



## Divisions of Plasticair Inc

**SKYPLUME**<sup>™</sup>  
TECHNOLOGIES



**Plasticair**  
FAN COMPANY





# Plasticair Inc.

## Founded in 1980

- All Products in FRP Corrosion Proof construction

### Applications and industries

- Mining
- Semi Conductor
- Pulp and paper
- Plating
- Laboratory and Hospital
- Waste Water Treatment
- Food Processing
- Pharmaceutical

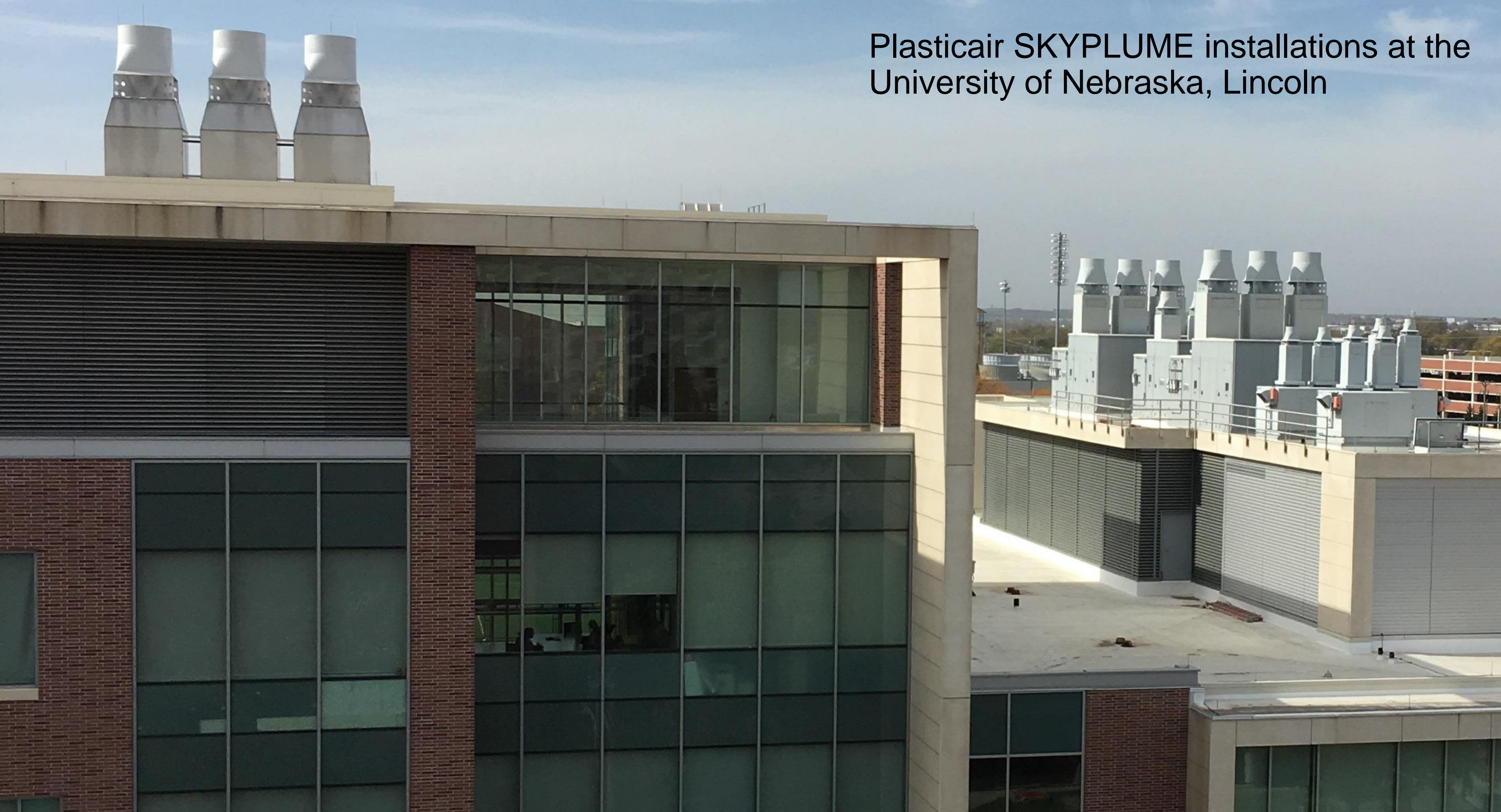


**Plasticair**  
FAN COMPANY



# Advanced Laboratory Exhaust

Plasticair SKYPLUME installations at the  
University of Nebraska, Lincoln





**MIT**



## **Induced Flow Fans**

- Induction and Aspiration of Air by Venturi Profile
- Maintain and Maximize Velocity
- Provide Dilution
- Create Mass Transfer

**Stanford University**



**FRP Acid Proof  
Induced Flow Fans**



# Why do we use FRP Technology?

## Plasticair installation:

**Florida Atlantic University (Circa 2003)**



Plasticair Fabricated – SKYPLUME-G1 induction Stacks in FRP Construction

Plasticair Fabricated – Exhaust inlet plenum in FRP Construction

Plasticair – Supplied (OEM) Model CPS with Baked Epoxy Coated Steel Fan.

**Argen Corp: Southern California  
(Supplied in 2016)**

Model USF with Polyester HI Pro Coated Steel Fan.





# Why do we use FRP Technology?



Before – (HCl application – Fan destroyed  
Painted Steel Product )



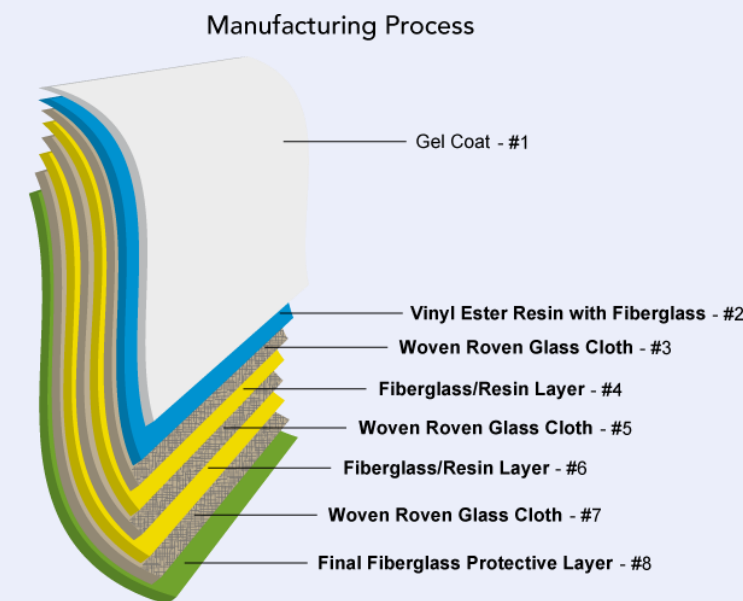
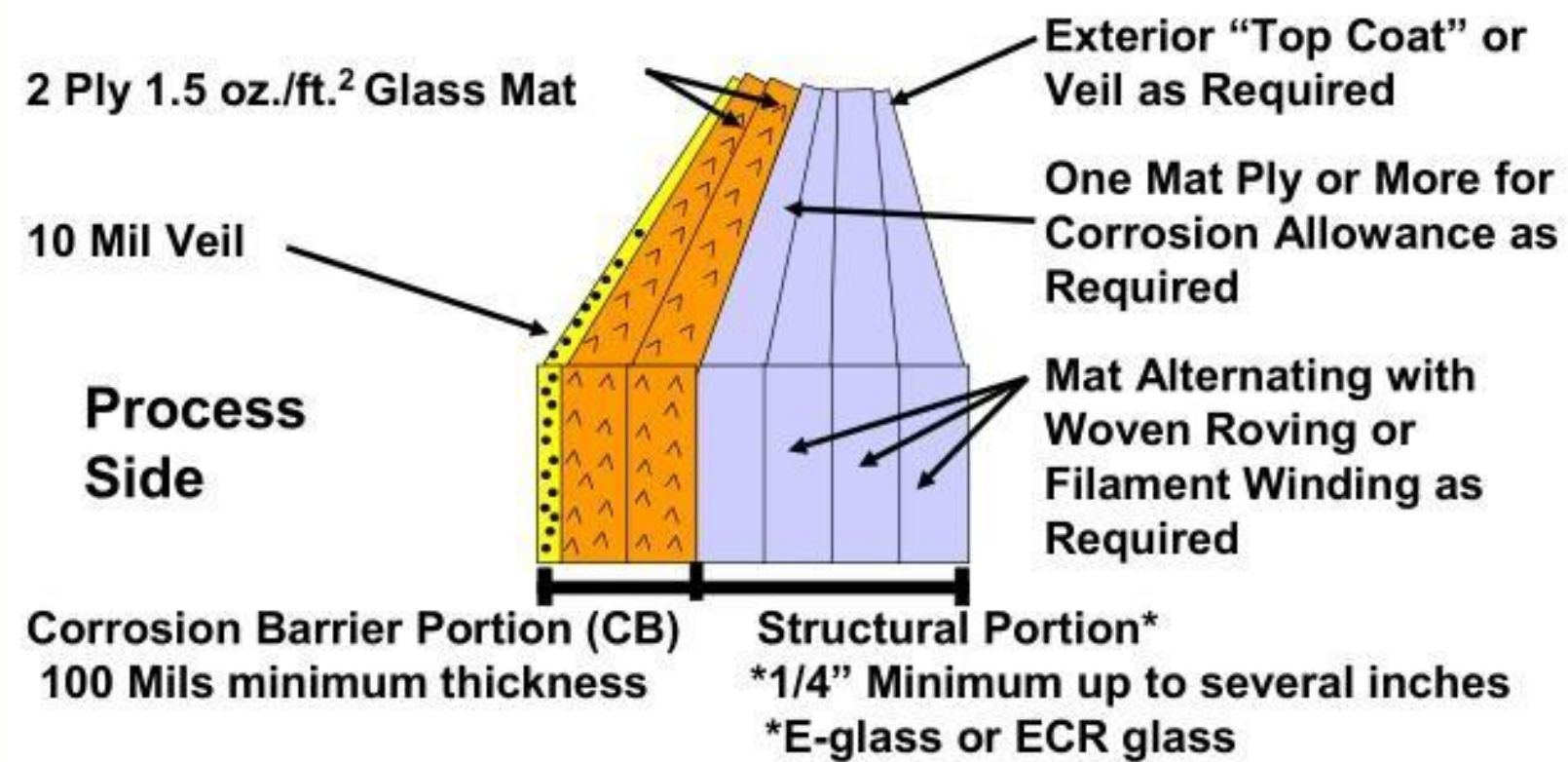
After – (HCl Exhaust fan constructed in FRP.  
SKYPLUME – G1 ELMV-DMF 150)





# Fiberglass Reinforced Plastic (FRP)

## Standard Construction Corrosion Resistant Laminate



- Premium Vinyl Ester Resin
- Long Term Corrosion Resistance which we prefer to use the term "Corrosion Proof" as it is Suitable for 99.9% of corrosion applications, and protects against heavy moisture and weathering
- Temperature capabilities are (-60° to 270° F)
- High Modulus and Tensile Strength. All systems designed to 125 MPH windload
- High Impact Strength – Resists Deformation from Impact
- Low Energy Absorption – Resists deformation from Wind Loading (Maintains Structural Shape)



# FRP vs Thermoplastics

- FRP has at least 2 x the tensile strength compared to PVC, Polypropylene or Polyethylene
- Thermoplastics degrade to the point of failure in ultraviolet light. FRP does not.
- PVC, Polypropylene and Polyethylene become brittle under cold temperatures. FRP does not.
- FRP heat ratings can be as high as 270F. Thermoplastics range from 140F – 180F



# Fiberglass Reinforced Plastic (FRP)

## Cutting Edge Construction

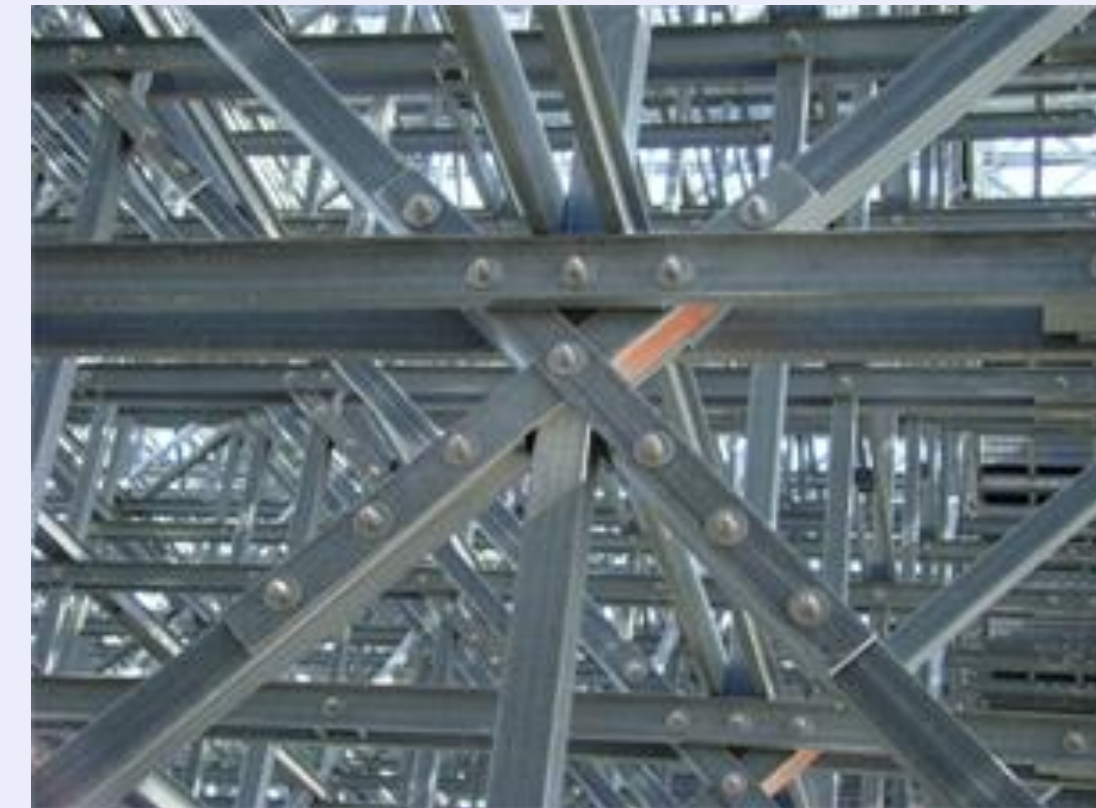
FRP technology traces back to the 1880's and is currently an important part of many industries seeking material characteristics with strength, light weight and durability.

