agreed with the CA
- text processors *.doc, *.docx, OpenDocument Format
- spreadsheet processors *.xls, *.xlsx, OpenDocument Format
- presentations *.ppt, *.pptx; OpenDocument Format

REQ-030082/A

The Supplier shall provide the following type of documents:

- 3D model (if available);
- 2D manufacturing drawings;
- Printable format for text documents.

5.4. Nonconformity Control System

REQ-030083/A

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

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6. Verification requirements for the Supplier

The verification process will be performed by the Supplier to demonstrate that the CIS mirrors substrates meet the specified requirements of the CA.

6.1. Verification methods

REQ-030084/A

The verification shall be accomplished by the Supplier through one or more of the following verification methods:

1. **Review**; Verification via Review **(R)** shall consist of using approved records (examples of such approved records are design documents and reports, technical descriptions, and engineering drawings, manuals and accompanying operation documentation) or evidence that unambiguously shows that the requirement is met.
2. **Inspection**; Verification via Inspection **(I)** shall consist of a visual determination of physical characteristics including photographs taken by the Supplier and sent to the CA proving that the specific requirements have been met.
3. **Test**; Verification via Test **(T)** shall consist of measuring product performance and functions under realistic operating conditions.

6.2. Phasing of the delivery

This chapter is intended to briefly summarize basic milestones of the Contract delivery. These milestones represent gates (checkpoints) where the quality of the delivery is to be evaluated.
Delivery shall not proceed past these gates unless their satisfactory accomplishment is approved by the CA.

Delivery lifecycle shall contain at least the following phases (***quality gates***):

- **Qualification of substrates by the Supplier**
- **Manufacturing**
- **Acceptance**

6.2.1. Qualification of substrates by the Supplier

The CA will supply uncoated substrates manufactured according to the drawings **RD-02**. The CA will also supply the following quality reports with each substrate IF REQUESTED:

- Interferometric report at normal incidence
- S-D report

The supplier can use these data for the qualification of the substrates.

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6.2.2. Manufacturing

The goal is to demonstrate that the manufactured products meet the specified technical requirements (RSD) of the CA.
This quality gate concerns primarily:

- **Testing at the Supplier's site** (factory testing);
- **Cleaning and Packaging**

The output of this phase is the **Verified Final Product**.

REQ-030085/A

The results of the Manufacturing phase of verification shall be recorded by the Supplier in corresponding QRs (see REQ-030078/A) and provided to the CA for approval.
Verification method: R - review

REQ-030086/A

The final issue of the VCD shall be submitted to the CA after the approval of the last report, within the time frame agreed with the CA in the VCD (see chapter 6.1.2).
Verification method: R - review

6.2.3. Acceptance

The Acceptance phase shall demonstrate the following:

- Final products have been successfully verified and this process has been documented in an appropriate way through QRs (see REQ-030078/A);
- All detected nonconformities have been solved in accordance with REQ-030083/A;
- Final products are free of fabrication errors.

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-030083/A shall be applied.

REQ-030087/A

Verification process shall be carried out by the Supplier and it is successfully completed when the final products comply with all specifications and the results of this process are documented in an appropriate way through QRs (see REQ-030078/A).
NOTE: Acceptance will be carried out by the CA (or if required, representatives/contractors appointed by the CA)at the Supplier´s site either in person or based on the provided verification documentation.

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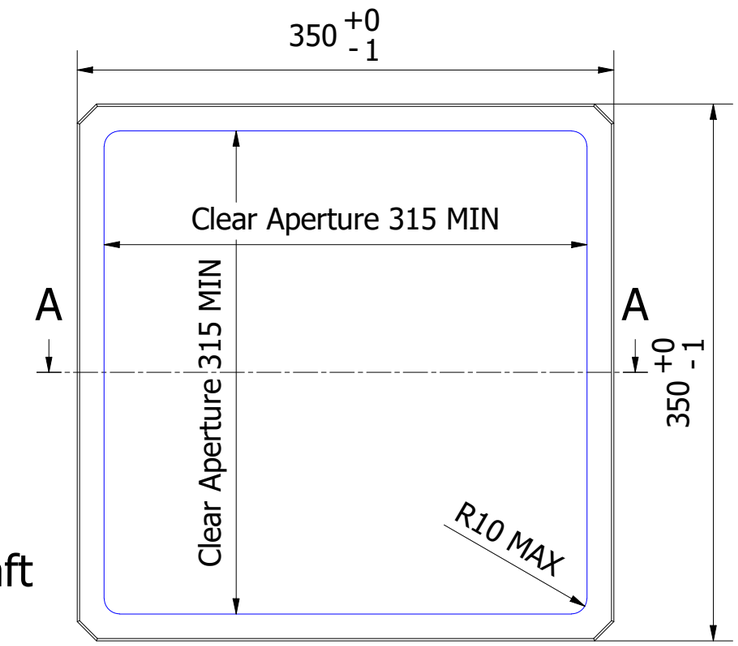
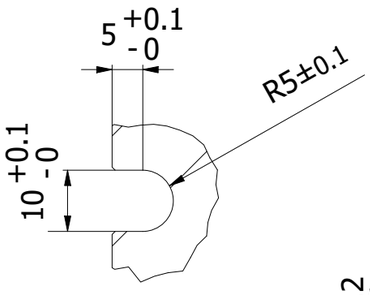
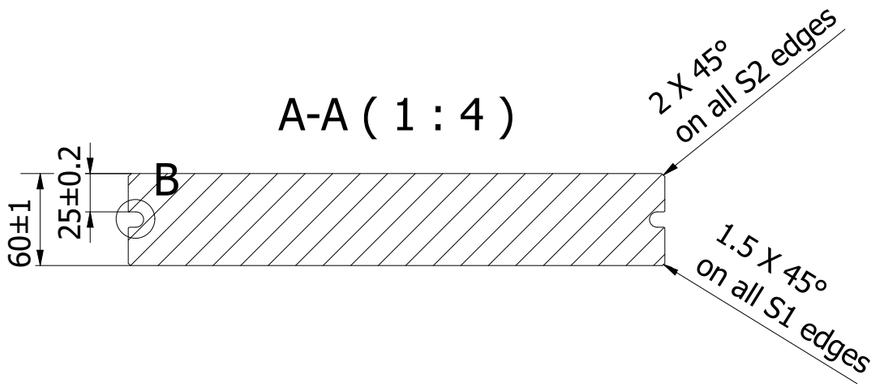


- No crazing anywhere on the optic within 1 year form delivery
- Will be used in high vacuum , dry air(dew point -70degC) or room air 20degC RH<55%

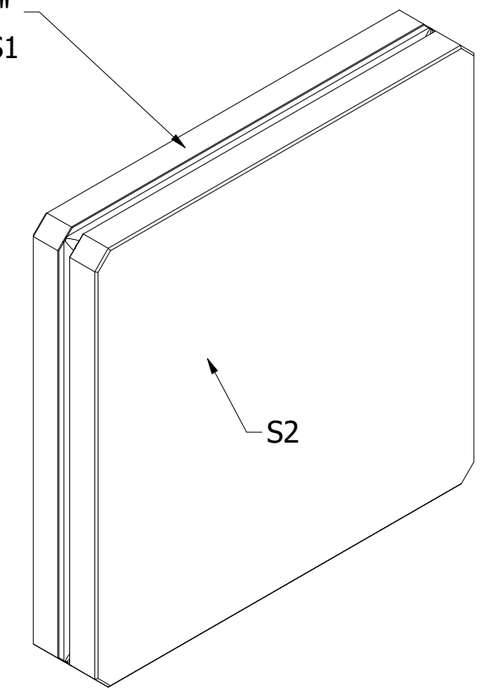
B (1 : 1) mounting shaft



A-A (1 : 4)



serial number and text "M3" and arrow to S1



S1 Clear Aperture	Substrate	S2
RoC: flat		
S-D: 30-10 per MIL-PRF-13830B or equivalent per ISO 10110 after coating	HPFS 7980 mirror grade	commercial polish
Coating: R≥99.7% for 1040-1080nm @ 15°±1° angle of incidence for s and p polarization		Coating: uncoated
Coating: LIDT≥10J/cm2 @3nsFWHM @1064nm 1000-on-1		
GDD<150fs2 for 1040-1080nm @ 15°±1° angle of incidence for s and p polarization		
RMS surface flatness ≤ 25nm after coating (power removed)		
RMS surface flatness ≤ 32nm after coating		
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

Drawn b [redacted]	Projection	Scale	Sheet size A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight: 15.857 kg		Note:	

