

Purchase Contract

(hereafter the "**Contract**")

1. CONTRACTUAL PARTIES

1.1 Fyzikální ústav AV ČR, v. v. i.,

with seat: Na Slovance 1999/2, 182 21 Praha 8,
represented by: RNDr. Michael Prouza, Ph.D., Director,
registered in the Register of public research institutions of the Ministry of Education, Youth and
Sports of the Czech Republic.

Bank: [REDACTED]
Account No. IBAN: [REDACTED]; SWIFT (BIC): [REDACTED]
ID No.: 68378271
Tax ID No.: CZ68378271

(hereinafter the "**Buyer**")

and

1.2 CORNES Technologies USA,

with seat: 780 Montague Expwy, Suite 506, San Jose, CA 95131, USA,
represented by: Dr Philippe Bergonzo, Vice President,
registered in California, USA.

Bank: [REDACTED]
ACCT No.: [REDACTED]; ABA No.: [REDACTED]; SWIFT (BIC): [REDACTED]
ID No.: C0956072
Tax ID No.: 94-2678373

(hereinafter the "**Seller**"),

(the Buyer and the Seller are hereinafter jointly referred to as the "**Parties**" and each of them
individually as a "**Party**").



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2. FUNDAMENTAL PROVISIONS

- 2.1 The Buyer is a public research institution whose primary activity is scientific research in the area of physics, especially elementary particles physics, condensed systems, plasma and optics.
- 2.2 The Buyer wishes to acquire the subject of performance hereof in order to perform deposition of diamond thin films on planar substrates from hydrogen rich plasma.
- 2.3 The Buyer is the beneficiary of the subsidy for the project **"Solid state physics for the 21st century (SOLID 21)"**, Reg. No CZ.02.1.01/0.0/0.0/16_019/0000760 (hereinafter the **"Project"**), within the Operational Program Research, Development and Education (hereinafter the **"OP RDE"**) of the provider Ministry of Education, Youth and Sports of the Czech Republic. The subject of public procurement will be co-financed by the EU Structural Funds.
- 2.4 The Seller was selected as the winner of a public procurement procedure announced by the Buyer in accordance with Act No. 134/2016 Coll., on Public Procurement, as amended (hereinafter the **"Act"**), for the public contract called **"Microwave plasma CVD deposition system"** (hereinafter the **"Procurement Procedure"**). Both the Procurement Procedure and the Contract shall be governed by the Rules for applicants and beneficiaries of OP RDE, which are publicly accessible and are binding on the Parties.
- 2.5 The documentation necessary for the execution of the subject of performance hereof consist of
- 2.5.1 Technical specifications of the subject of performance hereof attached as **Annex No. 1** hereto.
- 2.5.2 The Seller's bid submitted within the Procurement Procedure in its parts which describe the subject of performance in technical detail (hereinafter the **"Sellers's Bid"**); the Sellers's Bid forms **Annex No. 2** to this Contract and is an integral part hereof.
- In the event of a conflict between the Contract's Annexes the technical specification / requirement of the higher level / quality shall prevail.
- 2.6 The Seller declares that he has all the professional prerequisites required for the supply of the subject of performance under this Contract, is authorised to supply the subject of performance and there exist no obstacles on the part of the Seller that would prevent him from supplying the subject of this Contract to the Buyer.
- 2.7 The Seller acknowledges that the Buyer considers him capable of providing performance under the Contract with such knowledge, diligence and care that is associated and expected of the Seller's profession, and that the Seller's potential performance lacking such professional care would give



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rise to corresponding liability on the Seller's part. The Seller is prohibited from misusing his qualities as the expert or his economic position in order to create or exploit dependency of the weaker Party or to establish an unjustified imbalance in the mutual rights and obligation of the Parties.

- 2.8 The Seller acknowledges that the Buyer is not in connection to the subject of this Contract an entrepreneur and also that the subject of this Contract is not related to any business activities of the Buyer.
- 2.9 The Seller acknowledges that the production and delivery of the subject of performance within the specified time and of the specified quality, as shown in Annexes No. 1 and 2 of this Contract (including invoicing), is essential for the Buyer.
- 2.10 The Parties declare that they shall maintain confidentiality with respect to all facts and information, which they learn in connection herewith and / or during performance hereunder, and whose disclosure could cause damage to either Party. Confidentiality provisions do not prejudice obligations arising from valid legislation.

3. SUBJECT-MATTER OF THE CONTRACT

- 3.1 The subject of this Contract is the obligation on the part of the Seller to deliver and transfer into the Buyer's ownership:

the Microwave plasma CVD deposition system

(hereafter the **"Equipment"**)

and the Buyer undertakes to take delivery of the Equipment and to pay to the Seller the agreed upon price.

- 3.2 The following activities form an integral part of the performance to be provided by the Seller:
 - 3.2.1 Formulation of conditions which are recommended to be met at the place of Buyer in order to install the Equipment;
 - 3.2.2 Transport of the Equipment incl. all accessories specified in Annexes 1 and 2 of the Contract to the site, un-packaging and control thereof;
 - 3.2.3 Installation of the Equipment including connection to installation infrastructure at the site;
 - 3.2.4 Execution of the acceptance test:



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- base pressure measurement
- vacuum leak rate measurement
- MW radiation measurement
- water leak measurement
- safety interlock operation
- system and process tests
- growth of diamond film verified by Raman measurement (available by Buyer)
- growth rate and homogeneity evaluation over 4 inch area (optical measurements and cross section SEM images, available by Buyer)

3.2.5 Delivery of detailed instructions and manuals for operation and maintenance, including list of spare parts, vacuum, gas and electrical connection schemes - all in Czech or English language, in electronic or hardcopy (printed) versions;

3.2.6 Training of operators at the site (at least 1-day training of 4 operators);

3.2.7 Free-of-charge warranty service including service inspections;

3.2.8 Provision of technical support in the form of consultations.

3.3 The subject of performance (Equipment) is specified in detail in Annexes No. 1 and No. 2 hereto.

3.4 The Seller shall be liable for the Equipment and related services to be in full compliance with this Contract, its Annexes and all valid legal regulation, technical and quality standards and that the Buyer will be able to use the Equipment for the defined purpose. In case of any conflict between applicable standards it is understood that the more strict standard or its part shall always apply.

