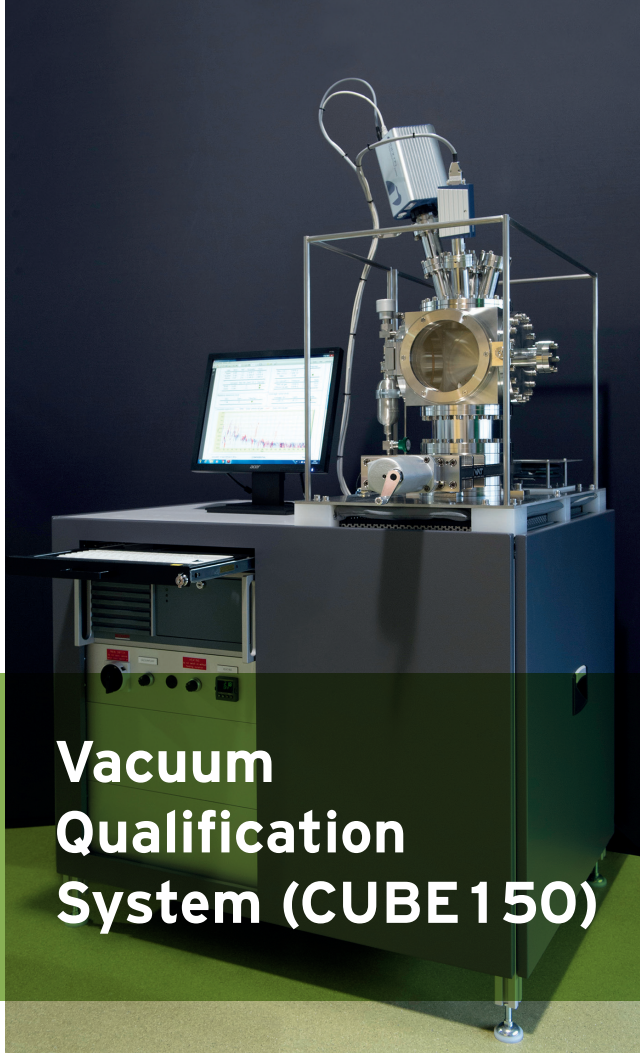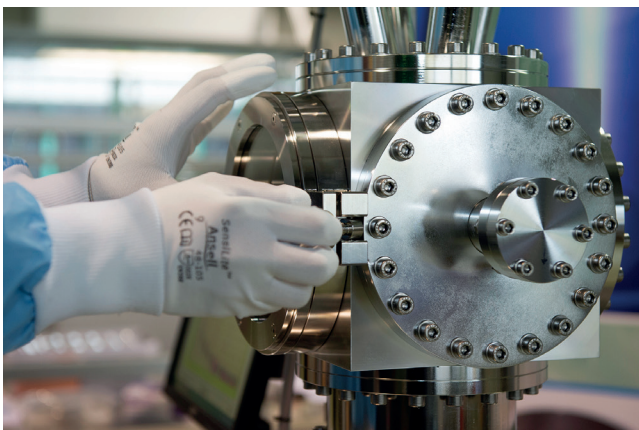# Vacuum Qualification System (CUBE150)

D&M vacuumsystems

D&M Vacuumsystemen BV has developed a new high vacuum qualification system. This system is especially designed in order to perform a final vacuum qualification of materials and/or modules prior to assembly within a high-vacuum environment. Furthermore, implementing this equipment will also result in having the possibility to carry out a well-defined mild vacuum bake-out as a final cleaning step.
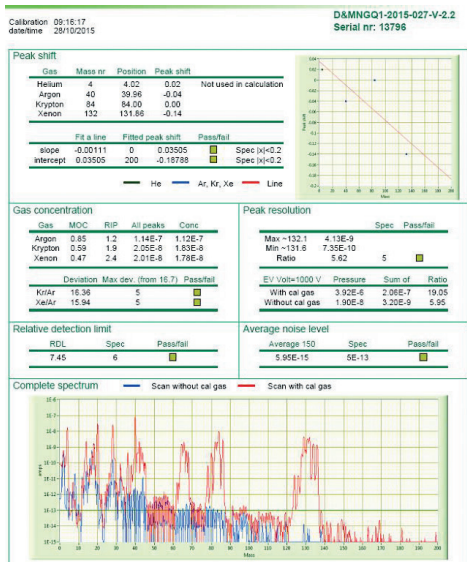
Proposition

