Procurement Guide

for the European open tender for a Closed-Cycle refrigerator Cryostat system

Contracting Authority:
The Netherlands Organisation for Applied Scientific Research (TNO)

Guide number	**:**	**2024 FPL/INK 081**
Date	**:**	**30-08-2024**

Contents

Definitions

In this Procurement Guide, words written with an initial capital, both singular and plural, shall have the following meanings. Terms not mentioned in this list but defined in the Dutch Public Procurement Act [*Aanbestedingswet*] have the meaning assigned to them in the Procurement Act.

Contracting Authority	:	TNO, Netherlands Organisation for applied scientific research
Procurement Guide	:	the present document describing the Procurement Procedure.
Procurement Procedure	:	the present European public Procurement Procedure by which the conclusion of the Contract is tendered.
Dutch Public Procurement Act	:	Dutch Public Procurement Act 2012 (hereinafter: "Procurement Act" or "Aw") concerning the implementation of procurement directives 2014/23/EU, 2014/24/EU and 2014/25/EU
Procurement Documents	:	all documents prepared by or on behalf of TNO for the purpose of the Procurement Procedure.
Announcement	:	the Notice of Procurement Procedure at www.TenderNed.nl.
Annex(es)	:	The Annexes to the Procurement Guide, namely: • **A01** to **A05** - i.e. the formats to be used by the Tenderer in preparing and submitting its Tender, • **B01** to **B03** - i.e. the formats to be used by the intended beneficiary for the purpose of submitting supporting documents relating to the ESPD at the request of TNO, • **C01** to **C03** - i.e. documents and (additional) information, which form part of the Procurement Guide and are not intended for submission by the Tenderer or the intended beneficiary.
Combination	:	an alliance of enterprises tendering jointly as a single Tenderer, each of the Combination members being jointly and severally liable for the performance of the Contract.
Third Party	:	natural persons on whom, or legal entities on which, a Tenderer may rely in order to meet the Suitability Requirements of financial and economic standing and/or technical and professional competence, irrespective of the legal nature of its links with said Third Party.
Suitability Requirements	:	the requirements imposed by TNO on Tenderers not excluded on the basis of the Grounds for Exclusion, which Tenderers must meet as a minimum in order to be eligible for the award of the Contract, on penalty of invalidation, as described in Section 5.
Award criterion	:	the criterion used by TNO in the assessment and ranking of Tenders for the purpose of awarding the Contract, as referred to in Section 6.
Award decision	:	the written communication of TNO's choice of the Tenderer with which it intends to conclude the Contract or its choice not to conclude a Contract.
Tenderer	:	an entrepreneur submitting a Tender.
Tender	:	an offer/quotation made by a Tenderer.
Minimum Requirements	:	the requirements set by TNO regarding the manner in which the Contractor must perform the Contract.
Information Notice	:	the document containing further information about the Procurement Procedure and/or the Procurement Documents and in which TNO presents and answers the Tenderers' questions in anonymised form.
Contractor	:	the Tenderer with which the Contract is concluded.
Contract	:	the Contract concluded with the Contractor pursuant to the outcome of the Procurement Procedure. The Contract is concluded after it has been signed by TNO and the Contractor.

Grounds for Exclusion	:	grounds for exclusion from participation in the Procurement Procedure, which – depending on the provisions of the Procurement Documents – relate to circumstances concerning the (person of the) Tenderer, the (person of the) Third Party and/or the (person of the) Subcontractor.
European Single Procurement Document	:	the declaration as referred to in Article 2.84(1) of the Procurement Act, which TNO has attached to the Procurement Guide as Annex **A01** (hereinafter: ESPD).

1 Contracting Authority and Contract

1.1 TNO

TNO, Netherlands Organisation for applied scientific research, hereinafter referred to as "TNO", is a modern unit-driven Research & Knowledge organisation, established by law in 1932 to make scientific research applicable to enterprises, government bodies and civil-society organisations and thereby strengthen innovative capacity.
TNO is a public-law legal entity and operates under the ministerial responsibility of the Dutch Minister of Economic Affairs but, as an organisation, performs its tasks independently.

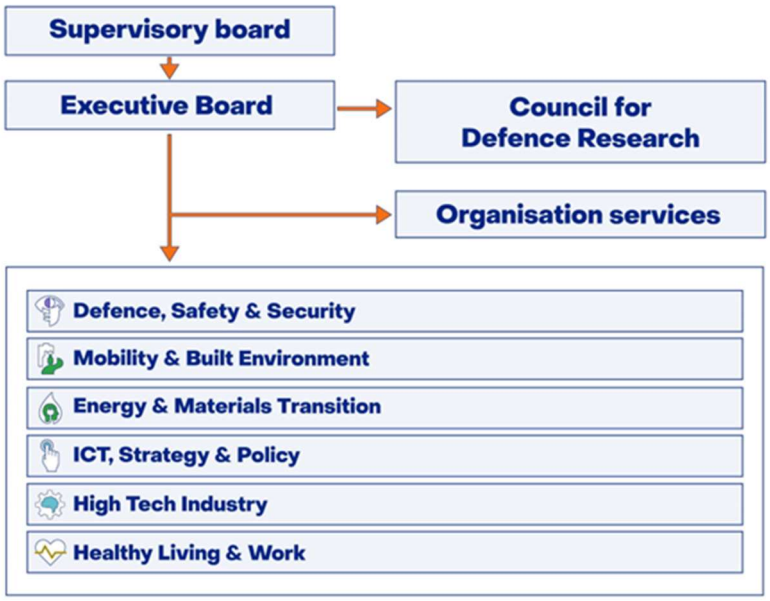
Every day, TNO's employees are working on the development and application of innovative research. TNO provides contract research and specialist consultancy and licenses patents and specialist software. TNO starts up new enterprises to bring innovations to market.

TNO's strength lies in its ability to combine diverse fields of science to create ground-breaking, sustainable solutions. Increasingly, TNO does so by collaborating with government bodies, industry, other knowledge institutions and civil-society organisations, both nationally and internationally. Through its work, TNO stimulates economic growth and social innovation.

TNO's mission is creating impactful innovations for the sustainable wellbeing and prosperity of society. How TNO fulfils this mission is described in its strategic plan for 2022-2025 and focuses on four societal challenges: a safe and secure society, a sustainable society, a healthy society and the digitalisation of society and industry. TNO's goal is to connect, change and accelerate: Innovation for Life. For more information on TNO, see: www.TNO.nl.

1.2 The TNO organisation

With TNO's highly ambitious approach comes an organisational form that effectively facilitates this ambition and a culture that challenges employees to innovate and collaborate. The TNO organisation has a unit structure as shown below:



The six organisational units (Units) are market-oriented and recognisable to TNO's customers and partners. The Units are based across the Netherlands with a total of 21 locations/research facilities. The head office is located in The Hague and accommodates the central staff bodies (Shared Services Organisation) and from where the entire TNO organisation is supported and managed.

1.2.1 Procurement department

The Procurement department is effecting the procurement on behalf of TNO in close cooperation with the department Quantum Technology. Procurement, as part of the Finance, Procurement & Legal (FPL) department, is responsible for organising and executing procurement processes and ensuring that these processes are in line with the TNO objectives.

1.2.2 Quantum Technology

Ultra-fast and microscopically small quantum systems, such as computers and sensors – these are what we're focusing on in the relatively new research area of quantum technology. Our aim is to use the unique properties of quantum mechanics for practical applications. That's why we're supporting this emerging industry with the design, development and manufacture of quantum sensors, quantum devices and complete systems.

1.2.3 NanoLabNL

NanoLabNL is the Dutch national facility for nanotechnology research. Its mission is to provide a full-service and Open-Access infrastructure for R&D in nanotechnology. It has an open character and it hosts many public-private partnerships. NanoLabNL is coordinated as one infrastructure while its facilities are distributed over five cities or 'hubs': Groningen, Enschede, Amsterdam, Delft and Eindhoven. NanoLabNL is part of the national programme on quantum technology. In that capacity NanoLabNL is dedicated to keeping its basic infrastructure 'state-of-the-art' to enable breakthrough-developments in the fabrication of quantum devices. In addition more specific focus is placed on high TRL infrastructure to serve the quantum agenda.
As such NanoLabNL supports scientists in their research and supports companies in improving or renewing their products/production process and/or developing new products. Finally, it aims to contribute to strengthening the Netherlands as a knowledge economy.

The hubs cooperate and share information on all possible activities, such as procurement. As a result a procurement working group has been established, within this working group, documentation, best practices, and investments plans are discussed and shared.

This Tender procedure, on behalf of TNO, contributes to the achievement of this ambitious mission.

1.3 Purpose of the Tender

One of TNO's core tasks is to strengthen the earning power of the Dutch economy and increase employment. This core task is, to an extent, realized by the creation of test and measurement facilities.

This demand is regarding a closed-cycle refrigerator cryostat system for a test and measurement setup called the Low Temperature Characterization Setup (LTCS). The LTCS will be a system for the characterization & calibration of colour centres, and related devices and materials. By creating this setup, TNO will strengthen the Dutch and European ecosystem on quantum technologies.

The purpose of the Tender is TNO's intention to enter into a Contract with one (1) Contractor for the supply/delivery of a closed-cycle refrigerator cryostat system (hereinafter also referred as "cryostat"). This supply/service shall be performed in accordance with the requirements and preferences as set out in the Procurement Documents.

<u>The use of the closed-cycle refrigerator cryostat system within the LTCT</u>
The device under test (DUT) will be located in the closed-cycle refrigerator cryostat system, as the colour centres (located within the DUT) require low (1 Kelvin or below) temperatures for coherent measurements. The possible DUT requires interfaces with optics (both fiber coupled and free-space), microwave equipment and analogue & digital electronics. These interfaces should be accommodated by the cryostat in the form of fiber optics, MW cables and DC cables, and additionally a free-space path from the sample to the optics outside the closed-cycle refrigerator cryostat system.

The DUT will require an adjustable vectorial magnetic field from 0 to 1 Tesla in each possible direction. As this will require an electromagnetic bore, and the system should be accessible to various different types of DUT, the bore should leave an inner sample space open with a minimal usable diameter of 93 mm.

The DUT in the bore should be accessible to by focused light originated from the free-space interface. This light will be focused using a lens system inside the cryostat. The whole light path should be a line of sight from the top of the cryostat to the sample, and feedthroughs through the various stages and housings.

1.4 Objective, scope and content of the proposed Contract

The Contract to be entered into provides for the supply of products and the provision of services, as specified in detail in the Programme of Requirements and Preferences (Sections 8).

Following the present Procurement Procedure, TNO intends to award a contract for a closed-cycle refrigerator cryostat in accordance with the Procurement Guide.

In general terms, the contract involves:
- The closed-cycle refrigerator cryostat system;
- Two year warranty
- (Critical) Design review
- Site Acceptance Tests (SAT)
- Installation on site
- Operator & (basic) maintenance training
- Delivery according Incoterm 'Delivered Duty Paid' (DDP, 2020. Location TNO Delft (further specified on PO)

1.5 Maintenance/services Contract

System downtime can lead to loss of opportunities and possibly revenue. Therefore, in relation with this Tender procedure, TNO might intend to enter into a contract for maintenance/services for a period of one year up to a maximum of five years. In this light, TNO expects to receive a proposal or proposals that minimise such system interruptions.

TNO has divided maintenance/services into two types, being 'basic' and 'all-inclusive'. The price for the various options for maintenance/services must be submitted by the Tenderer in Annex **A03**. These quoted prices shall be fixed, and no indexation should take place the first 2 years after the final acceptance of the cryostat by TNO.

For the elaboration of what exactly falls under the maintenance (for the relevant price, as offered in the price sheet), TNO expects an elaboration to be submitted as 'Annex **A05** - Maintenance/Services' (own format).

What is offered for the 'basic' and or 'all-inclusive' maintenance contract type?

What exactly does Tenderer offer and how does this match with the preferences of TNO, such as but not limited to response times, service-desk reachability, software updates, additional service hours which are not covered in this type of contract etc?

Make a preventive and (if available) a corrective breakdown here. The maintenance time of the cryostat shall not exceed two weeks per year. Therefore, state the consequences of not achieving or not fulfilling the service level specified by the tenderer.

The intention to enter into a maintenance contract depends on the price and whether it falls within the total available budget. For this reason, and to allow a fair price comparison, TNO will only include the price for a one-year basic maintenance contract multiplied by five (5) years in the price assessment (para. 6.1). It should be clear to TNO what is covered by the maintenance contract, but also what is not covered by the contract, and thus will result in an additional cost to TNO.

If you typically provide different types of maintenance contracts, you can present these variations alongside the basic maintenance contract. However, please be aware that only the basic maintenance contract and its price will be assessed. The price for all potential variations in maintenance services, covering a period of one year up to and including 2030, considering the closed-cycle refrigerator cryostat system, will only be available by 2025 (a total of (5 years). Tenderers can submit this information in Annex **A03**.

1.6 Optional second closed-cycle refrigerator cryostat system

TNO might have the intention to buy a second closed-cycle refrigerator cryostat system with the same similar requirements/preferences (chapter 8), and this within a period of maximum three years after final award decision and the signing of the Contract. Such a purchase will take place under the same tender conditions. For this reason, Tenderer is asked to fill-in the related line numbers in Annex **A03**.

2 Procurement Procedure

The Procurement Procedure is conducted pursuant to the applicable rules under the Aw. TNO has opted for the public procedure. TNO chose the public procurement procedure due to the contract's relative complexity, which implies that limited competition is anticipated. Consequently, the public procedure serves as an efficient and cost-effective approach. This tender has been published on and will proceed through TenderNed, www.TenderNed.nl.

2.1 Schedule for the Procurement Procedure

The proposed schedule for the Procurement Procedure is as follows:

No.	Action points	Date
1.	Publication of Announcement of Contract (at www.TenderNed.nl)	30-08-2024
2.	Closing date for submission of questions by Tenderers	19-09-2024, 23:59 CET
3.	Issue of (final) Information Notice	27-09-2024
4.	Closing date and time for submission of Tenders	10-10-2024; 13:00 CET
5.	Notification of Award Decision	31-10-2024
6.	Closing date for submission of supporting documents by intended beneficiary	17-10-2024
7.	Closing date for submission of challenges	21-11-2024
8.	Final award	Close after 21-11-2024

The dates are indicative. TNO reserves the right to change the dates, subject of course to the minimum periods as laid down in the Dutch Public Procurement Act [*Aanbestedingswet*]. Affected enterprises will be notified of any change in the schedule via TenderNed.

2.2 Tender conditions

As part of the Procurement Procedure, TNO applies the following conditions.

2.2.1 Agreement

Submission of the Tender implies that the Tenderer agrees to the terms and conditions of the Tender Procedure and agrees to the contents of the Tender Documents, including any unwelcome answers in the Information Notice.

2.2.2 Formats

The Tenderer should use the formats as included in the Annexes to this Procurement Guide. It is expressly not permitted to make changes to these formats, unless TNO has expressly stated otherwise.

2.2.3 European Single Procurement Document (ESPD)

The Tenderer must submit an ESPD as specified in the instructions given below. The Tenderer must use the ESPD as appended in Annex **A01**.

