

Development & Evolution of a Precision UV/T/RH Exposure Chamber

John Sparks, Measurement Analysis Corp., Torrance CA

SPECIFICATIONS

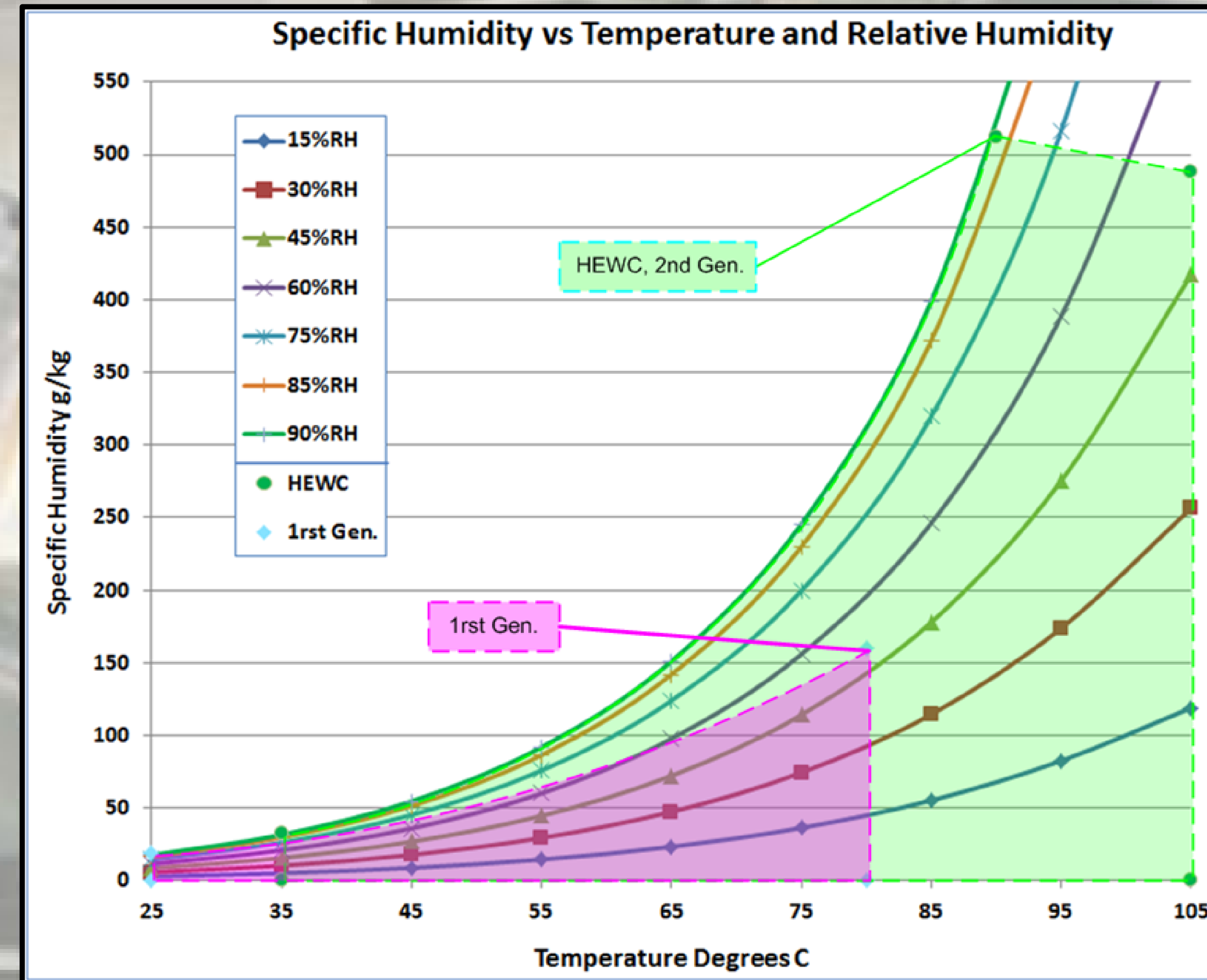
Sample Chamber Environment

Temperature: 35°C to 105°C, ± 1.0°C
 Humidity: -40°C dp to 90% RH @85°C, ± 2% RH
 Pressure: 1050 hPa (15.23 psia), ± 35 hPa
 Chamber Airflow: adjustable from 0.05 scfh to >1 scfh
 5.9"Ø Window

