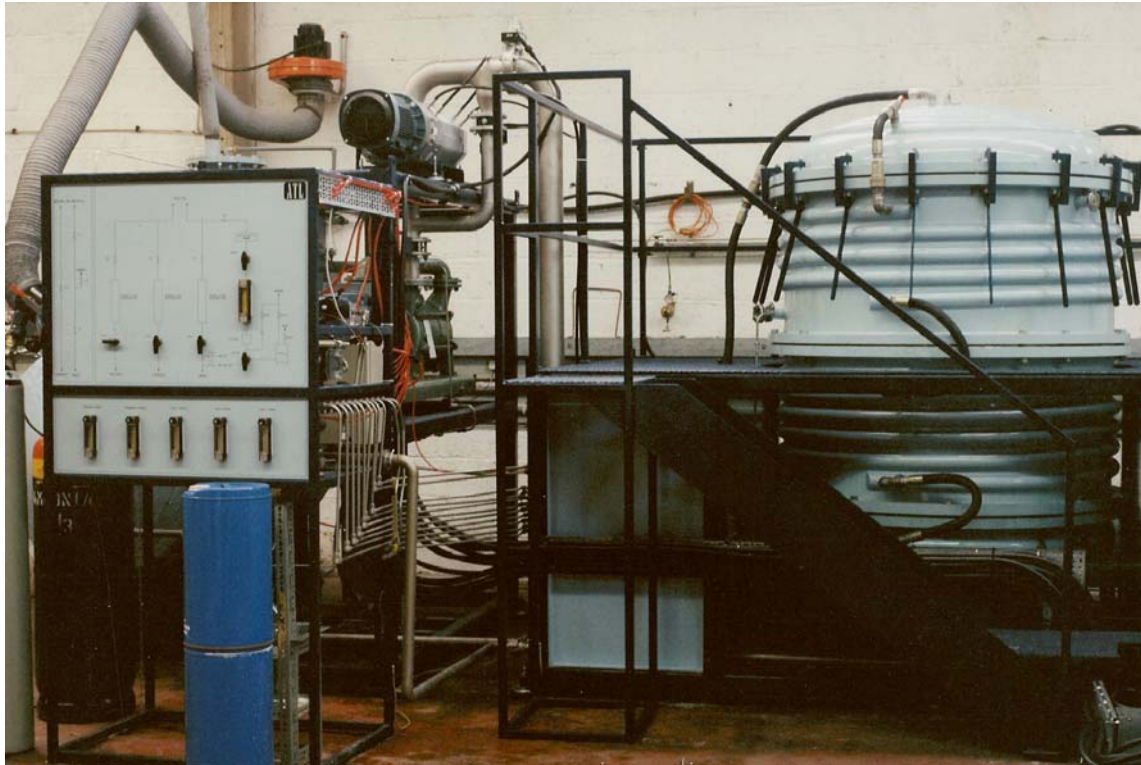


TECHNICAL SPECIFICATION

LABORATORY SCALE REACTOR FOR CVD/CVI TYPE HT2031

The HT2031 is a CVD reactor suitable for SiC, TiC, B₄C, Si₃N₄, TiN, BN, and related materials. It is a top-loading reactor with a working zone 540 mm diameter by 960mm high. The all carbon, working zone is suitable for operation up to 2,200°C at pressures between 1 and 1000mbar. The work assembly is carried on a rotating platform.



The HT2031 is a complete system consisting of a stainless steel CVD reactor with an all-graphite reaction chamber and furnace, supporting steelwork, gas supply system, vacuum pumps and effluent scrubber, and control system.

The CVD reactor has two forms: (1) Maximum operating temperature 1600°C for SiC, TiC, B₄C, Si₃N₄, TiN; (2) Maximum operating temperature 2200°C for BN and pyrolytic graphite in addition to those in (1). A pyrometer is used to control the temperature of the reactor. The process pressure is controlled automatically in the range 10-100 mbar.

The gas control system supplies 3 permanent gas flows and one flow from a liquid source evaporator.

All gas flows have mass flow controllers. The reactive gases are controlled by air-actuated ball valves to avoid ignition sources in the gas control system and to ensure a fail-safe situation in the event of a electrical power failure.

A liquid ring pump, combined with a mechanical booster, is used to pump the reactor. The effluent from the pumps is passed to a wet scrubbing system, which uses an alkaline solution to absorb the acid by-products of the CVD process.

The control system is housed in a single cabinet, which can be placed remotely from the rest of the plant. All normal operations can be carried out by push-button operation from the front panel. The controls are interlocked for 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.

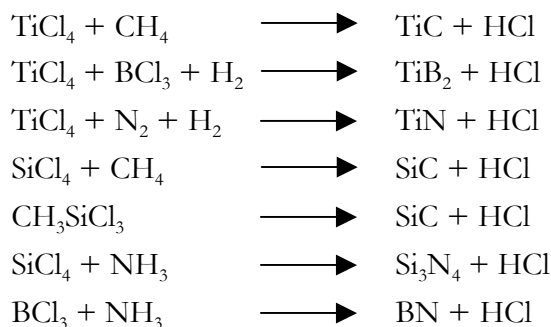
Progress Road, Sands Industrial Estate,
High Wycombe, Bucks. HP12 4JD
Tel. 00 44 1494 462101 Fax 00 44 1494 463049
www.cvd.co.uk

TECHNICAL SPECIFICATION

Specification for laboratory-scale reactor HT2031:

Reactor overall dimensions:	4 x 3 x 2.9m(high) + height above for loading
Working zone:	540 diameter x 960mm top loading
Temperature range:	900-1600°C or 2,200°C
Temperature measurement:	2-colour pyrometer
Pressure range:	10-100 mbar (standard control range)
Pressure measurement:	Absolute pressure transducer
Feed gases:	H ₂ Ar, CH ₄
Feed liquids:	CH ₃ SiCl ₃ or SiCl ₄
Flow control:	Mass flow controllers
Vacuum pumps:	Liquid ring vacuum pump - 520m ³ /hr Mechanical booster pump - 2000m ³ /hr Automatic pressure control by servo controlled line valve.
Materials of Construction:	Vacuum vessel - 316 stainless steel Heater - graphite Reactor inner chamber - graphite Thermal insulation - caron fibre
Electricity:	150 KVA (3-phase)
Cooling water:	50 L/min (20°C or less preferred)
Gases:	Argon, hydrogen, methane Total flow 100 SLM max.
Compressed air:	100-150 p.s.i. small amount for actuators
Overall space requirements:	10 x 6 x 4.5m high.

CVD/CVI processes which can be operated in the HT2031:



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