



HIGH PERFORMANCE SMART FUME HOODS



**Making The Laboratory
Environment Safer
And More Economical**

5 Energy Saving Advantages

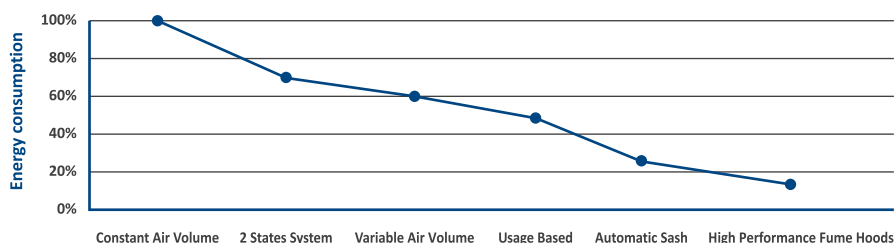
1. Reduces HVAC equipment investment cost
2. Reduces room air change (ACH) rate
3. Make expansion changes to laboratory easier
4. Increases the redundancy of ventilation systems
5. Reduces operational cost



Energy Efficient

The laboratory setup is a high-investment and high-energy consumption environment, and **JAD SMART** high-performance fume hoods employ a number of energy-saving strategies to improve the customers' returns on investment. Providing lower face air velocities (0.3m/s) with safety in mind, automatic sash control systems for active energy savings, and patented air foil designs for further energy savings when sashes are closed.

Fume Hood Systems' Development Trend Chart



JAD SMART Fume hood meets the EPA and ASHRAE definitions of high performance fume hoods

- Operates at 0.3m/s (0 to +10%) face velocity
- Conforms to ASHRAE 110-2016 AM testing
- Tested at 100% sash opening
- Tracer gas leakage rate <0.05ppm

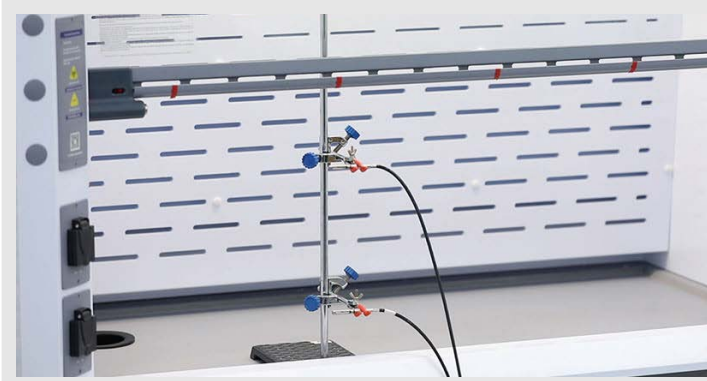
Imported polypropylene. Super high quality to increase durability by nearly 200%

- High chemical resistance
- High strength
- High heat resistance
- Electrical insulation

NOT ALL FUME HOODS ARE HIGH PERFORMANCE FUME HOODS

ASHRAE 110-2016 AM Test

JAD SMART high performance fume hoods are tested to ASHRAE 110-2016 AM (0.3m/s and 0.5m/s) including face velocity, flow visualization, tracer gas, perimeter scan and sash movement effect



VAV FACE VELOCITY CONTROL TEST

The purpose of these tests is to validate the average airflow face velocity meets the specifications at the required sash positions. This should include the calibration and adjustment of the controller, sensors, VAV supply and exhaust airflow control devices as part of the system.