Some industry to mention:

- Aerospace
- Automotive
- Power generation (wind turbine)
- Construction
- Ventilation



FRP wind turbine blade



FRP structural channel



FRP Exhaust Fans

Plasticair Fan Company



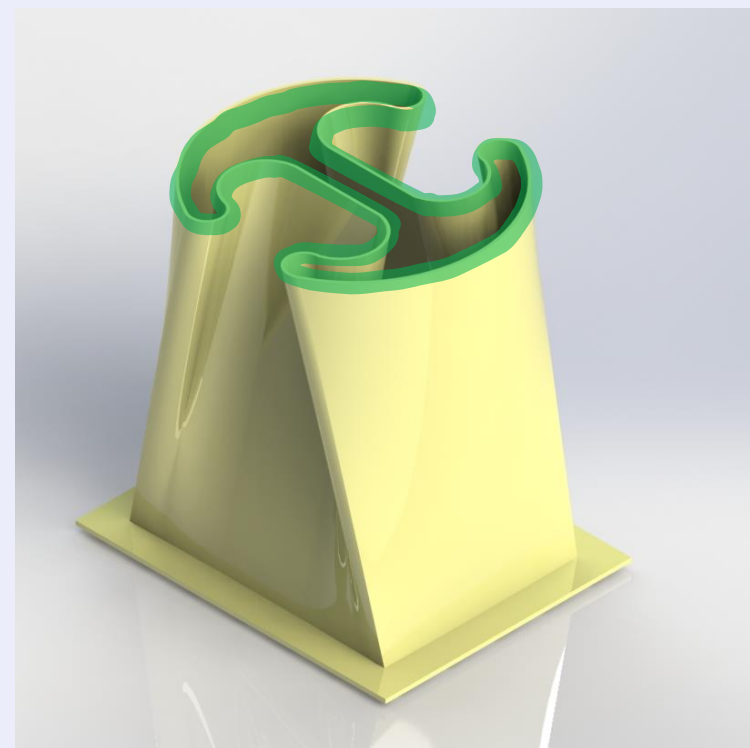
# SKYPLUME™

## Design Features...



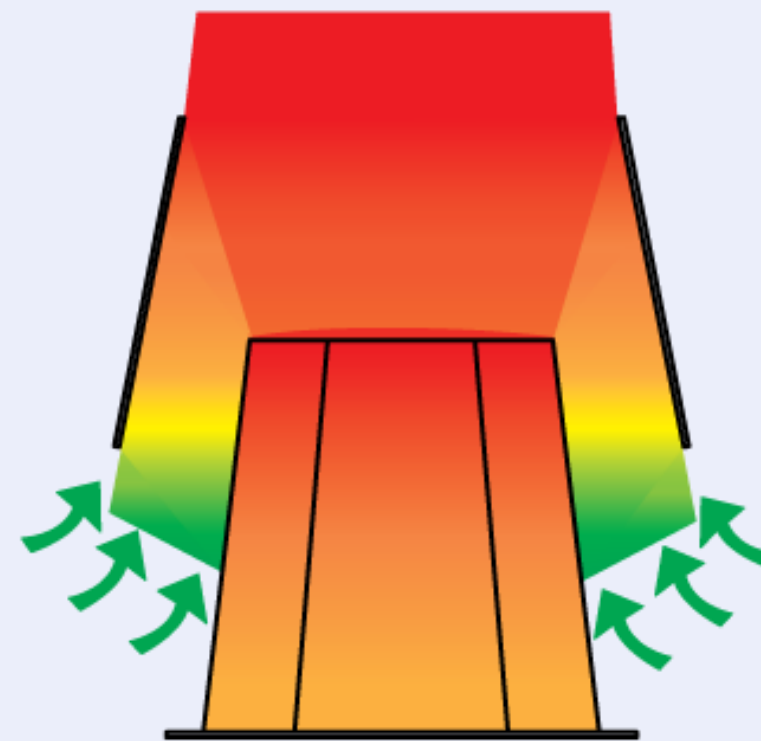
### Windband & Nozzle

Contraction Cone & Nozzle for Balanced Performance



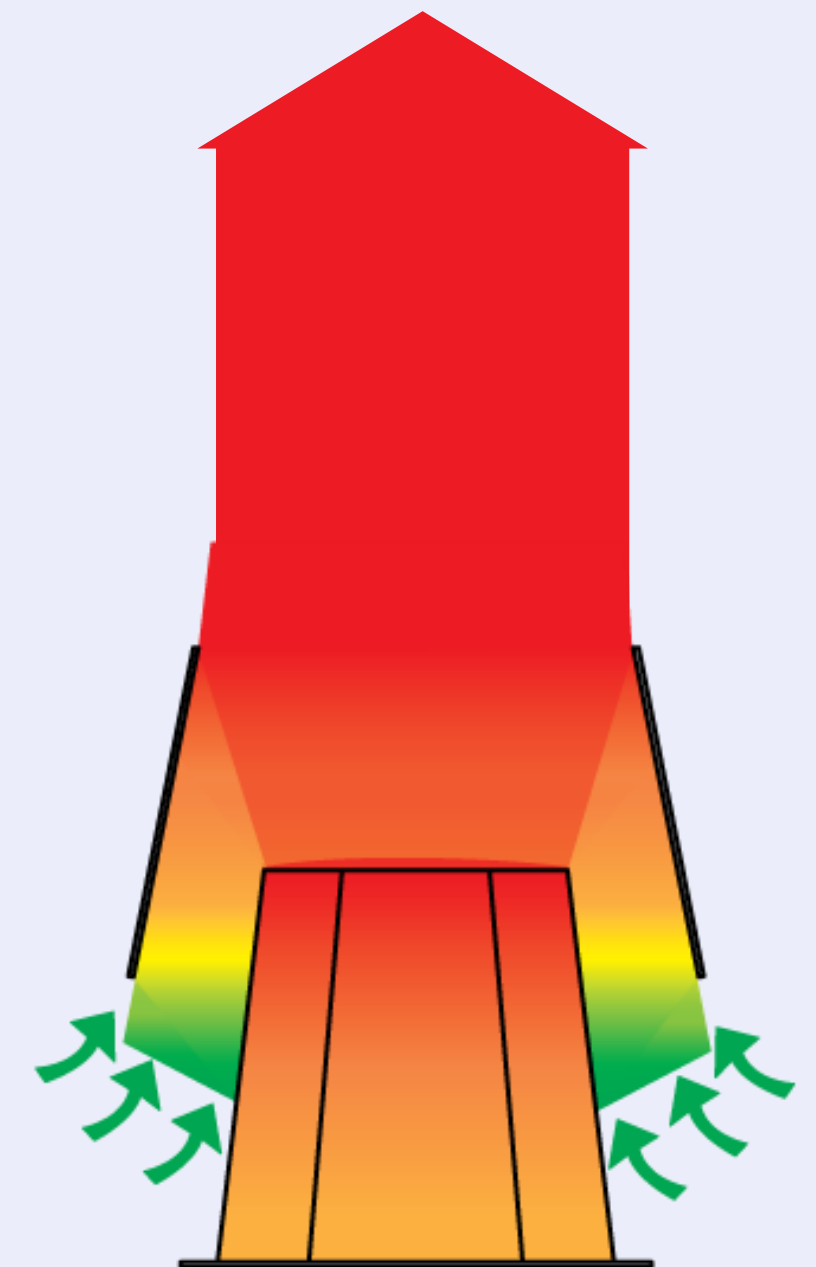
### Extended Lobe

Creates Drag – Mechanical Fluid Transition



### Volumetric Induction

More Induced Volume



### Momentum

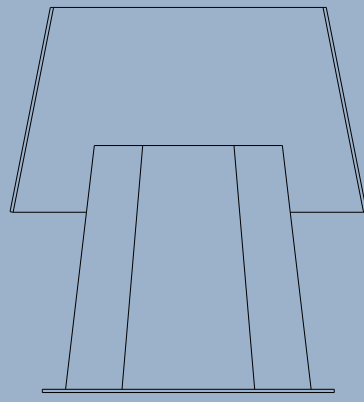
High Momentum Flux Rate



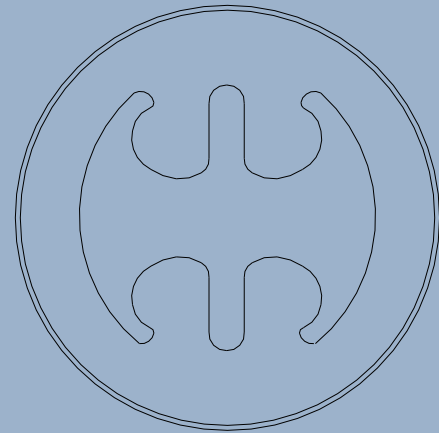
# Velocity, Volumetric Induction, & Momentum

## Advanced Design

Volumetric Induction  
Approx. 230%



Elevation Section



Plan View  
(Cross Section Upper Wind Band)

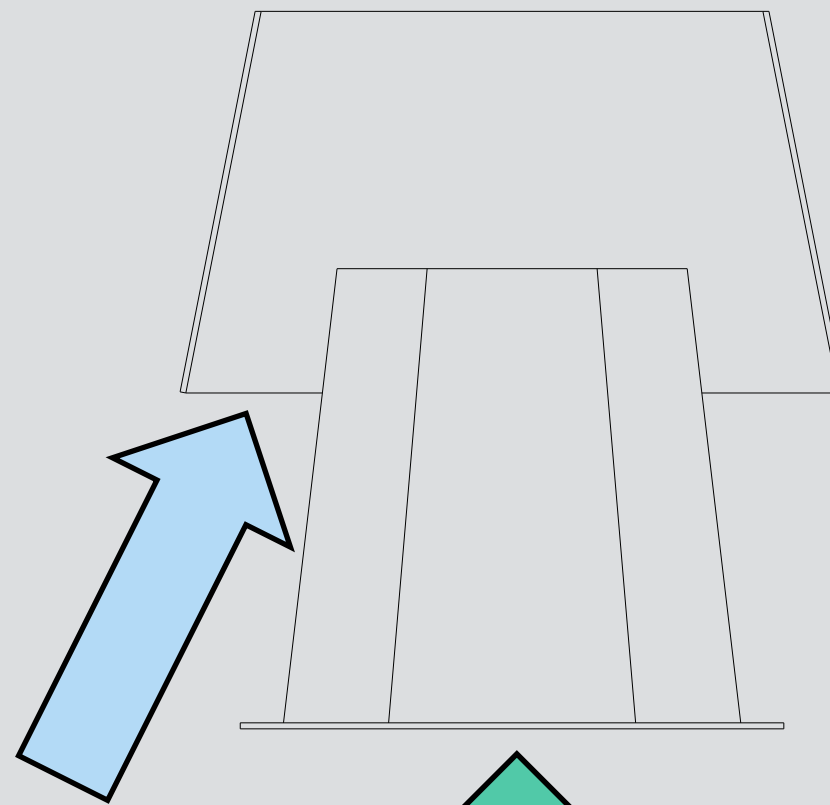
### Technical Review

Velocity Maintained and Even  
Extended Lobe Provides High  
Volumetric Induction  
Highest Momentum Flux Rates

## AMCA 260 Test Results

Volumetric Induction  
230%

23,000 CFM



13,000  
CFM

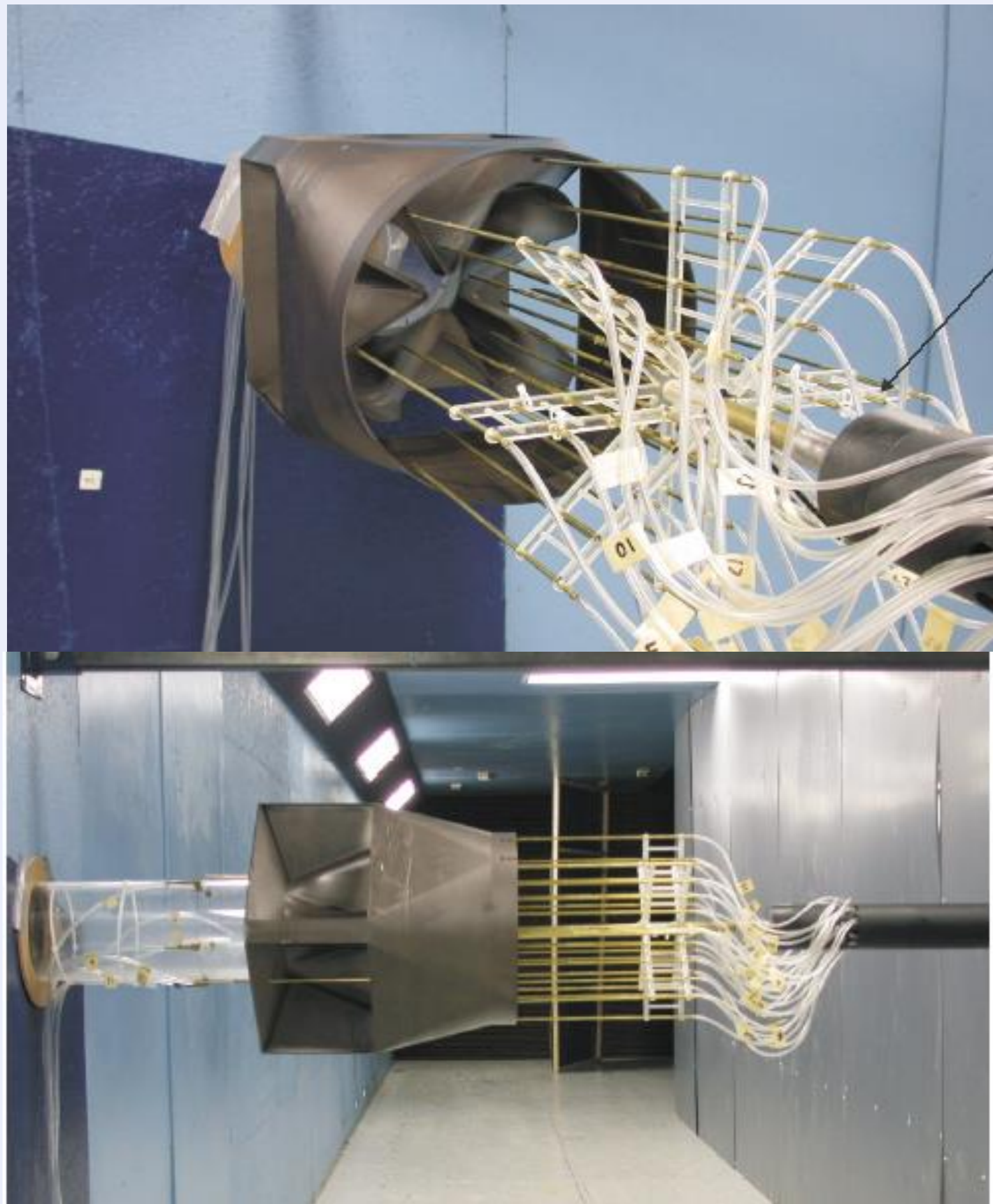
10,000  
CFM

Extended Lobe Shape



# Research

**SKYPLUME™**



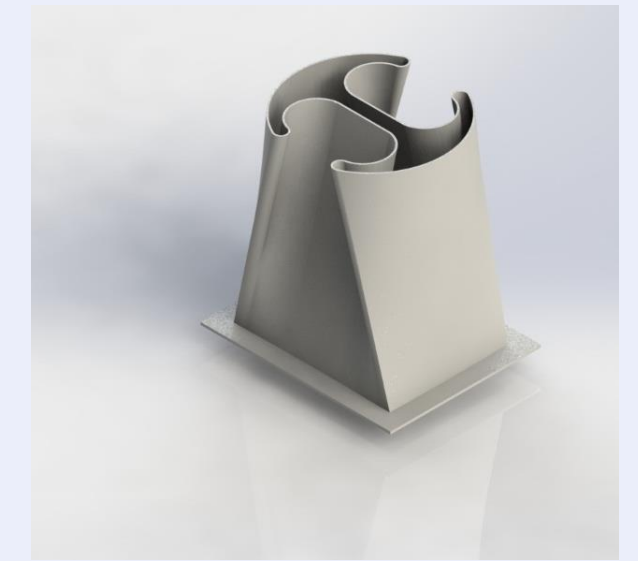
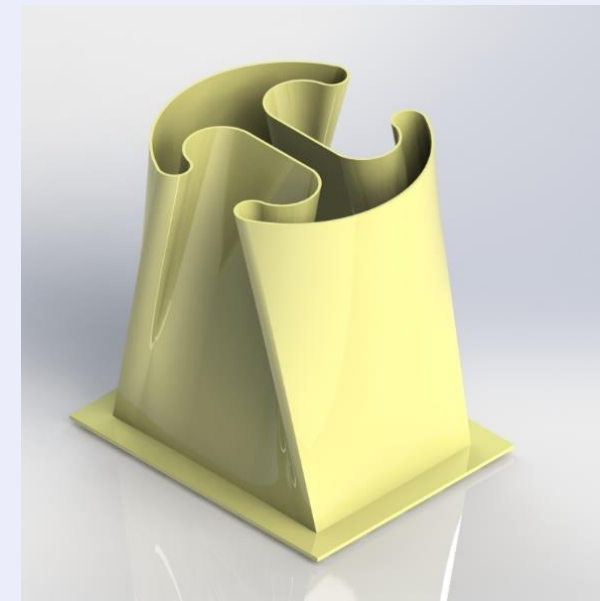
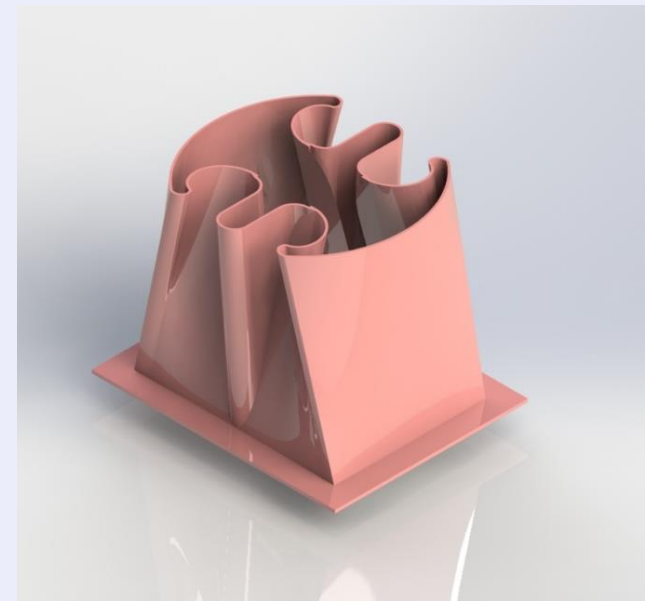
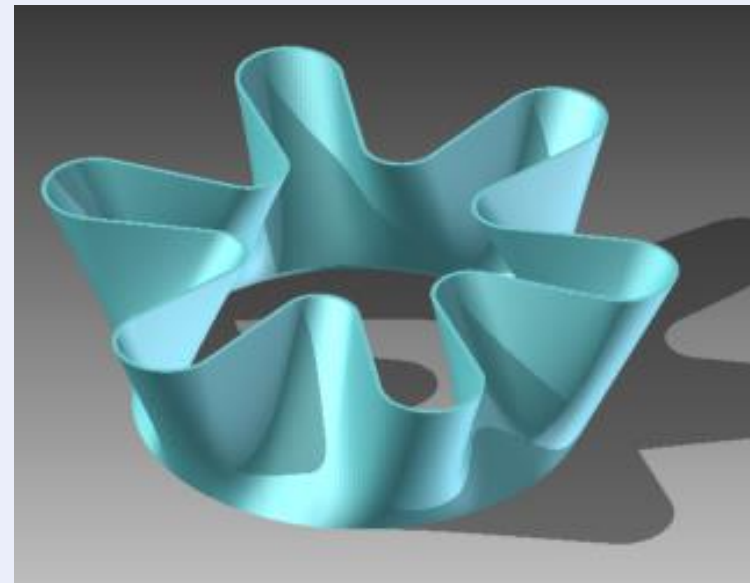
**SKYPLUME - G2**



