

Référence (n° chrono) : LITEN/DEHT/DIR/CDC/2025/19

Version A

Date of Issue: 17/12/2025

EQUIPMENT SPECIFICATIONS

« Ultrasonic Spray Pyrolysis »

EOTP: AMSBATG04EDD
OS: LOC7N4INDIVI
Platform: Matériaux Batteries – Périmètre 39

| | Name | Fonction | Signature / Date |
|-------------------------|-------------------|-------------------------------------|------------------|
| Written by | Thibaut GUTEL | R&D Engineer | #signature1# |
| Checked by security | Marlène LEBRUN | Safety Engineer | #signature2# |
| Checked by FEM | Ivo Canale | Facilities Engineering Manager | #signature3# |
| Checked by Hiérarchique | Caroline CELLE | Laboratory Head or Platform Manager | #signature4# |
| Issued by | Florence ROUILLON | Head of Department | #signature5# |

DISTRIBUTION LIST AND ARCHIVING**INTERNAL DISTRIBUTION**

| | | |
|-----------------------|---|------------------|
| Purchasing Department | - Mrs Clara GOGORIAN | - 1 copy (email) |
| Department | - Florence ROUILLON, Head of department | - 1 copy (email) |
| | - Marlène LEBRUN, Safety Engineer | - 1 copy (email) |
| | - Séverine MARQUET, Department Quality Engineer | - 1 copy (email) |
| | - Ivo CANALE, Facilities Engineering Manager | - 1 copy (email) |
| | | - 1 copy (email) |
| Division | - Sébastien PATOUX, Division Head | |
| Laboratory | - Caroline CELLE, Laboratory head | - 1 copy (email) |
| | - Thibaut GUTEL, Equipment Project Manager | - 1 copy (email) |
| | - Valérie BARTHEL, Platform Manager | - 1 copy (email) |

ARCHIVING

| | |
|----------------------------|-------------------------|
| Archiving by the assistant | - 1 hardcopy + PDF file |
|----------------------------|-------------------------|

TABLE OF CHANGES

| Version | Writer | Date | Subject of changes |
|---------|---------------|------------|--------------------|
| A | Thibaut GUTEL | 17/12/2025 | Creation |
| B | Thibaut GUTEL | 09/01/2026 | Modification |
| C | Thibaut GUTEL | 28/01/2026 | Finalization |
| | | | |

Table of content

| | | |
|-----|--|----|
| 1. | PURPOSE | 4 |
| 2. | DEFINITION | 4 |
| 3. | GLOSSARY | 4 |
| 4. | APPLICABLE DOCUMENTS | 4 |
| 5. | CUSTOMER – SERVICE PROVIDER CONTACT | 4 |
| 6. | CONFIDENTIALITY | 5 |
| 7. | TECHNICAL SPECIFICATIONS | 5 |
| 8. | WORK ENVIRONMENT, PLACE OF INSTALLATION, SUPPLY LIMITS | 6 |
| 9. | LEAD TIMES | 7 |
| 10. | QUALITY | 8 |
| 11. | SAFETY AND CONFORMITY | 8 |
| 12. | ENVIRONMENTAL CLAUSES | 13 |
| 13. | EQUIPMENT DOCUMENTATION | 13 |
| 14. | ACCEPTANCE CONDITIONS | 13 |
| 15. | TRAINING | 13 |
| 16. | WARRANTY | 14 |
| 17. | MAINTENANCE | 14 |
| 18. | ELEMENTS TO BE PROVIDED IN THE BID | 15 |

1. PURPOSE

The specifications set out the supply, on behalf of CEA, of an item of equipment of **spray pyrolysis** composed of a nano aerosol generator, a high temperature tube furnace and a nanoparticle collector. It will be dedicated to the synthesis of active material for lithium battery electrode.

The ultrasonic spray pyrolysis system could uniformly atomize the solution into microns or even nanoscale liquid particles. The atomized droplets are sent into a high-temperature reaction furnace through carrier gas for thermal cracking reaction and particles are gathered due to electrostatic collector.

