



Bid Number/बोली क्रमांक (बिड संख्या):  
GEM/2024/B/5232169  
Dated/दिनांक : 31-07-2024

### Bid Document/ बिड दस्तावेज़

Bid Details/बिड विवरण	
Bid End Date/Time/बिड बंद होने की तारीख/समय	21-08-2024 19:00:00
Bid Opening Date/Time/बिड खुलने की तारीख/समय	21-08-2024 19:30:00
Bid Offer Validity (From End Date)/बिड पेशकश वैधता (बंद होने की तारीख से)	180 (Days)
Ministry/State Name/मंत्रालय/राज्य का नाम	Ministry Of Mines
Department Name/विभाग का नाम	Na
Organisation Name/संगठन का नाम	Jawaharlal Nehru Aluminium Research Development And Design Centre (jnarddc)
Office Name/कार्यालय का नाम	West
Total Quantity/कुल मात्रा	1
Item Category/मद केटेगरी	AUTOMATIC DIGESTION SYSTEM (ULTRA / MULTIWAVE)
Minimum Average Annual Turnover of the bidder (For 3 Years)/बिडर का न्यूनतम औसत वार्षिक टर्नओवर (3 वर्षों का)	35 Lakh (s)
OEM Average Turnover (Last 3 Years)/मूल उपकरण निर्माता का औसत टर्नओवर (गत 3 वर्षों का)	210 Lakh (s)
Years of Past Experience Required for same/similar service/उन्हीं/समान सेवाओं के लिए अपेक्षित विगत अनुभव के वर्ष	3 Year (s)
MSE Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से एमएसई छूट	No
Startup Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से स्टार्टअप छूट	No
Document required from seller/विक्रेता से मांगे गए दस्तावेज़	Experience Criteria,Past Performance,Bidder Turnover,Certificate (Requested in ATC),OEM Authorization Certificate,OEM Annual Turnover,Additional Doc 1 (Requested in ATC),Compliance of BoQ specification and supporting document *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer
Past Performance/विगत प्रदर्शन	80 %

<b>Bid Details/बिड विवरण</b>	
<b>Bid to RA enabled/बिड से रिवर्स नीलामी सक्रिय किया</b>	No
<b>Type of Bid/बिड का प्रकार</b>	Two Packet Bid
<b>Time allowed for Technical Clarifications during technical evaluation/तकनीकी मूल्यांकन के दौरान तकनीकी स्पष्टीकरण हेतु अनुमत समय</b>	3 Days
<b>Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)</b>	No
<b>Evaluation Method/मूल्यांकन पद्धति</b>	Total value wise evaluation

#### **EMD Detail/ईएमडी विवरण**

Advisory Bank/एडवाइजरी बैंक	IDBI Bank
EMD Amount/ईएमडी राशि	210000

#### **ePBG Detail/ईपीबीजी विवरण**

Advisory Bank/एडवाइजरी बैंक	IDBI Bank
ePBG Percentage(%) / ईपीबीजी प्रतिशत (%)	5.00
Duration of ePBG required (Months) / ईपीबीजी की अपेक्षित अवधि (महीने).	14

(a). EMD EXEMPTION: The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category as per GeM GTC with the bid. Under MSE category, only manufacturers for goods and Service Providers for Services are eligible for exemption from EMD. Traders are excluded from the purview of this Policy./जेम की शर्तों के अनुसार ईएमडी छूट के इच्छुक बिडर को संबंधित केटेगरी के लिए बिड के साथ वैध समर्थित दस्तावेज प्रस्तुत करने हैं। एमएसई केटेगरी के अंतर्गत केवल वस्तुओं के लिए विनिर्माता तथा सेवाओं के लिए सेवा प्रदाता ईएमडी से छूट के पात्र हैं। व्यापारियों को इस नीति के दायरे से बाहर रखा गया है।

(b). EMD & Performance security should be in favour of Beneficiary, wherever it is applicable./ईएमडी और संपादन जमानत राशि, जहां यह लागू होती है, लाभार्थी के पक्ष में होनी चाहिए।

#### **Beneficiary/लाभार्थी :**

Senior Administrative Officer  
West, NA, Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Ministry of Mines  
(R Srinivasan)

#### **Splitting/विभाजन**

Bid splitting not applied/बोली विभाजन लागू नहीं किया गया.

