Difference between Class 1 and Class 2 Filters

Respiratory protection with filters in accordance with European standard EN 14387 is an essential part of personal protective equipment (PPE) in industrial, chemical and construction environments. This standard defines gas, vapour and combined filters used on negative pressure respirators (such as half or full face masks) to protect the wearer from harmful substances in the air.

Filters are classified in this standard based on:

- **Type:** which category of harmful substances they can capture (gases, vapours, particles)
- **Class:** the capacity/amount of substance they can absorb before breakthrough
- **Efficiency:** relevant for particle filtration

This classification helps in selecting the right filter for workplace risks and exposure scenarios.

301109 A1P3 filter cartridges

EN 14387 – Basic principles: Types, Classes and Markings

According to EN 14387, filters are characterised by:

- **Letter(s):** indication of **type of protection**

For example:

- A: organic gases and vapours with a boiling point > 65 °C (colour code brown)
- B: inorganic gases and vapours
- E: acidic gases and vapours
- K: ammonia and derivatives
- P: solid particles (particle filter, such as dust)
- Combinations such as A2P3 indicate gas and particle protection.

401209 A2P3 filter canister

- **Number** after the letter: **filter capacity**

This is the most important difference that determines the performance and sustainable use of filters.

What Does Class Mean? Capacity and Application

The class of a filter indicates the **capacity** or **maximum concentration** at which the filter can be used safely before the active filtration breaks down:

Class	Capacity (indication)	Meaning
1	till 0,1 vol% (1 000 ppm)	Low capacity
2	till 0,5 vol% (5 000 ppm)	Medium capacity
3	till 1,0 vol% (10 000 ppm)	High capacity

Practical interpretation

- **Class 1**: filters harmful substances but becomes saturated more quickly; suitable for short-term or low concentrations.
- **Class 2**: offers **greater absorption capacity** and can be used at higher concentrations and/or for longer exposure times than class 1.
- **Class 3**: even greater capacity than class 2 (for very harsh conditions).

NB: For combined filters (such as A1P3 or A2P3), the gas and vapour capacity is determined by the letter and number designation (A1 versus A2), while the particle filter performance (such as P3) is independent of this gas capacity..

A1P3 vs A2P3 – Concise Comparison

Marking explanation

- **A1P3 / A2P3**: combinatined filters with
  - **A** = protection against organic gases and vapours
  - **1/2** = filter class (capacity))
  - **P3** = **very high particle filtration** (≥ 99,95 % efficiency)

Characteristic	A1P3	A2P3
Gas-capacity	Class 1 – low capacity (up to ~1000 ppm)	Class 2 – medium capacity (up to ~5000 ppm)
Application	Shorter exposure / lower concentrations of organic substances	Longer exposure / higher concentrations of organic substances
Particle protection	P3 – very high efficiency	P3 – very high efficiency
Sustainability/lifespan	Shorter	Longer service life under comparable conditions

What does this mean in practice??

- **A1P3** filters have less active absorption capacity (less carbon) than **A2P3**, which means that:
  - they become saturated more quickly at the same gas concentrations;

  - in situations with higher concentrations of gases/vapours (but still below the limit values), the breakthrough occurs more quickly.
- **A2P3** filters contain more absorbent material and are therefore suitable for higher concentrations or longer periods of exposure before they need to be replaced.

In short: **The difference lies not in the type of hazard (which is the same: organic gases + particles), but in the extent and duration of protection that the filter can provide within safe limits..**

Risk Assessment and Selection

When selecting filters, you must take into account:

1. **Identification of risks in the workplace:** What substances are present? Are they organic gases? Are there dust or mist components??
2. **Concentration and exposure duration:** How high is the concentration and how long is the exposure? Higher concentrations or longer exposures usually require higher class filters (e.g. class 2 or 3)..
3. **Mask compatibility:** Not every filter fits every mask – pay attention to the connection type (Rd 40, screw, bayonet)..
4. **4. Lifespan and replacement:** filters have a limited lifespan; replacement must take place as soon as breakthrough approaches or the filter becomes saturated.

Conclusion

The **class designation** (1 vs 2 vs 3) in **EN 14387** is a measure of the **absorption/filtering capacity** of gas and vapour filters.:

- *Klasse 1* offers basic capacity and is suitable for lower concentrations or shorter use.
- *Klasse 2* offers higher capacity, longer operational availability and higher limits for safe use.
- *A1P3 vs A2P3:* Both filters offer the same **particle protection** (P3), but **A2P3** has a **higher capacity** for organic gases, allowing it to be used safely for longer in more demanding conditions..

References and EN Standard Sources

- EN 14387 standard description of gas and combined filters and classification.
- Capacity values and filter classes according to EN 14387.
- EN 14387:2021 standard classification and specifications.