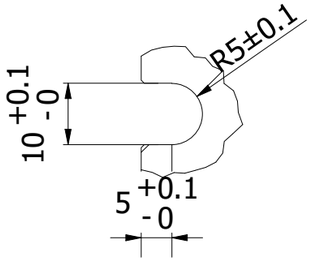
Dwg. title: M3 fold mirror

Dwg. no./TC ID: M3c_B

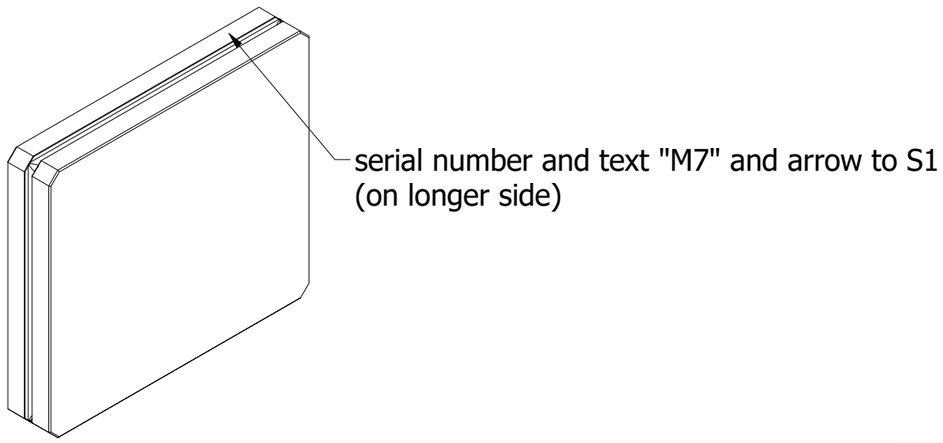
Rev.: 01

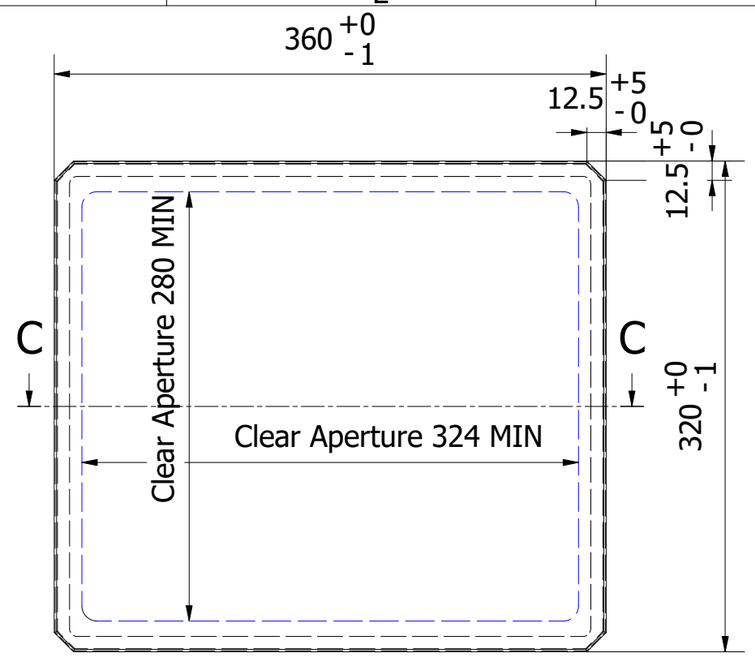
Eli no.: RA1.L4.CMP1.CIS.FM.5

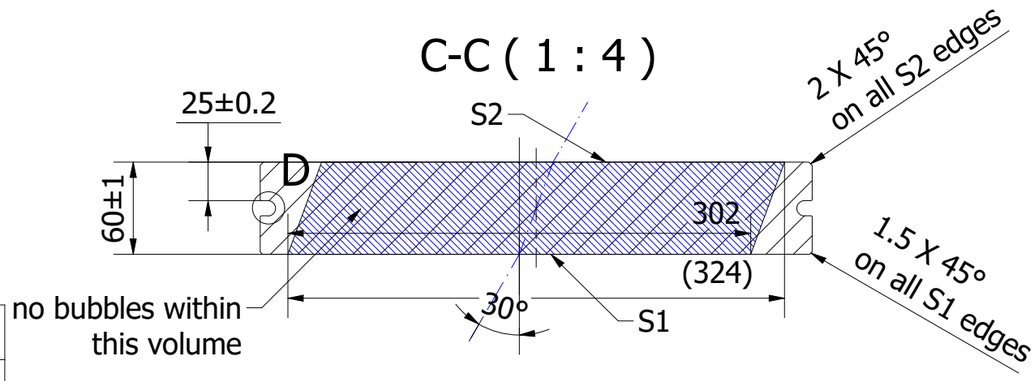
Sheets 1 of 1



- Coated area can span to the edges.
- Shafts can be used for mounting inside the coating chamber.
- NO coating inside the shafts.







S1 Clear Aperture	Substrate	S2 Clear Aperture
S-D: 30-10 per MIL-PRF-13830B or equivalent per ISO 10110 after coating	Corning HPFS 7980 0A grade (over >12'' diam.)	S-D: 40-20 per MIL-PRF-13830B or equivalent per ISO 10110
Coating: R≥99.7%, T>0.05% for 1040-1080nm @ 30°±1° angle of incidence for s and p polarization	RMS transmitted wavefront error ≤32nm PWR removed after coating	Coating: R≤0.4% for 1040-1080nm @ 30°±1° angle of incidence for s and p polarization
Coating: LIDT≥10J/cm2 @3nsFWHM @1064nm 1000-on-1	RoC: flat	Coating: LIDT≥0.3J/cm2 @3nsFWHM @1064nm 1000-on-1
GDD<150fs2 for 1040-1080nm @ 30°±1° angle of incidence for s and p polarization		
RMS surface flatness ≤ 25nm after coating (power removed)		
RMS surface flatness ≤ 32nm after coating		
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

Drawn by: [redacted]	Projection	Scale 1:4	Sheet size A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight: 14.902 kg		Note:	

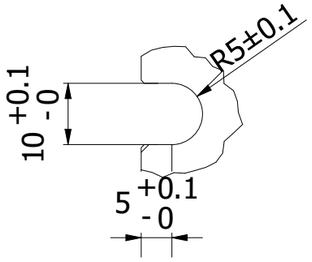
Dwg. title: M7 leaky mirror

Dwg. no./TC ID: M7-3c_B

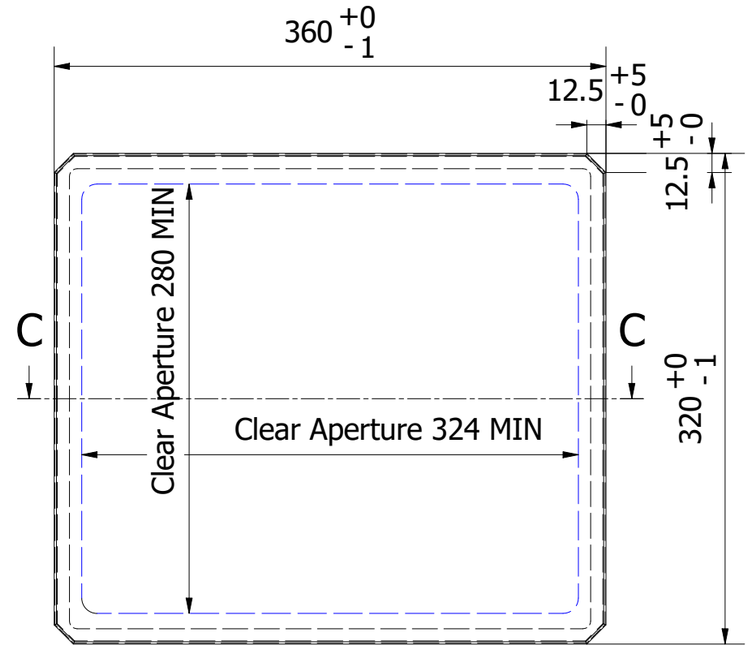
Rev.: 01

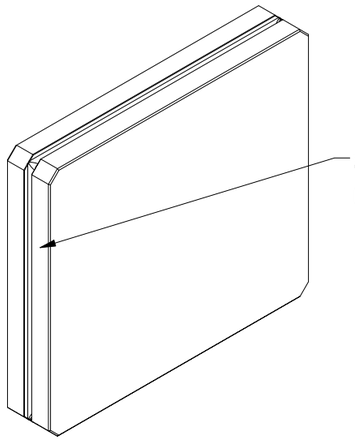
Eli no.: RA1.L4.CMP1.CIS.FM.9

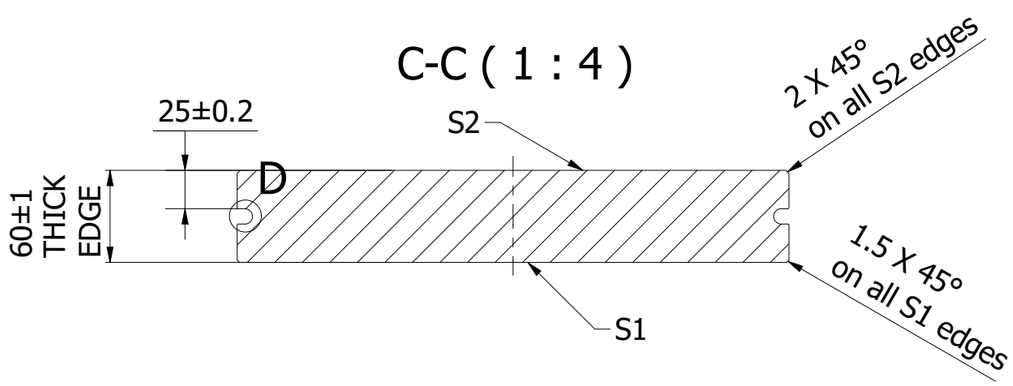
Sheets 1 of 1



- No crazing anywhere on the optic within 1 year from delivery
- Will be used in high vacuum and cycled to dry air(dew point -70degC) or room air 20degC RH<55%







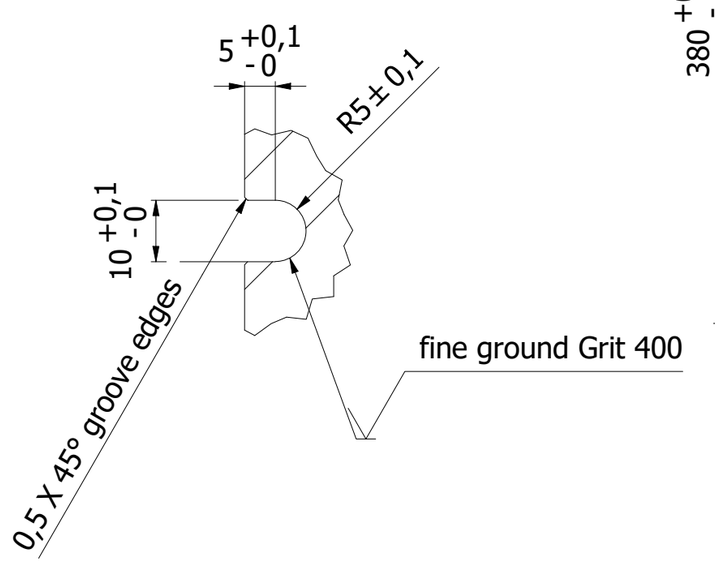
S1 Clear Aperture	Substrate	S2 Clear Aperture
S-D: 20-10 per MIL-PRF-13830B or equivalent per ISO 10110	Corning HPFS 7980 1D grade or equivalent	S-D: 40-20 per MIL-PRF-13830B or equivalent per ISO 10110
Coating: uncoated	TWE: RMS< 80nm	Coating: R≤0.4% for 1040-1080nm @ 29°±3° angle of incidence for s and p polarization
RMS surface flatness ≤ 25nm after coating (power removed)	RoC: flat	Coating: LIDT≥0.3J/cm2 @3nsFWHM @1064nm 1000-on-1
RMS surface flatness ≤ 32nm after coating	wedge 4±1 arcmin	environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room