FLOW VISUALIZATION

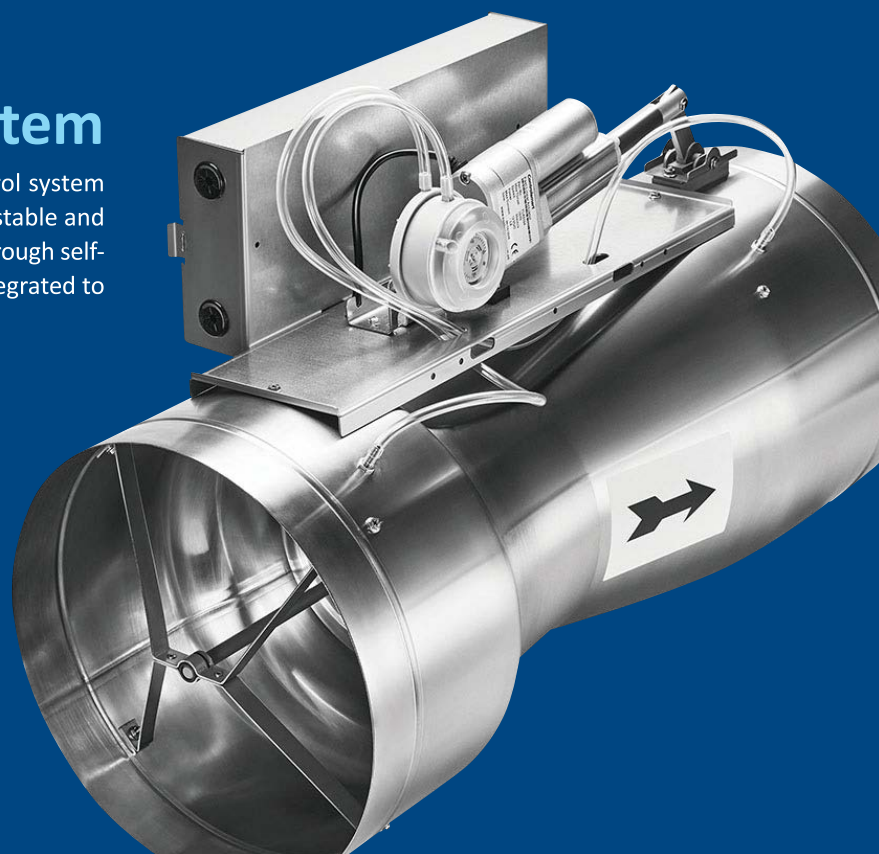
The purpose of these tests is to visually verify the fume hood's capture performance and all smoke shall be contained within the fume hood under all test procedure.

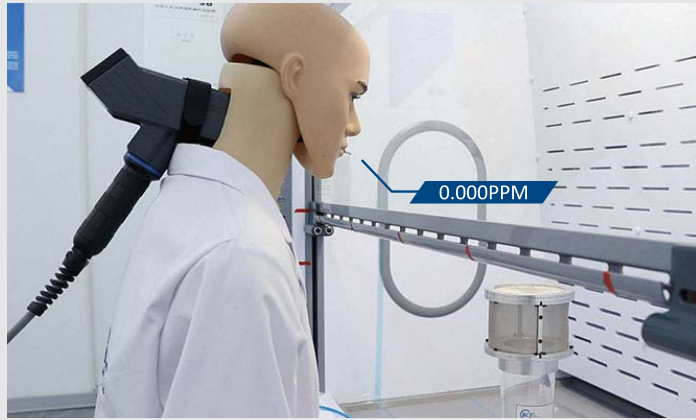
High-Performance Fume Hood Control System

Consists of an automatic sash system and a Smart control system that modulates the sashes and venturi valves to provide stable and accurate airflow, while minimizing total exhaust airflow through self-adaptive controls. The fume hood information can be integrated to a third-party building management system.

VENTURI VALVES

- 95% control accuracy
- Supports third-party building communication systems
- No minimum straight duct installation requirements
- Pressure independent
- Response time 0.83 seconds
- Turndown ratio 20:1
- Low noise
- Factory calibrated





SASH MOVEMENT CONTAINMENT TEST

A sash movement containment test is performed to determine the potential for contaminants escaping from the fume hood with the (sash) movement. This method is applicable to both constant volume fume hood systems and variable air volume fume hood systems.



TRACER GAS TESTS

The purpose of these tests is to verify the fume hood's containment performance. The procedures use a mannequin to simulate the actions of personnel in front of a fume hood which create turbulence to the airflow pattern. A tracer gas is introduced and released at a specific rate within the worktop area and the tracer gas leakage is then recorded at the tip of the mannequin nose, simulating the personnel inhalation effect.



PERIPHERAL SCAN

Perimeter scan data can be used as a diagnostic tool to identify potential leak points.

10.1 LCD TOUCH SCREEN

- **Visual display of system parameters**
Exhaust air volume, face velocity, fume hood status and other information
- **Product information is programmable**
Project name, room name, fume hood number and other project information can be displayed in the screen
- **Fault status alarm**
Any equipment failure will sets off an audio and visual alarm
- **Lighting, sash and valve touch control**
Lighting switch, purge mode and sash height operation settings can be done with one-touch control



Fast Response Time of 0.83 Seconds

The speed of response after opening the sash affects the safety of the user

VAV FACE VELOCITY CONTROL TEST

This test is applicable to laboratory fume hood systems equipped with variable air volume controllers, which regulate the flow rate according to the movement of the sash height. It includes: variable air volume response speed and variable air volume to steady state time.








