FläktGroup®
SEMCO®

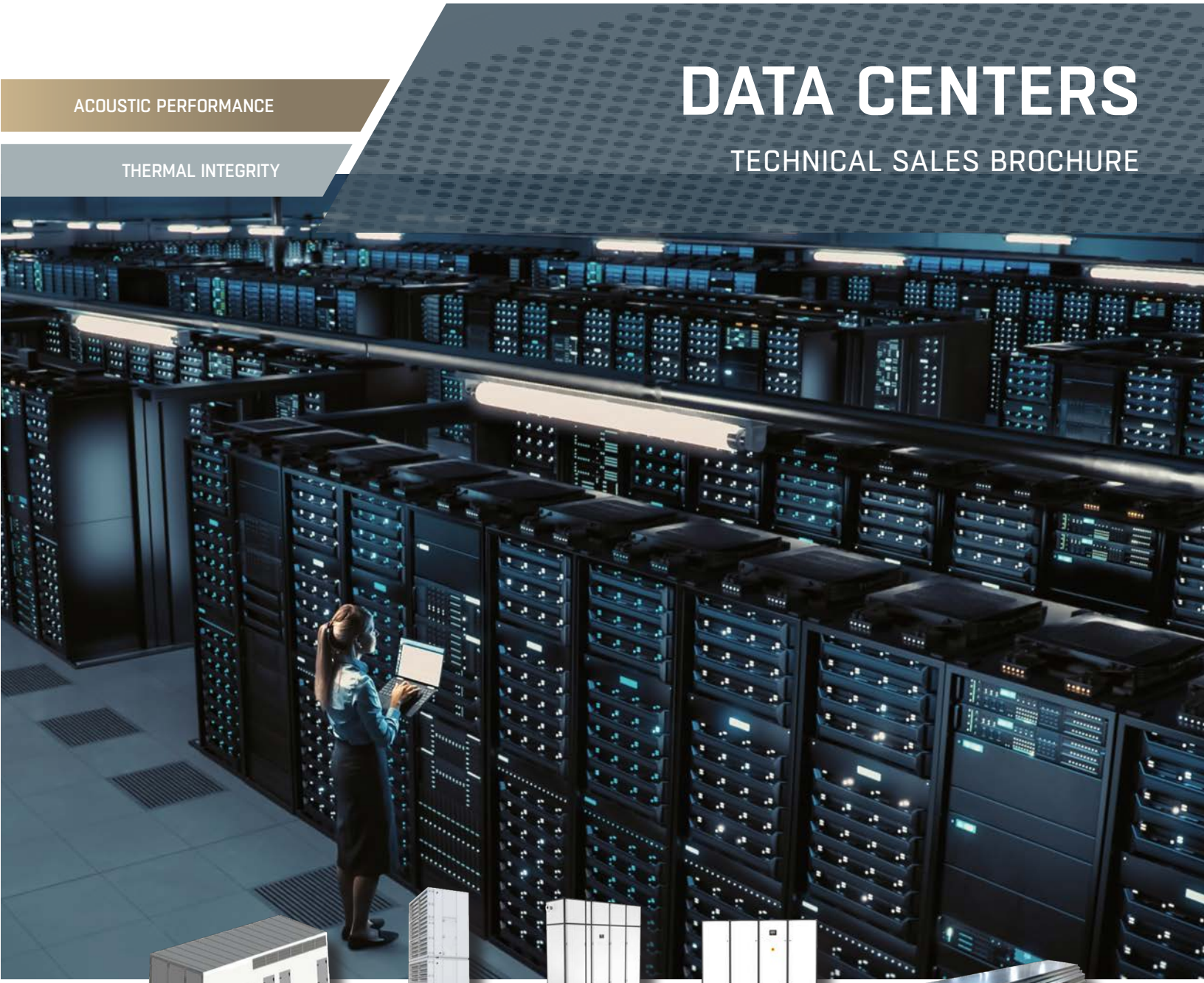
SPECIALIZED
HEALTHY
AIR SOLUTIONS

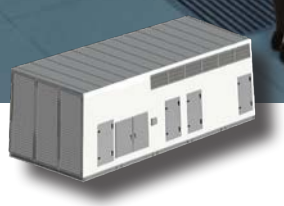
ACOUSTIC PERFORMANCE

THERMAL INTEGRITY

DATA CENTERS

TECHNICAL SALES BROCHURE



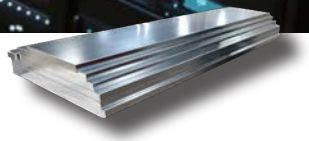


ECOCYCLE

FAN COIL
WALL

CRAH

CRAC



PANELS

DATA CENTER
COOLING SOLUTIONS

With companies around the world becoming increasingly more reliant on cloud technology, the data center industry is growing at a rapid rate. With the escalating amount of data being stored in clouds at data centers, it is crucial to ensure that the stored information is always protected and accessible to clients. Our complete portfolio and impressive references satisfy all requirements from maximum ambient conditions to minimum operating costs and offer an optimal price for performance.

Whether data is stored on-site, in a co-location facility, a hyper-scale campus, or a couple of racks in a small hosting room, maintaining safe thermal conditions for data center equipment and workers is critical. While developing plans for data center facilities, engineers may encounter a myriad of challenges, of which FläktGroup® SEMCO® has a solution. FläktGroup SEMCO has 60 years of air handling experience — all over the world our customers trust us to deliver the best and most efficient solutions for indoor air quality and critical air applications. Through this experience and world-class product development, we have built offerings that will support every step of your data center cooling project, from project planning to installation and commissioning and beyond with service plans and upgrade paths.

STABLE AND PRECISE AIR CONDITIONING
UNDER EVERY CONDITION

- Energy efficient solutions
- Low PUE
- Experienced team
- From small server rooms to co-location & hyper-scale

CHALLENGE:
OVERHEATING

The servers in the data center will overheat, resulting in millions of dollars in downtime and/or data loss.

SOLUTION:

FläktGroup SEMCO's computer room air handling (CRAH) units and computer room air conditioning (CRAC) units, keep data center equipment from crashing by maintaining an acceptable temperature with electrocomputated (EC) fans and chilled water coils (CRAH) or direct expansion (DX) coils (CRAC). All CRAH units are extremely reliable and require very little maintenance during their lifetime, keeping servers up and running, eliminating periods of downtime. CRAC units are also extremely reliable, but require slightly more maintenance due to its reliance on DX coils.

CHALLENGE:
HUMIDITY

Too little humidity can create electrostatic build-up that can damage servers.

SOLUTION:

Adding humidity to a data center environment greatly reduces the possibility of electrostatic build-up that can compromise server integrity. FläktGroup SEMCO offers two kinds of humidification solutions. In these solutions air is directed over either condenser coils (CRAC units) or chilled water coils (CRAH units). Once the air passes over the coils, the water or refrigerant cools the air, causing moisture to condense, and humidity levels to rise, preventing static electricity build-up.

CHALLENGE:
COMPREHENSIVE OFFERING

Each data center has unique cooling requirements, some of which may need equipment from multiple providers, to ensure that these requirements are met.