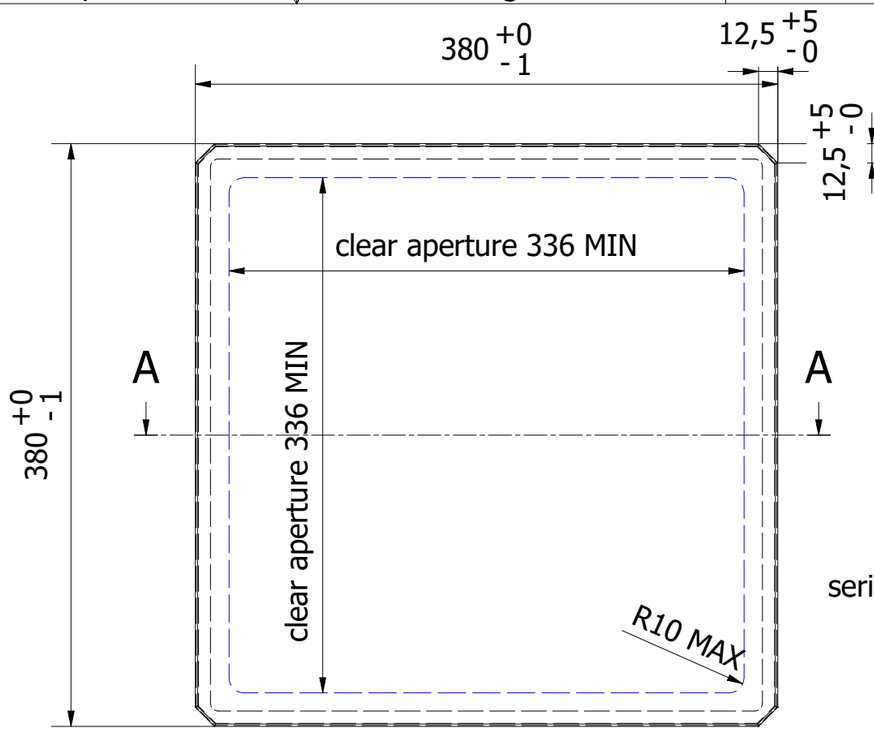
eli beamlines

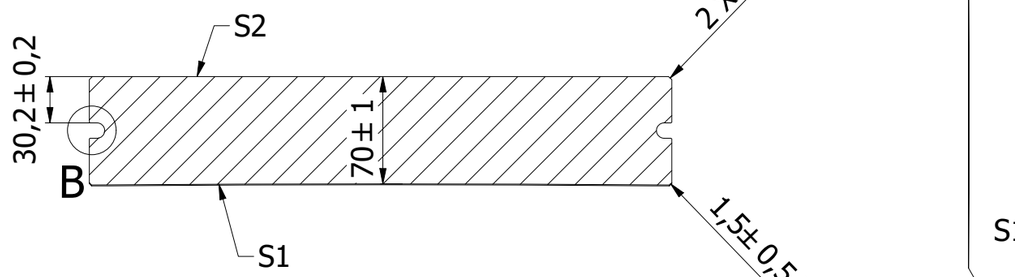
Fyzikální ústav
Akademie věd ČR, v. v. i.

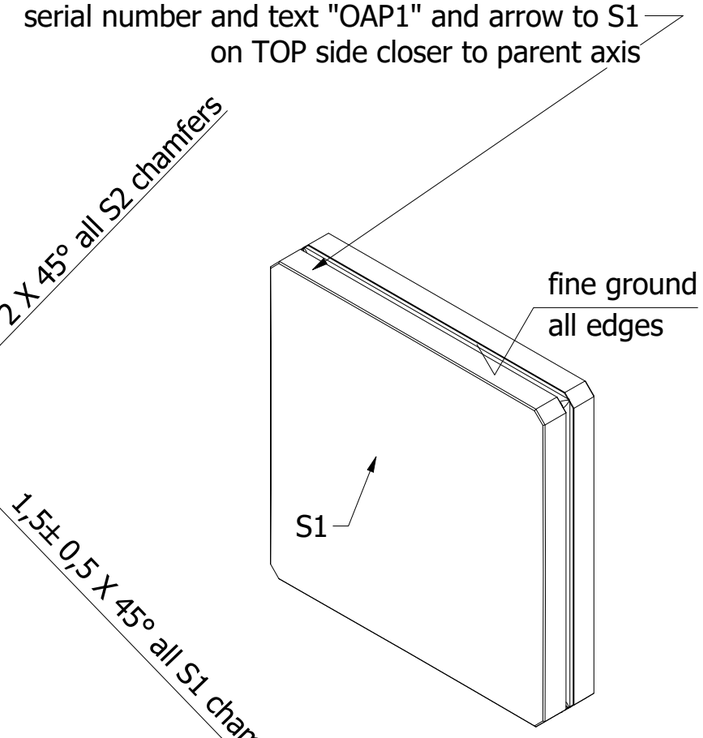
Drawn by: DK	Projection	Scale 1:4	Sheet size A3	Dwg. title: M7.5 mirror
Chkd by:				
Date:				
Material: Fused Silica		All dimensions in mm		Dwg. no./TC ID: M7p5-c
Raw mat.:		Tolerance: ISO10110		Rev.: 00
Weight: 14.902 kg		Note:		Eli no.: 00273914
				Sheets 1 of 1

- No crazing anywhere on the optic within 1 year form delivery
- Will be used in high vacuum , dry air(dew point -70degC) or room air 20degC RH<55%









S1 Clear Aperture	Substrate	S2 Clear Aperture
RoC and conical const - see sheet 2		
S-D 30-10 per MIL-PRF-13830B or equivalent per ISO 10110 after coating	Corning HPFS 7980 mirror grade	commercial polish
Coating: R≥99.7% for 1040-1080nm @ 15°±1.5° angle of incidence for s and p polarization		
Coating: LIDT≥10J/cm2 @3nsFWHM @1064nm 1000-on-1		Coating: uncoated
Coating: |GDD|<150fs2 for 1040-1080nm @ 15°±1.5° angle of incidence for s and p polarization		
RMS surface figure ≤ 25nm after coating		
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

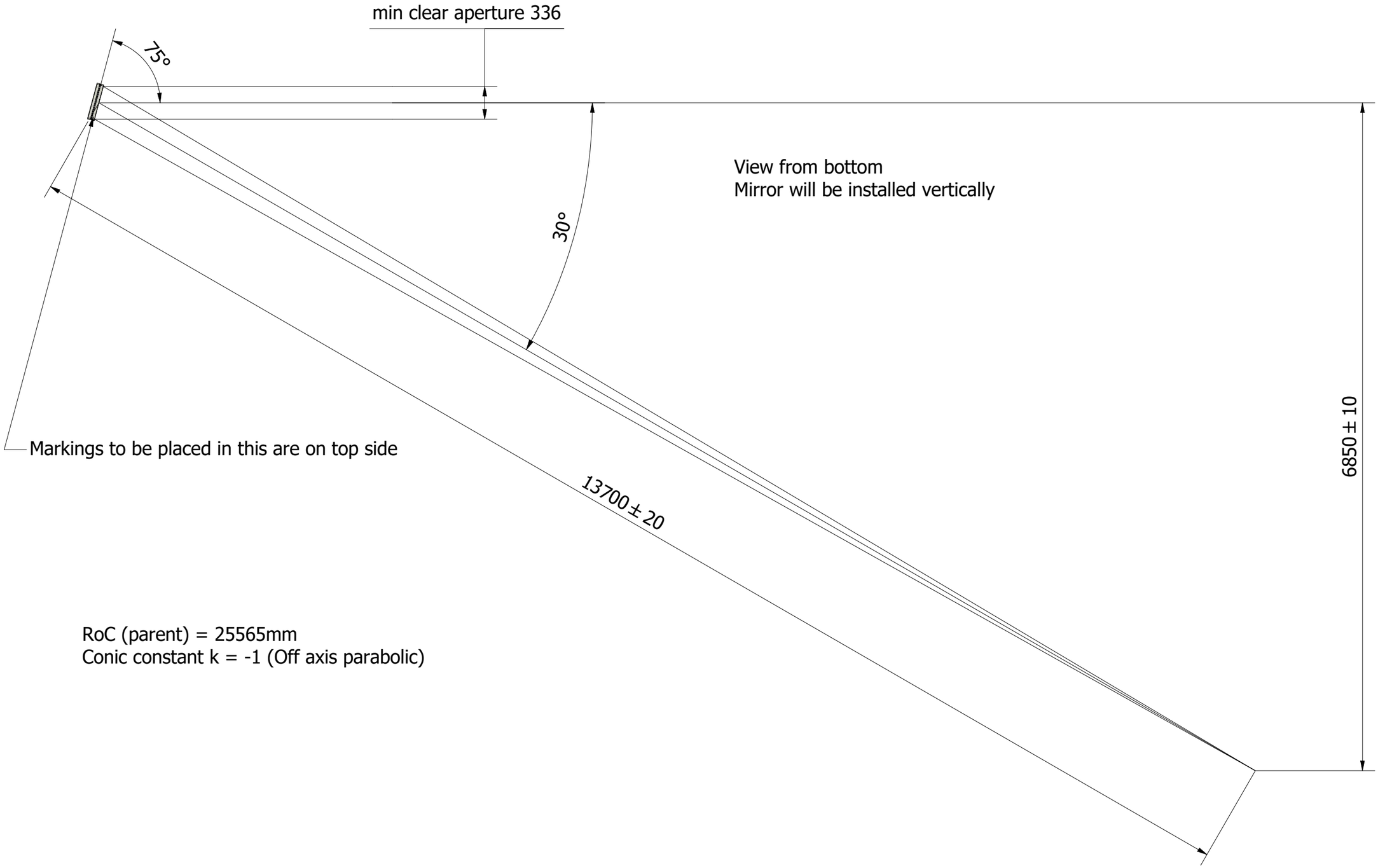
Drawn by: [redacted]	Projection	Scale 0	Sheet size A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight:		Note: `	

