Nanoshields Technology Limited

Tender for *the design and installation of electrospinning nanofiber production lines under Re-industrialisation Funding Scheme*

Headquarter: 12/F, Yardley Commercial Building, 3 Connaught Road West, Hong Kong
R&D office: Unit 306, 3/F, 16W, Phase 3, 16 Science Park West Avenue, Hong Kong Science Park, Shatin, N.T., Hong Kong

Part I – General Specification

1. Introduction

Nanoshields dedicated to develop advanced polymer materials, polymer composites materials and functional nanofiber materials for water and air filtration.

Nanoshields Technology Limited is now looking for qualified supplier(s) (hereinafter referred to as "the Supplier") to supply the design and installation of electrospinning production lines.

Nanoshields Technology Limited will go through an open tender to invite qualified Suppliers and will enter into contract with the selected Supplier based on the terms and conditions of this tender document (hereinafter referred to as "the Tender").

2. Tender Procedures

2.1. Clarification of Tender

For enquiries, please contact the following person:

Danny Chan – Senior Director/Adrian Wong – R&D Director

2.2. Submission of Tender Proposals

Based on "Part II – Technical Specification" and "Part III – Fee Specification", your tender should be completed in two proposals, namely "Technical Proposal" and "Fee Proposal" with **one set of softcopy**, which should be:

- named with "Technical Proposal" or "Fee Proposal";
- named with the tender reference and closing date; and

Soft copy of the documents must be submitted by email to kendrickwong@kingsflair.com.hk.

Late tenders may not be accepted.

2.2.1. The **Technical Proposal** should include at least the following:

- Tender Submission Form
- Documents and information required in "Part II – Technical Specification"
- NO PRICE OR COST should be included in "Technical Proposal", otherwise the tender may not be considered

2.2.2. The **Fee Proposal** should include at least the following:

- Schedule and Offer Form
- Reply to "Part III – Fee Specification"

3. General Requirements

3.1. Terms of Payment

Payment will be made by electronic means (e.g. bank transfer with [*30*] days credit against invoice) after completion of goods / services delivery supported by Nanoshields Technology Limited's acceptance, unless otherwise specified.

3.2. Validity of Quoted Fees

The fees provided by the Supplier in "Part III - Fee Specification" shall be valid from date of tender submission to the end of the tender appointment period. No change shall be made without the prior consent of Nanoshields Technology Limited.

3.3. Termination Policy

The appointment may be terminated by Nanoshields Technology Limited subject to mutual agreement.

3.4. Confidentiality

The Supplier shall at all times keep confidential (and to procure that its respective employees shall keep confidential) any confidential information which it may acquire in relation to Nanoshields Technology Limited, its clients, business or affairs and shall not use or disclose such information except with the consent of Nanoshields Technology Limited or in accordance with the order of a court of competent jurisdiction provided that the obligations of the Supplier contained in this clause shall cease to apply to any information coming into the public domain otherwise than by breach by the Supplier of its obligations contained in this clause and that nothing herein shall prevent the Supplier from disclosing any such information to the extent required in or in connection with legal proceedings arising out of the agreement / contract between the Supplier and Nanoshields Technology Limited.

4. Statutory Obligations

4.1. Working hours, rates of wages etc.

The Supplier shall comply with any current legislation or regulations regarding working conditions, working hours, or rates of payment to employees and accept the risk of any impending legislation or other conditions, which alters any obligations or imposes new obligations.

4.2. Compliance with Laws and Regulations

The Supplier shall ensure full compliance in accordance with the laws and regulations of the Hong Kong Special Administrative Region ("Hong Kong").

4.3. Where applicable, the Supplier (and its sub-contractors, if any) shall ensure that all staff, labour and workers employed and engaged in the supply of the Services to Nanoshields Technology Limited are legally entitled to be so employed and engaged, and that all necessary qualification, registration, visas, licenses and permits have been obtained. The Supplier shall indemnify Nanoshields Technology Limited on demand from any losses,

liabilities, costs and claims resulting from violation of or failure to comply with any terms or conditions of any qualification, registration, permits, licenses or visas or any applicable requirements of Hong Kong laws, ordinances, rules and regulations by staff, labour or workers (e.g. the "Designated workers for designated skills" provision under the Construction Workers Registration Ordinance). From time to time Nanoshields Technology Limited may require the Supplier (and its sub-contractors) to demonstrate that all necessary qualification, registration, visas, licenses and permits have been obtained for the lawful employment and engagement of staff, labour and workers in connection with the supply of the Services.