4. PERFORMANCE PERIOD

4.1 The Seller undertakes to manufacture, deliver, install and handover the Equipment to the Buyer within **8 (eight) months** of the conclusion of this Contract.

4.2 The performance period shall be extended for a period during which the Seller could not perform due to obstacles on the part of the Buyer.



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5. PURCHASE PRICE, INVOICING, PAYMENTS

- 5.1 The purchase price is based on the Seller's submitted bid and amounts to **269,000.00 EUR** (in words: Two Hundred and Sixty Nine Thousand Euros) excluding VAT (hereinafter the **"Price"**). VAT shall be paid by the Buyer and settled in accordance with the valid Czech regulation.
- 5.2 The Price represents the maximum binding offer by the Seller and includes any and all performance provided by the Seller in connection with meeting the Buyer's requirements for the proper and complete delivery of the Equipment hereunder, as well as all costs that the Seller may incur in connection with the delivery, and including all other costs of expenses that may arise in connection with creation of an intellectual property and its protection.
- 5.3 The Parties agreed that the Seller shall be entitled to invoice the Price as follows:
- 5.3.1 The Seller is entitled to issue an advance invoice corresponding to 30 % of the Price excluding VAT after the conclusion of the Contract;
- 5.3.2 The Seller is entitled to invoice the Price after the handover protocol in accordance with Section 10.4 will have been signed. In case the Equipment will be delivered with minor defects and / or unfinished work, the Price shall be invoiced after removal of these minor defects and / or unfinished work.
- 5.4 All invoices issued by the Seller must contain all information required by the applicable laws of the Czech Republic. Invoices issued by the Seller in accordance with this Contract shall contain in particular following information:
- 5.4.1 name and registered office of the Buyer,
- 5.4.2 tax identification number of the Buyer,
- 5.4.3 name and registered office of the Seller,
- 5.4.4 tax identification number of the Seller,
- 5.4.5 registration number of the tax document (invoice),
- 5.4.6 scope of the performance (including the reference to this Contract),
- 5.4.7 the date of the issue of the tax document (invoice),
- 5.4.8 the date of the fulfilment of the Contract,





- 5.4.9 purchase Price,
- 5.4.10 registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,
- 5.4.11 declaration that the performance of the Contract is for the purposes of the project "Solid state physics for the 21st century (SOLID21)", Reg. No. CZ.02.1.01/0.0/0.0/16_019/0000760

and must comply with the double taxation agreements, if applicable.

- 5.5 The Buyer prefers electronic invoicing, with the invoices being delivered to efaktury@fzu.cz. All issued invoices shall comply with any international double taxation agreements, if applicable.
- 5.6 Invoices shall be payable within thirty (30) days of the date of their delivery to the Buyer. Payment of the invoiced amount means the date of its remittance to the Seller's account.
- 5.7 If an invoice is not issued in conformity with the payment terms stipulated by the Contract or if it does not comply with the requirements stipulated by law, the Buyer shall be entitled to return the invoice to the Seller as incomplete, or incorrectly issued, for correction or issue of a new invoice, as appropriate, within five (5) business days of the date of its delivery to the Buyer. In such a case, the Buyer shall not be in delay with the payment of the Price or part thereof and the Seller shall issue a corrected invoice with a new and identical maturity period commencing on the date of delivery of the corrected or newly issued invoice to the Buyer.
- 5.8 The Buyer shall be entitled to unilaterally set off any of his payments against any receivables claimed by the Seller due to:
 - 5.8.1 damages caused by the Seller,
 - 5.8.2 contractual penalties.
- 5.9 The Seller shall not be entitled to set off any of his receivables against any part of the Buyer's receivable hereunder.

6. **OWNERSHIP TITLE**

- 6.1 The ownership right to the Equipment shall pass to the Buyer by handover. Handover shall be understood as delivery and acceptance of the Equipment duly confirmed by Parties on the Handover Protocol in accordance with Section 10.4.



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7. PLACE OF DELIVERY AND HANDOVER OF THE EQUIPMENT

- 7.1 The place of delivery and handover of the Equipment shall be the room No. A12 in the building A of the Fyzikální ústav AV ČR, v. v. i. at Cukrovarnická 112/10, 162 00 Praha 6, Czech Republic.

8. PREPAREDNESS OF THE PLACE OF DELIVERY AND HANDOVER

- 8.1 The Seller shall notify the Buyer in writing of the exact date of installation of the Equipment at least 30 days prior to such date, ensuring that the deadline for the performance hereunder is maintained.
- 8.2 The Buyer shall be obliged to allow the Seller, once the deadline set forth in Section 8.1 hereof expires, to install the Equipment at the place of delivery and handover.

9. COOPERATION OF THE PARTIES

- 9.1 The Seller undertakes to notify the Buyer of any obstacles on his part, which may negatively influence proper and timely delivery of the Equipment.