To access and complete the ESPD electronically, the Tenderer must only use the Adobe Reader software program, preferably the latest version. Opening the ESPD in a program other than Adobe Reader may result in the ESPD appearing different from the version pre-filled by TNO and/or showing errors. Submission of an ESPD that differs from the version as provided by TNO with the Procurement Documents will render the Tender invalid, unless TNO considers this disproportionate in a specific case. The responsibility for opening the ESPD in the prescribed manner and submitting the correct version thereof rests with the Tenderer.

For legally valid signature of the ESPD, see Section 2.2.20 of this Procurement Guide.

2.2.4 Precedence of Procurement Documents

In the event of discrepancies between the contents of the various Procurement Documents, the following order of precedence applies during the Procurement Procedure, in descending order of prevalence:

- Information Notice(s): from most recent to least recent;
- Procurement Guide with Annexes:
  - Programme of Requirements and Preferences (Annex A04);
  - The Price Sheet (Annex A03);
- Announcement.

2.2.5 Contact person and communication

All communication relating to the Procurement Procedure, with the exception of Section 2.3 "Further Information (questions)", will take place via TenderNed only and in the manner specified in this Procurement Guide.
If direct contact with TNO is specified/necessary, communication will take place exclusively with the TNO contact person stated below, in writing at all times, via the TenderNed messaging module.

Name	:	Arjan Verhoeven
Position	:	Procurement advisor
Department	:	Procurement
Postal address	:	PO Box 96800, NL-2509 JE The Hague

Tenderers cannot derive any rights from oral statements, undertakings and suggestions made by TNO employees and/or consultants in relation to the Procurement Procedure and/or the Procurement Documents. Tenderers may only rely on information provided in writing by or on behalf of TNO.

On penalty of exclusion, enterprises may not contact persons other than the contact person with regard to the Tender, unless TNO considers this disproportionate in a specific case. Nor is it permitted, on penalty of exclusion, to communicate with the contact person in any way other than via TenderNed, unless TNO considers this disproportionate in a specific case.

An instruction regarding digital procurement via TenderNed can be found by selected bidders in TenderNed's support environment (https://www.TenderNed.nl/cms/help). If you have any questions or are unclear about the operation of TenderNed (for example, if you are unable to log in or submit documents) or if TenderNed malfunctions, the TenderNed service desk can be contacted from 8.30 a.m. to 4.30 p.m. on working days on 0800 - 836 33 76 or via servicedesk@TenderNed.nl.

2.2.6 Language

Tenders must be written in the English language. Tenders in languages other than English will be excluded from participation. Official documents that cannot be submitted in the English language may be written in the language of the document's country of origin. Upon request, the Tenderer shall arrange a translation by a sworn interpreter-translator. The costs incurred shall be borne by the Tenderer.

2.2.7 Single Tender

An enterprise may only be involved in one (1) Tender: either as an independent Tenderer, a member of a Combination, or a subcontractor or Third Party. With regard to enterprises belonging to the same group as referred to in Sections 2:24b and 2:24c of the Dutch Civil Code, more than one company from the group may submit a Tender, provided that the enterprises demonstrate, at TNO's request, that the Tenders have been drawn up independently and autonomously.
Where this cannot be demonstrated by all the Tenderers concerned, all the Tenders emanating from enterprises belonging to the same group will be excluded.

2.2.8 Combination

A Combination of enterprises may submit a Tender jointly as a single Tenderer.
To do so, the following conditions must be met.

- All members of the Combination shall submit their own completed and validly signed ESPD. This states that registration takes place in Combination and, if selected, registered.
- The ESPD specifies which member of the Combination will fulfil the role of coordinator. The coordinator is the only member with which TNO corresponds regarding the Procurement Procedure and, where applicable, the Contract. The coordinator must have the power to legally bind all members of the Combination in respect of the Procurement Procedure and, where applicable, (the award of) the Contract.
- All members of the Combination must individually declare in their own ESPD whether they are subject to Grounds for Exclusion (see Section 5.1). The members of the Combination will each be assessed individually against the Grounds for Exclusion. If one or more Exclusion Grounds apply to one or more members, the entire Combination will be excluded.
- The Combination as a whole will be assessed against the Suitability Requirements, subject to any exceptions referred to in Section 5.2. In the ESPD, the Combination members declare how the Combination meets the Suitability Requirements. If the Combination as a whole does not meet all Suitability Requirements, the submission of the Combination will be laid aside.

By submitting the Tender, the Combination members declare that all the participants in the Combination are jointly and severally liable for the fulfilment of the obligations arising from the Procurement Procedure, as well as from any performance of the Contract. By submitting the Tender, the Combination members declare that the coordinator is authorised to validly represent the Combination and the individual Combination members in all matters relating to the Tender and, in the event of the award of the Contract, the Contract.

2.2.9 Subcontracting

A Tenderer may use one or more subcontractors to carry out the work. A cooperative venture in the form of a main contractor and subcontractors may tender as single Tenderer. The main contractor shall remain at all times responsible and liable for all work, including any work performed by a subcontractor.

TNO recognises the following subcontractors:

Reliance on subcontractor to meet Suitability Requirements
Where the Tenderer relies on the financial and economic standing and/or technical and professional competence of a subcontractor to meet the Suitability Requirements, said subcontractor shall also be deemed a Third Party. In this case, the Tenderer must follow the instructions as described in Section 2.2.10 concerning reliance on the resources of a Third Party or Parties. All Third Parties must be listed in Section IIC of the ESPD (Annex **A01**).

Deployment of subcontractor to perform the contract
Where a Tenderer meets the specified Suitability Requirements independently but wishes to use one of more subcontractors to carry out the work, the Tenderer need not disclose the identity of the subcontractor(s) in the Tender. While the Tenderer must tick the box in its ESPD, Part IID, to indicate that it intends to use subcontractors, their names need not be disclosed at this time. However, the Tenderer must do so not later than seven (7) calendar days after the provisional award, as TNO has to pre-approve the subcontractors to be used. If the Contractor wishes to replace a subcontractor during performance of the Contract, this will only be possible subject to TNO's prior consent in writing.

If a Tenderer wishes to use a subcontractor, a completed ESPD (Annex **A01**; parts IIA, IIB and III) must be submitted not later than seven (7) calendar days after the provisional approval of said subcontractor, as well as the supporting documents relating to the Grounds for Exclusion (Section 5). Where a subcontractor is subject to one or more Grounds for Exclusion and said subcontractor has not given convincing reasons in the ESPD why it should nevertheless not be excluded (see Section 5), the subcontractor will not be approved. Otherwise, approval of a subcontractor will not be unreasonably withheld.

If a Tenderer intends to use multiple subcontractors, a completed and duly signed ESPD (Annex A01) must be submitted from each subcontractor. The subcontractor has only to complete parts IIA, IIB and III of the ESPD. These ESPDs will be appended to the Tender.
The subcontractor's ESPD (Annex **A01**) must be duly signed. For signing authority, please refer to Section 2.2.20.

If the Tenderer does not intend to use subcontractors
The Tenderer should indicate its intention not to use subcontractor(s) by ticking only the "no" box in Part II D of the ESPD (Annex **A01**).

2.2.10 Reliance on Third Party resources?
The Tenderer may rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties.

If the Tenderer relies on the financial and economic capacity of a Third Party or Parties, both the Tenderer and the Third Party or Parties on whose financial and economic capacity the Tenderer relies will be jointly and severally liable for the obligations arising from the Procurement Procedure and for the obligations arising from the performance of the Contract, if awarded to the relevant Tenderer.

If the Tenderer relies on the technical and professional competence of a Third Party or Parties, said Third Party or Parties should also be involved in the performance of the Contract, if awarded to the relevant Tenderer.

No reliance on Third Party resources
If the Tenderer does not rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, it should complete Part II C of the ESPD (Annex **A01**) to indicate that it does not rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, by ticking the *"no"* box.

Reliance on Third Party resources

A) Requirements for submitting a Tender
If the Tenderer does rely on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, the Tenderer should complete Part II C of the ESPD (Annex **A01**) to indicate:
1. that it is relying on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, by ticking the *"yes"* box
2. the Suitability Requirements for which it relies on the Third Party or Parties and,
3. for each stated Suitability Requirement for which it relies on a Third Party or Parties, and the Third Party or Parties it relies on for that purpose.

In addition, if the Tenderer relies on the financial and economic standing and/or technical and professional competence of a Third Party or Parties, it shall submit the following:

4. a separately completed and duly signed ESPD (Annex **A01**) from each Third Party on whose financial and economic standing and/or technical and professional competence it relies, in which the Third Party completes Parts II A, II B and III in respect of the Third Party itself. The ESPDs of the Third Party or Parties must be duly signed as referred to in Section 2.2.20.

Additional requirement for submitting a Tender in the event of reliance on technical and professional competence of a Third Party or Parties

5. If and insofar as the Tenderer relies on the technical and professional competence of a Third Party or Parties, the Tenderer must submit a list of reference projects completed by the Third Party or Parties on whose technical and professional competence the Tenderer relies, in addition to any list of its own reference projects to be submitted by itself with its Tender. If and insofar as the Tenderer submits reference projects of a Third Party or Parties, it must also use the format for reference projects (Annex **A03**) for this purpose.

B) Requirements for intended beneficiary relying on a Third Party or Parties

The Tenderer to which TNO intends to award the Contract on the basis of the Award Decision and which relies on the financial and economic standing and/or technical and professional competence of a Third Party or Parties must submit at TNO's request within the period specified in Section 7.1 of the Procurement Guide:

1. a declaration by said Third Party or Parties stating that the Tenderer can actually access the resources of the Third Party or Parties relied upon. If the Tenderer relies on the financial and economic standing of a Third Party, it shall submit a declaration in the format provided in Annex **B01**. If the Tenderer relies on the technical and professional competence of a Third Party, it shall submit a declaration in the format provided in Annex **B02**;

2. any evidence as referred to in Section 5.1, which allows the Third Party or Parties whose suitability the Tenderer relies on to demonstrate that the Grounds for Exclusion do not apply to the Third Party.

Additional requirement for intended beneficiary in the event of reliance on financial and economic standing of a Third Party or Parties

3. The Tenderer to which TNO intends to award the Contract on the basis of the Award Decision and which relies on the financial and economic standing of a Third Party or Parties must, at TNO's request, submit within the period specified in Section 7.1 of the Procurement Guide, in addition to the documents referred to above under B) (regarding "*Requirements for the Intended Beneficiary*"): the documents that will be substituted for those that the Tenderer must submit to prove that it meets the Suitability Requirements regarding financial and economic standing.

2.2.11 Variants

Offering variants and/or alternative Tenders is not permitted and they will therefore be disregarded.

2.2.12 "Or equivalent"

The technical specifications are formulated as much as possible on the basis of EU and other standards, performance requirements and functional requirements. Where the Procurement Documents, including the Annexes, nevertheless refer to brand names, patents, types, manufacturing processes, etc., the Tenderer should read "or equivalent" after the relevant phrase.

Tenderers are free to provide an equivalent product, service or type of work. If they do so, the Tenderers must justify in or with their Tender why they are offering an equivalent product, service or type of work. It is up to TNO to assess whether the latter are actually equivalent. TNO reserves the right to have their equivalence assessed by a third party if necessary.

2.2.13 Rights reserved by TNO

1. TNO reserves the right to stop the entire Procurement Procedure temporarily or permanently. If TNO decides to discontinue the Procurement Procedure, legal protection is guaranteed in accordance with paragraph 2.4 of the Procurement Guide.

2. TNO reserves the right at all times to subject the data and statements provided by Tenderers to further investigation and verify their accuracy (or have them verified), as well as to approach any references provided, without prior notification thereof to Tenderer. The results thereof will be considered in the assessment of the Tender.

The Tenderer is aware that if at a later stage it is found that incorrect and/or incomplete information has been provided and/or that requirements set out in the Procurement Documents are not or no longer being met, the Tenderer will be excluded from further participation in the Procurement Procedure or agreements already made may be cancelled and contracts dissolved. In such cases, TNO cannot be held liable for the consequences thereof for the relevant Tenderer and TNO will not be obliged to reimburse any costs and/or any loss or damage of any kind.

2.2.14 Confidentiality

The Tenderer will observe strict confidentiality in respect of all information that is or becomes known to it through TNO. It will not make the information available to Third Parties and will only disclose it to its staff, including consultants, subcontractors and Third Parties, insofar as this is necessary for the submission of the Tender or – if and insofar as applicable – the performance of the Contract.

TNO acknowledges the confidentiality of the Tenderer's Tender and will not disclose to Third Parties any information known to it from this source. It will be necessary to disclose information from the Tender, where appropriate, in the context of justifying the Award Decision. The Tenderer recognises this and agrees accordingly.

2.2.15 Distortion of competition

Distortion of competition will result in exclusion. If TNO suspects that distortion of competition has occurred, it will give the relevant Tenderer(s) the opportunity to demonstrate that it has not been guilty of distorting competition. If TNO deems that the Tenderer has failed to do so, the Tenderer will be excluded from further participation in the Procurement Procedure.

2.2.16 Withdrawal by Tenderer
Any Tenderer who has submitted a Tender may withdraw it until the closing date for tenders. After that moment, the period of validity starts. The Tender is irrevocable during the period of validity.

2.2.17 Period of validity
The Tenderer upholds its bid at least one hundred twenty *(120)* calendar days from the closing date for submission of the Tender (Section 2.1). The period of validity is automatically extended until the final conclusion of the Contract with the first-ranked Tenderer.

If summary proceedings are instituted against the Award Decision, the period of validity will be automatically extended by a period of thirty (30) calendar days from the date of the decision of the preliminary relief judge.

TNO may request Tenderers to extend the period of validity. Tenderers cannot derive from this any right to be awarded the Contract.

2.2.18 Contract terms
The Contract will be awarded in accordance with:
- Contract entitled 'PURCHASE AND SUPPLY AGREEMENT TNO – [name supplier]', the draft version of which is included in Annex **C02**;
- A Purchase Order, and starts with 3100., and is mainly intended for administrative handling;
- TNO's Purchasing Conditions for Goods TNO 2022, as included in Annex **C03**, except insofar as they are explicitly departed from in the Procurement Documents.

In accordance with Section 2.3 of this Procurement Guide, Tenderers may submit text and amendment proposals for this Contract and the Purchasing Conditions for Goods TNO 2022. The final Information Notice will respond to these proposals or add the final Contract and Purchasing Conditions for Goods TNO 2022.

The general terms and conditions (including terms of supply) or terms and conditions of Third Parties (including subcontractors and auxiliary persons) used by the Tenderers, both during this Procurement Procedure and also, in the event of award, during the performance of the final Contract and any contracts to be concluded under its terms, are expressly rejected by TNO. If they declare their own terms and conditions applicable, this will render their Tender invalid.

In the final Information Notice, TNO will indicate where final changes have been made. Acceptance of the Final Contract and Purchasing Conditions for Goods TNO 2022 is a minimum requirement. Failure to comply with these conditions will result in the Tenderer's exclusion from further participation in the procedure.

2.2.19 Conditional Tender
TNO will exclude conditional Tenders from further participation in the Procurement Procedure.

2.2.20 Legally valid signature
The Tender must be validly signed. "*Validly signed*" means that the ESPD has been signed by the duly authorised representative(s) of the Tenderer as stated in TenderNed. A validly signed ESPD means that the Tender as a whole has been validly signed, unless a separate valid signature is required for one or more documents. TNO would point out that the trade register may state that two or more persons are joint authorised representatives, or that a representative is authorised only up to a certain monetary value. This has implications for the authority to sign and Tenderers should anticipate this.
The authority to sign should be evidenced by an extract from the trade register. It is also possible for the Tender to be signed by a proxy. In this case, a power of attorney must be issued by a legally authorised representative of the Tenderer, as evidenced by the trade register, or the power of attorney must be recorded in the trade register.