Dwg. title: OAP1

Dwg. no./TC ID: OAP1-2c

Rev.: 02

Eli no.:



RoC (parent) = 25565mm
Conic constant k = -1 (Off axis parabolic)

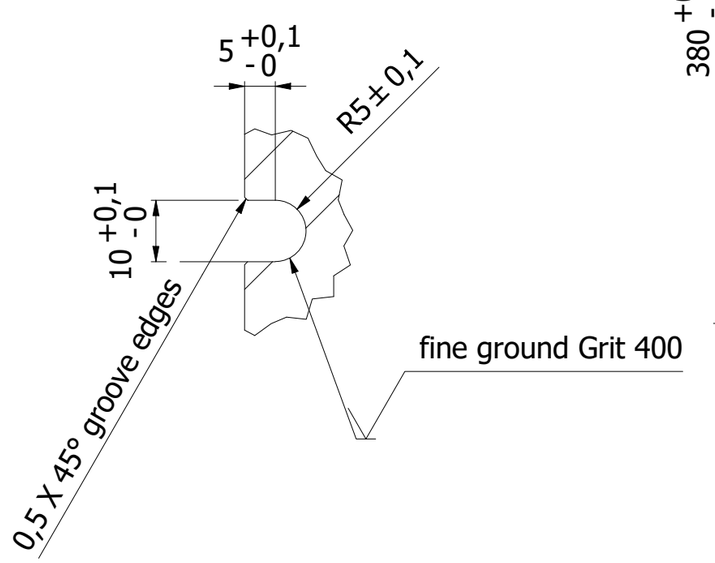
Drawn by: [redacted]	Projection	Scale	Sheet size A3	Dwg. title: 0AP1
Chkd by:				
Date:				
Material: Fused Silica		All dimensions in mm		Dwg. no./TC ID: 0AP1-2c_B; Rev.: 1
Raw mat.:		Tolerance: ISO10110		
Weight:		Note:		Eli no.: Sheets 2 of 2

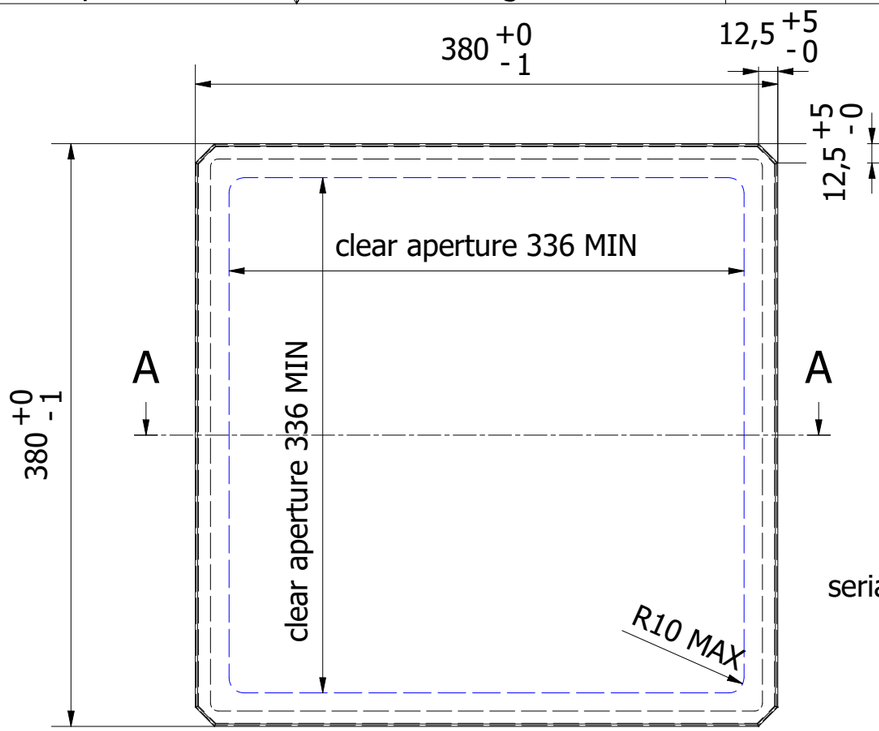
eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

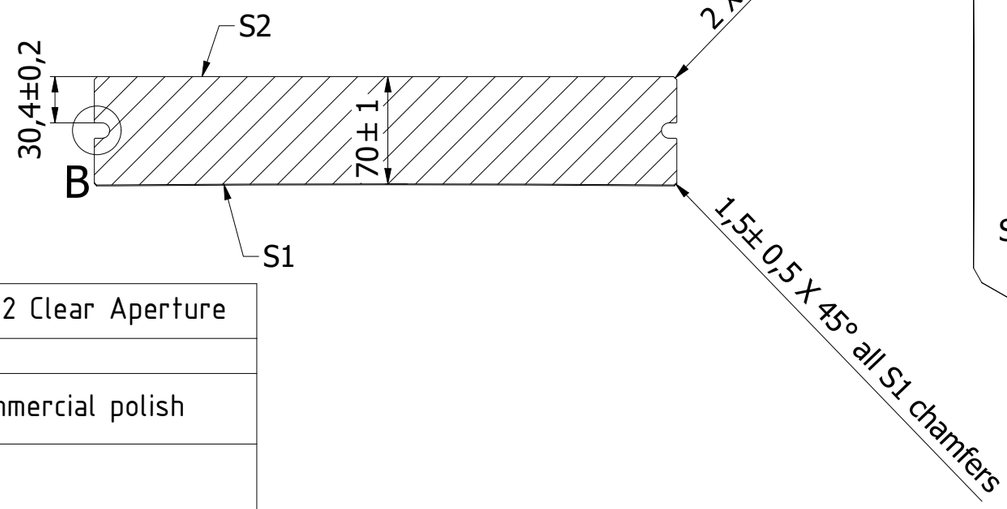
- No crazing anywhere on the optic within 1 year form delivery
- Will be used in high vacuum and cycled to dry air (dew point -70degC) or room air 20degC RH<55%

B (1 : 1)

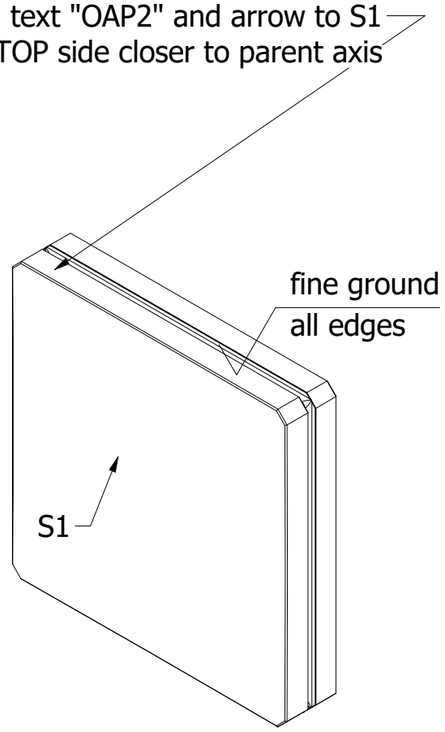




A-A (1 : 4)



serial number and text "OAP2" and arrow to S1 on TOP side closer to parent axis



S1 Clear Aperture	Substrate	S2 Clear Aperture
RoC and conical const - see sheet 2		
S-D 30-10 per MIL-PRF-13830B or equivalent per ISO 10110 after coating	Corning HPFS 7980 mirror grade	commercial polish
Coating: R≥99.7% for 1040-1080nm @ 15°±1.5° angle of incidence for s and p polarization		
Coating: LIDT≥10J/cm2 @3nsFWHM @1064nm 1000-on-1		Coating: uncoated
Coating: |GDD|<150fs2 for 1040-1080nm @ 15°±1.5° angle of incidence for s and p polarization		
RMS surface figure ≤ 25nm after coating		
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

Drawn by: [redacted]	Projection	Scale 0	Sheet size A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight:		Note: `	