#### **MII Purchase Preference/एमआईआई खरीद वरीयता**

MII Purchase Preference/एमआईआई खरीद वरीयता
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Yes
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#### **MSE Purchase Preference/एमएसई खरीद वरीयता**

MSE Purchase Preference/एमएसई खरीद वरीयता
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Yes
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1. The minimum average annual financial turnover of the bidder during the last three years, ending on 31st March of the previous financial year, should be as indicated above in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the bidder is less than 3-year-old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

2. Experience Criteria: In respect of the filter applied for experience criteria, the Bidder or its OEM {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU for number of Financial years as indicated above in the bid document before the bid opening date. Copies of relevant contracts to be submitted along with bid in support of having supplied some quantity during each of the Financial year. In case of bunch bids, the category of primary product having highest value should meet this criterion.

3. OEM Turn Over Criteria: The minimum average annual financial turnover of the OEM of the offered product during the last three years, ending on 31st March of the previous financial year, should be as indicated in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the OEM is less than 3 year old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.

4. Preference to Make In India products (For bids < 200 Crore): Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .The buyers are advised to refer the OM No.F.1/4/2021-PPD dated 18.05.2023.

[OM No.1 4 2021 PPD dated 18.05.2023](#) for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

5. Purchase preference will be given to MSEs having valid Udyam Registration and whose credentials are validated online through Udyam Registration portal as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail themselves of the Purchase preference, the bidder must be the manufacturer / OEM of the offered product on GeM. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises and hence resellers offering products manufactured by some other OEM are not eligible for any purchase preference. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service and Buyer will decide eligibility for purchase preference based on documentary evidence submitted, while evaluating the bid. If L-1 is not an MSE and MSE Seller (s) has / have quoted price within L-1+ 15% (Selected by Buyer) of margin of purchase preference /price band defined in relevant policy, such MSE Seller shall be given opportunity to match L-1 price and contract will be awarded for 25% (selected by Buyer) percentage of total quantity. The buyers are advised to refer the OM No. F.1/4/2021-PPD dated 18.05.2023 [OM No.1 4 2021 PPD dated 18.05.2023](#) for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017. Benefits of MSE will be allowed only if seller is validated on-line in GeM profile as well as validated and approved by Buyer after evaluation of documents

submitted.

6. Past Performance: The Bidder or its OEM {themselves or through re-seller(s)} should have supplied same or similar Category Products for 80% of bid quantity, in at least one of the last three Financial years before the bid opening date to any Central / State Govt Organization / PSU. Copies of relevant contracts (proving supply of cumulative order quantity in any one financial year) to be submitted along with bid in support of quantity supplied in the relevant Financial year. In case of bunch bids, the category related to primary product having highest bid value should meet this criterion.

## **AUTOMATIC DIGESTION SYSTEM (ULTRA / MULTIWAVE) ( 1 pieces )**

**(Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively/क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक)**

### **Technical Specifications/तकनीकी विशिष्टियाँ**

Buyer Specification Document/क्रेता विशिष्टि दस्तावेज़	<a href="#">Download</a>
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### **Consignees/Reporting Officer/परेषिती/रिपोर्टिंग अधिकारी and/ तथा Quantity/मात्रा**

S.No./क्र. सं.	Consignee Reporting/Officer/ परेषिती/रिपोर्टिंग अधिकारी	Address/पता	Quantity/मात्रा	Delivery Days/डिलीवरी के दिन
1	Lalit Mohan	440023,Opp Wadi Police Station Amarawati Road	1	45

### **Buyer Added Bid Specific Terms and Conditions/क्रेता द्वारा जोड़ी गई बिड की विशेष शर्तें**

#### **1. Generic**

OPTION CLAUSE: The Purchaser reserves the right to increase or decrease the quantity to be ordered up to 25 percent of bid quantity at the time of placement of contract. The purchaser also reserves the right to increase the ordered quantity by up to 25% of the contracted quantity during the currency of the contract at the contracted rates. Bidders are bound to accept the orders accordingly.

#### **2. Generic**

Actual delivery (and Installation & Commissioning (if covered in scope of supply)) is to be done at following address

J.N.A.R.D.D.C.  
Opposite Wadi Police Station  
Amravati Road  
Wadi  
Nagpur - 440023

#### **3. Generic**

Bidders are advised to check applicable GST on their own before quoting. Buyer will not take any responsibility in this regards. GST reimbursement will be as per actuals or as per applicable rates (whichever is lower), subject to the maximum of quoted GST %.

4. **Generic**

Data Sheet of the product(s) offered in the bid, are to be uploaded along with the bid documents. Buyers can match and verify the Data Sheet with the product specifications offered. In case of any unexplained mismatch of technical parameters, the bid is liable for rejection.

5. **Generic**

Experience Criteria: The Bidder or its OEM {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU for 3 years before the bid opening date. Copies of relevant contracts to be submitted along with bid in support of having supplied some quantity during each of the year. In case of bunch bids, the primary product having highest value should meet this criterion.