The extract or the power of attorney need only be issued to TNO if a request to that effect has been made by TNO, as specified in the requirements set out in Section 7.1 of the Procurement Guide.

A Tender not validly signed shall be deemed not to have been made and shall be invalid.

This provision also applies to the ESPD submitted by members of a Combination and/or for the Third Party or Parties on whose standing/experience/resources the Tenderer relies. In their case too, only the ESPD need be validly signed and this signature will also serve as a valid signature for other documents completed and submitted by them.

Electronic signature
Signature in the form of an electronic signature is also permitted. The following requirements apply in this regard: an E-recognition tool ("eHerkenning" in Dutch) with at least security level 4 (EH4) must be used.

2.2.21 Reimbursement of expenses incurred in submitting the Tender
Any expenses incurred by Tenderers in preparing and submitting the Tender will not be reimbursed.

2.2.22 Statement of prices and expenses
Prices and costs must be stated in euros excluding VAT and will be fixed for the term of the Contract unless otherwise specified. TNO hereby explicitly states that no price negotiations will be entered into as part of this Procurement Procedure.

2.2.23 Publicity
No publicity will be given to the Procurement Procedure by the Tenderer or by partners and/or subcontractors to be engaged by the Tenderer except with TNO's consent in writing. All information on the Tender will be treated confidentially by Tenderer and the parties to be engaged by them.

2.2.24 Intellectual property
Subject to exceptions as specified in the Dutch Copyright Act [*Auteurswet*], no part of the Procurement Documents may be reproduced (other than for the purpose of submitting a Tender) in any manner whatsoever without TNO's consent in writing. Tenders and all Annexes submitted by Tenderers as part of the Procurement Procedure will become TNO's property upon receipt.

2.2.25 TNO logo
The TNO logo may not be copied, altered or otherwise used on documents submitted by the Tenderer as part of the Procurement Procedure.

2.3 Further information (questions)
The Procurement Documents shall be prepared with the utmost care. Tenderers may request further information on the Procurement Procedure and/or the Procurement Guide up to the closing date and time "closing date for submission of questions" as stated in the schedule in Section 2.1. Said further information may, for example, address any lack of clarity, ambiguities, discrepancies. Further information should be requested within the time limit and in the manner described in this section. Questions and comments not submitted on time and/or correctly will in principle not be dealt with in the Information Notice, except in cases where this is deemed necessary and/or desirable at TNO's sole discretion.

Moreover, at the time of the above deadline, Tenderers will have the opportunity to ask reasoned questions on, or propose text or amendments to, the draft contract, as included in Annex **C02** and in the Purchasing Conditions for Goods TNO 2022, Annex **C03**. Text proposals will serve only to improve the Contract and must not affect its essence. TNO would point out that it reserves the right at all times to accept or not to accept these text or amendment proposals.

If the Tenderer fails to raise questions about and/or challenge to (lack of clarity, ambiguities or discrepancies in) the Procurement Procedure and/or the Procurement Guide and/or in the manner described in this section, or does not do so in a timely manner, it will forfeit its right to challenge any deficiencies identified at a later stage, e.g. in interlocutory proceedings.

Questions and/or comments should be communicated **exclusively** to the TNO contact person (see Section 2.2.5) using the "Standard Template for Tenderer Questions" in Annex **C01** ("editable" MS Excel file) prepared by TNO. Using the "pull-down" menu in this Excel file, the Tenderer should indicate which section of the Procurement Guide the question relates to. Once completed, Annex **C01** should be submitted via the TenderNed messaging module.

TNO is therefore **not using the question module in TenderNed**. Questions submitted in this question module will not be considered.

The TNO contact person will include the questions and/or comments and their answers in anonymised form in one or more Information Notices. The final date for asking questions is included in the schedule in Section 2.1.
The Information Notice(s) will be published at www.TenderNed.nl as per the schedule in the table in Section 2.1.

All the questions and their answers should be considered an integral part of this Procurement Guide. The basic premise is that the Procurement Guide will be deemed final after publication of the last Information Notice.

TNO may decide to hold one or more additional briefing rounds. Parties will be informed of this in the Information Notice. Questions and comments submitted as part of an additional briefing round may relate solely to the contents of the immediately preceding Information Notice. Questions and comments that do not relate to the immediately preceding Information Notice may be disregarded by TNO – without notice.

The responsibility for submitting questions and/or comments in a timely and correct manner rests with the Tenderer. Questions raised after the expiry of the deadline will in principle not be answered in the Information Notice unless answering is necessary, in TNO's opinion, for the submission of a proper Tender.

TNO would advise Tenderers to wait until the last Information Notice is published before submitting their Tender as the Information Notice may contain further clarifications and amendments to the Procurement Guide that are relevant to the preparation of the Tender.

TNO would expressly remind Tenderers that it can answer their questions in confidence (Section 2.53(3) Aw). If a Tenderer does not wish to have a question answered in the Information Notice, the Tenderer must give reasons as to why a public answer would damage its legitimate economic interests. TNO will take a decision on whether or not to answer a question in confidence based on these reasons. If TNO decides not to do so, it will notify the questioner accordingly, giving reasons. The questioner will then have the option of withdrawing or submitting its question for the Information Notice.

2.4 Applicable law and disputes

This Procurement Procedure is governed by the laws of the Netherlands. The Preliminary Relief Judge at the District Court of The Hague shall have exclusive jurisdiction to settle disputes relating to the present Procurement Procedure.
Tenderers should bring their challenges to all or part of the Procurement Procedure, to all or part of the information provided or to other aspects relating to the Procurement Procedure to the attention of the TNO contact person (see Section 2.2.5) at the shortest possible notice.
The period within which legal action must be taken against the Award Decision and/or the Procurement Procedure is twenty (20) calendar days from the date of the Award Decision. Any summons should be served within this period, which is a (contractual) expiry date, at TNO's address. If this objection period, also expiry date, is exceeded without legal proceedings having been commenced by service of a summons, any right to do so shall (inadmissible) lapse. The standstill period is automatically extended to the next working day if the standstill period ends at the weekend, on a public holiday or a so-called "notice-free day" [when bailiffs cannot issue writs].

A Tenderer wishing to initiate summary proceedings is requested to request foreclosures from TNO.

If a summons has been served within the standstill period, the relevant Tenderer is requested to send a copy of the served summons via TenderNed to the contact person for the Procurement Procedure no later than two (2) working days after service. This is because the processing of documents within TNO can lead to delays in processing the summons.

If a Tenderer institutes summary proceedings in a timely and valid manner in respect of the Award Decision and/or the Procurement Procedure, the Tenderer to which the contract has been provisionally awarded shall intervene in the summary proceedings. If the Tenderer to which the Contract has been provisionally awarded does not intervene, said Tenderer shall exercise the right to institute court proceedings or third-party proceedings in the event that the judgment in the first-instance summary proceedings orders the amendment or revocation of the Award Decision. This is because it is important for all the parties to obtain clarity as soon as possible and put all the arguments on the table in the first instance. If the standstill period is exceeded, this situation cannot be remedied.

Any Tenderer that has instituted summary proceedings is obliged to provide a copy of the summons when requested to do so by other Tenderers so that said Tenderer(s) can determine whether intervention is appropriate. Of course, it is up to the Tenderer that initiated the summary proceedings to determine whether or not confidential business information will be disclosed at that stage and, if so, which. If the Tenderer that initiated the summary proceedings does not (expeditiously) provide a copy of the summons to the Tenderer requesting it, TNO reserves the right to provide a copy of the summons itself. In doing so, TNO will determine at its own discretion whether confidential business information will be deleted and, if so, which.

If summary proceedings have been instituted in a timely and legally valid manner and the judgment does not oppose the conclusion of the Contract, TNO will be free to enter into the Contract. TNO is not obliged to await any appeal or proceedings on the merits. In other cases, TNO will consider the next steps to be taken based on the judgment in first instance.

2.5 Submission of the Tender

2.5.1 Digital tendering

The Tender consists of the completed and, where necessary, validly signed Annexes **A01 to A05,** the formats of which are appended as Annexes to the Procurement Guide. When the ESPD is validly signed, the Tender as such is also validly signed. The absence of a legally valid signature on the ESPD will render the Tender invalid.

For legally valid signatures, see Section 2.2.20.

For this Tender, TNO is using a digital procurement system via TenderNed. The Tender must be uploaded to the TenderNed digital vault not later than the date and time specified in the schedule in Section 2.1 under "Closing date for submission of Tenders". After uploading, the Tenderer will receive a transaction code via SMS. This code must be entered in TenderNed. The Tender is not actually submitted until the correct transaction code has been entered. The SMS code must therefore be entered within the tendering period for the Tender to be deemed complete and correct.

Tenders received late and/or Tenders not deposited in the digital vault and/or Tenders submitted by means other than via TenderNed will not be considered and will therefore be excluded from participation. Tenderers will remain at all times solely responsible for submitting their Tender on time and in the correct manner.

Tenderers are strongly advised to take careful note of the guide provided by TenderNed for the digital submission of Tenders, particularly as regards placing documents in the digital vault. In doing so, uploading should be completed with the tendering wizard (authorisation by SMS code).

Tenderers are advised to start uploading documents in good time. If a Tenderer experiences problems with the system due to a malfunction of TenderNed, the TNO contact person (Section 2.2.5) and TenderNed should be contacted without delay. In the event that a TenderNed malfunction actually occurs, as a result of which the submission of Tenders is not possible, shortly before the closing date and TNO has not taken note of Tenders that have been uploaded to the TenderNed digital vault on time despite the malfunction, TNO will extend the closing date for submission of Tenders pursuant to Section 2.109 Aw.

TNO further advises Tenderers to take note of the content of Section 2.109a Aw and, in accordance with the provisions of that section, to be prepared to submit the encrypted version of their Tender in a timely manner if occasioned by TenderNed malfunctioning.

2.5.2 Sending and grading Tender

The Tender consists of the following documents. Documents in **Part A** relate to the Tenderer. Documents in **Part B** relate to either Third Party(ies) whose experience/resources the Tenderer appeals to under the Eligibility Requirements and/or the Declaration of Willingness of Tenderer for the required insurance. The documents under **Part B** need to be submitted only if Third Party(ies) are invoked or if Tenderer is not (yet) in possession of either the insurance company's policy or satisfactory statement within the stipulated timeframe.

Part A Submission of the Tender

The Tender consists of the following components on pain of invalidity.

Annex A01	European Single Procurement Document (Tenderer, if applicable: all individual Combination members; the individual Third Party or for the benefit of one or more subcontractors to be used for the work).
Annex A02	Format for reference projects
Annex A03	Price sheet
Annex A04	Format for answering questions/fulfilling preferences, sub-award criterion: quality
Annex A05	Maintenance/Services' (own format)

The above sheets must be completed in full. Only the ESPD need be validly signed.

Gather the pdf files, Annexes **A01** to **A05**, as separate "loose" files into a compressed file (zip file) named: **"....."_part A.** The Tenderer should replace the dotted line with all or part of its company name. Upload this compressed file to TenderNed's digital vault.

Part B Submission of supporting documents

Annex B01	Format for Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties
Annex B02	Format for Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties
Annex B03	Format for Statement of Policy/Declaration as to Insurance

The above sheets must be completed in full. Only the ESPD need be validly signed.

Gather the pdf files, Annexes **B01** to **B03** as separate "loose" files into a compressed file (zip file) named: **"....."_part B.** The Tenderer should replace the dotted line with all or part of its company name. Upload this compressed file to TenderNed's digital vault.

3 Assessment of Tenderers and Tenders

3.1 Assessment team

A team of subject-matter and process experts has been constituted to conduct a qualitative assessment of the Tenders (assessment of the Tenders on the qualitative Award Criteria). The assessment team assesses the quality of the Tenders without having any knowledge of the financial part of the Tenders.

The members of the assessment team assess, on a strictly personal basis and independently, the elaboration of the qualitative (sub-sub-)award criteria for the Tenders. For these criteria, see section 6.1.2 and its elaboration in Chapter 8. In a meeting of the individual assessors, the average of the individual scores is then determined.
The average of the individual scores then determines the overall score for a sub-sub-award criterion. Average scores are rounded to one decimal place.

In the announcement of the Intention to Award, TNO will state the numbers of completed points per (sub-)sub-award criterion. The total score for sub-award criterion: Quality (QY) has been arrived at by totalling unrounded scores on the sub-sub-award criterion, after which this total score is rounded to a whole number for the purpose of said announcement.

3.2 Assessment procedure

The assessment procedure is as described in the following sections.

Section 4 : concerns the assessment of the timeliness, formal requirements and completeness of the Tender submitted.

Section 5 : concerns requirements formulated in respect of Grounds for Exclusion and Suitability Requirements. If one or more Grounds for Exclusion apply and/or if a Tenderer fails to meet the Suitability Requirements, the Tenderer will be excluded/the Tender will be invalid.

Section 6 : concerns the description of the assessment by TNO of the Tenders against the Award Criterion. The Award Criterion is assessed by allocating points to the Tender

Section 7 : concerns the assessment of supporting documents and other documents requested by TNO from the intended beneficiary.

Section 8 : this describes the assessment carried out by TNO in respect of the Minimum Requirements. This involves assessing TNO's requirements and preferences for the performance of the Contract, i.e. the Programme of Requirements and Preferences ("PoR"):

TNO assesses and ranks the Tenders on the basis of the Award Criterion: Best Value for Money (BVM), see Section 6 in this regard.

TNO may ask the Tenderer for clarification with regard to the submitted Tenders up to the end of the Procurement Procedure. The Tenderer is deemed to be willing and able to answer questions within 48 hours of sending the questions. If questions are not answered (in a timely manner), TNO may interpret the Tender in any manner it sees fit, based on the documents known to it.

4 Assessment of timeliness, formal requirements and completeness

4.1 Assessing timeliness of submission

The Tender must be submitted in a timely manner, i.e. within the tendering period (see Section 2.1). Tenders not submitted in a timely manner are invalid and TNO will discard them.

4.2 Assessing for other formal requirements and completeness

Tenders submitted by means other than through TenderNed will not be assessed and will be discarded. The foregoing is subject to any malfunctions of TenderNed, recognised as such by TenderNed.

The Tenders will be assessed as regards completeness and the formal requirements applicable in the Procurement Procedure, including at all events the legally valid signature. Tenders that are incomplete and/or fail to meet all the formal requirements will be declared invalid by TNO and discarded. Missing answers, documents, or data will result in exclusion if there is no rectifiable omission. Tenderers are reminded that TNO is not obliged to have deficiencies rectified. TNO has the discretionary power to offer a rectification option.

If – for whatever reason – a question cannot be answered or the requested data cannot be submitted in full or at all, this must be explicitly stated at the time of the Tender, together with reasons. Depending on the nature of the deficiency, TNO will assess whether the Tender is invalid, in which case it will be discarded, or whether the deficiency is amenable to rectification.

Deficiencies for which TNO offers a rectification option must be rectified within the timeframe as stated in the relevant request from TNO. If a deficiency is not rectified within the notified period or at all, the Tender will be invalid after all.