If the supplier is unable to draw up the required technical specifications or documents, this shall be clearly specified in its commercial bid by filling in at least the “Supplier’s Comments” area of these specifications.

2. DEFINITION

In this document, the contractor is referred to as “the supplier”.

The instructing party is referred to as “CEA”.

3. GLOSSARY

LITEN: Laboratoire d’Innovation pour les Technologies des Energies Nouvelles et les nanomatériaux - Laboratory of innovation for new energy technologies and nanomaterials

4. APPLICABLE DOCUMENTS

The supplier shall comply with the documents and all procedures in force at CEA/GRENOBLE. Below is a non-exhaustive list:

EQ/CS23-10: Règles applicables aux entreprises extérieures (French version)

EQ/CS23-11: Applicable rules for outside companies (English version)

These documents shall be available for consultation upon request by the supplier.

5. CUSTOMER – SERVICE PROVIDER CONTACT

The technical contacts for the basic and additional services are:

Mr : Thibaut GUTEL

Tel.: +33(4) 38 78 21 12

Email: thibaut.gutel@cea.fr

6. CONFIDENTIALITY

The supplier undertakes to keep confidential and shall refrain from disclosing to any third party, without written approval from CEA, the whole or part of information and/or knowledge belonging to CEA or any third party, that it may obtain or may have obtained during the service performed on behalf of CEA.

7. TECHNICAL SPECIFICATIONS

7.1 *Expected technical specifications*

The spray pyrolysis unit is composed of three parts that must meet the following specifications.

a) The nano aerosol generator:

- A high frequency ultrasonic atomizer shall be controlled by a digital megasonic generator.
- It shall be fed with an automatic liquid supply system such as a peristaltic pump.
- The generated droplet size shall be between 1 to 4µm.
- It must be compatible with aqueous or organic solutions with viscosity below 1.1cps. In the case of aqueous solution, it must endure large pH conditions from pH 1 to pH 13.
- It must work between 20 and 60°C.
- The flow rate could reach 50mL/h.

b) The high temperature tube furnace:

- the furnace must reach a maximal temperature of 1200°C
- the heating temperature zone length has to be at least 400mm

c) The electrostatic nanoparticle collector:

- Based on high-voltage electrostatic field (max voltage 30 kV), the collection efficiency has to be above 95% for gas flow rate below 50L/min

A precise pressure regulator (<0.1MPa) must guarantee a control of carrier gas flow thanks to a precision gas flowmeter (flow rate below 50L / min).

The operating principle of the equipment and of all its components has to be fully and clearly detailed in enclosed documents which must precise any limitations in terms of operating conditions or incompatibilities with specific chemical products. All consumable items have to be listed precising the validity period before to change them.

The size of the equipment has to be below : 3m x 1m x 2m. All requirements in terms of connection have to be mentioned and the procedure to clean it after operation must be detailed.

7.2 *IT equipment*

If the equipment is delivered with a computer, it shall be set up with a Windows 11 Entreprise (1607 version and later) Operating System and shall be compatible with the SYMANTEC Endpoint Protection 12.1 RU6 MP6 at least (12.1 RU6 MP9 preferred) antivirus.

The hardware shall enable networking and shall feature at least [wired \(Ethernet\) network](#).

CEA's facilities management shall be called on to configure the PC to the CEA standard before its networking.

It must be possible to save the configuration and acquisition data in a repository of a network server. Therefore, the acquisition data shall be supplied as result files that can be transferred onto the network.

The system must have a remote supervisory system. This supervisory system shall feature a read only profile of the parameters. It shall not be possible to perform any action on the operation of the equipment.

Additional profiles will allow to make the following functions:

- User for the piloting of the equipment
- Maintenance technician for the configuration of the equipment
- Administrator (only for the system administrator staff)

Remote control access of the computer equipment from the Internet shall not be authorised for the maintenance or commissioning phases. Should, for technical reasons, remote control access from an Intranet be required, the supplier shall specify such requirement in its bid. It shall provide the list of all the remote actions that may occur on the equipment using the remote control access. CEA will then carry out an analysis to determine whether or not CEA grants an exception, without this being constituted as a commitment. In any case, the implementation of remote control access shall give rise to a reduction by the supplier which shall be specified in the bid. By default, the remote control access shall then be implemented via RDP (Remote Desktop Protocol) software.

