



# Gas/Liquids Standards Calculator Tool

## PIB CS21004

Calibration gas standards play a vital role in ensuring accurate and reliable performance of gas analysers and detection systems. These standards are carefully prepared mixtures of specific chemical components, either gases or vaporised liquids at known concentrations in a balance gas. The method used to create these mixtures depends largely on the physical state of the components, the required concentration levels, and the intended application.



Preparing standards with purely gaseous components is generally more straightforward, involving direct blending under pressure using gravimetric or volumetric techniques. However, when components are liquids at ambient conditions, the process becomes significantly more complex. These liquids must be precisely vaporized and diluted to achieve a stable and accurate gas-phase concentration, often requiring specialized equipment and careful control of temperature, pressure, and flow dynamics.

Each preparation method, be it dynamic blending, static gravimetric filling, or permeation, comes with its own set of challenges and cost implications. Factors such as component volatility, chemical reactivity, required concentration ranges, and desired shelf life all influence the choice of method and the associated production costs.

Therefore, the cost and delivery timescales can be an unexpected factor when purchasing bespoke calibration gas standards. Also, for many customers the initial concentration levels required maybe unknown.

Therefore, a more sensible, quicker and cost-effective approach is to make your own standards. However, these can vary widely depending on several key factors. These include:

- Physical state of the components (liquid vs. gas)
- Number and type of components (reactive, toxic, or corrosive gases often require specialized materials and handling)
- Target concentrations (very low or high concentrations may require complex dilution or enrichment methods)
- Accuracy and stability requirements
- Vessel size and pressure rating
- Temperature and pressure conditions during filling and use





To assist clients in navigating these variables and optimizing their calibration gas formulations, ChromSolutions has developed a powerful automated spreadsheet tool. This custom-built calculator allows users to:

- Input target gas concentrations in a variety of units (e.g., ppm, mg/m<sup>3</sup>, mol%)
- Convert between concentration units based on standard conditions or user-defined temperature and pressure
- Model mixtures involving gaseous or vaporised liquid components
- Adjust for vessel volume and fill pressure
- Account for component-specific behaviour, including vapor pressure and density
- Over 500 gases and liquids to select from
- Warns of over pressurisation and issues with component purity

The tool provides rapid, accurate calculations and simplifies the process of preparing complex mixtures and reduces the risk of error.

Part Number	Product
CS-SCT-EWB-SW	Gas/Liquids Standards Calculator Tool

This automated solution reflects ChromSolutions' commitment to innovation, efficiency, and customer support. Empowering users to make informed decisions when specifying or producing calibration gas mixtures.

If you require more details, please contact us:  
<https://www.chromsolutions.co.uk/contactus.html>