

Commercial Kitchen Ventilation:

*Maximizing Energy Savings
& Reducing Capital Costs*

presented by:



Spring Air

Engineering Energy Savings

Agenda for the Day

- Commercial Kitchen Ventilation
 - Overview and Basic Concepts
- Maximizing Energy Savings
 - Hoods
 - Controls
 - Energy Recovery
- Minimizing Capital Costs
 - Cheap Hoods vs. Reduced Requirements
 - Engineered Ducts
 - Equipment Comparison
 - Payback & ROI
- New Products
 - ZoneFlow Down
 - UltraFlow UV Hoods
- Questions & Follow-up

Commercial Kitchen Ventilation:

What's the Big Deal?



ENERGY EFFICIENCY

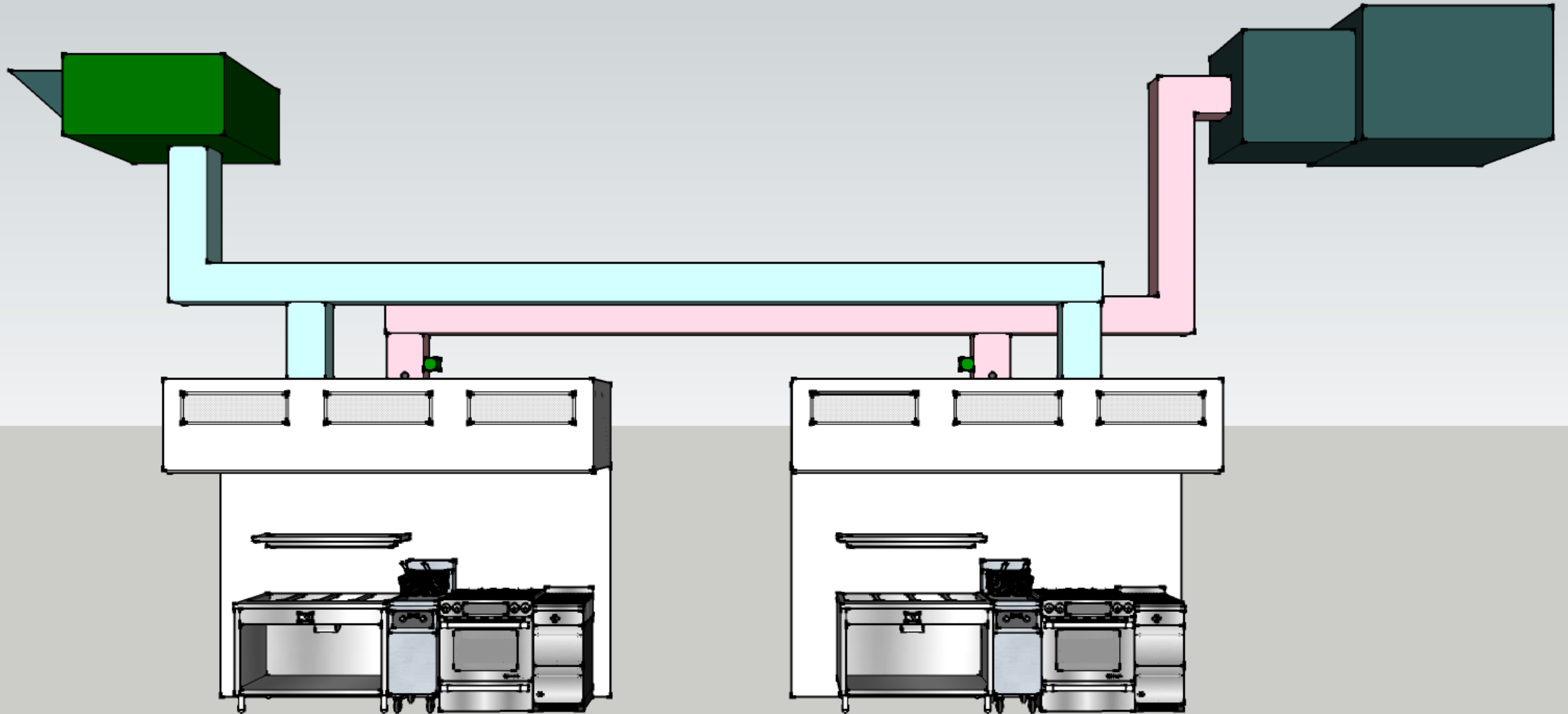


PERFORMANCE



SAFETY

Basic Principles of CKV



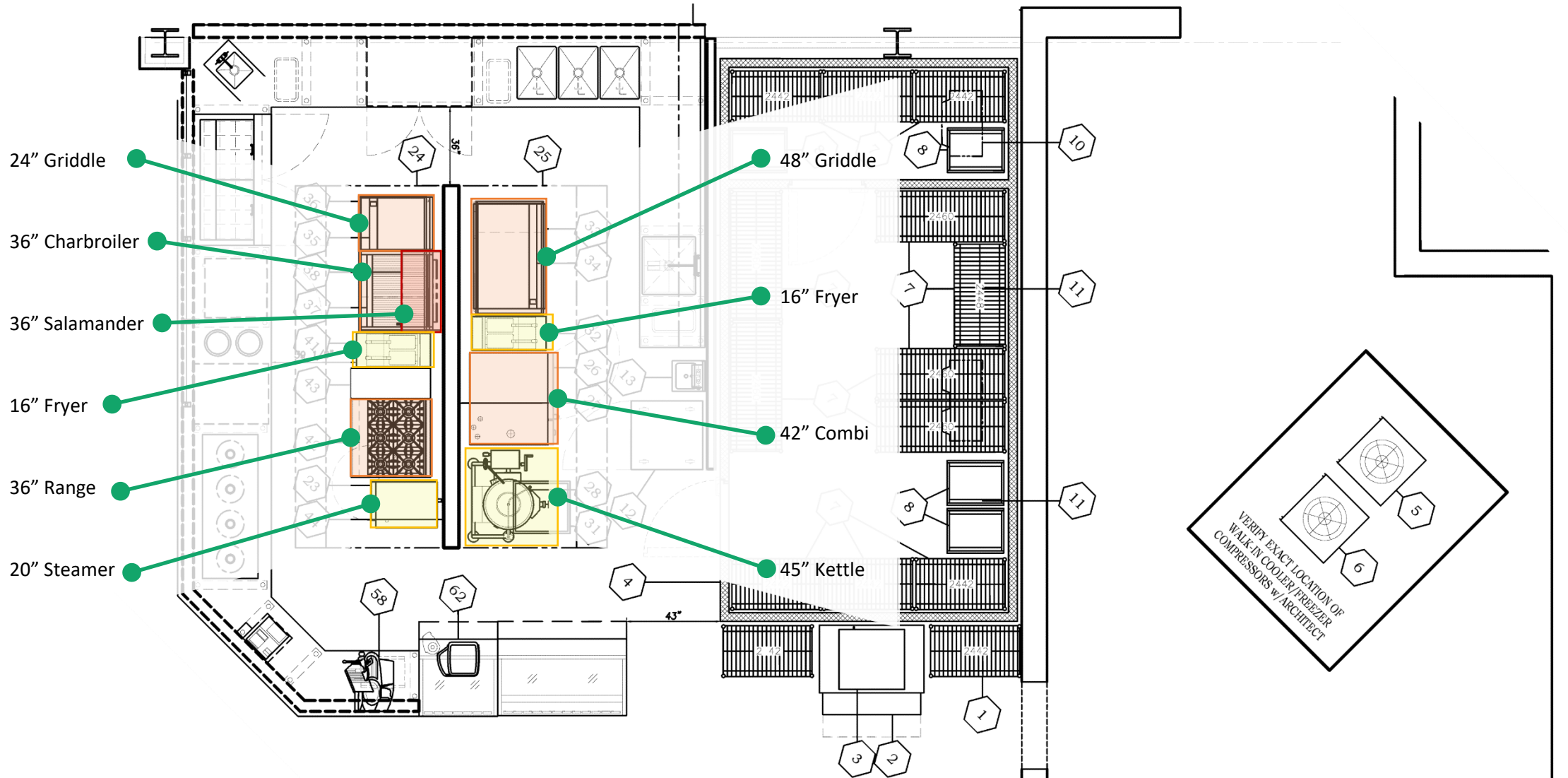
Maximizing Energy Savings:

The 2-step Method

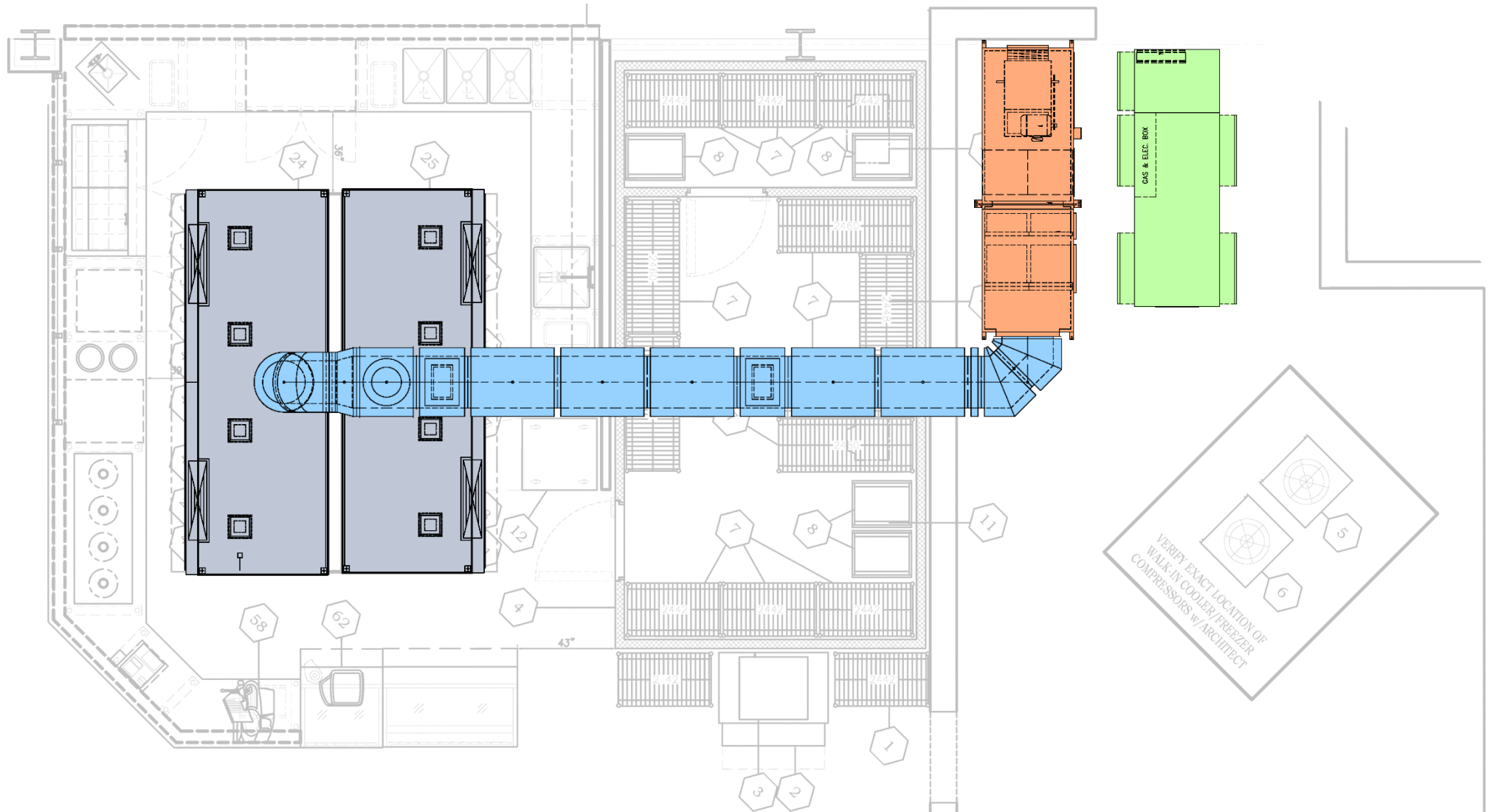
1. Hoods
2. Controls



Our Example Project



Our Example Project



Step 1: High Efficiency Hoods

DynaFlow Overview

Dynaflow hoods maximize efficiency by dividing 100% of Supply air into 3 zones, effectively balancing the entire kitchen and exhausting appliances