SOLUTION:

FläktGroup SEMCO provides an encompassing solution for data center's diverse cooling needs. We can address the distinct needs of different facility scales or different types of units for multiple parts of a single project. Our cooling portfolio includes innovative, energy-efficient CRAH systems designed for medium to large hyper-scale centers exceeding 200 kW in electrical loads, offering expandability and robust performance. As well as, CRAC systems which cater to small to medium-sized data center cooling needs with loads of 200 kW or less. For smaller footprints, we offer versatile fan coil wall systems that can be easily maneuvered.

CHALLENGE:
TEMPERATURE CONTROL

Data centers require precise temperature control in a challenging environment.

SOLUTION:

Both the CRAC and the CRAH systems offer better cooling and humidity control than a typical HVAC system.

The CRAH system comes equipped with variable controls, valves, and fans for precise temperature regulation.

Although CRAC units are typically simpler and easier to operate, precision control is harder to achieve, because there is usually only one operating mode.

CHALLENGE:
ENERGY-EFFICIENCY

Energy-efficient data centers are imperative in minimizing environmental impact and operational costs.

SOLUTION:

CRAH systems are extremely energy efficient, even though they rely on large chillers to supply cold water to coils. Even with the use of large chillers, water is less expensive than CRAC refrigerants, and can be set to chill at non-peak hours during the day, saving energy. At certain times of the year, in cooler climates, CRAH systems can effectively cool and dehumidify air with water sourced from cold lakes and rivers, saving energy by eliminating chiller use during this time. This process is referred to as "free cooling."

CHALLENGE:
CUSTOMIZATION

Customization is required to tailor infrastructure to precise requirements, ensuring optimal performance, scalability, and re-source utilization.

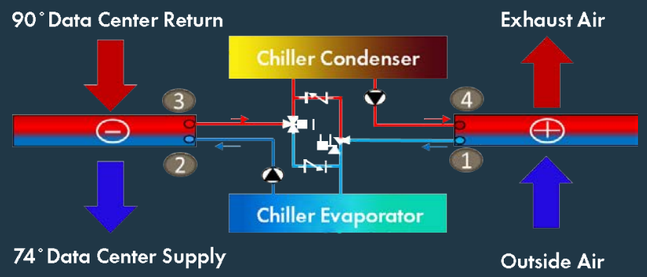
SOLUTION:

FläktGroup SEMCO's expertise centers on customization and made-to-order solutions, making us a formidable choice for tailored data center engineering. Our core skill set enables us to develop data center infrastructures that precisely match the unique needs of owners, encompassing everything from advanced cooling technologies to intricate resource allocation. The emphasis on customization ensures that FläktGroup SEMCO can deliver data center solutions that seamlessly integrate with the customer's specifications, ultimately resulting in a more efficient, and effective data center environment.

ECOCYCLE

The EcoCycle is an ultra energy efficient, economizer data center cooling system. Unlike traditional CRAH units, the EcoCycle utilizes outdoor air and a chiller as a part of the cooling process.

Designed to handle a large range of temperature differentials, the EcoCycle relies on cold water coils to do most of its cooling only using the chiller on an as needed basis. The EcoCycle is most energy efficient in cold weather, due to its complete bypass of the chiller and use of cold outdoor air to cool hot data center air and less efficient in hot climates where the chiller is relied upon more heavily.



PUE	DCiE	LEVEL OF EFFICIENCY
3.000	33%	VERY INEFFICIENT
2.500	40%	INEFFICIENT
2.000	50%	AVERAGE
1.500	67%	EFFICIENT
1.200	83%	VERY EFFICIENT
1.118	90%	FLÄKTGROUP SEMCO DRY
1.080	93%	FLÄKTGROUP SEMCO WET

Example based on Virginia location

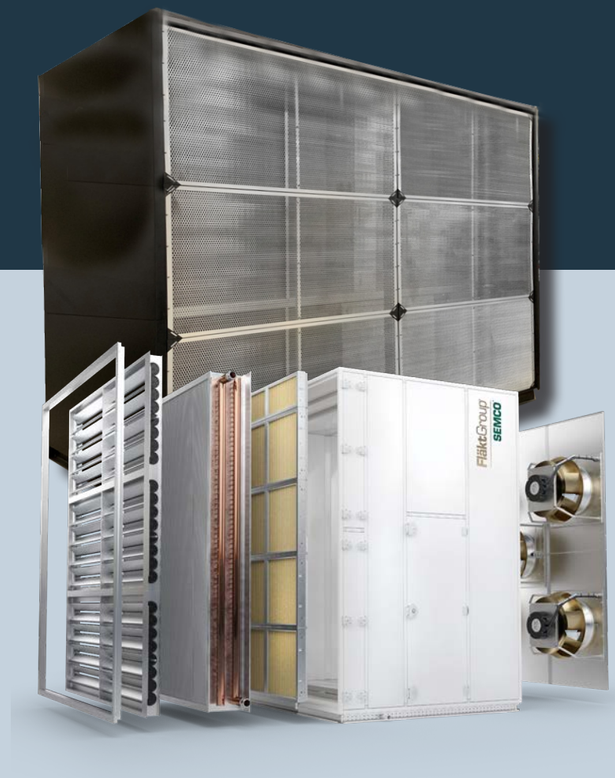
KEY FEATURES

- **Capacity: 150 kW — 450 kW**
  Custom Sizes Available Upon Request
- **Standard N-1 Fan Redundancy & N-1 Compressor Redundancy if Needed**
- **Best Lead TImes in the Industry**
- **Capacity to Footprint** — *Compact Configurations Available*
- **Hyper-scale or Co-location**
- **Low PUE**
- **DX and Hydronic Cooling**
- **Evaporative Cooling Option**
- **Patented**
- **Low First Cost**
- **Easy to Install — Split or One-Piece Unit**
- **Plug and Play Controls**
- **Low Maintenance**
- **No Leakage Between Air Streams**

FAN COIL WALL

The Cool Array is a highly customizable, configurable fan wall unit that uses CRAH technology. Comparatively, the Cool Array uses minimal cabinetry compared to traditional CRAH units, creating a smaller footprint.

Often used as a back wall, units can be connected in tandem from floor to ceiling, creating a large coil surface area. Having a large coil surface area allows for more efficient cooling and economization.



KEY FEATURES

- **Capacity: Up to 400 kW Net Standard**
  Larger Custom Sizes Available
  N-1 Fan Redundancy
- **Best Lead TImes in the Industry**
- **Hyper-scale**
- **Capacity to Footprint**
- **Low PUE**
- **Hydronic Cooling**
- **Evaporative Cooling Option**
- **Low First Cost**
- **Easy to Install**
- **Low Maintenance**
- **Perfect for Perpetually Changing Designs**

COMPUTER ROOM AIR HANDLER

Computer Room Air Handlers (CRAH) cool and dehumidify data center air indirectly with electronically computated fans (EC) and chilled water coils.

CRAH units are best suited for medium to large sized data centers. They provide precision cooling and humidity control, as well as, their high energy efficiency and low maintenance costs.

KEY FEATURES

- **Capacity: Up to 200 kW Net Standard**
  Larger Custom Sizes Available
- **Standard N-1 Fan Redundancy**
- **Best Lead TImes in the Industry**
- **Capacity to Footprint** — *Compact Configurations Available*
- **Hyper-scale or Co-location**
- **Minimized Air and Water Pressure Drops**
- **Low PUE**
- **Hydronic Cooling**
- **Easy to Install**
- **Plug and Play Controls**
- **Low Maintenance**

COMPUTER ROOM AIR CONDITIONER

Computer room air conditioners (CRAC) use refrigerant for cooling and heat transfer, that requires more maintenance than chilled water. CRAC units also tend to not be as energy efficient.