10. DELIVERY, INSTALLATION, HANDOVER AND ACCEPTANCE

- 10.1 The Seller shall transport the Equipment at its own cost to the place of delivery and handover. If the shipment is intact, the Buyer shall issue delivery note for the Seller.
- 10.2 The Seller shall perform and document the installation of the Equipment and launch experimental tests in order to verify whether the Equipment is functional and meets the technical requirements of Annexes No. 1 and 2 hereof.
- 10.3 Handover procedure includes handover of any and all technical documentation pertaining to the Equipment, user manuals and certificate of compliance of the Equipment and all its parts and accessories with approved standards.
- 10.4 The handover procedure shall be completed by handover of the Equipment confirmed by the Handover Protocol containing specifications of all performed tests. The Handover Protocol shall contain the following mandatory information:
- 10.4.1 Information about the Seller, the Buyer and any subcontractors;
- 10.4.2 Description of the Equipment including description of all components, their hardware/software setups (i.e. communication address, etc.) and serial numbers;
- 10.4.3 Description of executed tests according to Section 3.2.4 of the Contract: type of test,



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duration and achieved parameters;

10.4.4 List of technical documentation including the manuals;

10.4.5 Confirmation on training, its participants and extent;

10.4.6 Eventually reservation of the Buyer regarding minor defects and unfinished work including the manner and deadline for their removal and

10.4.7 Date of signature of the Equipment Handover Protocol.

10.5 Handover of the Equipment does not release the Seller from liability for damage caused by its defects.

10.6 The Buyer shall not be obliged to accept Equipment, which would show defects or unfinished work and which would otherwise not form a barrier, on their own or in connection with other defects, to using the Equipment. In this case, the Buyer shall issue a record containing the reason for his refusal to accept the Equipment.

10.7 Should the Buyer not exercise his right not to accept the Equipment with defects or unfinished work, the Seller and the Buyer shall list these defects or unfinished work in the Handover Protocol, including the manner and deadline for their removal. Should the Parties not be able to agree in the Handover Protocol on the deadline for removal of the defects, it shall be understood that any defects shall be removed / rectified within 14 days from the handover of the Equipment.

11. TECHNICAL ASSISTANCE – CONSULTATIONS

11.1 The Seller shall be obliged to provide to the Buyer free-of-charge technical assistance by phone or e-mail relating to the subject-matter hereof during the entire term of the warranty period. The Seller undertakes to provide to the Buyer paid consultations and technical assistance relating to the subject-matter hereof also after the warranty period expires.

12. REPRESENTATIVES, NOTICES

12.1 The Seller authorized the following representatives to communicate with the Buyer in all matters relating to the Equipment delivery:



12.2 The Buyer authorized the following representatives to communicate with the Seller:



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- 12.3 All notifications to be made between the Parties hereunder must be made out in writing and delivered to the other Party by hand (with confirmed receipt) or by registered post (to the Buyer's or Seller's address), or in some other form of registered post or electronic delivery incorporating electronic signature (qualified certificate) to epodatelna@fzu.cz in case of the Buyer and to [redacted] in case of the Seller.
- 12.4 In all technical and expert matters (discussions on the Equipment testing and demonstration, notification of the need to provide warranty or post-warranty service, technical assistance etc.) electronic communication between technical representatives of the Parties will be acceptable using e-mail addresses defined in Sections 12.1 and 12.2.

13. TERMINATION

- 13.1 This Contract may be terminated early by agreement of the Parties or withdrawal from the Contract on the grounds stipulated by law or in the Contract.
- 13.2 The Buyer is entitled to withdraw from the Contract without any penalty from the Seller in any of the following events:
- 13.2.1 The Seller is in delay with the delivery of the Equipment longer than 2 weeks after the date pursuant to Section 4.1 hereof.
 - 13.2.2 Technical parameters or other conditions required in the technical specification defined in Annexes No. 1 and 2 hereto and in the relevant valid technical standards will not be achieved by the Equipment at acceptance.
 - 13.2.3 Facts emerge bearing evidence that the Seller will not be able to deliver the Equipment.
 - 13.2.4 The Seller will not meet the qualification criteria set within the Procurement Procedure.
- 13.3 The Seller is entitled to withdraw from the Contract in the event of the Buyer being in default with the payment for more than 2 months with the exception of the cases when the Buyer refused an invoice due to defect on the delivered Equipment or due to breach of the Contract by the Seller.



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- 13.4 Withdrawal from the Contract becomes effective on the day the written notification to that effect is delivered to the other Party. The Party which had received performance from the other Party prior to such withdrawal shall duly return such performance.

14. INSURANCE

- 14.1 The Seller undertakes to insure the Equipment against all risks, in the amount of the Price of the Equipment for the entire period commencing when transport of the Equipment starts until duly handed over to the Buyer. In case of breach of this obligation, the Seller shall be liable to the Buyer for any damage that may arise.
- 14.2 The Seller is liable for the damage that he has caused. The Seller is also liable for damage caused by third parties undertaken to carry out performance or his part under this Contract.

15. WARRANTY TERMS

- 15.1 The Seller shall provide warranty for the quality of the Equipment for a period of 24 months.
- 15.2 The warranty term shall commence on the day following the date of signing of the Handover Protocol pursuant to Section 10.4 hereof. The warranty does not cover consumable things.
- 15.3 Should the Buyer discover a defect, he shall notify the Seller to rectify such defect using the e-mail address: [REDACTED]. The Seller is obliged to notify the Buyer without delay about any change of this email address. The Seller shall be obliged to review any warranty claim within 3 business days from its receipt and to propose solution, unless agreed otherwise by the Parties.
- 15.4 During the warranty period the Seller shall be obliged to rectify any claimed defects within 14 business days from receipt of the Buyer's notification. In cases of unusual defects, the Seller shall be obliged to rectify the defect in the period corresponding to the nature of the defect and to define the deadline for the handover of the rectified Equipment.
- 15.5 During the warranty period any and all costs associated with defect rectification / repair including transport and travel expenses of Seller shall be always borne by the Seller.
- 15.6 The repaired Equipment shall be handed over by the Seller to the Buyer on the basis of a protocol confirming removal of the defect (hereinafter the "**Repair Protocol**") containing confirmations of both Parties that the Equipment was duly repaired and is defect-free.
- 15.7 The repaired portion of the Equipment shall be subject to a new warranty term in accordance with Section 15.1 which commences to run on the day following the date when the Repair Protocol was executed. However, the aggregate warranty period shall not exceed 48 months.