① Consistency

Distributing Make-up air along the entire length of the hood minimizes the opportunity for drafts that can result from poorly placed diffusers

② Capture & Containment

An Air curtain encourages the natural rolling of exhaust, maximizing effectiveness of the hood while allowing for much lower air volumes than straight exhaust

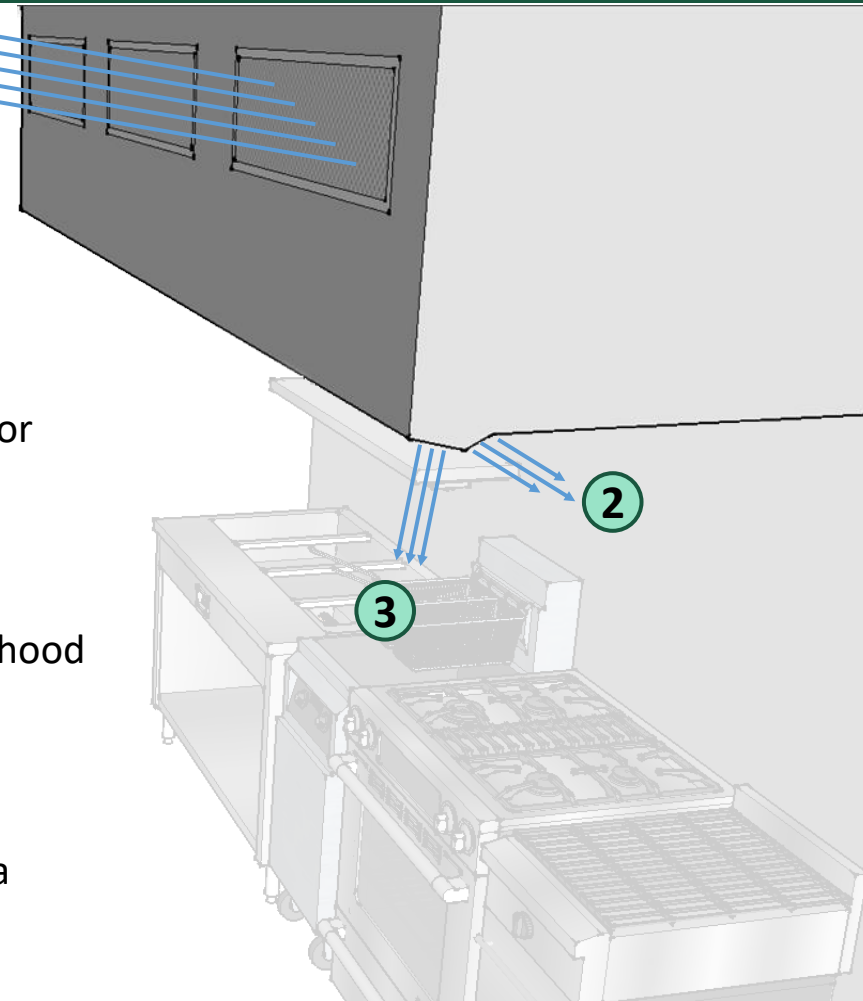
③ Comfort

A Custom Comfort Dial allows cooks to direct some of the supply air directly over them, a welcome feature in today's high-temperature kitchens

①

②

③



DynaFlow Hoods

Customizable to meet unique applications

Dynaflow hoods are available in a vast array of configurations and are flexible to accommodate in-field changes and discrepancies while maximizing efficiency

Configurations

DynaFlow hoods can be used in Wall-mounted or island configuration and can utilize standard filter banks or dry grease extraction in both single and double row applications

Settings tuned to Appliance Lineup

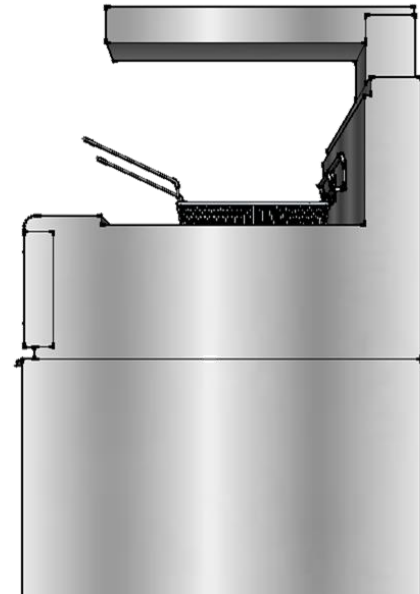
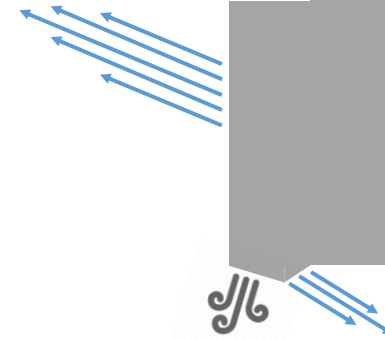
Baffles are adjustable every 33" to tailor the air curtain specifically to the appliance under the hood section rather than setting the entire hood length to the dirtiest appliance. This also makes appliance swaps easier.

Mounting Height

While most hoods are listed for applications of 78" – 80", DynaFlow hoods can be mounted at heights **up to 87"** without any necessary adjustments in airflow, ideal for a little extra headroom and clear sightlines.

Additional Options

Can't supply Make-up air to the hood? Our DynaFlow MJ model uses hood mounted blowers to create the Air Curtain. For sensitive island applications we can even wrap the entire hood perimeter with an Air Curtain!



DynaFlow = Reduced Air Volumes

High-Efficiency Hoods DynaFlow

Redi-Vent Straight Filter Hoods

5,117

Exhaust Vol.
(CFM)

7,998

4,356

Supply Vol.
(CFM)

6,798

2

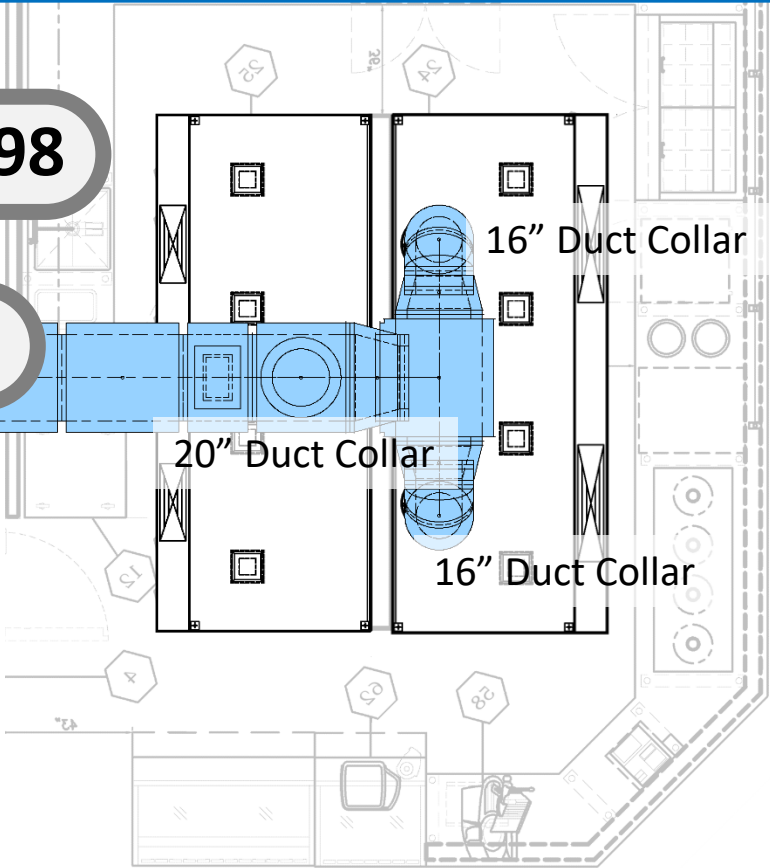
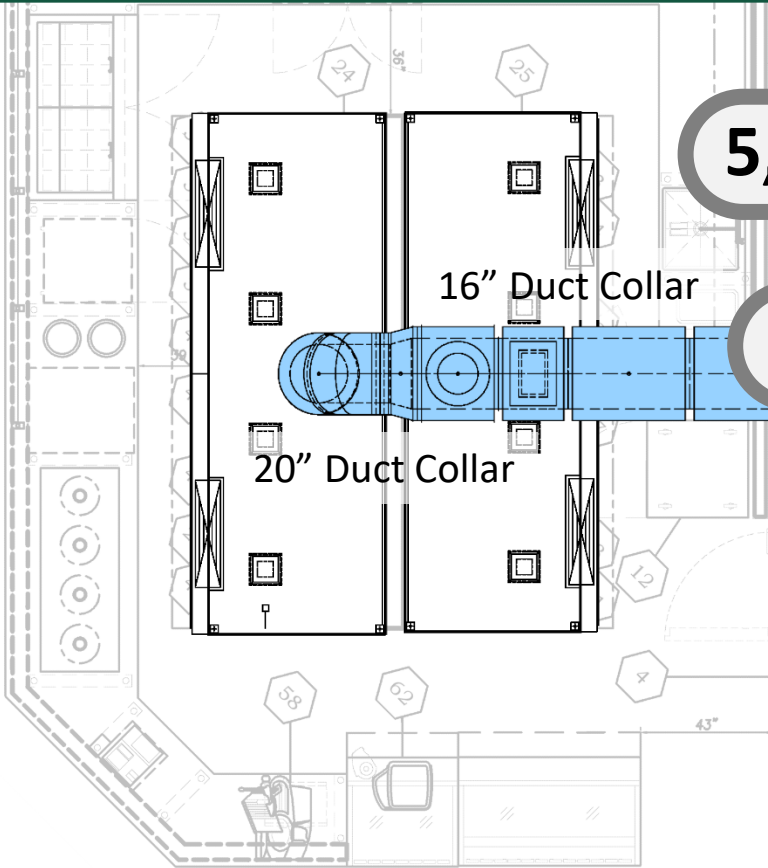
Duct
Collars

3

24"

Common
Duct

30"



High Efficiency Hoods:

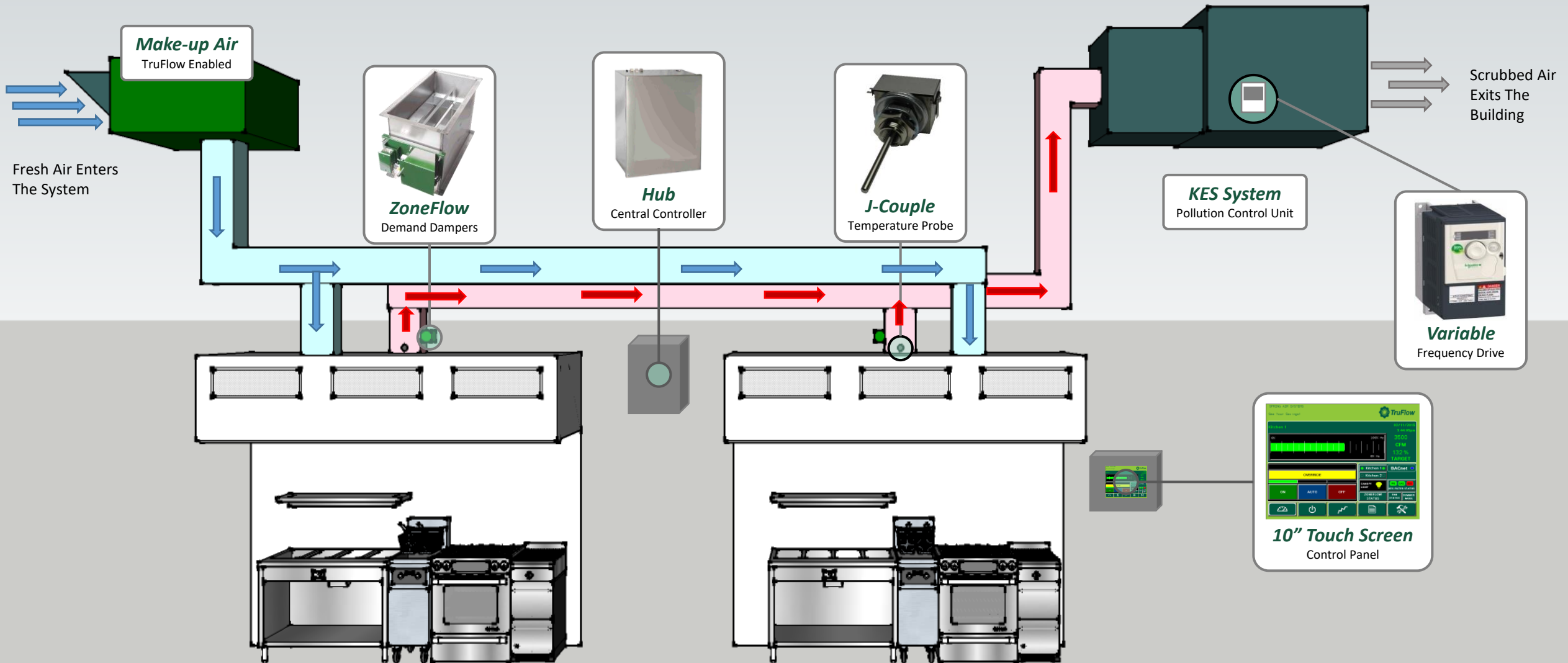
Energy Savings

	RediVent		DynaFlow	
DynaFlow Heating Savings	\$	-	\$	6,756.00
DynaFlow Latent Cooling Savings	\$	-	\$	1,044.00
Total Annual Savings	\$	-	\$	7,800.00

ASSUMPTIONS

Location	Ottawa
Operating Hours / Day	18
Operating Days / Week	7
Electricity Cost / kWh	\$0.09
Heating Cost / MMBtu	\$11.00
Winter Design Temperature	-13° Fahrenheit
Building and MUA Efficiency	0.80

Step 2: Demand Controls



About TruFlow

By modulating the volumes of exhaust and supply air in sync with the actual needs of appliances, TruFlow systems use significantly less energy than traditional systems

Recognized by the United States EPA

Spring Air Systems was just awarded the 2015 ENERGY STAR Emerging Technology Award for Demand Control Kitchen Ventilation Systems.

Savings come even without Behaviour Change...

Without any change in cooking behaviour, we find that most kitchens can save roughly 20% of their energy costs.

But are augmented with easy to understand “Nudges”

By showing Energy consumption compared to an auto-adjusting target, operators are encouraged to turn appliances down, or even off, when not in use. This reduces ventilation requirements even further and also means that appliances are using less gas or electricity – savings which can add up quickly



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND RADIATION

Mr. Josh Gardner
Spring Air Systems
1464 Cornwall Road, Unit 9
Oakville, ON – L6J7WS

June 26, 2015

Dear Mr. Gardner,

On behalf of the U.S. Environmental Protection Agency (EPA), I am pleased to inform you that the Spring Air TruFlow system has met all technical requirements to receive the 2015 ENERGY STAR® Emerging Technology Award for Demand Control Kitchen Ventilation (DCKV) Systems. Congratulations! As a recipient of the 2015 ENERGY STAR Emerging Technology Award, the TruFlow system is recognized as a promising technology that has the potential to significantly reduce greenhouse gas emissions.

EPA looks forward to working with Spring Air on efforts to promote the Award winning system in 2015. With this notification, Spring Air may discuss the Award winning status of the TruFlow system with dealers, distributors, operators, utilities, and other industry stakeholders, and use the ENERGY STAR Emerging Technology Award 2015 logo to promote the system. EPA would appreciate the opportunity to review press releases and other promotional materials that Spring Air develops in support of the Award winning system.

Should you have any questions, please contact Peter Banwell, EPA, at banwell.peter@epa.gov or (202) 343-9408.

Sincerely,

A handwritten signature in black ink, appearing to read "Ann Bailey".

Ann Bailey
Director, ENERGY STAR Product Labeling
Climate Protection Partnerships Division

TruFlow

Demand Control Ventilation

The TruFlow Demand control system gets the right amount of air to the right appliances... all while minimizing excess exhaust

Total Control

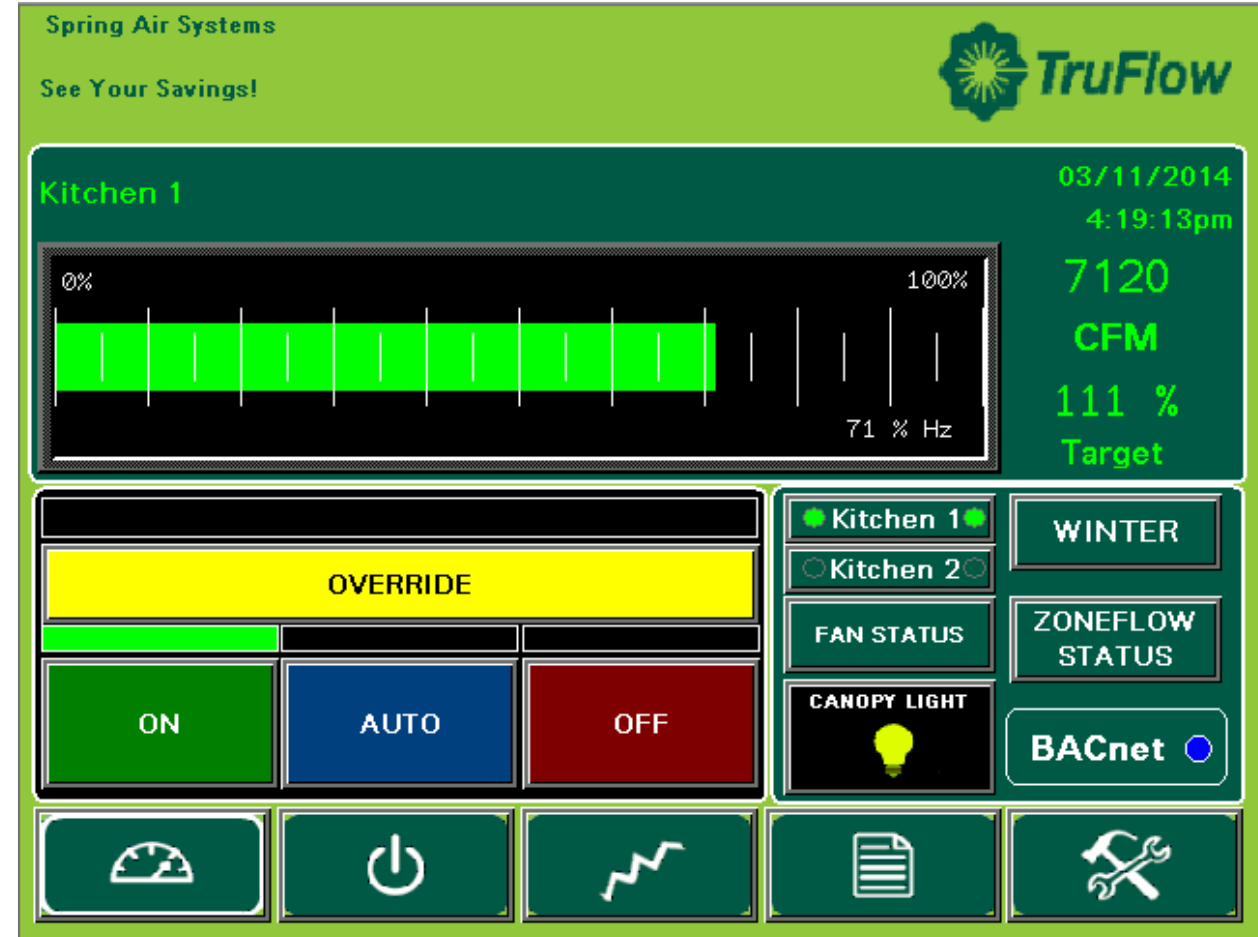
From adjusting air volumes to balancing supply air and tying into BMS systems, TruFlow gives you unprecedented control over the air in your space

A Simple Visual Cue

By changing colors based on how actual volumes compare to targeted volumes, TruFlow is a simple and easy way to coach operators to achieve better energy savings

Flexibility & Compatibility

TruFlow works with BMS systems through BACnet or LON, and can even be accessed through an internet portal. In addition to working with factory supplied drives, MUA units, and PCU's, it can also be combined with equipment from other manufacturers



TruFlow

Options to fit every application and need

TruFlow Model Comparison Chart



TruFlow
with Zoneflow



TruFlow
Original



TruFlow
Lite



TruFlow
TC

Controller Style		10" Touchscreen	10" Touchscreen	5.7" Touchscreen	Analog Panel
Compatible with Exhaust Pollution Control Systems		✓	✓	✓	✓
Number of Independant Kitchens or Zones Controlled		2	4	2	2
Number of VFD's Controlled		3	6	4	3
Number of Hoods Controlled / Monitored		12 (6 per Kitchen)	40 (10 per Kitchen)	20 (10 per Kitchen)	4
Controls Variable Flow Dampers (ZoneFlow)		✓			
Built-In Supply Proportioning for multiple MUA's		✓	✓	✓	Stepped Only
Primary Modulation Means		Continuously Variable	Continuously Variable	Continuously Variable	Stepped
Programmable Appliance Based Sensitivity		✓	✓	✓	
Modulation Range (% of Full Capacity) - Direct Gas MUA		50 - 100%	50 - 100%	50 - 100%	50 - 100%
Modulation Range (% of Full Capacity) - Indirect Gas MUA		0 - 100%	0 - 100%	0 - 100%	0 - 100%
Estimated Annual Energy Savings vs. Straight Exhaust		45.0%	35.1%	35.1%	31.7%
Real Time Energy Savings		✓	✓	✓	
User Adjustable Energy Savings Goal		✓	✓		
Auto Optimizing Energy Reduction Goals		✓	✓		
Connection Type		CAT-5	CAT-5	CAT-5	Twisted Pair
BMS Compatability		BACnet, Lon, Modbus	BACnet, Lon, Modbus	BACnet, Lon, Modbus	
Auxillary Fans interlocked with Supply Volume		✓	✓	✓	
Thermal Start		✓	✓	✓	Optional
Infared Detection Enabled	OPTIONAL	✓	✓		
Optical Capture Sensor	OPTIONAL	✓	✓		
Internet Accessible	OPTIONAL	✓	✓		
Email Alert Generator (TruFlow Talk)	OPTIONAL	✓	✓		