CRAC units are best suited for small to medium sized data centers. They provide precision cooling and humidity control. FläktGroup SEMCO offers a ground breaking more efficient CRAC system that has airflow monitoring to increase efficiency for every condition.

KEY FEATURES

- **Capacity: Up to Nominal 130 kW**
  Custom Sizes Available Upon Request
- **Standard N-1 Fan Redundancy & N-1 Compressor Redundancy if Needed**
- **Capacity to Footprint** — *Compact Configurations Available*
- **Hyper-scale or Co-location**
- **Energy Efficient Free Cooling**
- **Low PUE**
- **Comparable Costs to Evaporative Cooling Systems**
- **Low First Cost**
- **Easy to Install**
- **Plug and Play Controls**

PUE CATEGORY MEASUREMENTS

PUE CATEGORY 0

- IT load measured at the interruptible power supply
- Total data center power measured at the utility meters
- Peak utilization/demand in a single snapshot measurement

PUE CATEGORY 1

- IT load measured at interruptible power supply outputs
- Total data center power measured at the utility meters
- 12 month cumulative readings

PUE CATEGORY 2

- IT loads measured at power distribution unit supporting IT loads
- Total data center power measured at utility meters
- Peak utilization/demand in a single snapshot measurement

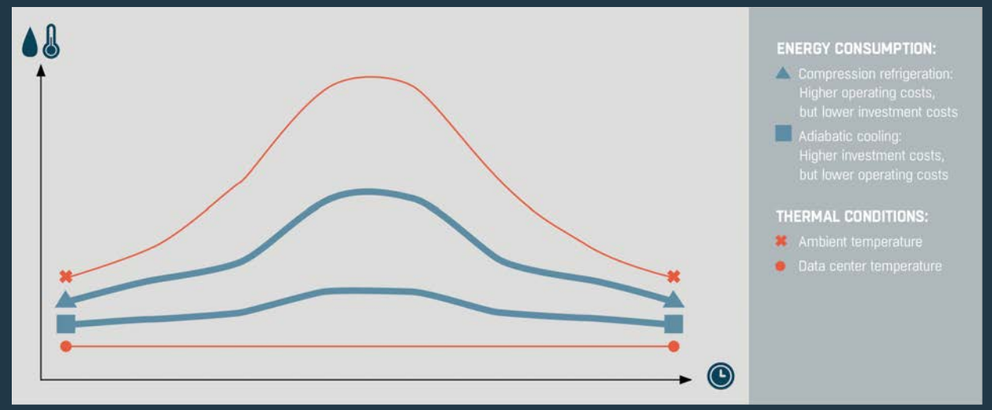
PUE CATEGORY 3

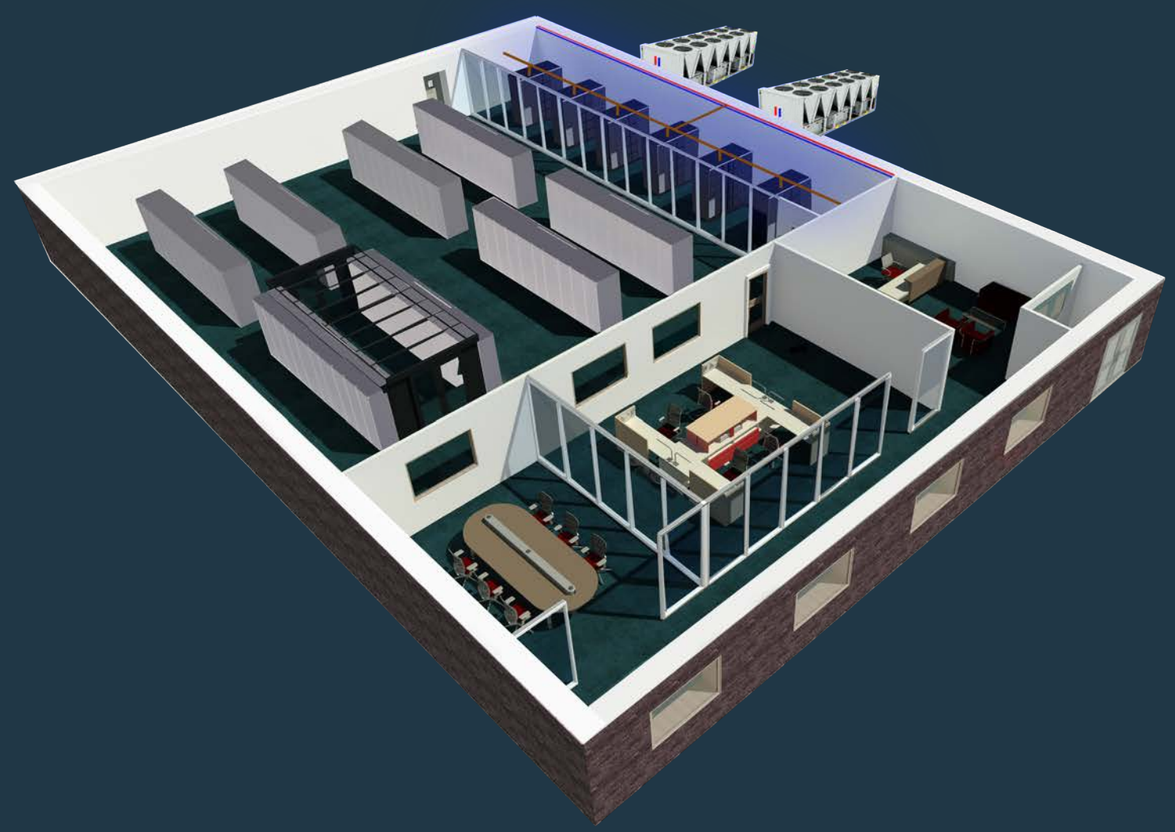
- IT load measured at the point of connection of IT devices to the electrical system
- Total data center power is measured at the utility meters
- 12 month cumulative readings

FIRST RATE EFFICIENCY

FläktGroup SEMCO data centers effectually reduce PUE. The PUE formula determines the efficiency of energy consumption within a data center. Efficient, precision cooling is a major factor for successful PUE reduction. FläktGroup SEMCO data centers can achieve a partial PUE of 1.03.