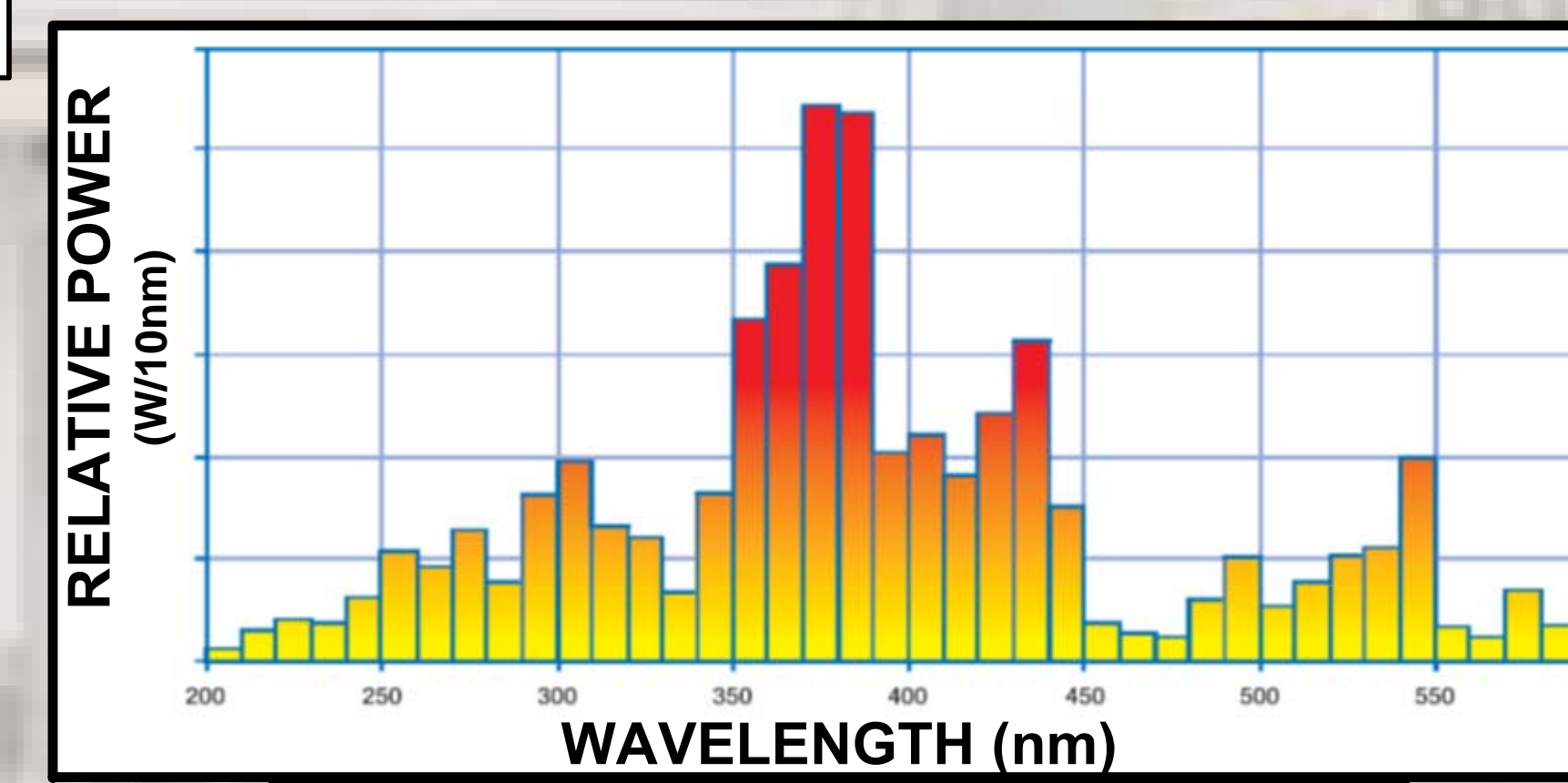
Ambient Operating Conditions

Temperature: Nominal lab conditions up to 25°C
 Altitude: Sea Level to 2250 m (7380 ft)
 Barometric Pressure Variation: ±30 hPa of nominal user facility BP

