Memorandum of Information 1

Clarification questions on European Public Tender for "a continuous furnace system, Ref. 2021 FPL/INK151, dated 10-11-2021"

No.	Section nr. / subject	Question	TNO's answer
1	8 - Minimum requirements with regard to Contract performance (Programme of Requirements) - 30	We would like to know if the column of (reference in tenderer's documentation where compliances with the requirement is described (is obligatory and we have to supply technical informations in this step of tender or not))	Correct. The Tenderer should indicate in the Tenderer's documentation where and when possible, how the requirement will be met. TNO is not asking for an in-depth explanation of the requirement or wish here, but would like to know in "broad outline" what solution you have in mind. In case of reasonable doubt TNO will actually verify the correctness of the information and supporting documents provided by you.
2	2.2.9 - Subcontractor - 11	We represent company X in Europe and will be the lead contractor when the contract is awarded to us. X will be the designer and builder of the machine with the necessary knowledge about glass treatment in furnaces. Is this in accordance with 2.2.9?	If you submit a Tender, and you make use of a subcontractor in one of the following manners: 1. Use of subcontractor's credentials to fulfil Eligibility Requirements. If the Tenderer is reliant on the financial, economic, technical and/or professional capacity of a Subcontractor to fulfil the Eligibility Requirements, that subcontractor is also regarded as a Third Party. In such instances, the Tenderer must follow the instructions given in Para. 2.2.10 concerning reliance on the resources of one or more Third Parties. 2. Subcontractor's contribution to fulfilment of Contract. Where the Tenderer meets all Eligibility Requirements unaided but nevertheless wishes to deploy a subcontractor for the fulfilment of the Contract or parts of the Contract, the Tenderer must list all subcontractors to be involved in the fulfilment of the Contract in part IID of the Self-Declaration. then yes, this is in accordance of paragraph 2.2.9
	2.2.23 - Factory Acceptance Test (FAT) - 15	FAT can be performed at our subcontractor's plant, but at this time our subcontractor is unable to accommodate non-employees at their production site due to Covid restrictions. These restrictions change from time to time and thus we cannot guarantee outside access to our facility.	TNO is aware that due to Covid-19 restrictions, established by governments or local authorities, the presence of TNO personnel during an on-site FAT may not be possible, and that a FAT must alternatively be performed remotely. If TNO personnel are authorized to be present on-site during an FAT, you must provide TNO with the latest safety precautions that TNO personnel must observe during the visit to your premises, such as whether or not it is mandatory to wear a mouth mask or to be in possession of a valid vaccination certificate, etc.
3	2.2.3 - Self-declaration - 9	For the "Own Declaration" documents, we don't really see any problems with these questions. However, for our subcontractor, none of this data is in an EU database, as Subcontractor's headquarter is outside Europe.	In order to approve a subcontractor, TNO must ascertain that none of the Grounds for Exclusion listed in the Tender Procedure apply. TNO may require the Contractor or subcontractor to submit evidential documents to establish that this is not the case. If such evidential documents, as referred to in our Tender, cannot be submitted, TNO is entitled to exclude Contractor from the remainder of the Tender Procedure. In the event that foreign companies are unable to submit such evidential documents, as referred to in our Tender, the tenderer must provide a statement in which the tenderer solemnly declares under oath that the grounds for exclusion do not apply to the business.
4	8.2 - Aspect "Heating & atmosphere" - 32	Heating Power / Limit of Electrical Supply. Last year we discussed, that it would make sense to have this furnace as a batch system in the first step, that can be transferred into a continuous system later during scaling up the process. If we take a look into section D of your temperature profile, we see in requirement 8.2.9 a max. heating rate of 0,45 °C/s. If we must have this heating rate in a batch furnace, this would mean a maximum stress for the material e.g. of the inner housing, but also we would need a quite high heating power (600-700 kW) for heating up the system that fast. This is in conflict with you max. allowed electrical supply of 180 A. With this supply we could install roughly 120 kW.	Before TNO published his tender, TNO consulted several market parties to gain more insight into what is technically feasible and/or available. In this way we wanted to give parties the opportunity, not only to get involved at an early stage, but also to think along with us about what the best solution might be for TNO. The context of the market survey as discussed with each party, the provided information, may differ from the information which now is provided in the Tender documents, something we also have said during the market survey. In our current planning is a maximum electrical supply foreseen of 180A, hence more power is not available, 0,45 °C/s => is a specification we need to achieve.