4.4. Safety precautions

The Supplier shall comply with the Labour Department's regulations for safety and health. The Supplier shall be liable for, and shall indemnify Nanoshields Technology Limited against, any expense, liability, loss, claim or proceedings whichever arising under any statue or at the common law in respect of personal injury to or death of any person, or in respect of any injury or damage whatsoever to any real or personal property in so far as such injury or damage whomever arising out of or in the course of or caused by the carrying out of the works.

5. Conditions of Tendering

5.1. No unauthorized alteration or erasure to the text of the tender documents will be permitted. Any tender containing such alteration or erasure may not be considered

5.2. No liability will be admitted, nor claim allowed, in respect of errors in the Supplier's tender due to mistakes which should have been rectified in the manner described above.

5.3. Nanoshields Technology Limited is not bound to accept the lowest or any tender it may receive.

5.4. Nanoshields Technology Limited reserves the right to withdraw the invitation before the acceptance of any tender.

5.5. Nanoshields Technology Limited will not be liable for any expenses or losses which may be incurred by the Supplier in the preparation of its tender including any alternative offers.

Part II – Technical Specification

1. Obligations of the Supplier

1.1. Subcontracting and/or out-sourcing the works to other sub-supplier(s) without prior consent from Nanoshields Technology Limited is not allowed.

1.2. The Supplier shall meet all the terms and requirements set out in this tender document.

2. Scopes of Service

The supplier should provide the drawings with detailed design, operation manual and installation of electrospinning nanofiber production lines, which includes the below items:

A. Electrospinning chamber
B. Unwinder and Rewinder
C. Adhesion module
D. Hot air dryer
E. Air conditioner module
F. Chiller for air conditioner
G. Polymer contact component
H. Electrospinning carriage without chemical distribution system (CDS-free)
I. Polymer mixing station
J. Data storage and remote access
K. Air permeability tester (inline)
L. Installation and commissioning of the electrospinning production lines, including items A to K

The supplier should provide the drawings with detailed design and installation of electrospinning nanofiber production lines as per the below specification.

A. <u>Electrospinning chamber</u>

- Specification of Electrospinning chamber:

I. Maximum effective electrospinning width: > 1500 mm;
II. Maximum voltage on spinning electrode: > 55 kV;
III. Maximum negative voltage on collecting electrode: < -30 kV;
IV. No. of polymer solution that can be spun simultaneously: ≥ 6;
V. Maximum spinning distance: > 220 mm;
VI. Maximum inlet air flow: > 500 m^3/hr;
VII. Maximum outlet air flow: > 800 m^3/hr;
VIII. Maximum sensitivity of inlet/outlet air flow: > 1600m^3/hr;
IX. Maximum sensitivity of inlet/outlet temperature: > 15°C;
X. Maximum sensitivity of voltage for spinning and collecting electrode: > 160kV;
XI. Maximum sensitivity of current for spinning and collecting electrode: >500mA;
XII. Maximum sensitivity of distance between spinning electrode and substrate: >230mm;
XIII. Maximum sensitivity of ambient temperature:>15°C;

XIV. Maximum sensitivity of ambient relative humidity:>85%.

B. Unwinder and Rewinder

- Specification of the Unwinder and Rewinder:

I. Maximum winding speed: > 30 m/min;
II. Maximum rewinding force: > 1600 N;
III. Maximum unwinding force: > 500 N;
IV. Maximum diameter of roll: > 900 mm.

C. Adhesion module

- Specification of the Adhesion module:

I. Maximum working width: > 1400mm;
II. Maximum line speed: > 30m/min;
III. Maximum glue coating mass (g/m^2): > 0.5 g/m^2;
IV. Accuracy of glue weight platform: ≤ ±12g;
V. Accuracy of glue pump: ≤ ±10RPM.