All Requirements met or exceeded



T & RH Operational Envelopes



SPHERE Lamp spectrum

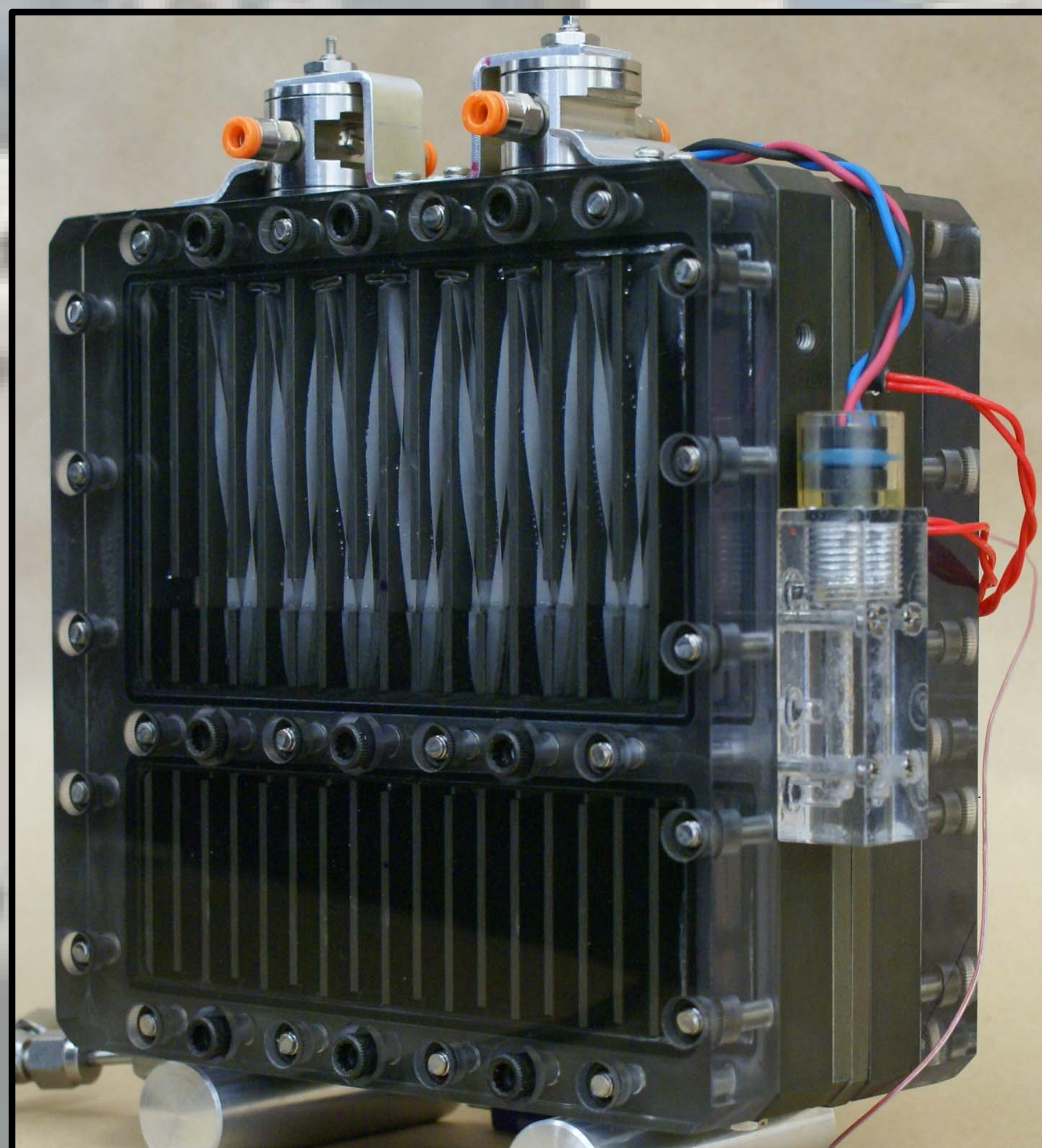
Future Options

Larger sample capacity (8.8"Ø window, irradiate 156 mm □ PV Cell; or ?)

