EasyTube™ 3000 – SiQC

Quality Control Solution for

TCS, DCS, $SiCl_4$ and SiH_4

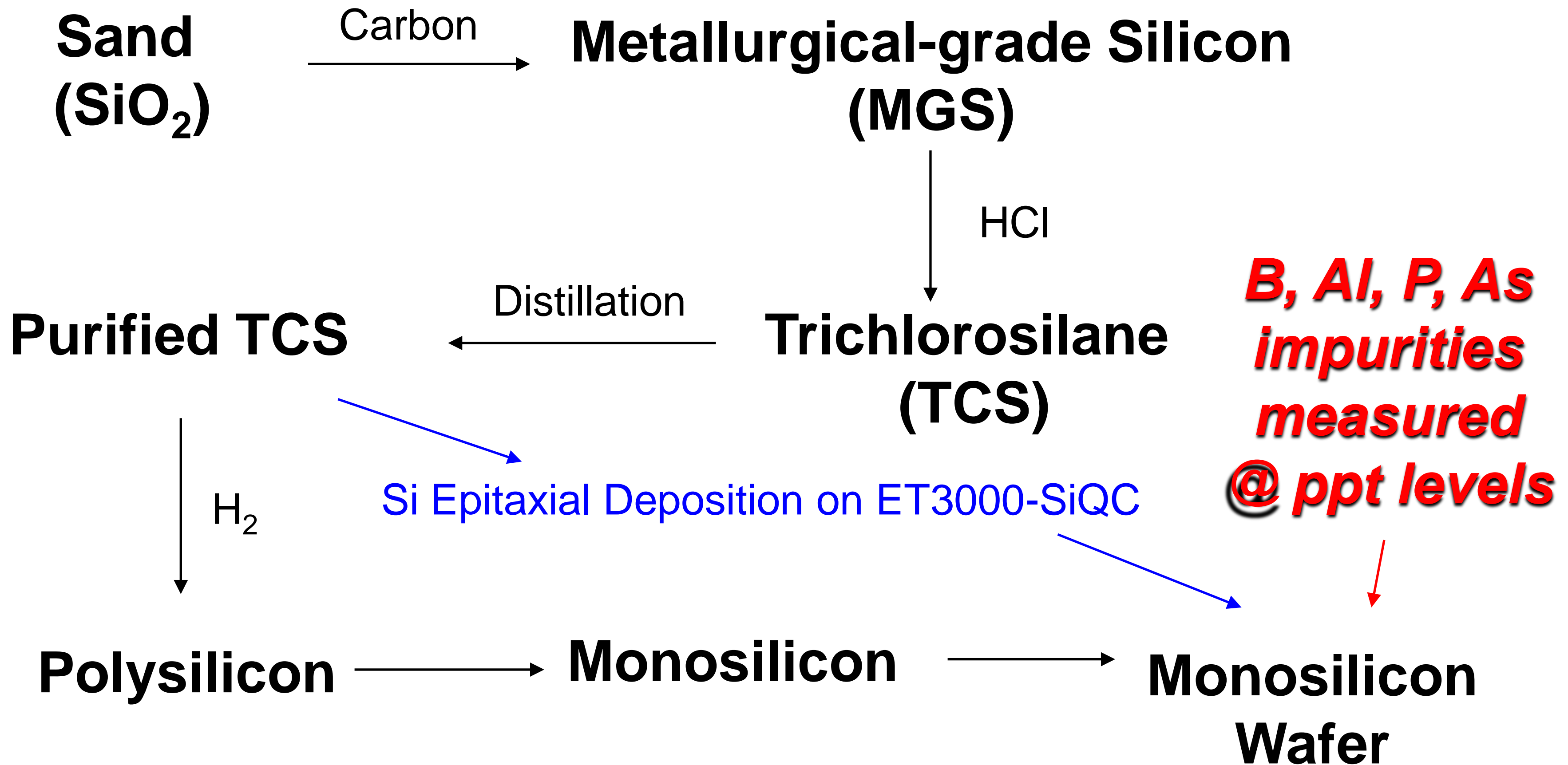
precursor material testing

for Poly Silicon Manufacturing

enabling tomorrow's technologies™

CVD Equipment Corporation

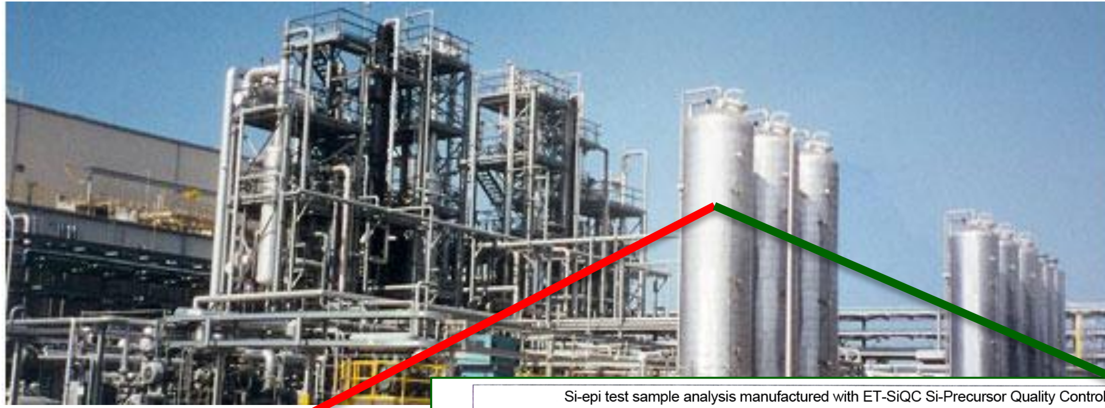
Polysilicon Produced by Siemens Process



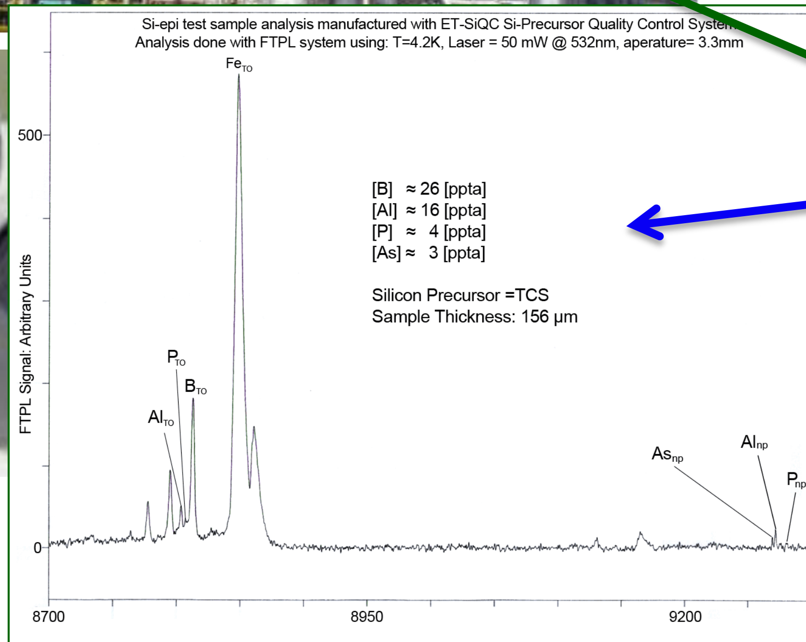
enabling tomorrow's technologies™

CVD Equipment Corporation

Helping Polysilicon Manufacturers Improve Profit with QC



Qualify Si Precursor Material as you are manufacturing your Polysilicon



Each Polysilicon manufacturer needs one or more QC systems for continuous evaluation of the quality of their Si-Precursor feed stock for impurities