In case parameters of the system can be modified, the supplier will have to indicate in the offer the elements of **analysis of security of this system of supervision allowing to demonstrate that the security of the equipment remains mastered by technical means independent from the system of supervision**. If these elements are not briefly known at the time of the offer, the supply of these elements will constitute a deliverable in the putting into service.

8. WORK ENVIRONMENT, PLACE OF INSTALLATION, SUPPLY LIMITS

8.1 Supply limits

The supply limits between CEA and the supplier are as follows:

| Elements | Incumbent upon CEA | Incumbent upon the supplier |
|--|--------------------|-----------------------------|
| Transport of the equipment from CEA reception to lab in which it will be installed | X | |
| Availability of various fluid (electricity, gas) closed to the equipment and hook-up | X | |

8.2 *Environment, Facilities*

The supplier shall include in its bid the fluid requirements, electrical power supply and any other required interfaces.

All required gas and connection types have to be precise. The dimensions to the full equipment and of each part have to be mentioned.

8.3 *Delivery*

Any item of equipment delivered shall bear the order number as well as the recipient's name. The supplier shall plan all measures for unloading and installing the equipment. Delivery shall be performed between 8 a.m. and 4:30 p.m. from Monday to Friday.

The equipment shall be installed on the Grenoble site in the C2 building.

The equipment and peripherals shall be delivered in a clean condition and packaged in a proper manner. The size of the package have to be below : 1250 (width) x 2100 (height) mm.

Transport trays, pallets and packaging crates shall be suited to the weights and volumes of the items so as to ensure safe transport and to subsequently prevent any dispute related to defective packaging.

All transport trays, pallets and packaging crates shall be removed by the supplier as the processing of packaging waste is not managed by CEA.

8.4 *Conditions for performing work on the CEA site*

In cooperation with the supplier and its subcontractors (if any), CEA shall draw up the overall prevention plan for the equipment installation and commissioning services.

As equipment lending, including safety equipment, is prohibited by CEA, the supplier and its subcontractors (if any) shall provide the required safety equipment for preventing the specific risks caused by its work (PPE, CPE, etc.). It shall be responsible for replacement and repair of said equipment and, as applicable (without compensation from CEA), it shall train and acquaint its staff with the use thereof in keeping with regulations. Said equipment shall comply with the regulations in force and the supplier shall possess a certificate of conformity.

The supplier and its subcontractors (if any) shall provide collective safety equipment designed to prevent accidents stemming from the work (marking out of the work areas, marking out of the traffic areas; marking out of the handling areas, marking out and implementation of barriers around pits, height differences, etc.). It shall perform and ensure their removal insofar as the service no longer requires the presence of marking systems.

9. LEAD TIMES

The equipment will be installed on site and received within a desired timeframe of 16 weeks from the date T_0 of notification of the order by the CEA.

10. QUALITY

The supplier shall apply a quality management system that is of the same level as ISO 9001 for all its activities.

Any significant and/or repeated failures to comply with the specifications shall be notified to the supplier (anomaly email or improvement sheet) in order to perform corrective actions within a stipulated timeframe. In the event of failures or should said corrective actions not be performed, penalty shall be applied to the service provider in reference to the contract.

CEA Grenoble reserves the rights to inspect the effective operation of the system at any time, via quality audits which may be performed at the service provider's premises and on the CEA Grenoble site.

Any measurements taken by the supplier for acceptance tests shall comply with the requirements of paragraph 7.6 of ISO 9001 (control of monitoring and measuring devices). Should the supplier subcontract these measurements, they shall be supplied with a certificate of conformity.