ASHRAE® THERMAL GUIDELINES FOR DATA CENTERS			
DATA CENTER CLASS	DRY-BULB TEMPERATURE °F	HUMIDITY RANGE (NON-CONDENSING)	MAXIMUM RATE OF CHANGE (°F/HR)
A1	59.0° — 89.6°	20% — 80% RELATIVE HUMIDITY	9.0 °F
A2	50.0° — 95.0°		
A3	41.0° — 104.0°	10.4°F — 62.6°F DEW POINT AND 8% TO 80% RELATIVE HUMIDITY	
A4	41.0° — 113.0°	10.4°F — 75.2°F DEW POINT AND 8% TO 90% RELATIVE HUMIDITY	
H1	64.4° — 71.6°	48.2°F — 59.0°F DEWPOINT AND 50% TO 70% RELATIVE HUMIDITY	

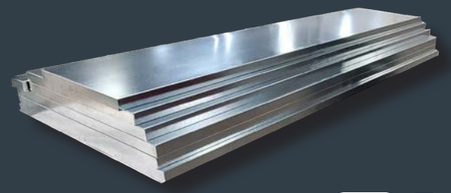




DATA CENTER
PANEL SOLUTIONS

FläktGroup SEMCO's quick-installing, tongue-and-groove designed insulated metal panels can be used for indoor or outdoor data center applications. When partnering with FläktGroup SEMCO, be assured that we use the latest in design technology and tools to ensure accuracy. Our proprietary design program confirms that custom systems are structurally sound, cost-effective, and always minimize installation time. Our computer aided design tool optimizes the layout, lowers structural material costs, and allows for the use of the fewest panels necessary for the job's assembly which assists with labor cost. FläktGroup SEMCO's engineered panels will save time in the field, reduce overall project costs, and eliminate countless hours of planning and logistical contacts while satisfying the project's specific, custom performance requirements.

FläktGroup SEMCO offers a line of Panel Solutions products to address many of the challenges facing data centers — including noise, thermal stability, large volume air distribution, custom enclosures, barriers, and fire-resistant walls.



PANEL SOLUTIONS

SUPERIOR QUALITY,
CUSTOM ENGINEERED
DATA CENTER STRUCTURES
AT A **LOWER COST.**

- Cost Reduction
- Engineered Performance
- Simplified Project Management
- Time Saving

CHALLENGE:
SOUND CONTROL

Noisy chiller, generators, mechanical, and electrical equipment is disruptive to workers and/or nearby communities.

SOLUTION:
ACOUSTICAL BARRIERS

Custom panel enclosures can be erected as sound barriers or screens around noisy equipment, successfully solving noise concerns.

CHALLENGE:
BUILDING ENVELOPE RETENTION

Penetrations in your building envelope, to transfer air into and out of the building, leave the building susceptible to the outdoor environment.

SOLUTION:
AIR DISTRIBUTION PLENUMS

Panels can be used to construct custom air intake and exhaust plenums, needed for air distribution within the data center. FläktGroup SEMCO intake and exhaust plenum panels use their thermal properties to help retain the full thermal and weather-proof properties of the building envelope.

CHALLENGE:
MASS AIR MOVEMENT

Large modular duct is needed to bring in the volume of outdoor air needed to keep data center equipment cool and functioning, resulting in increased labor and cost.

SOLUTION:
AIR DISTRIBUTION

Modular panels offer a low cost substitution to field-built dual wall duct used to connect plenums or housings.

CHALLENGE:
FIRE SAFETY

In the event of a fire, servers and equipment are destroyed before the fire fighters arrive.

SOLUTION:
FIRE PROTECTION PANELS

FläktGroup SEMCO fire panels are engineered to provide thermal and structural protection for up to two hours during the event of a fire. This ensures that equipment and staff will remain safe until fire fighters arrive. FläktGroup SEMCO fire-rated panels are the industry's only fire protection panel that is also building code-compliant for use in structural, acoustical, and thermal application.

CHALLENGE:
MODULAR DATA CENTERS

Portable data center enclosures need acoustic and insulating features for the exterior.

SOLUTION:
PANEL CLADDING

FläktGroup SEMCO AT panels have the acoustic and thermal properties to give the portable structure its needs.

CHALLENGE:
CUSTOM EXPANDABILITY

Additional air handling equipment is needed to enhance the facility's cooling capacity.

SOLUTION:
AIR HANDLING SYSTEM ENCLOSURE

Panels can be used to encase data center air handling fans, filters, coils, and dampers. Using panels to encase equipment results in less air leakage and noise generation. Panels can also be used to create plenums.

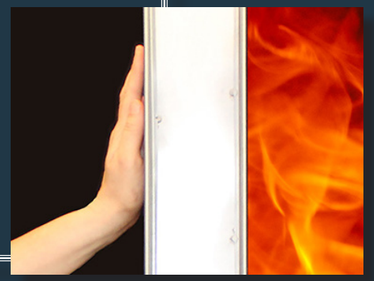
PANEL SOLUTIONS: APPLICATIONS

SCREENS/BARRIERS

Equipment in data centers can be loud and unsightly. FläktGroup SEMCO Panels can be leveraged as a chiller, mechanical, or electrical screen or a sound barrier and can successfully solve noise concerns. We modify our approach dependent upon the characteristics of sound for the optimal solution.

FIRE WALLS/BARRIERS

In the event of a fire, providing fire fighters extra time before critical systems are affected could make all the difference. FläktGroup SEMCO's fire-rated panel system is the industry's only certified fire protection panel that's also building code-compliant for use in structural, acoustical, and thermal applications. Ideal for interior walls, stairwell chase, elevator shafts, equipment rooms, penthouse construction, and building cladding.



GENERATOR ENCLOSURES & PLENUMS

In data centers, generators are critical to ensure uninterrupted service and to avoid data loss. However, the steady low frequency hum can aggravate neighbors and be detrimental to employees. An enclosure will provide noise abatement. If generators are installed in the building, they require fresh air to function correctly. FläktGroup SEMCO panel solutions can provide custom intake and exhaust plenums to meet this need.

MODULAR DATA CENTER ENCLOSURE

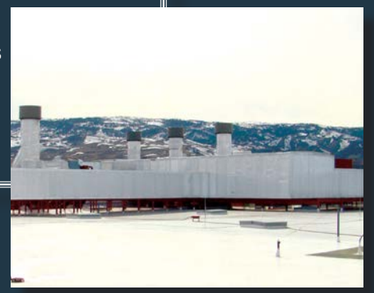
When additional weather-proof space is needed to house data center equipment, FläktGroup SEMCO panel enclosures can supply a solution.

FULL ROOM AIR HANDLING

Data center customers need a great deal of cooling to keep equipment functioning. Some customers design the cooling right into the building, creating an air handling room. Our panels can supply the fan, filter, and damper walls as well as the mixing plenums.

AIR PLENUMS

A plenum is a box attached directly to the HVAC system. Its function is to bring in, distribute, and remove air. Commercial HVAC systems for data centers often use an outdoor plenum for air-distribution. When cool air is critical for the building, FläktGroup Panel Solutions systems offer the thermal and acoustic properties to offer an excellent solution.



AIR DISTRIBUTION

To keep equipment cool, a large amount of air is required in the building. Air needs to be ducted, and in some cases, very large modular duct is required. Customers have leveraged our panel systems to customize their ducting system.