CKV Controls

Energy Savings

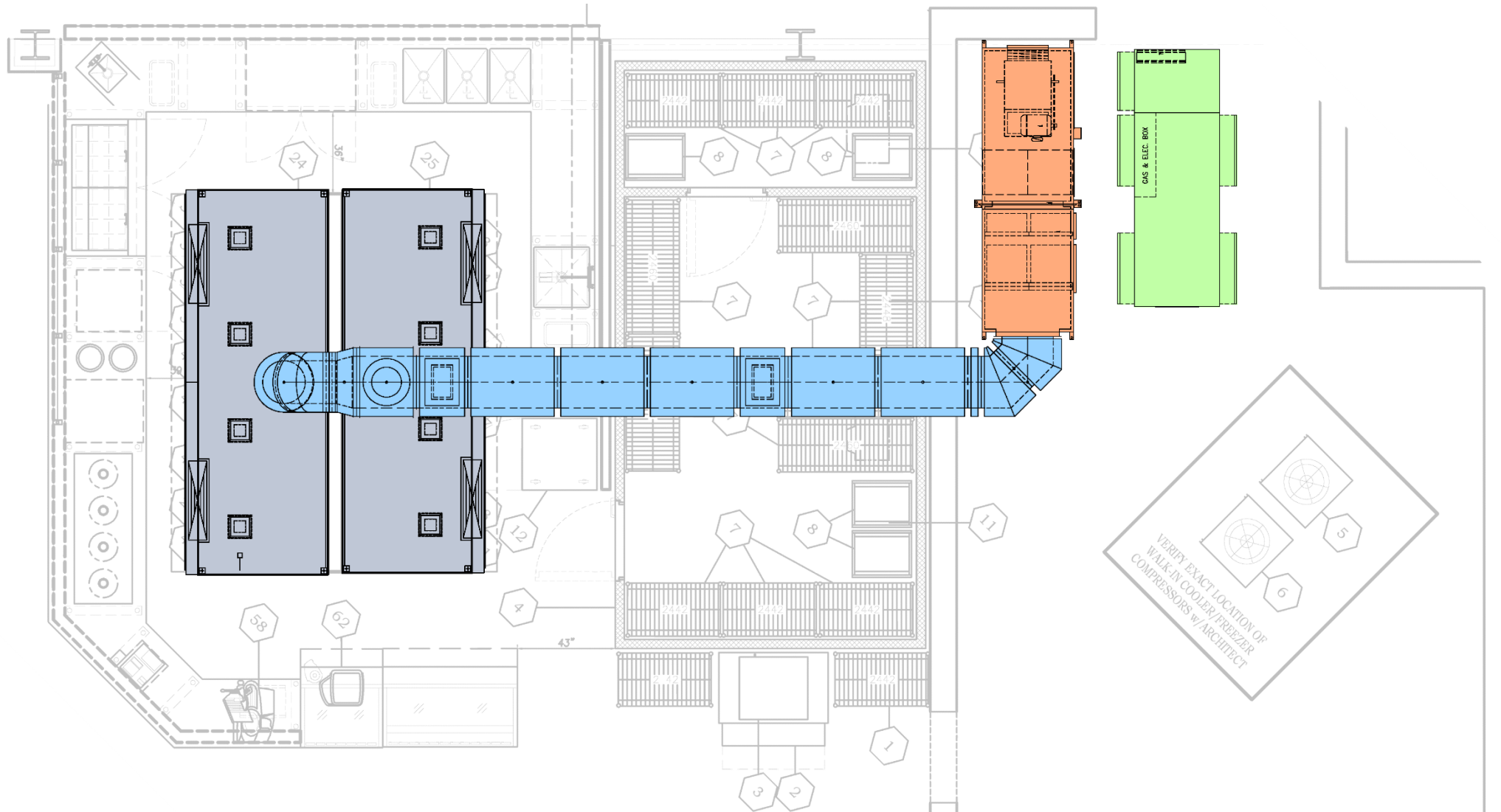
	RediVent <i>no TruFlow</i>		DynaFlow <i>no TruFlow</i>		DynaFlow <i>TruFlow Lite</i>	
DynaFlow Heating Savings	\$	-	\$	6,756.00	\$	6,756.00
DynaFlow Latent Cooling Savings	\$	-	\$	1,044.00	\$	1,044.00
TruFlow Heating Savings	\$	-	\$	-	\$	4,693.00
TruFlow Cooling Savings	\$	-	\$	-	\$	704.00
TruFlow Motor Savings	\$	-	\$	-	\$	1,748.00
Total Annual Savings	\$	-	\$	7,800.00	\$	14,945.00



Minimizing Capital Costs

Pay today or Pay Tomorrow

Our Example Project



Designing with Capital Costs in Mind

	Redi-Vent <i>Base Controls</i>	DynaFlow <i>Base Controls</i>	DynaFlow <i>TruFlow Lite</i>
Hood 1	\$6,442	\$10,551	\$10,551
Hood 2	\$6,354	\$10,978	\$10,978
Control Panel	\$1,307	\$1,390	\$9,561
	\$14,103	\$22,919	\$31,090

Engineered Duct – *Tying it all together*

Engineered ducts are designed, produced, and listed to provide a simple, elegant, and affordable alternative to field welded grease duct



Consistent Quality

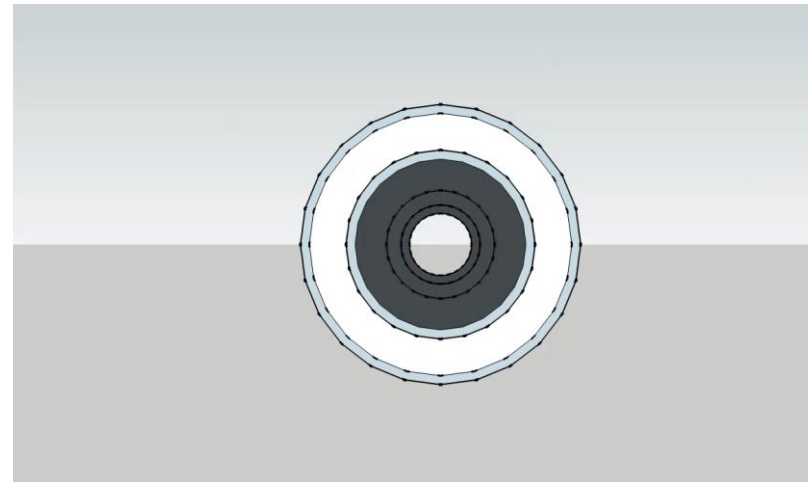
A majority of welds are done by machine, and those that aren't are done by highly trained technicians who weld ducts all day every day

UL Tested and Listed

Ducts are rigorously tested against codes and standards. Manufacturing is subject to random inspections & is held to a very high standard

Aesthetically Pleasing

Finish options range from Aluminized Steel to a 2b polished stainless make engineered duct a perfect option for spaces with exposed ceilings.



Engineered Duct – *Tying it all together*

Duct Type	Required slope / ft	Duct Run Length				
		25'	50'	75'	100'	150'
Engineered > 75'	0.0625	1.56	3.13	4.69		
Field < 75'	0.2500	6.25	12.50	18.75		
Engineered < 75'	0.1875				18.75	28.13
Field >75'	1.0000				100.00	150.00
Engineered - Stagger Sloped	0.0625	0.78	1.56	2.34	9.38	14.06

Greatly reduced Slope Requirements

Engineered duct only requires a 0.5% slope, vs Field Fabricated requiring 2% if less than 75' and 8% on longer runs.

Eliminate the need & cost to wrap

Because of the ceramic insulation and the tested listing process, Zero Clearance duct can be run right up to all materials. Generally if wrap is necessary the engineered duct actually becomes the cheaper option!

Improved Static, Drainage, and Efficiency

Reduced static and better drainage increase operating efficiency by requiring smaller fans and motors and reducing cleaning requirements



Comparing Equipment

	RediVent <i>no TruFlow</i>	DynaFlow <i>no TruFlow</i>	DynaFlow <i>TruFlow Lite</i>
Exhaust	7,998	5,117	5,117
Supply	6,798	4,356	4,356
KES	KES80-80 Maxed Out Air Volumes	KES60-51 Plenty of Capacity	KES60-51 Plenty of Capacity Variable Speed Drive Max-Flow Filter Extender
MUA Unit	SAA18 Plenty of Capacity	SAA12 Plenty of Capacity	SAA12 Plenty of Capacity Variable Speed Drive

Capital Costs vs. Operating Costs

	RediVent <i>no TruFlow</i>	DynaFlow <i>no TruFlow</i>	DynaFlow <i>TruFlow Lite</i>
Capital Cost	\$87,753	\$87,682	\$101,481
DynaFlow Heating Savings	\$0	\$6,756	\$6,756
DynaFlow Latent Cooling Savings	\$0	\$1,044	\$1,044
TruFlow Heating Savings	\$0	\$0	\$4,693
TruFlow Cooling Savings	\$0	\$0	\$704
TruFlow Motor Savings	\$0	\$0	\$1,748
Total Annual Savings	\$0	\$7,800	\$14,945
Payback (In Months)		-0.11	11.02
10 Year Savings		\$78,071	\$135,722

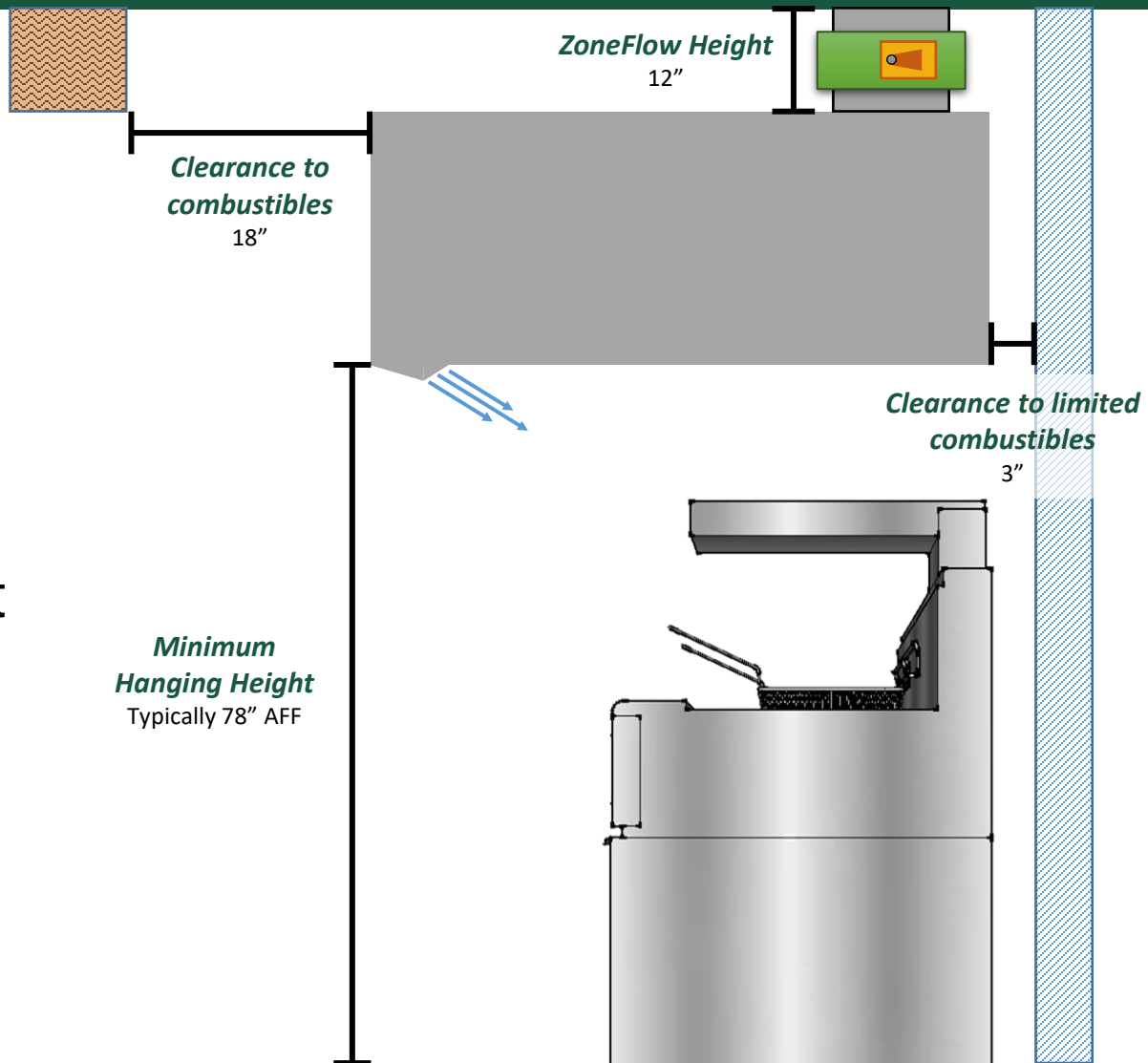


New Products

Innovation through Research & Development

Solving Clearance Issues

- Space is at a premium
- Site conditions
 - Height Restrictions
 - Fire Clearances
 - Doors
 - Unknowns...
 - Let alone accessing equipment once it's installed...