5 Assessment of Grounds for Exclusion and Suitability Requirements

5.1 Assessing Grounds of Exclusion

The Tenderer will be assessed in terms of the Grounds for Exclusion listed in the ESPD (Section III). The Tenderer declares in the ESPD whether the Grounds for Exclusion used are applicable or not at the time of tendering. Where one or more Grounds for Exclusion apply, the Tenderer will generally be excluded. The Tenderer will have the opportunity to give reasons in the ESPD why it should not be excluded after all because of self-cleansing measures or at least why exclusion would be disproportionate. TNO will take these reasons into account in its decision on the final exclusion of the Tenderer. The reasons must be included in or appended to the ESPD. Tenderers may not continue to submit and/or alter the reasons once the tendering period has elapsed.

If the Tenderer is a Combination and a Ground for Exclusion applies to any of the participants in that Combination, the Combination as a whole will be excluded. Each Combination member must submit its own legally signed ESPD.

If the Tenderer relies on the suitability of a Third Party or Parties as described in Section 2.2.10 of the Procurement Guide and a Ground for Exclusion applies to one or more Third Parties, TNO will reject its reliance on the suitability of the Third Party or Parties in question. If the Tenderer, whose reliance on a Third Party or Parties has been rejected, fails – after having been given the opportunity to do so by TNO – to rely (in a timely manner) on the resources of a substitute Third Party or Parties, or if the Tenderer does rely on a substitute Third Party or Parties but fails to comply fully or at all with the requirements set for that purpose, the Tenderer will be excluded from participating in the Procurement Procedure. The substitute Third Party or Parties must be proposed within seven (7) calendar days of a request to that effect from TNO, submitting all the documents requested in the Procurement Documents for that purpose. Proposing a substitute Third Party is not considered an amendment to the Tender. If a Tenderer is permitted to propose a substitute Third Party, the Tenderer may only substitute the Third Party while submitting the relevant documents in this connection. Other parts of the Tender, including, but not limited to, the elaboration of the award criteria remain unchanged.

The completed and validly signed ESPD will suffice in the first instance as evidence that the Grounds for Exclusion do not apply to the Tenderer. At TNO's request, the Tenderer to which TNO intends to award the Contract will provide – by the date specified in Section 7.1 of the Procurement Guide – the supporting documents referred to in section 7.1. If the Tender is submitted in Combination, all the Combination members must submit the supporting documents listed below. If the Tenderer relies on the standing/resources/experience of one or more Third Parties, then the supporting documents listed below from each Third Party should be submitted.

Tenderers are reminded that it may take several weeks to obtain some supporting documents. Tenderers are therefore advised to request the supporting documents at the earliest possible stage so that they can be supplied in a timely manner – in response to any request from TNO. TNO would point out that any Tenderer relying on a Third Party is itself responsible for the timely submission of supporting documents in respect of the Third Party's ESPD. TNO therefore advises Tenderers to inform, in a timely and appropriate manner, Third Parties on whose suitability they rely which documents may be requested by TNO in the event of award to the Tenderer and the time required to obtain these documents.
Failure to obtain supporting documents in a timely manner or at all remains at the Tenderer's risk. If the supporting documents are not supplied in a timely manner and/or complete, the Tenderer will still be excluded. If a supporting document has not been obtained in a timely manner, but has been requested in good time and the failure to obtain it is not due to a circumstance within the Tenderer's sphere of risk, the Tenderer will not be excluded. To this end, the Tenderer must demonstrate that the relevant supporting document has been requested not later than two (2) working days after publication of the announcement of the Procurement Procedure.

5.2 Assessing Suitability Requirements

The Tenderer must, at the time of Tendering, possess a certain minimum level of expertise and ability to perform the contract: the Suitability Requirements.
The Tenderer will be assessed on the Suitability Requirements. If the Tenderer relies on the suitability of a Third Party or Parties as referred to in Section 2.2.10 of the Procurement Guide, TNO will assess whether the Third Party or Parties meets the specified Suitability Requirements, for which the Tenderer relies on said Third Party or Parties.

The Suitability Requirements refer to the required financial and economic standing, technical and professional ability and professional competence that the Tenderer must meet in order to be eligible to submit a Tender.

The Tenderer must meet all the Suitability Requirements at the time when the Tender is submitted. If the Tenderer fails to meet all the Suitability Requirements, with or without relying on one or more Third Parties, the Tender will be invalid.

If tendering in Combination, the Combination as a whole must meet the Suitability Requirements and in principle not all the individual Combination members. However, this may be different for a specific Suitability Requirement.

5.2.1 Financial and economic standing

5.2.1.1 Insurance

The Tenderer must be insured against business liability and professional liability, with cover of at least € 1,250,000 per loss-causing or series of related events, or be willing and able to arrange said insurance cover in the event of an Intention to

Award. The Tenderer is responsible for ensuring that, if awarded Contract, it remains insured at least in accordance with this requirement during the term of the Contract. The Contractor will inform TNO without delay of any changes to the insurance policies. If the Contractor's insurance does not or no longer meets this Suitability Requirement during the term, TNO will be entitled to dissolve the Contract without notice of default or judicial intervention and without being liable to pay compensation to the Contractor.

Ticking the "*yes*" box in Part IV of the Tenderer's ESPD (Annex **A01)** will suffice in the first instance as evidence that the Tenderer meets this requirement.

At TNO's request, the Tenderer whose Tender was ranked first will provide the evidence of insurance within the set timeframe as referred to in Section 7.1. This supporting document comprises a policy showing the required insurance cover, the insurance contract, the policy schedule or a satisfactory declaration from the insurance company showing that the Tenderer is insured as required in the Procurement Documents. If a group policy is submitted, the Tenderer must supply a copy thereof to demonstrate that it is jointly insured.

If the Tenderer does not (or not yet) have the insurance company's policy or satisfactory declaration in its possession within the set timeframe, it should sign a Declaration of Readiness instead (Annex **B03**). By signing this declaration, the Tenderer declares that it will provide a copy of the policy or of a satisfactory statement by the insurance company within seven (7) calendar days after the notification by TNO that it intends to enter into the Contract with the Tenderer under the suspensive condition of the required insurance, based on the assessment of the supporting and other documents already submitted (see Sections 7.1 and 7.2). Said notification will be issued by TNO only after the standstill period has expired without summary proceedings being instituted or – where summary proceedings have been instituted – the relevant judgment states that the Award Decision can be upheld. The Contract will be not be entered into until such time as evidence of the Tenderer being adequately insured has been received. If the Tenderer is unable to provide the required insurance policy or a satisfactory declaration from the insurance company within the set timeframe, the Contract will not be concluded and TNO will retain the right to award the Contract to the Tenderer which would be ranked in first place after the number one was eliminated in accordance with the assessment system, and which has stood by its Tender.

5.2.2 Technical and professional competence

Competence requirements state the degree to which Tenderers may be considered capable of performing the actual activities under the present Contract as required.

5.2.2.1 Reference projects

The Tenderer shall demonstrate experience in the required core competences by providing details of reference projects. The Tenderer shall cite one reference project for each core competence. The Tenderer may cite the same reference project to fulfil the different core competences.

As evidence that the Tenderer has experience in the core competences listed below, the Tenderer shall cite the required reference projects immediately upon submission of the Tender. To this end, the Tenderer shall submit a fully completed Annex **A02** for each core competency. If the Tenderer uses one reference for multiple core competences, then a completed Annex **A02** must be submitted for each core competence. The completed Annex **A02** must show that the reference project cited fulfils all aspects of the core competence. Additions or amendments to the details in Annex **A02** are not permitted after the expiry of the tender date.

If the Tenderer relies on the technical and professional competence of a Third Party or Parties, the Tenderer shall submit for each core competence for which it relies on the relevant Third Party or Parties an Annex **A02** fully completed by said Third Party or Parties.

If a project is cited that has not yet been (fully) completed, only the actual results achieved under the current Contract may be stated and a forecast of results is not sufficient.

TNO has identified the following core competences that correspond to the desired experience in key areas of the present Contract.

Core Competence 1: The Tenderer has experience in building cryostats as defined in this Tender (e.g. meeting all requirements).

Reference project: The Tenderer must have delivered a closed-cycle refrigerator cryostat system, with simultaneously an optical window on the top of the cryostat and a vector magnet, that fulfils Core Competence 1 in the past 3 year from the date of Announcement of this Procurement Procedure and whose contract value was a minimum of € 400.000,00 excluding VAT. The closed-cycle refrigerator cryostat system should have been delivered in accordance with the conditions agreed at the time, including the completion date and budget.

TNO reserves the right to check references with the referee without involving the Tenderer. TNO assumes that the Tenderer has informed the referees accordingly. The information obtained by TNO from the referent will be taken into account in the assessment of the Tender.

If the Tenderer has not demonstrated in its Tender that it has the required experience in all the core competences, this will result in the Tender being rendered invalid.

5.2.3 Professional competence

By completing the ESPD (Annex **A01**) and ticking the "*yes*" box in Part IV, the Tenderer declares that it is registered in the professional or trade register in accordance with the regulations of the Member State in which it is based.

At TNO's request, the Tenderer to which TNO intends to award the Contract within the period specified in Section 7.1 of the Procurement Guide will provide relevant evidence:

- for enterprises based in the Netherlands, an extract from the trade register of the Chamber of Commerce must be submitted, which is not more than six months old at the time of submission of the Tender. For enterprises based outside the Netherlands, a similar document should be appended in accordance with the applicable regulations of the relevant country in which the enterprise is based;

- where the Tenderer is a partnership or general partnership, the Tenderer shall submit the extracts of those that form the partnership/general partnership (if recorded in the trade register) as well as a declaration signed by all the partners showing the power of representation for the purposes of this Tender;

- where the Tenderer is a Combination, the Tenderer shall submit extracts from all participants in that Combination, and;

- where the Tenderer submits a Tender relying on the standing/capacity/experience of one or more Third Parties, the Tenderer shall submit extracts from all Third Parties or subcontractors, as the case may be.

5.2.4 Legal suitability to perform an assignment

On 8 April 2022, the EU adopted a fifth sanctions package regarding the Russian war in Ukraine (Council Regulation 2022/576). In that package, contracting authorities are prohibited from granting assignments to (1) natural persons with Russian nationality or legal entities established in Russia, (2) legal entities that are owned for 50% or more by one of the natural persons or legal entities referred to under (1), and/or (3) natural persons or legal entities acting in the interests or on the instructions of a natural person or legal entity referred to under (1).

TNO applies the above requirements as a suitability condition for this Procurement Procedure. A Tenderer will be legally unsuitable to perform the assignment (Section 2.90(4) of the Dutch Public Procurement Act (*Aanbestedingswet*)), and its Tender will be invalid, if:

1) the natural persons have Russian nationality or the legal entities are domiciled in Russia; and/or
2) they are legal entities that are owned for 50% or more by natural persons or legal entities referred to under (1); and/or
3) they are natural persons or legal entities acting in the interests or on the instructions of a natural person or legal entity referred to under (1).

The Tenderer must therefore demonstrate in its Tender that:

1) the Tenderer does not have Russian nationality and/or is not domiciled in Russia; and
2) the Tenderer is not owned for 50% or more by a natural or legal person referred to under (1); and
3) the Tenderer is not acting in the interests or on the instructions of a natural or legal person referred to under (1), including the payment of monies to a natural or legal person referred to under (1), whether or not it is legally obliged to do so and whether or not it is actually possible at present.

If one or more of the above three (3) requirements cannot be demonstrated, the Tender will be invalid.

Where the Tenderer tenders in Combination, this requirement shall apply to all the individual Combination members. Where the Tenderer relies on the standing/resources/experience of one or more Third Parties, this requirement shall also apply to the Third Parties on whose standing/resources/experience the Tenderer relies. If the Tenderer wishes to use one or more subcontractors during the performance of the Contract, the Contractor will have to demonstrate – for that subcontractor – that it meets this requirement at the time a subcontractor is presented to TNO for approval.

Ticking the "*yes*" box in Part IV of the Tenderer's ESPD (Annex **A01)** will suffice in the first instance as evidence that the Tenderer meets this requirement.

To this end, the Tenderer to which TNO intends to award the Contract within the set timeframe as referred to in Section 7.1, shall provide the means of proof relating to this Suitability Requirement. This concerns the following documents:

a) a recent (not older than six (6) months from date of Tender) extract from the trade register reflecting the most recent state of affairs; and
b) an up-to-date report on the holding structure (where the Tenderer is part of a holding structure) showing the direct and indirect ownership relationships of the Tenderer; and
c) a copy of the Tenderer’s current articles of association.

In addition, the Tenderer shall declare categorically not to supply products - including semi-finished and finished products - listed in Annex XVII of the European Commission Regulation (EC) No 833/2014 on Russia Sanctions. When supplying products covered by this Annex XVII, the Tenderer shall provide as proof a Mill Test Certificate (MTC), or similar certificate such that it meets the requirements and obligations to establish the country of origin.

The Tenderer must continue to meet the Suitability Requirement. TNO will be entitled to verify this during the term of the Contract. If it becomes apparent during the term of the Contract that the Contractor does not meet – or no longer meets – the Suitability Requirement, TNO will be entitled to terminate the Contract with immediate effect, without being liable to pay damages to the Contractor and without the necessity of a notice of default or judicial intervention.

6 Assessment of Award Criterion

TNO assesses and ranks the Tenders based on the Award Criterion: Best Value for Money (BVM). The Tenderer with the highest overall score is deemed to have submitted the 'Most Economically Advantageous Tender' and is therefore provisionally awarded the contract.

6.1 Award Criterion: Best Value for Money (BVM)

This criterion is divided into the following sub-award criteria, with the corresponding weighting factors, where the assessment of the sub-award criteria: Price (TP, Total Price) and Quality (QY) is scored by setting a number of point scores to be achieved.

Award Criteria	Max. points score
Price (TP, Total Price)	200
Quality (QY)	800
Total	**1000**

The Tender with the highest total points score will be designated as Best Value for Money "BVM", on the basis of which TNO intends to award the Contract. See also Section 6.2 Award.
Point scores for each sub-award criterion will be rounded to one (1) decimal place. Total points are scored for each sub-award criterion by adding up unrounded point scores. In the announcement of the Intention to Award, TNO will state the rounded points scores allocated to each (sub-)sub-award criterion.

If the Tenderers with the highest Total Score have an equal Total Score, the Contract will be provisionally awarded to the Tenderer with the highest score for the sub-sub-award criterion Quality. If these scores are also equal, a draw will be held among the Tenderers with equal scores which are eligible for award. The protocol for the draw, if any, will be shared with the Tenderers among which lots will be drawn.

If, after the provisional award, the Tenderer with the highest score nevertheless proves to be invalid/is excluded from the procedure, the Tenders will be reassessed on the basis of the Award Criterion: Price, after which a new total score will be determined. TNO will award the Contract again based on this reassessment. This is to avoid what is referred to as the "ranking paradox".

6.1.1 Sub-award criterion: Price TP (Total Price)

To determine the sub-award criterion: TP (Total Price), TNO asks the Tenderer to use the Price Sheet prepared by TNO (in MS Excel) according to Annex **A03** for its price proposal. This Price Sheet should be completed and appended to the Tender. The Tenderer should strictly follow the outline of the Price Sheet and complete it in full. If the Price Sheet has not been submitted in full and/or correctly or at all, TNO will declare the Tender invalid and exclude it from further participation in the Procurement Procedure. Changing the format and layout of the Price Sheet (Annex **A03**) will also invalidate the Tender.