MATERIALS

- Galvanized steel
- Stainless steel
- Aluminum
- Aluminized

FINISHES

- Powder Coat Custom Color*
- Field Painted
- Mill Finish

DIMENSIONS

- Up to 16-foot maximum length
- Up to 45.5-inch maximum width

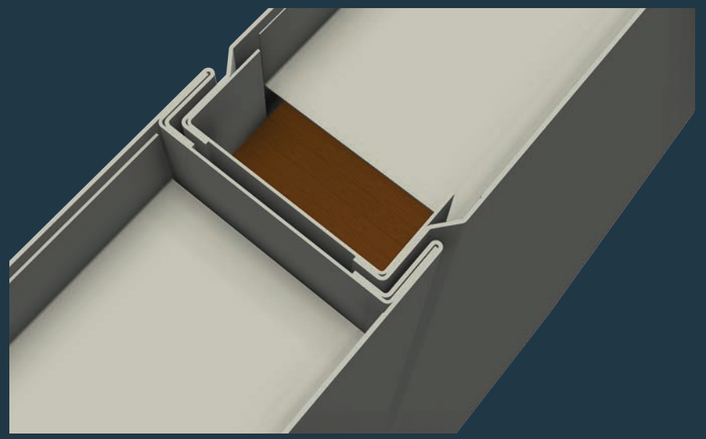
DEPTH

- 2-inch thick
- 3-inch thick
- 4-inch thick
- 6-inch thick

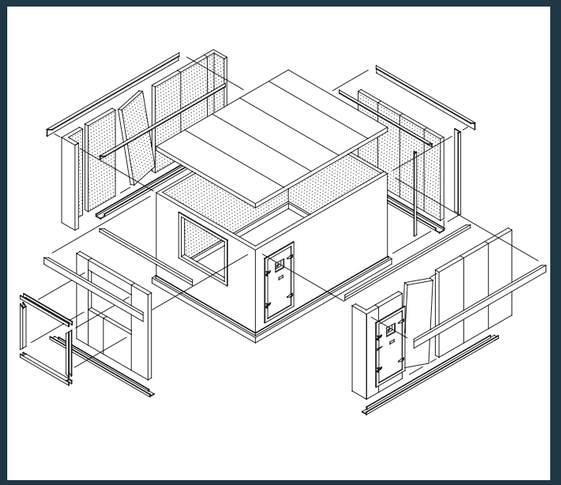
PANEL SOLUTIONS

EASE OF INSTALLATION

- Roll formed tongue-and-groove construction, fully enclosed and insulated joint gives better fit with closer tolerance.
- No screws through vertical panel joints reduces install cost and eliminates the possibility of air and noise leaks that may occur with screws.
- Tongue-and-groove panel is fully insulated at the male-female joint. Eliminates field insulation of joints and the need for screws at the joints.
- No thru-metal panel. Designed to perform in all temperatures and to prevent condensation problems, unlike the competition.
- Custom, versatile insulation options: fiber, gypsum, and more.
- Panels up to 18-inches in length add strength, rigidity, making installation easier.
- Factory interior cuts, notches, and sloped ends as required reduces install costs and accommodates equipment
- Available with pre-hung standard doors with or without a double pane wire glass window.



A close-up of a fully insulated tongue-and-groove panel at the male-female joint.



PROJECT MANAGEMENT

- Complete ¼" scale "D" size assembly drawings.
- Computer aided design prevents the use of excessive structural steel, while providing a calculated safety factor and reducing installation costs by as much as 15%.
- Auto CAD drawings shorten the approval process and reduces field labor. The drawings include: panel layout, installation details, and individual panel markings.
- Flexible design options to meet special requirements.
- Individually piece marked panels

PERFORMANCE TESTING & CERTIFICATION

FläktGroup SEMCO's panel systems outperform all other commercially available modular panel systems on the market. Backed by independently certified test data, our unique tongue-in-groove panel design provides optimum transmission loss and interior absorption resulting in unequaled STC and NRC ratings.

- Significantly low thermal transfer rate.
- High sound transmission loss. Meets critical noise levels.
- Fire panel available with one or two hours of fire-protection during an event.

TRANSMISSION LOSS AND ABSORPTION COEFFICIENT**

CONSTRUCTION	TRANSMISSION LOSS						STC
OCTAVE BAND FREQUENCY (HZ)	2 125	3 250	4 500	5 1K	6 2K	7 4K	
2" 18 GAUGE SOLID/22 GAUGE PERFORATED	26	29	33	44	52	60	38
2" 18 GAUGE SOLID/22 GAUGE SOLID	29	35	39	47	51	64	39
4" 18 GAUGE SOLID/22 GAUGE PERFORATED	26	32	38	51	60	67	43
4" 18 GAUGE SOLID/22 GAUGE SOLID	23	37	43	53	60	58	46
4" 18 GAUGE SOLID/22 GAUGE PERF. W/ GYPBOARD	27	34	42	53	61	70	45
6" 18 GAUGE SOLID/22 GAUGE PERFORATED	28	38	44	53	62	58	49
6" 18 GAUGE SOLID/22 GAUGE SOLID	30	40	46	55	63	61	50

CONSTRUCTION	ABSORPTION COEFFICIENT					
OCTAVE BAND FREQUENCY (HZ)	2 125	3 250	4 500	5 1K	6 2K	7 4K
2"	0.58	0.93	1.16	1.18	1.15	1.12
4"	0.70	1.14	1.18	1.14	1.14	1.16
6"	0.82	1.14	1.20	1.15	1.15	1.20

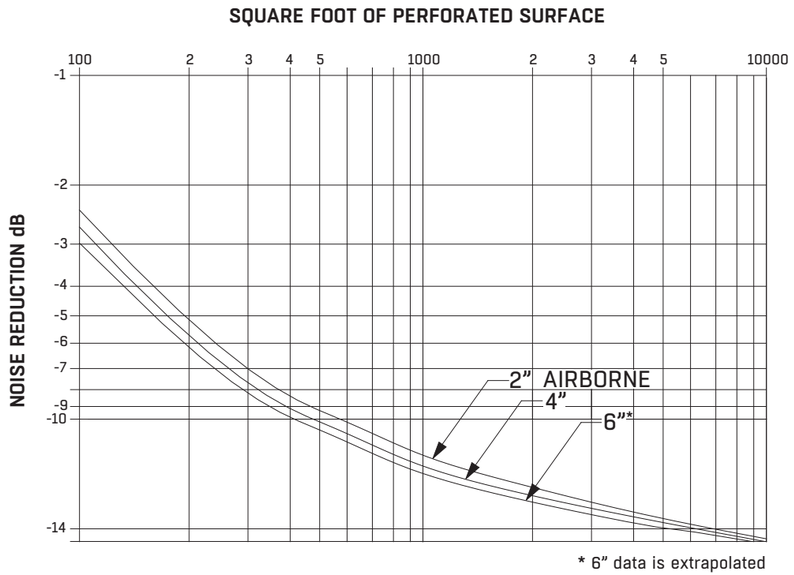
DETAILED LOOK AT ACOUSTICAL TESTING DATA**

2" PANEL*							
OCTAVE BAND FREQUENCY (HZ)	125	250	500	1000	2000	4000	
ABSORPTION COEFFICIENT	0.58	0.93	1.16	1.18	1.15	1.12	1.10 NRC
TRANSMISSION LOSS	26	29	33	44	52	60	38 STC
4" PANEL*							
OCTAVE BAND FREQUENCY (HZ)	125	250	500	1000	2000	4000	
ABSORPTION COEFFICIENT	0.7	1.14	1.18	1.14	1.14	1.16	1.15 NRC
TRANSMISSION LOSS	26	32	38	51	60	67	43 STC
6" PANEL*							
OCTAVE BAND FREQUENCY (HZ)	125	250	500	1000	2000	4000	
ABSORPTION COEFFICIENT	0.82	1.14	1.2	1.15	1.15	1.2	1.16 NRC
TRANSMISSION LOSS	28	38	44	53	62	58	49 STC

* Thermal performance of panels shall provide for a U-factor of 0.10 for 2" panels and 0.06 for 4" panels or .05 for 6" panels.

