

Storage Instructions: Media/Cassettes

1. Unopened Media and Cassettes

- Media and cassettes stored in their original, unopened, and undamaged shipping containers have an indefinite shelf life.
- Storage should be indoors but does not require strict climate control.
- Avoid exposing the cartons to elevated temperatures above 90–95°F for extended periods, as this may cause condensation inside poly bags and potentially affect the media's physical properties and long-term performance.

2. Bulk Media Storage

- Bulk media stored in unconditioned indoor spaces generally does not experience significant performance degradation.
- Media directly exposed to ambient air may show minor effects over time, though typically not enough to impact performance unless the media becomes physically wet.
- Normal temperature and humidity fluctuations or proximity to vehicle traffic (e.g., loading docks) are generally not a concern.
- Ensure that storage containers such as sling bags, drums, and other bins remain closed/sealed to prevent contamination or moisture exposure.

3. Finished Goods (e.g., V-bank filters, pleated or honeycomb filters, AmAir-type products)

- Finished goods may require greater care in packaging and storage to maintain product integrity prior to shipment.
- Evaluate whether additional packaging, repackaging, or protective measures are needed based on storage conditions.

4. General Recommendations

- Keep all materials indoors, away from direct water exposure.
- Maintain containers in a closed, clean, and dry condition.
- Avoid prolonged exposure to high temperatures, direct sunlight, or environments where condensation may occur.
- Carbon is a non-selective adsorbent and will adsorb almost anything it encounters, including moisture.
- Carbon naturally equilibrates with ambient humidity.
- If the contaminant of concern is miscible with water, removal still occurs but at lower capacity.
- If the contaminant is immiscible, moisture reduces service life even further.

Service Life & Storage Guidance: HEGA Filters

1. Overview

Due to the number of environmental and operational variables involved, there is no single definitive service life for a HEGA filter filled with nuclear grade carbon. However, general expectations can be provided based on storage conditions and operating environment.

2. Shelf Life – Uninstalled (Sealed in Original Packaging)

A HEGA filter filled with nuclear grade carbon that:

- Remains sealed in its original shipping packaging
- Is stored in an environment below 50°C
- Is protected from extreme humidity and contaminants

Has a maximum expected shelf life of up to five (5) years.

3. Service Life – Installed in a Non-Operational System

Once the HEGA filter is removed from its packaging and installed in a system (even if there is no airflow), additional variables affect service life.

Below are estimated remaining service life ranges under various conditions:

Condition	Estimated Remaining Service Life
No airflow, high humidity (>85% RH)	2–3 years
Low airflow (not necessarily fan-induced), typical ambient contaminants	1–3 years (depends on carbon type)
Intermittent airflow at design rate, low contaminant load	1–3 years
Intermittent airflow at design rate, high contaminant load	0–2 years

These estimates assume typical environmental exposure and do not account for unusual contaminant loads or extreme environmental conditions.

Service Life & Storage Guidance: HEGA Filters

4. Technical Considerations

The following principles explain the variability in service life:

- **Carbon is a non-selective adsorbent.** It will adsorb nearly any substance it comes into contact with.
- **Moisture adsorption:** Carbon equilibrates with ambient humidity.
 - If the target contaminant is miscible, adsorption capacity is reduced but still functional.
 - If the contaminant is immiscible, service life may be significantly reduced due to moisture occupying adsorption sites.
- **Aging after installation:** Once removed from packaging and placed into an Air Handling Unit (AHU), the impregnating agents within the carbon begin reacting with air. This natural aging process gradually reduces adsorption capacity and overall service life.
- **Contaminant poisoning:** Carbon can be “poisoned” by harmless vapors, reducing its ability to adsorb the intended contaminant.

5. Recommendation: Incorporation of Sample Canisters

To eliminate uncertainty and avoid reliance on estimated ranges, it is recommended to incorporate **sample canisters** into the HEGA filter design (if feasible).

Proposed Approach:

1. Establish a **baseline performance test** (assuming vendor testing of the nuclear grade carbon prior to filling).
2. Periodically remove and test sample canisters.
3. Compare results to the baseline.
4. Conduct testing annually (or at defined intervals) to establish a **data-driven projected service life**.

This method replaces estimation with measurable performance data.

AAF can provide an alternate quotation for a HEGA design incorporating built-in sample canisters.

6. AAF/Flanders Recommendation on Carbon Shelf Life

According to AAF/Flanders guidance:

- Carbon stored in properly packaged drums or filters with a vapor barrier may have a shelf life of up to five (5) years.
- Carbon over three (3) years old should be retested to confirm it meets the original efficiency specifications.
- Carbon should always be protected from harmful vapors, as it can adsorb unintended substances and lose effectiveness.

7. Summary

- Maximum sealed shelf life: **Up to 5 years (under proper storage conditions)**
- Installed service life: **Highly dependent on humidity, airflow, and contaminant load (0–3 years typical range)**
- Best practice: **Implement sample canister testing to establish actual performance-based service life**

Because HEGA carbon performance is directly influenced by environmental exposure, ongoing monitoring is the most reliable way to determine actual system life expectancy.