The distribution of the maximum number of point scores to be achieved for TP is given in the table below:

Criterion	Max. points score
Price TP 1 – Closed-cycle refrigerator cryostat system, this includes: - Two year warranty; - (Critical) Design review; - Site Acceptance Test (SAT); - Installation on site; - Operator & (basic) maintenance training; - Delivery according Incoterms Delivered Duty Paid (DDP), 2020 (location TNO Delft, the Netherland	200
Price TP 2 – Maintenance/services A one-year 'basic' maintenance contract multiplied by five (5) years (see section 1.5 for more information).	
Total TP = TP1 + TP2	**200**

When completing the Price Sheet, the following Minimum Requirements apply:

1) Prices and expenses should be stated in euros excluding VAT, and to two (2) decimal places;

2) The prices/rates listed in the Price Sheet are all-inclusive. This means that all the costs/services/obligations/etc. required for the performance of the Contract in accordance with the contract terms have been factored into the prices and rates. During the performance of the Contract, the Contractor shall not be entitled to any other and/or additional remuneration other than that in accordance with the Price Sheet;

3) The Price Sheet should include a price proposal on all the required items. The Tenderer shall use the Price Sheet prepared by TNO unchanged;

4) The Tenderer is solely responsible for stating figures and adding them correctly;

5) The prices quoted by the Tenderer should be based on the Procurement Documents without reservations of any kind;

6) Specific Minimum Requirements or additional instructions relating to the Price Sheet are included in the "additional instructions" tab and are accepted by the Tenderer reservations of any kind;

7) The prices and rates quoted in the Tender will apply in the event of final award on commencement of the Contract and will be fixed for the first two (2) contract years of the Contract, with the exception of the listed prices for the optional second closed-cycle refrigerator cryostat system, which should be fixed for each of the mentioned period.

The value of the lowest TP (Total Price) is determined on the basis of the cumulative costs in the Price Sheet defined by TNO.

The Tenderer with the lowest TP, being the lowest total price calculation, will be awarded the full number of points, set by TNO at 200 points. For the remaining Tenderers, the number of points to be obtained will be determined on a pro rata basis, with points deducted from the maximum number of points to be obtained.

Total points for TP (Total Price) are calculated according to the following formula:

$$\textbf{\textit{Number of points}} = \mathbf{200} - \{\frac{(\mathbf{I} - \mathbf{LI})}{\mathbf{LI}} \, \boldsymbol{x} \, \mathbf{200}\}$$

Where:
Number of points = number of points obtained for sub-award criterion TP
I = Tender with "TP"
LI = Tender with the lowest "TP"

If I ≥ 2 x LI, then zero (0) points are awarded for sub-award criterion TP.
The total score is rounded to whole points.

6.1.2 Sub-award criterion: Quality (QY)

Section 8, the Programme of Requirements and Preferences (hereinafter "PoR"), of the Procurement Guide describes the requirements to be met by the performance of the Contract.

The PoR also contains a number of preferences with regard to the quality of the requested service/supply. These preferences are set out in the form of a questionnaire. By filling in the preferences section and answering questions, Tenderers can differentiate themselves in terms of quality.
The Tenderer is asked to provide notes for each preference/question, answering the subject-matters listed in the questionnaire.

The Tenderer shall answer the open questions clearly, unambiguously and point by point.
When elaborating an answer for each open question, the Tenderer should respect the set maximum number of A4 pages (font size at least 10 points and line spacing at least 1.5). Tenderers should bear in mind, when elaborating the preferences, that said answers become part of the Contract and must therefore be capable of fulfilment by the Tenderer.

TNO bases the assessment of the answers on the set maximum per answer. This means that Annexes or references to them should not form part of the answer in order to "get round" the set maximum number of A4 pages in this way. However, illustrations, diagrams, organisational charts and sample reports can form part of the answer. Annexes should not form part of the answer and will not be included in the assessment. If the set maximum is exceeded, the excess number of A4 pages will not be included in the assessment. Any part of the elaborated answer that exceeds the maximum will not become part of the Contract.

The elaboration of the preferences will be assessed in absolute terms. It is therefore possible that more than one Tenderer has the same score for the relevant answer to the question asked.

The answers to the questions and therefore the compliance with preferences should be structured in the manner and order as specified in Section 8 and can be submitted using the Tenderer's own A4 format, subject to the aforementioned requirements.

The distribution of the maximum number of points to be achieved for sub-sub-award criterion: Quality (QY) is shown in the table below.

Section 8 **Sub-sub-award criterion: Quality**	**Max. points**
8.2.1 QY 1 Upgradability to dilution refrigerator	100
8.2.2 QY 2 Cooling power	150
8.2.3 QY 3 Interface and control	100
8.2.4 QY 4 Maintenance and support	100
8.2.5 QY 5 Track record of upgrades to dilution fridges	150
8.2.6 QY 6 Magnetic field homogeneity	100
8.2.7 QY 7 Magnetic field stability	100
Total	**800**

The assessment of the answers to the questions as posed under the preferences in the PoR is carried out in the manner described in Section 3.1. As stated in Section 3.1, the average of the individual scores determines the corresponding total score. The average is determined by first determining the score per assessor (percentage * maximum score) and then averaging that score across all assessors (individual scores summed/number of assessors).

Each percentage referred to in the table equals a percentage of the maximum score per preference.

Valuation	**Score**	**Notes to valuation**
No/poor answer	*0%*	*No answer given or answer is not good, i.e. it is not in accordance with TNO's (minimum) preference(s)*
Unsatisfactory answer	*20%*	*Answer is not complete (the wish is not fully elaborated), not sufficient, not satisfactory, i.e. it is not fully in line with TNO's preference(s)*
Satisfactory answer	*50%*	*Answer is sufficient, satisfactory, adequately reflects TNO's preference(s)*
Good answer	*85%*	*Answer is good, i.e. the answer accurately reflects TNO's preference(s)*
Very good answer	*100%*	*Answer is outstanding, i.e. the answer exceeds TNO's preference(s)*

The following questions will be considered when assessing compliance with the preferences:

- Is the answer specific, realistic, achievable, effective, complete and consistent?
- To what extent does the answer reflect TNO's situation and the Programme of Requirements and Preferences? Does the Tenderer address the requested elements, subject-matters and aspects as stated in the relevant preference/question and the Programme of Requirements and Preferences?

The assessment will be based on the overall impression given by the answer given. The wish does not involve separate assessment aspects or criteria.

6.2 Award of Contract

6.2.1 Notification of the Award Decision

All Tenderers will receive from TNO, expectedly on the date referred to in the schedule under Section 2.1, the notification of the final result of the assessment of the Tenders and the intended Award Decision.
In this notification of the Award Decision, TNO will indicate the Tenderer to which it intends to award the Contract, as well as, for unsuccessful Tenderers, reasons for their rejection.

6.2.2 Challenge

If a Tenderer disagrees with the Intention to Award as notified by TNO, it will be given the opportunity to challenge the Intention to Award within twenty (20) calendar days after the date of publication of the Intention to Award in the manner described in Section 2.4 of the Procurement Guide.

6.2.3 Final award

Once the standstill period has expired without summary proceedings having been instituted or, if summary proceedings have been instituted in a timely manner, the judgment in first instance does not oppose final award, TNO will contact the successful Tenderer as soon as possible to proceed with the award, except where a situation exists in which summary proceedings have been instituted in a timely manner. No final award will be made until the Contract has been validly signed by both Parties. If this is not the case, there is no question of TNO being bound in any way.

Kick-off meeting

TNO may intend to hold a kick-off meeting before the final contract is awarded. The Kick-off meeting objective is to cross-check and clarify (if any need) the Supplier proposed design including the complete set of compliance against customer applicable documentation at the issue that is relevant for the contract/kick off.

Digital Signature of Contract

To this end, TNO signs its Contracts using a so-called advanced digital signature tool, known as ValidSign. On receipt of the provisional award, the Tenderer is requested to provide the e-mail address and personal mobile phone number of the organisation's authorised signatory. The telephone number is needed to make the Contract legally binding (using SMS authentication).

On receipt of the final award, the Tenderer receives an e-mail containing a link to the documents to be digitally signed and clicks on "sign the documents" and is automatically redirected to ValidSign where the signature fields are visible. To sign, the Tenderer clicks "click to sign" and then "confirm". Once the documents have been digitally signed by the Tenderer and TNO, the Tenderer can download the digitally signed documents within a timeframe of thirty (30) days.

Progress meetings

After the Contract award, the Tenderer is required to participate in regular progress meetings. These meetings shall be held on a weekly or biweekly basis. The purpose of these progress meetings is to ensure effective communication, monitor the progress of the Contract, address any issues or concerns, and deadlines are being met. Each progress meeting shall include, but is not limited to, the following agenda items:

- Review of the current status
- Discussion of completed and upcoming tasks
- Identification and resolution of any issues or risks
- Review of timelines and milestones
- Any other relevant topics as agreed upon by both parties

The Tenderer must ensure that key personnel, including the project manager and relevant team members, attend these meetings. TNO will also designate representatives to attend the meetings.

Minutes of each meeting shall be recorded and shared with all attendees within 48 hours. These minutes should include a summary of discussions, decisions made, action items, and deadlines. The frequency and format of the progress meetings may be adjusted based on mutual agreement between TNO and the Tenderer, depending on the contract’s needs and progress.

7 Assessment of supporting and other documents from intended beneficiary

7.1 Requesting supporting and other documents from intended beneficiary

The Tenderer to which TNO intends to award the Contract must submit the supporting documents for the ESPD and any other documents and/or data within seven (7) calendar days after the date of TNO's request.

The following supporting documents must be supplied to TNO by the Tenderer to which TNO intends to award the Contract within seven (7) calendar days after the date of the request:

- Certificate of Conduct for Procurement (not more than two years old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- Declaration of Payment Behaviour from the Dutch Tax and Customs Administration (not more than six months old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- Extract from trade register (not more than six months old as at the date for submission of the Tender): The Tenderer, where applicable: all individual Combination members; all individual Third Parties;
- ISO 9001 Certification or similar measures. The tenderer must ensure that their ISO 9001 certification remains valid throughout the duration of the contract;
- ISO 14001 Certification or similar measures The tenderer must ensure that their ISO 14001 certification remains valid throughout the duration of the contract.;
- Insurance policy or Declaration of Readiness as to insurance (Annex **B03**);
- If applicable: Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties (Annex **B01**);
- If applicable: Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties (Annex **B02**).

Certificate of Conduct

The Certificate of Conduct (GVA; Dutch: Gedragsverklaring Aanbesteden) is a statement from the Minister of Security and Justice. The GVA indicates that an investigation into the natural or legal person concerned has not resulted in any objections in connection with the application and tendering for public contracts, special sector contracts, concession agreements for public works and/or services or competitions. After a provisional award, the provisionally awarded tenderer(s) must submit a valid GVA as proof that the grounds for exclusion do not apply to them.

TNO will request the intended beneficiary to submit the supporting documents. TNO will assess the following aspects of these documents:

- ascertain whether supporting documents submitted by Tenderer are submitted in a timely manner
- assess whether all the supporting documents requested by TNO have been submitted and whether the supporting documents received are complete. The absence of all or part(s) of supporting documents and/or other data will result in exclusion if there is no rectifiable omission. Depending on the nature of any deficiency, TNO will assess whether, as a result of that deficiency in the supporting documents, the Tender is invalid after all and will be disregarded, or whether the deficiency is amenable to rectification. The offer of rectification is a discretionary power of TNO and not a (legally enforceable) obligation.
- assess whether the Tenderer demonstrates through the supporting documents submitted that it complies with what it has declared through its Tender.

If the supporting documents are not, not completely and/or not timely received, or if the supporting documents show that the information in the Tender is incorrect, the Tenderer will be excluded after all/the Tender will be disregarded after all. If this is the Tenderer with the lowest price, the score for the sub-award criterion on price (TP) will be recalculated, after which a new ranking will be determined. If this was not the Tenderer with the lowest price, the ranking order will be maintained and the Contract will be provisionally awarded to the Tenderers ranked in order of succession.

TNO is also entitled to verify the Tender from the Tenderer to which it intends to award the Contract. If this verification shows that the Tender contains inaccuracies or cannot be fulfilled, the Tender will be disregarded after all. If this is the Tenderer with the lowest price, the score for the sub-award criterion on price (TP) will be recalculated, after which a new ranking will be determined. If this was not the Tenderer with the lowest price, the ranking order will be maintained and the Contract will be provisionally awarded to the Tenderers ranked in order of succession.

7.2 Contract subject to condition precedent

If the Tenderer is unable to provide a copy of the policy, nor a satisfactory statement from the insurance company, within the timeframe referred to in the previous section, but has signed the Declaration of Readiness in accordance with Annex **B03** then TNO will notify the Tenderer after a positive outcome of the assessment of the other (supporting) documents and after the standstill period has expired without summary proceedings having been instituted or – where summary proceedings have been instituted within the standstill period – the relevant judgement shows that the Award Decision can be upheld, that TNO will enter into the Contract with the Tenderer subject to a condition precedent. This condition precedent implies that the Contract will only actually be entered into if, after a timeframe of seven (7) calendar days (see Section 7.1), the Tenderer provides TNO with a copy of the required insurance policy or a satisfactory statement from the insurance company showing that the Tenderer is insured as required in the Procurement Documents. The Contract will not be entered into until after receipt of either document.

If the Tenderer is unable to provide the required insurance policy or a satisfactory statement from the insurance company within the set timeframe, the Contract will not come to fruition and TNO will retain the right to award the Contract to the Tenderer which would be ranked in first place after the number one which was eliminated in accordance with the assessment system.

8 Programme of Requirements and Preferences

TNO assesses the Tenders against the Programme of Requirements and Preferences. The Programme of Requirements and Preferences includes Minimum Requirements, Performance Requirements and Preferences. The Minimum Requirements must be met on penalty of invalidity at the time of submission of the Tender, the Performance Requirements only at the time of performance of the Contract and the Preferences must be worked out by Tenderers as part of the award of the Contract.

TNO has the right, but not the (legally enforceable) duty, to ask for clarification as regards meeting the Minimum Requirements and how the Tenderer expects to meet the Minimum Requirements.

As stated in Section 6.1.2 of this Procurement Guide, in addition to the Minimum Requirements and performance requirements, this PoR also contains a number of preferences as regards the quality of the supply. The preferences must be answered/elaborated upon by the Tenderer in the Tender in response to the qualitative sub-award criteria.

Any changes to the PoR that may occur during the performance of the Contract will be implemented in accordance with the conditions of the Contract. In this regard, TNO will ensure that no material amendment will be made to the Contract.

The objective and scope of the Contract (including this PoR) as well as a description of the current conditions have been described in Section 1.

