

TECHNICAL SPECIFICATION

LABORATORY SCALE REACTOR FOR CVD/CVI TYPE HT0510

The HT510 is a versatile laboratory-scale CVD/CVI reactor, which is suitable for SiC, Si₃N₄, BN, B₄C, AlN, TiC, TiN, TiB₂ and many similar materials. The all carbon, working zone is suitable for operation up to 2,200°C at pressures between 1 and 1000mbar.



The reactor is contained within a water-cooled stainless steel vacuum vessel. The internal graphite working chamber is heated by a single zone graphite resistance heater. The insulation is carbon fibre. A 2-colour pyrometer provides excellent temperature control. Several types of graphite jig are available to support samples within the working zone.

The gas supply system uses mass flow controllers to deliver permanent gases into the reactor. It can also be fitted with liquid and solid sources for less volatile starting materials. All parts are stainless steel. Valves are air-actuated for safety. In the event of a supply or system failure, all reactive gases are isolated.

The reactor is evacuated by a chemically resistant rotary pump. The pressure in the reactor is controlled automatically by a motorised valve. The effluent gas is passed to a wet scrubber unit which neutralises the acid by-products of the CVD process. A cold trap can also be fitted before the vacuum pump if this is required.

The control system is housed in a single cabinet with all of the controls on its front panel. All normal operations of the equipment can be performed from the front panel. The control cabinet can be installed remotely from the rest of the system for increased safety when using toxic or flammable gases.

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Archer Technicoat Ltd.

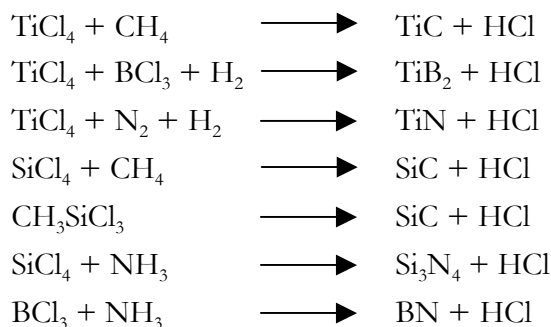
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Specification for laboratory-scale reactor HT0510:

Reactor overall dimensions:	3(10) x 1.5(5) x 2(6.5) [high] m(ft)
Reactor working zone:	125(5.0)diameter x 250(10.0) [high] mm(inch)
Temperature range:	900 - 2200°C
Temperature measurement:	2-color pyrometer
Pressure range:	10-100mbar (standard control range) Lowest operating pressure: 1 mbar Highest operating pressure: 1000mbar
Pressure measurement:	Absolute pressure transducer
Feed gases:	H ₂ , Ar, N ₂ , CH ₄ as standard - others are possible
Feed liquids:	TiCl ₄ , SiCl ₄ , CH ₃ SiCl ₃ , etc.
Flow control:	Mass flow controllers for gases (4 are standard) Metering pump for liquids (1 is standard)
Vacuum pumps:	Chemically resistant rotary oil pump Automatic pressure control by motorised valve
Materials of construction:	Vacuum vessel: 304L stainless steel Heater: graphite Reactor inner chamber: graphite Thermal insulation: carbon fiber
Electricity:	50KVA(3-phase)
Cooling water:	20 liter/min
Compressed air:	6.5 bar (100 psi) in small amounts for actuators.

CVD/CVI processes which can be operated in the HT0510:



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