UltraFlow UV Hoods

- Clean, Environmentally Friendly Technology
- Improves Exhaust Efficiency
- Reduced Grease, Fat, and Odours

The logo for JIMCO UV-C & OZONE Technology. It features the word "JIMCO" in a bold, white, sans-serif font. To the right of "JIMCO" is a red graphic element resembling a stylized flame or a drop. To the right of this graphic, the words "UV-C & OZONE" are written in a smaller, white, sans-serif font, with "Technology" written in an even smaller font below it.

JIMCO
UV-C & OZONE
Technology

Basic Kitchen Exhaust

- Heat + Food = Exhaust laden with Aerosolized Organic Compounds
 - A 2001 Study showed that meat cooking operations accounted for 21% of fine Organic Particulate Matter released into the atmosphere
 - There are thousands of organic compounds created during the cooking process
 - These compounds have a wide range of volatility and are responsible for both odours and pollution
- Currently, municipalities have a wide range of codes and regulations to address the pollution associated with cooking
 - Most focus on Immediate Safety (NFPA 96)
 - Can also deliver against secondary environmental concerns
 - Some jurisdictions are starting to address environmental concerns at the primary level

Current Filtration Technology

Primary Filtration

This is often times the only filtration required by local jurisdiction, and consists of filtration that happens in the hood (Baffle, Mesh, Cartridge)



Secondary Filtration

Filtration units that are found between the hood and discharge to atmosphere (Mechanical Filtration, Electrostatic precipitators)



Enhanced Filtration

Additional filtration technologies that go above and beyond current code and regulatory requirements (Ozone, UV)



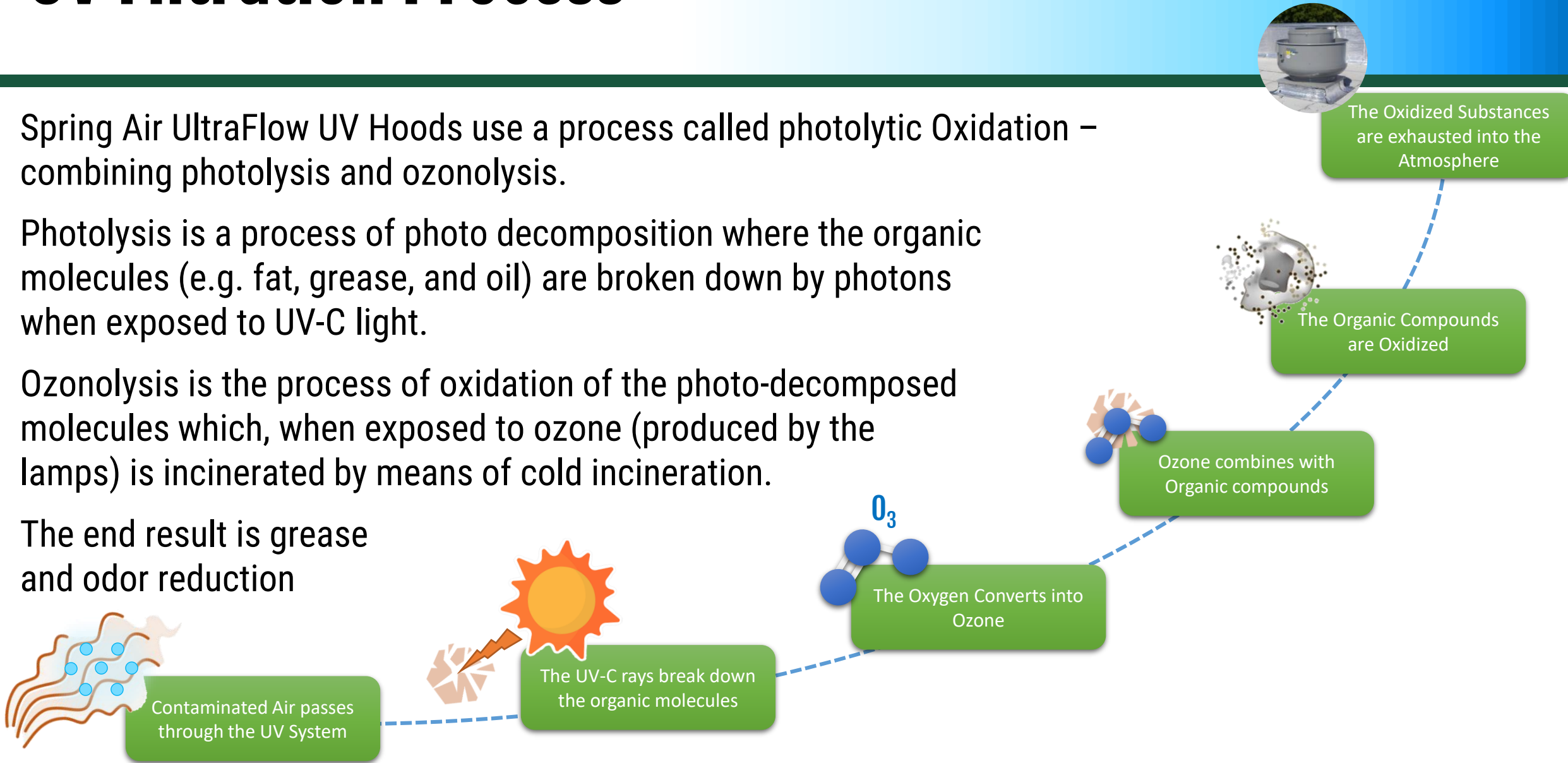
UV Filtration Process

Spring Air UltraFlow UV Hoods use a process called photolytic Oxidation – combining photolysis and ozonolysis.

Photolysis is a process of photo decomposition where the organic molecules (e.g. fat, grease, and oil) are broken down by photons when exposed to UV-C light.

Ozonolysis is the process of oxidation of the photo-decomposed molecules which, when exposed to ozone (produced by the lamps) is incinerated by means of cold incineration.

The end result is grease and odor reduction



UV Results



Fryer Duct **with** JIMCO UV-C Technology - not cleaned for 60 months

Fryer Duct **without** JIMCO UV-C Technology - not cleaned for 12 months :



Hood **with** JIMCO UV-C Technology - not cleaned for 6 months

Hood **without** JIMCO UV-C Technology - not cleaned for 6 months



Inspection Hatch **with** JIMCO UV-C Technology - not cleaned for 60 months

Inspection Hatch **without** JIMCO UV-C Technology - not cleaned for 12 months



UV Benefits

- Environmentally Friendly
 - Reduces Grease and Odour Emissions
- Increased Efficiency
 - Fans and other components require less energy
- Reduced Maintenance
 - Less Frequent Duct and Hood Cleaning Required
 - Reduced Filter consumption in media based Filtration Units
- Reduced Risk of Fire
 - Grease buildup in the system is greatly reduced

Why Choose UltraFlow by Spring Air?

- Partnering with Industry Leader
 - Jimco was the original inventor of the UV technology used in kitchen hoods and hold multiple patents for the process
- Only independently certified UV system
 - ETV – Environmental Technology Verification
 - Reduced Grease in exhaust by 50- 85%
 - Reduced Odours by 44-91%
- Appliance based specifications
- Reduced Filter Cost Guarantee

Choosing the right CKV solution

- There are Lots of Variables
 - Equipment
 - Exhaust Volume
 - Height Restrictions
 - Fire Clearances
 - Budgets
 - Operating Schedule
- That's why we're here
 - Knowledge & Experience
 - Enable Conversations with Mechanical Engineers & Owners

In Summary

Agenda for the Day

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 - Codes & Regulations
- Maximizing Energy Savings
 - Hoods
 - Controls
 - Energy Recovery
- Minimizing Capital Costs
 - Cheap Hoods vs. Reduced
 - Equipment Comparison
 - Payback & ROI
- Questions & Follow-up

Maximizing Energy Savings:

The 3-step Method

1. Hoods
2. Controls
3. Heat Recovery



We have covered a lot of ground

We typically prefer energy efficient solutions

But what matters most is Happy Customers



Minimizing Capital Costs
Pay today or Pay Tomorrow

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Maximizing Energy Savings:

The 3-step Method

1. Hoods
2. Controls
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We

Prefer

Happy Customers



Minimizing Capital Costs
Pay today or Pay Tomorrow

Any Questions,

Comments, or Nasty Remarks?



A modern dining room with long wooden tables, white chairs, and a large mural on the wall. The room has a bright, airy feel with large windows and exposed ceiling pipes. The text "Appendix & Extra Materials" is overlaid in the center.

Appendix & Extra Materials

springairsystems.com | 1.866.874.4505

NFPA 96 – Common Questions

- What Type of Hood do I need?
- What exhaust Volume does NFPA Mandate?
- What type of Make-up Air should I use?
- How Much clearance is required between the hood and ...?
- Do I require demand ventilation?
- Which version of NFPA 96 should I use?

Annual Energy Savings Generated through the use of Demand Control Kitchen Ventilation



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Objective & Methodology

OBJECTIVE

Calculate the average annual Energy savings that can be obtained by utilizing Demand Control Kitchen Ventilation for Various locations across Canada.