This Programme of Requirements and Preferences is laid out in the following sections:

Requirements
8.1 - Cryostat system requirements
8.2 - Cryostat requirements
8.3 - Free-space optics interface
8.4 – RF interface
8.5 – DC interface
8.6 – Fiber interface
8.7 - Vector magnet
8.8 - Cryostat supporting frame requirements
8.9 - Software and system control
8.10 - Gas handling system
8.11 - Compressor
8.12 - Facilities
8.13 - Contractual aspects

Preferences
8.2.1 - Upgradability to dilution refrigerator
8.2.2 - Cooling power
8.2.3 - Interface and control
8.2.4 - Maintenance and support
8.2.5 - Track record of previous systems
8.2.6 - Magnetic field homogeneity
8.2.7 - Magnetic field stability

Definitions, abbreviations and acronyms

May	Expresses permissive guidance.
Shall	Expresses a characteristic which is to be present in the item which is the subject of the specification, i.e. "shall" expresses a binding requirement.
Should	Expresses a target or goal to be pursued, but not necessarily achieved.
Will	Expresses a declaration of intent on the part of a party, usually the sponsoring or acquiring organisation. "Will" does not express a binding requirement. "Will" may also be used in cases where the simple future tense is required, for example, "The operating system will be supplied by the government.". Will may also express simple futurity. Any statement which employs the term "will", if used in chapter 4, should be present as a note so as to be clearly distinguishable from requirements.
Goal	The desired value for a requirement.
Threshold	The acceptable value for a requirement.
Remark	Information that is meant to clarify or supplement a requirement.
Rationale	Reasons or logical basis for a requirement.
Accuracy	The degree to which the result of a measurement, calculation, or specification conforms to the correct value or a standard.
Reproducibility	The degree of agreement between measurements or observations conducted on replicate specimens in different locations by different people, as part of the precision of a test method.
Sample	Object to be measured.
State	A required, permitted or prohibited condition of the system.
Mode	A group of functions related to an aspect of use.
Test (T)	The operation of the system, or part of the system, using instrumentation or other special test equipment to collect data for later evaluation.

Demonstration (D)	The operation of the system, or a part of the system that relies on observable function not requiring the use of the instrumentation, special test equipment, or subsequent analysis.
Analysis (A)	The processing of accumulated data obtained from other qualification methods. Examples are reduction, interpolation, or extrapolation of test results.
Inspection (I)	The visual examination of system components, documentation, etc.
Certification (C)	A declaration by designated stakeholder, usually the supplier or developer.
Review (R)	Detailed review of the received specification of the supplier or developer on the (sub-)system.

8.1 Programme of Requirements

8.1.1 Subject-matter 'Cryostat System Requirements'

Requirement	Description	Validation Method
Requirement R-0000-005	The supplier shall deliver a system that is capable of meeting all the stated requirements in this document at the same conditions and time, unless indicated otherwise in a specific requirement. Rationale: Required to meet the functioning of the system.	R
Requirement R-0000-010	The system shall be an existing product, which has been produced, tested and delivered at least once before. Rationale: The facility is not suitable for testing equipment, the system shall be an existing and tested product.	R
Requirement R-0000-015	The system shall be able to cool down the device under test (DUT). Rationale: Required for cooling and holding the sample.	I
Requirement R-0000-020	The cryostat shall be electrically isolated from the gas handling system, compressor and control unit. Rationale: This is required for to avoid damage on the device and other components around the cryostat during electric faults as well as preventing interference via ground loops.	T
Requirement R-0000-025	The cryostat pumping system shall be able to keep a pressure below 10e-5 mbar at the room temperature platform on the inside of the cryostat when the cryostat's temperature is at 1 Kelvin. Rationale: For proper insulation of the cryostat from the lab environment and avoid freezing of contaminants on the sample.	D
Requirement R-0000-030	The cryostat shall be able to go from ambient to cryogenic temperatures and vice-versa without requiring any physical action from the operator besides performing the command via the remote software. Rationale: Controlling the setup from a distance is a must for our facility.	D
Requirement R-0000-035	The cryostat shall be able to pump-down and vent without requiring any physical action from the operator besides performing the command via the remote software. Rationale: Controlling the setup from a distance is a must for our facility.	D
Requirement R-0000-040	The system shall be of the type closed-cycle cryogen-free cryostat. Rationale: Required for the type of devices and experiments.	I
Requirement R-0000-045	CE certification – the cryostat shall be CE certified. Rationale: Safety and quality of the cryostat.	C

TNO expects that the different sub-systems deliver specific functions in order to facilitate the main goal. In Figure 1, a product tree is shown that demonstrates how TNO envisions the system. Transparent items indicate items TNO expects to be part of the delivery of the Cryostat. The items that TNO will supply or is responsible for are indicated in green.

To each box depicted in Figure 1 the corresponding requirements will be shown in the following sections of this document.

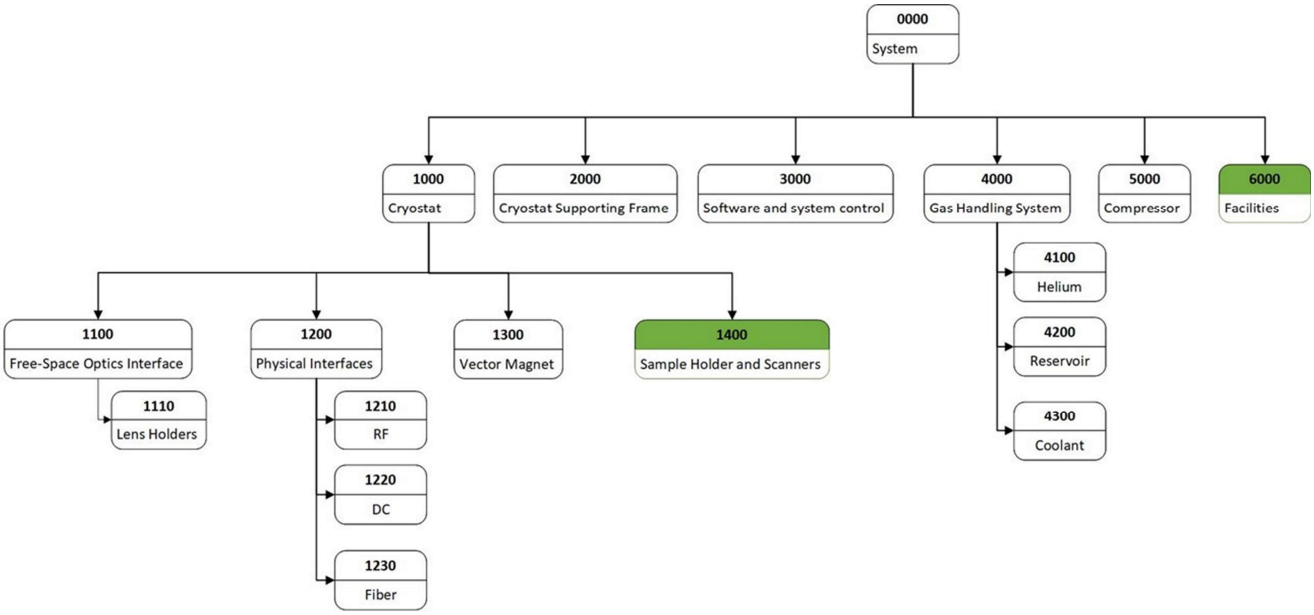


Figure 1 - Different Subsystems of the system

8.1.2 Subject-matter 'Cryostat Requirements'

Requirement	Description	Validation Method
Requirement R-1000-005	The Cryostat shall have a base temperature of less than 1 kelvin, as measured on the cold plate. Rationale: Required for our DUT; < 1K at the DUT, where the temperature is higher than on the cold plate.	D
Requirement R-1000-010	The cooling power of the Cryostat at 1 Kelvin shall be at least 30 mW with all components in place and thermalized (e.g. the vector magnet, optical windows and optical fibers, RF lines and DC wiring) as measured on the cold plate. Rationale: 30 mW is required for the measurements on samples that include colour centers and heat dissipating electronics.	D
Requirement R-1000-015	The Cryostat shall be able operate continuously at the 1 Kelvin or below with a heat load of 30 mW, for at least 1 week. Rationale: Various more complicated experiments on the DUT can take as long as 1 week.	D
Requirement R-1000-020	The Cryostat shall be monitored by at least one thermometer per stage with a resolution of 0.1 Kelvin or better. Rationale: Required to make sure that the temperature is known during each experiment.	D
Requirement R-1000-025	The Cryostat shall be monitored by at least one thermometer per stage calibrated with an accuracy of 0.2 Kelvin or better. Rationale: Required to make sure that the temperature is known during each experiment.	C
Requirement R-1000-030	The Cryostat shall be upgradable to a working dilution refrigerator capable of base temperatures below 100 mK. Rationale: Required flexibility for future research and applications to reduce risks for TNO.	A
Requirement R-1000-035	The Cryostat shall ensure that the temperature of the cold plate has a maximum peak to peak variation of 0.05 K with a varying heat load.	D

Requirement	Description	Validation Method
	Rationale: To ensure a stable environment for measurements and repeatability between measurements.	
Requirement R-1000-040	The vacuum housing of the cryostat shall be removable in separate parts, each part weighing equal or less than 22.5 kg. Rationale: To make sure a single operator can perform the action to open the fridge and change the device under test from the sample chamber.	I
Requirement R-1000-045	The vacuum housing of the cryostat shall be removable in the direction of the floor, and the housing design shall take this into account. Rationale: To make sure a single operator can perform the action to open the fridge and change the device under test from the sample chamber.	I
Requirement R-1000-050	The required tooling for the removing of the vacuum housing of the cryostat shall be included in the delivery. Rationale: We require a working system from this Tender.	I

8.1.3 Subject-matter 'Free-Space Optics Interface'

Requirement	Description	Validation Method
Requirement R-1100-005	The Cryostat shall contain a free-space optical interface connecting the optics at atmospheric pressure to the DUT using an optical window on the top platform of the cryostat and removable optical windows at the 50 K, 4 and 1 K stages of the cryostat. Rationale: A free-space interface is required for our experiments.	I
Requirement R-1100-010	The optical window on the housing shall be located centered on the top of the cryostat. Rationale: The top of the cryostat has been chosen as a baseline after discussions with suppliers to create the biggest possible aperture. We require the window to be center to be aligned with the sample space and magnet bore.	I
Requirement R-1100-015	The optical windows on the stages within the cryostat shall be located centered on the stage and allow for line-of-sight between the window of the housing and the center of the sample space. Rationale: The top of the cryostat has been chosen as a baseline after discussions with suppliers to create the biggest possible aperture. We require the window to be center to be aligned with the sample space and magnet bore.	I
Requirement R-1100-016	At the Room Temperature, 50K, 4K and 1K stages there shall be a clear aperture of at least 40 mm when the optical windows are removed. Rationale: At the 50K stage we want to mount a lens with 40 mm diameter, which will be mounted on a lens tube mount with 50.2 mm. Of this lens, a diameter of 35 mm is used, a 40 mm clear aperture gives some leeway.	I
Requirement R-1100-017	At the 50K stage there shall 6 holes surrounding the optical window such that a lens mount can be mounted there. Rationale: To fixate the lens mount at the correct distance.	I
Requirement R-1100-025	The optical window on the housing (room temperature platform) shall have a diameter of 40 mm. Rationale: A free-space interface is required for our experiments.	D
Requirement R-1100-030	The mount for the optical window on the housing (room temperature platform) shall be of type KF40. Rationale: Standard in case the window shall be replaced. for the lenses we are planning to use.	D
Requirement R-1100-040	Where used, the optical windows shall have a transmission of 95% or more for light of any wavelength within the range between 532 nm to 800 nm. Rationale: Transmission requirement to limit losses towards the DUT.	T
Requirement R-1100-045	Where used, the optical windows shall have a transmission of 97% or more for light of any wavelength within the range between 619 nm to 637 nm.	T

Requirement	Description	Validation Method
	Rationale: Transmission requirement to limit losses towards the DUT.	
Requirement R-1100-055	Where used, the optical windows defined in requirements R-3000-010 and R-3000-015 shall have a transmitted wavefront error of λ/4 or better (less). Rationale: Required to achieve good optical coupling.	I
Requirement R-1100-060	The optical windows at every stage (including the housing on top of the cryostat) shall be centered with respect with the optical axis of the cryostat with a maximum deviation of 1 mm from the axis. Rationale: The optical axis should be in the middle of the cryostat for the ease of alignment, the center line of the bore of the vector magnet should be aligned w.r.t. to the optical axis.	I

8.1.4 Subject matter 'RF interface'

Requirement	Description	Validation Method
Requirement R-1210-005	The Cryostat shall contain at least 10 RF feedthroughs and RF lines from room temperature to the sample space. Rationale: Required for control of DUT from RF sources outside the fridge.	I
Requirement R-1210-010	The RF Feedthroughs in the Cryostat shall be of the type SMA on the room and vacuum side. Rationale: Chosen for frequency range and as the standard.	I
Requirement R-1210-015	The RF lines shall connect the feedthroughs to the sample space. Rationale: Required for control of DUT from RF sources outside the fridge.	I
Requirement R-1210-020	The RF lines shall be thermalized at each stage. Rationale: Required to avoid unnecessary heat load on the sample space.	I
Requirement R-1210-025	The RF lines shall consist of segments between: - The room temperature and 50 k stage - The 50k and the 4K stage - 4K stage and final (1K or below) stage Rationale: Required to debug and/or replace damaged RF lines. Such that the user can replace the lines effortless.	I
Requirement R-1210-035	The RF lines shall have a bandwidth of 15 GHz or more, defined as 0-15 GHz. Rationale: Required for control of DUT from RF sources outside the fridge.	T
Requirement R-1210-040	The RF lines shall have SMA connectors at the sample space side. Rationale: Chosen for frequency range and as the standard.	I
Requirement R-1210-045	The RF lines shall allow the inclusion of a patch cable to convert the output connector to SMP at the sample space. Rationale: Some of our devices require a SMP connector on the sample side.	I
Requirement R-1210-050	The RF lines shall have a characteristic impedance of 50 Ohm. Rationale: To avoid impedance mismatches with components outside the cryostat.	T
Requirement R-1210-055	The RF lines shall be able to handle an input RF power on the room temperature side of at least 33 dBm (2 W). Rationale: Required maximum time-average RF power at the DUT.	T
Requirement R-1210-060	The RF lines shall have an attenuation below 5 dB between the input of the feedthrough to the output of the lines at the sample space, in the range of 0-15 GHz. Rationale: To minimize losses and create maximum signal at DUT.	T
Requirement R-1210-065	At least 5 of the RF lines shall have an attenuation below 3 dB between room temperature and the sample space, in the range of 0-15 GHz.	T

Requirement	Description	Validation Method
	Rationale: To minimize losses and create maximum signal at DUT.	