# SKYPLUME™

## Induction Nozzles for Every Application

We Deliver High Plume Induction



### ALP – Low Profile Series

Dilution Ratios: 140 – 180%



### ELLV – Low Velocity Series

Dilution Ratios: 210 – 240%



### ELMV – Medium Velocity Series

Dilution Ratios: 240 – 270%



### ELHV – High Velocity Series

Dilution Ratios: 270 – 330%





# Fan Technologies Employed in Lab Applications

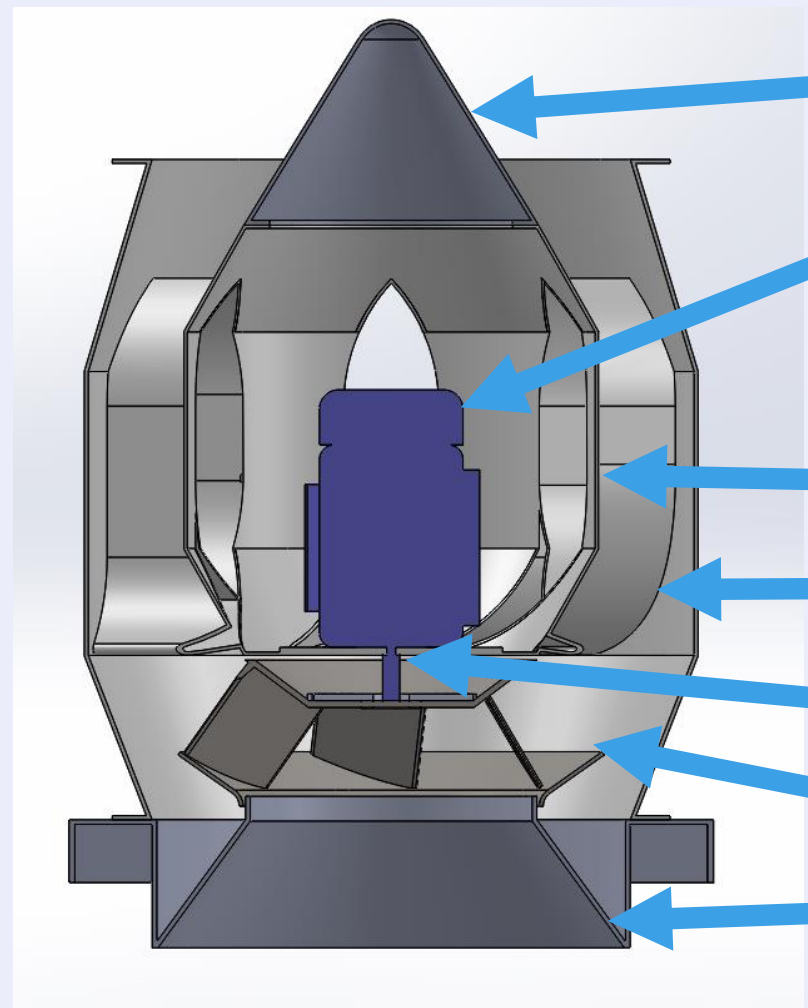


- Vertical Curb Mount - Mixed Flow Impeller  
In FRP – Corrosion Proof construction
- SWSI - Centrifugal Backward Inclined – Airfoil Blade  
In FRP – Corrosion Proof construction
- SWSI - Centrifugal Backward Inclined – Airfoil Blade  
Steel Coated Construction – Corrosion Resistant

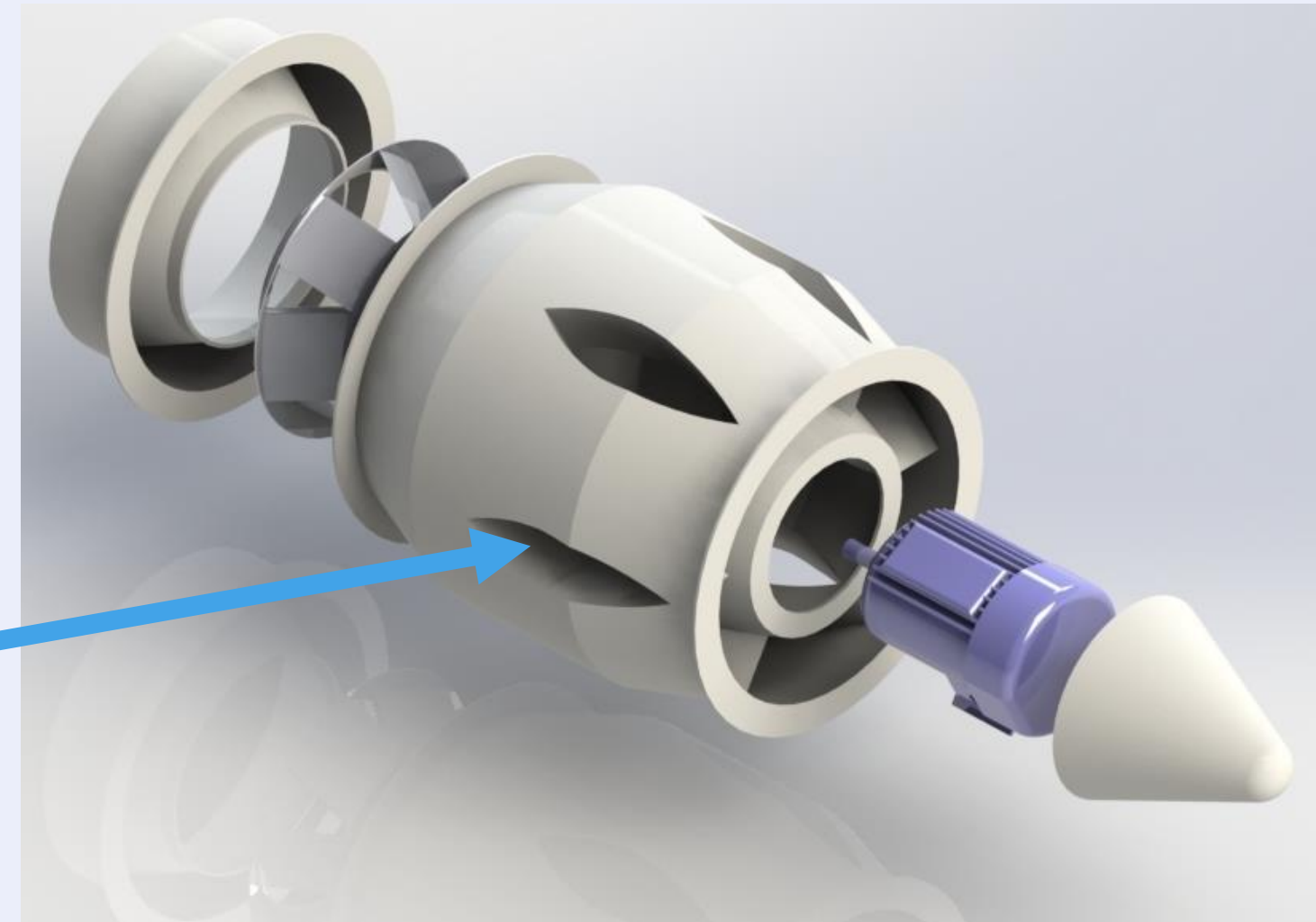


# SKYPLUME™

Vertical Curb Mount - Mixed Flow Impeller  
Model DMF – AMCA Arrangement #4



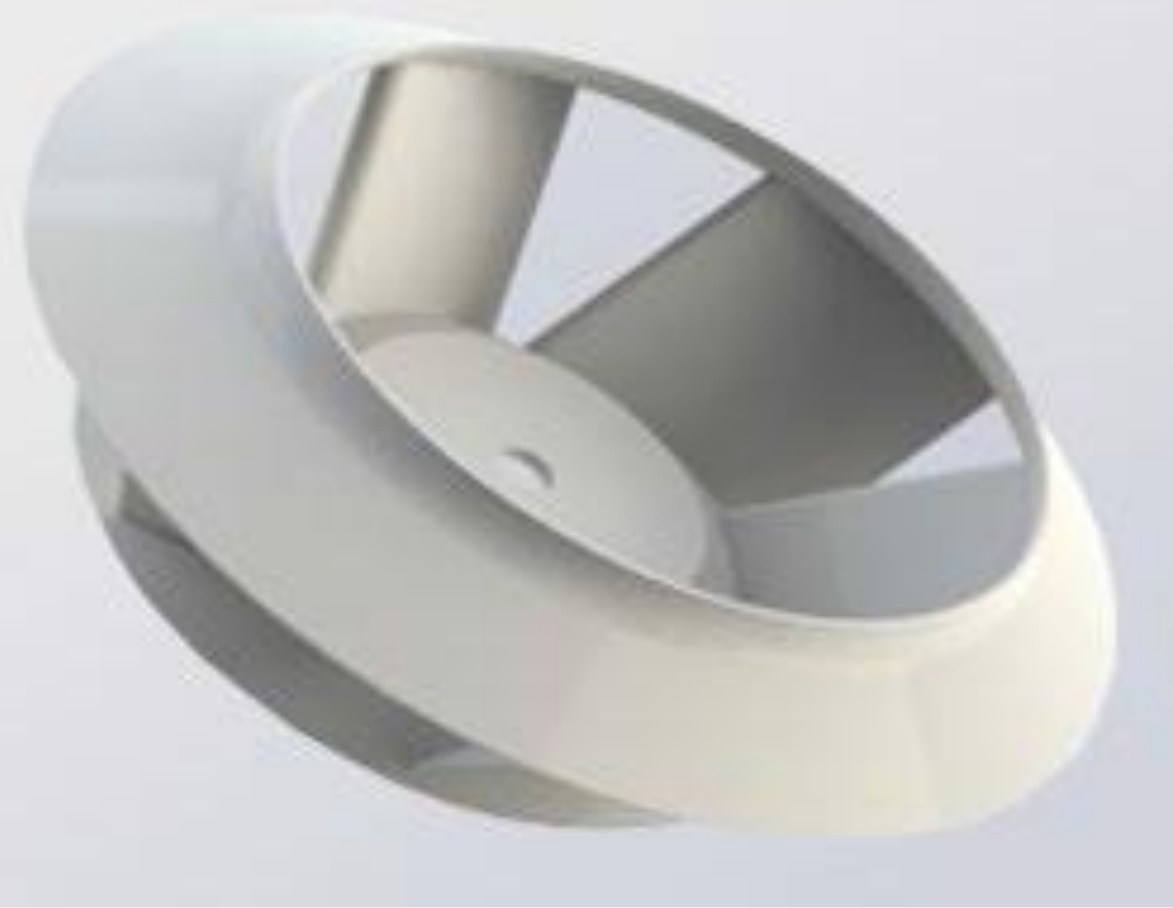
- FRP Motor Cover
- Motor (no airstream contact)
- Motor Cooling Port
- Inner Duct Wall
- Outer Duct Wall
- Teflon Shaft Seal with FRP shaft sleeve
- Mixed Flow Wheel
- Inlet Cone



Corrosion Proof  
Lifetime Rust Proof  
Warranty on FRP Parts







## Mixed Flow Impeller Technology

- Independent Static and Dynamic Balance
- Balanced to 1.5 - 0.3 Mil – Peak to Peak (well below the AMCA standard of G6.3)
- Construction equal to AMCA A spark proof is available when specified
- Maximum tip speeds up to 18,000 FPM
- Maximum pressure capability up to 10" W.G.
- Maximum volumes up to 80,000 CFM
- AMCA Arrangement #4 – Direct drive only
- On non-corrosive applications; Competes with:  
Strobic Air, MK-Axijet V, TCF – TVIFE, Cook – QMX-VP, GH – Vektor CD
- For Corrosive applications: No direct equal in rust proof construction

# SKYPLUME™





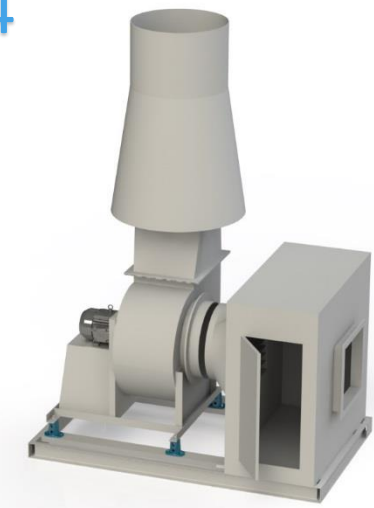
# SKYPLUME™

## Centrifugal Single Width Single Inlet Fans Model GIF

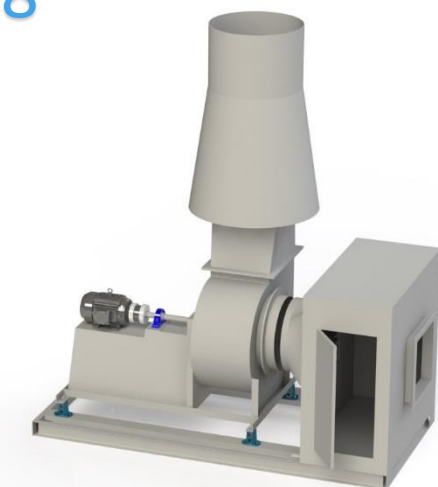


- FRP Backward Inclined Wheels
- FRP Housing with UV Stable Gel Coat Finish
- Fan steel bases are epoxy coated to 6 mils, however can be FRP coated if specified
- Construction equal to AMCA A spark proof is available when specified

Arrangement 4  
Direct Drive



Arrangement 8  
Direct Drive



Arrangement 9  
Belt Drive



Corrosion Proof  
Lifetime Rust Proof Warranty on FRP Parts



# SKYPLUME™

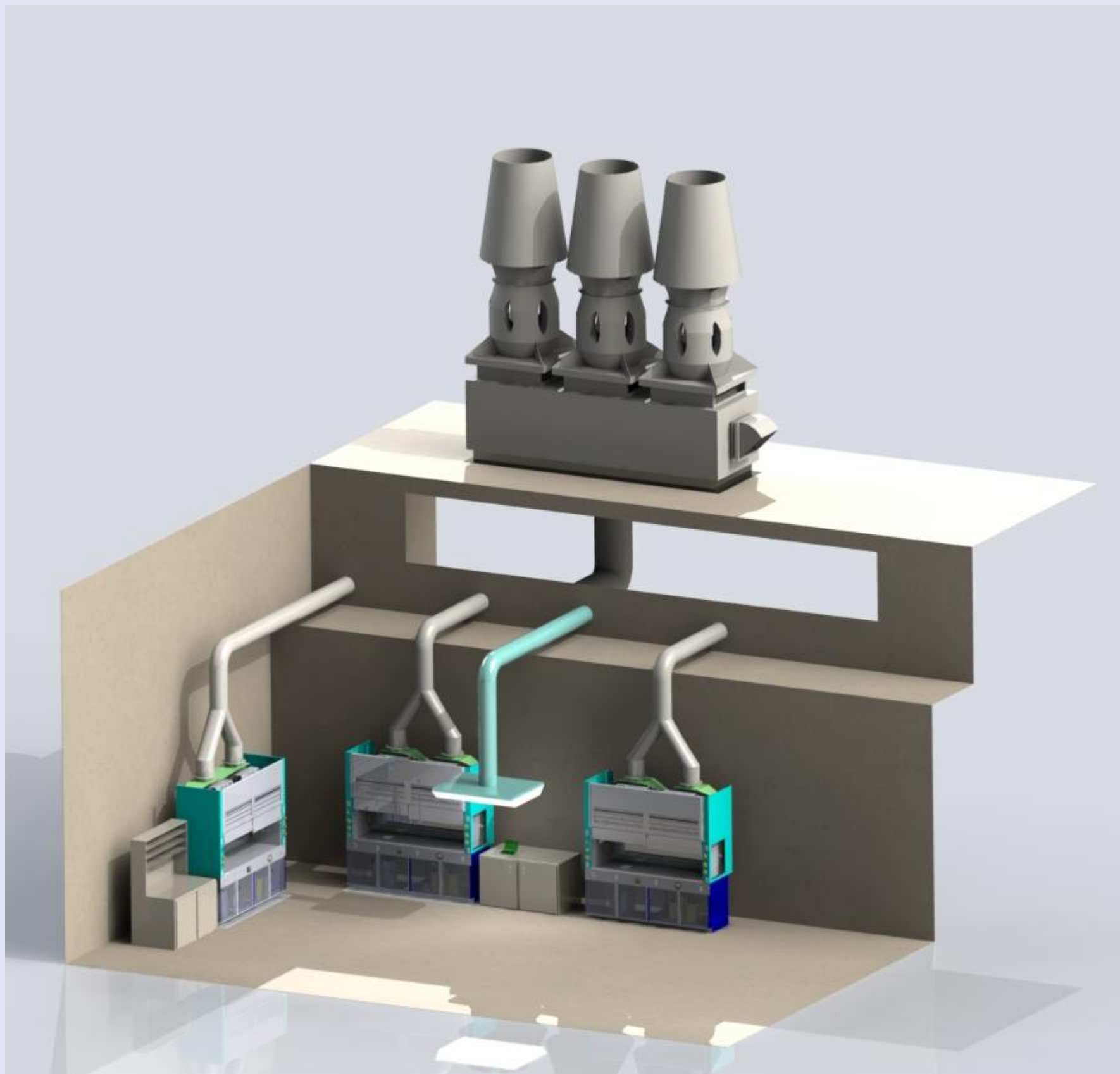
Backward Inclined Airfoil Impeller Technology



- Balanced to 2.5 - 0.3 Mil – Peak to Peak (well below the AMCA standard of G6.3)
- Independent Static and Dynamic Balance
- AMCA FEG Performance Tested with our GIF series
- Maximum tip speeds up to 18,000 FPM
- Maximum pressure capability up to 14" W.G.
- Maximum volumes up to 80,000 CFM
- Competes with: MK-Axijet-F (only with FRP wheel)



## Control Methods



- Fans pressurize the building
- As fume hoods shut down, bypass damper modulates to maintain at least 3000 FPM at the stack outlet.
- If enough fume hoods shut down that is equal to one fans full flow, that fan would shut down by de-energizing the motor and closing the isolation damper.
- Bypass damper actuator modulates
- Isolation damper actuator is two position open / close
- Airflow measuring stations can be installed on the inlets of Plasticair fans to assist in flow monitoring and control.