5	8.1 - Aspect "Continuous furnace system - Dimensions and specifications" - 30	Nitrogen Consumption. In the "flushing step", we need to bring down the O2-content to a very low level, so that we would have to flush the atmosphere of the furnace several times, to reduce the O2-content as specified. You have mentioned in requirement 8.1.7 that we may have a max. flow of 50 m^3/h of nitrogen. For the system that we have developed together last summer, this would be too less, as we have a time of 290 s for this step and would need to flush or volume several times, which is roughly 20 m^3.	Before TNO published his tender, TNO consulted the market to gain more insight into what is technically feasible and/or available. In this way we wanted to give parties the opportunity, not only to get involved at an early stage, but also to think along with us about what the best solution might be for TNO. The context of the market survey as discussed with each party, the provided information, may differ from the information which now is provided in the Tender documents, something we also have said during the market survey. A higher max. flow of 50 m^3/h of nitrogen is not permitted.
6	8.1 - Aspect "Continuous furnace system - Dimensions and specifications" - 30	The maximum current is 180 amps - but this will only happen at maximum run-up. At steady state, it would be more likely to be 110 Amps. Does TNO allow for a slower warm-up, where the amperage may be lower?	The continuous furnace system, including all components, shall not consume more energy than 180A at 400V at peak power, and preferably the system consumes less than 180A at 400V 5p. The required 180 A is the maximum permitted energy output to achieve the required start-up speed, and to fully utilize the system. TNO does allow a slower warm-up than 180A at 400V, provided that the requirement under section 8.2 are met.

7	8.1 - Aspect "Continuous furnace system - Dimensions and specifications" - 31	The maximum N2 flow rate is currently 42 M3/h - however, the N2 flow rate is completely dependent on the process needs and we cannot say what the actual steady-state usage will be. Lower N2 usage is possible. it is adjustable under conditions that the process is suitable for it. Our question is whether N2 adjustability is meant in order to reach a good score.	42 m3/h is below 50 m3/h hence the requirement fulfils acceptance, but indeed, lower rates our preferred (preference 8.1.8). In other words, if you could achieve a reduction in N2 consumption, as mentioned in preference 8.1.8, you'll be granted the corresponding score, with a maximum of 28 points. In short, for every 10 m3/h reduction in N2 consumption; you'll be awarded with 7 points, meaning: < 40 m3/h. = 7 pnt < 30 m3/h. = 14 pnt < 20 m3/h. = 21 pnt < 10 m3/h. = 28 pnt If you could achieve such a reduction, you are asked to describe how this adaptability could be achieved, taking into account the conditions for which the process should be suitable, the advantages and disadvantages, if known. Try to describe as fully as possible how you think you can meet TNO's preference.
8	8.2 - Aspect "Heating & atmosphere" - 32	With multiple (>5) adjustable dwell times in a set. Can this be better explained? Each recipe can have a different dwell time with a specific duration and temperature. Our current design does not allow programming multiple dwell times with different dwell times at specific temperatures in one recipe/production run. A recipe consists of a temperature profile and a specific belt speed. Can you explain what you would like to have in the case of intermittent dwell times?	With multiple (>5) dwell times; which is meant that, for instance, substrate is heated and during heating the material is hold at an isotherm for 300sec, subsequently is heated again to a new preset temperature and then kept again at an isothermal etc.
