



Request for Proposals (RFP)

The supply of a Breathing Simulator (BS) machine to the CSIR

RFP No. 3427.1/13/09/2021

Date of Issue	Monday, 30 August 2021	
Compulsory briefing session	None	
Closing Date and time	Monday, 13 September 2021 at 16h30	
Place of tender submission	tender@csir.co.za Mail size is 25MB, send multiple emails when exceeded	
Enquiries	Strategic Procurement Unit	E-mail: tender@csir.co.za
CSIR business hours	08h00 – 16h30	
Category	Engineering	

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SECTION A – TECHNICAL INFORMATION

1 INTRODUCTION

The Council for Scientific and Industrial Research (CSIR) is one of the leading scientific research and technology development organisations in Africa. In partnership with national and international research and technology institutions, CSIR undertakes directed and multidisciplinary research and technology innovation that contributes to the improvement of the quality of life of South Africans. The CSIR's main site is in Pretoria while it is represented in other provinces of South Africa through regional offices.

2 BACKGROUND

A Breathing Simulator (BS) machine simulates approximate human respiration under definable and reproducible conditions in a controlled laboratory environment. The BS replicates human breathing pattern by controlling carbon dioxide input, ventilation rates, monitoring inhalation & exhalation pressures, oxygen production, carbon dioxide absorption, and inhalation & exhalation temperatures. The BS machine must be capable of testing a wide range of respiratory protective devices (RPD) for prototype development and routine evaluation of the existing RPDs assessed in accordance with South African National Standards – SANS 1737 clause 4.17 and equivalent regional standards. The BS machine supplied must comply with ISO 16900-5.

The BS shall perform accurately, reliably, and consistently in laboratory conditions of: ambient temperature of $21^{\circ}\text{C} \pm 2^{\circ}\text{C}$, relative humidity of 20-80%.

3 INVITATION FOR PROPOSAL

Proposals are hereby invited for the supply of a Breathing Simulator (BS) machine to the CSIR.

4 PROPOSAL SPECIFICATION

All proposals are to be submitted in a format specified in this enquiry. However, tenderers are welcome to submit additional / alternative proposals over and above the originally specified format.

Technical Minimum requirements

1	<p><u>Breathing Module</u></p> <table><tr><td>Lung type</td><td>Bellows or diaphragm or piston</td></tr><tr><td>Breathing volume</td><td>0.7 - 4 L</td></tr><tr><td>Breathing shapes</td><td>Sine and custom</td></tr><tr><td>Volume auxiliary lung</td><td>40 - 300 ml</td></tr><tr><td>Breathing frequency</td><td>10 – 45 /min</td></tr><tr><td>Max. Breathing pressure for inhalation</td><td>30 mbar</td></tr><tr><td>Max. Breathing pressure for exhalation</td><td>50 mbar</td></tr><tr><td>Leak tightness</td><td><1.2 mbar/min @ 15 mbar</td></tr><tr><td>Safety shutdown</td><td>at pressures > 50 mbar</td></tr></table> <p>The breathing machine shall be capable of delivering fine ventilation settings given in Table 1 of ISO 16900-5, using a sinusoidal waveform.</p> <p>The machine shall have the following features:</p> <ol style="list-style-type: none">1. be capable of switching from one ventilation setting to another in less than 60 s during a test.2. temperature and pressure monitoring inside the bellows or diaphragms or piston.3. include additional channels for thermocouples within the circuit and software4. have a self-diagnostic function to verify that it is operating correctly5. selectable / pre-set (as per ISO 16900-5) and manual (for non-standard ventilation rates) fine ventilation settings from 0 to 135 l/min6. Bellows or diaphragm or piston shall be readily replaceable by a trained operator.7. The connection between the breathing simulator and the unit under test shall be as specified in SANS 1737 figure 9.	Lung type	Bellows or diaphragm or piston	Breathing volume	0.7 - 4 L	Breathing shapes	Sine and custom	Volume auxiliary lung	40 - 300 ml	Breathing frequency	10 – 45 /min	Max. Breathing pressure for inhalation	30 mbar	Max. Breathing pressure for exhalation	50 mbar	Leak tightness	<1.2 mbar/min @ 15 mbar	Safety shutdown	at pressures > 50 mbar
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2

Conditioning Module

Type	Circular flow
Dead volume of complete cycle	<4 L
CO ₂ dosing:	0-8 L/min
Temperature and humidity control	monitoring and controlling of water temperature to achieve exhaled air temperature in the range 25°C-40°C, 80-100% relative humidity

The module shall have the following features:

1. measurement of exhaled and inhaled humidity, temperature and pressure
2. measurement of exhaled and inhaled CO₂ concentration
3. means / device for removing moisture from inhalation gas
4. automated heater for adjusting the temperature of the water bath
5. automated cooler for adjusting the temperature of the inhaled gas
6. measurement of temperature downstream of the cooling device
7. measurement accuracy shall be in accordance with ISO 16900-5.