# Inlet Plenums and Energy Recovery Units

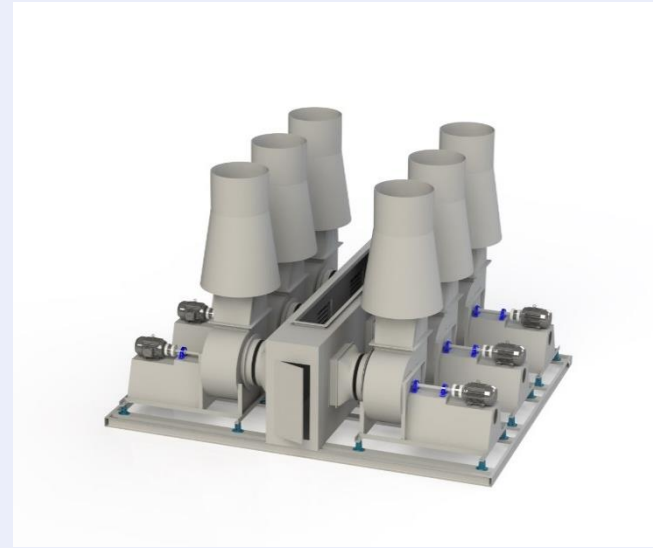
- Plenum Arrangements
- Construction and Materials
- Dampers
- Access Doors
- Runaround coils with coatings
- Custom plenums
- How to specify



### Standard Plenum Arrangements



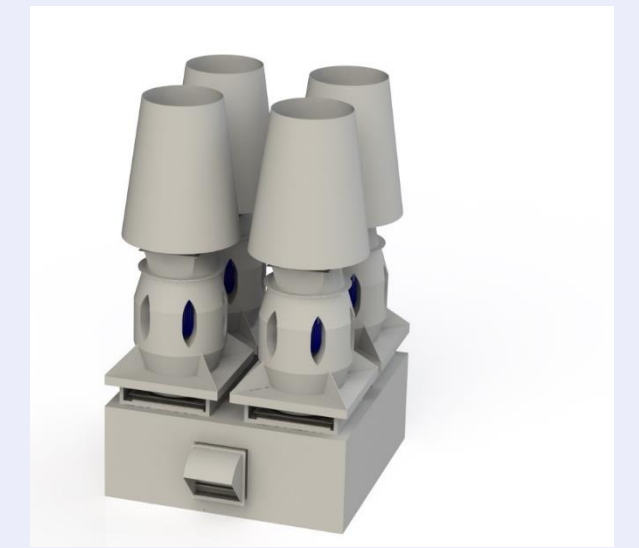
SWSI Inline



SWSI Opposed



Mixed Flow Inline



Mixed Flow Opposed

- Inline – Fans would be situated beside each other
- Opposed – Fans would be facing each other
- Inlet location would be as required, side, bottom or top
- Single Fan Arrangements with option for multiple fans up to any number



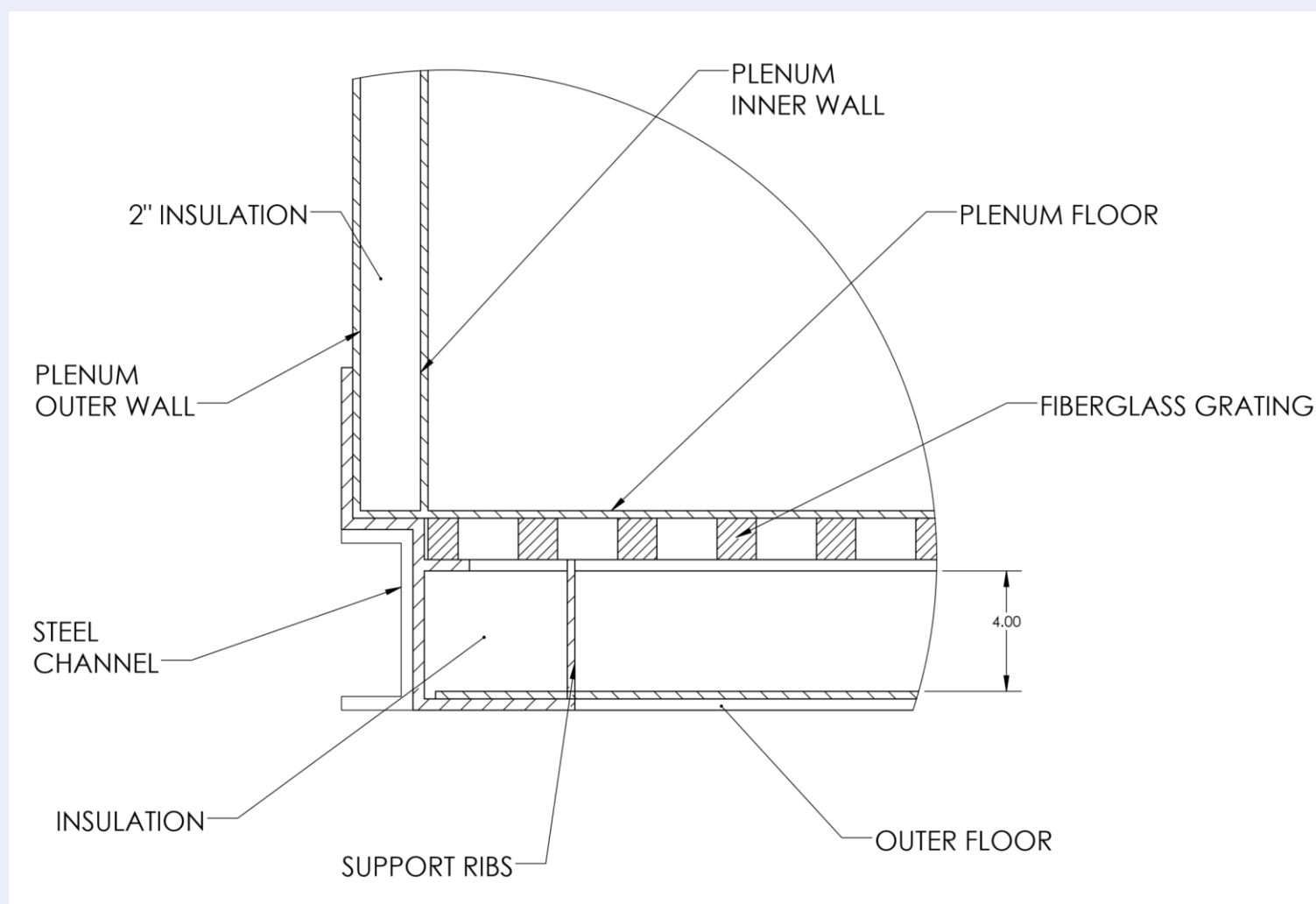
### Standard materials of construction

#### Wall construction: Single or double wall

- Seamless FRP. Provides zero leakage up to 10" W.G.
- If the plenum is double wall, we use a 2" thick construction with an insulation rating of R4

#### Floor construction

- Seamless FRP. If double wall, floors are 4" thick slip resistant texture built into the FRP





## Standard Doors

- Material 316L ss (FRP is available upon request)
- Double wall. Insulated with R4 insulation, Tedlar rapped.
- Reinforced Window
- Automotive seals

- Stainless steel handles with quarter turn operation
- Full piano hinge
- Custom door sizes available
- Ventlok port
- Doorframe permanently embedded in FRP plenum wall for Air Tight one piece construction.

## Access Doors



**DOOR INSTALLATION INSTRUCTIONS**

- 1) ALIGN EVERYTHING PERFECTLY
- 2) ENSURE DOOR IS LEVEL
- 3) MATCH DRILL HOLES TO FRAME
- 4) USE 1/4" SS BOLTS TO BOLT DOOR TO FRAME
- 5) APPLY MILL FIBER PUTTY ON OUTSIDE PERIMETER OF DOOR FOR GRADUAL TRANSITION FROM FRAME TO PLENUM
- 6) APPLY 3 MATTS (5-6" WIDE) OF FIBERGLASS ON DOOR OUTSIDE PERIMETER - COVER BOLTS
- 7) APPLY 3 MATTS (5-6" WIDE) OF FIBERGLASS ON DOOR INSIDE PERIMETER - COVER BOLTS

DOOR ORIENTATION FRONT VIEW

DOOR ORIENTATION BACK VIEW

DETAIL A SCALE 1 : 2

FRP FLANGE FRONT 3/16" THK

FRP FLANGE BACK 3/16" THK

STAINLESS STEEL DOOR FRAME

MILL FIBER PUTTY

1/4" SS BOLTS

FIBERGLASS MATTS APPLIED

FULLY INSTALLED DOOR

DOOR OPENS IN COUNTER CLOCKWISE ROTATION

Ø 3/8" x 10  
1/4" BOLT SIZE TO BE USED

**PA**

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	<b>Plasticair Inc.</b>	
DIMENSIONS ARE IN INCHES		DRAWN	A.F.		11/17/2017
TOLERANCES:		CHECKED	N.K.		11/17/2017
FRACTIONAL ± 1/8"		ENG APPR.			
ANGULAR: MATCHES BEND ±		MFG APPR.			
TWO PLACE DECIMAL ±		G.A.			
THREE PLACE DECIMAL ±		COMMENTS:			
INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		TITLE:			
OPTION		4125 - DOOR ASSEMBLY			
NEXT ASSY	USED ON	SIZE	DWG. NO.	REV	
APPLICATION	DO NOT SCALE DRAWING	<b>B</b>	Door Assembly		
		SCALE: 1:8	WEIGHT:	SHEET 1 OF 1	



### Dampers

#### Available Options

- FRP
- 316 ss
- 304 ss
- Galvanized with option for Epoxy Paint
- Aluminum with Epoxy or Heresite P-413 coating
- Isolation dampers – parallel blade
- Bypass dampers – opposed blade
- All dampers complete with jam seals and stainless steel linkages

### Actuators

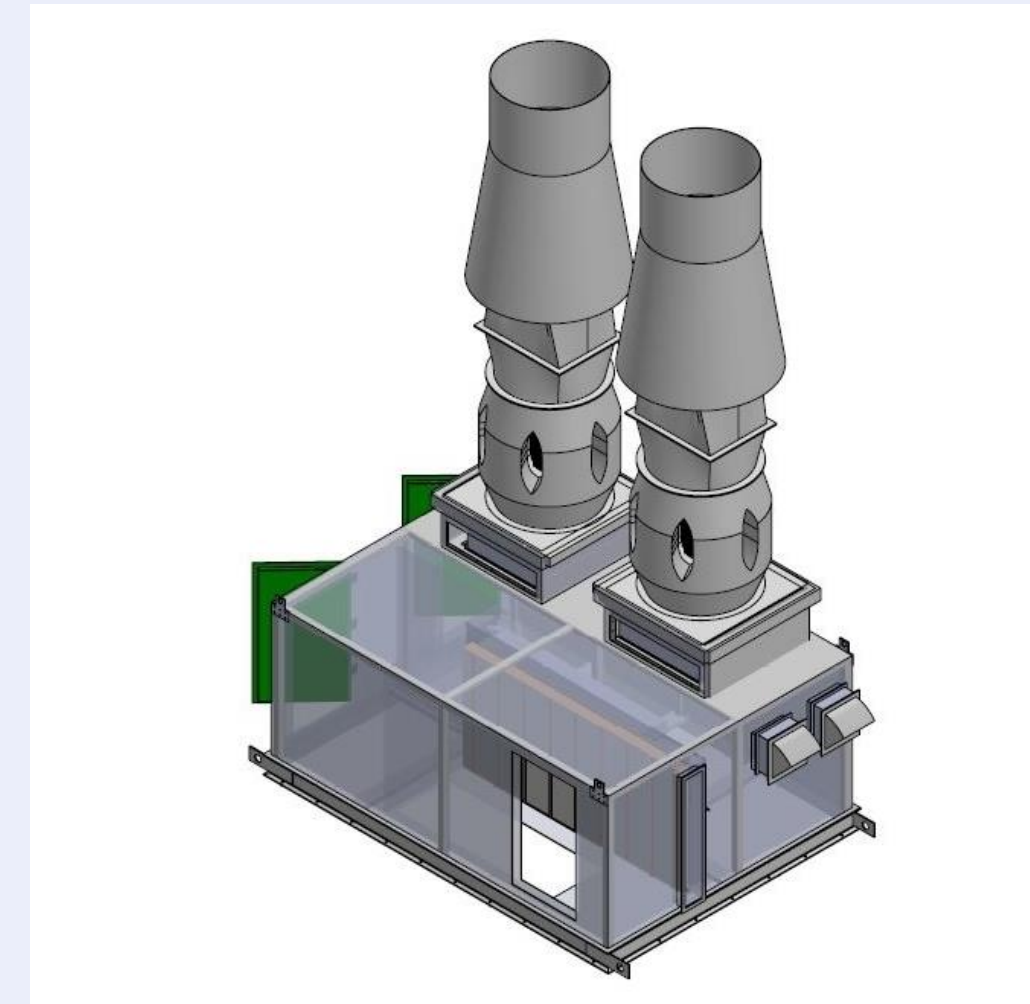
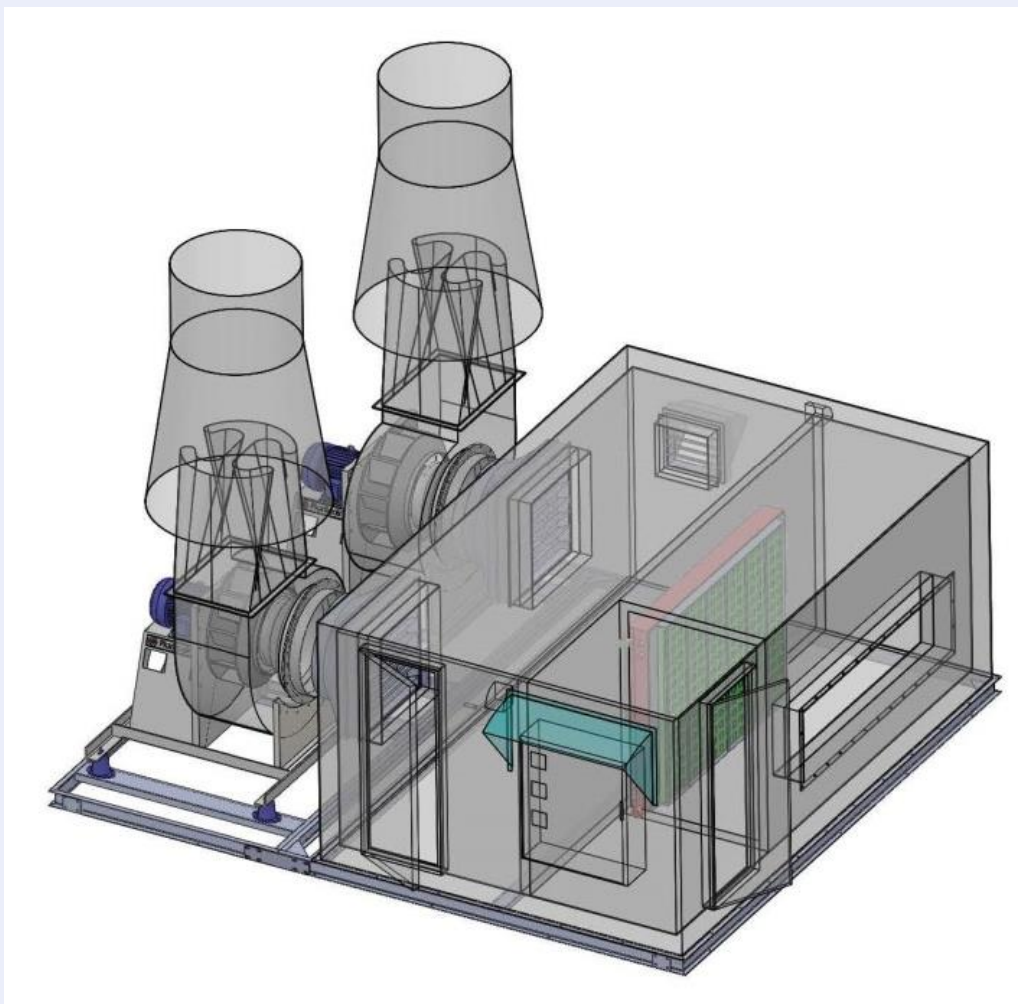
#### Available

- NEMA 2 with weather cover (Belimo)
- NEMA 4X
- Explosion Proof. Class 1 Division 1.
- Factory mounted or field mounted





# SKYPLUME™



## Features

- Custom size plenums.
- Coil performance specification as required by customer
- Coils are Heresite P-413 coated
- Filter racks fitted to meet system requirements
- Option for filters to be changed out from outside the unit.