11. SAFETY AND CONFORMITY

As set forth in CEA's general purchasing conditions, the supplier undertakes to consider safety as an absolute priority in the design, preparation and performance of the services subject of the Contract.

The supplier shall read and apply the "Rules applicable to outside companies working at the Grenoble centre" (refer to chapter 4, "Applicable documents").

The supplier and its subcontractors (if any), irrespective of their rank, shall apply the legal and regulatory provisions pertaining to safety and environmental protection.

The equipment shall comply with the regulations in force.

The equipment shall be CE certified, feature a "CE marking" and shall be accompanied by a CE declaration of conformity (refer to chapter 13 "Documentation").

11.1 Risk analysis

The Supplier shall provide a risk analysis for the equipment and include all the associated items of safety equipment, their actions and servo-controls.

Said analysis shall highlight the specific risks related to the equipment and provide substantiation for the associated protection measures.

The supplier shall transmit this analysis to CEA right from the design phase (refer to chapter 13 "Documentation").

11.2 Risks related to facilities and machines

The equipment shall comply with the regulations in force, especially the "Machinery" Directive 2006/42/EC.

11.2.1 Power supply disconnection and separation device

A power supply disconnection and separation device shall be provided on the equipment, for each source of energy of the machine.

11.2.2 Power supply lockout / tagout device

A power supply lockout / tagout device with dissipation of the residual energy shall be provided on the equipment, for each source of energy of the machine.

11.2.3 Emergency stop

Emergency stop buttons shall feature protection against unintentional operation. See the example on the photo opposite.



11.2.4 "Service" nitrogen or compressed air connection

Whenever the equipment uses compressed air or nitrogen to control valves, actuators and other systems, the machine shall be equipped with a general shut-off valve.

This valve may be secured in closed position by means of a padlock in order to allow lockout / tagout of the facility (maintenance).

11.3 Risks related to electricity

11.3.1 Generalities

The equipment shall comply with the regulations in force, in particular the following Directives:

- "Electrical Equipment" 2017/35/EU;
- "Electromagnetic compatibility" 2014/30/EU;
- "Restriction of the use of certain hazardous substances in electrical and electronic equipment" (2011/65/EU).

If the equipment is composed of electrical measurement, control and laboratory devices, it shall comply with standard NF EN 61010-1.

If the equipment forms an electrical test equipment facility, it shall comply with standard NF EN 50191.

If the equipment uses safety extra low voltage, its source shall comply with standard NF EN 61558-2-6.

If the equipment features a source capable of feeding electricity back to the power grid, it shall comply with standard DIN VDE 0126

11.3.2 Presence of an uninterruptible power supply (UPS)

N/A

11.4 Risks related to fire

By default, the detectors integrated into the equipment shall not be connected to the fire safety system of the building and shall act only on the equipment concerned and its associated peripherals, if any.

If the supplier considers that it is necessary to connect its fire safety system to the fire safety system of the building, it shall previously contact CEA to verify the compatibility of the entire system.

11.5 Risks related to explosion

The equipment shall comply with the regulations in force, especially the "ATEX" Directive 2014/34/EU.

Whenever the equipment is likely to generate an explosive atmosphere, the supplier shall perform an ATEX risk assessment and substantiate the choice of the selected ATEX equipment. The ATEX zoning plan as well as the certificates of conformity of the ATEX items of equipment shall be supplied to CEA.

11.6 Risks related to chemicals

Whenever the equipment uses chemicals which involve risks for the health and safety of operators, the supplier shall provide a risk analysis with all details concerning the protection measures implemented during the various work phases (normal, degraded or maintenance work).