6. **Generic**

Installation, Commissioning, Testing, Configuration, Training (if any - which ever is applicable as per scope of supply) is to be carried out by OEM / OEM Certified resource or OEM authorised Reseller.

7. **Generic**

**Manufacturer Authorization:**Wherever Authorised Distributors/service providers are submitting the bid, Authorisation Form /Certificate with OEM/Original Service Provider details such as name, designation, address, e-mail Id and Phone No. required to be furnished along with the bid

8. **Generic**

Scope of supply includes Training: Number of employees to be trained

2

, Place for Training

JNARDDC, Nagpur

and Duration of training

2

days.

9. **Generic**

While generating invoice in GeM portal, the seller must upload scanned copy of GST invoice and the screenshot of GST portal confirming payment of GST.

10. **OEM**

**IMPORTED PRODUCTS:** In case of imported products, OEM or Authorized Seller of OEM should have a registered office in India to provide after sales service support in India. The certificate to this effect should be submitted.

11. **Forms of EMD and PBG**

Bidders can also submit the EMD with Account Payee Demand Draft in favour of

JNARDDC

payable at

Nagpur

. Bidder has to upload scanned copy / proof of the DD along with bid and has to ensure delivery of hardcopy to the Buyer within 5 days of Bid End date / Bid Opening date.

**12. Forms of EMD and PBG**

Bidders can also submit the EMD with Banker's Cheque in favour of

JNARDDC  
payable at  
Nagpur

. Bidder has to upload scanned copy / proof of the BC along with bid and has to ensure delivery of hardcopy to the Buyer within 5 days of Bid End date / Bid Opening date.

**13. Forms of EMD and PBG**

Bidders can also submit the EMD with Payment online through RTGS / internet banking in Beneficiary name

JNARDDC  
Account No.  
041104000192392  
IFSC Code  
IBKL0000041  
Bank Name  
IDBI Bank  
Branch address  
Civil Lines, Nagpur

. Bidder to indicate bid number and name of bidding entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the Online Payment Transfer along with bid.

**14. Forms of EMD and PBG**

Successful Bidder can submit the Performance Security in the form of Account Payee Demand Draft also (besides PBG which is allowed as per GeM GTC). DD should be made in favour of

JNARDDC  
payable at  
Nagpur

. After award of contract, Successful Bidder can upload scanned copy of the DD in place of PBG and has to ensure delivery of hard copy to the original DD to the Buyer within 15 days of award of contract.

**15. Forms of EMD and PBG**

Successful Bidder can submit the Performance Security in the form of Payment online through RTGS / internet banking also (besides PBG which is allowed as per GeM GTC). On-line payment shall be in Beneficiary name

JNARDDC  
Account No.  
041104000192392  
IFSC Code  
IBKL0000041  
Bank Name  
IDBI Bank  
Branch address  
Civil Lines, Nagpur

. Successful Bidder to indicate Contract number and name of Seller entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the Online Payment Transfer in place of PBG within 15 days of award of contract.

**16. Scope of Supply**

Scope of supply (Bid price to include all cost components) : Supply Installation Testing and Commissioning of Goods

**17. Certificates**

Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

**18. Service & Support**

Dedicated /toll Free Telephone No. for Service Support : BIDDER/OEM must have Dedicated/toll Free Telephone No. for Service Support.

**19. Service & Support**

Availability of Service Centres: Bidder/OEM must have a Functional Service Centre in the State of each Consignee's Location in case of carry-in warranty. (Not applicable in case of goods having on-site warranty). If service center is not already there at the time of bidding, successful bidder / OEM shall have to establish one within 30 days of award of contract. Payment shall be released only after submission of documentary evidence of having Functional Service Centre.

**20. Warranty**

Warranty period of the supplied products shall be 1 years from the date of final acceptance of goods or after completion of installation, commissioning & testing of goods (if included in the scope of supply), at consignee location. OEM Warranty certificates must be submitted by Successful Bidder at the time of delivery of Goods. The seller should guarantee the rectification of goods in case of any break down during the guarantee period. Seller should have well established Installation, Commissioning, Training, Troubleshooting and Maintenance Service group in INDIA for attending the after sales service. Details of Service Centres near consignee destinations are to be uploaded along with the bid.

