

Classification of chemicals used at Atest-Gaz

Because of the need to present a **consistent and high level of maintenance services**, to ensure **the safety of the calibration process** and to **create a basis for a rational calculation of the costs** of this process, Atest-Gaz developed the "Classification of Chemical Substances" described below.

The classification determines the complexity of the calibration process of a particular detector type, consider two criteria:

- ✍ stability of the calibration mixture (criterion **A**):
 - ease of generate and its stability,
 - ergonomic complexity of operations,
 - required experience and knowledge of the employee performing the calibration,
 - required equipment,
 - environmental requirements for the process (e.g. weather conditions).
- ✍ safety / potential hazard generated by the mixture (criterion **B**).

These both criteria have an impact on the final cost of the calibration services and level of competence required from the employee conducting the calibration.

This classification is applied both by Atest-Gaz and the entities cooperating with it – distributors, authorized service providers and users of the systems.

In the case of calibration with the "crossover" substances, the classification is made in accordance with the substance category that is applied (e.g. for the detector with a PID sensor this substance is isobutylene, i.e. BO A0).

The detector are classified on the stage of offer.

On the next page we present tables showing the above relationships.

Category	Description	Terms of facility calibration
A0	Cylinder gases, stable environment	No precipitations, and no strong winds, and temperature over -10°C^1 . In other cases, calibration at a location that meets the above conditions (necessary to remove the detectors).
A1	Cylinder gases, unstable environment or absorption by the moisture	No precipitations, and no strong winds, and temperature over $+10^{\circ}\text{C}^1$, and relative humidity under 70%. In other cases, calibration at a location that meets the above conditions (necessary to remove the detectors).
A2	Gases not available in cylinders can be generated at the relevant facilities	like A1 In other cases, calibration at a location that meets the above conditions (necessary to remove the detectors).
A3	Laboratory calibration	Facility calibration impossible, laboratory calibration only, probably at the manufacturer's. This group also includes conditions resulting from other reasons, e.g. the need for temperature compensation, non-linearity of the sensor, the need for calculation, the use of special tools, etc.

Table 1. Classification of chemicals used at Atest-Gaz. Criterion A: mixture stability

Category	Description	Classification criteria
B0	Safe substances	concentration of flammable components $< 60\% \text{ LEL}$, and concentration of toxic components $\leq \text{NDSch}^2$, and oxygen concentration $< 25\% \text{ vol}$, and tank $< 3 \text{ dm}^3$ (water capacity) and $p \leq 70 \text{ atm}$, or specified liquid chemical compounds, e.g.: glycerol, 1,2-propanediol.
B1	Low-risk substances	concentration of flammable components $< 60\% \text{ LEL}$, and concentration of toxic components $\leq \text{NDSch}^2$, and oxygen concentration $< 25\% \text{ vol}$, and tank $> 3 \text{ dm}^3$ (water capacity) or $p > 70 \text{ atm}$, or toxic gases with the concentration of $\text{STEL} \div 15 \times \text{NDSch}$, or specified liquid chemical compounds, e.g.: petrol, acetone, 1-methoxy-2-propanol.
B2	High-risk substances	inert gases having an oxygen concentration $> 25\% \text{ vol}$, or flammable gases with a concentration $> 60\% \text{ LEL}$, or specified liquid chemical compounds, e.g.: styrene, methanol, xylene, toluene, methyl methacrylate.
B3	Extremely dangerous or extremely flammable substances	toxic gases with the concentration of $> 15 \times \text{NDSch}^2$, or specified liquid chemical compounds, e.g.: benzene, formaldehyde, formic acid, epichlorohydrin.

Table 2. Classification of chemicals used at Atest-Gaz. Criterion B: OHS

1 Is allowed to perform calibrations at lower temperatures, if they meet the conditions of operation of the detector, e.g. ammonia refrigeration units.

2 In the absence of determined NDSch it is necessary to adopt $2 \times \text{NDS}$ as a criterion.