

Sensitive and accurate furnace AAS

Technical Overview



Agilent's GTA-120 Graphite Furnace system has been designed to deliver:

- high sensitivity
- excellent background correction, even with tough interferences and high background absorbances
- high productivity
- reduced running costs, and
- ease-of-use.

The GTA-120 is available as part of the 240Z and 280Z dedicated Zeeman system, or as an accessory for the AA240 and AA280 systems, where Deuterium background correction is used.



Agilent Technologies

Outstanding furnace performance for challenging samples

Agilent's integrated GTA-120 and Zeeman GTA-120 Graphite Tube Atomizers are best known for outstanding furnace performance, no matter how difficult the sample. Agilent's furnace design is capable of reaching the high atomization temperatures required for refractory elements such as V, Mo and Ti, and also allows rapid heating rates throughout the furnace program, resulting in faster sample analysis.

<CTZ diagram to come>

The high level of performance is achieved via the Constant Temperature Zone (CTZ) design. This sees the furnace power supply being matched to low thermal mass, end-heated graphite tubes with optimized wall thickness. The result is rapid, controlled and uniform heating of the graphite tube, creating a constant temperature zone, centered on the injection, resulting in high sensitivity and precision.

Have confidence in your results with Zeeman Background Correction

Agilent's Zeeman systems provide background correction over the full wavelength range and can handle structured backgrounds, spectral interferences and high background absorbances.

Agilent Zeeman systems feature the transverse AC modulated Zeeman configuration with the field applied across the atomizer. This avoids the sensitivity losses observed with a DC (permanent) magnet, and maximizes light throughout compared with longitudinal designs where end caps restrict the light passing through the pole pieces of the magnet. The Agilent design delivers outstanding sensitivity and maximum performance with challenging sample matrices.

While atomizing the sample, the magnet operates at twice the mains frequency to accurately track the background signal. A three point polynomial interpolation is applied to the background signal to further improve the determination of the background

and provide an 11-fold improvement in correction accuracy.

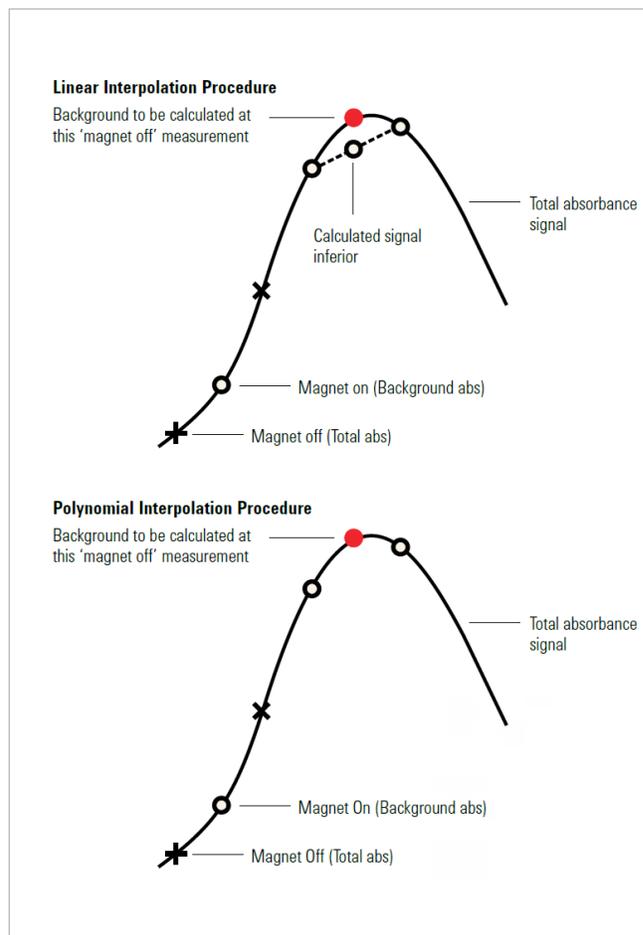


Figure 1. Agilent Zeeman systems use three point polynomial interpolations to accurately track the background signal, resulting in an 11-fold improvement in correction accuracy.

