

Expression of Interest (EOI)

Production of Nanofiber Filtration Membrane Plant

1. Background

The Botswana Institute for Technology Research and Innovation (BITRI) is a parastatal under the Ministry of Tertiary Education Research, Science and Technology, established in 2012 to conduct needs-based research and development in focused areas in accordance with national priorities. The Mandate of BITRI is to identify, develop and/or adapt appropriate technology solutions that provides sustainable innovative solutions through co-creation and collaboration in line with national priorities and needs of Batswana. The technologies will as much as possible maximize the use of local materials to ensure efficiency and affordability. BITRI will harness its institutional capacity as well as collaborate with other organizations and institutions.

2. Introduction

BITRI invites suitable companies to respond to the EOI to produce the Non-Woven Nanofiber as it intends to scale up the production of the filtration nanofiber membranes. The production requires an industrial scale nanofiber production facility locally in Botswana to partner with BITRI to supply local and international companies in the air filtration sector.

3. About the Nanofiber Filtration Membrane

The product is non-woven electro-spun nanofiber membrane made of PA 6 polymer with good contaminant blocking capacity at sub-micron level or it can sieve some Nanoparticles including unwanted bacteria and microparticles. This filter material is a critical component or key feature in the respiratory mask industry (especially in 3 layered masks).

Key Features

- i. High Breathability
- ii. Particulate Matter Proof
- iii. Light Weight

4. Application Areas

Filtration Technologies at BITRI uses nanofiber membranes to develop various products and this first version of the nanofiber production plant will be most suitable for air-filtration application especially dust masks and surgical masks.

The nanofibers will overtime induce local production of filtration products like (air filters) and health related products (surgical suits, head mops etc.)

5. Technology Transfer

A technical team from BITRI will work in partnership with the company to ensure the appropriate quality of the membranes produced. This will involve sampling of the polymer solutions and the membranes that are produced to ensure consistency.

6. Production Requirements

It should satisfy the following requirements:

- 6.1 Production of minimum of 5000 square meters of 0.3 gsm of at least 200 mm width, nanofiber membrane per month.
- 6.2 The production facility should be able to produce nanofiber membranes derived from polymers such as polyamides and polyurethanes.
- 6.3 Production facility should be in Botswana.

7. Eligibility

Interested parties must provide information indicating their expertise and experience that is relevant in undertaking a project for the production and supply of nanofiber membranes to meet industry demands.

7.1 Company profile, including a valid certificate of incorporation from CIPA, BURS clearance certification, trading license, Industrial License. **Companies must be 100% citizen owned.**

7.1.1 Director's Forms.

7.1.2 Nature of Ownership e.g. Sole proprietary, Joint Venture etc.

7.2 Category of the firm: Large / Medium / Small Scale Unit / Startup.

7.3 A clear project outline, indicating the scope of the work to be undertaken.

7.4 Description of similar work undertaken, and technology deployed.

7.5 References from three (3) current and/or previous clients in the last five years, for whom similar services were provided.

7.6 Audited financial statements 3 year for existing or future financial projections for start-ups.

7.7 Availability of resources or proof of capacity for putting in place such, including

7.7.1 Qualified and/or experienced staff, providing CVs of key staff; and

7.7.2 Appropriate physical facilities (industrial scale electrospinning facility).

7.8 Special Dispensation will be given to Youth, Women and People with Disabilities owned Companies.

BITRI will shortlist (pre-qualify) potential strategic partners basing on the assessment of the received EOI and the criteria stipulated above. Shortlisted service providers will be invited to tender for the required services by responding to a detailed Invitation to Tender (ITT).

8. Enquiries

Clarifications pertaining to this EOI may be obtained between 0730 -1230 Hrs. and 1345-1630 Hrs. Monday to Friday, should be forward either in writing, facsimile or email to:

Senior Researcher – Nanomaterials

Email: imavunkal@bitri.co.bw; Ph. No: +267 360 7594

9. Submission Requirements and Closing Date

Expressions of Interests clearly marked “**Production of Nanofiber Filtration Membranes**”, should be hand delivered to:

Registry

Botswana Institute for Technology Research and Innovation

Private Bag 0082

Plot 50654, Machel Drive

Gaborone, Botswana

The EOI should reach the above address not later than Friday **22 January 2021**, at 0900hrs Botswana time.

