



Technical note TNE-07

Use and treatment of calibration gases

1. All manual transport of gas cylinders from/to the warehouse and inside the laboratory must take place with cylinder valve protection on. Always attach the calibration gas bottle to the place of consumption.
2. Store calibration gases for at least 12 hours at room temperature before analysis. If condensation is suspected, follow the instructions on the certificate. NB*1
3. Unscrew the cylinder valve protection and check for any contaminants in the outlet of the cylinder valve. If necessary, clean with a dust-free cloth and rinse well with dry inert gas.
4. Fit pressure regulator with correct threads. NB*2
5. Check that the regulator valve on the regulator is closed.
6. Open the cylinder valve slowly until total pressure is reached and then close quickly. (Note that acid-proof steel valves often have to be screwed several rounds before pressure reaches the regulator.)
7. Open the control valve and release the overpressure to the exhaust. Close regulator valve immediately.
8. Repeat step 5 to step 7 at least ten times. Record total pressure and reduction pressure before analysis.
9. Use relatively low reduction pressure and use control valve (or additional flow-controller) to create constant sample gas flow through sample loop in gas sample valve (GSV) for all gas sample injections (example 100 ml / min). Use the same flow for calibration gas and gas sample!
10. Inject with automatic GSV with the same time intervals for each parallel. NB*4
11. After obtaining stable results, at least 5 parallel GC areas are stored for each component. Remove any "outliers". Calculate the mean and standard deviation (SD) for the parallel injections of calibration gas and sample, respectively. SD <0.5% are generally considered as acceptable values.
12. Register the cylinder number, total pressure, date and signature of the analyst on the analysis form.
13. Finish by closing the cylinder valve and opening the regulating valve to the exhaust. Disconnect the pressure regulator, attach the cylinder valve protection and store the cylinder securely (attached upright or horizontally). As a general rule, calibration gases should be stored at room temperature. (Calibration gases can also be fitted with a manual regulator open and a motorized shut-off valve for automatic calibrations over time.)

Proper use of calibration gases is crucial for the analysis result in gas analysis.

A calibration gas has a high value and this guide is intended to ensure that the gas specifications at the point of use are of the same quality as in the cylinder.

Nippon Gases provides this guide for professional handling and safety when using calibration gases.

NB!

*1 When using a calibration gas with condensed components, the composition will change!

*2 Remember the correct quality and material selection for pressure regulator.

*3 Use the same reduction pressure for all injections if flow is not stopped by injection. Stopping the flow a few seconds before the injection time will result in better parallels, but be aware of any changes in atmospheric pressure. For corrosive components, it may be an advantage not to stop flow by injection.

*4 Remember the correct choice of material in GSV and transfer pipes for the relevant gas components! Heating of GSV and transfer pipes can provide better parallels for heavier hydrocarbons.