



Market consultation for Electrospinner (R&D scale to pilot scale) for Wetsus

Introduction

This Market consultation is for a new Electrospinner for Wetsus, European Institute of Excellence for Sustainable Water Technology, Oostergoweg 8, 8911MA Leeuwarden, The Netherlands. After publication of the Market consultation, 2 weeks will be available for sending your reply and 2 weeks for the feedback to your reply.

Wetsus plans to publish a Tender after the results of this Market consultation are known to Wetsus.

Available budget

The available budget for Electrospinner (R&D scale to pilot scale) is **350k€ ex VAT**.

Procedure for the market consultation

Communication

All communication will take place via inkoop@wetsus.nl

Contact for this market consultation (in case TenderNed is not available) is:

Jurre Tjepkema, assistant controller

Jurre.Tjepkema@wetsus.nl

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Time table

The time table that applies to this market consultation is:

Event	Date and time
Submitting publication of the market consultation on Ted and TenderNed	September 20, 2024



Deadline for submitting questions to Wetsus regarding the market consultation	October 14, 2024 12:00 CET
Publication of answers to the submitted questions	October 30, 2024
Deadline for submitting the answers to the market consultation	November 15, 2024 12:00

Please note that in case of inconsistencies the timetable in TenderNed has precedence over this time table. No rights can be derived from the time table or the planning in TenderNed.

Open to all economic actors

This market consultation has been announced on Tenders European Daily and TenderNed. Every market party may take part in this market consultation.

Questions about the market consultation

Market parties will have the opportunity to ask questions about the market consultation procedure or questions.

If the market parties have any questions about the market consultation, they can ask them via inkoop@wetsus.nl until October 14, 2024 12:00 CET. The questions submitted by parties and the answers submitted by Wetsus will be published (anonymized) in an Information Notice on TenderNed before October 30, 2024.

The questions must be provided in MS Excel format, in the form of a three-column table. The first column lists the number of the question in the market consultation or the procedural aspect the question relates to. The second column contains the excerpt from the text to which the question relates. The last column contains the actual question.

Final answers

Final answers to the questions in this market consultation can be submitted only in .docx format via inkoop@wetsus.nl until November 15, 2024.

Level playing field

- Wetsus wants (and legally spoken has) to ensure the existence of a level playing field for all parties involved in the market consultation and has therefore taken at least but not exclusively the following measures:
- Wetsus will adhere to the principles of equal treatment, non-discrimination, mutual recognition, proportionality and transparency.
- In the event of a tender that might follow as a next step there will be no distinction between parties that participated in the market consultation and parties that did not.
- To ensure that no participants in the market consultation are favoured in the event of a tender regarding the sought-for solution, the information shared by Wetsus during the market consultation will also be included in the tender documents.

Conclusions and feedback

The market consultation team will conclude the market consultation by drafting a report of the market consultation. The report will contain what the market consultation team considers to be the most important conclusions of the market consultation. Regarding this report, please note:

- The report will be made publicly available. The market parties will permit the market consultation team to include in this report the answers and other information and/or data provided by the market parties. Wetsus will consider any confidential and competitively sensitive information, provided the information is indicated as such by the relevant party.
- The answers and other information and/or data will be anonymised in the report, although the report will state the participating market parties.
- The report will contain the conclusions as formulated by the market consultation team. The report and its contents will not be exchanged or discussed with the participating parties during the draft phase. The report will however state that the information is presented from the market consultation team's perspective and that this is not necessarily shared by the participating market parties.

Additional provisions

- The entire market consultation will be carried out in English. All documents submitted by interested parties must therefore be in English.
- All communication relating to this call for tenders must be conducted via inkoop@wetsus.nl.
- It is not permitted to directly or indirectly approach Wetsus officials except for Jurre Tjepkema regarding this market consultation.
- In no event whatsoever will any costs incurred by the interested parties about participation in this market consultation be eligible for reimbursement by Wetsus.

- Information in this market consultation can differ from information provided later (within the scope of a call for tenders or another acquisition process).
- No rights whatsoever can be derived from the information provided within the scope of the market consultation.
- The information is for information purposes only and merely intended to increase the quality of the market consultation. If this information contradicts the information provided later (within the scope of a call for tenders or another acquisition process), then the latter will be taken to apply.