D. Hot air dryer

- Specification of the Hot air dryer:

I. Maximum working width: > 1400 mm;
II. Maximum heating temperature: > 55 ℃;
III. Maximum sensitivity of the heating power: > 15 kV;
IV. Maximum sensitivity of chamber temperature: > 125℃;
V. Maximum sensitivity of inlet/outlet airflow: > 800m3/hr.

E. Air conditioner module

- Specification of the Air conditioner module:

I. Range of controlled relative humidity: 20-50%;
II. Accuracy of humidity: <± 5% ;
III. Range of controlled temperature: 20-30 ℃.

F. Chiller for air conditioner

- Specification of the Chiller for air conditioner:

I. Accuracy of outlet water temperature: <± 2.5 degrees;
II. Volume of chilled water tank: > 250L.

G. Polymer contact component

- Specification of the Polymer contact component:

I. Volume of the tank: > 20L;
II. Stirring speed of the tank: > 160RPM;
III. Pumping rate: > 15 L/min.

H. Electrospinning carriage without chemical distribution system

- Specification of the Electrospinning CDS-free carriage:

I. Number of individual polymer solution reservoir for each spinning production line: ≥ 6 ;
II. Volume of polymer solution reservoir: **>** 160 mL.

I. Polymer mixing station

- Specification of the Polymer mixing station:

I. Dosing speed of solvent into the mixing vessel: > 15L/min;
II. Dosing speed of the polymer resin into the mixing vessel: >0.5kg/min;
III. Cooling rate of the mixing process: >0.6℃/min;
IV. Heating rate of the mixing process: >0.2℃/min
V. Volume of the mixing tank: **>** 40L.

J. Data storage and remote access

- Specification of the Data storage and remote access:

I. Data storage capacity: > 500GB;
II. Number of data field: > 25.

K. Air permeability tester (inline)

- Specification of the Air permeability tester (inline):

I. Maximum sampling width: **>** 1500 mm;
II. Maximum area per sample reading: > 30cm^2;
III. Maximum sampling head speed: **>** 30m/min;
IV. Maximum pressure drop: **≥** 55,000 Pa.

L. Installation of the electrospinning production lines

- Specification of the installation, commissioning and training service of the electrospinning production line including:
  - the operation of the electrospinning production lines;
  - the introduction of the electrospinning technology;
  - the testing methodology of the nanofiber filter material;

- the maintenance of the electrospinning production lines;
- the chemical safety of the raw material.

2.1. Proposed Technical Design

- Implementation plan and lead time required for the completion of works.

Item	Description	Qty	Delivery date
A	Electrospinning chamber	2	
B	Unwinder and Rewinder	2	
C	Adhesion module	2	
D	Hot air dryer	2	
E	Air conditioner module	2	
F	Chiller for air conditioner	2	
G	Polymer contact component	2	
H	Electrospinning carriage without chemical distribution system	2	
I	Polymer mixing station	2	
J	Data storage and remote access	2	
K	Air permeability tester (inline)	2	
L	Installation and commissioning of the electrospinning production lines	1	

3. Compliance of Mandatory Requirements

It is mandatory for the supplier to complete the following table which requires full compliance to be considered.

No.	Description	Compliance (Y=comply) (N=not comply)
3.1	The General Conditions of Contract and Terms of Tender are fully understood and accepted	
3.2	Compliance to all requirements as set out in "section 2 of Part II – Technical Specification".	
3.3	Provide at least 3 job references of electrospinning production line for mass production of nanofiber as per below requirement (i) Fabrication of industrial scale eletrospinning production line with the following features: automation, needleless type, modularization; (ii) To provide complete turn-key solution services	

4. Information to be provided by the Supplier

A total score of 100 will be assigned in this Section. The passing mark is 60. Only tender(s) getting at least 60 marks will be considered further.