**21. Buyer Added Bid Specific ATC**

Buyer Added text based ATC clauses

1. Catalogue of the offered product must be submitted with bid documents for technical evaluation. Catalogue and offered model submitted with this bid must be available at OEM website. Fabricated /customized catalogue will not be accepted.
2. If any deviation in offered model with JNARDDC technical specifications, same to be mentioned in technical compliance sheet .
3. Bidder have to submit 03 satisfied customers ( Govt/ PVT/PSU/ Educational institution ) details where bidder has sold this product. For this copy of purchase order along with installation report to be submitted. Name of buyers, mobile no and e-mail address also to be submitted . Without this bid will be simply rejected.
4. Demonstration of offered model will be the part of technical evaluation . JNARDDC reserve the rights to ask any bidder to arrange demonstrate the offered model .

**Disclaimer/अस्वीकरण**

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization, whereby Buyer organization is solely responsible for the impact of these clauses

on the bidding process, its outcome, and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. If any clause(s) is / are incorporated by the Buyer regarding following, the bid and resultant contracts shall be treated as null and void and such bids may be cancelled by GeM at any stage of bidding process without any notice:-

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issued by DPIIT in this regard.
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to exemption provided to such sellers under GeM GTC.
3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category item bunched with it.
4. Creating BoQ bid for single item.
5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
7. Floating / creation of work contracts as Custom Bids in Services.
8. Seeking sample with bid or approval of samples during bid evaluation process. (However, in bids for [attached categories](#), trials are allowed as per approved procurement policy of the buyer nodal Ministries)
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifying equivalent Indian Certification / standards.
10. Seeking experience from specific organization / department / institute only or from foreign / export experience.
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case may be.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

[This Bid is also governed by the General Terms and Conditions/ यह बिड सामान्य शर्तों के अंतर्गत भी शासित है](#)

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws./जेम की सामान्य शर्तों के खंड 26 के संदर्भ में भारत के साथ भूमि सीमा साझा करने वाले देश के बिडर से खरीद पर प्रतिबंध के संबंध में भारत के साथ भूमि सीमा साझा करने वाले देश का कोई भी बिडर इस निविदा में बिड देने के लिए तभी पात्र होगा जब वह बिड देने वाला सक्षम प्राधिकारी के पास पंजीकृत हो।बिड में भाग लेते समय बिडर को इसका अनुपालन करना होगा और कोई भी गलत घोषणा किए जाने व इसका अनुपालन न करने पर अनुबंध को तत्काल समाप्त करने और कानून के अनुसार आगे की कानूनी कार्रवाई का आधार होगा।

---Thank You/धन्यवाद---



**TECHNICAL SPECIFICATIONS FOR  
AUTOMATIC DIGESTION SYSTEM ( ULTRA / MULTIWAVE)**

**Automatic Digestion system is required for sample preparation of various types of matrices (Organic and Inorganic). The system should be able to digest different types of samples using different acids in single run simultaneously.**

**The system should have following specifications**

1. The unit must be a bench top system with a high-pressure single reaction chamber (SRC) in stainless steel; chamber volume 990 ml with 950mL liner.
2. The unit must be bench-top system with a high-pressure single reaction chamber in SS chamber of about 990 ml.
3. The system must be capable to run any kind of acid chemistry, including aggressive mixtures, such as aqua regia and/ or large volumes of HCl, using loose-fitting caps to maintain the same pressure level in and outside the vials;
4. Microwave coupling directly into the single reaction chamber, high microwave power emission 1500W.
5. Noiseless and water-cooled magnetron to ensure more comfortable working conditions and higher microwave efficiency and power stability regardless the microwave program.
6. Automated pre-pressurization of the chamber with inert gas (nitrogen or argon), fully controlled by the user interface, to prevent sample/reagents boiling and eliminate risk of cross contamination.
7. Separated line for pre-pressurization and venting of the chamber should be made of corrosion resistant stainless steel to reduce potential contamination and ensure low blanks. Single high-pressure line led to contamination and high blanks.
8. Single reaction chamber cooled by closed-loop water cooling system, connected with a chiller, to ensure fast cooling, higher throughput and prevent overheating during the microwave program.
9. The cooling system should have a minimum power of 1000 W to provide high cooling efficiency and fast cooling (270°C to 80°C in approximately 12 minutes)
10. System should have working temperature up to 300°C and working pressure up to 199 bar.
11. Temperature and pressure must be control simultaneously in the reaction chamber and in all vials. SRC enables the same temperature and pressure to be achieved in all samples simultaneously.
12. The temperature reading should be done by a contactless sensor capable to read through the PTFE TFM liner. Contact sensor located outside the PTFE liner do not ensure the same level of accuracy and control.
13. The system must have a 950 ml PTFE-TFM liner and be able to work with multiple vials simultaneously. Availability of racks with 7, 20, 27 and 40 positions.