3

Software and Hardware

1. The supplier shall provide a Dell PC (desktop) as part of the contract with the following minimum specifications:
 - a. Model: Optiplex 7080 Small Form Factor
 - b. Processor: Intel Core i7
 - c. RAM: 32 GB
 - d. Hard-drive: 1 TB
 - e. USB: 6 ports
 - f. Operating system: Windows 10 Pro 64-bit license
 - g. Warranty: 5 years all care
 - h. The compatibility between the breathing simulator operating software and Sophos Antivirus software shall be stated.

2. The system shall consist of measuring and controlling hardware with the interface between the test bench and the PC / software.
3. Data/trends shall be stored and plotted on screen as per pre-configured selection of various data channels (i.e. temperature, pressure, carbon dioxide, oxygen, time). The recorded test data (inhalation and exhalation temperatures, pressure (inhalation and exhalation breathing resistance), carbon dioxide (input and scrub), oxygen, time) shall be plotted on screen on one graph.
4. Data from each test shall be recorded and plotted electronically in an easily retrievable format.
5. The system shall plot on the PC screen real time control values and variables during a test.
6. The system shall be configured to produce a graphical representation of the simulation test data upon request.
7. The software shall provide a means to generate a test certificate, in the format defined by the user, for current and historic test data.
8. Test data shall be stored on PC for future use and the user shall be able to export test data for remote archiving.
9. The system shall be equipped with fully automated calibration of gas analysers and an automated warm up procedure.

Data acquisition and controlling software:	LabVIEW based
Measuring / controlling hardware:	National Instruments, PC (Desktop)
Data format:	tdms / csv / MS Excel or better

4	<p><u>Documentation</u></p> <p>Electronic and hard copies of the equipment manual in English shall be provided and shall include the following, along with any other manufacturer information deemed necessary:</p> <ol style="list-style-type: none"> 1. A description of the conditions for storage, operation, and transportation of the entire machine or different components. This includes a description of any conditions that will deem immediate service of the instrument necessary, along with any safety precautions and personal protective equipment needed to operate the simulator. 2. A description/time table of the preventative maintenance and service necessary to keep the simulator functioning accurately, reliably, and in a consistent manner. 3. Instructions for operation of the machine to enable a person knowledgeable in an appropriate technical field to run the simulator. 4. Documentation related to the design and principle of operation for the machine. This shall include user manual (including troubleshooting guide), maintenance manual, maintenance parts list (including part numbers and cost), mechanical and electrical drawings. 5. Project acceptance report at the project close-out.
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Additional requirements

- 1) Equipment shall run on single phase 230VAC 50Hz and/or three phase 380VAC 50Hz.
- 2) The supplier shall offer hotline technical support for trouble shooting.
- 3) The tender shall preferably be awarded to the Original Equipment Manufacturer (OEM) or their local Authorised Agent. In case of local Authorised Agent, the bidder shall provide official letter of authorisation from the OEM to distribute, sell and maintain in SA.
- 4) The supplier must have an established local (South Africa) technical support team and must indicate the technical capabilities specific to the lung breathing simulator machines and associated accessories including the testing software. If the supplier does not have an established local (South Africa) technical support capability, then the supplier shall indicate on which basis after sales technical support shall be provided and provide typical cost of such support.
- 5) The supplier shall install and commission the equipment at the CSIR Self-contained Self-rescuer laboratory, 2 Frost ave, Braamfontein Werf, Johannesburg, South Africa.
- 6) The equipment shall conform to the requirements of breathing simulators specified in ISO 16900-5.

