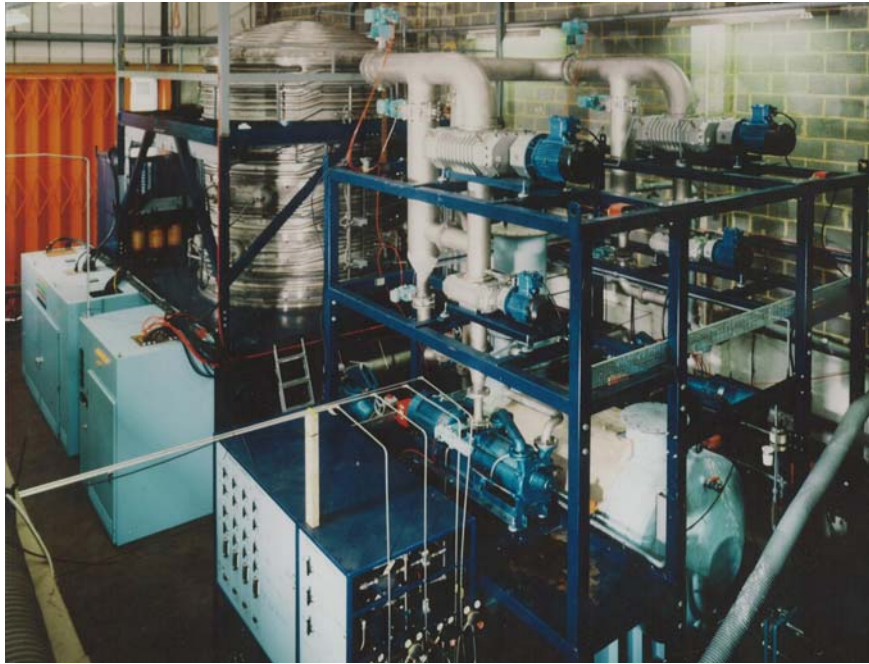


TECHNICAL SPECIFICATION

CVD/CVI REACTOR FOR SiC and C TYPE HT5159

The HT 5159 is designed for the CVD/CVI of silicon carbide and carbon. It has a rotating platform to permit the overall coating of parts weighing up to 400 Kg in a single cycle. A PLC control system runs the cycle without any operator intervention. The all carbon, working zone is suitable for operation up to 1,600°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 5 graphite resistance heaters, working as 3 independent zones, each controlled by a 2-color pyrometer. The thermal insulation is provided by carbon fibre.

The reactor is suitable for the CVD of SiC and C on large single objects or many small objects. Several types of jig are available to permit the coating of components on all surfaces.

The reactor is also suitable for the isothermal isobaric CVI of SiC and C. The reactive gases are admitted into the chamber at 16 separate inlets. These flows are controlled in groups to ensure uniform gas distribution over the working zone.

The reactor is evacuated by 2 sets of pumps working in parallel. Each set consists of a liquid ring pump with 2 mechanical booster pumps. The booster pumps have by-passes so that a number of different pump combinations can be run. This permits the reactor to be run with a wide range of gas inputs over a wide range of pressures. Automatic pressure control is achieved by a motorised valve in the vacuum line.

The effluent gas is passed to a wet scrubbing unit, which neutralises the gas before releasing it to the atmosphere.

The control system is supervised by a PC, which will run complete cycles without any operator intervention. Active mimic screens indicate the progress of the process. All processes parameters are monitored and any variation beyond chosen limits initiates a safe shut down procedure. The control system is normally installed remote from the rest of the system for increased safety.

In association with:
IonBond AG,
Industriestrasse 211,
CH-4601 Olten,
Switzerland.
Tel. 00 41 62 2878787
Fax 00 41 62 2878791



Archer Technicoat Ltd.

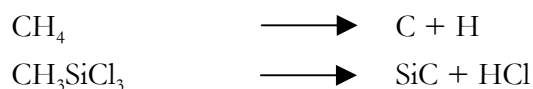
Progress Road, Sands Industrial Estate,
High Wycombe, Bucks. HP12 4JD
Tel. 00 44 1494 462101 Fax 00 44 1494 463049
www.cvd.co.uk

TECHNICAL SPECIFICATION

Specification for CVD/CVI Reactor HT5159:

Reactor overall dimensions:	6m x 10m x 6m(high) + height above for loading
Working zone:	1300 diameter x 1490mm top loading
Temperature range:	900-1600°C
Temperature control:	5 resistance heaters combined in 3 PID zones
Temperature measurement:	2-colour pyrometer (1 per zone)
Pressure range:	1-100 mbar (standard control range)
Pressure measurement:	Absolute pressure transducer
Feed gases:	H ₂ , Ar, CH ₄
Gas Inlets:	14 inlets arranged in 3 independent zones
Feed liquids:	CH ₃ SiCl ₃ or SiCl ₄
Flow controls:	22 Gas Mass flow controllers + 4 liquid MFCs
Vacuum pumps, 2 sets consisting of:	Liquid ring vacuum pump - 500m ³ /hr Mechanical booster pump 1 – 1,000m ³ /hr Mechanical booster pump 2 – 5,000m ³ /hr Automatic pressure control by servo controlled line valve.
Materials of Construction:	Vacuum vessel - 316 stainless steel Heaters - graphite Reactor inner chamber - graphite Thermal insulation – carbon fibre
Electricity:	500 KVA (3-phase)
Cooling water:	350 L/min
Compressed air:	100 p.s.i. small amount for actuators
Effluent Scrubber:	Wet scrubbing column with 5,000L tank. Continuous pH monitoring & control.

CVD/CVI processes normally operated in the HT5159:



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