- ❑ Whenever the supplier procures chemicals (in solid, gas or liquid forms), it shall provide the full list of products as well as the Material Safety Data Sheets (in French) for each product.
CEA will be particularly vigilant with regard to compliance of the content, pictograms and classification used, as well as the provision of a version written in French.
- ❑ All items of equipment containing liquid chemicals shall be organised so as to form a containment to prevent unintentional spreading of these products outside of the equipment. Said containment systems shall be fitted with leak detectors that display the information on the equipment's control console. If a detector sends an alarm signal, this shall cut off the automatic supply to the machine and the flow of chemical fluids. The detectors shall be tested before the equipment is set into operation.
- ❑ Operation of the equipment shall be subordinated to the proper operation of the extraction system. The extraction level shall be permanently controlled by one or more extraction controllers, which shall display a visual alarm on the work station (on the equipment and, if necessary, on the related peripherals).
Note: with regard to automated equipment, this "extraction" alarm may be grouped with other types of alarms on the control consoles of the equipment. The following items of equipment shall be placed under extraction: tanks, work surfaces and, more generally, any location where leakage may occur: presence of couplings, valves, pumps, storage capacities (even closed), canisters, etc.
- ❑ The chemical tanks of the laboratory tables shall be equipped with an automatic drainage system with an adjustable timer, so that the solutions can be automatically directed towards the drains in the event of an extended interruption of the extraction.
- ❑ For the requirements of specific processes, chemicals will need to be heated. At the end of the operation, these baths are evacuated towards dedicated drains. For temperatures above 60°C and for evacuations in the "solvents" drain, a study shall be carried out in order to determine the best solution: PVDF material, dilution module, heat exchanger, etc.

If the solution selected by the supplier involves the installation of a buffer tank to allow these effluents to cool, said tank shall feature a containment device and be fitted with a draining system with an adjustable timer, as mentioned above.

- ❑ As regard equipment comprising process chambers, the supplier shall provide the list of expected by-products if the chamber is open, this in order to make maintenance operations easier.
- ❑ The supplier shall provide CEA with the technical data sheets and the Material Safety Data Sheets (MSDS) of the heat insulating materials used and shall give priority to the least hazardous heat insulating products (non CMR). Use of category 1a and 1b CMR substances is PROHIBITED. The use of heat insulating products classified as category 2 CMR shall be substantiated by the supplier and previously validated by CEA.

11.7 Risks related to handling

For those parts of the equipment requiring handling (pumping units, chamber lids, covers, etc.), in particular during maintenance or installation operations, suitable lifting means shall be provided and described in the safety instructions of the equipment.

Systems integrated into the equipment shall be given preference over removable systems.

11.8 Risks related to pressure vessels

N/A

11.9 Risks related to work at height

N/A

11.10 Risks related to artificial optical radiation

N/A

11.11 Risks related to noise

The equipment shall comply with the regulations in force, in particular the "Machinery" Directive 2006/42/EC.

11.12 Risks related to temperatures

The equipment shall comply with the regulations in force, in particular the "Machinery" Directive 2006/42/EC.

11.13 Signalling

The equipment shall comply with the regulations in force, in particular the "Machinery" Directive 2006/42/EC.

Residual risks shall be indicated on the machine by means of regulatory hazard pictograms (triangles with yellow background), accompanied by additional text when applicable. In this case, this text shall be written in French.

11.14 Regulatory inspections

CEA shall have the necessary regulatory inspections carried out by an authorised organisation of its choice, in order to verify that the supplied equipment complies with the regulations.

The Supplier shall remedy any non-conformity in the shortest time possible without being able to claim any compensation. Depending on the severity of the detected anomalies, CEA may decide to suspend the commissioning operations until the problems have been solved (refer to Article 30 of chapter 11 of the General Purchasing Conditions).

11.14.1 Inspection of the work equipment

The equipment supplied shall comply with the regulations in force in France.

These regulations include European texts.

The various standards applicable to the machine shall be complied with.

The general rules specified by the "Machinery" Directive 2006/42/EC on the use of work equipment and protection measures shall be complied with.

11.14.2 Regulatory electrical inspection

Once the equipment is installed on the site and prior to commissioning, CEA shall have a regulatory electrical inspection carried out by an inspection body of its choosing.

CEA shall have the necessary regulatory inspections carried out by an authorised organisation of its choice, in order to verify that the supplied equipment complies with the regulations.

