

IAQ Solution for Safe Reopening of a Leading Private Bank

CASE STUDY - COMMERCIAL BUILDING

Customer Profile

- Location: **India**
- Leading private sector bank in India
- One of the Indian multinational banking and financial services company

The nationwide lockdown has tested the resilience of banking services. To work out with the existing modalities, multinational banks launched several online services to support their customers and altered employees' working pattern during the lockdown.

Client Requirement

One of the giant multinational banks planned to reopen two of their largest offices from December 1st, 2020. To prepare for the reopening, bank management decided to provide safe working for their employees by improving the air quality to mitigate the risk of COVID-19. Thus, the customer delineated the project to their consultant to add HEPA filters to their AHUs in accordance with ISHRAE standards. An additional requirement from the maintenance team was to increase the building's filter efficiency and to decrease the filter changeout time to reduce the waste.

Technical Situation

Hyderabad: Building's AHUs were 15 years old, and these designs are made for comfort applications only. The existing mounting frames used were not able to hold the HEPA filter and fan capacity was not sufficient to handle the additional static caused by the HEPA filter. Upgradation of air filtration was challenging.

Mumbai: AHUs were approximately 10 years old, but the option for upgradation was quietly possible at first glance.

AAF International Solutions

The project moved to AAF through the consultant to upgrade the AHUs to HEPA filters. Several parameters were considered while upgrading the AHUs to the HEPA filter.

AAF presented 2 different solutions for 2 facilities for filtration upgrade with TCO (Total Cost of Ownership) Diagnostic report. The purpose of TCO Diagnostic is to assist the customer in selecting the best filters for their air handling systems and to understand their sensitivity to your operating conditions. This proposition includes filter cost, energy consumption, and service cycle time for both current filters being used and the recommended filters.

AHU Upgradation at Hyderabad facility

AAF engineers observed that filter mounting frames inside the AHUs could not accommodate HEPA filters and may lead to leakage. They recommended to replace the complete AHUs with higher capacity to install 3-stage filters - prefilter, fine filter and HEPA filters with adequate fan capacity.

AHU Refurbish for Mumbai Facility

Upgrading the filters to higher filtering capability was tested by retrofitting the HEPA filters into the existing system. Fan and motor capacities are also recommended to upgrade accordingly to handle the higher pressure drop.

Filter Recommendations

The proposed 3 stage filtration was MEGApleat MERV 8, disposable prefilter, VariCel VXL MERV 13 disposable fine filter and AstroCel I, H14 HEPA filter.



MEGApleat MERV 8

Recommended Prefilter: MEGApleat MERV 8

It loads at a slower rate, increasing the life of the filter. Its lower pressure drop and higher dust holding capacity (DHC) translate to reductions in energy consumption and operating costs.



VariCel VXL MERV 13

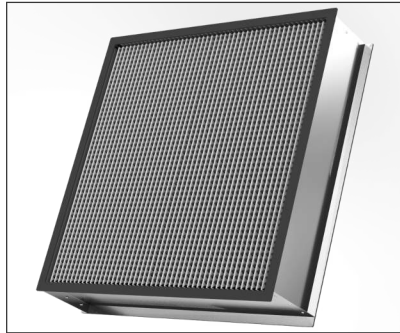
Recommended Fine Filter: VariCel VXL MERV 13

It has multiple mini-pleat media packs which are assembled into a series of V-banks which permits substantially more media — up to 50% more than standard rigid cartridge filters. Maximum effective media area provides greater airflow capacity, low resistance, high dust holding capacity, and unusually long service life.