- 15.8 The Seller declares that he shall ensure paid post-warranty [out-of-warranty] service for the period of 10 years after the expiration of the warranty; the service terms shall be identical to those of Sections 15.3 and 15.4.
- 15.9 The Seller undertakes to provide the Buyer with updates of the software controlling the Equipment for the entire term of warranty service.

16. CONTRACTUAL PENALTIES

- 16.1 The Buyer shall have the right to a penalty in the amount of 0.1 % of the Price for each commenced day of delay with the performance pursuant to Section 4.1 hereof.
- 16.2 The Buyer shall have the right to a penalty in the amount of 0.1 % of the Price for each commenced day of delay with rectifying of defects claimed within the warranty period.
- 16.3 In case of default in payment of any due receivables (monetary debt) under the Contract, the defaulting Buyer or Seller (the debtor) shall be obliged to pay a contractual penalty in the amount of 0.1 % of the owed amount for each commenced day of delay with the payment.
- 16.4 The Buyer shall be entitled to claim a contractual penalty against the Seller in the amount of 30 % of the Price, in case it will subsequently take advantage of the opportunity to withdraw from the Contract pursuant to Section 13.2.1 and 13.2.2.
- 16.5 Contractual penalties are payable within 30 days of notification demanding payment thereof.
- 16.6 Payment of the contractual penalty does not prejudice the rights of the Parties to claim damages.

17. DISPUTES

- 17.1 Any and all disputes arising out of this Contract or the legal relationships connected with the Contract shall be resolved by the Parties by mutual negotiations. In the event that any dispute cannot be resolved by negotiations within sixty (60) days, the dispute shall be resolved by the competent court in the Czech Republic based on application of any of the Parties; the court having jurisdiction will be the court where the seat of the Buyer is located. Disputes shall be resolved exclusively by the law of the Czech Republic.

18. ACCEPTANCE OF THE PROJECT RULES

- 18.1 The Seller, using all necessary professional care, shall cooperate during financial inspections carried out in accordance with Act No. 320/2001 Coll., on Financial Inspections, as amended, or during other financial inspections carried out by any auditing entities (particularly by the Managing Authority of the Operational Program Research, Development and Education) and shall allow





access also to those portions of the bid submitted within the Procurement Procedure, the Contract and related documents which may be protected by special legal regulation, given that all requirements set forth by legal regulation with respect to the manner of executing such inspections will have been observed.

19. **FINAL PROVISIONS**

- 19.1 This Contract represents the entire agreement between the Buyer and the Seller. The relationships between the Parties not regulated in this Contract shall be governed by the Act No. 89/2012 Coll., the Civil Code, as amended.
- 19.2 In the event that any of the provisions of this Contract shall later be shown or determined to be invalid, ineffective or unenforceable, then such invalidity, ineffectiveness or unenforceability shall not cause invalidity, ineffectiveness or unenforceability of the Contract as a whole. In such event the Parties undertake without undue delay to subsequently clarify any such provision or replace after mutual agreement such invalid, ineffective or unenforceable provision of the Contract by a new provision, that in the extent permitted by the laws and regulations of the Czech Republic, relates as closely as possible to the intentions of the Parties to the Contract at the time of creation hereof.
- 19.3 This Contract may be changed or supplemented solely by means of numbered amendments in writing, furnished with the details of time and place and signed by duly authorised representatives of the Parties. The Parties expressly reject modifications to the Contract in any other manner.
- 19.4 The Parties expressly agree that the Contract as a whole, including all attachments and data on the Parties, subject-matter of the Contract, numerical designation of this Contract, the Price and the date of the Contract conclusion, will be published in accordance with Act No. 340/2015 Coll. on special conditions for the effectiveness of some contracts, publication of these contracts and Contract Register, as amended (hereinafter the "**CRA**"). The Parties hereby declare that all information contained in the Contract and its Annexes are not considered trade secrets under § 504 of the Civil Code and grant permission for their use and disclosure without setting any additional conditions.
- 19.5 The Parties agree that the Buyer shall ensure the publication of the Contract in the Contract Register in accordance with CRA.
- 19.6 This Contract becomes effective as of the day of its publication in the Contract Register.
- 19.7 The following Annexes form an integral part of the Contract:

Annex No. 1: Technical specification on the subject of performance



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Annex No. 2: Technical description of the Equipment as presented in Seller's bid

19.8 The Parties, manifesting their consent with the entire contents of this Contract, attach their signature hereunder.

In Prague

In Massy

For the Buyer:

For the Seller:

17. 04. 2020

16. 04. 2020

RNDr. Michael Prouza, Ph.D.
Director

Dr Philippe Bergonzo
Vice President



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Annex No. 1 - Technical specification on the subject of performance

Tab. 1 – The Equipment is a microwave plasma CVD deposition system and will be used to perform deposition of diamond thin films on planar substrates from hydrogen rich plasma. It must meet the technical conditions and include components listed in this table.