The Supplier shall remedy any non-conformity in the shortest time possible without being able to claim any compensation. Depending on the severity of the detected anomalies, CEA may decide to suspend the commissioning operations until the problems have been solved (refer to Article 30 of chapter 11 of the General Purchasing Conditions).

11.14.3 Inspection of the work equipment

The equipment supplied shall comply with the regulations in force in France.

These regulations include European texts.

The various standards applicable to the machine shall be complied with.

The general rules specified by the "Machinery" Directive 2006/42/EC on the use of work equipment and protection measures shall be complied with.

Refer to chapter 14. CEA shall have an inspection of the work equipment carried out on the place of installation. The report issued further to this inspection shall be free of any non-conformity. In the event of a non-conformity, a second inspection shall be carried out after the equipment is installed on the site.

11.14.4 Regulatory electrical inspection

Once the equipment is installed on the site and prior to commissioning, CEA shall have a regulatory electrical inspection carried out by an inspection body of its choosing.

12. ENVIRONMENTAL CLAUSES

During the application stage, applicants shall be required to submit quality certificates based on the EC eco-management and audits scheme (EMAS) or on environmental management standards (ISO14001 for example) or any other equivalent proof of implementation of an environmental management system of a level equivalent to ISO 14001 helping to assess the technical capacity of the applicants in terms of environmental protection.]

The equipment manufacturer will present in its offer the actions it has already implemented in its activity in favor of sustainable development and its proposals for improvements specific to this service

The equipment must be designed in such a way as to limit polluting emissions into the environment, in particular by the implementation of clean technologies, the segregation and treatment of effluents and waste according to their characteristics, and the reduction of the quantities released.

13. EQUIPMENT DOCUMENTATION

The supplier undertakes to provide:

- The user's manual written in French; if this is not possible, only the "safety" section of the manual shall be written in French.
- The servicing and maintenance manual.
- The work equipment inspection.
- The regulatory electrical inspection.
- The CE declaration.
- The equipment safety analysis (refer to §11) and in particular the supervisory system, the safety instructions and risk identification.
- The drawings.
- The as-built file (DOE).

14. ACCEPTANCE CONDITIONS

Acceptance is given after complete delivery of the equipment and at the end of the installation and commissioning operations, and after satisfactory tests. If there were any remarks during the pre-acceptance (if it was carried out in the factory, see 11.14.1 Checking work equipment), it will be necessary to check that the solutions provided comply with the safety requirements (for example, refer to to form FOR259).

Criteria for granting acceptance:

- Supply of the documents stipulated in the "Documentation" paragraph 13
- Perform a reference test.

The reference test will generate a spray of water to verify the atomization. The function of each part of the equipment will be checked to ensure it worked normally. A final inspection report will be provided.

15. TRAINING

The supplier undertakes to provide the following training:

15.1 Training on the use of the equipment

The supplier undertakes to conduct training on the use of the equipment for 2 persons.

The supplier shall specify the duration of the required training courses in its bid.

This training shall include a global presentation of the unit and provide a quick guideline to perform some experiments.

15.2 Training on first level maintenance

The supplier undertakes to conduct training on first level maintenance for 2 people. The supplier shall specify the duration of the required training in its bid.

This training shall include the equipment cleaning, the replacement of various glassware part and maintenance of ultrasonic atomizer.

15.3 Training on advanced maintenance

N/A

16. WARRANTY

Notwithstanding the legal warranty, the equipment shall be guaranteed 1 year(s) as from acceptance against any material, manufacturing, installation and operating defect, in compliance with the technical requirements of the specifications.

Said warranty shall cover the parts (excluding consumables), workmanship, transportation and travel.

Throughout the warranty period, the supplier undertakes to carry out repair work at the latest within 48 hours following receipt of a fax or an email form CEA requesting a service call. These services shall be carried out every day from Monday to Friday, from 8 a.m. to 5 p.m.

In the event of equipment unavailability, the warranty period shall be extended by a period of time equal to the equipment downtime.

17. MAINTENANCE

At the end of the warranty, CEA shall be given the possibility to purchase a maintenance contract.