Energy Recovery  
Runaround Coils  
with filter racks



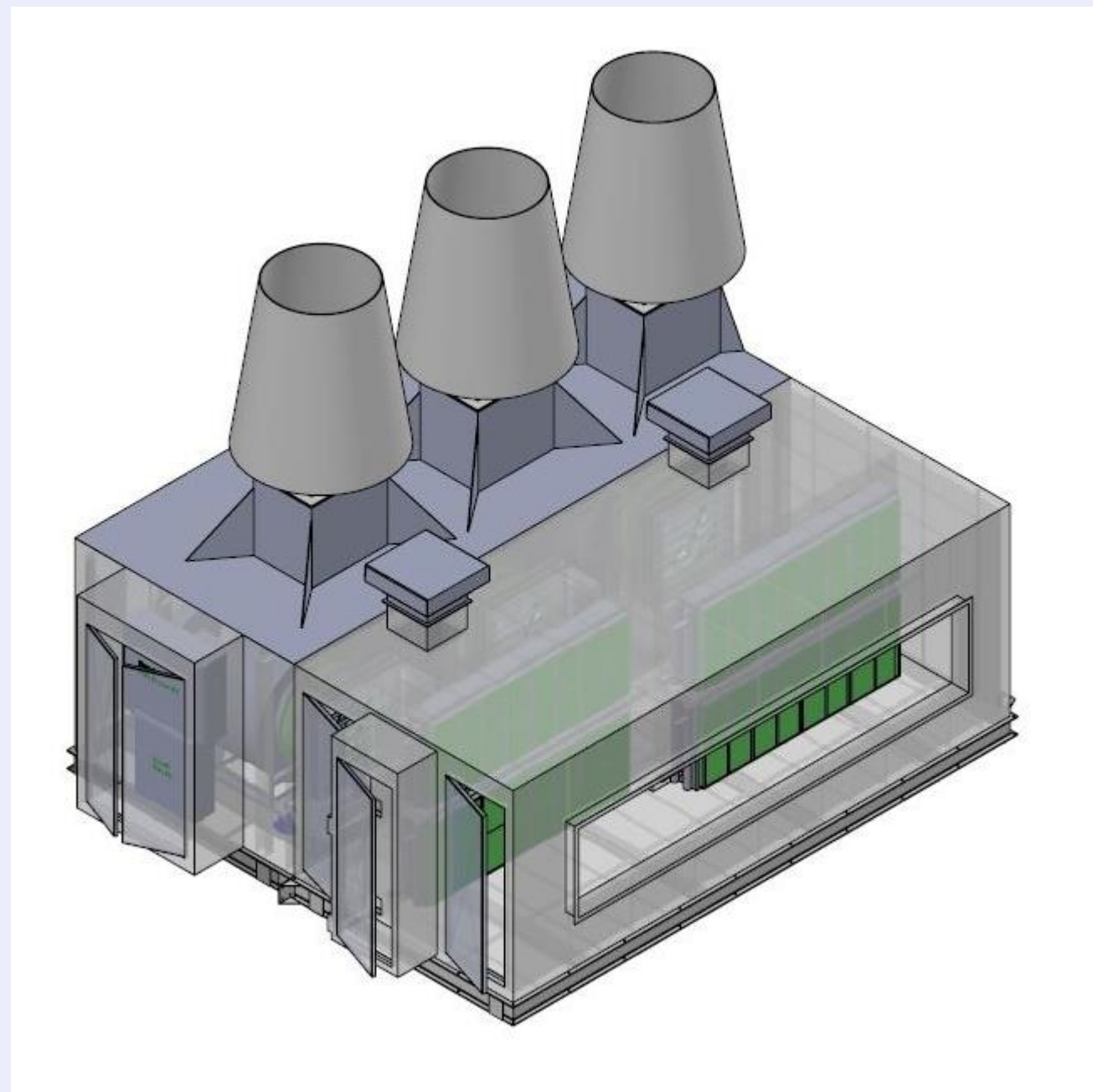


# SKYPLUME™

## Inlet Plenums

Energy Recovery

Runaround Coils with filter racks



SKYPLUME installation:

Located in Burlington, Ont.

Three fan system 2+1.

50,000 CFM Energy

Recovery with Filter Bank.

Factory mounted VFD with

Single point 3 wire

connection for entire unit.

Fan Penthouse and double

wall ER section all FRP

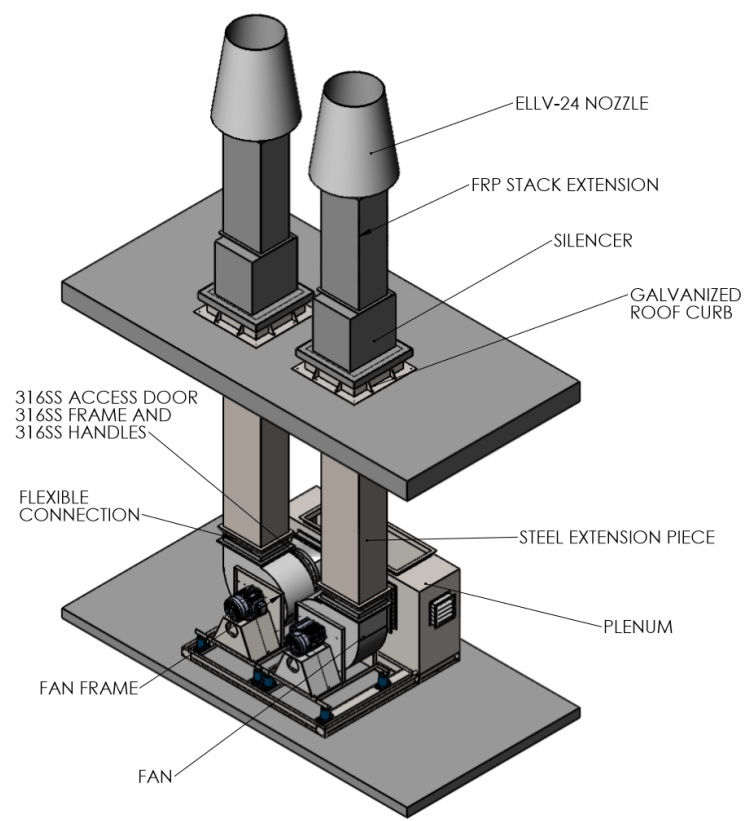




# Working together

## Factory Service

- Revit files
- CAD files
- We usually meet a 24 hour turnaround
- Suggested Specifications
- Suggested Schedules



MODEL(S): EX-6A and EX-6B  
 MODEL AND QTY: 1xSKYPLUME SYSTEM WITH 2xG1- ELLV- SC - 24 FANS

**PLENUM:**  
 CONSTRUCTION: STEEL WITH EPOXY COATING  
 INSULATION: SINGLE WALL  
 INLET LOCATION: SIDE  
 ACCESS DOOR: 316SS WITH AUTOMOTIVE SEALS, RIVETED AND CAULKED  
 DRAIN: PAN/NO  
 DRAIN: YES  
 ISOLATION DAMPERS: EPOXY COATED ALUMINUM CONSTRUCTION - 24"x24"  
 ISOLATION DAMPER CONTROL: ACTUATOR - AFBUP-S SPRING RETURN 24VAC-240VAC  
 BYPASS DAMPER: EPOXY COATED ALUMINUM CONSTRUCTION - 20"x20"  
 BYPASS DAMPER CONTROL: MODULATING ACTUATOR - AFB-24-SR-S SPRING RETURN 24VDC  
 BYPASS DAMPER RAINHOOD: NO  
 BYPASS SILENCER: NO  
 SLOPED ROOFING: NO  
 MOUNTING: SHARED PLATFORM  
 ENERGY RECOVERY COILS/FILTERS: NONE

**FANS:**  
 CONSTRUCTION: STEEL/ALUMINUM CONSTRUCTION WITH HERESITE VR-506 (GREY COLOR) COAT  
 SPARK-RESISTANT CONSTRUCTION: AMCA B - WITH GROUNDING KIT  
 FAN SEAL: INDUCED FLOW  
 MOTOR WEATHER COVER: NO  
 VFD: REQUIRED (BY OTHERS)  
 ACCESS DOOR: BOLTED  
 FAN DRAIN: YES  
 DISCONNECT: NEMA 3R - MOUNTED NOT WIRED  
 FLOW METER: NONE  
 VIBRATION ISOLATION: 2" DEFLECTION SPRING - HOUSED AND RESTRAINED

**STACK AND NOZZLE:**  
 CONSTRUCTION: HIGH STRENGTH FRP WITH UV STABILIZER  
 NOZZLE MODEL: G1-ELLV-24  
 STACK EXTENSION: SILENCER AND DUCTWORK TO EXTEND STACK TO 14' ABOVE ROOF DECK  
 SILENCERS: SEPARATE - 3' SILENCER PER STACK, FILM LINED, 316SS INTERIOR AND FRP EXTERIOR

**MOTOR:**  
 HP: 10, 1800 RPM, 460 V, 3 PH, TEFC - FRAME SIZE  
 EXPLOSION PROOF: NO  
 SHAFT GROUNDING: YES  
 MANUFACTURER: BROOK CROMPTON/WEG/TECO/SKYPLUME TECHNOLOGIES'S CHOICE  
 LINE VOLTAGE REQUIREMENTS: 414V-505V

**GENERAL NOTES:**  
 WIND LOAD RATING: 125 MPH  
 GUY WIRES: NOT REQUIRED  
 ALL HARDWARE 316SS  
 COLOR: PLASTIC AIR STANDARD LIGHT GREY  
 ESTIMATED WEIGHT: PLENUM AND FANS: 2865 LBS - STACK AND CURB: 650 LBS

**EXTRAS:**  
 IMPELLER: CENTRIFUGAL ALL FRP WITH TEFLON SHAFT SEAL AND FRP SHAFT SEAL  
 ROOF CURB FOR STACK  
 MOTOR BEARING LIFE OF 110,000,000 (SPHERICAL ROLLER BEARINGS)  
 SPRINGS ARE EPOXY COATED CARBON STEEL IN POWDER COATED SUCTILE IRON HOUSINGS  
 UNLESS OTHERWISE SPECIFIED:

NO.	DATE	TITLE
1	07/06/2019	4361-EF-6A and EF-6B

DRWING NO. 4361-1  
 SCALE: 1:48  
 SHEET 1 OF 6

**Plasticair** **SKYPLUME** TECHNOLOGIES

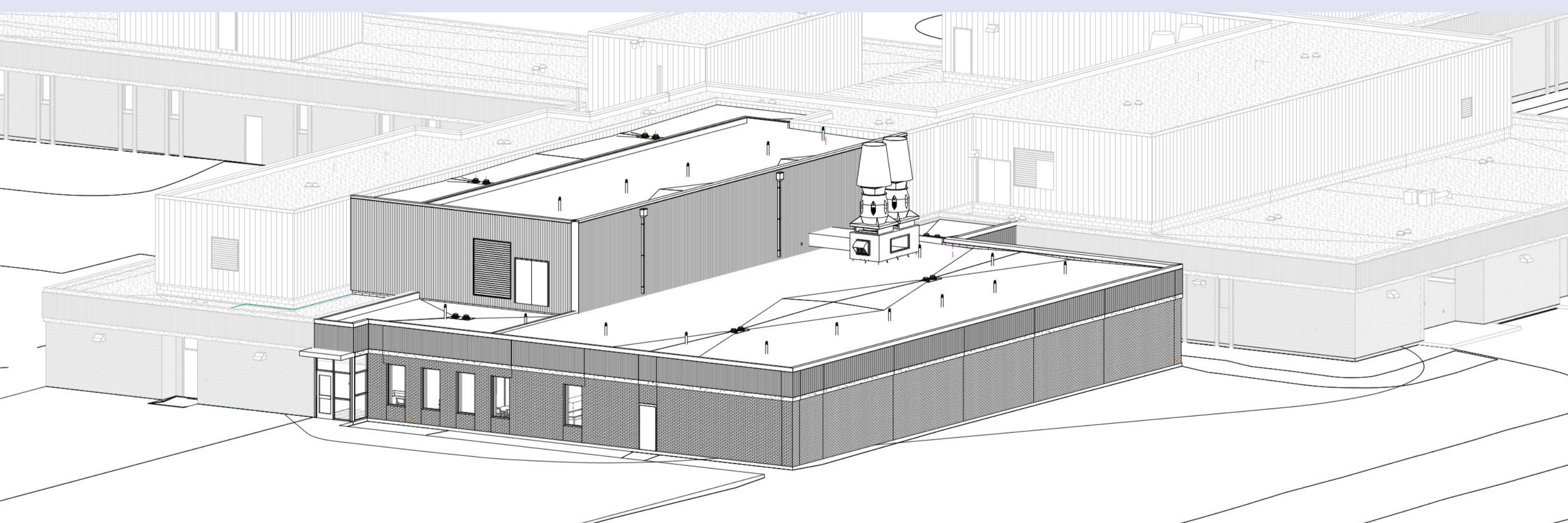
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APPLICATOR: \_\_\_\_\_

DATE: \_\_\_\_\_

SCALE: \_\_\_\_\_

REV: 0



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Kansas City, Missouri  
 Fairway, Kansas  
 Fort Collins, Colorado  
 TCEP No.: 018-262-18

Seal:

Project Revisions: 

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Issue: Construction  
 Date: \_\_\_\_\_  
 Dwg File: \_\_\_\_\_  
 Drawn By: \_\_\_\_\_  
 Checked By: \_\_\_\_\_

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Sheet Title: Exterior Elevations

Sheet Number: \_\_\_\_\_







# Specification Points

## Writing a corrosion proof specification for SKYPLUME Technologies

- 1) AMCA Certified products
- 2) Corrosion Proof FRP with Warranty
- 3) 25 year warranty on UV and Rust proof construction
- 4) Plenums to have seamless, zero leakage construction
- 5) Stack momentum. Specify the highest Momentum rate for the safest system.
- 6) Specifications are downloadable from Website





Stanford University

Installed 2018:

SKYPLUME G1- ALP - 49 - DMF 402 (360,000 CFM)

Energy Recovery coil with Prefilters



**SKYPLUME**<sup>™</sup>



University of Guelph

Installed 2017:

SKYPLUME G1- ELLV- 33 - DMF 270 (15,000 CFM)

Energy Recovery coil with Prefilters

# SKYPLUME™







**INSTALLED AT THE  
North Eastern University (Mass.)**

Plasticair Model  
SKYPLUME G1-ELLV-44 – DMF 365  
50 HP PER FAN  
60000 CFM @ 5" W.G.  
COATED STEEL ER UNIT WITH FILTERS  
316 SS SILENCERS



**Plasticair**



# SKYPLUME™

**INSTALLED AT THE  
UNIVERSITY OF ALBERTA**

Plasticair Model  
SKYPLUME G1-44 SC  
100 HP PER FAN  
35000 CFM @ 11" W.G.  
PLASTICAIR PENTHOUSE  
12 FEET WIDE – 38 FEET LONG  
316 SS SILENCERS





# SKYPLUME™

Laboratory Exhaust Systems

High Induction Fans

Plasticair SKYPLUME Installation at MIT. Total of 780,000 CFM Lab Exhaust





# Online – Fan Selection Application

# SKYPLUME

TECHNOLOGIES



A DIVISION OF  Plasticair

Reference Catalog ID (AMCA): PLASTICAIR WEB FAN SELECTOR 5.0 - JUNE 2015  
Aug 8, 2019