**Does not apply to Fire Panels

PLENUM ACOUSTICS**



* 6" data is extrapolated

PLENUM ACOUSTICS- AIRBORNE NOISE REDUCTION

1. Noise reduction is per square foot of perforated area. The perforated area from the fan discharge to the supply air opening is effective area of absorption of the supply system.
2. Perforated area from the fan intake to the return air opening is the effective area of absorption for the return system.
3. Area not defined by either notes 1 and 2 are not to be used in calculating dB reduction.

FIRE PANEL ACOUSTICAL TESTING DATA

The result of the ASTM® E90 transmission loss testing on non-load-bearing wall assembly is shown in the table below.

FREQUENCY (HZ)	63	125	250	500	1,000	2,000	4,000	8,000	STC
TRANSMISSION LOSS (dB)	20	28	42	57	63	64	74	71	42

The result of the ASTM C430 sound absorption testing on non-load-bearing wall assembly

FREQUENCY (HZ)	125	250	500	1,000	2,000	4,000	NRC
TRANSMISSION LOSS (dB)	0.27	0.15	0.05	0.03	0.01	0.03	0.05

**Does not apply to Fire Panels

STRUCTURAL INTEGRITY**

MAXIMUM UNSUPPORTED PERFORATED PANEL SPAN (IN INCHES)

STATIC PRESSURE	2" ROOF		2" WALL		4" ROOF		4" WALL		6" ROOF		6" WALL	
	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG
0"	192	192	192	192	192	192	192	192	192	192	192	192
2"	159	144	136	160	192	192	192	192	192	192	192	192
4"	115	120	108	127	192	192	188	192	192	192	192	192
6"	98	107	94	111	172	175	163	183	192	192	192	192
8"	88	98	85	101	147	161	141	166	186	192	177	192
10"	78	91	76	93	130	150	126	154	165	192	158	192

Span based on maximum deflection of L/240

MAXIMUM UNSUPPORTED SOLID PANEL SPAN (IN INCHES)

STATIC PRESSURE	2" ROOF		2" WALL		4" ROOF		4" WALL		6" ROOF		6" WALL	
	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG	(+) POS	(-) NEG
0"	192	192	192	192	192	192	192	192	192	192	192	192
2"	187	153	155	173	192	192	192	192	192	192	192	192
4"	133	129	123	137	192	192	192	192	192	192	192	192
6"	113	115	107	120	192	188	182	192	192	192	192	192
8"	101	105	97	109	173	173	165	180	192	192	192	192
10"	93	98	90	101	155	162	149	168	192	192	189	192

Span based on maximum deflection of L/240

DETAILED LOOK AT FIRE PANEL STRUCTURAL TESTING DATA

1HR-FIRE PANEL — TRANSVERSE ULTIMATE LOAD (HORIZONTAL)				
TESTING CATEGORY	STANDARD	L/360 (PSF)	L/240 (PSF)	L/180 (PSF)
6 FT. TRANSVERSE LOAD	ASTM® E72-15	34.0	42.7	50.8
12 FT. TRANSVERSE LOAD		25.9	58.5	90.1

2HR-FIRE PANEL — TRANSVERSE ULTIMATE LOAD (HORIZONTAL)				
TESTING CATEGORY	STANDARD	L/360 (PSF)	L/240 (PSF)	L/180 (PSF)
6 FT. TRANSVERSE LOAD	ASTM E72-15	34.0	42.7	50.8
12 FT. TRANSVERSE LOAD		4.5	5.4	6.3

1HR-FIRE PANEL — TRANSVERSE ULTIMATE LOAD (VERTICAL)				
TESTING CATEGORY	STANDARD	L/360 (PSF)	L/240 (PSF)	L/180 (PSF)
6 FT. TRANSVERSE LOAD	ASTM E72-15	44.9	53.6	61.7
12 FT. TRANSVERSE LOAD		25.9	58.5	90.1

2HR FR-PANEL™ — TRANSVERSE ULTIMATE LOAD (VERTICAL)				
TESTING CATEGORY	STANDARD	L/360 (PSF)	L/240 (PSF)	L/180 (PSF)
6 FT. TRANSVERSE LOAD	ASTM E72-15	44.9	53.6	61.7
12 FT. TRANSVERSE LOAD		15.4	16.3	17.2

**Does not apply to Fire Panels

STRUCTURAL LOAD CONVERSIONS**

When designing enclosures that will be out in the elements, units will need to apply structural design criteria for adverse environmental conditions like snow and/or wind load. When evaluating wind and snow load, internal pressure must also be considered. The chart below lists the equivalent pressure of wind, snow, and live loads.

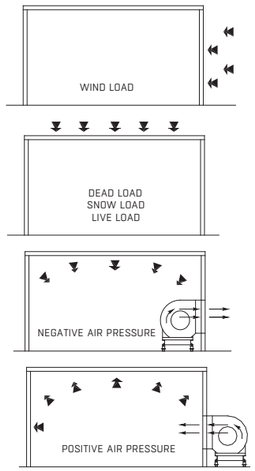
For additional information on seismic and design loads, refer to ASCE® 7-88 for an expanded discussion on "Minimum Design Loads for Buildings and Other Structures." Always refer to local building codes for specific information on local requirements.

PRESSURE (W.G.)	WIND LOAD (M.P.H.)	SNOW LOAD (LBS. PER SQ. FT.)	LIVE LOAD* (LBS. PER SQ. FT.)
0.5	30	3	3
1.0	40	5	5
1.5	50	8	8
2.0	60	10	10
3.0	80	16	16
4.0	90	21	21
5.0	100	26	26
6.0	110	31	31
7.0	120	36	36
8.0	130	42	42
9.0	135	47	47
10.0	140	52	52
11.0	150	57	57

*Live load converted to static pressure equals 1" w.g. for each 5.2 lbs.

This information is not intended to be the primary source of your structural design. For additional information on structural design contact FläktGroup SEMCO.

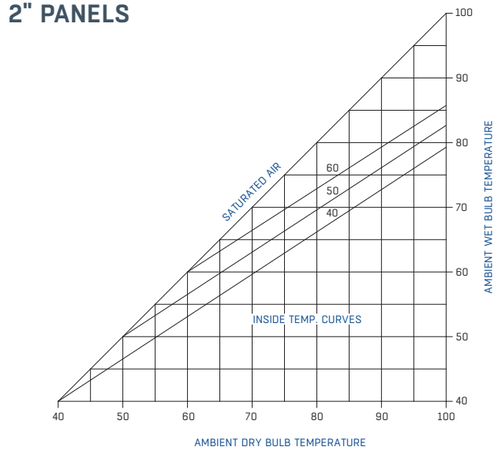
POSITIVE & NEGATIVE AIR PRESSURE**



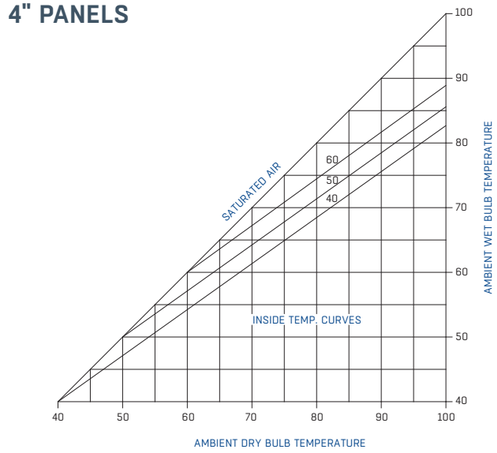
PANEL JOINT CONDENSATION**

Ambient design conditions must fall below the inside temperature curves to prevent condensation at panel joints.