The supplier shall include in its price base, a cost estimate of the annual and/or pluriannual maintenance services by taking into account the following levels of requirement:

- Full service (commitments on the availability time of the equipment including the preventive maintenance services, unlimited corrective maintenance and supply of spare parts). By default, the performance expected in the Full Service contract is that stipulated herein;
- Preventive maintenance (parts and manpower) + corrective maintenance on demand (hourly rate) including compliance with service and repair lead times.

Following adjustment of CEA's maintenance requirements, the maintenance contract may be put in place after the warranty period, further to negotiations.

18. ELEMENTS TO BE PROVIDED IN THE BID

- ☐ Comments from the Equipment Manufacturer on the Equipment Specifications (refer to § Annex 1).
- ☐ The description of required utilities. Completed characteristics of fluid requirements, power supply and all other necessary interfaces (refer to § Appendix 2).
- ☐ Maintenances costs
- ☐ The duration and description of the planned training
- ☐ Safety analysis of the equipment (refer to § 11.1)

Appendix 1. Equipment Specifications compliance - to be provided by the equipment manufacturer

| | |
|-----------------|--|
| Supplier name | |
| Offer reference | |

C = Compliant
NC = Non Compliant adaptations are necessary
NA = Non Applicable

| Spécification Topics | Compliant ? | | | Supplier Comments | Supplier Alternative proposal | Final decision |
|------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------|-------------------------------|----------------|
| 1.Purpose | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 6. Confidentiality | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 7.1 Expected Spécifications | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 7.2 IT equipment | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 8.1 Supply limits | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 8.2 Environnement facilities | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |

| Spécification Topics | Compliant ? | | | Supplier Comments | Supplier Alternative proposal | Final decision |
|--|-------------------------------|--------------------------------|--------------------------------|-------------------|-------------------------------|----------------|
| 8.3 Delivery | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 8.4. Conditions for performing work on the CEA site | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 9-Lead Times | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 10 Quality | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11 1. Risk analysis | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.2.1- Power supply disconnection and separation device | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.2.2 Power supply lockout/tagout device | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.2.3- Emergency stop | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.2.4-“Service” nitrogen or compressed air connection | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |

| Spécification Topics | Compliant ? | | | Supplier Comments | Supplier Alternative proposal | Final decision |
|--|-------------------------------|--------------------------------|--------------------------------|-------------------|-------------------------------|----------------|
| 11.3.1 Risks related to electricity - Generalities | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.3.2 Presence of an uninterruptible power supply (UPS) | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.4- Risk related to fire | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.5 Risks related to explosion | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.6 Risks related to chemicals | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.7 Risks related to handling | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.8 Risks related to pressure vessels | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.9 Risks related to work at height | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.10 Risks related to artificial optical radiation | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |

| Spécification Topics | Compliant ? | | | Supplier Comments | Supplier Alternative proposal | Final decision |
|--|-------------------------------|--------------------------------|--------------------------------|-------------------|-------------------------------|----------------|
| 11.11 Risks related to noise | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.12 Risks related to temperatures | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.13 Signalling | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.14.1 Work equipment inspections | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 11.14.2 Regulatory electrical inspections | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 12. Environmental Clauses | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 13. Equipment documentation | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 14 Acceptance Conditions | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 15.1 Training on the use of the equipment | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |

| Spécification Topics | Compliant ? | | | Supplier Comments | Supplier Alternative proposal | Final decision |
|---|-------------------------------|--------------------------------|--------------------------------|-------------------|-------------------------------|----------------|
| 15.2 Training on first level maintenance | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 15.3 Training on advanced maintenance | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 16 Warranty | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 17 Maintenance | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |
| 18 Elements to be provided in the BID | C <input type="checkbox"/> | NC <input type="checkbox"/> | NA <input type="checkbox"/> | | | |

| Validation summary of the points to be clarified | | | |
|--|------|------|-----------|
| | Name | Date | Signature |
| SUPPLIER | | | |
| CDPE | | | |
| Division Manager | | | |

Dispatch : Head of the Department- CDPE (Chef de Projet Equipement) - Service Achats - Chef d'installation - Responsable plateforme

Appendix 2. Specifications for installing equipment - to be provided by the equipment manufacturer

Features completed with fluid requirements, power supply and any other interfaces he deems necessary for a good estimate of the cost of installing the equipment.