8.1.5 Subject matter 'DC interface'

Requirement	Description	Validation Method
Requirement R-1220-005	The Cryostat shall contain DC feedthrough and DC lines separated over 3 types: - Sample Scanner signal lines - Sample Scanner readout lines - Experimental lines. Rationale: Required for the control of the DUT and positioners for positioning the DUT within the cryostat.	R
Requirement R-1220-010	The DC lines shall be thermalized at each stage. Rationale: Required to avoid unnecessary heat reaching the sample space.	I
Requirement R-1220-015	The DC lines shall consist of segments between: - The room temperature and 50 k stage - The 50k and the 4K stage - 4K stage and final (1K or below) stage Rationale: Required to debug and/or replace damaged lines. Such that the user can replace the lines effortless	I
Requirement R-1220-020	The Sample Scanner signal lines shall consist of at least 6 twisted pairs. Rationale: The DUT requires to positions of up to 6 positioners, we need to be able to control them.	I
Requirement R-1220-025	The Sample Scanner signal lines shall have an electrical resistance of 5 ohm or less. Rationale: 5 Ohm comes from commonly used positioners. This is required to avoid cross-talk between wires.	T
Requirement R-1220-030	The Sample Scanner signal lines shall have a bandwidth of 100 kHz or more. Rationale: Required for the positioners.	T
Requirement R-1220-035	The Sample scanner readout lines shall consist of at least 6 twisted pairs. Rationale: Required for the positioners.	I
Requirement R-1220-040	The Sample scanner readout lines shall have an electrical resistance of 20 ohm or less. Rationale: Wire resistance must be negligible compared to the resistive encoder (10-50 k ohm) in order to be able to use only 3 wires for readout.	T
Requirement R-1220-045	The Sample scanner signal and readout feedthrough connectors on the room temperature side shall be of the type Fischer connector. Rationale: Required for the positioners.	I
Requirement R-1220-050	The Sample scanner signal and readout lines connectors on the sample space side shall be of the type micro-D connector. Rationale: Required for the positioners.	D
Requirement R-1220-055	The experimental lines shall consist of at least 12 twisted pairs. that allow for voltages up to 300 V with a bandwidth of 100 kHz or more. Rationale: Required for the control of electronics on the DUT as well as measurements.	I
Requirement R-1220-060	The experimental feedthrough connectors shall be of the type fischer connector, sub-D or micro-D. Rationale: The standard within our systems.	I
Requirement R-1220-065	The experimental lines connectors at the sample space shall be of the type micro-D. Rationale: The standard for our DUTs.	I

8.1.6 Subject matter 'Fiber interface'

Requirement	Description	Validation Method
Requirement R-1230-005	The Cryostat shall contain at least 16 optical fibers and feedthrough's. Rationale: Required for DUT, amount given by the maximum amount we foresee to use.	I
Requirement R-1230-010	The optical fiber feedthroughs shall be suited for FC-APC fiber connectors. Rationale: Using FC-APC, for limiting reflections and standardized connections.	I
Requirement R-1230-015	There shall be optical fiber lines to connect the input feedthrough to the sample space. Rationale: Required to bring the light from outside to the DUT.	I
Requirement R-1230-020	The optical fiber lines shall be thermalized at each plate. Rationale: Required to avoid unnecessary heat reaching the sample space.	I
Requirement R-1230-025	8out of the 16 fiber lines shall be of the type PM460-HP fiber with FC-APC connectors. Remark: Polarization maintaining is required too Rationale: The DUT requires light from 532 nm to 620 nm. Therefore, this fiber type seems the optimal choice with a single mode range of 460 nm to 700 nm.	I
Requirement R-1230-030	8 out of the 16 fiber lines shall be of the type PM630-HP fiber with FC-APC connectors. Rationale: The DUT requires light from 637 nm to 850 nm. Therefore, this fiber type seems the optimal choice with a single mode range of 570 nm to 850 nm.	I
Requirement R-1230-035	The optical fiber lines shall provide strain relief at the sample space end of each fiber. Rationale: To prevent fibers from breaking.	I

8.1.7 Subject matter 'Vector Magnet'

Requirement	Description	Validation Method
Requirement R-1300-005	The Vector Magnet shall have a bore of 93 mm or larger. Rationale: To ensure the DUT, actuators and mounting of both fit.	R
Requirement R-1300-010	The sample space (empty for the user to place components) shall have a height of at least 160 mm, as defined from the center of the magnetic field within the vector magnet to the bottom of the experimental space, and a radius of at least 93 mm. Rationale: The total height of the positioning system with the selected positioners and sample will be about 130 mm. The height is required so the sample is close/in the field center.	I
Requirement R-1300-015	The Vector magnet shall be able to create a magnetic field in the range of 0 to 1 Tesla in steps of 0.1 milliTesla or smaller in the X, Y and Z directions. Rationale: Required to create magnetic fields at the place of the DUT. Depending on the measurement we require a different magnitude and/or direction of the field.	T
Requirement R-1300-020	The Vector magnet shall be equipped with the persistent switches for all three magnetic coils. Rationale: Persistent switches allow for low energy consumption and stable operations.	D
Requirement R-1300-025	The Vector magnet shall be monitored by at least one thermometer. Rationale: To ensure stable operation.	I
Requirement R-1300-030	The vector magnet shall have a homogeneity of 1% or better over 10 mm diameter spherical volume in the Z direction. Rationale: To ensure stability over the DUT.	D
Requirement R-1300-035	The vector magnet shall have a homogeneity of 1% or better over 10 mm diameter spherical volume in the X and Y direction. Rationale: To ensure stability over the DUT.	D
Requirement R-1300-040	The system shall include a suitable power supply for the vector magnet. Rationale: To ensure a complete and working system.	I

8.1.8 Subject matter 'Cryostat Supporting Frame Requirements'

Requirement	Description	Validation Method
Requirement R-2000-005	The supporting frame of the cryostat shall have a height equal to or below 2,60 m. Rationale: To be installed in a laboratory with a ceiling height of 320cm. An optical breadboard will be mounted on top of the frame for the coupling of the light in the fridge. For adjusting the optics, the frame of the cryostat shall be at most 260cm in height.	I
Requirement R-2000-010	At a facility with 320 cm height, the supporting frame of the cryostat shall allow for the placement of an optical breadboard of 90 cm by 90 cm, with 12,7 mm height, adjacent to the window on top of the cryostat mentioned in requirement R-1100-010. Rationale: An optical breadboard will be mounted on top of the frame for the coupling of the light in the fridge.	I
Requirement R-2000-015	The system shall not contain components above a height of 3,00 m. Rationale: To be installed in a laboratory with a ceiling height of 320cm.	I
Requirement R-2000-020	The supporting frame of the cryostat shall have a maximum width of 1,30 m and a maximum length of 1,80 m. Rationale: The laboratory in which the system will be installed has limited space. The footprint of the system is desired as small as possible with a maximum width and length of 1,30 m x 1,80 m. As described below we have a preference for a fridge as small as possible.	I
Requirement R-2000-025	The supporting frame shall ensure vibrations in the horizontal plane are below 10 um RMS between the cold plate and support frame. Rationale: To be able to efficiently couple optical light from the breadboard on top of the optical frame to the device under test within the cryostat, the vibrations should be limited.	D

8.1.9 Subject matter 'Software and system control'

Requirement	Description	Validation Method
Requirement R-3000-005	The system shall be controllable and monitorable via a control unit. Rationale: Control of the system via a control unit is required for the acceptance test of the system and integration into the setup.	I
Requirement R-3000-010	The system shall be controllable and monitorable remotely via a software package. After the cryostat system is integrated into the setup, we want to remotely control and monitor the setup using software.	I
Requirement R-3000-015	The software package shall be able to run on windows and/or linux computers. Rationale: Our labs have windows and linux computers so the software should run on one of them.	I
Requirement R-3000-020	The software package shall allow to turn off internet-enabled functionality, such as: - (Automatic) updates - Forwarding of usage information Remark: If the software package doesn't contain internet-enabled functionality, this requirement is not applicable. Rationale: We need to be aware of, and have control over, any security-related behaviours of the devices we have in the lab.	I
Requirement R-3000-025	The software package (requirement R-3000-010) shall be able to control the following functionality: - Pumping down and venting the system - Cooling down the sample to a temperature specified by the user down to the base temperature - Warm-up the system to ambient temperature - Power of the heaters at the 1K plate Rationale: After the cryostat system is integrated into the setup, we want to remotely control and monitor the setup using software. This is the minimal controllable system functionality.	I

Requirement	Description	Validation Method
Requirement R-3000-030	The software (requirement R-3000-010) shall be able to show the following system parameters: - Vacuum pressure - Temperature of each stage - Temperature of the DUT - Temperature of the Vector magnet - Magnetic field magnitude (based on a recent (<5 second) measurement of the electrical current that is computed to the magnetic field magnitude using a known & measured calibrated magnetic field magnitude vs electrical current dataset) Rationale: After the cryostat system is integrated into the setup, we want to remotely control and monitor the setup using software. This is the minimal monitored system functionality.	I
Requirement R-3000-035	The software package and python interface shall show the current values for the parameters defined in requirement R-3000-030 with a maximum delay of 5 seconds. Rationale: Required for the Operator controlling the experiments.	D
Requirement R-3000-040	The software package shall display a graph with the evolution of the parameters defined in requirements R-3000-030 for the previous 3 months. Rationale: Would increase the user-friendliness for the operator when studying results from past experiments.	I
Requirement R-3000-045	The software package and python interface shall allow the user to monitor the value of the parameters defined in requirement R-3000-030 with the minimum resolutions of (or better): - Temperature - 0.1 Kelvin - Pressure – 1 x 10^{-7} mbar Rationale: Required for the operator to know the status of the system.	I
Requirement R-3000-050	The software package and python interface shall allow the user to set the temperature value with a minimum resolution of: - Temperature - 0.1 Kelvin Rationale: Required for the Operator controlling the experiments.	D
Requirement R-3000-055	The control unit shall allow be able to control the following functions: - Pumping down and venting the system - Cooling down the sample to a temperature specified by the user down to the base temperature - Warm-up the system to ambient temperature - Power of the heaters at the 1K plate Rationale: Required for the Operator for acceptance tests.	I

8.1.10 Subject matter 'Gas Handling System'

Requirement	Description	Validation Method
Requirement R-4000-005	The Gas handling system shall be able report the pressure of the gasses to the user. Rationale: For maintenance and safety.	I
Requirement R-4000-010	The system shall warn the user when the pressure of the gasses is too low. Rationale: For maintenance and safety.	I
Requirement R-4000-015	The system shall include the required gases for the operation of the system. Rationale: The system should work out of the box.	I
Requirement R-4000-020	The gas handling system shall be possible to be placed at a distance of 6 meter or more from the cryostat. Rationale: Gas handling system shall be in another room e.g. the hoses and cabling shall be at least 6 meters long	I
Requirement R-4000-025	The gas handling system shall be able to be filled by the operator. Rationale: This is required for continuous operation within TNO.	I

Requirement	Description	Validation Method
Requirement R-4000-030	The gas handling system shall include all tooling required to be filled by the operator. Rationale: This is required for continuous operation within TNO.	I
Requirement R-4000-035	The Gas Handling System components shall all be contained in a single rack/cabinet. Rationale: Needed to reduce footprint of the system in the lab. There's no room for more than one cabinet.	I

8.1.11 Subject matter 'Compressor'

Requirement	Description	Validation Method
Requirement R-5000-005	The compressor shall be controlled remotely via a software package. Rationale: We want to be able to remotely operate the setup.	I
Requirement R-5000-010	The compressor shall have a strategy to prevent the existence of contaminant gases in the helium. Rationale: To prevent reduction of cooling power and proper working of the system.	I
Requirement R-5000-015	The compressor shall be water cooled. Rationale: To prevent the heat load in the compressor room.	I
Requirement R-5000-020	The compressor shall be possible to be placed at a distance of 6 meter or more from the cryostat. Rationale: compressor shall be in another room, e.g. the hoses and cabling shall be at least 6 meters long	I
Requirement R-5000-025	The compressor shall have a minimal lifetime of 2 years of continuous operation. Rationale: This is the minimal lifetime we expect from the system as a whole.	I

8.1.12 Subject matter 'Facilities'

Requirement	Description	Validation Method
Requirement R-6000-005	The electric power connections of the System shall have double poled fusing or circuit breakers (fuses placed in both the phase (s) and neutral conductors). Rationale: TNO safety standard.	I
Requirement R-6000-010	The electric power supplies for the system shall be of the types: 240 Volt, 1 phase, 50 Hz and / or 400 volt, 3 phase, 50 Hz. Rationale: The Cryostat shall comply with the building resource specifications.	I
Requirement R-6000-015	The gas handling system and compressor shall able to be located in a separate room, separated by a wall from the cryostat. Rationale: To limit noise, the GHS and compressor shall be separated from our experimental setup.	I
Requirement R-6000-020	The gas handling system and compressor together shall be able to fit on a floorspace of 2 meter wide by 1 meter long. Rationale: To fit the facility.	I
Requirement R-6000-025	The shipping boxes including the equipment shall fit through a door of 250 cm wide and 250 cm height. Rationale: To be able to enter the facility.	I
Requirement R-6000-030	The shipping boxes including the equipment shall not weight more than 1500 kg per shipping box. Rationale: To be able to enter the facility.	I
Requirement R-6000-035	The unboxed equipment shall have a maximum size of 130cm wide and 202 cm height. Rationale: To be able to enter the lab.	I

8.1.13 Subject matter 'General & Contractual aspects'

Requirement	Description	Validation Method
Requirement 8.1.13.1	Critical design review (CDR) The objective of the CDR is to confirm that the equipment and all deliverables satisfies the requirements. It establishes the compatibility of external & internal interfaces and the compliance of the design with contractual requirements (predicted and/or measured). The successful completion of the CDR permits the Supplier to start the manufacturing of the system. The CDR will contain the following details: - Physical dimensions of the system and system components. - External and internal interface location and dimensions of the system. - Showing the design meets the functional and performance requirements. The acceptance of the CDR shall by achieved using a written document, to be signed by both parties. In the event that the CDR fails to meet the requirements, the supplier or TNO must set out such failure in a written statement, to be signed by both parties. The supplier must then provide TNO with corrective action plan within fourteen (14) calendar days from the date of signing. The supplier must remedy these deficiencies at no additional cost within the timeframe set out in the corrective action plan, but not exceeding 1 month.	R

Requirement 8.1.13.2	Site Acceptance Test (SAT)
	The SAT contains the following checkpoints:
	- The cryostat will be checked for damages;
	- The proper functioning of the equipment will be checked;
	  o Mechanical functions,
	  o Electrical safety- and switching functions,
	  o Gas safety and functions,
	  o Vacuum functionality,
	  o Cryogenic functionality,
	  o User interface(s), including software.
	- All requirements (such as requirements R-0000-025, R-1000-005, R-1000-10, R-1300-10, etc.) and possible additional requirements will be checked;
	- The presence and quality of the documentation will be checked
	
	A full user acceptance test on-site of the contracted tenderer must be performed by the Tenderer in cooperation with TNO.
	
	Following approved user acceptance test on-site, the cryostat shall be at the unrestricted disposal of TNO for one month. If the cryostat works according to TNO's functional and technical specifications, without faults and/or malfunctions during operational mode, the test period is considered successfully concluded by TNO. If the cryostat is not operating in this period according TNO's functional and technical specifications, the faults and/or malfunctions will be remedied and another test period of one month must successfully be concluded and approved by TNO, up to a maximum of three test periods of one month each.
	
	The details of the site acceptance test shall be agreed between the user and the supplier. Tenderer must submit a draft test protocol for the site acceptance test with its Tender.
	