Market consultation questions

Our market consultation includes the Technical Requirement List and several open questions relating to your company and the Electrospinner and the relation with Wetsus.

Related to your company and Wetsus we have the following questions:

- 1) Do you consider a partnership with Wetsus as a Research Institute?
- 2) Do you consider such a relation with Wetsus as a bonus to your company?
- 3) How do you consider a training program for Ph-D students for working with the advanced Electrospinning instrument?

Related to the installation and guarantee of the Electrospinner we have the following questions:

- 4) What type of guarantee do you offer after the first year of guarantee on the Electrospinner?
- 5) How do you deal with the Factory Acceptance Test?
- 6) How do you deal with the Site Acceptance Test?
- 7) How is your Service on Site at Wetsus facilities? Give your Service Response Time please.

Related to your company and Wetsus we have the following questions about upscaling:

- 8) How do you deal with upscaling using the input parameters of the pilot Electrospinner?
- 9) What can you say about the production of electrospun layers at your facility?
- 10) Is your production facility open to manufacturing of membranes on a larger scale?
- 11) Do you have a production facility that works with 3 different materials for the same product?

Related to the Electrospinner we have defined several Technical Requirements.

The Electrospinner needs to be delivered together with an Environmental Control Unit ECU that enables heating and cooling and drying and humidifying between 18°C and 45°C and regulation of the relative humidity. We give here the Technical Requirement List first in several parts.

Part 1 of the Technical Requirement List

Technical requirement	Give range
First high voltage power supply (positive) of at least 60kV differential between emitter-collector	Maximum pos voltage in kV
Second positive high voltage power supply (positive) of at least 60kV differential between emitter-collector	Maximum pos voltage in kV
Third positive high voltage power supply (positive) of at least 60kV differential between emitter-collector	Maximum pos voltage in kV
Forth high voltage power supply (negative) of at least 60kV differential between emitter-collector	Negative voltage in kV
First large volume peristaltic liquid feeding system with precise gravimetric dose control of at least 1L	Maximum volume in L
Second large volume peristaltic liquid feeding system with precise gravimetric control of at least 1L	Maximum volume in L
Third large volume peristaltic liquid feeding system with precise gravimetric control of at least 1L	Maximum volume in L
Environmental Control Unit ECU: give range of humidity for temperature range of 18°C and 45°C	..% RH to ..% RH
Actively regulated exhaust system	give m ³ /h
Conveyor belt mechanism for roll-to-roll (substrate winding speed): 1 mm/s to at least 10mm/s	give range in mm/s
Universal rotating collector platform at 200-2000rpm minimal	give range in rpm
Bidirectional conveyor belt mechanism (back and forth) for roll-to-roll – give speed range	give range in mm/s
Automated regulator for the emitter-collector distance of at least 0-300mm range	Give max range in mm
Needleless spinning injector 500mm for polymer solutions	Volume range in ml/min
Electrospraying injector for aqueous dispersions of inorganic compounds	Volume range in mm/min
Number of linear emitter heads – minimal of 4 emitter heads	Give number of heads

Part 2 of the Technical Requirement List

Technical requirement	Remark
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Safety features	
CE-compliance	
Control from Touch Screen	
Ability to store all process parameters for a given recipe	
Ethernet diagnostics and software upgrade	
Special safety-encapsulated diffuse LED lighting	
Temperature and humidity display	
Data logging and export function	
Detailed drawings of the proposed electrospinning instrument for the drum collector mode	
Detailed drawings of the proposed electrospinning instrument for the roll-to-roll mode	
Height of the Electrospinner must be less than 1950mm including the pallet for transport via elevator	
Length of the Electrospinner must be less than 2800mm for transport via elevator	
Width of the Electrospinner must be less than 1840mm for transport via elevator	
Floor load of the Electrospinner must be less than 600kg/m ²	
The Electrospinner has 2 adjustable feet to achieve a perfect leveling of the equipment by a bubble level located on the top.	