- 1) This appendix will allow the CEA to produce the fluids PID and electrical PID.
- 2) These PIDs will then be sent for verification to the equipment supplier for approval.
- 3) The Hook Up and Fit Up will begin after the official validation of the PIDs by the supplier.



Annexe2_Datasheet
_for_Tool_Installatic

This file can be sent at a companie.

The file content is put here as an illustration of the requested content.

Modèle de l'équipement :

| Liste des Equipments & sous-equipments | | | | | | |
|--|---------------------------|-------------------------|-------|------------------------------|-------------|-------------|
| Nom | Location (Fab or sub-fab) | Type (Chiller, pump...) | Model | Dimensions (L x w x h) in mm | Weight (Kg) | Supplied by |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Dimensionnement nécessaire des facilities pour le bon fonctionnement de l'équipement | | | Description (b) | Connection | | Consumption (e) = "Consomation" | | | | Pressure (bar) at the connection on the tool | | Temp (° C) | | Purity | Supplied by | Comments (ex: max length..) (f) |
|--|------|----|-----------------|------------|----------|---------------------------------|-----|-----|---------|--|-----|------------|-----|--------|-------------|---------------------------------|
| Fluid (a) | From | To | | ID (c.) | Size (d) | Type | Min | Max | Average | Min | Max | Min | Max | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Comments

(a): Voir feuille "Fluids" pour quelques exemples

(b): Pour décrire le but et les caractéristiques de connexion

(c): Nom de la connexion identifiée sur l'équipement

(d): Taille de la connexion, l'unité doit être précisée

(e): Flows (débit entrant et sortant) et consommations qui doivent être converti comme décrit ci-dessous :

Exhaust : m³/h

ERP (PCW), EDI (DIW), VP, drain : l/min

Gaz : Slm (Standard liter per minute)

(f): Mettre les remarques et contraintes à connaître pour l'installation de l'équipement : par exemple longueur maximale, ...

| Exigences Electriques | | | | | | | | | |
|-----------------------|----|------------------------|---------|--------|---|--------------------------|-------------|-------------|--------------|
| From | To | Type (power, signal..) | Voltage | Phases | Breaker Amp = limite en ampères de sécurité | FLA (Full Load Amperage) | Average Amp | Supplied by | Installed by |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Nuisances | | | | | | | | | |
|-----------|----|------------------------|---------|--------|---|--------------------------|-------------|-------------|--------------|
| From | To | Type (power, signal..) | Voltage | Phases | Breaker Amp = limite en ampères de sécurité | FLA (Full Load Amperage) | Average Amp | Supplied by | Installed by |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Nuisances | | unity | level |
|---------------------------------------|------------------|-------|-------|
| Security description must be attached | Noise | dB | |
| | Vibrations | | |
| | X rays | | |
| | Magnetic | | |
| | Dust | | |
| | "Nano" particles | | |

| Fluids | Descriptions |
|---------------|--|
| ACS / CDA | Air Comprimé Sec / Compressed Dry Air |
| N2S | Nitrogen Service |
| N2P | Nitrogen Process |
| Ar | Argon Process |
| He | Helium Process |
| Exhaust | Exhaust |
| Acid Drain | Acid Drain |
| HF Drain | HF Drain (if [HF] > 1%) |
| Solvent Drain | Solvent Drain |
| ERP / PCW | Eau de Refroidissement Process / Process Cooling Water |
| EDI / DIW | Eau Dé-Ionisée / Deionised Water |
| VP | Vide Process / Vacuum (P=-880mbar) (expect pump) |
| Process Gas | Example : H2, SiH4, CH4... |
| Process Fluid | Example : IPA, HF, H3PO4... |