

Standard Configuration

- **CVDWinPrC™** based process control software for Real Time Process Control, Data Logging and Recipe Generation and Editing
- Preprogrammed Recipes for SW/ MW CNT's, Nanowires, Annealing, Diffusion, Oxides, Nitrides, ALD, Epitaxial layers, Graphene, etc.
- 3 Zone Resistance Furnace for Temperatures up to 1100 °C
- Atmospheric Process Operation
- Proprietary Real-Time Cascade Process Temperature Control
- Cantilevered Automatic Substrate Loading/Unloading System
- Quartz Process Tube, Sample Holder, Gas Injector and Profiling Thermocouple
- Dual O-Ring process seals with a vacuum monitoring system to insure leak free operation
- 4 Mass Flow Controlled UHP Gas Lines
- User Settable Warnings and Alarms
- Application Customized Safety Systems
- Comprehensive Software and Hardware Safety Interlocks
- One (1) Year Warranty
- SEMI - S2/S8 and CE Certified

First Nano's **EasyTube™ 101** System is an advanced Chemical Vapor Deposition process development tool for the University or Industrial Researcher. It is controlled by our proprietary real-time, LabWindow™ based process control software **CVDWinPrC™** that provides recipe driven process control, real-time graphing and automatic data logging for optimal process reproducibility. The **EasyTube™ 101** communicates with a PLC that handles the hardware interface and provides the appropriate industrial level safety systems. The system has a standard Web interface connection that allows for remote training, software upgrades and system trouble shooting.

Our modular platform offers up to eight (8) input lines for gases. Three (3) of the input lines can be configured for solid or liquid sources. Heating is provided by a resistance furnace. The system can be configured for both low pressure and atmospheric processes. The 40 mm (ID) process tube has a usable processing area of 25x50mm and most system options are field upgradable.

The system can be configured to run a wide range of processes – CNT's, Graphene, Nanowires, APCVD, LPCVD, Epitaxial, Oxides, Nitrides, Annealing, Diffusion, Chemical Vapor Infiltration, ALD using selected combinations of gaseous and/or liquid precursors.



This platform is the perfect research tool for next generation material growth and novel process development across many fields including nanoelectronics, semiconductor, photovoltaic, MEMS, composites, structural coatings and more.

Designed to meet today's stringent safety standards, the system safely processes pyrophoric, corrosive, flammable and toxic gases such as Silane, Germane, Diborane, Hydrogen Chloride, Hydrogen and metal organic liquid source precursors with a fully developed safety system. The system also has application customized safety protocols imbedded into relay logic, PLC and **CVDWinPrC™** software

The **EasyTube™ 101** is a user friendly, low cost equipment/process solution for the researcher that has a limited budget and needs turn-key equipment with a baseline process recipe and proven safety system.

R&D Turn-Key Equipment / Process Solutions

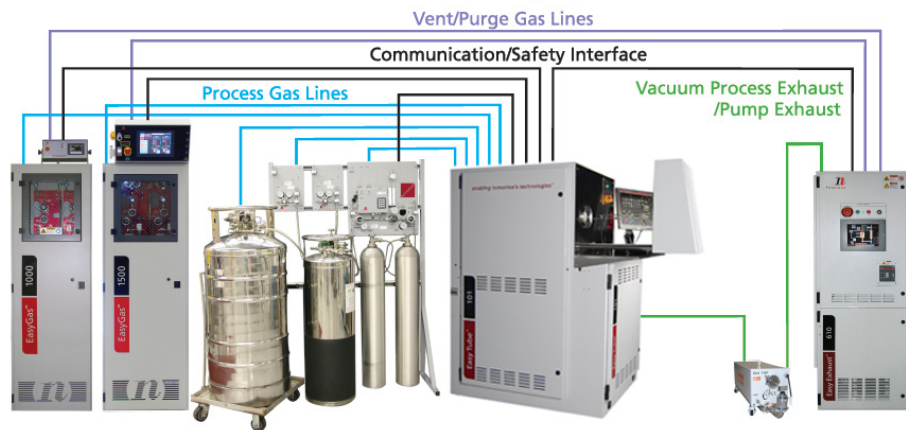
Options

- Up to an additional 4 Mass Flow Controlled UHP Gas Lines
- Purge/Reactant: inert gas purge for reactive gas lines
- Run/Vent: stabilizes gas flows (bypassing the Process Tube) before flowing into Process Tube
- Atmospheric or Low Pressure Liquid Source Vapor Delivery - maximum of three (3)
- Liquid Source Bubbler: 250ml or 500ml
- Air Pump - air feed into system for removing carbon residue in a CNT process tube
- Low Pressure and APCVD Operation
- 20 CFM Oil based Vacuum Pump
- Fomblin Oil based Vacuum Pump
- 50 CFM Dry Mechanical Screw pump
- Fast acting pneumatic valves for enhanced ALD operation
- Imperial (Inch) Tool Kit
- Seismic Mounts
- Wheels to allow easy movement of system into your laboratory
- Onsite system Start-Up and Training
- EasyGas™ Hazardous Gas Cabinets
- EasyPanel™ UHP Gas Panels for Argon, Nitrogen, Helium, Oxygen
- EasyExhaust™ Gas Conditioning System

Gas Cabinets

Process Equipment

Gas Abatement



First Nano offers turn-key system capabilities with support equipment such as Gas Cabinets and Exhaust Gas Conditioning Systems. All major components from one vendor makes interfacing easy. The First Nano EasyGas™ gas cabinet is capable of delivering a variety of toxic and hazardous gases. The EasyExhaust™ System will thermally pyrolyze and/or wet scrub the process effluent gases.

Our field proven system performance and solid customer base establishes First Nano as the clear choice in leading edge CVD research and development equipment for the advanced research facility.

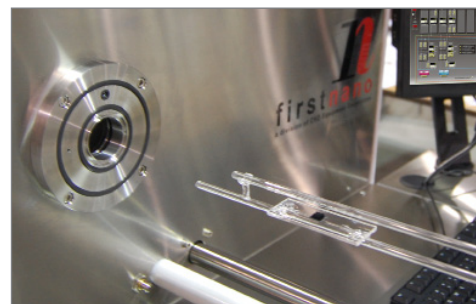
FACILITIES REQUIRED

Electrical	208 V.A.C	60 Hz	3 Phase (other voltages and frequency available – consult factory)
Dimension	40" W	49" L	60" H
Exhaust	300 CFM		
Pneumatic Supply	Clean Dry Air or Nitrogen ½ SCFM @ 80 PSIG		
Facility Nitrogen	10 SLPM @ 20 PSIG		
Process Gases	System specific/typically field upgradable		
Cooling Water:	<ul style="list-style-type: none"> • With Resistance Heating – 0.25 GPM @ 20-30 PSIG • With Infrared Heating - 2 GPM @ 20-30 PSIG 		

* Note: Electrical varies with country; facilities requirements vary with system options. Consult Factory for details.



Operator Interface Station



Cantilevered Sample Loading

First Nano, a Division of CVD Equipment Corporation

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