**SKYPLUME G1-ELLV-36 - DMF 300**

Project: Rowan University | Project Location: Toronto, Ontario, Canada  
Contractor: | Engineer Location: Ontario, Canada  
SKYPLUME Sales Rep: C/Otel | Fan Tag: EF-1-2-3-4

FAN PERFORMANCE DATA			
Volume at Plenum Inlet: 5500 CFM	Wheel Size: 36.5 inches	Tip Speed: 14475.5 ft/min	Altitude: 0 ft
Volume at Bypass: 0 CFM	Wheel Width: 100%	Nozzle Velocity: 3487.5 ft/min	Actual Density: 0.075 lb/ft <sup>3</sup>
Volume at Fan Inlet: 18333 CFM	Fan Power: 21.48 BHP	AMCA Drive Arrangement # 4	Temperature: 70 °F
Fan E.S.P.: 4 in. W.G.	Fan Speed: 1514.9 RPM	Fan Class: Class 8	
Efficiency (Mechanical): 57%	Efficiency (Static): 54%		

STACK PERFORMANCE DATA		PLENUM REQUIREMENT	
Inlet Volume	18333 CFM	Plenum Required:	Yes
Induced Volume	25560 CFM	Plenum Wall Construction:	Double Wall, Insulated
Windband Volume	43884 CFM	Energy Recovery Coil:	Yes
Dilution Ratio Of The System	239.42%	Plenum Arrangement:	In-line
Nozzle Exit Velocity	3487.5 FPM	No. of Operating Fans:	3
Windband Velocity	4204.5 FPM	No. of Standby Fans:	1
Stack Pressure Loss	0.41 in. WG	Total No. of Fans:	4

EFFECTIVE PLUME RISE AT INLET VOLUME (DOES NOT INCLUDE EQUIPMENT)	
CROSSWIND	PLUME RISE(ft)
10 MPH	52.26
15 MPH	34.84
20 MPH	26.13

EFFECTIVE STACK HEIGHT (INCLUDES EQUIPMENT)	
CROSSWIND	EFFECTIVE STACK HEIGHT(ft)
10 MPH	70.28
20 MPH	44.15
15 MPH	52.86

1275 Creighton Drive, Mississauga, ON, L4W1A8 | Tel: (905) 625 9164 | Fax: (905) 625 4147  
Email: sales@plasticair.com | Website: www.skyplumetechnologies.com

Reference Catalog ID (AMCA): PLASTICAIR WEB FAN SELECTOR 5.0 - JUNE 2015  
Aug 8, 2019

**SKYPLUME G1-ELLV-36 - DMF 300**

Project: Rowan University | Project Location: Toronto, Ontario, Canada  
Contractor: | Engineer Location: Ontario, Canada  
SKYPLUME Sales Rep: C/Otel | Fan Tag: EF-1-2-3-4

Insertion Loss	Project Sound Performance							
	3	4	8	13	10	9	7	5
Silencer Size	36							
Outlet Sound Power Levels (dB)	95	97	100	98	94	88	78	72
Correction for 3 Fans Operating	5	5	5	5	5	5	5	5
Dynamic Insertion Loss for Silencer	-3	-4	-8	-13	-10	-9	-7	-5
Corrected Outlet Sound Power Levels (dB)	97	98	97	90	89	82	76	72
Correction for 50 Ft. - No Reflective Surfaces	-34	-34	-34	-34	-34	-34	-34	-34
Sound Levels at 50 Ft. Distance	63	64	63	56	55	48	42	38
A Weighting	-25.5	-15.5	-8.5	-3	0	1	1	-1
dBA Spectrum (50 Ft.)	37.5	48.5	54.5	53	55	49	43	37
Net Sound Level at 50 Ft.	60 dBA (at 60 Hz)							

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Project: Rowan University | Project Location: Toronto, Ontario, Canada  
Contractor: | Engineer Location: Ontario, Canada  
SKYPLUME Sales Rep: C/Otel | Fan Tag: EF-1-2-3-4

CFM	RPM	Static Pressure	4 in. W.G.	BHP	21.48
18333	1515				

Octave Band Centre Frequency	Sound Data							
	63	125	250	500	1K	2K	4K	8K
Outlet Sound Power Levels (dB)	95	97	100	98	94	88	78	72
Sound Pressure Levels 50 ft (A-weighted)	35	47	57	61	59	52	45	37
Total A Weighted Sound Pressure @ 50 ft from Fan (dBA)	65							

Surrounding Conditions		Other Performance Data	
Temperature (°F)	70	Tip Speed (ft/min)	14475.5
Altitude (ft)	0	Fan Class	Class 8
Actual Density (lb/ft <sup>3</sup> )	0.075	Efficiency (Mech)	57%
		Efficiency (Static)	54%
		Wheel Width (%)	100
		Nozzle Exit Velocity (ft/min)	3487.5

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Performance Data		Effective Plume Rise at Inlet Volume	
Inlet Volume	18333 CFM	CROSSWIND	PLUME RISE(ft)
Induced Volume	25560 CFM	10 MPH	52.26
Windband Volume	43884 CFM	20 MPH	26.13
Dilution Ratio Of The System	239.42%	15 MPH	34.84
Nozzle Exit Velocity	3487.5 FPM		
Windband Velocity	4204.5 FPM		
Stack Pressure Loss	0.41 in. WG		

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**SKYPLUME G1-ELLV-36 - DMF 300**

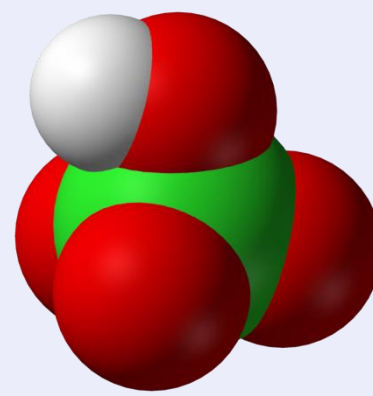
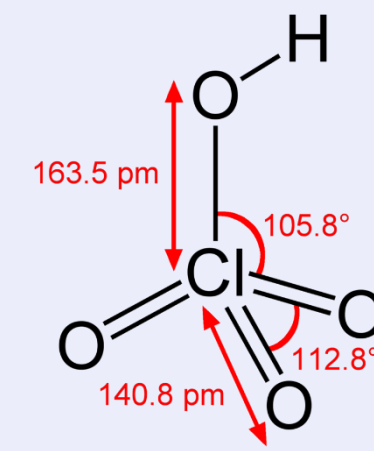
Project: Rowan University | Project Location: Toronto, Ontario, Canada  
Contractor: | Engineer Location: Ontario, Canada  
SKYPLUME Sales Rep: C/Otel | Fan Tag: EF-1-2-3-4

FAN PERFORMANCE DATA		PLENUM REQUIREMENT	
Volume at Plenum Inlet: 5500 CFM	Wheel Size: 36.5 inches	Tip Speed: 14475.5 ft/min	Altitude: 0 ft
Volume at Bypass: 0 CFM	Wheel Width: 100%	Nozzle Velocity: 3487.5 ft/min	Actual Density: 0.075 lb/ft <sup>3</sup>
Volume at Fan Inlet: 18333 CFM	Fan Power: 21.48 BHP	AMCA Drive Arrangement # 4	Temperature: 70 °F
Fan E.S.P.: 4 in. W.G.	Fan Speed: 1514.9 RPM	Fan Class: Class 8	

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# Perchloric Acid - HClO<sub>4</sub>



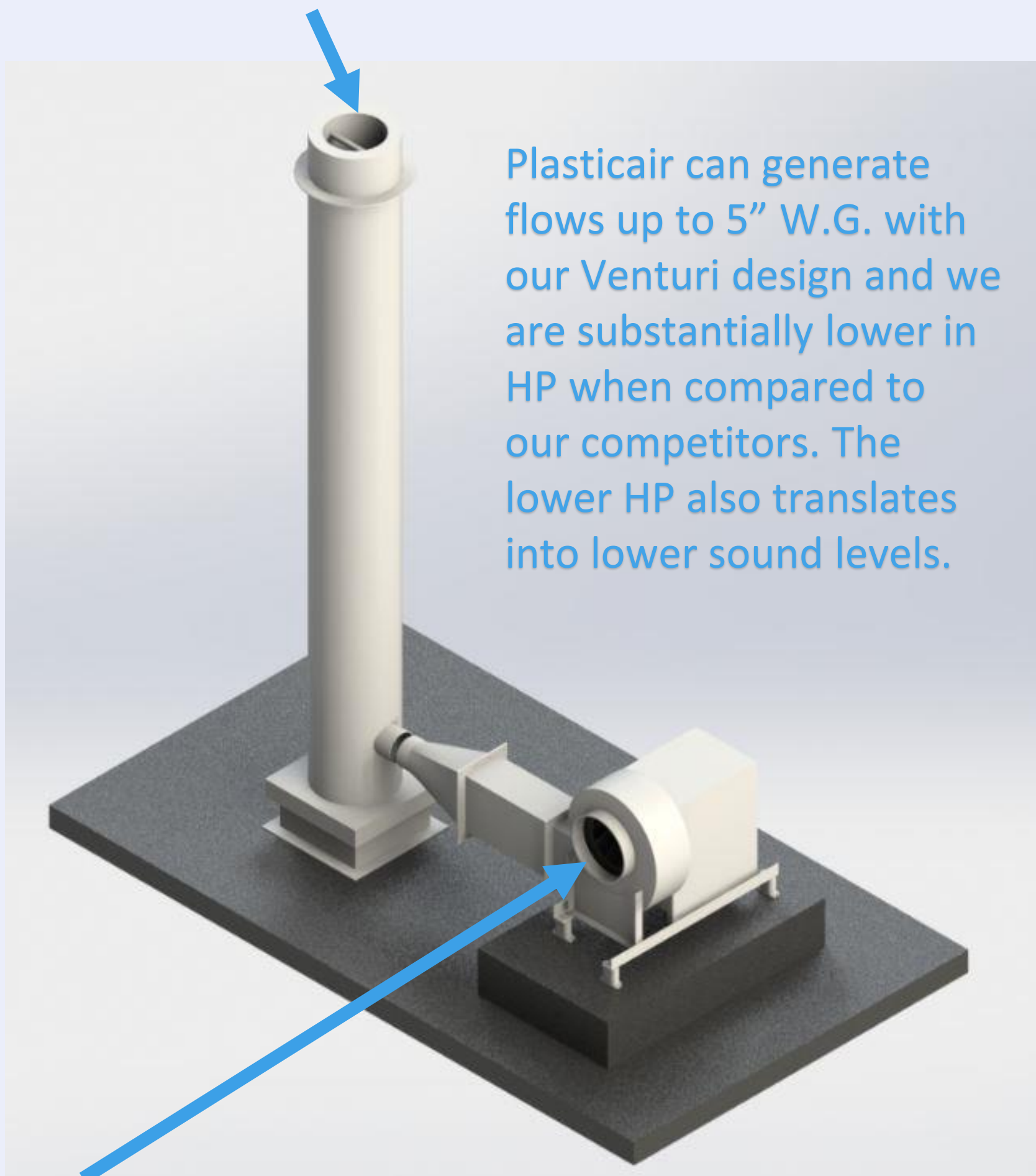
- In Laboratories, Perchloric Acid is used as an aggressive oxidizer.
- It is an extremely corrosive acid.
- When in a dry state, HClO<sub>4</sub> can react (explode) if exposed to vibration or impact.
- Perchloric Acid will also react with any organic material.
- Due to the nature of HClO<sub>4</sub>, Exhaust Systems should always be designed as a dedicated duct run per ANSI Z9.5. One fume hood, one fan system. There is history that these explosions have caused serious injury and death.



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Open outlet designed for minimum 3000 FPM outlet velocity with high rate of dilution

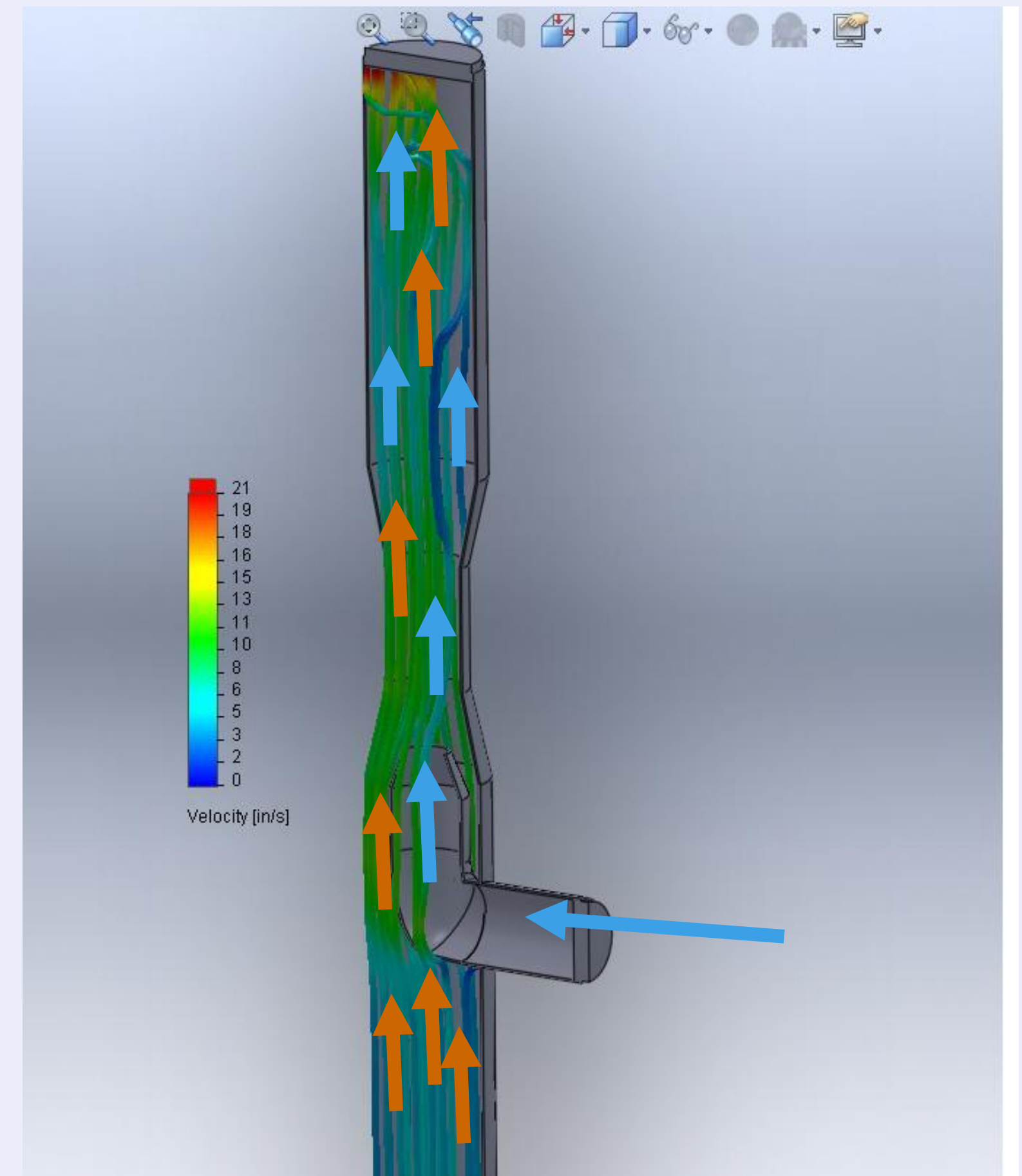


Plasticair can generate flows up to 5" W.G. with our Venturi design and we are substantially lower in HP when compared to our competitors. The lower HP also translates into lower sound levels.