14. The system must be able to digest different samples type and different acid mixtures simultaneously (in the same cycle), ensuring same temperature and pressure in all vials.
15. The dedicated terminal controls all the parameters: temperatures (T1: temperature of the sample/ solutions in the main PTFE vessel, T2: temperature of the stainless-steel reactor), pressures, time and power. Online modifications can be done by the operator.
16. The system must automatically vent the chamber after every digestion run. The operator can choose the releasing speed and the temperature of release, for example 8 bar/ min at 60°C.
17. At the competition of the venting, the system automatically flushes the high-pressure lines with inert gas to remove any residue and avoid potential contamination.
18. System should have Reactor bottom made of quartz to avoid the diffusion of acid through the PTFE-TFM liner and reduce potential maintenance, increasing the components lifetime.
19. The system must be provided with a web-based application capable to remotely control the system. It has also to incorporate tutorial videos, application notes, scientific papers, user manuals, spare parts and consumables list, etc.
20. Lighting of the reactor working compartment with color coding to indicate the status of the process.

## **HARDWARE**

21. SRC securely closed by double interlocked stainless-steel clamps.
22. The reaction chamber must be closed by the operator through the stainless-steel clamps, this operation ensures the proper and complete sealing of the reaction chamber.
23. Dedicated lift, fully controlled by the software, to automatically lower and raise the cover and the rack. Automated lift to close the frontal door of the system for maximum operator safety.
24. Integrated exhaust system to vent the chamber during the pressure release and to extract residual vapors during chamber opening
25. The pressurize gas can be only nitrogen or argon, to create inert environment in the reaction chamber.
26. The loaded gas must act as a cover, preventing cross contamination. The groove in the caps actively facilitates the pressure equilibrium between the vials and the main chamber
27. Software controlled pneumatic lift of the PTFE-TFM liner to facilitate its removal
28. System should have Failsafe mechanism to safely release pressure inside the cabinet in the case of an overpressure situation (over 199 bar). The pressure will be collected into the exhaust line.

29. An anagoric manometer, located in the front of the unit, always shown the pressure inside the reaction chamber.
30. System should contain Safety valve which enables manual release of pressure after a digestion cycle, in case of power failure.

### **TEMPERATURE AND PRESSURE CONTROL**

31. Contactless temperature control via an advanced infrared sensor located on the bottom of the reactor to directly control the temperature in the main liner. Enhanced temperature control by measuring a bulk area and not a single point Operating maximum temperature up to 300°C
32. Pressure transducer directly monitors and controls the pressure in the chamber and all vials simultaneously. Operating pressure up to 199 bar
33. Built-in temperature sensor to monitor and control the external temperature of the chamber, preventing overheating
34. Built-in thermal switch and sensor to monitor magnetron temperature

### **RACKS**

35. Rack must be made in PTFE-TFM, no other materials are accepted
36. All vials required only a loose-fitting cap. Shields, membrane, segments or other sealing mechanisms components are not accepted
37. The system must work with quartz, glass (disposable) or PTFE-TFM vials
38. The system must be capable to work without rack or with any of the following racks without any modification or any additional sensor

# of positions	Volume (mL)	Vials material
7	40	PTFE-TFM, Quartz and disposable glass
20	15	
27	8	
40	4.5	disposable glass

### **CONTROL TERMINAL**

39. Integrated touchpad with 10,1" display, 1280 RGB (H) X 800 (V) resolution. Multiple USB ports for connection with balance, printer, mouse, and keyboard.
40. Operating software: fully icon driven and multi-language
41. Multi-level access by password, such as User, administrator, service
42. Built-in documentation: library of methods, industry reports, user manual, tutorial videos, dashboards for the samples processed and system status
43. The software must have dedicated pages to the sample information, such as sample amount, reagents mixture.
44. Check-sensor function controls and prevent strong increase of temperature and pressure. The software stops the microwave program in case a too fast temperature and/or pressure increase is noticed.

## **SOFTWARE**

45. Software must have a simple graphic interface so that the operator can easily build a suitable temperature profile. Power output is automatically controlled via PID algorithms in the software and temperature probe so that the profile is precisely followed.
46. Additional features: sample list table, 21 CFR part 11 compliant, auto-save of the runs, search functions in the method library; counter and automatic notification on the maintenance intervals
47. Web-based application (Milestone Connect) integrated into the terminal and accessible from external devices (PC, tablets or smartphones) connected to the microwave unit. It includes a database with updated information (list of parts, technical notes, user manual, video tutorials, updated application notes, the complete library of available scientific articles) as well as a remote monitor of the microwave system.