No.	Description and minimum specification of the Equipment as defined by the Buyer	Description and specification of the Equipment offered by the Seller	Complies YES/NO
1	based on microwave plasma enhanced chemical vapor deposition	Microwave plasma excitation is provided by a Muegge power supply capable of providing 6kW at 2.45 GHz to a resonant over mode plasma cavity.	YES
2	sample holder compatible to fit in substrate with diameter up to 4"	The sample holder consists of a 22cm in diameter stage, on which can be accommodated a substrate holder that can hosts substrates from 1 to 8 inch, although the system is designed to be able to grow on 2 to 4 inches in diameter.	YES
3	inhomogeneity of coating across 3" lower than 10%, across 4" lower than 20 %	Using specific plasma conditions as provided with the equipment, homogeneities better than 1% have been achieved on 3-inch substrates, as well as 5% on 4-inch substrates.	YES
4	deposition temperature range from 400 to 1100 °C	The deposition temperature can be varied from 400°C to 1100°C, although under 600°C the deposition rates remain very low ($< 0.1 \mu\text{m/h}$).	YES
5	water-cooled metal vacuum chamber with optical viewports	All Aluminium made, the chamber is water cooled and offer 6 view ports in the lateral plane of the substrate holder and 4 viewports from above the substrate.	YES
6	quick & user friendly access door for sample loading	The door is over 40cm in diameter and is extremely easy to operate and to load/unload samples.	YES
7	vacuum chamber leak-tested to at least $5 \cdot 10^{-8}$ mbar·l/s or better	The vacuum leak integrity is assessed using He leak detection to be below 1.0×10^{-9} torr.l/sec, thus 1.33 mbar l/sec, thus well under $5 \cdot 10^{-8}$ mbar·l/s.	YES





8	chamber base pressure 10^{-2} mbar or lower	Base pressure as measured by the external pirani gauge is less than 0.01 torr (within 20 minutes).	YES
9	automatic pressure control during the deposition process range 20 to >200 torr	The system pressure control enables the use of operating pressures in the range 10 to 200 torr.	YES
10	possible future upgrade to automatic, motorized microwave tuner	The system can be upgraded with an auto tuner. Muegge's automatic tuner can select automatic or manual stub position setting by tuner control program from control computer.	YES
11	two-color IR pyrometer for substrate temperature monitoring through optical fiber with digital display, temperature range 500 to 1200 °C	The system is provided with a dual wavelength pyrometer equipped with fiber optics and mounted on a top port of the reactor chamber to measure the temperature from the top through plasma. The measurement range is from 475°C to 1475°C.	YES
12	microwave power supply at least 6 kW compatible with 2.45 GHz (CW and pulsable regime available), one spare part magnetron must be included	Muegge power supply as used in SEKI SDS6K, namely model number MX6000D is pulsable from 5Hz to 2.5 kHz, with pulse On and Off time from 200µs to 100ms. One spare magnetron is included.	YES
13	full range vacuum gauge and high accuracy process pressure gauge with digital displays, automatic process pressure control	The process pressure is t-monitored using a pressure gauged Baratron type capacitance manometer, insensitive to gas composition. Process pressure is monitored like all process parameters by control computerbased and software controlled, with Graphical User Interface (GUI) and controls for interactive recipe development, monitoring and alarm point updates.	YES
14	4 mass flow controllers to control gas flow, flowmeter calibration and specific sccm ranges will be specified to successful bidder within the purchase contract	5 high accuracy MFC are provided, with following gas and ranges: Gas: Hydrogen (H ₂): 1000 sccm Methane (CH ₄): 100 sccm Nitrogen (in H ₂): 2 sccm Oxygen (O ₂): 20 sccm	YES





		Ar (Ar): 100sccm (adjustable according to gas mixture)	
15	system hardware/software compatible and ready for extension with new flow controller(s)	Additional MFCs can be straightforwardly added up to a total number of 6.	YES
16	adjustable gas correction factors of mass flow controllers within software or hardware	Adjustable zero correction factor both from software and hardware	YES
17	in plane and top view plasma and substrate viewing/diagnostic ports	6 diagnostic ports around the chamber and 4 on the top above the plasma	YES
18	standard gas connections and internal flow meter connections all VCR 1/4", no Swagelok	All standard gas lines inlets are 1/4" VCR-Male.	YES
19	system operation fully automated, controlled with computer, suitable computer included	The SDS6K is computer-based and software controlled, with Graphical User Interface (GUI) and controls for interactive recipe development, monitoring and alarm point updates. A Specific application software handles Apps Files (Recipe Operation, Alarm and Interlock Fault Sequencing Operation) and keep an event log of all parameters (Microwave Power (FWD & REF), Gas Flow, Dual Wavelength IR Pyrometer Temperature, Pressure.	YES
20	manual and automatic recipe driven operation with data logging of process parameter	The specific control software enables recipe driven processes to be run in automatic mode or semi-automatic. The recipe editor allows to memorize and edit recipes, that can be written as 100 steps of operation.	YES
21	possible online monitoring of deposition parameters, including remote access via internet	Automatic as well as semi automatic modes enable continuous parameter logging, namely Microwave Power (FWD & REF), Gas Flow, Dual Wavelength IR Pyrometer Temperature, and pressure. Similarly, the Alarm Logger tracks and memorize all alarms that happens and show alarm detail in the alarm history log. Remote operation can be performed using conventional windows	YES





		10 remote operability and protected by password.	
22	hardware and software safety interlocks	Hardware interlock is provided on the power supply and is used to control external errors. Software interlocks are driven by the automatic control and prevent abnormal use from all setpoint not matching, namely Pump Abnormal, Soft Rough Time Interval exceeded, Rough time interval exceeded, MW generator error, Ref power, over pressure, Manifold pressure error, Low pressure, low coolant flows or pressures (in circuit, system, stage, and power supply), low process gas flow or pressure, etc. A total number of 19 Alarm are raised, each at two levels, "warning" and "alarm" levels.	YES
23	future upgrade to sample rotation is possible	The ultra large base plate (> 200mm) enables several upgrades that could be implemented at a later stage, that includes today a Z-stage and future developments could enable rotating substrate holder.	YES
24	future upgrade to substrate bias or electrically floating upper electrode with electrical connection is possible	Similarly, the sample stage can also be modified to be bias-able with respect to the chamber walls, thus enabling bias enhanced nucleation.	YES
25	diamond deposition (Raman spectra) and coating homogeneity over 4 inch across the sample area	Using specific plasma conditions as provided with the equipment, homogeneities better 5% have been achieved on 4-inch substrates.	YES
26	conform to European Union EMC directive and European Union electrical standards	The equipment is compliant with EC conformity requirements. The Declaration of conformity is provided in the current document, together with conformity to ISO12100, 9001 and 14001 standards.	YES
27	power supply must be 240/400V, 50Hz	The power supply is functioning on threephase 400V power supply.	YES