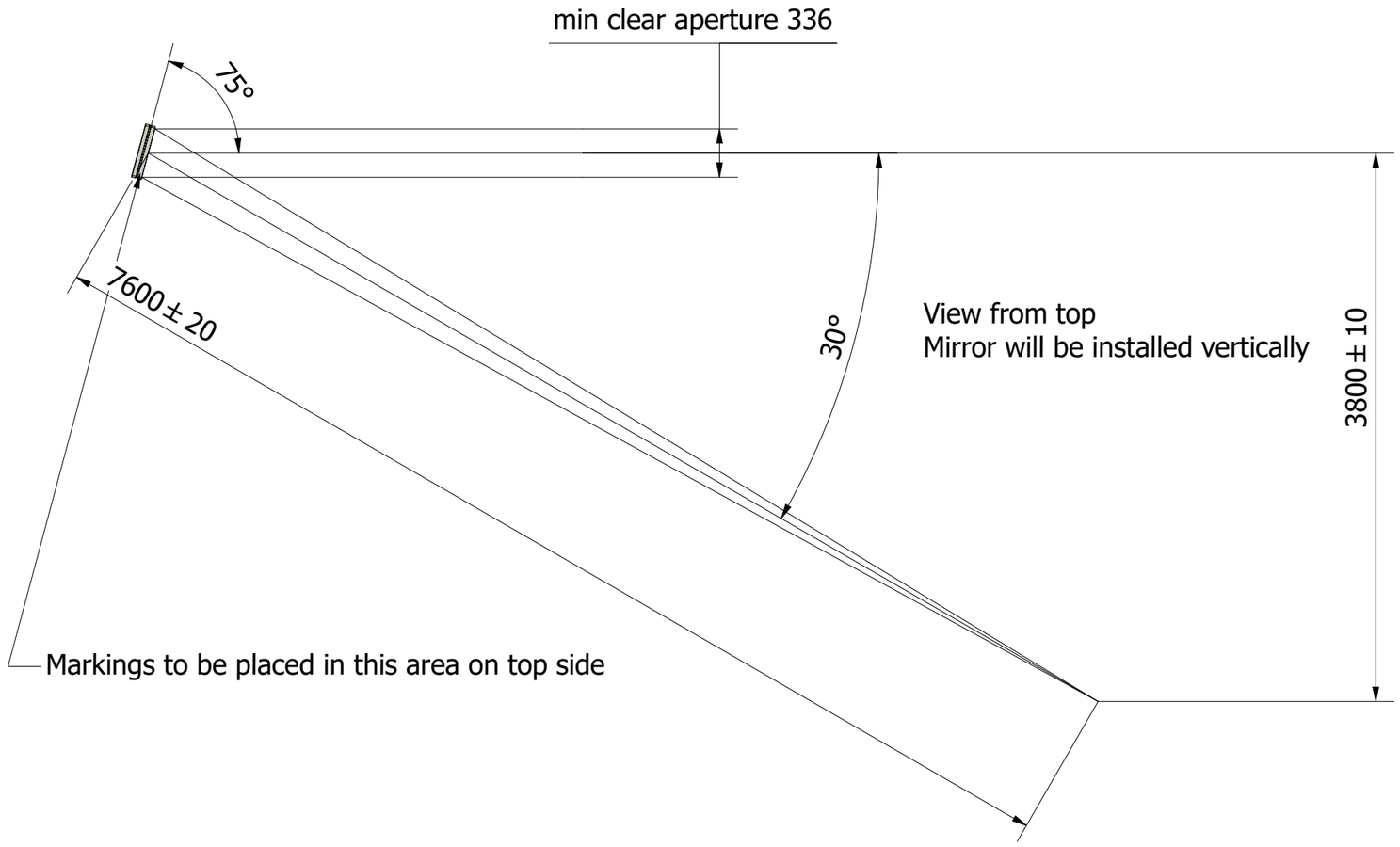
Dwg. title: OAP2

Dwg. no./TC ID: OAP2-1c

Rev.: 02

Eli no.:

Sheets 1 of 2

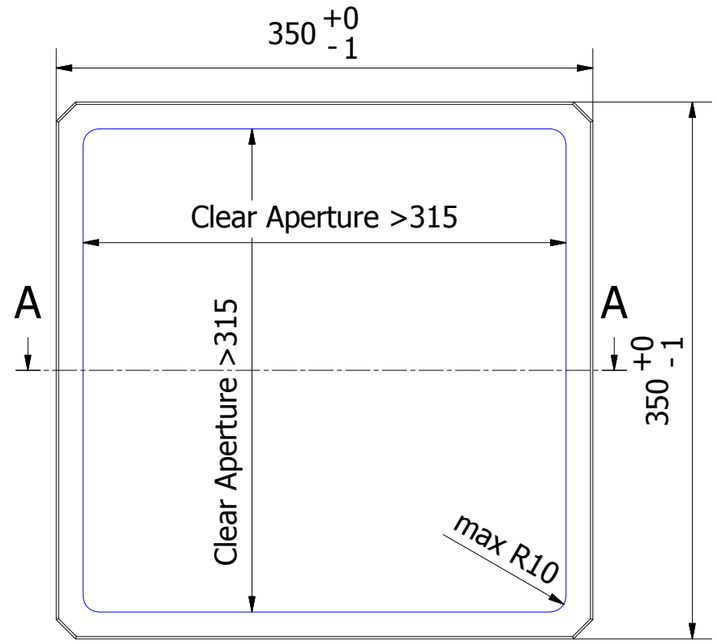


RoC (parent) = 14182mm
Conic constant k = -1 (Off axis parabolic)

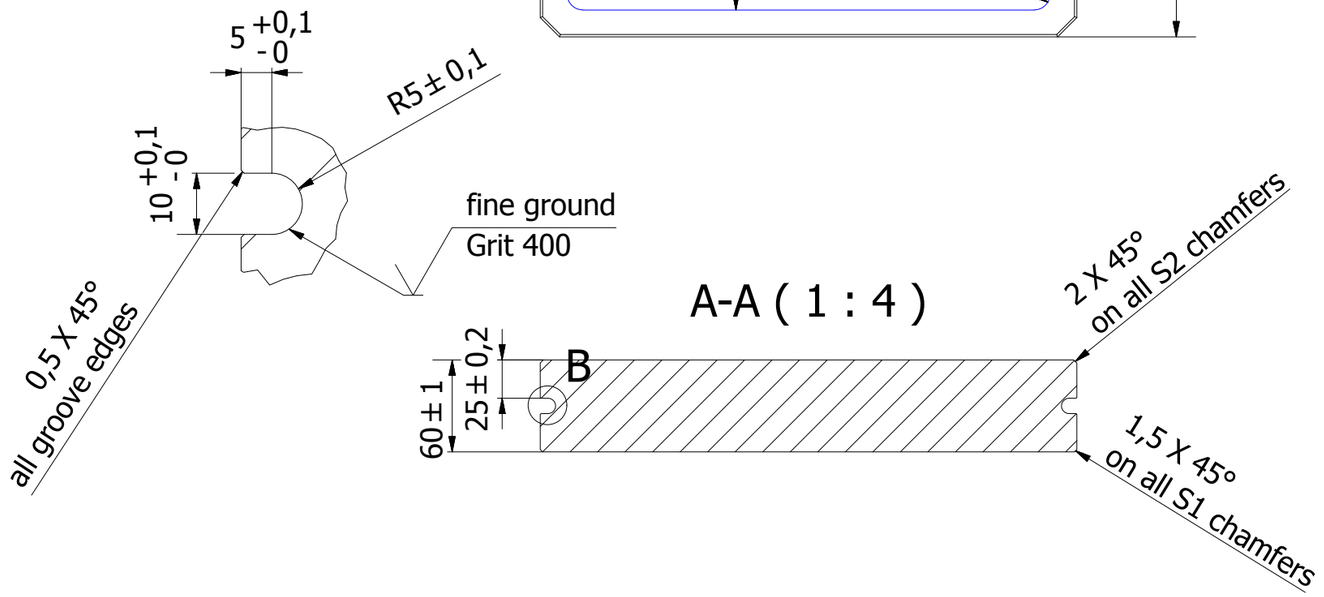
Drawn by: [redacted]	Projection	Scale	Sheet size A3	Dwg. title OAP2
Chkd by:				
Date:				
Material: Fused Silica		All dimensions in mm		Dwg. no./TC ID OAP2-1c_B / Rev. 1
Raw mat.:		Tolerance: ISO10110		
Weight:		Note:		Eli no.: / Sheets 2 of 2

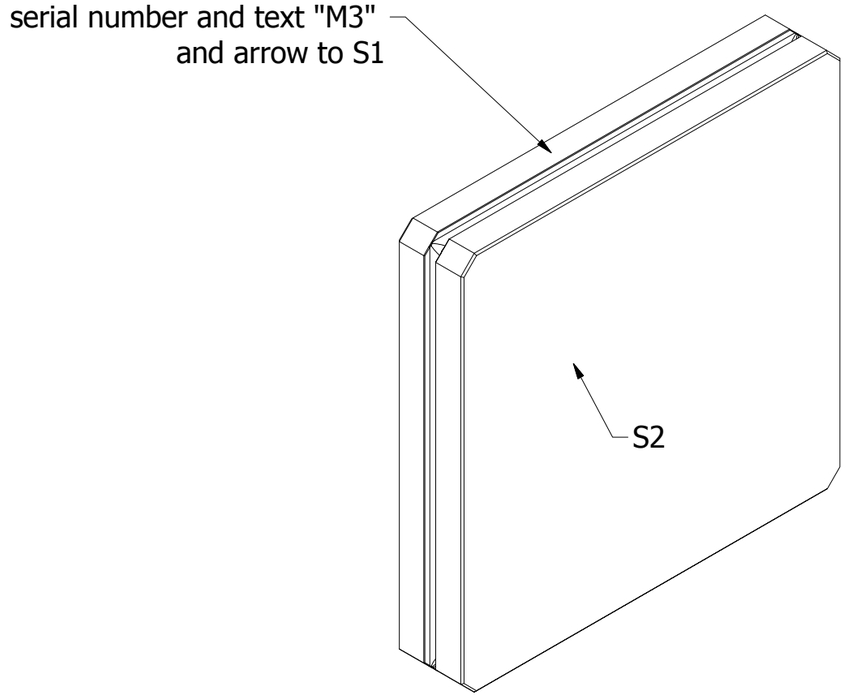
eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.