Hood Sizes & CFM Air Flows

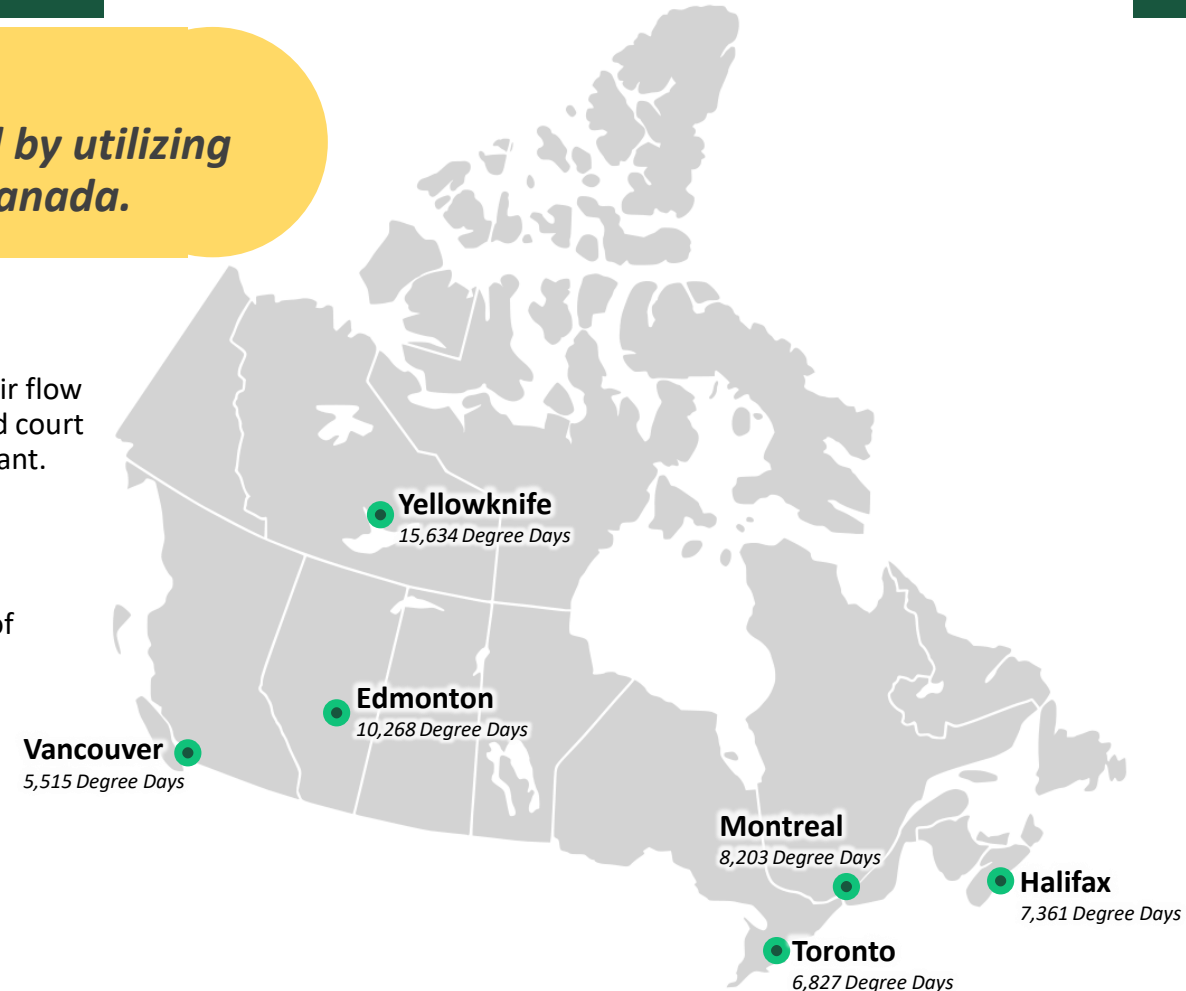
We calculate our energy savings based on a 10' and 20' hood ventilation system with an average Air flow of 300 CFM/linear foot of hood. A 10' hood would approximate the requirements of a smaller food court style restaurant while a 20' system would be closer to meeting the needs of a larger eat-in restaurant.

Degree Days

In the Canadian marketplace, Supply Air is commonly only tempered by heating during the cooler months. As such, our calculations use historical "Degree Day" information to calculate the volume of fresh air that will need to be tempered prior to entering the kitchen. Historical Degree days are shown at right.

Turn Down / Savings Level

In traditional kitchens, the Ventilation system is operating at 100% capacity from Open to Close. Our savings reflect a **very moderate** turn down to 50% capacity for 30% of operating hours. This reflects time when the kitchen is operating, but high levels of exhaust are unnecessary (prep time, baking, clean-up, etc...)



3,000 CFM System (10' Hood)

EXHAUST VOLUME COMPARISON

	Straight Exhaust	TruFlow System
Total Hood Exhaust	3,000	3,000
Average Daily Exhaust	3,000	2,400
Average Heated Kitchen Air	2,400	1,920
Average Heated Dining Room Fresh Air	600	480

MUNICIPALITY:

	Vancouver	Toronto	Halifax	Montreal	Edmonton	Yellowknife
Degree Days	5,515	6,827	7,361	8,203	10,268	15,634
Straight Exhaust Heating Energy Cost	\$ 3,083.54	\$ 3,817.11	\$ 4,115.68	\$ 4,586.45	\$ 5,741.03	\$ 8,741.27
TruFlow System Heating Energy Cost	\$ 2,466.83	\$ 3,053.68	\$ 3,292.54	\$ 3,669.16	\$ 4,592.83	\$ 6,993.01
HEATING ENERGY COST - ANNUAL SAVINGS	\$ 616.71	\$ 763.42	\$ 823.14	\$ 917.29	\$ 1,148.21	\$ 1,748.25
Straight Exhaust Motor Cost	\$ 1,286.47	\$ 1,286.47	\$ 1,286.47	\$ 1,286.47	\$ 1,286.47	\$ 1,286.47
TruFlow Motor Cost	\$ 863.97	\$ 863.97	\$ 863.97	\$ 863.97	\$ 863.97	\$ 863.97
MOTOR ELECTRICITY COST - ANNUAL SAVINGS	\$ 422.50	\$ 422.50	\$ 422.50	\$ 422.50	\$ 422.50	\$ 422.50
TOTAL ANNUAL SAVINGS	\$ 1,039.21	\$ 1,185.92	\$ 1,245.63	\$ 1,339.79	\$ 1,570.71	\$ 2,170.75

MOTOR OPERATION ASSUMPTIONS

Exhaust %	TruFlow Operation			Standard Operation		
	Derated output (KW/HP)	Average Run Time (% of Total)	KW/HP x Run Time %	Derated output (KW/HP)	Average Run Time (% of Total)	KW/HP x Run Time %
100	0.746	50	0.373	0.746	100	0.746
90	0.567	5	0.028	0.567	0	0
80	0.44	5	0.022	0.44	0	0
70	0.313	5	0.016	0.313	0	0
60	0.205	5	0.01	0.205	0	0
50	0.173	30	0.052	0.173	0	0
	Effective KW/hp:		0.501	Effective KW/hp:		0.746

HEATING COST ASSUMPTIONS

Operating Hours / Day	14.00	
Energy Cost (\$/m3)	\$ 0.3449	
Energy Cost (\$/MM BTU)	\$ 9.7705	converted at 35,300 BTU / m3
MAU Heating Efficiency	0.80	
Building Heating Efficiency	0.80	

MOTOR COST ASSUMPTIONS

Cost Per Kilowatt Hour	\$ 0.1128
Fan motor load factor	0.90
Motor Efficiency	0.90
Motor HP	3.00

6,000 CFM System (20' Hood)

EXHAUST VOLUME COMPARISON

	Straight Exhaust	TruFlow System
Total Hood Exhaust	6,000	6,000
Average Daily Exhaust	6,000	4,800
Average Heated Kitchen Air	4,800	3,840
Average Heated Dining Room Fresh Air	1,200	960

MUNICIPALITY:	Vancouver	Toronto	Halifax	Montreal	Edmonton	Yellowknife
Degree Days	5,515	6,827	7,361	8,203	10,268	15,634
Straight Exhaust Heating Energy Cost	\$ 6,167.08	\$ 7,634.21	\$ 8,231.35	\$ 9,172.91	\$ 11,482.07	\$ 17,482.53
TruFlow System Heating Energy Cost	\$ 4,933.67	\$ 6,107.37	\$ 6,585.08	\$ 7,338.33	\$ 9,185.66	\$ 13,986.03
HEATING ENERGY COST - ANNUAL SAVINGS	\$ 1,233.42	\$ 1,526.84	\$ 1,646.27	\$ 1,834.58	\$ 2,296.41	\$ 3,496.51
Straight Exhaust Motor Cost	\$ 2,572.93	\$ 2,572.93	\$ 2,572.93	\$ 2,572.93	\$ 2,572.93	\$ 2,572.93
TruFlow Motor Cost	\$ 1,727.94	\$ 1,727.94	\$ 1,727.94	\$ 1,727.94	\$ 1,727.94	\$ 1,727.94
MOTOR ELECTRICITY COST - ANNUAL SAVINGS	\$ 845.00	\$ 845.00	\$ 845.00	\$ 845.00	\$ 845.00	\$ 845.00
TOTAL ANNUAL SAVINGS	\$ 2,078.41	\$ 2,371.84	\$ 2,491.27	\$ 2,679.58	\$ 3,141.41	\$ 4,341.51

MOTOR OPERATION ASSUMPTIONS

Exhaust %	TruFlow Operation			Standard Operation		
	Derated output (KW/HP)	Average Run Time (% of Total)	KW/HP x Run Time %	Derated output (KW/HP)	Average Run Time (% of Total)	KW/HP x Run Time %
100	0.746	50	0.373	0.746	100	0.746
90	0.567	5	0.028	0.567	0	0
80	0.44	5	0.022	0.44	0	0
70	0.313	5	0.016	0.313	0	0
60	0.205	5	0.01	0.205	0	0
50	0.173	30	0.052	0.173	0	0
	Effective KW/hp:		0.501	Effective KW/hp:		0.746

HEATING COST ASSUMPTIONS

Operating Hours / Day	14.00
Energy Cost (\$/m3)	\$ 0.3449
Energy Cost (\$/MM BTU)	\$ 9.7705
MAU Heating Efficiency	0.80
Building Heating Efficiency	0.80

converted at 35,300 BTU / m3

MOTOR COST ASSUMPTIONS

Cost Per Kilowatt Hour	\$ 0.1128
Fan motor load factor	0.90
Motor Efficiency	0.90
Motor HP	3.00

Stadium Complex

Commercial Kitchen Ventilation Proposal



springairsystems.com | 1.866.874.4505

Proposal Comparison Overview

OBJECTIVE

Enable S20 and ME to easily compare our conventional “Redi-Vent” filter exhaust hoods to our high efficiency “DynaFlow” offering

Knowing that the project is tight from a budget perspective and has a significantly limited number of operational hours per year, we are focusing on:

- **Capital Cost of Hoods**
- **Total Exhaust Requirements**
- **Number of Ducts and Duct Size Requirements**
- **Capital Cost of Air Handling Equipment required for System**

Capital Cost Comparison of Hoods

Redi-Vent *Straight Filter Hoods*

Redi-Vent is engineered to maximize hood performance while minimizing capital expenditure requirements

\$85,145

Capital Cost

Using Redi-Vent as a base, and enhancing widths we were able to exactly match the drawings provided

35

Number Of Hoods

Because Fire Suppression is based on the appliance line-up the cost will be the same for either set of hoods

=

Cost of Fire Suppression

=

High Efficiency Hoods DynaFlow

DynaFlow is engineered Specifically for Energy Savings, but often reduces capital costs in other areas

\$207,615

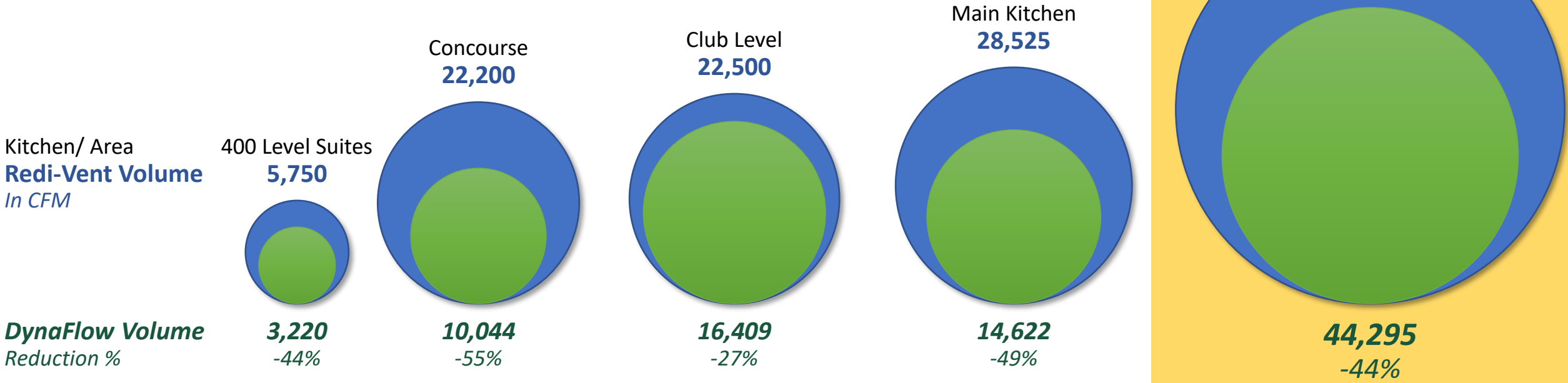
Because DynaFlow is only listed to 14' Lengths we had to add an incremental hood to the Main Kitchen (Hood H)