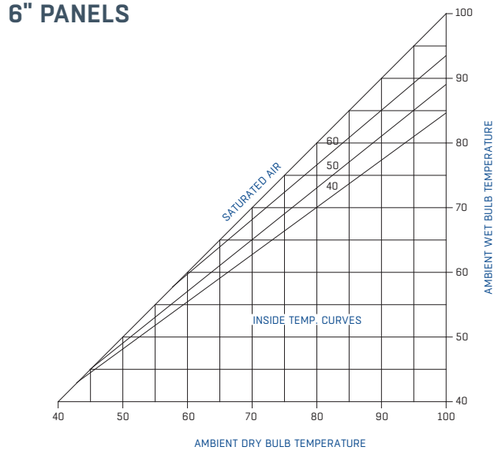
2" PANELS



4" PANELS



6" PANELS



THERMAL PERFORMANCE**

STANDARD PANEL CONSTRUCTION	2” PANEL	4” PANEL	6” PANEL
PANEL U-FACTOR	0.10	0.06	0.05
JOINT PERFORMANCE FACTOR	0.53	0.63	0.67

In very humid environments condensation may occur at the panel joint.

OST = TI + [JTF X (TO - TI)]
OST = OUTSIDE SKIN TEMPERATURE
TI=TEMPERATURE INSIDE
TO=TEMPERATURE OUTSIDE
JTF = JOINT FACTOR

The outside skin will condense if the temperature is less than the dew point of the space wet bulb.

FIRE SAFETY**

FläktGroup SEMCO’s panels come with a three pound per cubic foot (minimum) density fiberglass insulation. The insulation is corrosion and moisture resistant, and rated noncombustible as defined by NFPA Standard 220 when tested in accordance with ASTM E136. Surface burning characteristics per ASTM E84 are listed in the chart below.

	FLAME SPREAD	SMOKE DEVELOPMENT
Surface Burning Characteristics	15	0

CERTIFICATIONS

Intertek® ATI — an independent laboratory, has verified that the 1HR and 2HR Fire Panel systems have achieved the certifications in the chart below:

CERTIFICATION	DESCRIPTION
ASTM® E119	VERTICAL WALL FIRE RETARDANT TEST
ASTM E84	SMOKE DEVELOPMENT AND FLAME SPREAD RATINGS TEST
ASTM E283 AND ASTM E331	AIR FILTRATION AND WATER PENETRATION TEST
ASTM C236	THERMAL TRANSMITTANCE AND RESISTANCE RATING TEST
ASTM E72	COMPRESSIVE AND TRANSVERSE LOAD RATING TEST
ASTM E90 AND ASTM C430	SOUND TRANSMISSION LOSS AND ABSORPTION RATING TEST

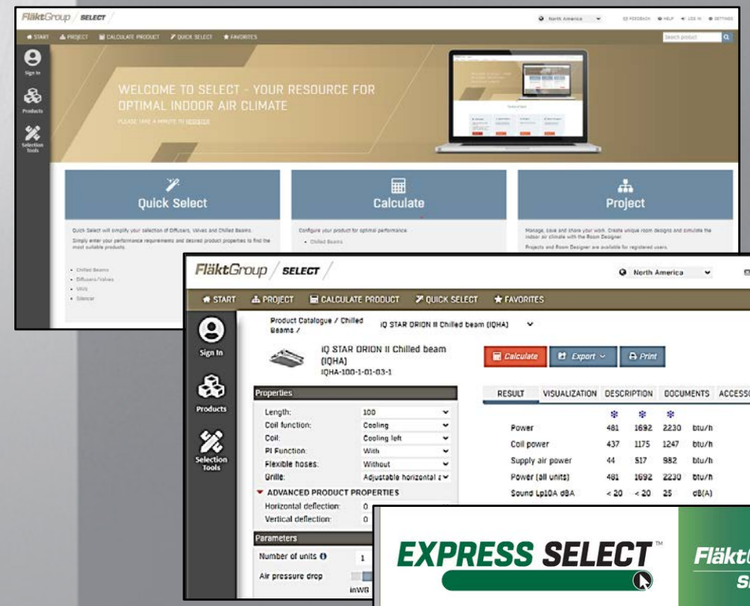
**Does not apply to Fire Panels

TESTING CATEGORY		STANDARD	RESULTS
ACOUSTICAL	SOUND TRANSMISSION LOSS	ASTM® E90	STC 42
	SOUND ADSORPTION	ASTM C430	NRC 0.25
STRUCTURAL	HORIZONTAL COMPRESSIVE ULTIMATE LOAD	ASTM E72-15	13,192 LBS.
	VERTICAL COMPRESSIVE ULTIMATE LOAD		7,254 LBS.
	12 FT TRANSVERSE ULTIMATE LOAD		39 PSF
THERMAL	THERMAL TRANSMITTANCE (U-VALUE)	ASTM C236	0.11 BTU/HRFT²F
	THERMAL TRANSMITTANCE (R-VALUE)	ASTM C1363	7.86 BTU/HRFT²F
WEATHER	AIR INFILTRATION	ASTM E283	<0.01 CFM/F² AT 20 PSF
	WATER PENETRATION	ASTM E331	0 AT 20 PSF
FIRE	VERTICAL (WALL) FIRE RETARDANT	ASTM E119	1 HOUR
	HORIZONTAL (ROOF) FIRE RETARDANT		1 HOUR
	SMOKE DEVELOPMENT AND FLAME SPREAD	ASTM E84	FLAME SPREAD = 0
			SMOKE DEVELOPED = 0

SERVICE & SUPPORT

While FläktGroup SEMCO products are relatively maintenance free throughout their lifecyle — we have a knowledgeable and dedicated service team available 24/7 to help anytime you require it.

FläktGroup SEMCO takes pride in supplying exceptional sales support and service.
Our experienced sales team, is always just a phone call away, to help guide you through the selection process, and make sure the most efficient products for your project specifications and budget are selected.



WHO WE ARE & WHAT WE DO

INNOVATION HAS
BEEN AT THE CORE
OF FLÄKTGROUP SEMCO'S
60 YEAR HISTORY

A business unit of FläktGroup, which is owned & backed by Triton Partners — a $17 billion annual investment firm, we are headquartered in Columbia, Missouri, with 275,00 SQ FT of manufacturing space in 3 plants in Arkansas and Virginia.

ENERGY & ENVIRONMENTAL FOCUS

All of our products are energy efficient, saving customers money while also helping to save the environment.

PATENTED & CERTIFIED PRODUCTS

Our innovative, industry leading patented products meet many AHRI, ASTM®, and ASHRAE® standards.

ENGINEERED AIR DISTRIBUTION & SOUND SOLUTIONS

Our duct, panel and sound products offer high quality customizable solutions a large range of applications.