B (1 : 1)





S1 Clear Aperture	Substrate	S2 Clear Aperture
RoC: flat		
S-D: 20-10 per MIL-PRF-13830B or equivalent per ISO 10110	equivalent to Corning HPFS 7980 mirror grade	commercial polish
Rq<1nm for spatial periods <1mm	wedge on S2 between 3 to 5 arcmin	
Coating: uncoated		Coating: uncoated
RMS surface figure ≤λ/35 @633nm		
RMS wavefront gradient ≤1urad for 1-10mm spatial periods	all edges and chamfers fine gound GRIT 200-400	
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

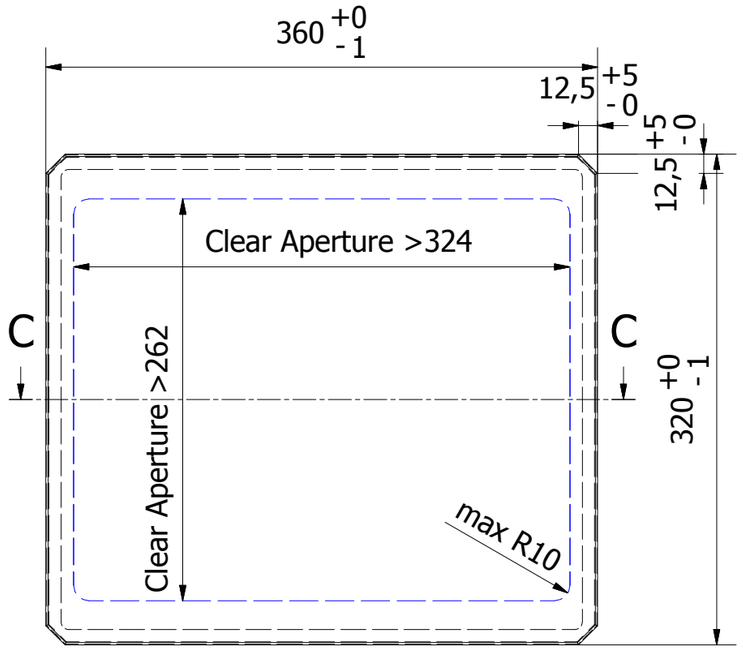
Fyzikální ústav
Akademie věd ČR, v. v. i.

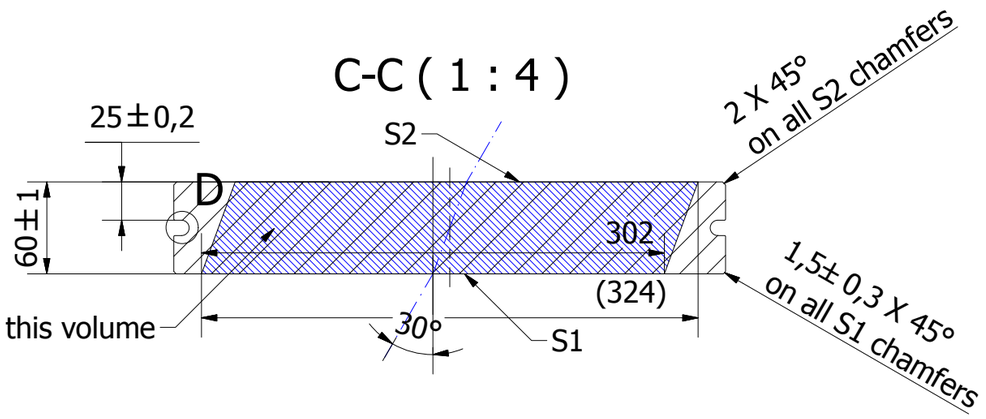
Drawn by: [redacted]	Projection	Scale	Sheet size: A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight: 15.857 kg		Note:	

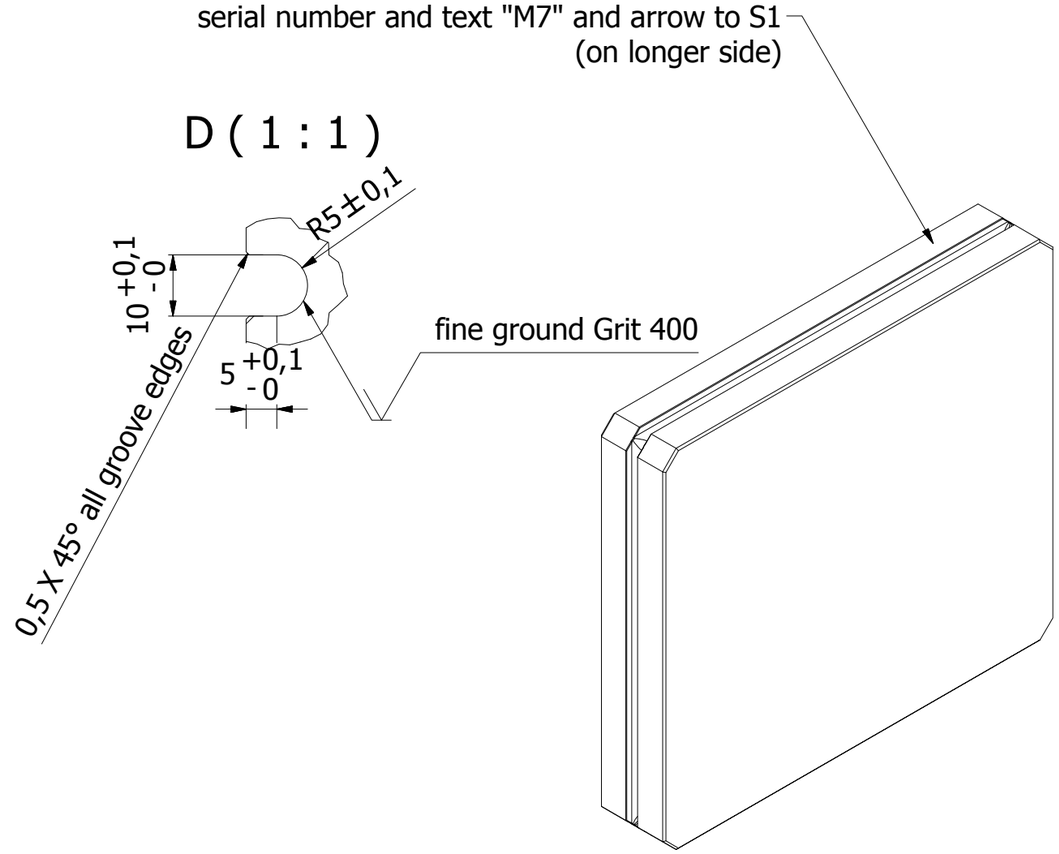
Dwg. title: M3 fold mirror

Dwg. no./TC ID: M3_2 — Rev.: 00

Eli no.: RA1.L4.CMP1.CIS.FM.5 — Sheets 1 of 1







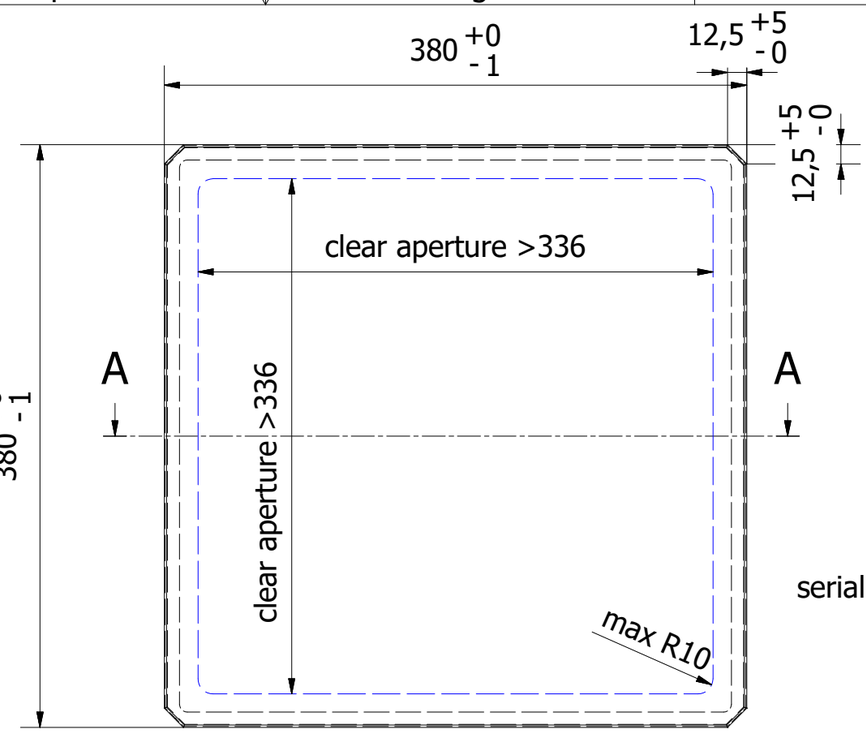
S1 Clear Aperture	Substrate	S2 Clear Aperture
RoC: flat		
S-D: 20-10 per MIL-PRF-13830B or equivalent per ISO 10110	equivalent to Corning HPFS 7980 0A grade	S-D: 40-20 per MIL-PRF-13830B or equivalent per ISO 10110
Rq<1nm for spatial periods <1mm	wedge on S2 between 3 to 5 arcmin	Rq<1.5nm for spatial periods <1mm
Coating: uncoated	wedge axis // to longer side	Coating: uncoated
RMS surface flatness ≤λ/35 @633nm		
RMS wavefront gradient ≤1urad for 1-10mm spatial periods	RMS transmitted wavefront error ≤λ/30 @633nm	RMS wavefront gradient ≤5urad for 1-10mm spatial periods
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room	all edges and chamfers fine gound GRIT 200-400	

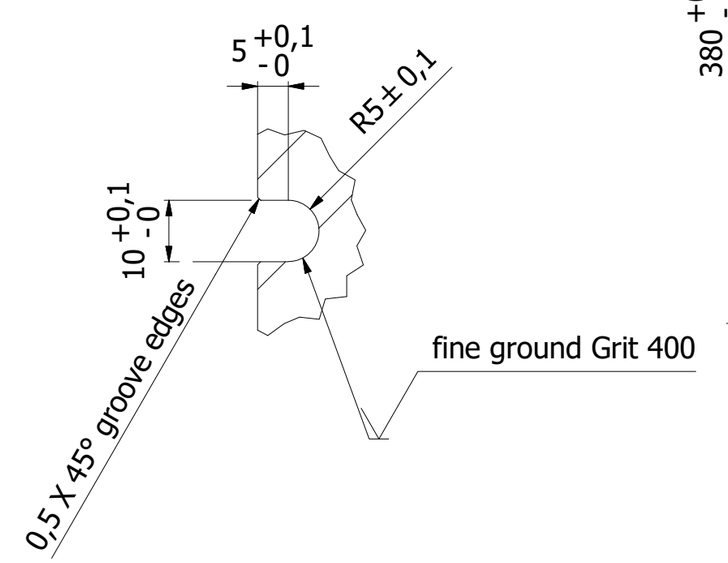
Drawn by: [redacted]
Chkd by:
Date:
Projection
Scale
Sheet size: A3
Material: Fused Silica
Raw mat.:
Weight: 14.902 kg
All dimensions in mm
Tolerance: ISO10110
Note:

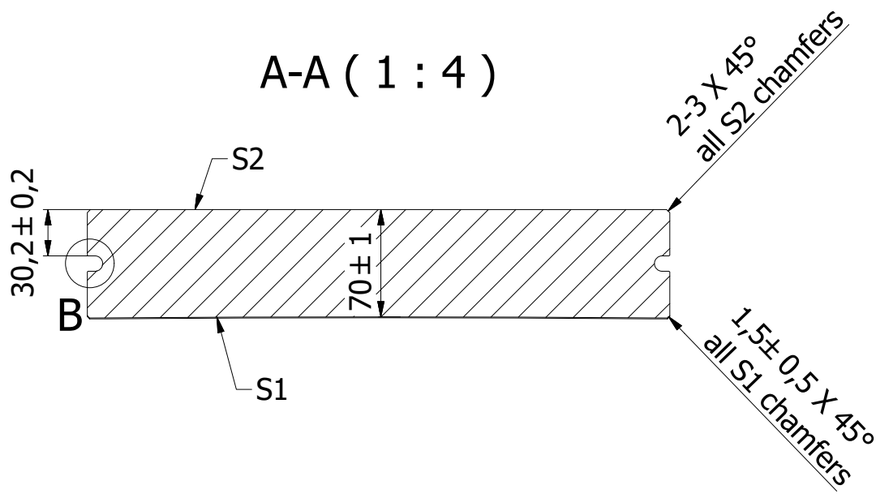
eli beamlines

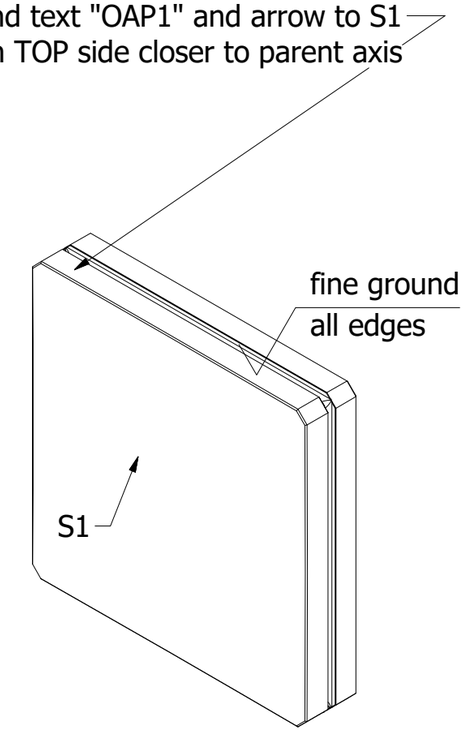
Fyzikální ústav
Akademie věd ČR, v. v. i.

Dwg. title: M7 leaky mirror
Dwg. no./TC ID: M7_4
Rev.: 00
Eli no.: RA1.L4.CMP1.CIS.FM.9
Sheets 1 of 1









S1 Clear Aperture	Substrate	S2 Clear Aperture
RoC and conical const - see sheet 2		
S-D 20-10 per MIL-PRF-13830B	equivalent to Corning HPFS 7980 mirror grade	commercial polish
Rq<1.2nm for spatial periods <1mm		
Coating: uncoated		Coating: uncoated
RMS surface figure ≤λ/35 @633nm		
RMS wavefront gradient ≤5urad for 1-10mm spatial periods (best effort <2urad)	all edges and chamfers fine gound GRIT 200-400	
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

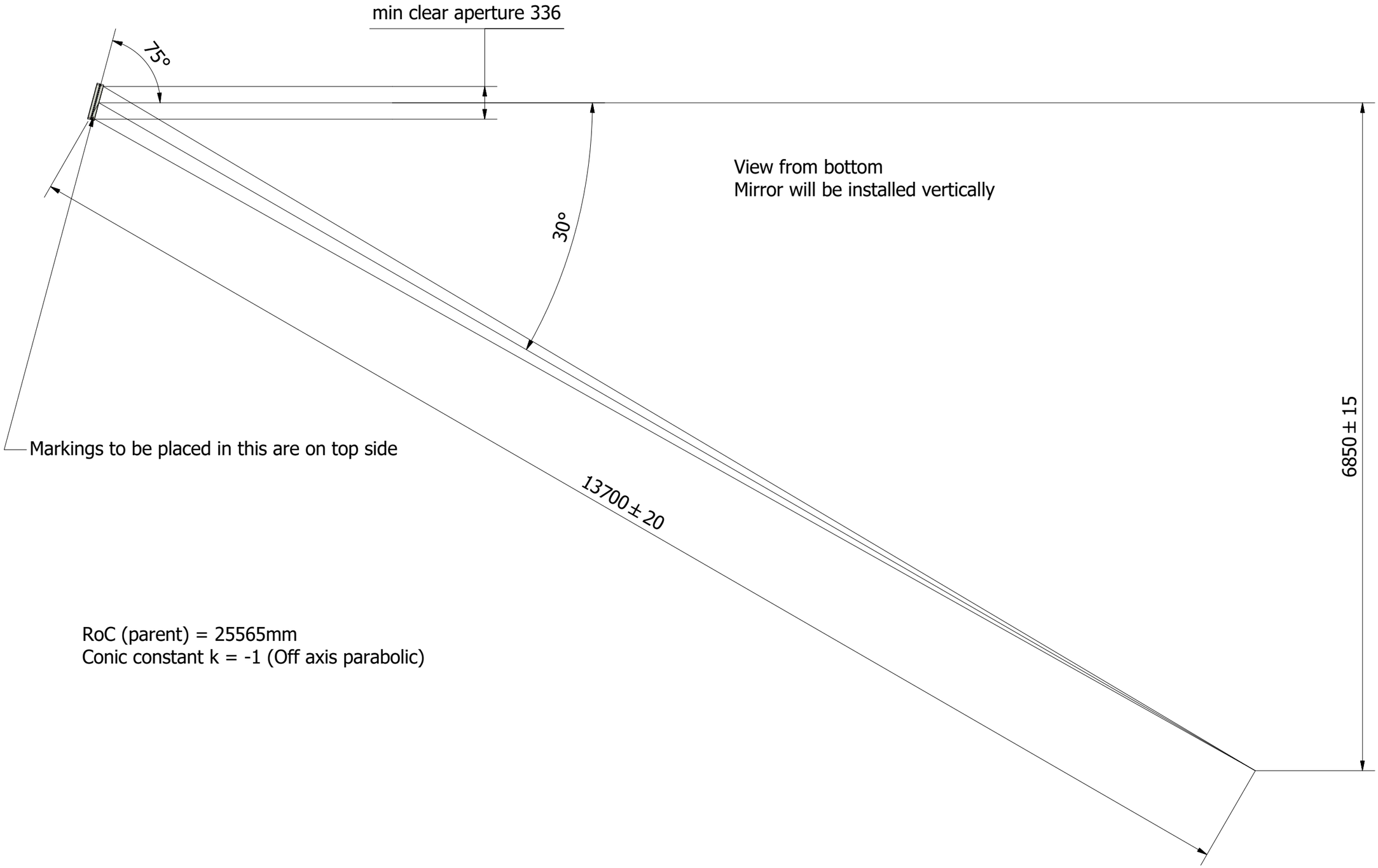
Drawn by: [redacted]	Projection	Scale: 0	Sheet size: A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight: 22kg		Note: '	