28	possible future upgrade to substrate independent heating on plasma	The ultra large base plate (> 200mm) enables several upgrades that could be implemented at a later stage, that includes today a Z-stage and future developments could enable heating substrate holder.	YES
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Tab. 2 – Evaluation criterion according to paragraph 7.2.2 of the Tender Documentation - Technical characteristics of the bid (regarding microwave plasma CVD deposition system with technical specification in Tab. 1)

No.	Feature	Value
1.	Diamond Growth Rate on 3 inch silicon substrates within the allowed inhomogeneity, Table 1 - No. 3 [$\mu\text{m}/\text{h}$]	5 $\mu\text{m}/\text{h}$
2.	Thin film homogeneity (higher than 95 %) over 4" substrate [mm]	100 mm
3.	System equipped with liquid sample injection (bubbler) [yes/no]	No
4.	Extensibility of independent gas lines with flow controllers [how many controllers]	Yes/[12]
5.	Substrate holder which allows rotation [yes with bias/yes without bias/no]	No







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Annex N° 2 – The Seller's bid in the extent it describes technical parameters of the Equipment

	SEKI DIAMOND SYSTEMS																					
<h3>System Specifications</h3>																						
Product: Model No.:	Microwave Plasma CVD System SDS6K																					
<table border="1" style="margin: auto; border-collapse: collapse;"><tr><td colspan="4" style="text-align: center;"><i>Accepted by Customer</i> <small>(Signature & Chop)</small></td></tr><tr><td colspan="4" style="height: 40px;"></td></tr><tr><td colspan="4" style="text-align: center;">CORNES Technologies Ltd.</td></tr><tr><td style="text-align: center;"><small>Approved by</small></td><td style="text-align: center;"><small>Checked by</small></td><td style="text-align: center;"><small>Checked by</small></td><td style="text-align: center;"><small>Prepared by</small></td></tr><tr><td style="text-align: center;"><div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div></td><td style="text-align: center;"><div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div></td><td style="text-align: center;"><div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div></td><td style="text-align: center;"><div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div></td></tr></table>			<i>Accepted by Customer</i> <small>(Signature & Chop)</small>								CORNES Technologies Ltd.				<small>Approved by</small>	<small>Checked by</small>	<small>Checked by</small>	<small>Prepared by</small>	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>
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<p><i>Seki Diamond Systems</i> <i>CORNES Technologies Ltd.</i></p>																						
<div style="display: flex; justify-content: space-between;">5IX-51131CONFIDENTIAL1 / 13</div> <p style="margin-top: 10px;">Cornes Technologies Ltd. 2-15-3 Tokiwa, Koto-ku, Tokyo 135-0006, Japan Phone: +81-3-5625-4777 • Fax: +81-3-3820-4778</p>																						



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SEKI DIAMOND SYSTEMS		System Specifications				CORNES Technologies																															
<div>Revision</div> <table border="1"><thead><tr><th rowspan="2">Rev. No.</th><th rowspan="2">Rev. Mark</th><th rowspan="2">Date</th><th colspan="2">Description</th><th rowspan="2">Approved by</th><th rowspan="2">Checked by</th><th rowspan="2">Checked by</th><th rowspan="2">Prepared by</th></tr><tr><th>Page</th><th>Item #</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td>Initial release</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>									Rev. No.	Rev. Mark	Date	Description		Approved by	Checked by	Checked by	Prepared by	Page	Item #					Initial release													
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System Specifications



1 – System Description

The SDS6K Microwave Plasma CVD Diamond Deposition System is designed to operate with plasma at high power densities for large area, high deposition rate processes. This system incorporates the latest microwave technology with computer control and recipe driven processes with high reliability, stable operation and safety interlocks for unattended operation.

-This equipment is a manufacturer updated CVD system used for process qualification. It includes new following parts: stage, particle filters, gas spring to support chamber, O-rings, viewports, Rotary pump, magnetron and PC & software)

2 – System Specifications

2.1 – Vacuum System & Reactor

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

2.2 – Substrate Stage

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

2.3 – Operation

The SDS6K is operated by computer-based software with graphical user interface (GUI) including interactive recipe editing, monitoring, and alarm point updating.

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

2.4 – Microwave Generator

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

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System Specifications

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2.5 – Mass Flow Controllers (MFC)

F.S.

[illegible][illegible]

[REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]

2.6 – Temperature Monitoring

System includes the following temperature measurement instruments for in-situ process monitoring.

[REDACTED] [REDACTED]
 [REDACTED]
 [REDACTED]

2.7 – Vacuum Pump

[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED]

[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]

2.8 – Dual Wavelength IR Pyrometer

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2.9 – Pirani Gauge

2.10 – Auto Temperature Control

-Auto Temperature Control is a function to maintain a sample at a constant temperature by adjusting microwave power in accordance with measured sample temperature. The function is realized with an interface unit and a software program and can be accessed from the system-control software on the system PC.

2.11 – Water Pump and Filter

SDS6K is equipped with a multi-stage water pump [REDACTED] and a mesh filter in its cooling water circuit.

