

[illegible]

PANEL
SOLUTIONS

Offering more than a competitive price:

- Cost reduction
- Time savings
- Engineered performance
- Simplified project management

SEMCO PANEL Solutions are comprised of four unique systems.

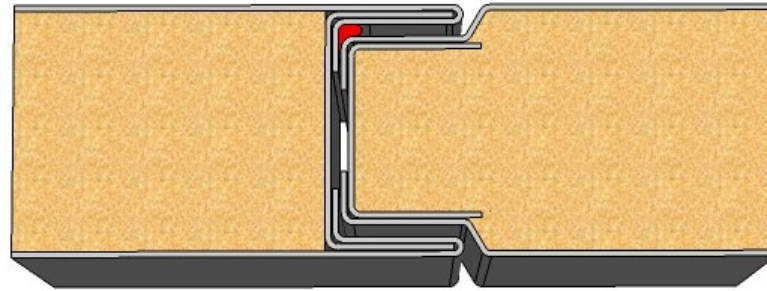
- **AT-PANEL Solutions** Acoustic/Thermal Systems
- **MD-PANEL Solutions** Modular Duct Systems
- **IN-PANEL Solutions** Industrial Systems
- **FR-PANEL Solutions** Fire Rated Systems





It's all in the joint.

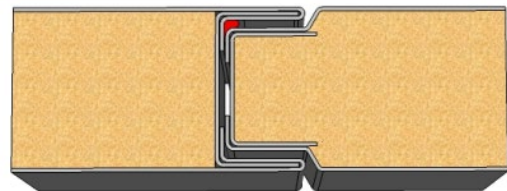
SEMCO's unique tongue and groove design does not require joint screws and requires only one bead of caulk.



SEMCO joint

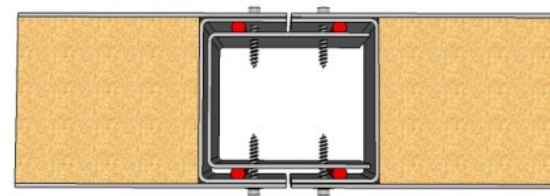


Compare to the competition:

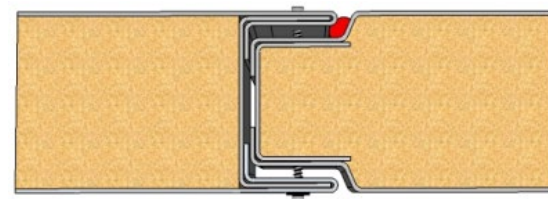


SEMCO joint

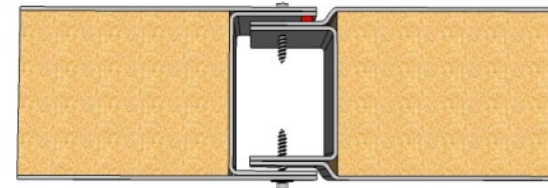
TYPE A
(Commercial
Acoustics, IAC)



TYPE B
(Ruskin)



TYPE C
(Commercial Acoustics, United,
Vibro-Acoustics, Aerosonics,
Pottorff)



Note: Competitors' screws are 12" O.C.



Time-saving design

	SEMCO	IAC	Ruskin	Vibro	Commercial	Pottorff	Aerosonics	United
2" Panels	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4" Panels	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6" Panels	Yes	No	No	No	No	No	No	No
Max Width	45-1/2"	48"	45-1/2"	24" - 45"	48"	45-1/2"	45-1/2"	24" - 36"
Max Length	192"	192"	192"	120"	192"	144"	192"	144"
Preformed Corner	Yes	No	No	Yes	No	Yes	No	No
Field Insulate	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Fire Rated	Yes	No	No	No	No	No	No	No



Panel Joint Labor Comparison				
Panel Type	Joint-Field Insulated	Screw Joint	Seal Joint	External "H" Joiner
SEMCO	No	No	Yes (1 time)	No
Type A	Yes (2 times)	Yes (4 each 12" O.C.)	Yes (4 times)	Yes
Type B	No	Yes (2 each 12" O.C.)	Yes (1 time)	No
Type C	Yes (1 time)	Yes (2 each 12" O.C.)	Yes (2 times)	No
Labor Calculations*				
Panel Type	# of Screws in Joint	Linear Foot of Insulation Fill	Liner Foot Sealant	Total Man Hours
SEMCO	0	0	1,000	136
Type A	4,000	2,000	4,000	204
Type B	2,000	0	1,000	160
Type C	2,000	1,000	1,000	170

*Based on a 2,500 sq. ft. enclosure, 10'-0" high or a total of (100) 10'-0" panels that average 25 sq. ft. per panel.