4.1. Company information (5 marks)

Please provide the following information about your company include but not limited to:

A. Scope of business (2 marks)
B. Year of establishment (2 marks)
C. Number of staff (1 mark)

4.2. Patent information (15 marks)

Patents related to the electrospinning technologies and production lines, including:

- The company have related patents in at least two countries or regions;
- Please provide a list of patent families of each of the patents/patent applications and their current status;
- Please provide copies of the patent document, search reports issued prior to filing and during the persecution stage;
- Please specify if the patent rights were acquired from other inventor(s) and please provide copies of the documents in support;
- Please specify if the company have signed IP related agreements with other companies and if any exclusive right was granted under these agreements;
- Please provide copies of the agreements or legal opinion to ascertain that none of them would cause a negative effect on our right or position to submit this tender;
- Please specify if part of the interest of the patents/patent applications were transferred or licensed;
- Please specify if the company have received including but not limited to pre-action letter, cease of desist letter, warning letter that concern the patent/patent applications;
- Please specify if there are pending proceedings and incidents that the validity of the patent/patent applications have been challenged by other parties.

4.3. Job reference (15 marks)

Please provide at least 3 job references of industrial scale electrospinning production line for mass production of nanofiber as well as electrospinning production line have the following features: automation, needleless type, modularization. Please also provide the supporting documents including photos or videos from previous clients' websites or social media to prove the installation of industrial-scale electrospinning production line for mass production. Please specify if the company provide a complete turn-key solution service for each job reference.

4.4. Proposed design (65 marks)

A. Please provide the drawings with detailed design and operation manual of electrospinning chamber include but not limited to (18 marks):
   i. Maximum effective electrospinning width;
   ii. Maximum voltage on spinning electrode;
   iii. Maximum negative voltage on collecting electrode;
   iv. Number of polymer solution(s) that can be spun simultaneously for each spinning unit;
   v. Maximum spinning distance;

vi. Maximum inlet air flow;
vii. Maximum outlet air flow;
viii. Maximum sensitivity of inlet air flow;
ix. Maximum sensitivity of inlet air temperature;
x. Maximum sensitivity of voltage for spinning and collecting electrode;
xi. Maximum sensitivity of current for spinning and collecting electrode;
xii. Maximum sensitivity of distance between spinning electrode and substrate;
xiii. Maximum sensitivity of ambient temperature;
xiv. Maximum sensitivity of ambient relative humidity.

B. Please provide the drawings with detailed design and operation manual of unwinder and rewinder include but not limited to (6 marks):
i. Maximum winding speed;
ii. Maximum rewinding force;
iii. Maximum unwinding force;
iv. Maximum diameter of roll.

C. Please provide the drawings with detailed design and operation manual of adhesion module include but not limited to (7 marks):
i. Maximum working width;
ii. Maximum line speed;
iii. Maximum glue coating mass (g/m^2);
iv. Accuracy of glue weight platform;
v. Accuracy of glue pump.

D. Please provide drawings with detailed design and operation manual of hot air dryer include but not limited to (7 marks):
i. Maximum working width;
ii. Maximum heating temperature;
iii. Maximum sensitivity of the heating power;
iv. Maximum sensitivity of chamber temperature;
v. Maximum sensitivity of inlet/outlet airflow.

E. Please provide the drawings with detailed design and operation manual of air conditioner module include but not limited to (3 marks):
i. Range of controlled relative humidity;
ii. Accuracy of humidity (%);
iii. Range of controlled temperature.

F. Please provide the drawings with detailed design and operation manual of chiller for air conditioner include but not limited to (2 marks):
i. Accuracy of outlet water temperature;
ii. Volume of chilled water tank.

G. Please provide the drawings with detailed design and operation manual of polymer contact component include but not limited to (3 marks):
i. Volume of tank;
ii. Stirring speed of the tank
iii. Pumping rate.

H. Please provide the drawings with detailed design and operation manual of electrospinning carriage without chemical distribution system include but not limited to (2 marks):
   i. Number of individual polymer solution reservoir for each spinning production line;
   ii. Volume of polymer solution reservoir.

I. Please provide the drawings with detailed design and operation manual of polymer mixing station (5 marks):
   i. Dosing speed of solvent into the mixing vessel;
   ii. Dosing rate of the polymer resin into the mixing vessel;
   iii. Cooling rate of the mixing process;
   iv. Heating rate of the mixing process;
   v. Volume of the mixing tank.