3 – System Dimensions & Weight (Standard type, approx.)

4 – Facilities Requirements

The followings must be provided by the customer:

4.1 – Electrical Service Requirements

All electrical connections must be according to local safety regulations to ensure personnel safety and equipment integrity. [REDACTED]

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System Specifications			
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4.2 – Cooling Water Requirements			
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<div style="background-color: black; height: 15px; width: 80%;"></div>			
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4.3 – System Pneumatic Control Gas Input Requirements			
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4.4 – Reactor Cabinet (Exhaust Out)			
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4.5 – Gas Connections			
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4.6 – Facilities Connections (on system side)			
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5 – Standard Factory Acceptance Test Verification			
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6 – Manuals			
- Operation manuals:	CD-ROM only		
- Equipment manuals:	CD-ROM only		
- Language:	English		
7 – Training			
Maintenance training and operation training will be conducted during equipment installation.			
8 – Delivery			
- Reactor chamber	x 1		
- Control rack	x 1		
- Rotary vane vacuum pump	x 1		
- Oil mist filter	x 1		
- Water pump	x 1		
- Shim type sample holder	x 1		
- Dual wavelength IR pyrometer	x 1		
- Standard tool set	x 1		
- Pirani gauge	x 1		
- Manual	x 1		
<div style="display: flex; justify-content: space-between; margin-top: 20px;"><div>5IX-51131</div><div><div style="background-color: black; height: 15px; width: 70px;"></div></div><div>8 / 13</div></div> <div style="text-align: center; margin-top: 10px;">Cornes Technologies Ltd. 2-15-3 Tokiwa, Koto-ku, Tokyo 135-0006, Japan Phone: +81-3-5625-4777 • Fax: +81-3-3820-4778</div>			



SEKI DIAMOND
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9 – On-site Acceptance Validation

[illegible]

10 – Warranty

Warranty period is: (a) 12 months from the date of acceptance or (b) 14 months from the date of shipment [air way bill (AWB) date], whichever is earlier.

Note: CTL offers additional warranty period of 12 months from the AWB date exceptional limited to this order. The followings are not covered under warranty:

- Consumable parts
- Damages caused by natural disaster, fire, etc.
- Faults arising from unauthorized system modifications or changes from the original system configuration as delivered.
- Failure caused by mishandling or improper operation by customer/end user.
- Any other failures not directly attributable to CTL and/or its products as supplied.

11 – Intellectual Properties for Apparatus

All intellectual property (IP) rights of the products described in this specification belong exclusively to CTL. Copying or other infringements of CTL's IP rights are strictly prohibited.

12 – Arbitration and Settlement of Disputes

Any dispute arising out of or in connection with this agreement shall be finally settled in accordance with the Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more arbitrators designated in accordance with said Rules. The language of arbitration shall be English.

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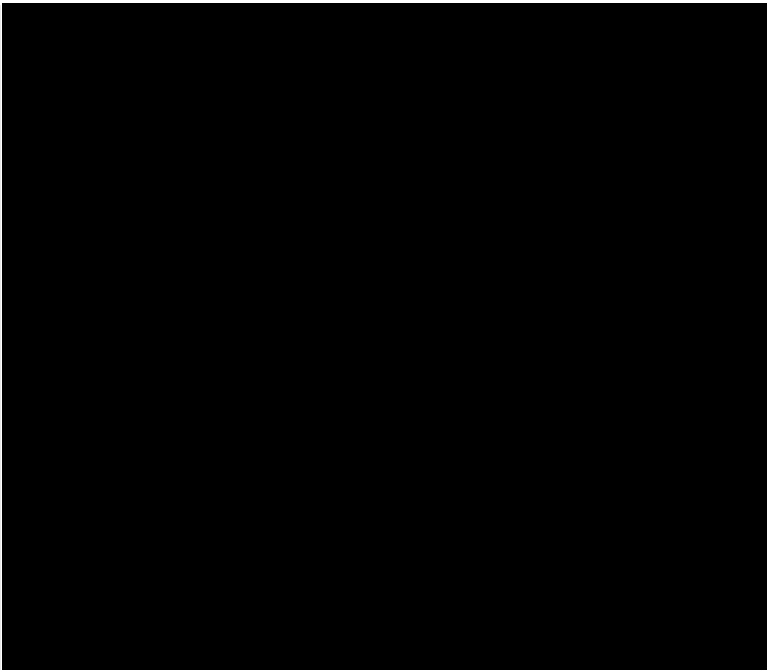
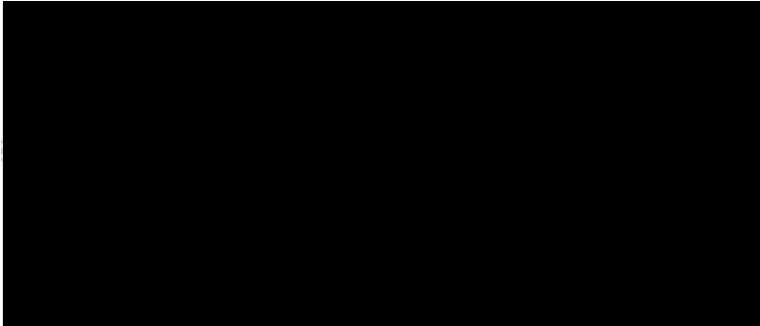
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System Specifications

Figure 1. Front and Top Views
(For reference only. Instruments in the control rack sub-assemblies may differ depending on options)