Higher temperature capability (105°C, or higher?)

Programmable T & RH profiles

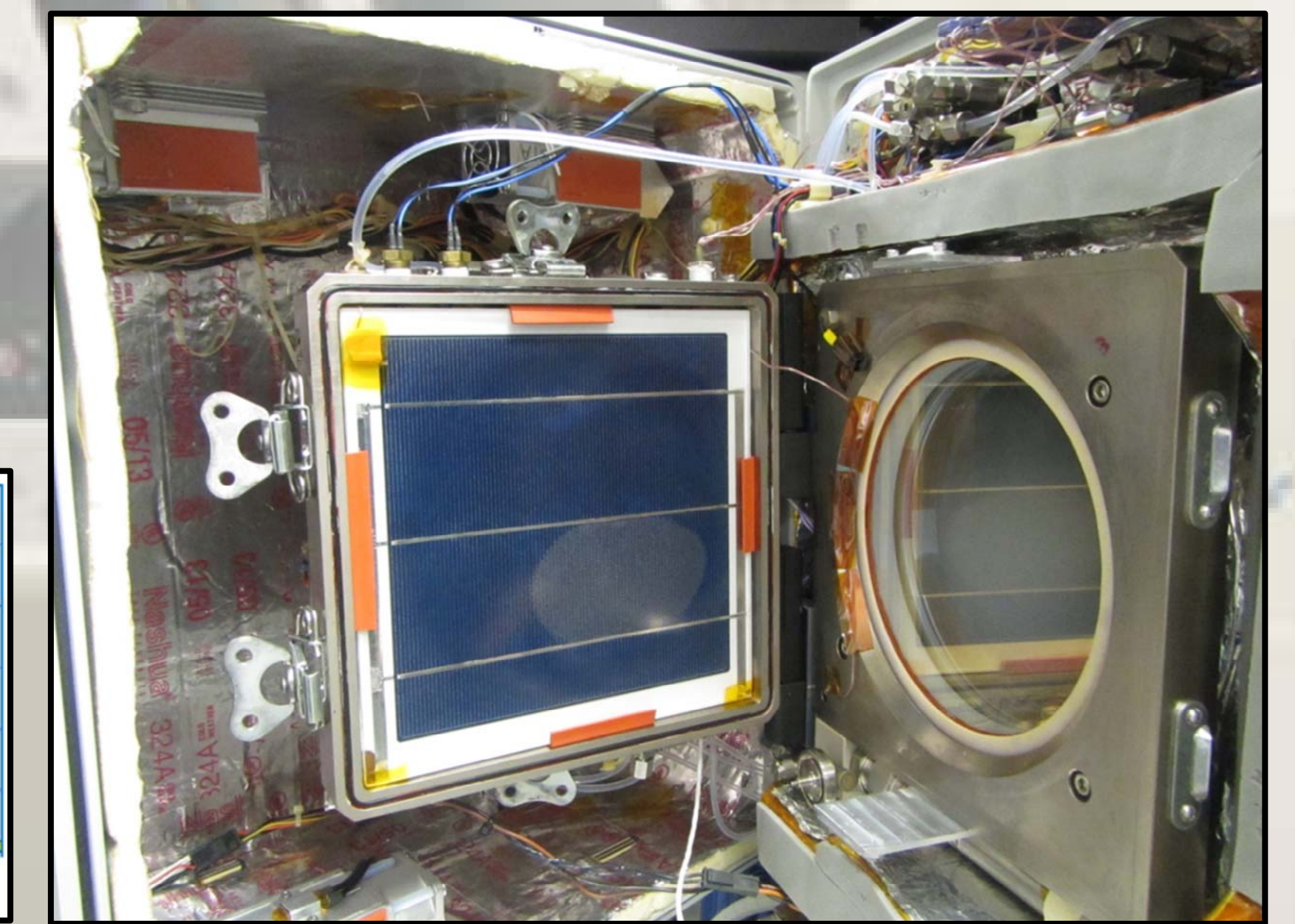
Changes in irradiation intensity or spectra