36

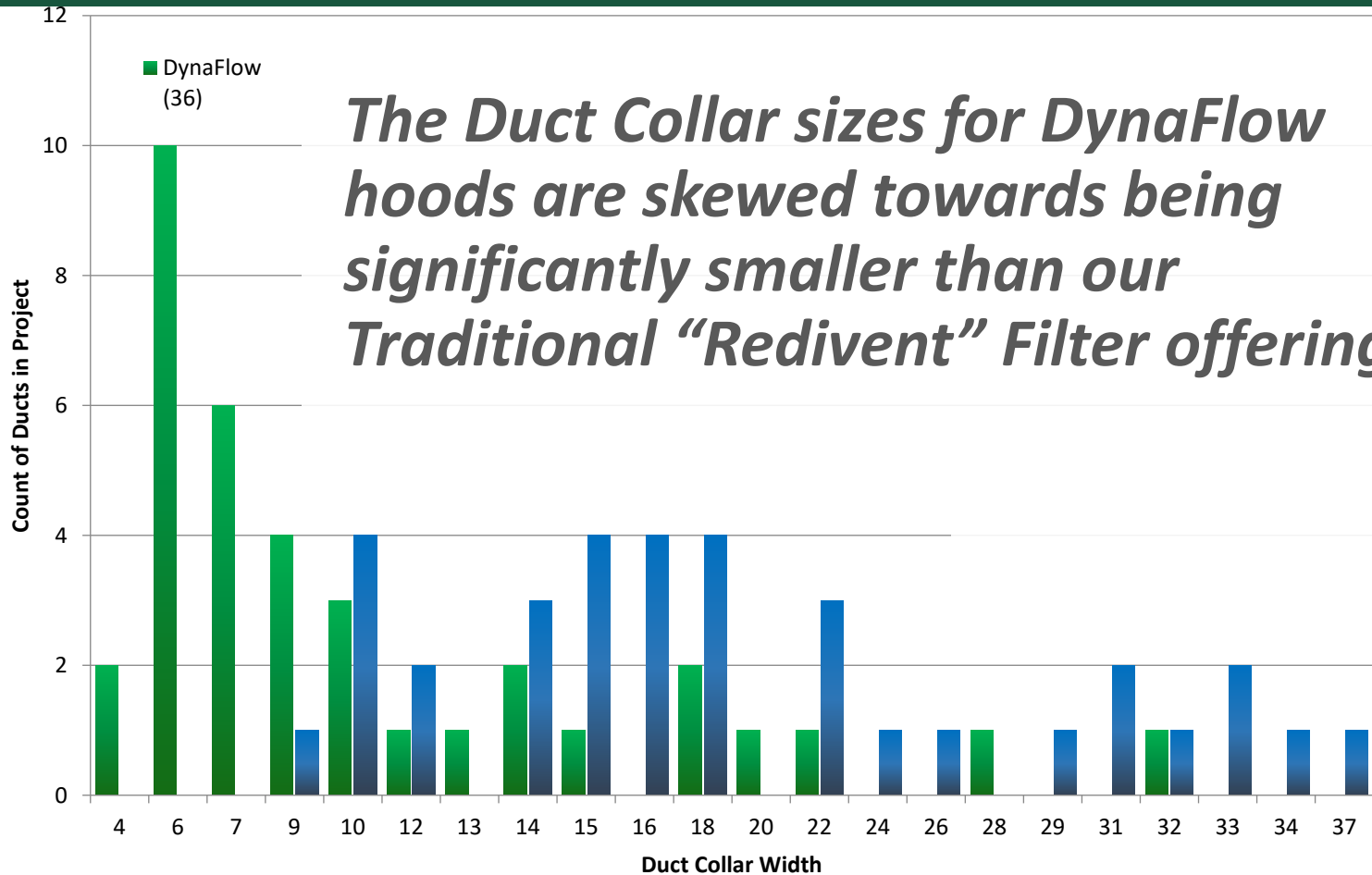
Where Cooking Line-ups are finalized we can provide costs for ANSUL R102 Systems to be pre-piped and field installed

Total Exhaust Requirements

By utilizing the High Efficiency DynaFlow hoods, we've been able to cut exhaust volumes by 44%



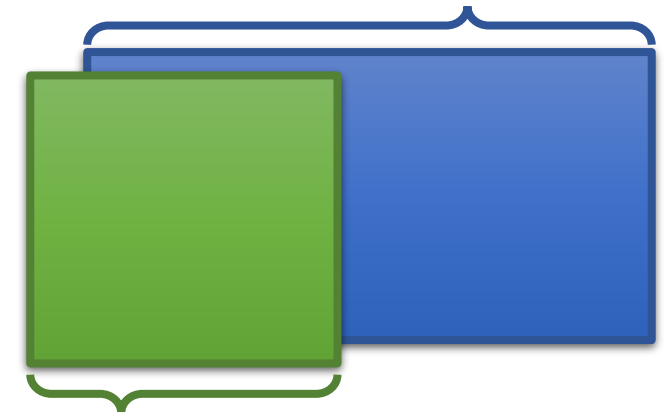
Duct Collars: Sizes & Quantities



The Duct Collar sizes for DynaFlow hoods are skewed towards being significantly smaller than our Traditional “Redivent” Filter offering

Average Duct Width

RediVent: 19.63”



DynaFlow: 10.61”

The average duct size for the DynaFlow system is greatly reduced vs. the Redi-Vent option. We Can also provide round duct collars if desired

All our rectangular duct collars have a 10” “Height”

Air Handling – First Cost of Equipment

Reducing total Exhaust Volumes allows for smaller pollution Control Units which adds up to substantial savings, **Air Handling units should encounter similar savings in volume and conditioning tonnage**

	400 Level	Concourse	Club Level	Main Kitchen	Total
Redi-Vent CFM	5,750	22,200	22,500	28,525	78,975
Model	KES60	KES240	KES240	KES320	4 Units
Capital Cost	\$29,568	\$76,291	\$76,291	\$98,981	\$281,131
DynaFlow CFM	3,220	10,044	16,409	14,622	44,295
Model	KES40	KES120	KES180	KES160	4 Units
Capital Cost	\$25,795	\$44,208	\$56,616	\$53,232	\$179,851
Savings	-\$3,773	-\$32,083	-\$19,675	-\$45,749	-\$101,280

While models and capabilities might change based on design and specifications, what we've used here is:

- Indoor Horizontal Configuration
- Mechanical Separation
- 4" Pre-filter
- Spray based odor elimination
- MaxFlow: VFD Enabled fans to maintain static pressure and extend filter lives

In Summary

While we can't quite recoup the incremental cost to go to DynaFlow, We believe there are still significant savings that will be found in ductwork and Supply Air Systems

Hood Cost
Number of Hoods
Total Exhaust Volume (CFM)
Exhaust Duct Collars
Average Duct Collar Size

	Redi-Vent	DynaFlow
Hood Cost	\$ 85,145	\$ 207,615
Number of Hoods	35	36
Total Exhaust Volume (CFM)	78,975	44,295
Exhaust Duct Collars	35	36
Average Duct Collar Size	10" x 19.63"	10" x 10.61"
PCU Savings:		-\$101,280
Duct Savings:		???
MUA Savings:		???

As Cooking Line-ups continue to develop and additional hoods are issued, please keep feel free to reach out to us at any time for updated figures, drawings, quotes, or design challenges that you are facing.

KES Pollution Control Systems

Our KES systems have UL 710 & ULc 647 listings & permit side-wall discharge at street level... allowing for installation virtually anywhere!

Real-Time Monitoring

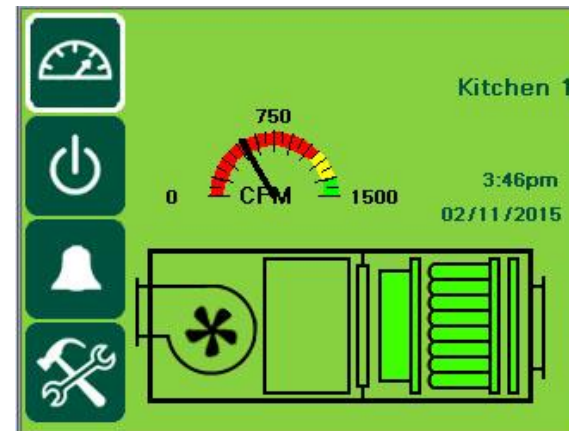
A Kitchen Mounted Screen shows real time static pressure, and corresponding filter statuses, at each filter; providing live information about performance

MaxFlow Filter Optimization

As Filters load with particulate, our system speeds up to maintain constant static – prolonging filter life by 20%!

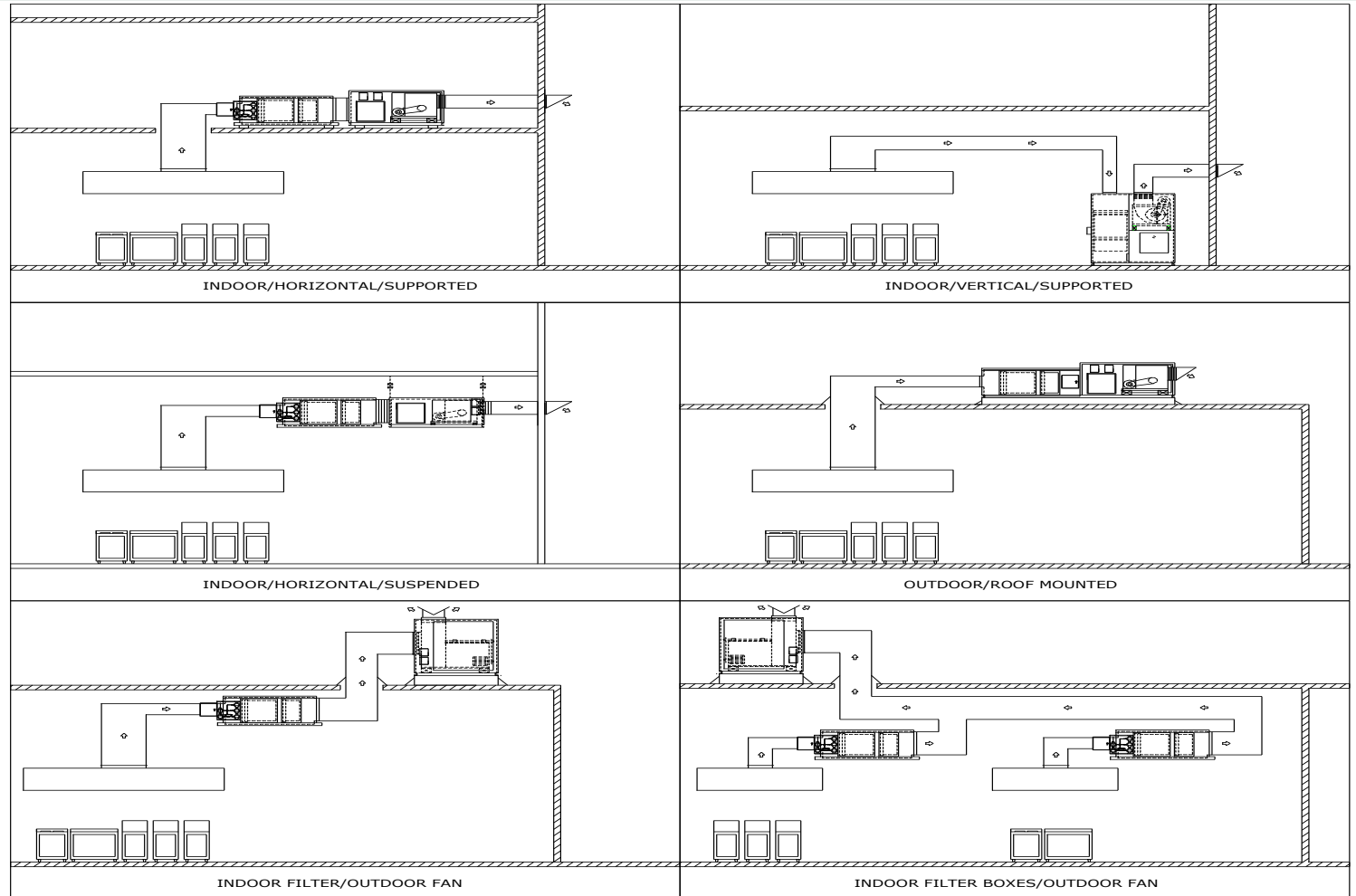
Odor Control

Spring Air KES systems can use Spray or Pellets to mask or eliminate odors to allow discharge in populated areas