enabling tomorrow's technologies™

CVD Equipment Corporation

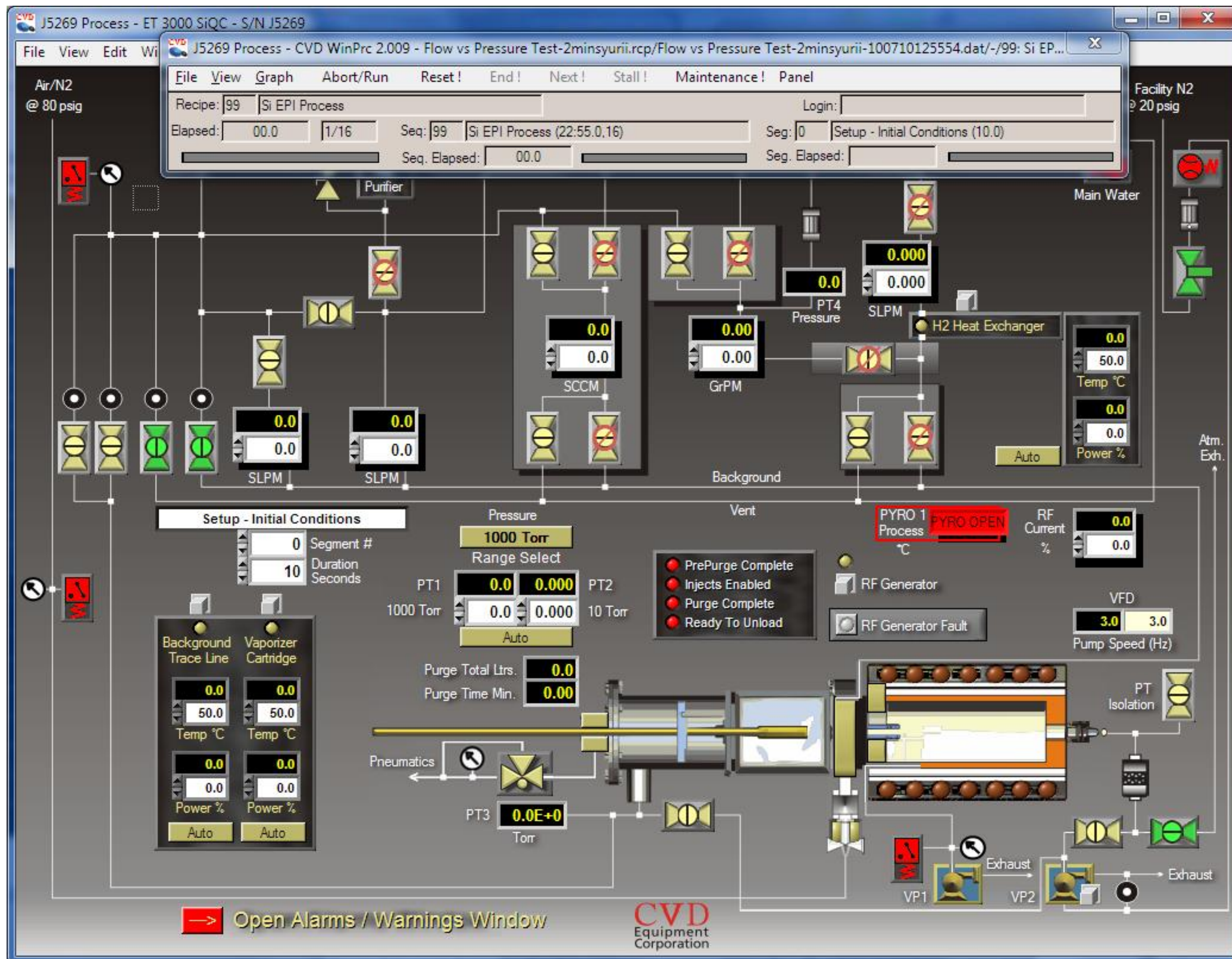
EasyTube 3000-SiQC

- RF Induction Heating 700°C-1500°C
- High Purity, Cold Wall Quartz Process Tube
- Silane and Chlorosilane Liquid Source Vapor Delivery System
- Direct or Indirect feed sources