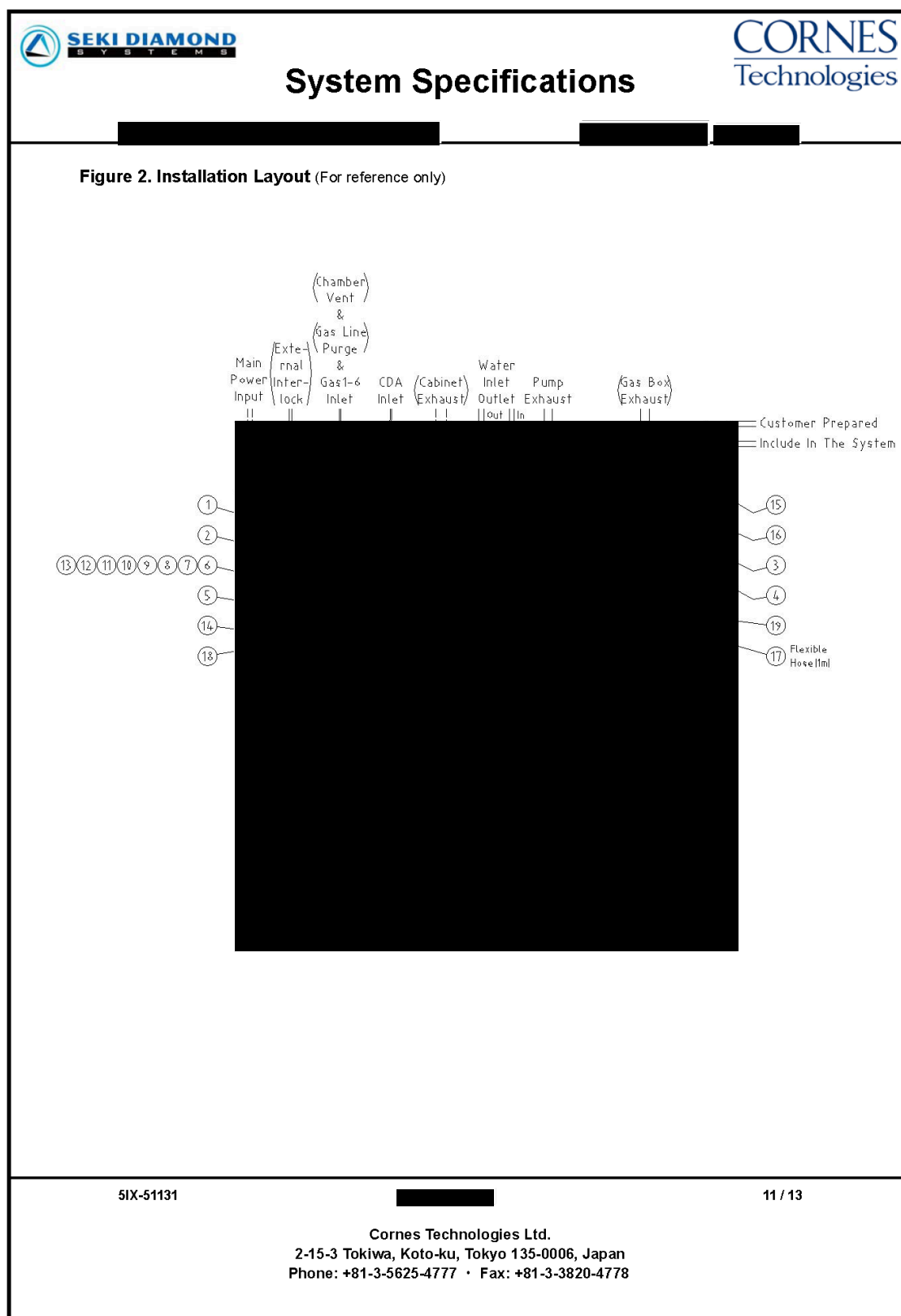
Note: All dimensions are given in millimeters.



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System Specifications






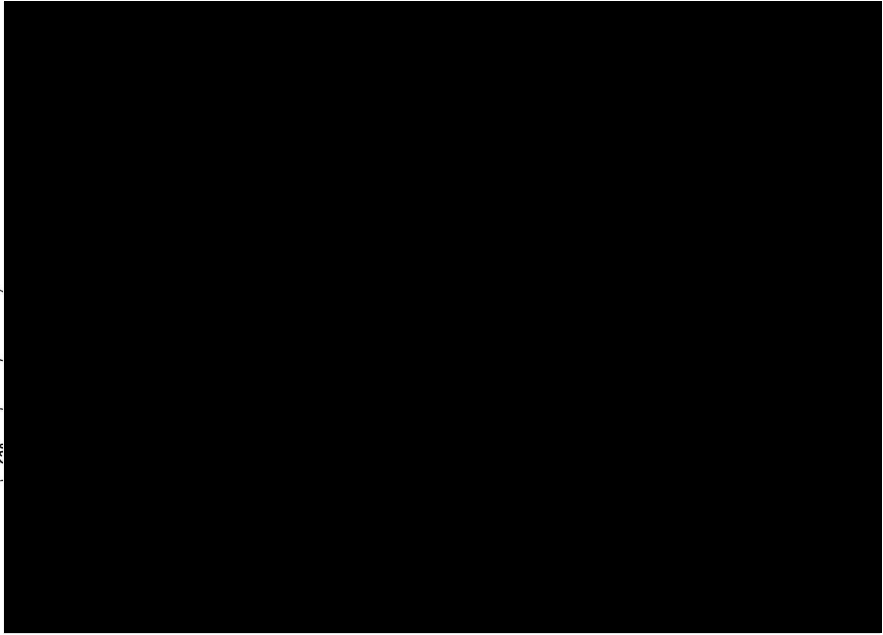


Figure 3. Cabinet Rear View and Facility Connections (For reference only)



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System Specifications



Table 1. External Connection Requirements

No.	Item	Connection Destination	Required Specifications	Connection Type	Classification	Constructed by
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