ENGINEERED AIR QUALITY & DATA CENTER SOLUTIONS

Our energy recovery, chilled beam, and data center products offer the highest air quality on the market for a large range of applications.

OEM, KEY ACCOUNT & SALES REP ROUTE TO MARKET

We have a vast network of knowledgable third-party sales reps throughout the United States and Canada, as well as an experienced in house sales team.

AWARD WINNING

FläktGroup SEMCO has won numerous awards including multiple AHRI Innovation, Green Building, Dealer Design, School/College Planning & Management Awards.

ADDITIONAL PRODUCTS

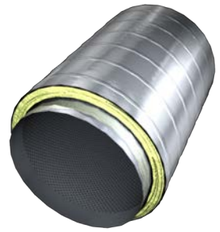
For over 60 years FläktGroup SEMCO has been an industry leader in the manufacturing of oval and round duct. FläktGroup SEMCO's extensive experience in duct manufacturing make it the go to destination for standardized and customized duct.

ROUND DUCT

- Efficient and economical
- Available in long lengths, eliminating costly field joints.
- Available in spiral or rolled and welded
- Available in galvanized steel galvannealed steel, stainless steel type 304 and 316, aluminum, PVC coated, and black steel
- Superior acoustic performance with little breakout noise
- Meets SMACNA and RIDCS standards
- Single or dual wall
- Spiral lock seam construction available for all sizes

FLAT OVAL DUCT

- Efficient and economical
- Available in long lengths, eliminating costly field joints.
- Available in spiral or rolled and welded
- Available in galvanized steel galvannealed steel, stainless steel type 304 and 316, aluminum, PVC coated, and black steel
- Superior acoustic performance with little breakout noise
- Meets SMACNA and RIDCS standards
- Single or dual wall
- Spiral lock seam construction available for all sizes



DUAL WALL DUCT

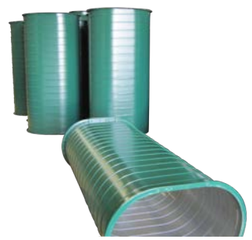
- Greater efficiency than single wall duct.
- Round duct up to 120" diameter or 350 sizes of oval
- Duct and fittings are made with 1" of fiberglass insulation between the outer shell and the inner perforated liner.
- Available in 2", 3", or 4" thickness
- Quieter than single wall duct
- Available in galvanized steel galvannealed steel, stainless steel type 304 and 316, aluminum, PVC coated, and black steel

VELOCITY®

- Self-sealing gasketed joint system
- Available for single wall, dual wall, or manifold duct
- Galvanized steel

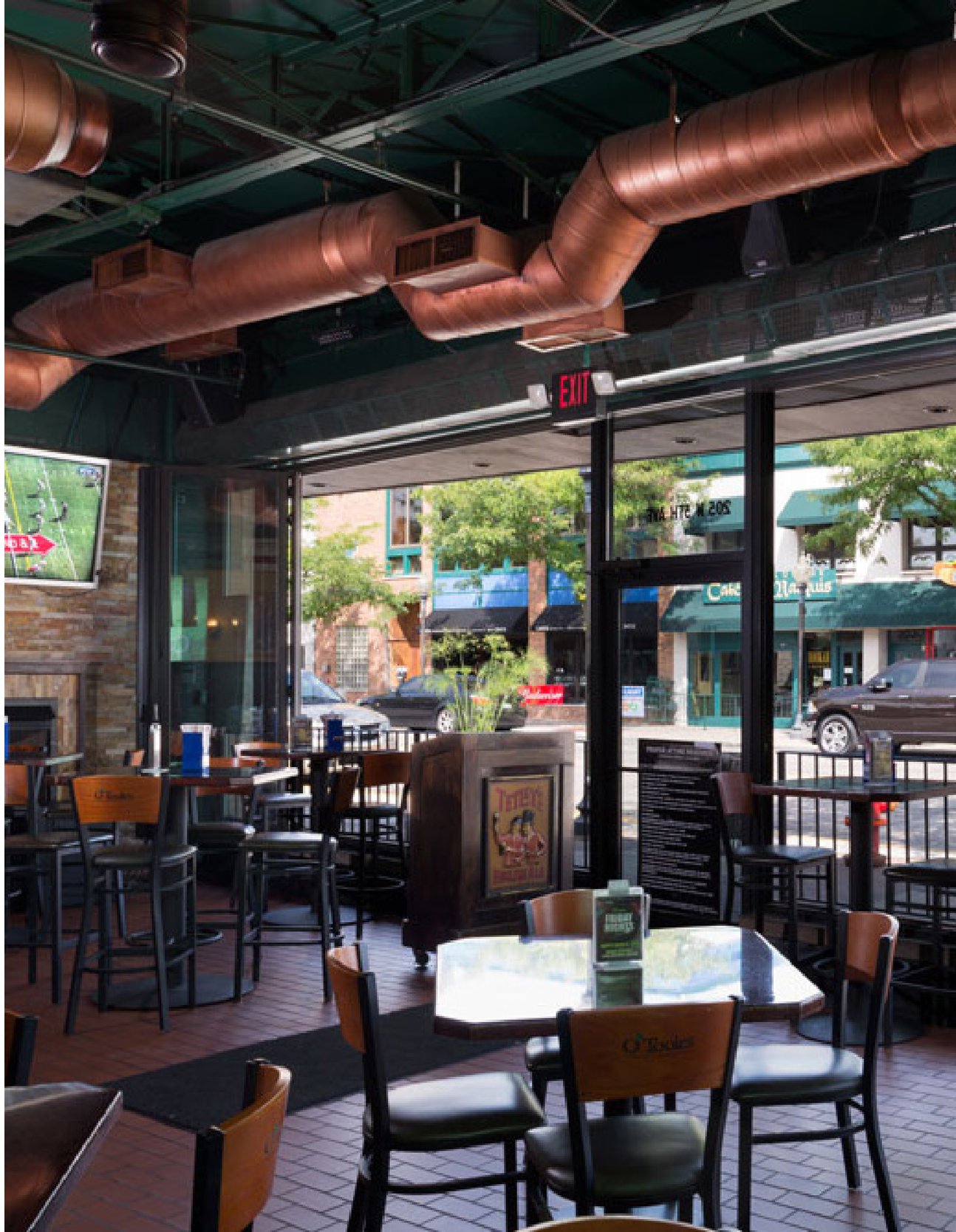
MANIFOLD DUCT

- Factory installed taps and fittings
- Fewer pieces to handle and fewer field joints saving time and money.



POWDER COATING

- Factory painted
- Multiple surface finished and matched accessories
- UV resistant coating



FläktGroup® SEMCO®

SPECIALIZED
HEALTHY
AIR SOLUTIONS

WWW.SEMCOHVAC.COM /DATA CENTERS / 20232208

EXCELLENCE IN SOLUTIONS

FläktGroup® SEMCO® delivers smart, energy-efficient, air-quality solutions to support every building application. We offer our customers innovative technologies, high-quality products and outstanding performance supported by more than fifty years of accumulated industry experience. The broadest offering on the market and a strong market presence in 65 countries worldwide guarantees that we are always by your side, ready to deliver: Excellence in Solutions.

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To learn more about FläktGroup® SEMCO® offerings and to contact your nearest representative please visit

www.semcohvac.com