Technique	Max Temp (°C)	Vacuum level Torr *(mbar)*	Ambient Atmosphere	Mass range (amu)	Data type	Insights gained	Best suited for
ASTM E595	125	5×10^{-5} *(6.67×10^{-5})*	Air	NA	Data table for TML[1], CVCM[2], WVR[3]	Quantifies total outgassing and volatile condensables; optional Water Vapor Regained	Space-grade material screening; contamination risk assessment
Glass Ampoule Study-IVA®	450* 1100#	1.0×10^{-3} *(1.3×10^{-3})*	Air, N_2, O_2, any required gas mix	1-300	Concentration of inorganic gas species (DL 100 ppm)	Provides qualitative and quantitative gas analysis; simulates sealed environments	Long-term aging studies; internal atmosphere characterization
Glass Ampoule Study-GCMS					Identification of organic gas species		
UHV-EGA	1200	$< 5\times10^{-8}$ *($<6.67\times10^{-8}$)*	NA	1-300	**2D plots**: Total pressure *vs.* temperature, Mass signals *vs.* temperature **3D Plot:** mass-*vs.*-mass signal-*vs.* temperature Semiqualitative mass composition	Identifies gas species released during heating; profiles vs. temperature Characterize outgassing of Hydrogen, moisture or other gases when material subjected to elevated temperature	Simulating bake-out, curing, and thermal cycling processes contamination in raw materials,
TGA-MS	1000	NA	Air, N_2, O_2, or a gas mix	1-300	Quantification of change in sample weight vs temperature 2D plot of mass spectrum vs temperature	Tracks decomposition and thermal stability; links weight loss to chemical changes	Evaluating thermal behavior and degradation of materials

GCMS: Gas Chromatography mass spectrometry

UHV-EGA: Ultra-High Vacuum Evolved Gas Analysis

TGA-MS: Thermogravimetric analysis coupled with mass spectrometry

1: Total Mass Loss (g)

2: Collected Volatile Condensable Materials

3:Water Vapor Regained (WVR)

IVA®: Internal Vapor Analysis

*: when sample sealed in Borosilicate ampoule

#: when sample sealed in Quartz ampoule

2D Plots:

Total Pressure vs. Temperature:
Reveals overall pressure behavior as a function of thermal variation, highlighting transitions or anomalies across the temperature range.

Mass Spectral Signal vs. Temperature:
Tracks the intensity of mass-specific signals relative to temperature, providing insight into species evolution, outgassing profiles, or decomposition patterns.

3D Plot:

Mass Number vs. Signal Intensity vs. Temperature:
A volumetric visualization showing the dynamic behavior of specific mass fragments across the thermal cycle. Enables cross-comparison of species and thermal response.

Mass Composition Analysis:

Semi-Qualitative Mass Composition:
Approximate identification of major constituents based on signal intensity trends and fragmentation behavior. Interpretation is supported by expected cracking patterns but is not quantitatively calibrated.