9	8.2 - Aspect "Heating & atmosphere" - 32	It is unlikely that we can make in situ measurements of surface temperature. Where does TNO want the measurement to take place. If it's inside the heated chamber or controlled cooling chamber - basically where the atmosphere is controlled and the process is at a temperature above 100C, we don't have a temperature probe that will give consistent results. The atmosphere of the furnace - with everything burned off the substrate - is usually destructive to temperature sensors. Can TNO tell what might be in the exhaust gases so we can compare it to available probes and determine if they can survive at elevated temperatures and with that atmosphere? Our experience with temperature probes is negative for now.	Pyrometers might be used to determine the temperature. Determination of the temperature of the temperature of a substrate continuously in-line and real time is seen as an advantage, however is not a requirement. Decomposition products to be expected per m^2 at temperatures' greater than 120^{o}C - <50 mg oxalic acid - < 2 mg acetic acid - < 70-100 mg CO2 - < 50-100 mg CO - < 100 mg H2O
10	8.3 - Aspect "General requirements" - 36	Our systems may use some parts that are UL equivalent to CE marked parts in the manufacture of the furnace. They do not have access to some CE-marked parts. The furnace as a whole has CE	Please be aware that the CE Mark is not optional in Europe—it's legally required. A product that is already UL Listed in the U.S. doesn't automatically qualify for the CE Mark. If a UL Listed product has also been tested to the European harmonized standards, then it may be eligible for CE certification; however, it still must receive a CE Mark and have a Declaration of Performance certificate available before it can be used in Europe. By affixing the CE marking to a product, a manufacturer declares that the product meets all the legal requirements for CE marking and can be sold throughout the EEA. In addition to the manufacturer, you also bear the responsibility of placing a machine on the market that is CE compliant, insofar as an EU directive requires it. To be supplied with the machine: - The operating instructions which, in a nutshell, cover all the relevant information required to use the machine safely throughout its lifetime and in all phases of use. - The EC Declaration of Conformity. This is the legal document by which the manufacturer declares that the machine complies with the applicable product directives. - A nameplate with the CE mark must be affixed to the machine. For TNO it is necessary to understand the transition from UL to CE, among other things for safety reasons, and it is necessary to understand which components only have UL certification and not the mandatory CE marking. If necessary, TNO will engage a third party to verify compliance with the European regulations. These costs will have to be borne by you.
11	8.3 - Aspect "General requirements" - 36	FAT can be performed at our subcontractor's facility, but at this time our subcontractor is unable to accommodate non-employees at their production site due to Covid restrictions. These restrictions change from time to time and thus we cannot guarantee outside access to our facility.	The presence of TNO personnel during FAT on site is strongly preferred by TNO, but we understand that due to Government and/or local restrictions, the presence of TNO personnel is not permitted or is subject to strict conditions. TNO will always respect and comply with such measures. If the presence of TNO Personnel is prohibited by your (local) Government, or is subject to specific precautionary measures, you must immediately inform TNO, and in any event at least 5 working days prior to the scheduled FAT. If TNO personnel are not allowed to be present at the FAT, the FAT must be performed remotely. However, TNO believes that every effort should be made to have TNO personnel present during the FAT, especially since travel is no longer restricted.
12	8.7 - Aspect "Terms and conditions of payment" - 39	For payment of the furnace, 80 to 90% is required by our subcontractor before the furnace is shipped. Our payment proposal is 40% at order entry, 40% after FAT (Factory Acceptance Test) before shipment. 10% after delivery, 10% after SAT (Site Acceptance Test). We can issue a bank guarantee up to 60% of the furnace price.	TNO does not agree with your counter-proposal, and retains without change the requirement as stated in the Tender. We believe that our requirement is reasonable, and certainly cannot be considered unreasonable.

13	6.1.1 - Sub-award criterium: Price (TP) - 25	The "Price and Cost Schedule" is set up differently than the way we usually quote our furnaces. We generally provide a base price with additional option prices. We do not break down our base price to provide specific items with prices as requested. For example, for uniformity of temperature to achieve ± 3. we do not have a separate costing available. To what extent is it possible to deviate from the requested layout? Does filling in the "schedule of prices and cost" mean that TNO takes the liberty of excluding certain aspects of the machine? The machine does not consist of options.	To allow a fair price comparison, it is necessary to quote to TNO a price that meets all minimum requirements as stated in the Tender. If a preference does not result in an additional price, it should be clearly stated in Appendix A04. However, if a preference does result in an additional price, you should state so in Appendix A04. TNO requires insight into your basic system and, in addition, insight into: - costs for Two Year Warranty; - costs of FAT & SAT; - costs of Installation on Site; - costs Operator & maintenance training; - costs Delivery of the continuous furnace system according to Incoterms DDP, TNO location BMC, Geleen, The Netherlands"
14	8.5 - Aspect “Trial test on-site” - 38	Has TNO planned or conducted an on-site trial?	Due to the current Covid-19 pandemic, TNO decided not to plan and hold an on-site trials, as not all interested companies would have had the opportunity to eventually organize such a trial. All parties submitting a tender will receive a nil score on this criteria in order to safeguard the Tender Principles.