	In the event that the deliverables fail to meet the user Acceptance Criteria for the SAT, the Supplier must set out such failures in a written statement, to be signed by both parties. The supplier must then provide TNO with a corrective action plan for such failures within fourteen (14) calendar days from the date of signing of such statement. The supplier must remedy these deficiencies at no additional cost within the timeframe set out in the corrective action plan, but not exceeding 3 months. A new acceptance test will then take place.
		I

Requirement 8.1.13.3	Terms and conditions of payment - 20% at order, after receipt of a bank guarantee covering 40% of the total amount. - 20% after the critical design review (CDR) acceptance by TNO (Requirement 8.1.13.1). - 40% after delivery at location TNO Delft, STW At this moment TNO will return the bank guarantee.	R

Requirement	Description	Validation Method
	- 20% after installation and commissioning On-site and Site Acceptance Test (SAT) including test periods, approved by TNO, Management Quantum Technology and Procurement. The Tenderer to whom the Contract will be awarded must provide a bank guarantee to TNO, covering at least 40% of the total price. The Bank guarantee and the bank who issues the Bank guarantee have to be approved by TNO (minimal A rating). TNO must have the right to draw the bank guarantee in any and all cases where Tenderer falls short in fulfilling its obligations under the Contract. The validity of the bank guarantee may not expire until approval of the SAT by TNO Management and Procurement. Alternatively to a bank guarantee, TNO also accepts a Parent Company Guarantee, in which the parent company agrees to the repayment of the progress payment in the event that tenderer, or wholly owned subsidiary, defaults on the supply of an cryostat, which is the subject of this order.	
Requirement 8.1.13.4	When supplying the cryostat, the Tenderer shall provide a Mill Test Certificate (MTC), or similar certificate such that it meets the requirements and obligations to establish the country of origin (further specified in paragraph 5.2.4).	C
Requirement 8.1.13.5	Maintenance/services Contract, further specified in paragraph 1.5.	R
Requirement 8.1.13.6	The Tenderer must have comprehensive maintenance facilities within Europe. These facilities should be equipped to handle all aspects of maintenance, including diagnostics, repairs, and parts replacement. The facilities must be strategically located to ensure quick and efficient service delivery	R
Requirement 8.1.13.7	User manual with detailed description of the hardware and software, including any custom made options. Rationale: To provide clear understanding of the system's functionalities, facilitate effective utilization and help with the troubleshooting of the instrument.	R
Requirement 8.1.13.8	The Contract will be executed through a purchase order, incorporating the Purchasing Conditions for Goods TNO 2022 and Incoterms 2020 Delivered Duty Paid (DDP), see paragraph 2.2.18.	R

8.2 Programme of Preferences/Questions

8.2.1 Quality element 'Upgradability to dilution refrigerator'

Preference QY 1 **Max. 100 points**	As our current research line has uncertain factors, it is important that we have the flexibility to upgrade the Sub-Kelvin fridge to a dilution refrigerator, allowing to change the purpose of the fridge. Describe the process of upgrading the Sub-Kelvin fridge to a full dilution refrigerator and the specifications of the resulting dilution refrigerator. The following items must be elaborated by the Tenderer in this regard: - How long will the fridge be unusable for experiments during the upgrade? - What parts need to be added or replaced in the upgrade? - What is the cooling power for 100mK? - How many litres of He-3 and He-4 are necessary for operation?	Validation method: R
	The complete answer for Preference QY 1 must not exceed **a maximum of three (3) A4 pages**. If the answer is longer than 3 pages, the excess pages will not be included in the assessment. Also, the Tenderer should submit its answer **to each bullet point (!) and in the same order *("from top to bottom")* of the bullet points under this preference**.	
Assessment criteria:	The assessment of this sub-sub-criterion involves considering the extent to which the response is specific, realistic, achievable, effective, complete and consistent. To what extent does the answer align with TNO's situation, the stated preference/question and the PoR. The assessment will be based on the overall impression created by the answers given. The aspects "specific, realistic, achievable, effective, complete and consistent" are not sub-sub-award criteria that are assessed individually.	

	This sub-sub-criterion is rated in absolute terms in accordance with the table as included in Section 6.1.2 with a score between 0% (no/poor answer) and 100% (very good answer).

8.2.2 Quality element 'Cooling power'

Preference QY 2 **Max. 150 points**	As stated in requirement R-1000-010 the minimum cooling power at 1K stands at 30 mW. For expanding our experiments in the future, more cooling power at 1K will allow for more complicated experiments. Specify the cooling power at 1K with all components in place and thermalized (e.g. the vector magnet, optical window(s), and optical fibers, RF lines and DC wiring) as measured on the cold plate.	Validation method: D
	The complete answer for Preference QY 2 must not exceed **a maximum of one (1) A4 page**. If the answer is longer than 1 page, the excess pages will not be included in the assessment.	
Assessment criteria:	Every additional mW of cooling power above 30 mW will give 5 extra points up to a maximum of 150 points.	

8.2.3 Quality element 'Interface and Control'

Preference QY 3 **Max. 100 points**	The system should allow easy integration into our experimental setup and software framework, including remote control and readout of relevant system operations (such as temperature, pressure, etc.). Describe the control API, the features of the work panel and other features related to the control of the system, including (continuous) availability of drivers for different operating systems and automated scripts for operation of the system. Some of our preferences: ➢ A properly documented protocol for monitoring and control is strongly preferred over access exclusively via programming-language specific API support that ultimately depends on binary components, such as DLLs for Windows or shared object (.so) files for Linux. **Rationale:** Such binary drivers are often tied to specific versions of the OS, and introduce undesirable dependencies in the software, and may render the device useless in the future if the OS makes an ABI-breaking change and the device vendor does not update their drivers. ➢ A hardware interface based on Ethernet using TCP/IP is preferred over alternatives (e.g. Ethernet/UDP, Ethernet/Custom, USB-based interfaces using USBTMC or serial-over-USB). **Rationale:** Ethernet provides more flexibility with respect to the physical placement of the device relative to the controlling PC, and is generally a more robust interface compared to USB. TCP provides flexibility to monitor and control device traffic. An automated and robust operation of the system is important for our experiments. Describe how the system ensures automated and robust operation. Include in your answer at least the following: - Does the fridge rely on a local PC for operation? - Is the fridge unaffected by a crash of any PC connected to it? - Is the valve of the bypass of the compressor closed automatically after condensation? - Does the fridge store a user-accessible log of the received commands and errors it encountered?	Validation method: R
	The complete answer for Preference QY 3 must not exceed **a maximum of two (2) A4 pages**. If the answer is longer than 2 pages, the excess pages will not be included in the assessment. Also, the Tenderer should submit its answer **to each bullet point (!) and in the same order *("from top to bottom")* of the bullet points under this preference**.	

Assessment criteria:	The assessment of this sub-sub-criterion involves considering the extent to which the response is specific, realistic, achievable, effective, complete and consistent. To what extent does the answer align with TNO's situation, the stated preference/question and the PoR. The assessment will be based on the overall impression created by the answers given. The aspects "specific, realistic, achievable, effective, complete and consistent" are not sub-sub-award criteria that are assessed individually. This sub-sub-criterion is rated in absolute terms in accordance with the table as included in Section 6.1.2 with a score between 0% (no/poor answer) and 100% (very good answer).

8.2.4 Quality element 'Maintenance and support'

Preference QY 4 **Max. 100 points**	As broken parts can cause downtime of the system, it is important that a good support infrastructure is present. Include in your answer the following points: - How is preventive maintenance of the fridge organized? - How is the repair or replacement of broken components organized? - What is the normal interval between maintenances? Indicate the typical timeframe (from failure to restart of the experiments) for replacing a critical component in the system including: ➢ A broken part in general ➢ Compressor parts ➢ Cryostat parts (e.g. the pulse tube) ➢ A broken pump ➢ A broken turbo ➢ A broken magnet Describe the required preventive maintenance and schedule of the cold parts, the vacuum system, and the electronics. What is the lifetime of the compressor? This should meet minimally requirement R-5000-025.	Validation method: R
	The complete answer for Preference 8.2.1 must not exceed **a maximum of three (3) A4 pages**. If the answer is longer than 3 pages, the excess pages will not be included in the assessment. Also, the Tenderer should submit its answer **to each bullet point (!) and in the same order *("from top to bottom")* of the bullet points under this preference**.	
Assessment criteria:	The assessment of this sub-sub-criterion involves considering the extent to which the response is specific, realistic, achievable, effective, complete and consistent. To what extent does the answer align with TNO's situation, the stated preference/question and the PoR. The assessment will be based on the overall impression created by the answers given. The aspects "specific, realistic, achievable, effective, complete and consistent" are not sub-sub-award criteria that are assessed individually. This sub-sub-criterion is rated in absolute terms in accordance with the table as included in Section 6.1.2 with a score between 0% (no/poor answer) and 100% (very good answer).	

8.2.5 Quality element 'Track record of upgrades to dilution fridges'

Preference QY 5 **Max. 150 points**	As our current research line has uncertain factors, it is important that we have the flexibility to upgrade the Sub-Kelvin fridge to a dilution refrigerator, allowing to change the purpose of the fridge. With this said we value previous experience on delivering systems that fulfill our needs as presented in this document. Demonstrate your previous experience in upgrading cryostats to full dilution fridges. Include in your answer the following points: ➢ How many 1 K systems has the tenderer upgraded to a sub-Kelvin fridge?	Validation method: R

	➢ TNO prefers a supplier with more experience	
	The complete answer for Preference QY 5 must not exceed **a maximum of two (2) A4 pages**. If the answer is longer than 2 pages, the excess pages will not be included in the assessment.	
Assessment criteria:	The assessment of this sub-sub-criterion involves considering the extent to which the response is specific, realistic, achievable, effective, complete and consistent. To what extent does the answer align with TNO's situation, the stated preference/question and the PoR. The assessment will be based on the overall impression created by the answers given. The aspects "specific, realistic, achievable, effective, complete and consistent" are not sub-sub-award criteria that are assessed individually. This sub-sub-criterion is rated in absolute terms in accordance with the table as included in Section 6.1.2 with a score between 0% (no/poor answer) and 100% (very good answer).	

8.2.6 Quality element 'Magnetic field homogeneity'

Preference QY 6 **Max. 100 points**	In our experiments, we may have multiple emitters on a single DUT and it may be beneficial to minimize the differences in the magnetic field they are subjected to. The Tender which offers the highest Field Homogeneity (FH), corresponding to the lowest variation of magnetic field over 10 mm diameter spherical volume (DSV) from the center of the vector magnet bore, will be awarded the maximum of 25 points. Other Tenders will be scored pro rata in inverse proportion to Field Homogeneity. As stated in Requirement R-1300-025 and R-1300-030 a variation equal to or below 1% over a 10 mm diameter spherical volume minimum values is required, thus, tenders showing a higher variation than this will not be considered.	Validation method: D
	The complete answer for Preference QY 6 must not exceed **a maximum of one (1) A4 page**. If the answer is longer than 1 page, the excess pages will not be included in the assessment.	
Assessment criteria:	Considering that suppliers can present different values for the transversal (XY) and longitudinal (Z) components of the magnetic field homogeneity, the calculation of the total number of points for magnetic field homogeneity is made using the following formula: $$H_{xy} = 50 - \left\{\frac{(I_{xy} - LI_{xy})}{LI_{xy}} .50\right\} \qquad H_Z = 50 - \left\{\frac{(I_z - LI_z)}{LI_z} .50\right\}$$ $$H = H_z + H_{xy}$$ Where: - H: Number of points scored for the criterion Magnetic field homogeneity - Hz: Number of points scored for the criterion Magnetic field homogeneity in the Z direction - Hxy: Number of points scored for the criterion Magnetic field homogeneity in the XY plane - Ixy: Field Homogeneity over 10 mm DSV X and Y direction of the tender being evaluated in percentual points - LIxy: Field Homogeneity over 10 mm DSV X and Y direction of the tender with highest Field Homogeneity (lowest percentual variation) - Iz: Field Homogeneity over 10 mm DSV Z direction of the tender being evaluated in percentual points - LIz: Field Homogeneity over 10 mm Z direction of the tender with highest Field Homogeneity (lowest percentual variation)	

8.2.7 Quality element 'Magnetic field stability'

Preference QY 7 **Max. 100 points**	In our experiments we are looking for low drifts in the magnetic field when it is in persistent mode. To ensure similar conditions for experiments performed at different points in time. Describe the expected drift of the magnetic field in ppm/hour or percentual points and the measures that are taken to minimize the drift. This should take into account the situation with the persistent switches turned on.	Validation method: D
	The complete answer for Preference QY 7 must not exceed **a maximum of one (1) A4 page**. If the answer is longer than 1 page, the excess pages will not be included in the assessment.	
Assessment criteria:	The assessment of this sub-sub-criterion involves considering the extent to which the response is specific, realistic, achievable, effective, complete and consistent. To what extent does the answer align with TNO's situation, the stated preference/question and the PoR. The assessment will be based on the overall impression created by the answers given. The aspects "specific, realistic, achievable, effective, complete and consistent" are not sub-sub-award criteria that are assessed individually. This sub-sub-criterion is rated in absolute terms in accordance with the table as included in Section 6.1.2 with a score between 0% (no/poor answer) and 100% (very good answer).	

8.2.8 Questions

Question 1	Corporate Social Responsibility is becoming increasingly important in our own organization and in the future TNO will also ask more from our suppliers to play a part in this. What possibilities have you already initiated and where do you see opportunities for yourself and for TNO in future?
Question 2	As you're aware, ISO 20400 is an international standard that provides guidelines on sustainable procurement. The standard can be used by any organization that intends to improve their social, economic, and environmental sustainability. Considering the growing awareness with regard to sustainable business practices, nationally and internationally, whether required by laws and regulations, promoted by the UN Sustainable Development Goals, or even by the changing societal expectations – there are a myriad of reasons in today's world that drive organizations to be more sustainable, including TNO. Do you embrace the ISO 20400 guideline and, if so, are you currently implementing it in your own organisation or will you be implementing it in the coming period?
Question 3	Laboratory instruments that TNO uses for its scientific research consume a lot of power and also consist of very high-quality raw materials. For the benefit of the corporate social responsibility (CSR), are you making or willing to make technological investments to reduce power consumption during the use of the instrument, without negatively affecting the technical application of the instrument?
Question 4	Biobased Goods are made of materials derived from fully renewable sources. TNO is considering to require in future Goods that devices be made (in part) from biobased materials. Can you give TNO some insight into whether this is feasible for the Goods in your portfolio, and if so, which biobased Goods do you think could be used as alternative Goods?
Question 5	Are you experiencing negative impacts from global problems in your supply chain and, if so, what measures have you taken to ensure, for example, that you can meet agreed delivery deadlines?

9 List of Annexes

All the Annexes appended to the Procurement Documents are published with the Procurement Guide at www.TenderNed.nl.

The Annexes are divided into three (3) main groups, namely:

A) Submission of Tender:

Annex A01	The Tenderer's ESPD, "European Single Procurement Document" (ESPD) o *If applicable, this format should be multiplied in proportion to the number individual Combination members; the individual Third Party or for the benefit of one or more subcontractors to be used for the work).*
Annex A02	Format for Reference Projects
Annex A03	Format for Price Sheet
Annex A04	Answer to questions/compliance with preferences, sub-award criterion: Quality
Annex A05	Maintenance/Services' (own format).

B) Submission of supporting documents:

Annex B01	Format for Declaration as to Reliance on Financial and Economic Standing of Third Party or Parties
Annex B02	Format for Declaration as to Reliance on Technical and Professional Competence of Third Party or Parties
Annex B03	Format for Statement of Policy/Declaration as to Insurance

C) Additional information:

Annex C01	Standard Template for Tenderer Questions
Annex C02	Draft Contract
Annex C03	TNO's Purchasing Conditions for Goods TNO 2022.

Additional note on Section 2.2.2 Formats
Some of these Annexes are accessible in "editable" MS Excel or MS Word versions. This is with the aim of simplifying the preparation of a Tender by the Tenderer and therefore also forms the basis for the assessment procedure as described in Section 3.
Some documents may be, partially, secured to prevent inadvertent and unintentional changes being made to the documents and texts (including format texts).

Changes to the formats are not permitted. The premise for these documents is that the text (including format text) as contained in the Procurement Guide and published on www.TenderNed.nl will be the authoritative text at all times.