enabling tomorrow's technologies™

CVD
Equipment
Corporation

ET3000-SiQC

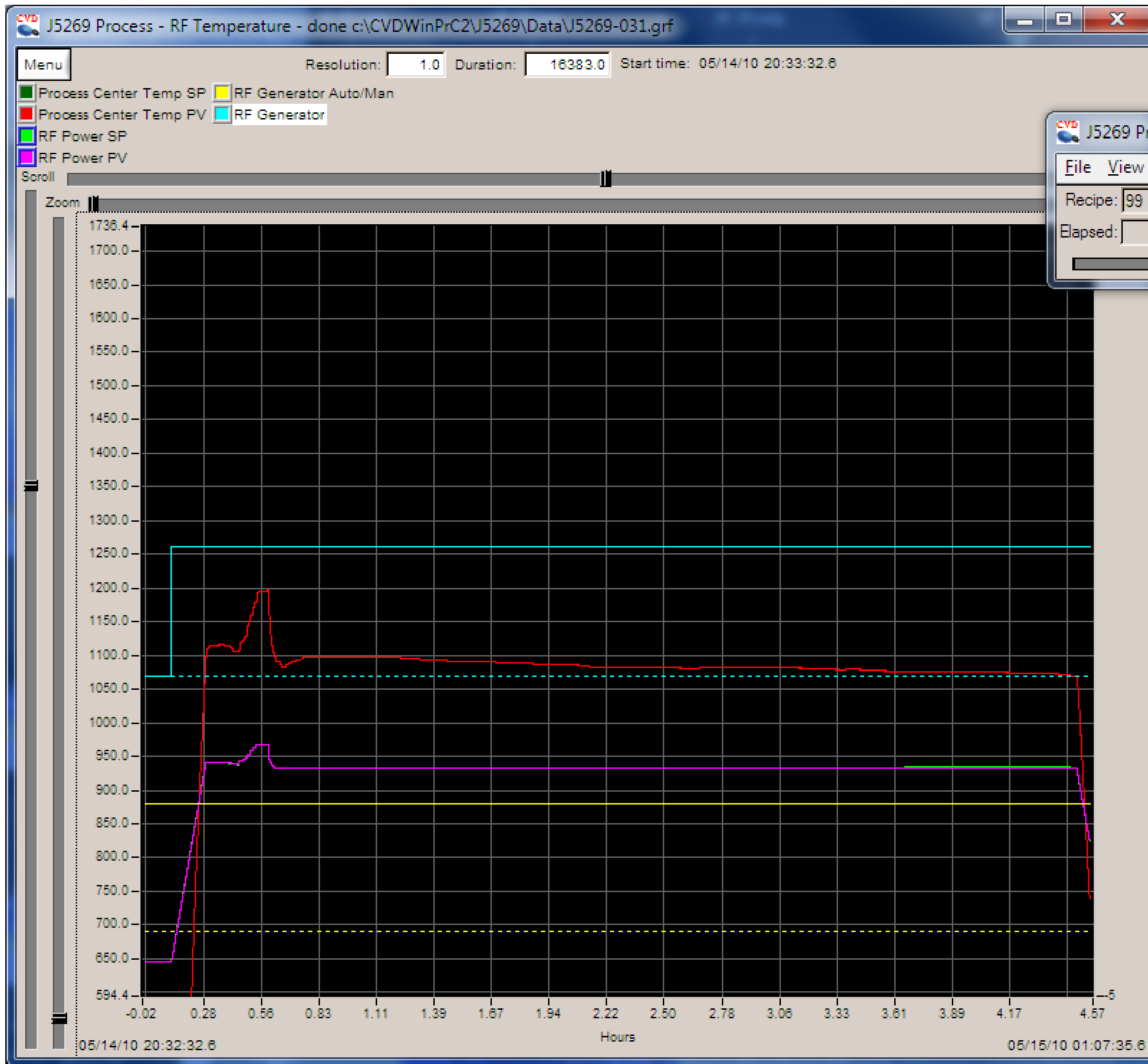


CVD *WinPrC*™ Process Control Software front panel

enabling tomorrow's technologies™

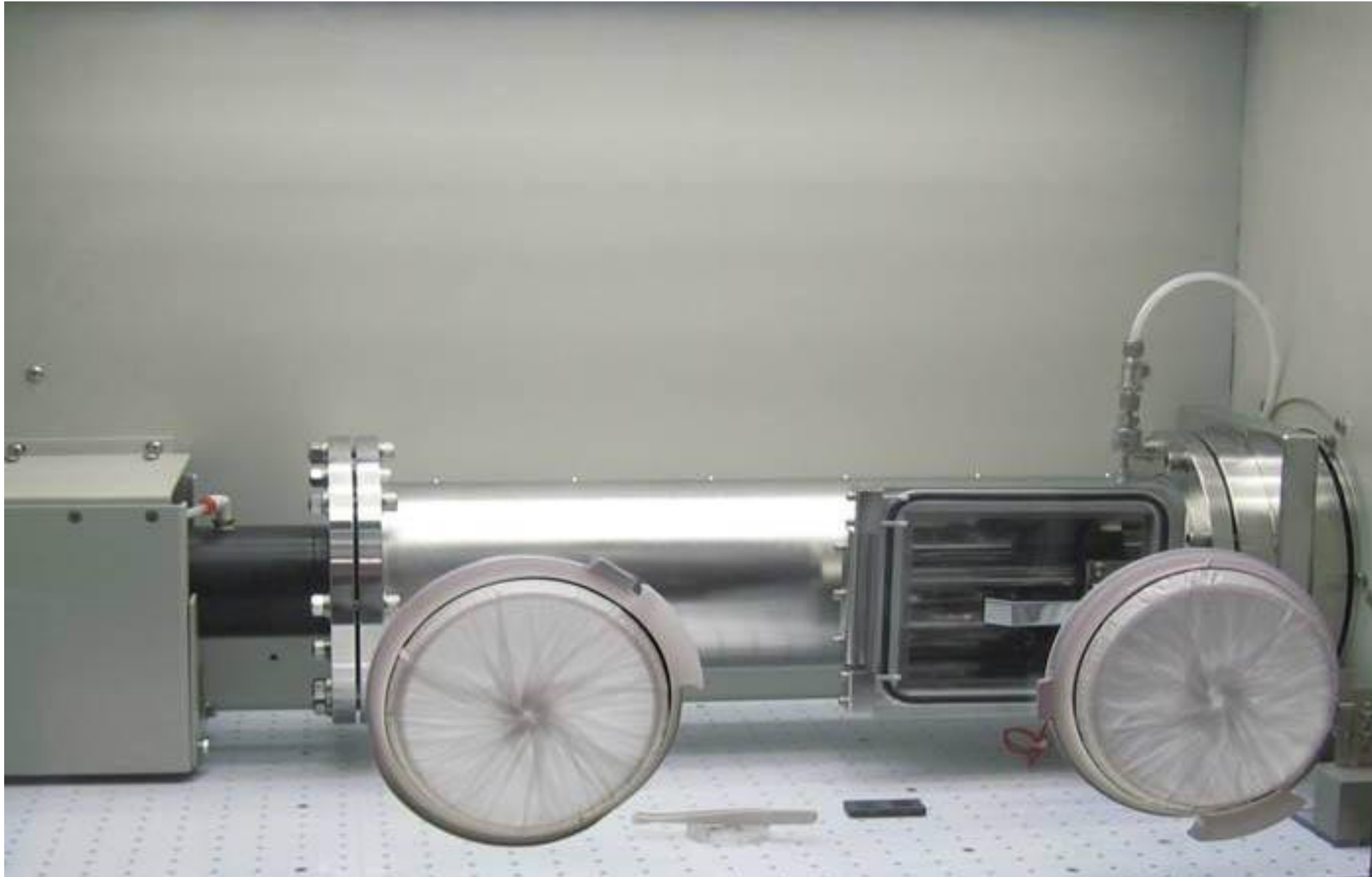
CVD Equipment Corporation

ET3000-SiQC



CVD *WinPrC*™ real time graphing of key process variables

ET3000-SiQC



Sample loading area with ULPA filtered laminar flow, Iris Ports & Load Lock

enabling tomorrow's technologies™

CVD Equipment Corporation

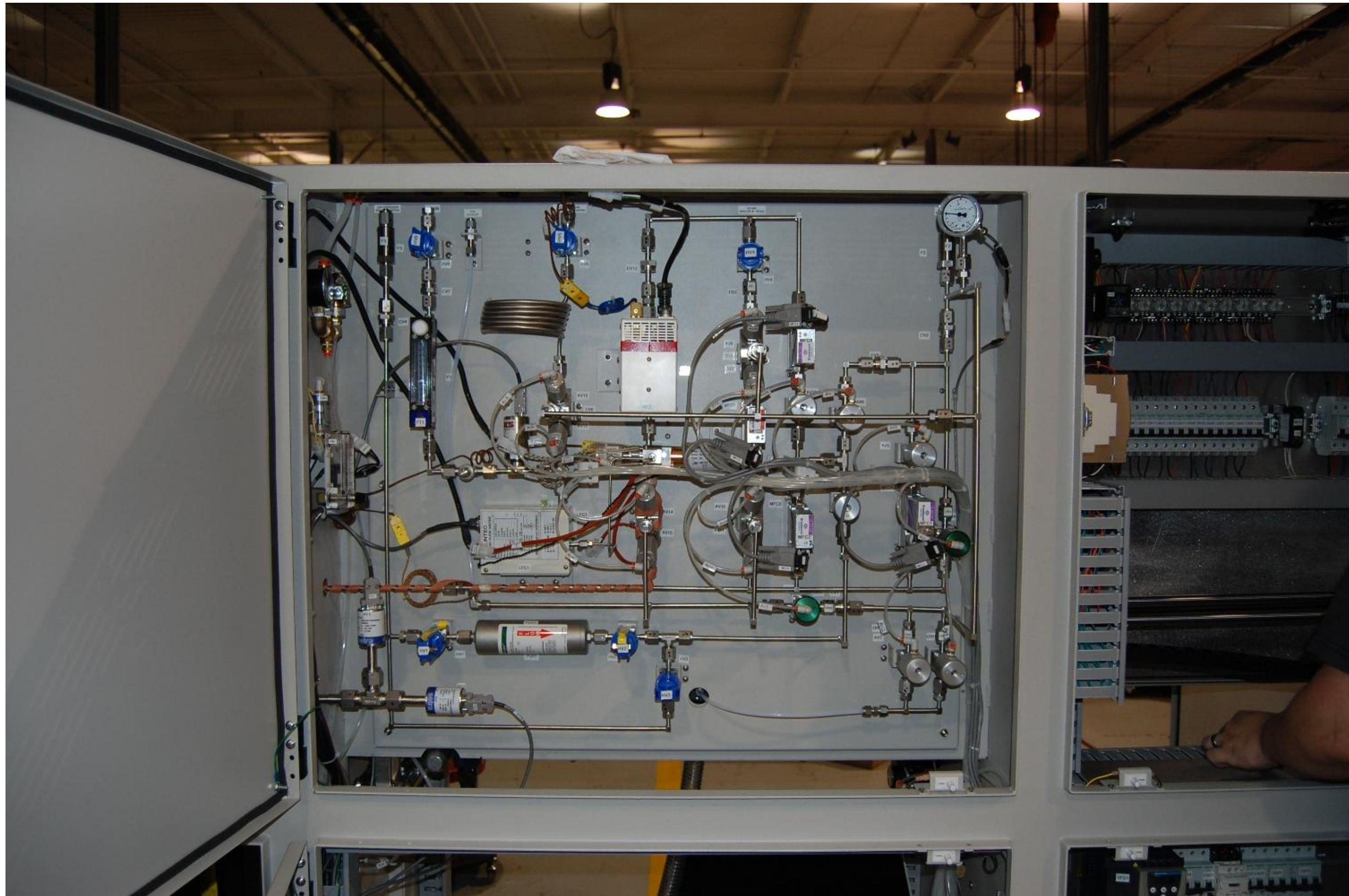
ET3000-SiQC