Injector Fan: Powers outside air flow Into Venturi

# Plasticair Model: BVS Series (Bypass Venturi System)

Blue arrows = outside air from injector fan  
Brown arrows = fume hood air with HClO<sub>4</sub>



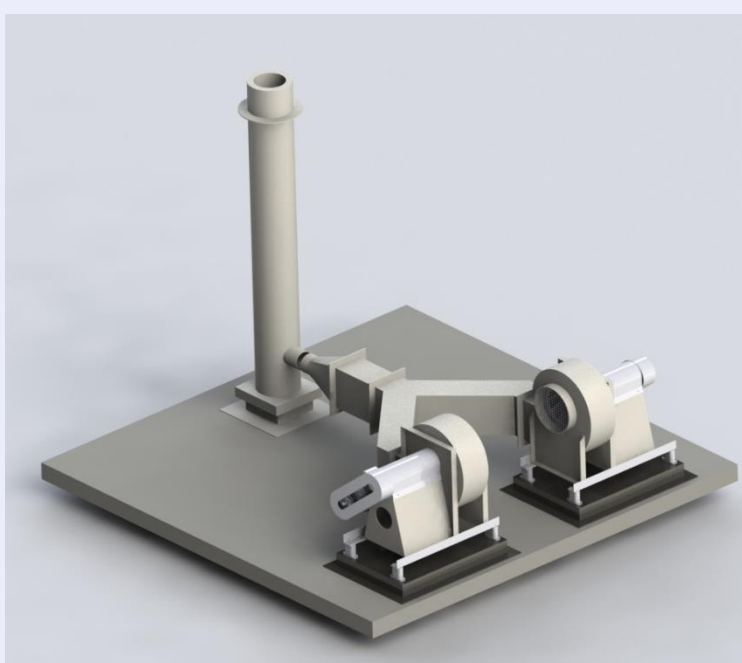
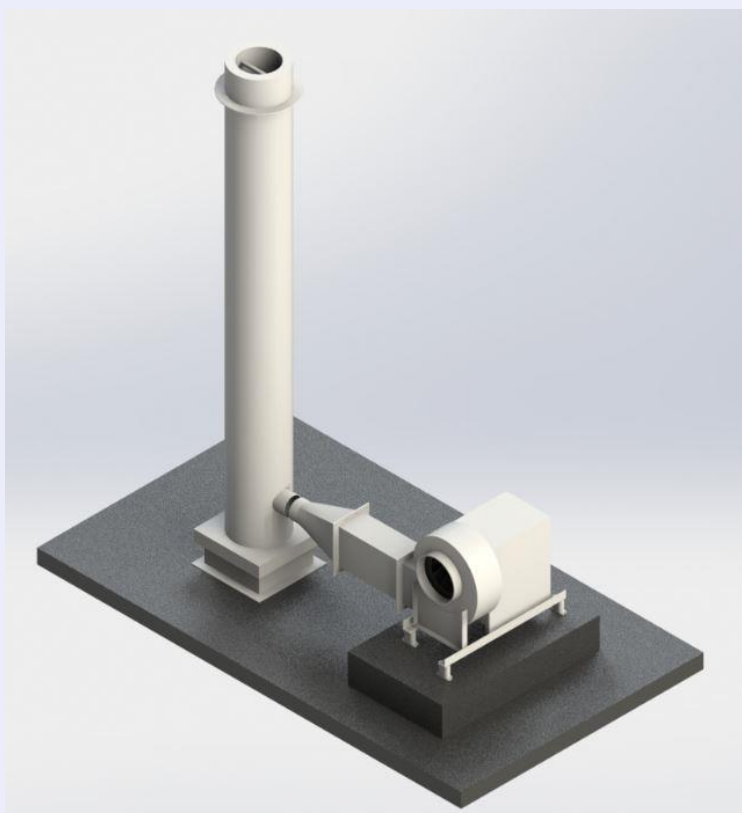
This BVS incorporates exhaust with no moving parts within the airstream which eliminates danger of impact from the fan impeller



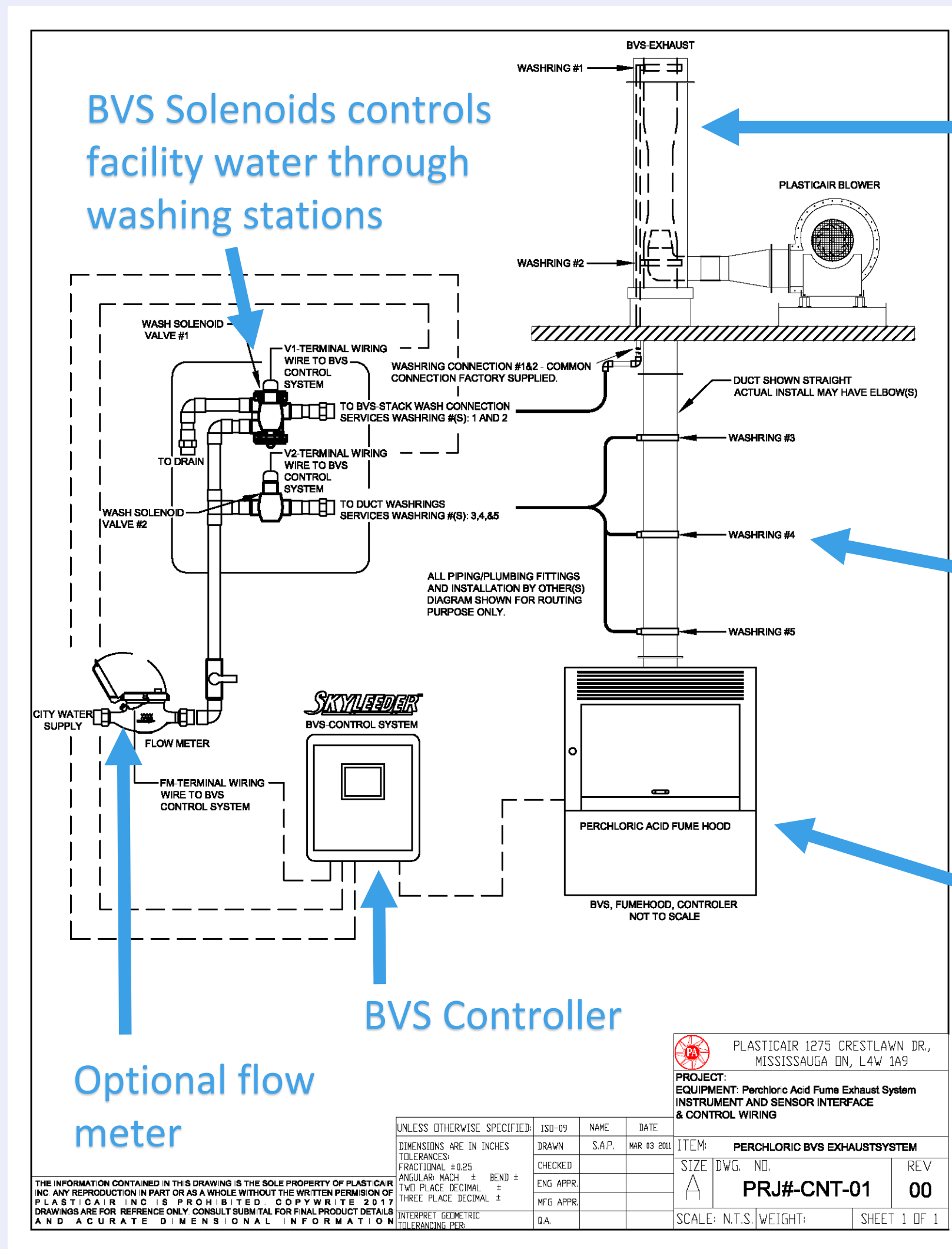
# Perchloric Acid Exhaust Systems



BVS with no redundancy

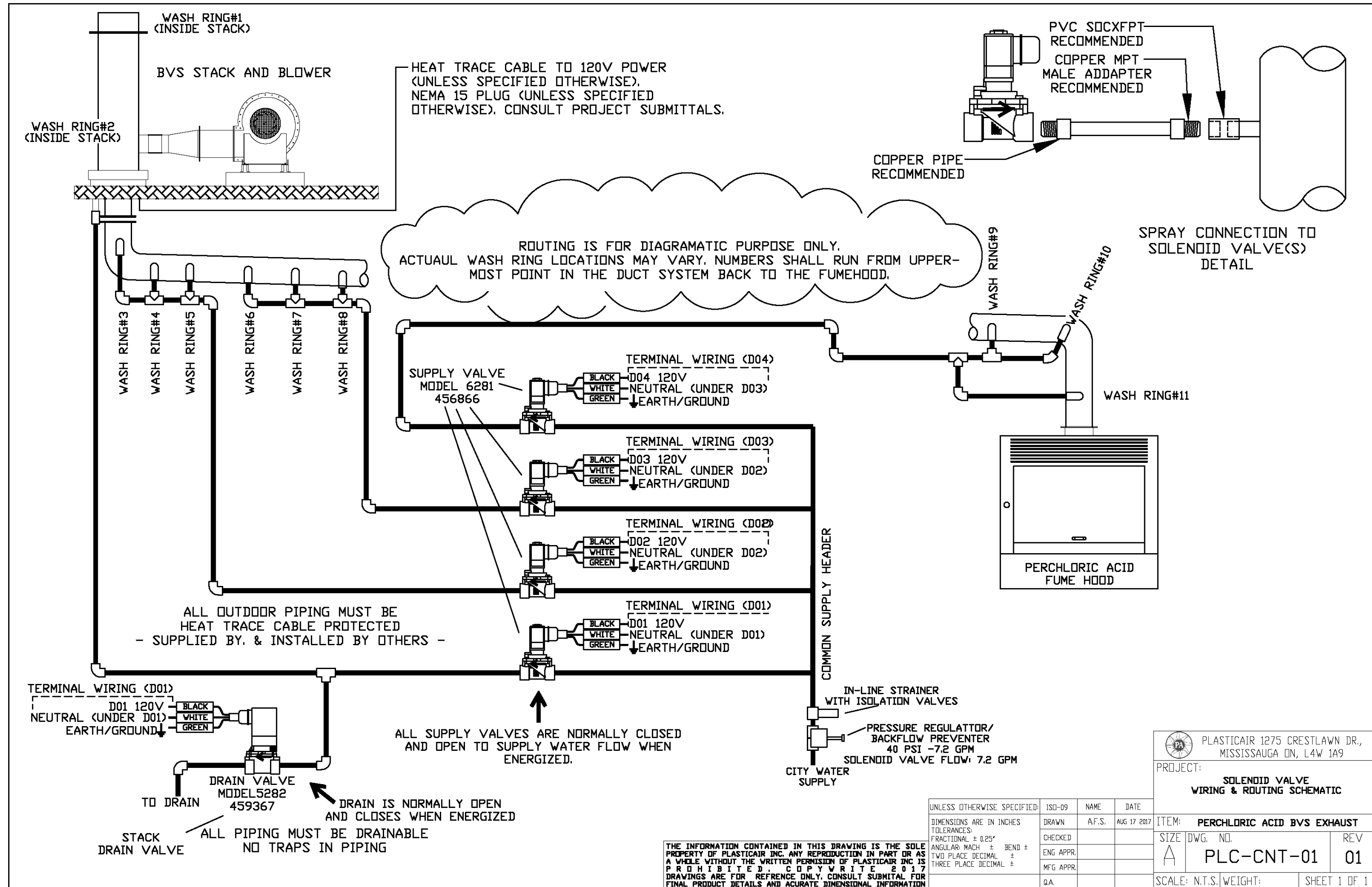


BVS with standby blower





# Perchloric Acid Exhaust By-Pass Ventilation Wash Down Requirements



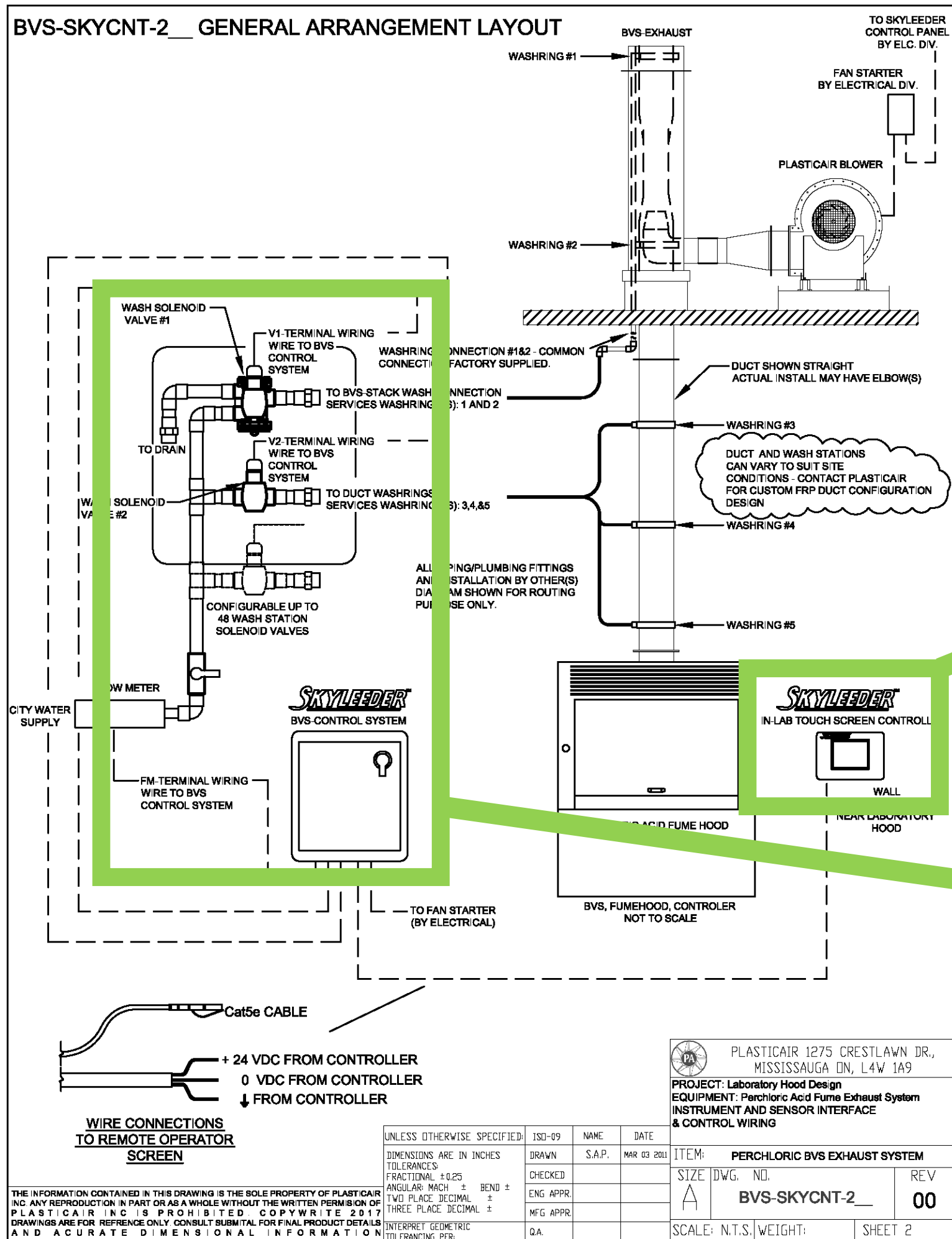
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UNLESS OTHERWISE SPECIFIED:	ISO-09	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	A.F.S.	AUG 17 2017
TOLERANCES:	CHECKED		
FRACTIONAL ± 0.25"	ENG APPR.		
ANGULAR MACH ± BEND ±	MFG APPR.		
TWO PLACE DECIMAL ±			
THREE PLACE DECIMAL ±			
	Q.A.		