Please note the following dimension limits:

Maximum height 2.30meter

Maximum width 1.30 meter

Maximum length 2.10 meter

Related to the Manufacturing of the Electrospinner and Environmental Control Unit we have the following questions:

12) Can you give the delivery time in weeks of the complete Electrospinner and Environmental Control Unit?

- 13) Can the Electrospinner work with a closed inert gas loop in the form of nitrogen gas (recycling nitrogen gas)?
- 14) Can you give the gas requirements for the Environmental Control Unit?
- 15) Can you give the electrical requirements for the Electrospinner?
- 16) Can you give the electrical requirements for the Environmental Control Unit?
- 17) Is a visit to your factory possible for instructions and discussion?

Factory Acceptance Test

18) Please give your opinion about the Factory Acceptance Test as given below.

The FAT will be done to check if the constructed **Electrospinner Wetsus** is working properly according to the requirements as described below.

Materials description

A= polymeric solution A in solvent

B= polymeric solution B in solvent

C= inorganic suspension of catalyst in aqueous solvent

The FAT is needed to check the requirements of the **Electrospinner Wetsus** and the connected Environmental Control Unit to control Temperature and Relative Humidity.

Not reaching the requirements as given below means **no** acceptance of the **Electrospinner Wetsus**.
Also, not performing part of the tests means no acceptance of the Electrospinner Wetsus.

The required checks are given below.

Checklist of the Wetsus Electrospinner for the FAT

- Control of the Relative Humidity and Temperature ranges inside the chamber of the Electrospinner:
 - Temperature 18°C - 45°C (accuracy +/- 1°C) at RH range 10-80% (accuracy +/- 1%)
- Testing the roll-to-roll speed in the specified speed range with 1mm/s as a required minimum speed rate
- Check of the touch control panel in setting the Electrospinner conditions
- Check of storage of the recipe for the Electrospinner
- Check of the working of the diffuse LED lighting
- Check of the Positive High Voltage Power Supply 1
- Check of the Positive High Voltage Power Supply 2
- Check of the Positive High Voltages Power Supply 3
- Check of the Negative High Voltage Power Supply 1
- Check of the Installed Safety (High Voltage must be switched off when opening the door)
- Check of the rotation rate of the drum collector
- Check of the dosing speed of the first large volume peristaltic liquid feeding system with precise gravimetric dose control
- Check of the dosing speed of the second large volume peristaltic liquid feeding system with precise gravimetric dose control
- Check of the dosing speed of the third large volume peristaltic liquid feeding system with precise gravimetric dose control
- Check of the automated control of the emitter-collector distance

In case of needles for Electrospinning and Electrospaying

The test should last at least 30 minutes.

- Electrospinning and Electrospaying, with installed roll-to-roll at a set roll speed of 1 mm/s, and using needles, at **different** positions 1, 2 and 3 of
 - Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3
- Electrospinning, with installed roll-to-roll at a roll speed of 1 mm/s, and using needles, **directed at identical** positions 1, 2 and 3 of
 - Mix of material A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3

In case needles-less for Electrospinning and Electrospaying
The test should last at least 30 minutes.

- Electrospinning, with installed roll-to-roll at a set roll speed of 1 mm/s, and using **needles-less spinning injector**, at **different** positions 1, 2 and 3 of
 - Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3 using mono-directional coating
 - Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3 using bi-directional coating

Hybrid case.

In case of needleless Electrospinning and needles for Electrospaying.

- Combined Electrospinning and Electrospaying test, with installed roll-to-roll at a set roll speed of 1 mm/s, and **using needleless Electrospinning** at **different** positions **1 and 3** and **using needles for Electrospaying at position 2** of
 - Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and electrospaying material B, at position 2 and electrospinning material C, at position 3

Solvent

All tests can be done with water as solvent.

This means that the polymeric solution can be polymer that can be dissolved in water.

Polymer A and Polymer B can be identical for the test.

Suspension

The suspension is a dispersion of an inorganic compound in water. The electrospaying of this aqueous dispersion needs to be tested with needles as well as with a needleless system.

Site Acceptance Test

19) Please give your opinion about the Site Acceptance Test as given below.