Water cooled, Quartz Process Tube & Optical Pyrometer

enabling tomorrow's technologies™

CVD Equipment Corporation

ET3000-SiQC



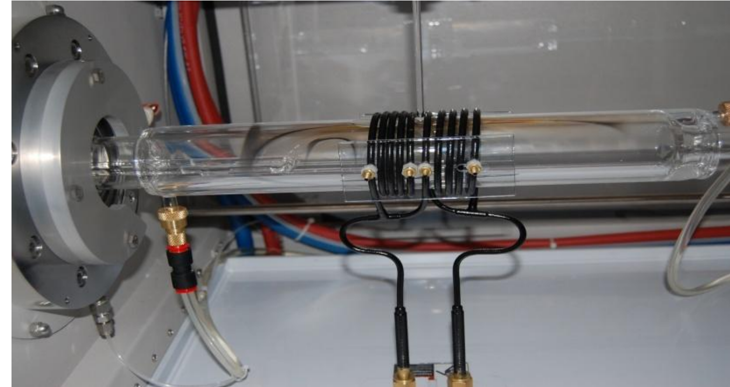
Gas & Liquid Control Compartment

enabling tomorrow's technologies™

CVD Equipment Corporation

ET3000-SiQC

Cleanhood with Iris Ports and Load Lock



RF Induction Heated, Water Cooled, Process Tube with Optical Pyrometer

Indirect Chlorosilane Vapor Delivery

H_2 Purifier for UHP H_2

Additional Features

- High Purity Susceptors
- Integrated Vacuum System to evacuate the Process Tube to a base pressure of <20 millitorr and Vacuum Baking of Susceptors
- Fully Automatic CVD*WinPrC*™ software, recipe driven process, real time graphics and safety interlocks
- Laminar Flow Clean Hood with Iris Ports to minimize contamination during loading and unloading of substrates
- Comprehensive Software and Hardware Safety Interlocks

TCS Si-Epitaxial Film Deposition

- **Film Thickness: > 100 μm**
- **Deposition rate (temperature dependent): 0.5 - 3 μm/min, 2 μm/min typical**
- **Total Process Cycle Time: 2-5 hours, 3 hours typical**
- **# of Runs between tube cleaning: > 20 typical**