Automatic Sash System

Automatic Sash System will lower the sash to a closed position when no user is detected in front of the fume hood after a specific pre-set delay and reduced the face velocity from 0.5 m/s to 0.3 m/s while maintaining a minimum airchange rate within the fume hood. The Sash will automatically stop if any obstacle is detected. The sash will open to operating height or any pre-set height when a user is detected in front of the fume hood.

TEST REPORT		Fume Hood Performance Test Method Factory Test (AM)
Response Time (s)	0.8 s	
Response Time To Steady State (s)	1.8 s	
Perimeter Scan (ppm)	0.004 ppm	
Sash Movement Test (ppm)	0.000 ppm	
Tracer Gas Concentration Test (ppm)	0.001 ppm	
Static Pressure (pa)	28 pa	
Visualization Test Large Smoke	Complies	
Visualization Test Local Challenge	Complies	
Sash Operating Height (mm)	457 mm	

VAV Face Velocity Control Test		Avg Face Velocity Deviation
100%	0.486 (m/s)	9.8%
50%	0.52 (m/s)	3.3%
25%	0.481 (m/s)	7.8%



Report No.: RQ21081401001 Date: Aug.27, 2021 Page: 3/20

Project Information


Project Name	Fume Hood Performance Test (ASHRAE110-2016-AM)
Applicant Name	JAD Solutions Pte Ltd
Applicant Address	87 Defu Lane 10#05-02, Singapore 539219
Name/Type	JAD Smart Fume Hood
Brand/ Model Number	JAD-W-FXXXX150
Hood Test Status	VAV (Venturi Valve)
Sash Type	Vertical Sash
Hood Sizes	1520 mm*990 mm*2400 mm
Opening (H*W)	820 mm*1280 mm
Design Face Velocity	0.5 m/s
Exhaust Air Volume	1229 m ³ /h (723 cfm)
Exhaust Diameter	250 mm

Summary of Result

Test Projects	Sash Opening Height (mm)	Static Pressure (Pa)	VAV Face Velocity (m/s)	Flow Visualization	Tracer Gas Test (ppm)	Sash Movement Effect (ppm)	Peripheral Scan (ppm)
Result	457	58	0.50 0.50 0.50	No escape	0.00	0.00	0.00
Criteria	/	/	Pass	Pass	Pass	Pass	Pass

*The date of static pressure is tested without the venturi valve.

Receive Date:	Aug. 25, 2021	Test Date:	Aug. 25, 2021(First)
Tester:	Haidong Xu		
Editor:	Hehu Lin	Review:	Junjie Fan



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Model Selection

Model	JAD Smart - 120	JAD Smart - 150	JAD Smart - 180
Face Velocity	0.3 – 0.6 m/s	0.3 – 0.6 m/s	0.3 – 0.6 m/s
Noise	<60 db	<60 db	<60 db
Exhaust Air Volume (0.5 m/s)	764 m ³ /h	1003 m ³ /h	1242 m ³ /h
Sash Opening Height	702 mm	702 mm	702 mm
Lighting	>1000 LUX	>1000 LUX	>1000 LUX
Work Top Length	960 mm	1260 mm	1560 mm
Work Top Depth	620 mm	620 mm	620 mm
Internal Work Height	1210 mm	1210 mm	1210 mm
External Dimension Length	1200 mm	1500 mm	1800 mm
External Dimension Depth	972 mm	972 mm	972 mm
External Dimension Height	2348 mm	2348 mm	2348 mm



Support Testing Service

On-site AI/AU testing services are available to ensure the safe operation of fume hoods in the working environment



Factory Certification

Our fume hood testing facilities have a comprehensive ventilation system setup to meet the requirements of fume hood testing experiments

Fully adjustable exhaust system to control face velocity and exhaust volume accurately
Supply, exhaust and door locations can be created to simulate their effects on fume hood face velocity
Smoke generation equipment can display airflow pattern in any situation

Prototypes and new designs are subjected to this rigorous testing
 Upon request, technicians will test samples of standard fume hoods under specific and unique operating conditions

Fully calibrated, commissioned, tested and ready for use when connected to a power supply



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