- 7) The breathing simulator with all its accessories shall have on-site comprehensive warranty for a period of 1 year from the date of commissioning. The supplier shall also offer, as options, warranty extension of 2 years and 4 years and quote for each separately.
- 8) The supplier shall quote for a maintenance kit comprising the required and recommended replacement parts (service parts) for the first five years and parts which are likely to fail in the first five years of service.
- 9) The supplier shall attend any breakdown of the equipment within 2 days of reporting such breakdown.
- 10) The supplier shall provide on-site training at CSIR Self-contained Self-rescuer laboratory, 2 Frost ave, Braamfontein Werf, Johannesburg, South Africa to 4 people on the experimental set up and use of the equipment and ancillaries. The on-site training shall be such that laboratory technician are competent to operate the system independently upon completion of the training. Laboratory technicians who will operate the machine have minimum qualification of a 3-year diploma in Mechanical engineering.
- 11) Instrumentation used for validating the simulator function and measurements shall be traceable to national or international standards.
- 12) The supplier shall provide copies of calibration certificates of various equipment used in validation of the system at the time of installation & commissioning.
- 13) The supplier shall provide original calibration certificates of all measuring instruments which are part of the system and which will require period calibration.
- 14) The following equipment, which will be needed for periodic verification of the system, shall be included in the scope of supply:
 - a) Validation orifices (ISO 16900-5, Figures 7, 8 and 9)
 - b) Carbon dioxide verification tubes (ISO 16900-5, Figures 13a and b)
- 15) The bidder shall include equipment performance acceptance procedure in the proposal.
- 16) All metallic materials used shall be corrosion resistant or protected from corrosion.
- 17) The bidder shall provide the weight and dimensions of the complete system (including accessories) packed, ready for export.
- 18) Pricing should be on FCA basis (Free Carrier) (Incoterms ® 2020) i.e. shipping to be arranged by and for the account of the CSIR. Your bid should clearly state the following:
 - a) Packed weighted, ready for shipping
 - b) Packed dimensions in centimetre.
 - c) Complete collection address
- 19) Preference will be given to proposals with a shorter lead time to delivery.

5 FUNCTIONAL EVALUATION CRITERIA

5.1 The evaluation of the functional / technical detail of the proposal will be based on the following criteria:

Description	Weight	Score			
		25	50	75	100
Proven track record of competent supply, support and maintenance of same or similar equipment. Vendor to provide endorsement letters (Reference Letters) from users of breathing simulators supplied by the bidder. Number of reference / endorsement letters	30%	0 - Letters	1 - Letter	2 – Letters	3 - Letters
Technical after-sales support	20%	Sub-contracted from foreign service provider	Foreign based OEM support	Local authorised agent	Local OEM support
Delivery period	10%	> 34 weeks	>30 weeks < 34 weeks	30 weeks	<26 weeks
OEM is ISO 9001 certified	10%	NO	N/A	N/A	YES
Warranty	10%	None	1 years	3 years	5 years
Spares availability guaranteed period	10%	1 year	5 years	10 years	15 years

Product documentation in English	10%	<ul style="list-style-type: none"> - User manual - Calibration certificates of measuring devices incorporated in the supplied system 	<ul style="list-style-type: none"> - User manual - Maintenance manual - Calibration certificates of measuring devices incorporated in the supplied system 	<ul style="list-style-type: none"> - User manual - Maintenance manual - Maintenance/spare parts list and parts cost - Calibration certificates of measuring devices incorporated in the supplied system 	<ul style="list-style-type: none"> - User manual - Maintenance manual - Maintenance/spare parts list and parts cost - Mechanical drawings - Electrical drawings - Calibration certificates of measuring devices incorporated in the supplied system
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- 5.2 Proposals with functionality / technical points of less than the pre-determined minimum overall percentage of 70% and less than 50% on any of the individual criteria will be eliminated from further evaluation.
- 5.3 Refer to Annexure A for the scoring sheet that will be used to evaluate functionality.

6 ELIMINATION CRITERIA

Proposals will be eliminated under the following conditions:

- Submission after the deadline;
- Proposals submitted at incorrect location;
- Equipment non-compliance with ISO 16900-5 standard;
- Suppliers listed on the National Treasury list of restricted suppliers

7 NATIONAL TREASURY CENTRAL SUPPLIER DATABASE REGISTRATION

Before any negotiations will start with the winning bidder it will be required from the winning bidder to:

- be registered on National Treasury's Central Supplier Database (CSD). Registrations can be completed online at: www.csd.gov.za ;
- provide the CSIR of their CSD registration number; and
- provide the CSIR with a certified (SANAS approved) copy of their B-BBEE certificate or an affidavit on DTIC template. If no certificate can be provided, no points will be scored during the evaluation process. (RSA suppliers only)

SECTION B – TERMS AND CONDITIONS

8 VENUE FOR PROPOSAL SUBMISSION

All proposals must be submitted at: tender@csir.co.za

9 TENDER PROGRAMME

The tender program, as currently envisaged, incorporates the following key dates:

- Issue of tender documents: Monday, 30 August 2021
- Last date for submission of queries: Wednesday, 8 September 2021
- Closing / submission Date: Monday, 13 September 2021

10 SUBMISSION OF PROPOSALS

10.1 All proposals are to be clearly marked with the RFP number and the name of the tenderer.

Proposals must consist of two parts clearly marked:

PART 1: Technical Proposal: RFP No.: 3427.1/13/09/2021

PART 2: Pricing Proposal, B-BBEE and other Mandatory Documentation:

RFP No.: 3427.1/13/09/2021

10.2 Proposals submitted by companies must be signed by a person or persons duly authorised.

10.3 The CSIR will award the contract to qualified tenderer(s) whose proposal is determined to be the most advantageous to the CSIR, taking into consideration the technical (functional) solution, price and B-BBEE.

