

AmericanAirFilter® SAAF™ Media Remaining Life Analysis (RLA)

- Estimates remaining life, replacement schedules, and inventory requirements of media and gas-phase filters
- Provides confirmation of media activity after an event (helicopter landing, solvent spill, open media container)
- Provides information to optimize media choices and maximize system life
- Controls cost by ensuring replacement of media at the proper time

Engineers and end users often ask, "How long will the media last?" or "How frequently should the media be changed?" The answer depends on the application and the gas concentrations in the environment. Various tools can help answer these questions ranging from air measurements to occupant surveys. AAF recommends Remaining Life Analysis (RLA) for standard SAAF media. RLA assists customers in estimating remaining media life, confirming media activity, optimizing media selection, and controlling costs with timely media replacement.

Estimating Media Replacement Dates

AAF's RLA helps our customers estimate media replacement dates. As shown in Figure 1 below, it is best to base the media replacement date on multiple samples. AAF recommends sampling the media every three to six months during the first year to develop a history of media life analysis. After the first year, a less frequent sampling schedule can be developed based on the RLA trend from the previous year.

Remaining Life Analysis Trend

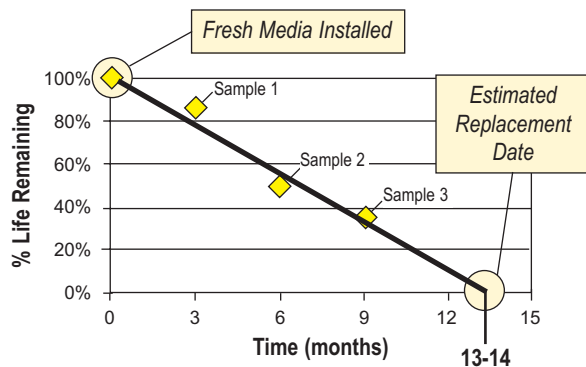


Figure 1



Sampling Gas-Phase Media Systems

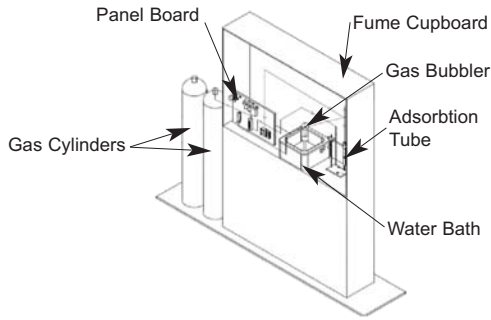
RLA samples may come from various gas-phase filtration systems including: SAAF Cassette Systems (Front Access Housings, Side Access Housings, Recirculation Units, Pressurization and Recirculation Units), PORTA-Scrubbers, and Deep Bed Scrubbers.

For instructions and details of remaining life calculations, please refer to SAAF Media Life Analysis Testing GPF-9-101.



Media samples taken from customer filtration systems are submitted to AAF Laboratories for detailed analysis.

SAAF™ Media Remaining Life Analysis (RLA)



Types of Remaining Life Analysis

Gas-phase filtration media include a wide range of materials. Virgin activated carbon, impregnated carbon, and impregnated alumina are the most common. The life of each media depends on multiple factors such as particle size, activity level, contaminant concentrations, operating temperature, operating RH, time of operation, minimum allowable breakthrough, type of impregnant, and percent impregnation. AAF estimates the impact of these factors on media life by comparing used media properties to those of fresh media.

The following RLA methods are required for various types of media:

Carbon Tetrachloride (CTC) Activity applies to virgin activated carbon. This test evaluates activated carbon capacity for organic compounds. Since regulations now ban the use of CCl₄ in many areas, the ASTM D 5742 Butane Activity Test is used and correlated to the CTC Activity. Other methods correlated to the CTC activity may also be used to estimate this property.

Gas Capacity applies to many impregnated media. This test evaluates the media capacity for inorganic compounds. It uses the ASTM D 6646 method for hydrogen sulfide and a modification to this method for other inorganic compounds.

Percent Active Impregnant also applies to impregnated media. This test evaluates the remaining active impregnant (potassium permanganate or other chemical) contained in the media. The percentage of remaining active impregnant correlates to a known gas capacity in certain impregnated media and can be used to estimate the remaining media capacity.

Remaining Life Analysis (RLA) Reports

For each analyzed sample, AAF produces a Remaining Life Analysis Report. The report contains the installation and equipment information, an explanation of the results, recommendations, and a summary table. This data can be logged over time to analyze the RLA trend of a system.

AAF
Better Air is Our Business

Remaining Life Analysis Report
Report Date: 20-Aug-09

Installation
Company: ABC Pulp and Paper
Installation Location: Control Room 155
Equipment Type: Deep Bed Scrubber
Equipment Label: DBS-402
AAF Equipment Serial #: GP09-F0099

AAF Analysis
AAF performed life analysis on the following media samples submitted by ABC Pulp and Paper.
 CN 1234567-1: The laboratory analyzed this sample by the AAF 392-800-002-3 test method and found it to contain 11% remaining life; estimated 2 more month(s). AAF estimates that the customer will need to replace this media Oct-2009. AAF recommends a reanalysis date of Oct-2009.
 CN 1234567-2: The laboratory analyzed this sample by the AAF 392-800-002-3 test method and found it to contain 24% remaining life; estimated 2 more month(s). AAF estimates that the customer will need to replace this media after May-2011. AAF recommends a reanalysis date of Nov-2009.
 CN 1234567-3: The laboratory analyzed this sample by the AAF 392-800-002-3 test method and found it to contain 82% remaining life; estimated >24 more month(s). AAF estimates that the customer will need to replace this media after May-2011. AAF recommends a reanalysis date of Nov-2009.
 CN 1234567-4: The laboratory analyzed this sample by the AAF 392-800-002-3 test method and found it to contain 100% remaining life. AAF recommends a reanalysis date of Nov-2009.

Comments: (none)

Table 1 – Summary of Remaining Life Analysis and Estimates

Sample ID:	CN 1234567-1	CN 1234567-2	CN 1234567-3	CN 1234567-4
Media Bed Number	1	2	3	4
Media Submitted	SAAFCarb MA	SAAFCarb MA	SAAFCarb MA	SAAFCarb MA
Date installed	2-Feb-09	2-Feb-09	1-Dec-08	2-Feb-09
Date sampled	10-Aug-09	10-Aug-09	1-Jun-09	10-Aug-09
Time installed (months)	9	6	6	6
Test Method	AAF 392-800-002-3	AAF 392-800-002-3	AAF 392-800-002-3	AAF 392-800-002-3
Sample Moisture	10%	5%	7%	8%
Calculated % life remaining	11%	24%	82%	100%
Remaining Life Component Remaining Life (months)	1	2	>24	fresh media
Component Replacement Date	Immediately	Oct-09	after May-2011	not calculated
Media Reanalysis	not applicable	2	6	3
Reanalysis Time (months)	not applicable	not applicable	not applicable	not applicable
Reanalysis Date	not applicable	Oct-09	Nov-09	Nov-09

Note: *These results assume the challenge concentration to the media has been constant over the installation period and continues at the same concentration for the future life of the media. Events such as spikes in the challenge concentration, chemical spills, or other unplanned events will affect the remaining life of the media and most likely reduce it.

Detailed example of AAF's Remaining Life Analysis Report



AAF has a policy of continuous product research and improvement and reserves the right to change design and specifications without notice.

ISO Certified Firm

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