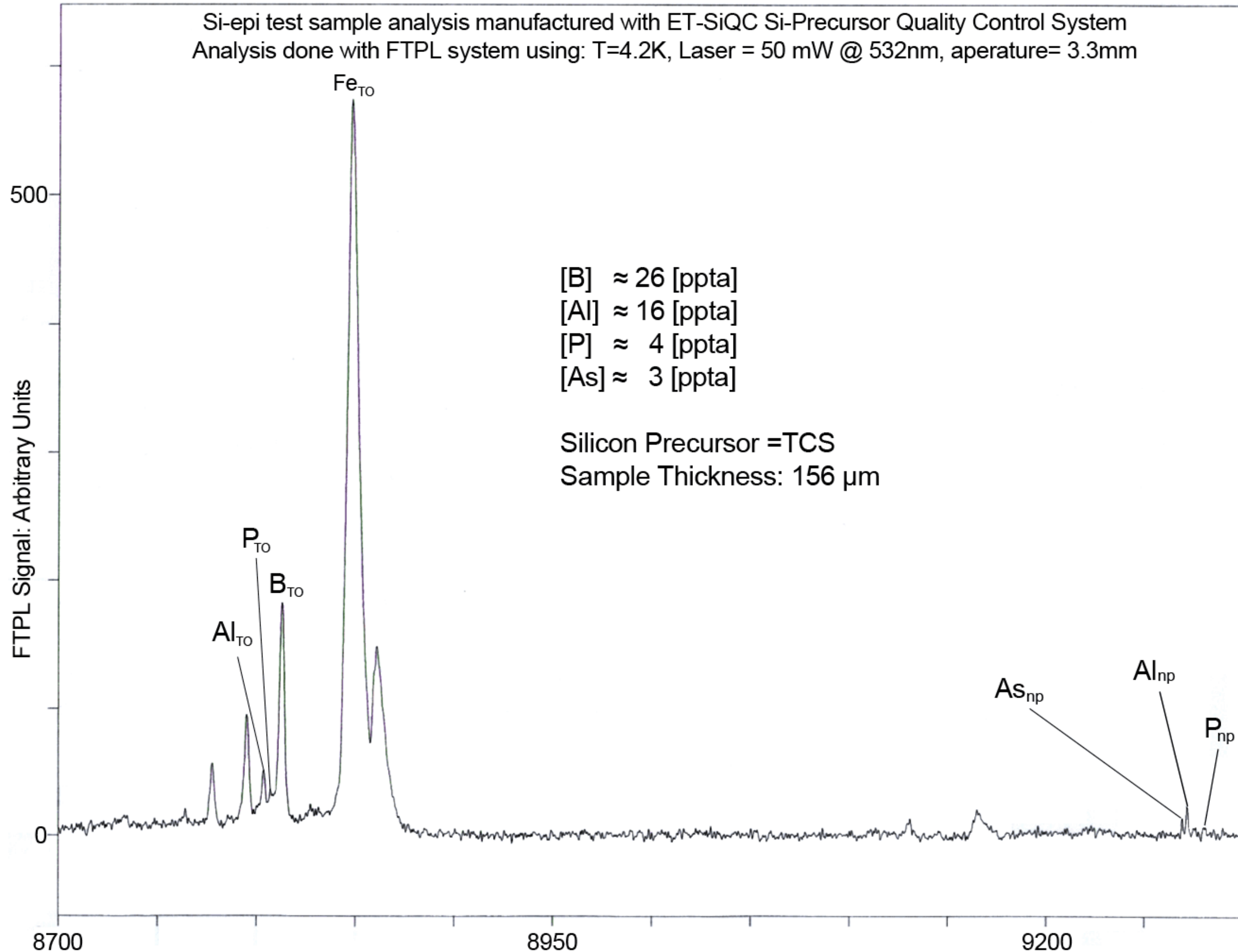
SiH_4 Si-Epitaxial Film Deposition

- **Film Thickness: > 100 µm**
- **Deposition rate (temperature dependent):
  0.3 - 1 µm/min, 0.5 µm/min typical**
- **Total Process Cycle Time: 3-6 hours, 4.5 hours typical**
- **# of Runs between tube cleaning: > 10 typical**

Impurity Measurement

- Impurities (As, Al, B, P):
  - Low Temperature FTIR and Photoluminescence
- Carbon and Oxygen:
  - Infrared Absorption
- Metals:
  - X-Ray Fluorescence (XRF) Spectroscopy
- Mass Spectrometry :
  - Capable of measuring most of the elements