Early generator core, showing saturator with transparent cover



2nd Generation prototype installed on SPHERE



Mini-module installed in chamber

Unique Design

2-P Humidity Control

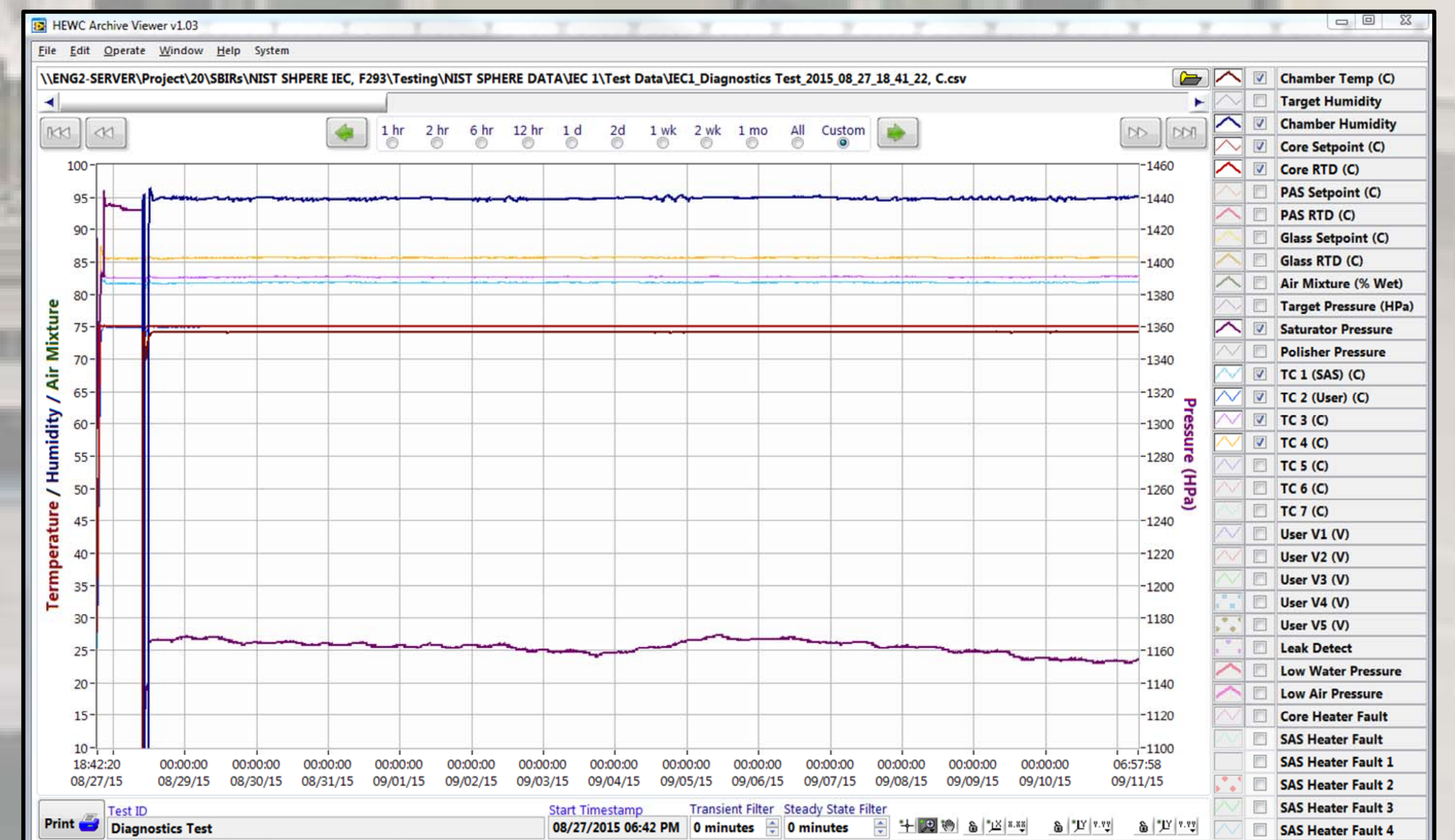
Similar to humidity calibration standards, the saturation chamber pressure sets the Specific Humidity, which sets the Relative Humidity in the sample chamber

Compact Isothermal Core

Temperature control is enhanced by quasi-monolithic integration of the generator and sample chamber

High Efficiency Saturator

Saturator achieves 100% over operating range, within measurable limits of error



Extraordinary T & RH Operating Control & Stability