11 DEADLINE FOR SUBMISSION

Proposals shall be submitted at the address mentioned above no later than the closing date of **13 September 2021** during CSIR's business hours. The CSIR business hours are between 08h00 and 16h30.

Where a proposal is not received by the CSIR by the due date and stipulated place, it will be regarded as a late tender. Late tenders will not be considered.

12 AWARDING OF TENDERS

12.1 Awarding of tenders will be published on the National Treasury e-tender. No regret letters will be sent out.

13 EVALUATION PROCESS

13.1 Evaluation of proposals

All proposals will be evaluated by an evaluation team for functionality, price and B-BBEE. Based on the results of the evaluation process and upon successful negotiations, the CSIR will approve the awarding of the contract to successful tenderers.

A two-phase evaluation process will be followed.

- The first phase includes evaluation of **elimination** and **functionality criteria**.
- The second phase includes the evaluation of **price** and **B-BBEE** status.

Pricing Proposals will only be considered after functionality phase has been adjudicated and accepted. Only proposals that achieved the specified minimum qualification scores for functionality will be evaluated further using the preference points system.

13.2 Preference points system

The 80/20 preference point system will be used where 80 points will be dedicated to price and 20 points to B-BBEE status.

14 PRICING PROPOSAL

14.1 Pricing proposal must be cross-referenced to the sections in the Technical Proposal. Any options offered must be clearly labelled. Separate pricing must be provided for each option offered to ensure that pricing comparisons are clear and unambiguous.

14.2 Price needs to be provided in South African Rand (excl. VAT), with details on price elements that are subject to escalation and exchange rate fluctuations clearly indicated.

14.3 Price should include additional cost elements such as freight, insurance until acceptance, duty where applicable.

14.4 Only firm prices* will be accepted during the tender validity period. Non-firm prices** (including prices subject to rates of exchange variations) will not be considered.

**Firm price is the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs or excise duty and any other duty, levy, or tax which, in terms of a law or regulation is binding on the*

contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract;

***Non-firm price is all prices other than “firm” prices.*

14.5 Payment will be according to the CSIR Payment Terms and Conditions.

15 VALIDITY PERIOD OF PROPOSAL

Each **proposal** shall be valid for a minimum period of three (3) months calculated from the closing date.

16 APPOINTMENT OF SERVICE PROVIDER

16.1 The contract will be awarded to the tenderer who scores the highest total number of points during the evaluation process, except where the law permits otherwise.

16.2 Appointment as a successful service provider shall be subject to the parties agreeing to mutually acceptable contractual terms and conditions. In the event of the parties failing to reach such agreement CSIR reserves the right to appoint an alternative supplier.

16.3 Awarding of contracts will be announced on the National Treasury website and no regret letters will be sent to unsuccessful bidders.

17 ENQUIRIES AND CONTACT WITH THE CSIR

Any enquiry regarding this RFP shall be submitted in writing to CSIR at tender@csir.co.za with ***“RFP No 3427.1/13/09/2021 - The supply of a Breathing Simulator (BS) machine”*** as the subject.

Any other contact with CSIR personnel involved in this tender is not permitted during the RFP process other than as required through existing service arrangements or as requested by the CSIR as part of the RFP process.

18 MEDIUM OF COMMUNICATION

All documentation submitted in response to this RFP must be in English.

19 COST OF PROPOSAL

Tenderers are expected to fully acquaint themselves with the conditions, requirements and specifications of this RFP before submitting proposals. Each tenderer assumes all risks for resource commitment and expenses, direct or indirect, of proposal preparation and participation throughout the RFP process. The CSIR is not responsible directly or indirectly for any costs incurred by tenderers.

20 CORRECTNESS OF RESPONSES

20.1 The tenderer must confirm satisfaction regarding the correctness and validity of their proposal and that all prices and rates quoted cover all the work/items specified in the RFP. The prices and rates quoted must cover all obligations under any resulting contract.

20.2 The tenderer accepts that any mistakes regarding prices and calculations will be at their own risk.

21 VERIFICATION OF DOCUMENTS

21.1 Tenderers should check the numbers of the pages to satisfy themselves that none are missing or duplicated. No liability will be accepted by the CSIR in regard to anything arising from the fact that pages are missing or duplicated.