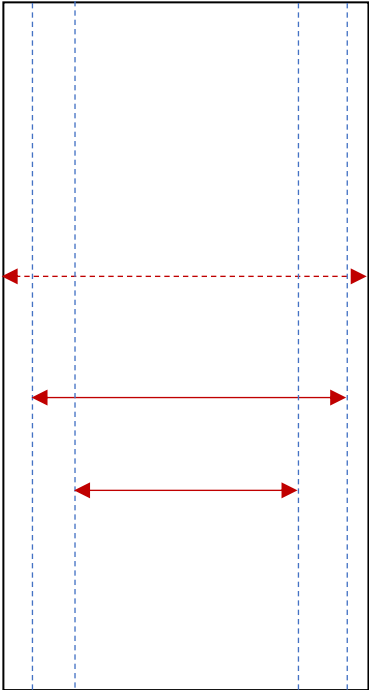
Submission received after the above deadline will not be considered.

Expression of Interest from companies failing to provide the required information will be disregarded. Invitation to bid and any subsequent purchase order will be issued in accordance with procurement rules and procedures of Botswana Government.

This Expression of Interest does not entail any commitment on the part of BITRI, either financial or otherwise

10. Technical Score Table

ITEM	SPECIFICATION	WEIGHTING
1. Industrial Scale Electrospinning Unit	<ul style="list-style-type: none"> • Should be able to produce at least 5,000 m² of 0.3 g/m² membrane. 	Pass/Fail
	<ul style="list-style-type: none"> • Width of the substrate: 1.0 – 2.0 m 	Pass/Fail
	<ul style="list-style-type: none"> • Should be upgradable to a higher capacity 	Pass/Fail
2. Solvent compatibility	<ul style="list-style-type: none"> • Resistant to corrosive solvents like Formic acid and Trifluoroacetic acid 	Pass/fail
3. Solvent Capture	System to trap all the solvent vapors	Pass/Fail
4. Range of Polymers	Water soluble and non-water soluble	Pass/fail
5. Climate control	<ul style="list-style-type: none"> • Humidifier/dehumidifier • RH Level 10 – 80% • Temperature 20 – 50 °C 	Pass/fail
6. Roll collection system	Continuous roll to roll collection with subsequent cutting system Cutting size range: 100 mm to 200 mm	Pass/fail

Item	Specification	Score
Membrane consistency	Uniform membrane thickness in the middle and the edges of the substrate <ul style="list-style-type: none"> • 100% uniform • 98% uniform • 95% uniform • Less than 95% <p>Please see schematic diagram below:</p> 	<p style="text-align: center;">20</p> <p style="text-align: center;">16</p> <p style="text-align: center;">12</p> <p style="text-align: center;">0</p>
Extent to which solvent is captured	<ul style="list-style-type: none"> • 100% • 95% to 99% • 85% to 94% • Less than 85% 	<p style="text-align: center;">20</p> <p style="text-align: center;">16</p> <p style="text-align: center;">12</p> <p style="text-align: center;">0</p>
Substrate cutting unit	<ul style="list-style-type: none"> • Automatic • Manual 	<p style="text-align: center;">20</p> <p style="text-align: center;">16</p>
Adhesion module	<ul style="list-style-type: none"> • Integrated to the instrument 	<p style="text-align: center;">20</p>
	<ul style="list-style-type: none"> • Not integrated 	<p style="text-align: center;">15</p>
Stitching module	<ul style="list-style-type: none"> • Integrated to the instrument 	<p style="text-align: center;">20</p>
	<ul style="list-style-type: none"> • Not integrated 	<p style="text-align: center;">15</p>

Total : 100

NB: A minimum of 70% score is required for a company to be considered for inclusion in the list.