Appendix 1

**ORDER SUBJECT DESCRIPTION**

The subject of the order is a delivery and installation of a hot air autoclave 1 x 1,5 m. The autoclave will be part of the equipment of Center for Composite Technologies.

1. **Technical requirements:**
   1. Autoclave must be dedicated for manufacturing of composite structures,
   2. Autoclave must be equipped with a trolley,
   3. All undermentioned requirements must take into account the load: 50 kg composites + trolley,
   4. Working length must cover object of min. length 1500mm,
   5. Working diameter must cover object of min. width 1000mm,
   6. Working pressure not less than 10 bar,
   7. Pressure deviation inside the autoclave not greater than ±0,1 bar,
   8. Autoclave’s door must be equipped with a safety locking mechanism in case of an explosion inside the autoclave,
   9. Autoclave must be equipped with an overpressure safety valve with a certificate or calculation proving its ability to empty the autoclave in case of an explosion inside the autoclave
   10. Autoclave must quipped with a Man Inside panic switch,
   11. Working temperature must be not less than 250°C, measured by a thermocouple on a composite element,
   12. Autoclave must be equipped with at least 5 thermocouples (ability to measure temperature of at least 5 elements independently),
   13. Temperature deviation should be not greater than ±2°C, measured by a thermocouple on a composite element,
   14. Heating/cooling ramp should be at last 3°C/min, measured by a thermocouple on a composite element,
   15. The offer must include a vacuum station and the piping connection to the autoclave,
   16. Autoclave must have ability to connect and control the vacuum of at least 5 elements,
   17. Th offer must include set of valves to operate the vacuum, pressure and cooling system,
   18. The offer must include a silencer,
   19. The offer must include cooling system with tanks and cooling tower and piping connection (up to 5 meters from autoclave),
   20. The offer must include air compressor with tank and air filter and piping connection (up to 10 metrs from autoclave),
   21. Autoclave must be powered with voltage 380V,
   22. Autoclave must be equipped with stand alone control panel with functions: process abort, depressurization, door unlocking,
   23. The offer must include usable materials for a guarantee period: greases (including door gasket grease), oils, spare gaskets.
2. **Control and software**
   1. The offer must include PLC controller with possibility to control and present process parametrs:

* time,
* temperature (heating and cooling),
* pressure (pressurization i de pressurization),
* vacuum (vacuum station control).
  1. The offer must include advanced control unit (PC based)   
     with possibility:
* cycle programming,
* parameters control,
* save cycles,
* data archive,
* operate through personalized accounts,
* LAN connection,
* USB connection.

1. **Assembly and installation**
   1. Supplier performs connections in defined range from the autoclave (including material, equipment, men):

* Cooling system: 5m
* Air compressor: 10m
* Craddles welding
  1. Supplier delivers layout and connections study that are client’s responsibilitis (with regard to interfaces between suppliers range and clients range, material, equipment, men). Supplier delivers a schedule with regard to resources and dates to be provided by customer during installation and training. The schedule and resources plan is base to confirm that the client fulfilled his obligations and no extra costs are accounted in case of extended training and installation.
  2. Supplier is to supervise unloading at client’s site.

1. **Norms and occupational safety**
   1. Autoclave should hold certificate of conformity CE, or equivalent.,
   2. Autoclave should contain a manual in polish language version,
   3. Autoclave should contain an electrical sheme in polish language version,
   4. Autoclave should contain a cooling system scheme in polish language version,
   5. Autoclave should contain an pressure system scheme in polish language version,
   6. Autoclave should contain an vacuum system scheme in polish language version.
2. **Realization time**

Realization time no longer that 25 tygodni (175 days) from the contract signing (including device installation and the training).

1. **Warranty**
   1. Minimal required full warranty period for the offered system – 24 months (2 years) from the reception protocol signing,
   2. If case of failure, repair time should not exceed 7 days (working time accounted) from the failure report (excluding time for order and delivery of spare parts). With respect to the fact, that the repair start will occur within 72h from the failure report,
   3. In case the repair exceeds 7 days period the Supplier is obliged to deliver spare parts enabling the device usage.
   4. During the warranty period the supplier is obliged to perform annually conservation check-up, in a date set by both sides of the contract.
2. **Trainings**

The contract subject includes training customer’s employees. The training should include training for 4 employees defined by the Customer. The training should take place in the Institute of Aviation, on site of the device installation, on the installed device,   
in a date set by both sides of the contract. The training should be theoretical and practical. The training should present methods to:

* 1. Typical curing proces programming with use of the controller,
  2. Vacuum pack connection inside the autoclave,
  3. Performing the process,
  4. Emergency process abortion,
  5. Manual operating on cooling system to dry the system,
  6. Planned maintenance,
  7. Door gasket replacement,
  8. Door adjustment,
  9. Diagnostics and repair of basic defects,
  10. Fan disassembling,
  11. Electrical cabinet architecture presentation.