Extended graphite tube lifetime

The GTA 120 reduces running costs by minimizing argon consumption and extending graphite tube lifetimes.

The two stage external gas flow in the furnace work head greatly extends tube lifetimes. Gas consumption can be reduced by up to 40% compared to other designs by using low flows at low temperatures, and high flows at high temperatures when the graphite tube needs maximum protection.

Increased productivity with the PSD-120

The PSD-120 is a high capacity furnace autosampler with capacity for up to 130 samples. It can automatically perform the following sample preparation processes, all at ppb levels, which eliminates time consuming sample preparation:

- Prepare calibration standards from just 1 bulk standard
- Prepare standard additions spikes
- Automatically prepare a second, reduced-volume, sample injection of over-range samples

To further increase productivity, subsequent samples are collected while the furnace analyses a sample, reducing wait time between samples.

Additionally, the PSD-120 provides flexible dispensing options that are commonly used in GFAAS, including hot injects, multiple injects, and pre- or post- addition of modifiers.

Greater ease of use

Tube-CAM video monitoring (Figure 2) is a standard feature on Agilent Zeeman systems and is an indispensable tool for method development and monitoring GFAAS analysis. The Tube-CAM images enable you to quickly and accurately set critical parameters such as the dispensing height, and allows you to monitor the sample in the graphite tube during the drying and ashing steps.

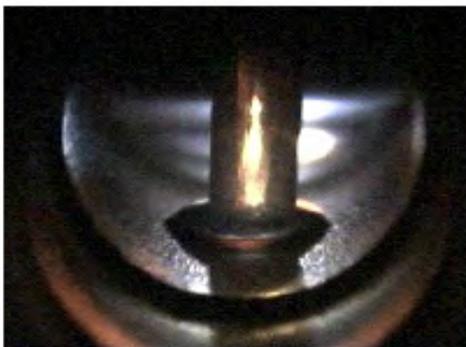


Figure 2. TUBE-Cam simplifies method development and enables you to set the dispensing height and monitor the analysis.

The optional fume extraction accessory includes a mirror and lights to provide a clear view of the injection hole, making alignment of the autosampler capillary easy. The accessory connects to the exhaust system to remove vapors at the source.



Figure 3. The optional fume extraction accessory includes a mirror and lights to make autosampler alignment easy

Agilent's Surface Response Methodology (SRM) software Wizard accelerates furnace method development and reduces training requirements for new users. The SRM Wizard steps the user through the process of optimizing the ashing and atomization temperatures for the best absorbance and automatically creates a method with the recommended conditions.

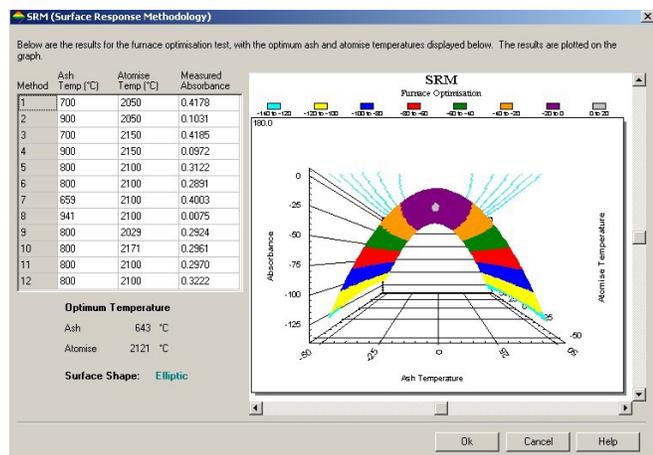


Figure 4. The Surface Response Methodology Wizard automatically creates a method with the recommended conditions

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