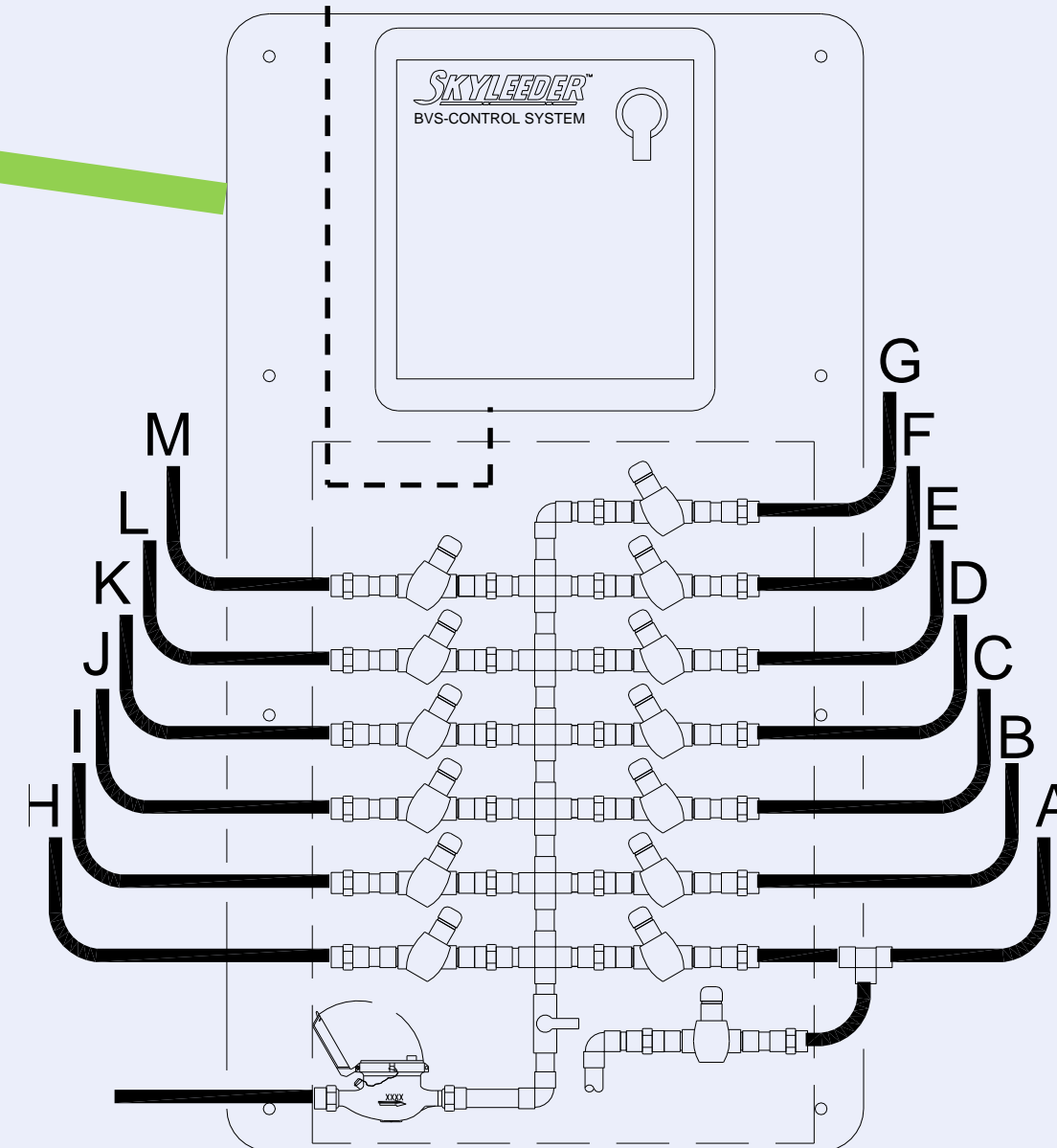
PLASTICAIR 1275 CRESTLAWN DR., MISSISSAUGA ON, L4W 1A9	
PROJECT: SOLENOID VALVE WIRING & ROUTING SCHEMATIC	
ITEM: PERCHLORIC ACID BVS EXHAUST	REV
SIZE DWG. NO. A PLC-CNT-01	01
SCALE: N.T.S. WEIGHT:	SHEET 1 OF 1



# Perchloric Acid Exhaust By-Pass Ventilation – Wash Down Control



In Lab Touch Screen HMI



Mechanical Room Wash Station



# Perchloric Acid Exhaust By-Pass Ventilation – Wash Down Controller Functions and Communication



Field – Reprogrammable

BAS Monitoring





# Scrubbers (Acid & Odor Wet Scrubbers)

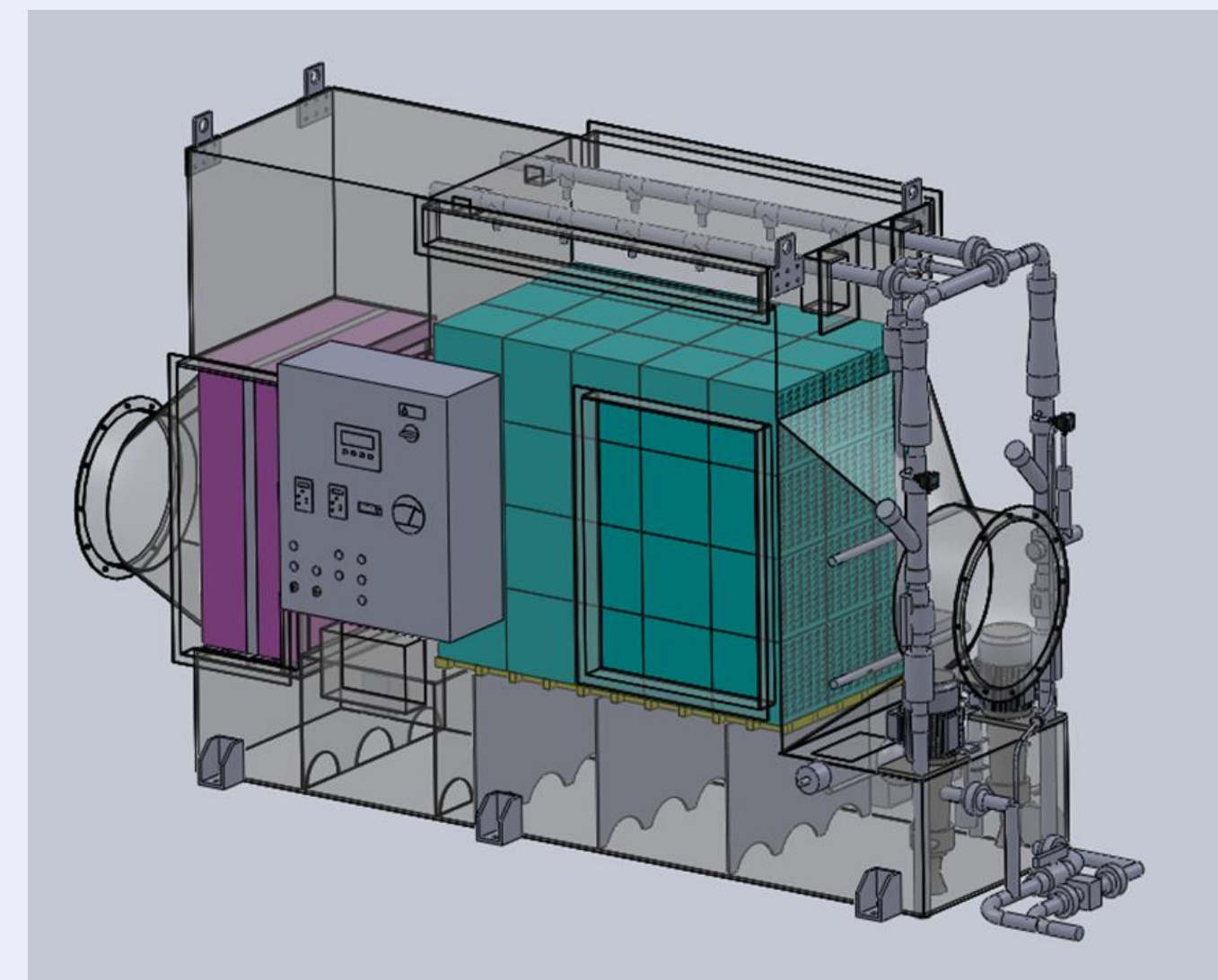
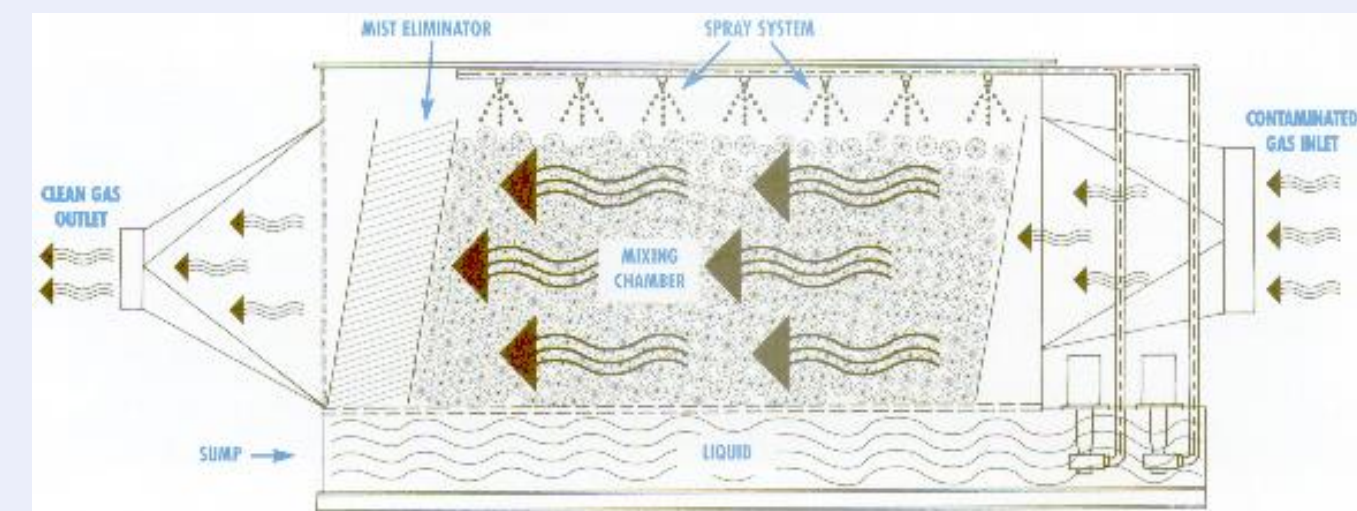
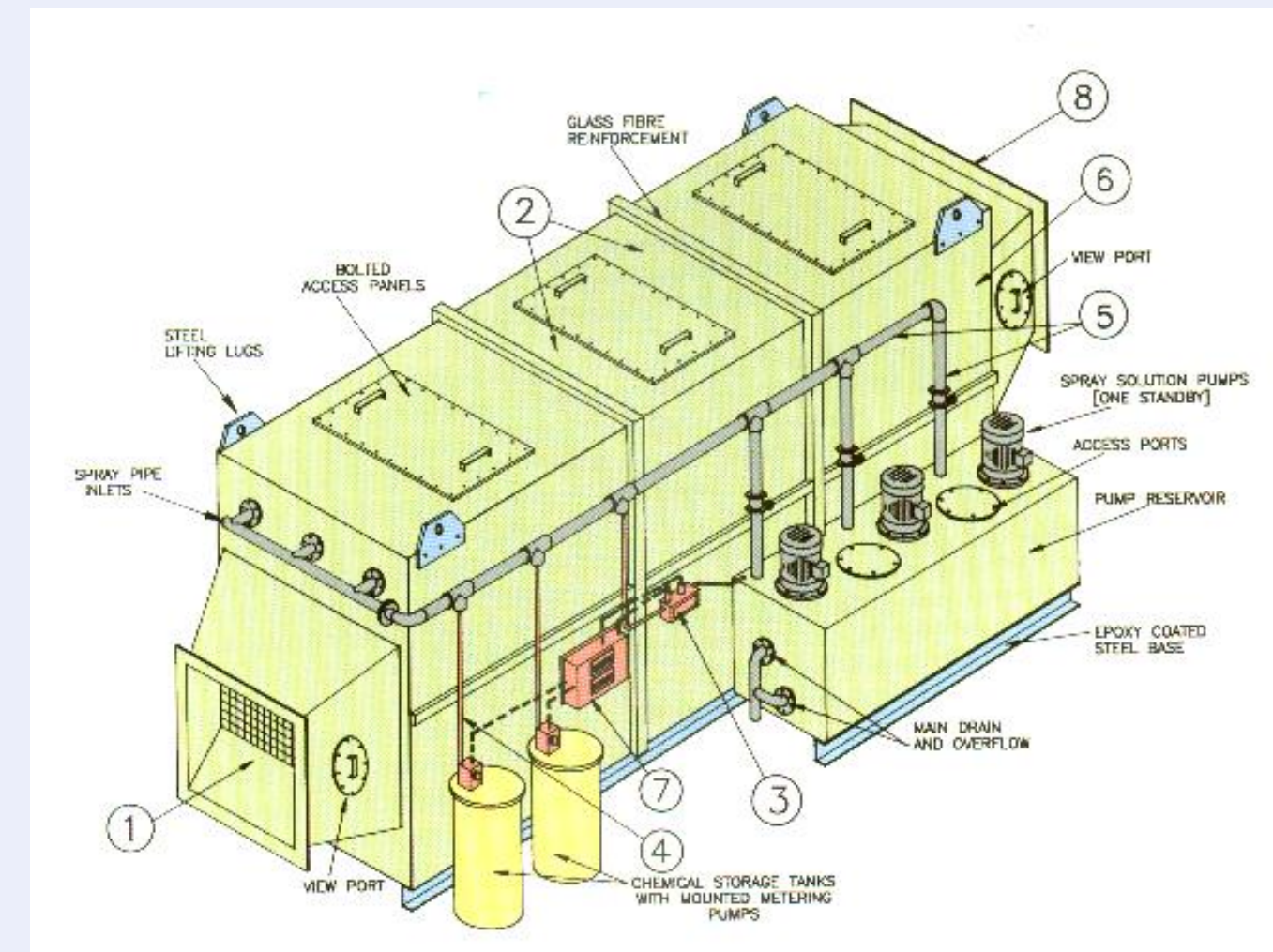


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## Horizontal Scrubber Technologies

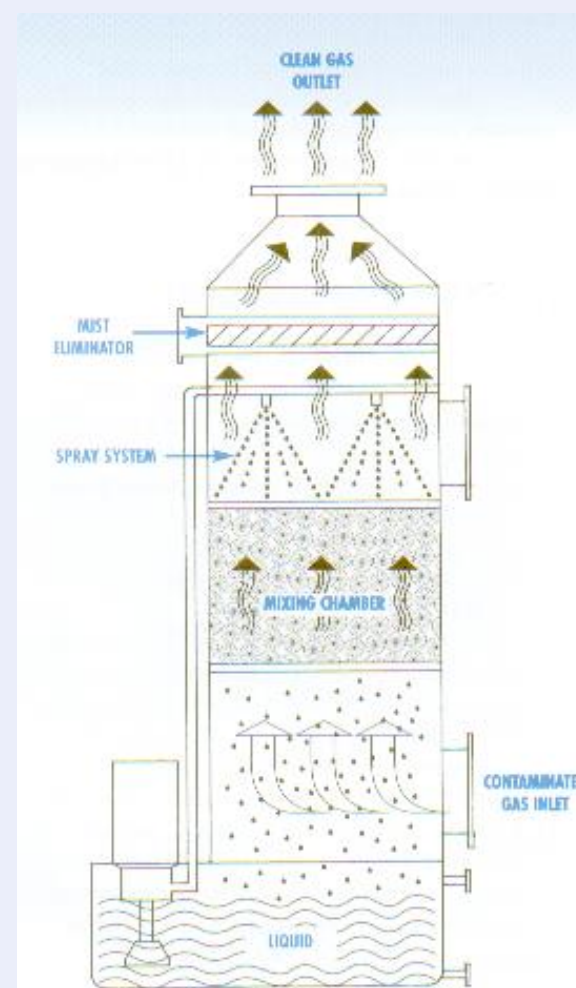
- FRP construction
- Integrated Factory provided controls with CSA field certification on entire system
- Indoor or outdoor construction
- PVC recirculation system with PVC pumps
- Recirculated from scrubber sump back to packing mixing chamber
- Mist eliminator and chevron blades for final removal of water particulate





# Vertical Scrubber Technologies

- Counter Current Scrubber
- Water treated with pH adjustment
- Recirculated from scrubber sump back to packing mixing chamber
- Mist eliminator and chevron blades for final removal of water particulate





# FRP Fans (Direct & Belt Drive)

### DMF Series Fans Direct Drive Mixedflow



FRP Construction

- Roof Top Mounting • Fourteen Sizes
- Industrial and Commercial Applications
- Static pressures up to 7.25" W.G. (1801 Pa)
- Volume Range 1300 CFM (614 l/sec) up to 65,000 CFM (30,680 l/sec)

 Plasticair

### GIF Series Centrifugal Fans



FRP Construction

- Eleven sizes from 24 to 66
- Volumes up to 140,000 CFM
- Static pressures up to 16" W.G.
- Class I • Class II • Class III

 Plasticair

### Tubular Backward Curved Centrifugal Fans



FRP Construction

- Roof Top Mounting • Ten Sizes
- Industrial and Commercial Applications
- Static pressures up to 10" W.G. (2484 Pa)
- Volume Range 200 CFM (95 l/sec) up to 60,000 CFM (28,320 l/sec)

 Plasticair

### DMFV Series Fans Direct Drive Mixedflow




FRP Construction

- Roof Top Mounting • Fourteen Sizes
- Industrial and Commercial Applications
- Static pressures up to 7.25" W.G. (1801 Pa)
- Volume Range 1300 CFM (614 l/sec) up to 65,000 CFM (30,680 l/sec)

 Plasticair

### Backward Curved Centrifugal Fans




FRP Construction

- Four Sizes
- Industrial and Commercial Applications
- Static pressures up to 14" W.G. (3477 Pa)
- Volume Range 400 CFM (189 l/sec) up to 5000 CFM (2360 l/sec)


 Plasticair

### Duct Mounted Axial Flow




FRP Construction

### Roof Top




FRP Construction

- Fourteen Sizes • Industrial Applications
- Static pressures up to 3" W.G. (745 Pa)
- Volume Range 1000 CFM (472 l/sec) up to 80000 CFM (37760 l/sec)


 Plasticair

### Wall Mounted Panel Fans




FRP Construction

### Box Mounted Panel Fans



FRP Construction

- Thirteen Sizes • Industrial Applications
- Volume Range 1000 CFM (472 l/sec) up to 50,000 CFM (23,600 l/sec)

 Plasticair

### Industrial Mini Vent Sets



FRP Construction

- Radial and Backward Inclined Impellers
- Volume Range shut off up to 4000 CFM (1888 l/sec)
- Static pressures up to 19" W.G. (4719 Pa)
- Industrial and Commercial Applications

 Plasticair

### High Pressure Blowers



FRP Construction

- Fourteen Sizes
- Industrial Applications
- Static pressures up to 53" W.G. (13,163 Pa)
- Volume Range from shut off up to 27,000 CFM (12,744 l/sec)

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**Plasticair Inc.**  
**Founded in 1980**



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