J. Please provide the design of data storage and remote access include but not limited to (3 marks):
   i. Data storage capacity;
   ii. Number of data field.

K. Please provide the design of air permeability tester include but not limited to (5 marks):
   i. Maximum sampling width;
   ii. Maximum area per sample reading;
   iii. Maximum sampling head speed;
   iv. Maximum pressure drop;

L. Installation and commissioning of the electrospinning production lines and training service including (4 marks):
   - the operation of the electrospinning production lines;
   - the introduction of the electrospinning technology;
   - the testing methodology of the nanofiber filter material;
   - the maintenance of the electrospinning production lines;
   - the chemical safety of the raw material.

5. Tender Evaluation

5.1. A total score of 100 is assigned to "Section 4 Information to be provided by the Supplier". Tender with scores less than 60 or failing in any attribute may be regarded as unsuccessful and may not be considered further.

The technical to price assessment weight will be [70%] and [30%] respectively.

Score Calculation Methodology

Technical Score

Supplier Technical Score = (Supplier Score / Highest score) x 70%

Price Score

Supplier Price Score = (Lowest Price / Supplier Price) x 30%

Overall Supplier Score

Overall Supplier Score = Supplier Technical Score + Supplier Price Score

5.2. In principle, Nanoshields may select [one] tender with the highest total scores from technical proposal and fee proposal. However, Nanoshields reserves the right to accept the whole or part of the tender and is not bound to accept the highest scores or any tender.

5.3. Tentative schedule

It is a tentative schedule of the tender process. However, Nanoshields Technology Limited reserves the right to change the schedule to suit its operation need.

Items	Tentative Schedule
Tender invitation	30-Sep-2021
Tender Q&A Submission by Supplier	1- Oct -2021 to 10-Oct-2021
Posting of Q&A Reply from Nanoshields Technology Limited	11-Oct-2021 to 18-Oct-2021
Tender Closing	28-Oct-2021
Tender Evaluation	29-Oct-2021 to 5-Nov-2021
Tender Award / Issue Purchase Order	12-Nov-2021

6. All documents/materials submitted to Nanoshields Technology Limited will not be returned.

Part III – Fee Specification

Please submit "Fee Proposal" with **one softcopy**, which should be submitted by email to kendrickwong@kingsflair.com.hk.

The Supplier shall complete the tables below to show the prices / fees for the provision of the Services / the Items. All other associated costs shall be specified (if any).

1. Prices

1.1 Price Table (Please provide information in additional sheet, if necessary)

Items	Description	QTY	Total Price (Currency:____)
A	Electrospinning chamber	2 set	
B	Unwinder and Rewinder	2 set	
C	Adhesion module	2 set	
D	Hot air dryer	2 set	
E	Air conditioner module	2 set	
F	Chiller for air conditioner	2 set	
G	Polymer contact component	2 set	
H	Electrospinning carriage without chemical distribution system	2 set	
I	Polymer mixing station	2 set	
J	Data storage and remote access	2 set	
K	Air permeability tester (inline)	2 set	
L	Installation and commissioning of the electrospinning production lines	1 set	
M	Warranty (1 year)	Included	Included
N	Trade Term: Delivery Duty Paid (DDP) to Nanoshields Technology Limited in Hong Kong	Included	Included
		Total:	

1.2 Other cost, if any (please specify)

2. Payment Terms

Please state your acceptance of our payment term in below table.

Description	Acceptance
Net 30 days against invoice by direct credit or T/T after completion of goods / services delivery supported by Nanoshields Technology Limited's acceptance	Yes/No (If no, please specify)

3. Validity of Quoted Prices

The offer provided above shall be valid from date of tender submission to the end of the tender appointment period. No change shall be made without the prior consent of Nanoshields Technology Limited.

Remarks:

The submitted fee proposal must comply with the submitted technical proposal in accordance with those requirements set by Nanoshields Technology Limited in "Part I – General Specification" and "Part II –Technical Specification".

Tenderer Information

Company Name:

Address:

Contact Person:

Telephone:

Authorized Signature

_____
Tenderer Company
Date:30 September 2021