21.2 One electronic copy of each proposal must be submitted.

21.3 Pricing schedule and B-BBEE credentials should be submitted with the proposal, but as a separate document and no such information should be available in the technical proposal.

22 SUB-CONTRACTING

22.1 A tenderer will not be awarded points for B-BBEE status level if it is indicated in the tender documents that such a tenderer intends sub-contracting more than **25%** of the value of the contract to any other enterprise that does not qualify for at least the points that such a tenderer qualifies for, unless the intended sub-contractor is an exempted micro enterprise that has the capability and ability to execute the sub-contract.

22.2 A tenderer awarded a contract may not sub-contract more than **25%** of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an exempted micro enterprise that has the capability and ability to execute the sub-contract.

23 ENGAGEMENT OF CONSULTANTS

The consultants will only be remunerated at the rates:

23.1 Determined in the "Guideline for fees", issued by the South African Institute of Chartered Accountants (SAICA); or

23.2 Set out in the "Guide on Hourly Fee Rates for Consultants", by the Department of Public Service and Administration (DPSA); or

23.3 Prescribed by the body - regulating the profession of the consultant.

24 TRAVEL EXPENSES

24.1 All travel expenses for the CSIR's account, be it directly via the CSIR's travel agent or indirectly via re-imburements, must be in line with the CSIR's travel policy. The following will apply:

24.1.1 Only economy class tickets will be used.

24.1.2 A maximum of R1400 per night for accommodation, dinner, breakfast and parking will be allowed.

24.1.3 No car rentals of more than a Group B will be accommodated.

25 ADDITIONAL TERMS AND CONDITIONS

25.1 A tenderer shall not assume that information and/or documents supplied to CSIR, at any time prior to this request, are still available to CSIR, and shall consequently not make any reference to such information document in its response to this request.

25.2 Copies of any affiliations, memberships and/or accreditations that support your submission must be included in the tender.

25.3 In case of proposal from a joint venture, the following must be submitted together with the proposal:

- Joint venture Agreement including split of work signed by both parties;

- The original or certified copy of the B-BBEE certificate of the joint venture;
- The Tax Clearance Certificate of each joint venture member;
- Proof of ownership/shareholder certificates/copies; and
- Company registration certificates.

25.4 An omission to disclose material information, a factual inaccuracy, and/or a misrepresentation of fact may result in the disqualification of a tender, or cancellation of any subsequent contract.

25.5 Failure to comply with any of the terms and conditions as set out in this document will invalidate the Proposal.

26 CSIR RESERVES THE RIGHT TO

26.1 Extend the closing date;

26.2 Verify any information contained in a proposal;

26.3 Request documentary proof regarding any tendering issue;

26.4 Give preference to locally manufactured goods;

26.5 Appoint one or more service providers, separately or jointly (whether or not they submitted a joint proposal);

26.6 Award this RFP as a whole or in part;

26.7 Cancel or withdraw this RFP as a whole or in part.

27 DISCLAIMER

This RFP is a request for proposals only and not an offer document. Answers to this RFP must not be construed as acceptance of an offer or imply the existence of a contract between the parties. By submission of its proposal, tenderers shall be deemed to have satisfied themselves with and to have accepted all Terms & Conditions of this RFP. The CSIR makes no representation, warranty, assurance, guarantee or endorsements to tenderer concerning the RFP, whether with regard to its accuracy, completeness or otherwise and the CSIR shall have no liability towards the tenderer or any other party in connection therewith.

DECLARATION BY TENDERER

Only tenderers who completed the declaration below will be considered for evaluation.

RFP No: 3427.1/13/09/2021

I hereby undertake to render services described in the attached tendering documents to CSIR in accordance with the requirements and task directives / proposal specifications stipulated in RFP No 3427.1/13/09/2021 at the price/s quoted. My offer/s remains binding upon me and open for acceptance by the CSIR during the validity period indicated and calculated from the closing date of the proposal.

I confirm that I am satisfied with regards to the correctness and validity of my proposal; that the price(s) and rate(s) quoted cover all the services specified in the proposal documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this proposal as the principal liable for the due fulfilment of this proposal.

I declare that I have no participation in any collusive practices with any tenderer or any other person regarding this or any other proposal.

I accept that the CSIR may take appropriate actions, deemed necessary, should there be a conflict of interest or if this declaration proves to be false.

I confirm that I am duly authorised to sign this proposal.

NAME (PRINT)

CAPACITY

SIGNATURE

NAME OF FIRM

DATE

WITNESSES	
1
2
DATE:	