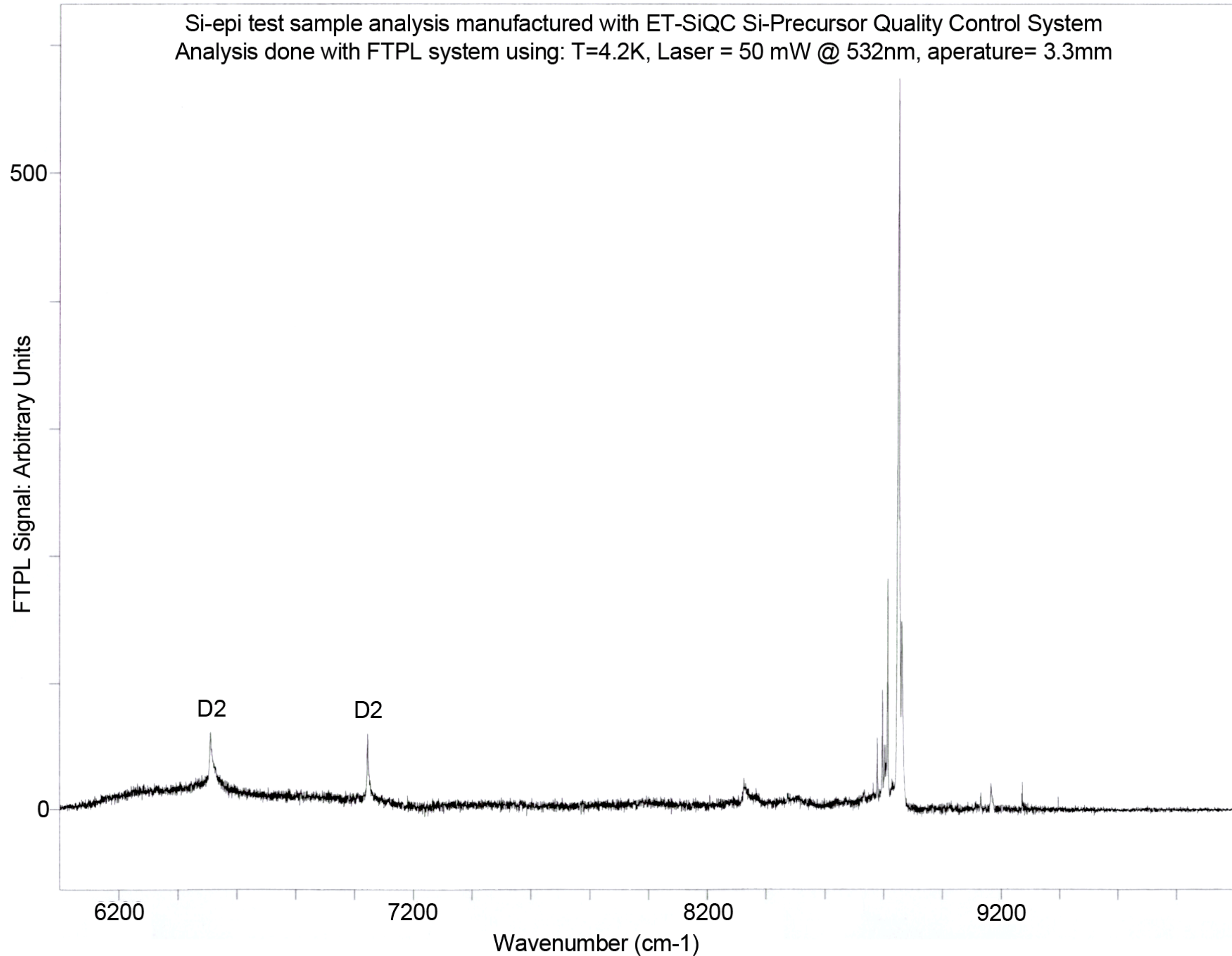
ET3000-SiQC



enabling tomorrow's technologies™

CVD Equipment Corporation

ET3000-SiQC



enabling tomorrow's technologies™

CVD Equipment Corporation

ET3000-SiQC
Impurity Levels

- B < 40 ppta
- Al < 30 ppta
- P < 10 ppta
- As < 10 ppta

measured with He cooled Fourier Transform Photo-Luminescence

ppta = parts per trillion atomic

For more information

Contact us:

CVD Equipment Corporation
Phone: (631) 981-7081
Email: info@cvdequipment.com
Web: www.cvdequipment.com