KES – Configurations to meet your needs

Various configurations allow the flexibility and freedom to have a commercial Kitchen anywhere



Engineered Duct – Tying it all together

Engineered ducts are designed, produced, and listed to provide a simple, elegant, and affordable alternative to field welded grease duct



Consistent Quality

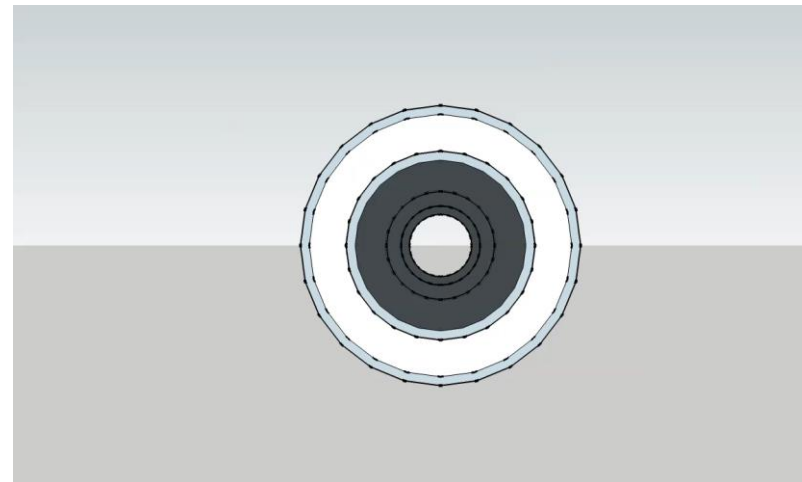
A majority of welds are done by machine, and those that aren't are done by highly trained technicians who weld ducts all day every day

UL Tested and Listed

Ducts are rigorously tested against codes and standards. Manufacturing is subject to random inspections & is held to a very high standard

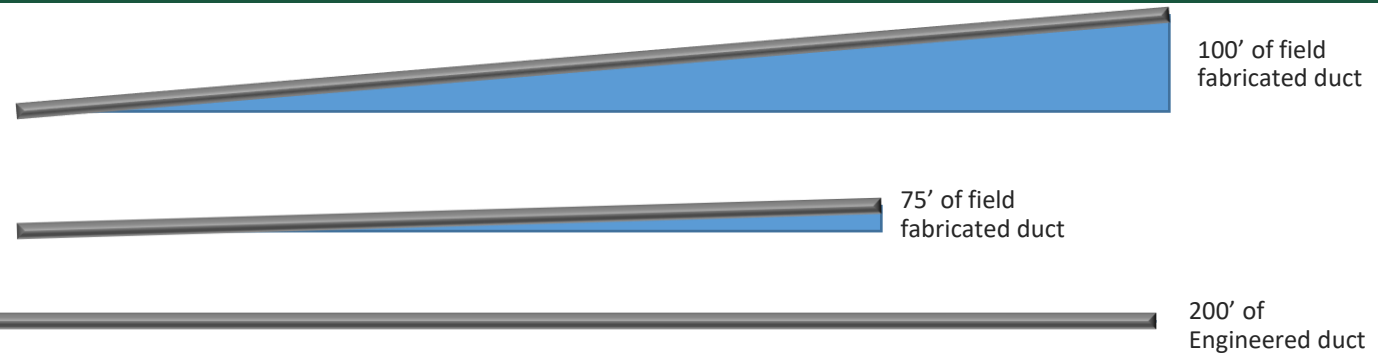
Superior Specifications

Because of the structural integrity and it's ability to shed grease, Engineered duct can go places and do things that field fabricated duct cannot



Engineered Duct – Tying it all together

Duct Type	Required slope / ft	Duct Run Length		
		25'	50'	100'
Engineered	0.0625	1.56	3.13	6.25
Field < 75'	0.2500	6.25	12.50	25.00
Field >75'	1.0000			100.00



Greatly reduced Slope Requirements

Engineered duct only requires a 0.5% slope, vs Field Fabricated requiring 2% if less than 75' and 8% on longer runs.

Eliminate the need & cost to wrap

Because of the ceramic insulation and the tested listing process, Zero Clearance duct can be run right up to all materials. Generally is wrap is necessary the engineered duct actually becomes the cheaper option!

Aesthetically Pleasing

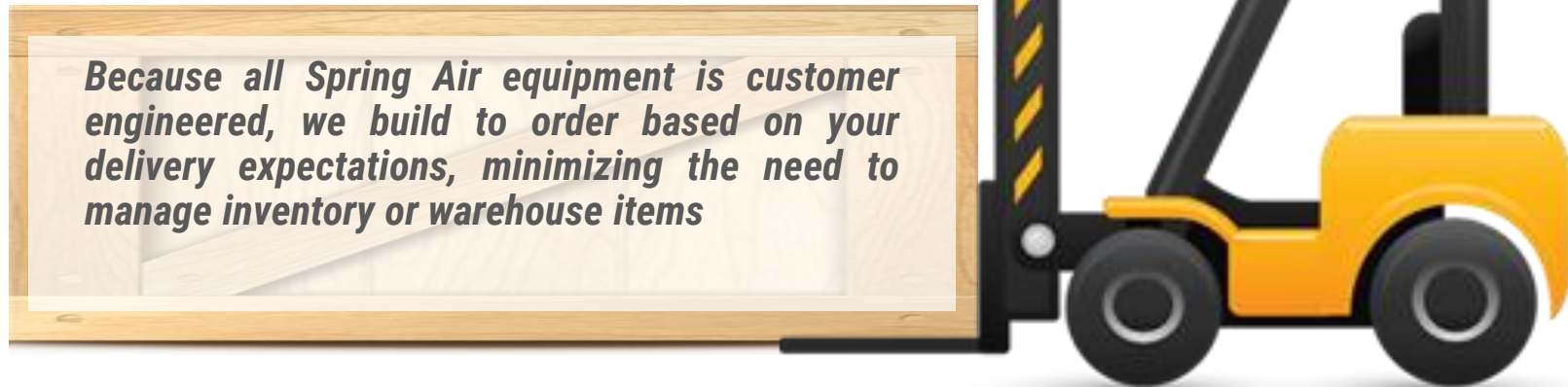
Finish options range from Aluminized Steel to a 2b polished stainless make engineered duct a perfect option for spaces with exposed ceilings.



Freight / Inventory / Warehousing

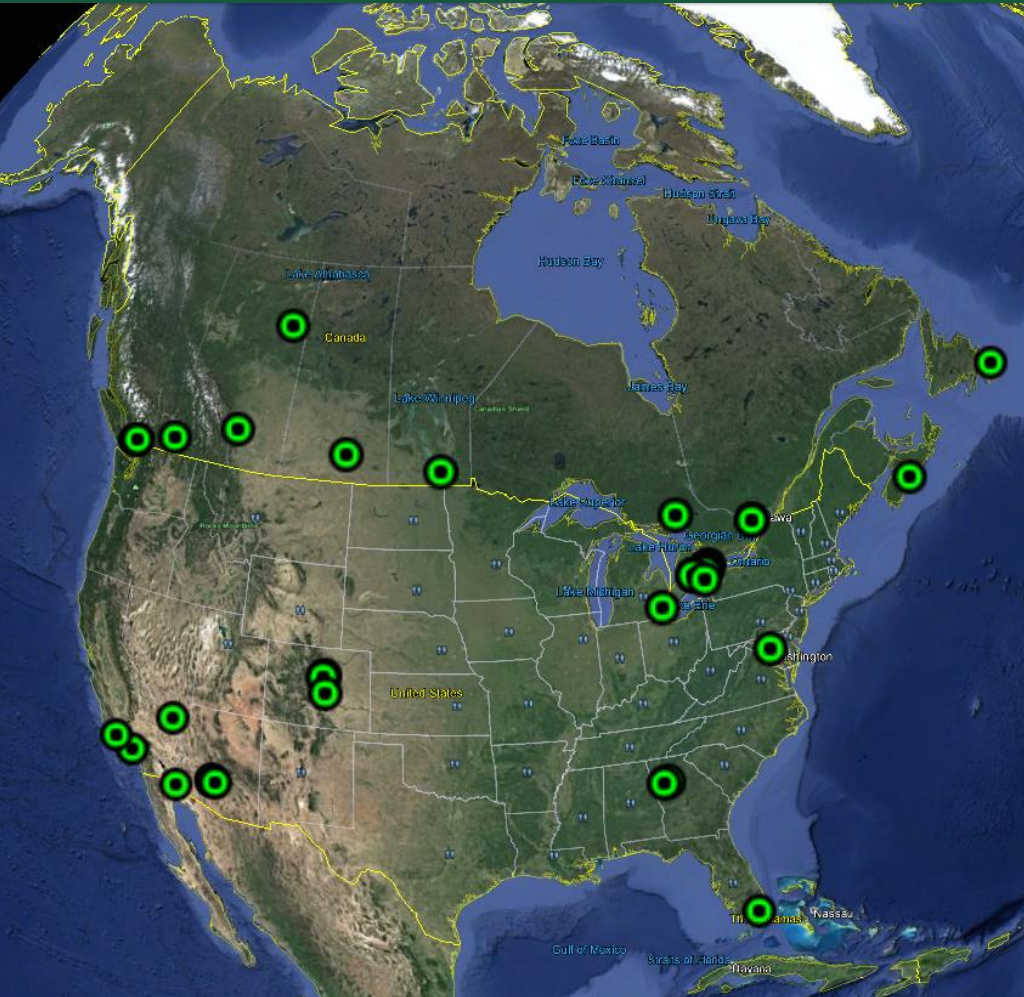
Warehouse & Plant Space

While we don't actively warehouse items, we do have sufficient space at our production facilities and warehouse to store items temporarily should the jobsite experience delays – we know this can happen.



Because all Spring Air equipment is customer engineered, we build to order based on your delivery expectations, minimizing the need to manage inventory or warehouse items

Service Coverage – Canada & USA



The Spring Air Service Network is most dense in Canada but covers much of North America

Factory Trained

Established territories have technicians that have been identified, trained, and supported by Spring Air head office.

Expandable

As Spring Air Sells into new Areas, our service department is notified and begins the search for a local technician. Once identified, our head office will accompany the technician until he is satisfactorily trained.

Factory Supported

In the event of more complex start-ups or trouble-shooting issues, Spring Air can send out a head office service manager to visit the site with the local technician. This means that issues are addressed, and service technicians can increase their capabilities

Single Point of Contact Service

When any component of the Exhaust System fails, we generally get the call and are charged with responding

Local

Technicians will be in close proximity to locations with a better understanding for sourcing required parts & managing local codes or requirements

Quickest Response

Many of our service partners offer 24/7 service and being local means that they should be onsite in a quick and efficient manner

Fixed. Then Figured out

Technicians are charged with getting the restaurant up and running. For issues that occur under warranty the store will never see a bill. Work performed outside of warranty agreement will be billed to the store.

Head Office Option

Spring Air Systems will happily field calls directly, trouble shoot, and arrange service for locations during our normal business hours (M-F 9:00am – 5:00pm)