Dwg. title: OAP1

Dwg. no./TC ID: OAP1_2

Rev.: 2

Eli no.: RA1.L4.CMP1.CIS.CM.1

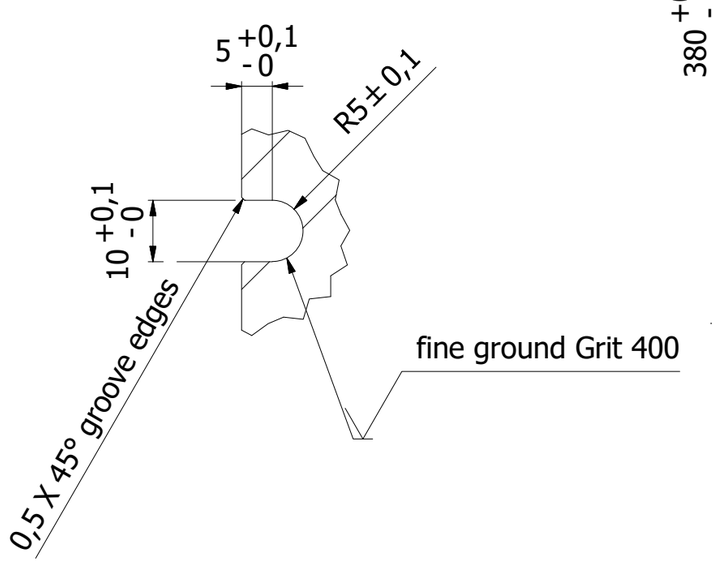


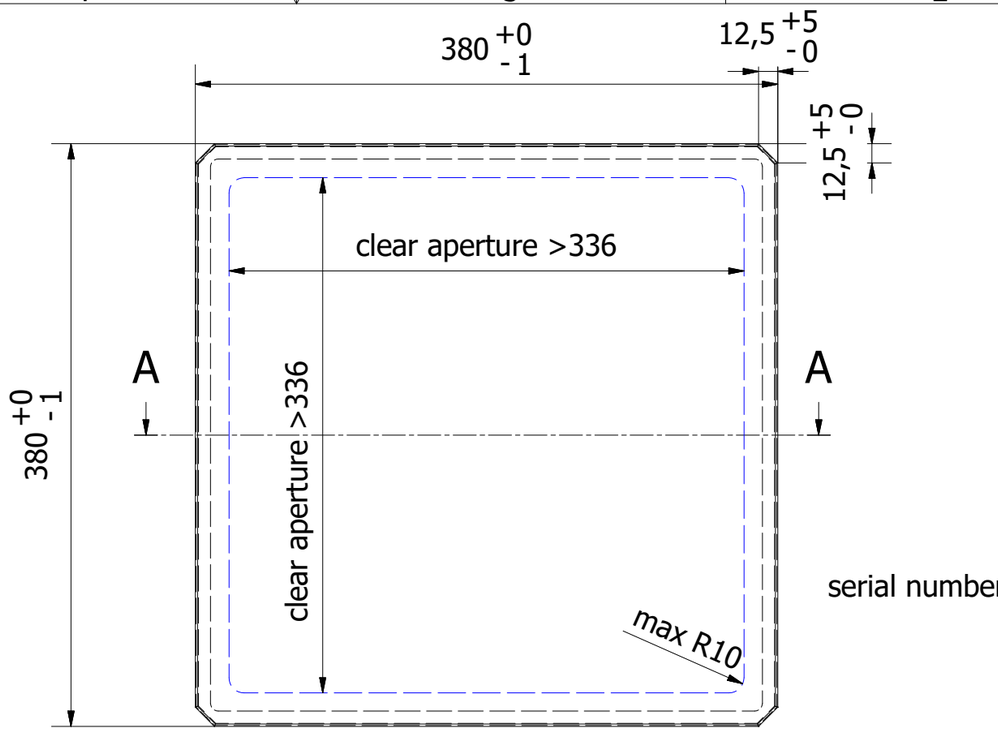
RoC (parent) = 25565mm
Conic constant k = -1 (Off axis parabolic)

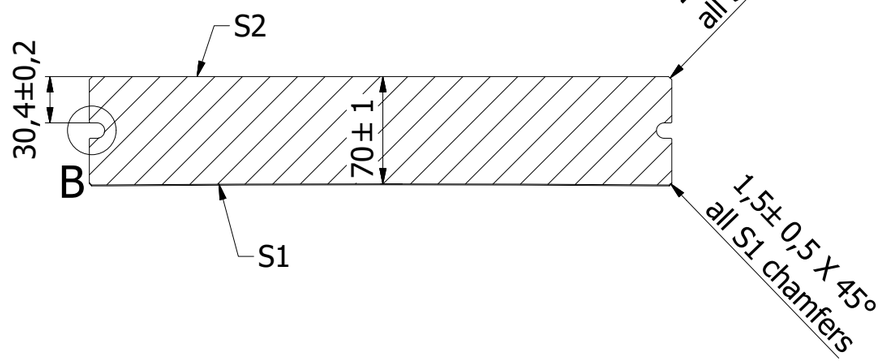
Drawn by: [redacted]	Projection	Scale	Sheet size A3	Dwg. title: 0AP1
Chkd by:				
Date:				
Material: Fused Silica		All dimensions in mm		Dwg. no./TC ID: 0AP1_2 — Rev.: 2
Raw mat.:		Tolerance: ISO10110		
Weight: 22kg		Note:		Eli no.: RA1.L4.CMP1.CIS.CM.1 — Sheets 2 of 2

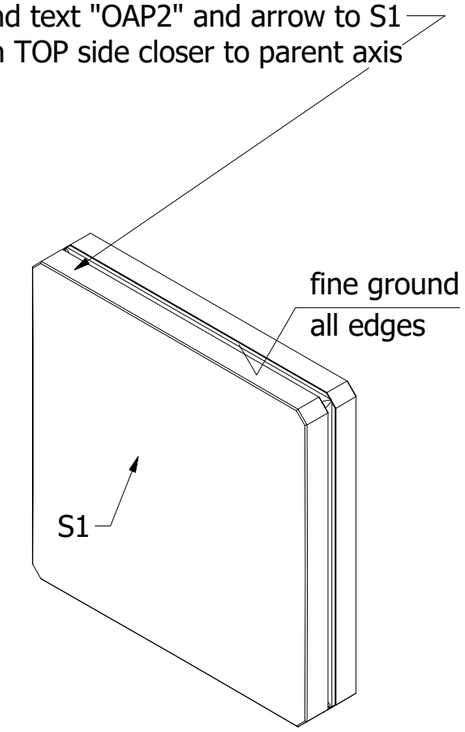
eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.









S1 Clear Aperture	Substrate	S2 Clear Aperture
RoC and conical const - see sheet 2		
S-D 20-10 per MIL-PRF-13830B	equivalent to Corning HPFS 7980 mirror grade	commercial polish
Rq<1.2nm for spatial periods <1mm		
Coating: uncoated		Coating: uncoated
RMS surface figure ≤λ/35 @633nm		
RMS wavefront gradient ≤5urad for 1-10mm spatial periods (best effort <2urad)	all edges and chamfers fine gound GRIT 200-400	
environment: High Vacuum 1E-6mbar <0.1% RH;20°C; class 100 clean room		

eli beamlines

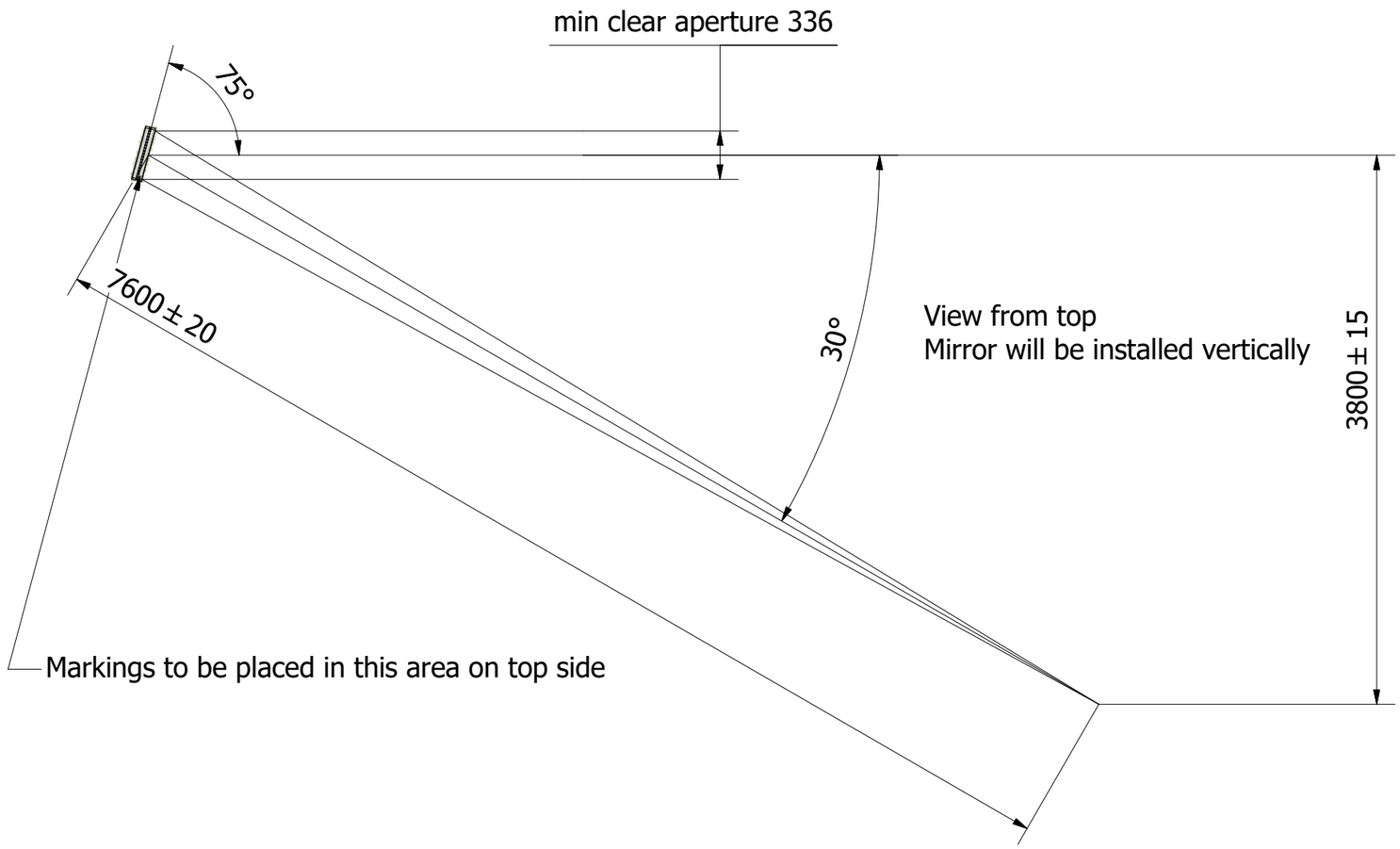
Fyzikální ústav
Akademie věd ČR, v. v. i.

Drawn by: [redacted]	Projection	Scale 0	Sheet size A3
Chkd by:			
Date:			
Material: Fused Silica		All dimensions in mm	
Raw mat.:		Tolerance: ISO10110	
Weight: 22.1kg		Note: '	

Dwg. title: OAP2

Dwg. no./TC ID: OAP2_2 — Rev.: 2

Eli no.: — Sheets 1 of 2



RoC (parent) = 14182mm
Conic constant k = -1 (Off axis parabolic)

Drawn by: [redacted]	Projection	Scale	Sheet size A3	Dwg. title OAP2
Chkd by:				
Date:				
Material: Fused Silica		All dimensions in mm		Dwg. no./TC ID OAP2_2 / Rev. 2
Raw mat.:		Tolerance: ISO10110		
Weight: 22.1kg		Note:		Eli no.: / Sheets 2 of 2

eli beamlines

Fyzikální ústav
Akademie věd ČR, v. v. i.

Annex No. 2 Additional Terms

No additional terms.