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AstroCel I H14

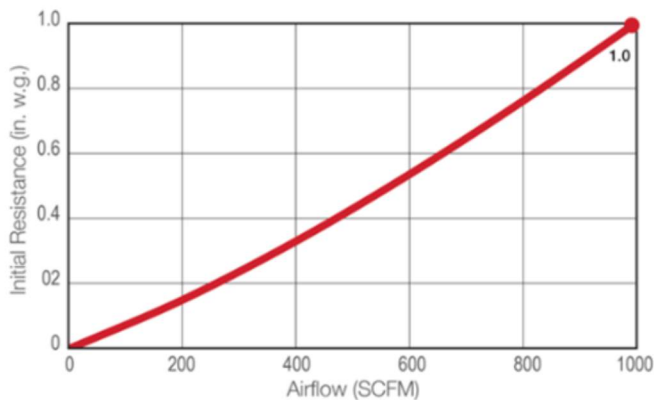


Recommended HEPA Filter: AstroCel I H14

AstroCel I HEPA filters are the most efficient air filters. These are auto-scan tested HEPA filters to ensure there are no pinhole leaks. The scanning process detects these leaks, which are repaired before the filter is released for shipment. The pleat openings and exits of the Astrocel I filter deliver low entrance and exit losses. This, combined with less restriction from separator material and better media utilization, delivers a low-pressure drop.

AstroCel I – 24 x 24 x 11½

Initial Resistance vs. Airflow Capacity



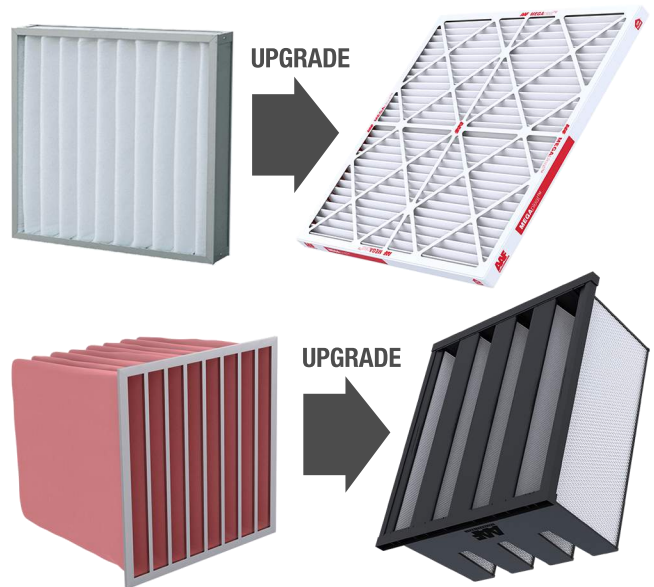
Graph 1: AstroCel I - Initial Resistance vs Airflow Capacity

Proposal of Disposable Filters over Washable Filters

AAF team cautiously convinced the consultant to opt for disposable filters. They conveyed washable filters media disintegrates/degrades to the lower efficiency which defeats

the purpose of choosing the right MERV grade and the purpose of upgradation the filters to mitigate the risk of COVID-19. Washable filters indeed increase the risk of spread with improper maintenance. Along with this, disposable filters are more economical compare to washable filters in TCO (Total Cost of Ownership).

Further to this, AAF recommended glass fibre media over synthetic fibre media for fine filters. The reason being is the electrostatic charge of synthetic filters drastically reduces its efficiency once the dust particles shield the electrostatic charge of the fibres. Whereas glass fibre media continue working with the same efficiency as the initial even with the loaded dust.



Results

The consultant and the customer were happy with the detailing of the products and the complete IAQ model proposed by AAF for a safe and healthy building. AAF representative worked on the CFM calculation for each AHU for both regions. The proposed filter stages were implemented by their contractor and appreciated AAF's customized IAQ model. AAF implemented its innovative IAQ model for the complete building by crucially analysing the building requirements by demonstrating the TCO of recommended products.

Sales Office: India & Middle East

AAF India Pvt Ltd (Bangalore) Tel : +91 9448 751 680
 AAF India Pvt Ltd (Noida) Tel : +91 6363 920 271
 AAF Saudi Arabia Ltd Tel : +96 611 265 1116
 Tel : +96 611 265 2285
 AAF International Air Filtration Systems L.L.C (Dubai)
 Tel : +971 4339 7688



www.aafintl.com

For enquiries email us at:

India: info@aafindia.net
 Saudi: info@aafsaudi.com
 Middle-East: info-me@aafintl.com
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