The SAT will be done to check if the constructed **Electrospinner Wetsus** is working properly once installed at Wetsus in Leeuwarden according to the requirements as described below.

Materials description

A= polymeric solution A in solvent

B= polymeric solution B in solvent

C= inorganic suspension of catalyst in aqueous solvent

The SAT is needed to check the proper working of the **Electrospinner Wetsus** and the connected Environmental Control Unit to control Temperature and Relative Humidity once installed at Wetsus.

Not reaching requirements given below means no acceptance of the Electrospinner Wetsus. Not performing part of the tests means no acceptance of the Electrospinner Wetsus.

Technical checklist of the Wetsus Electrospinner for the SAT

- **Check of the equipment after shipping and installation on site at Wetsus for:**

- **Damage**
- **Missing parts**
- **Electrical functioning**
- **Mechanical functioning**
- Control of the Relative Humidity and Temperature ranges inside the chamber of the Electrospinner after installation at Wetsus:
 - Temperature 18°C - 45°C (accuracy +/- 1°C) at RH range 10-80% (accuracy +/- 1%)
- Testing the roll-to-roll speed in the specified speed range with 1mm/s as a required minimum speed rate
- Check of the touch control panel in setting the Electrospinner conditions
- Check of storage of the recipe for the Electrospinner
- Check of the working of the diffuse LED lighting
- Check of the Positive High Voltage Power Supply 1
- Check of the Positive High Voltage Power Supply 2
- Check of the Positive High Voltages Power Supply 3
- Check of the Negative High Voltage Power Supply 1
- Check of the Installed Safety (High Voltage must be switched off when opening the door)
- Check of the rotation rate of the drum collector
- Check of the dosing speed of the first large volume peristaltic liquid feeding system with precise gravimetric dose control
- Check of the dosing speed of the second large volume peristaltic liquid feeding system with precise gravimetric dose control
- Check of the dosing speed of the third large volume peristaltic liquid feeding system with precise gravimetric dose control
- Check of the automated control of the emitter-collector distance

The following **Side Acceptance Test** is done **only if needles are used** for Electrospinning and Electrospraying.
The test should last 30 minutes.

In case needles are used for Electrospinning and Electrospraying.

- Combined Electrospinning and Electrospaying test, with installed roll-to-roll at a set roll speed of 1 mm/s, and **using needles**, at **different** positions 1, 2 and 3 of
 - Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and electrospaying material B, at position 2 and electrospinning material C, at position 3
- Combined Electrospinning and Electrospaying, with installed roll-to-roll at a roll speed of 1 mm/s, and **using needles**, and directed at **identical** positions 1, 2 and 3 of
 - Mix of material A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3

In case needleless injectors are used for Electrospinning and Electrospaying.

The following **Side Acceptance Test** is done **only if needleless injectors are used** for Electrospinning and Electrospaying.
The test should last 30 minutes.

Combined Electrospinning and Electrospaying, with installed roll-to-roll at a set roll speed of 1 mm/s, and using **needleless spinning injector**, at **different** positions 1, 2 and 3 of

- Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3 using mono-directional coating
- Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and material B, at position 2 and electrospaying material C, at position 3 using bi-directional coating

Hybrid case.

In case of needleless Electrospinning and needles for Electrospaying.

- Combined Electrospinning and Electrospaying test, with installed roll-to-roll at a set roll speed of 1 mm/s, and **using needleless Electrospinning at different positions 1 and 3 and using needles for Electrospaying at position 2** of
 - Mix of materials A, B and C with simultaneously electrospinning material A, at position 1 and electrospaying material B, at position 2 and electrospinning material C, at position 3

Solvent

All tests can be done with water as solvent.

This means that the polymeric solution can be polymer that can be dissolved in water.

Polymer A and Polymer B can be identical for the test.

Suspension

The suspension is a dispersion of an inorganic compound like nanosized silica in water. The electrospaying of this aqueous dispersion needs to be tested either with needles or with a needleless injector system.

20) Final question, please mention your standard test how to check the Electrospinner/Electrospaying machine is working fine.

Sincere thanks for your valuable time to answer our market consultation.

We highly appreciate your expertise.