A new high vacuum qualification system has been developed by D&M Vacuumsystemen BV. The system is designed to perform a Residual Gas Analysis on samples/modules, resulting in quantitative outgassing data.
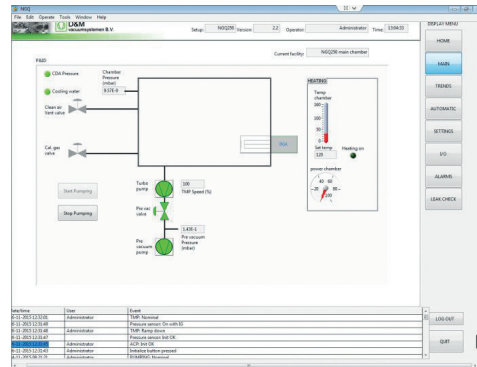
Application:

The qualification system is meant to perform a Residual Gas Analysis on materials/components in order to determine the specific outgassing of e.g. H_2O and CxHy-species. Qualification can be carried out in static as well as dynamic mode using feed through flanges for e.g. cooling and power supply.

Benefits:

- Semi-automatic qualification system
- Labview user interface
- Quantitative gas analysis by means of a standard (password-protected) semi-automated measuring procedure. Gas analysis carried out by means of mass spectrometry (RGA)
- Validation executed by automated script
- Can be implemented as in-line process control tool
- Possibility to link onto LAN (remote access)
- System bake-out cycle is well defined (convective heating for optimum uniformity)
- On-board calibration gas and specific validation algorithm makes this tool excellent for reproducibility/repeatability
- True compare and evaluation/review/ discrimination of measured results on equal systems worldwide

Impression GUI (graphical user interface)

(e.g. ion gauge, mass spectrometer) and equipped with a Labview based semi-automatic measuring procedure during which mass spectra as well as pump-down-data are being monitored.
Data analysis as well as report generation are carried out/produced according to standard/tested algorithms. This automated measurement also ensures that correct system parameters and background signals are used and monitored. Besides the above mentioned functionality (authorized) expert users have the possibility to perform a more detailed analysis of contaminants present on materials/components processed.

Specifications

Dimensions vacuumchamber	(CUBE CF150)
Maximum temperature	150°C
Adjustable temperature	10+/- 5°C
Timer	24-48 hrs
Leakrate system	< 5x10-9 mbar.l/s
Leakrate welds	< 5x10-10 mbar.l/s
Q H_2O	< 5.0-7 mbar.l/s
Q CxHy 45-100	< 5.0-10 mbar.l/s
Q CxHy 101-200	< 5.0-11 mbar.l/s

(After bake-out (24 hrs/120°C) and 10 hrs pumpdown (20l/s) metal-sealed

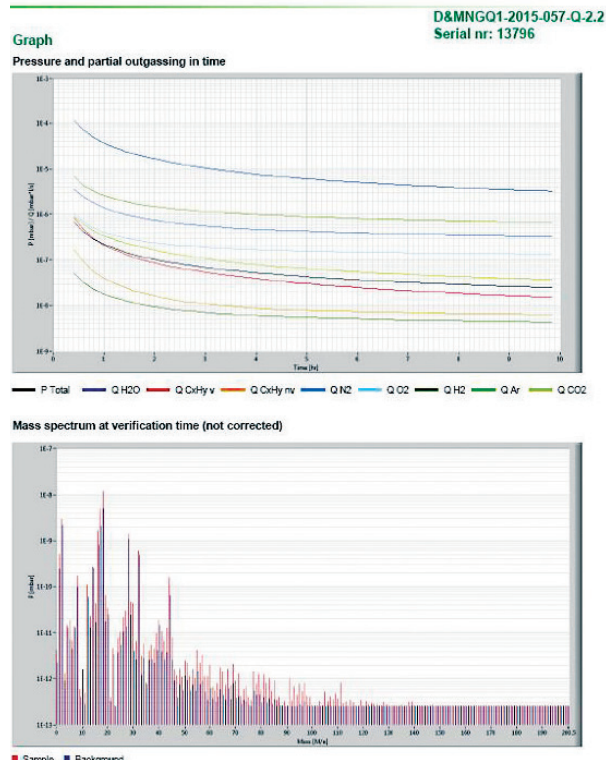|	
Mass spectrometer	0-200 amu

Proven concept and performance

This type of qualification system has been the standard for more than 50 systems worldwide (especially for the EUV lithography program) for over an extensive period of time.
Within these projects monitoring vacuum (outgassing) budgets in order to meet vacuum specifications was of great importance.
This procedure guarantees vacuum performance of complex systems prior to assembly. These tools also have proven to be very helpful monitoring as well as improving the production process of materials/components and modules used within vacuum systems.

Characteristics

High vacuum qualification system to carry out quantitative Residual Gas Analysis on components/ modules prior to usage in a HV or UHV environment. Total system is build up out of oil free components

Automatic report generation and automatic pumpdown/outgassing in time.