Installation Labor
2,500 sq. ft. at \$50/Man Hour*

	Man Hours	Labor	Difference
SEMCO	136	\$6,800	
Ruskin	160	\$8,000	\$1,200
Commercial	170	\$8,500	\$1,700
United McGill	170	\$8,500	\$1,700
Aerosonics	170	\$8,500	\$1,700
IAC	204	\$10,200	\$3,400

The above illustrates the additional labor costs a contractor will incur installing a competitors panel housing versus SEMCO. On average of 25% - 50%.

* 2011 RSMeans Mechanical Cost Data estimates \$52.70 per hour for common building laboror



The SEMCO Panel Line: AT-PANEL



ACOUSTIC



THERMAL



The SEMCO Panel Line: AT-PANEL



ACOUSTIC



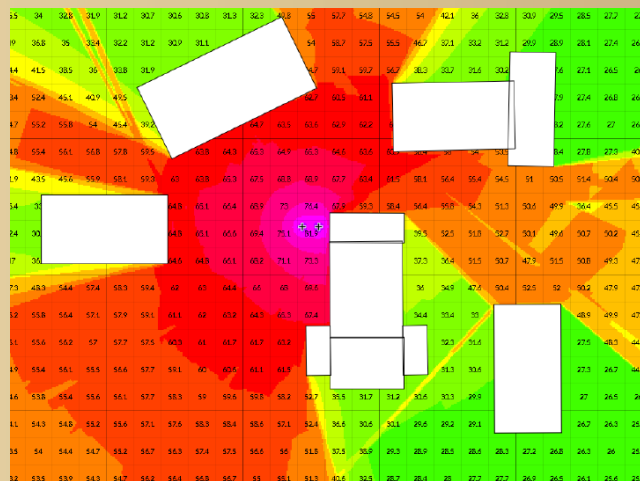
THERMAL



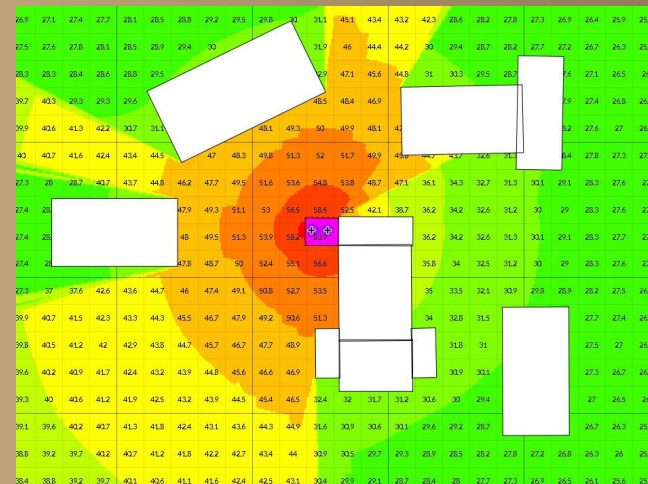


The SEMCO Panel Line: AT-PANEL

Example: 2 AHU's near multiple other buildings



Without a barrier, the noise would be problematic

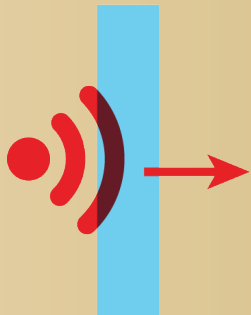


With a barrier around them, the noise is greatly reduced.



Sound barriers made from acoustical panels contain a perforated face allowing sound waves to enter, and additional internal components that further diffuse or “absorb” the sound waves to prevent them from reflecting, is known as an absorptive sound wall or noise barrier.

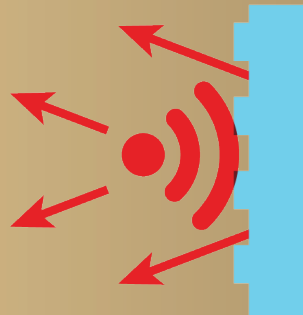
Transmission



Reflection



Diffusion



Absorption





Standard Panel Construction	2" Panel	4" Panel	6" Panel	4" Sheetrock
Panel U-Factor	0.10	0.06	0.05	0.14

Under very humid conditions the most probable location that condensation will occur is at the panel joint.

$$OST = TI + [JTF \times (TO - TI)]$$

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 space wet bulb.

*ASTM Tested performance



The SEMCO Panel Line: AT-PANEL

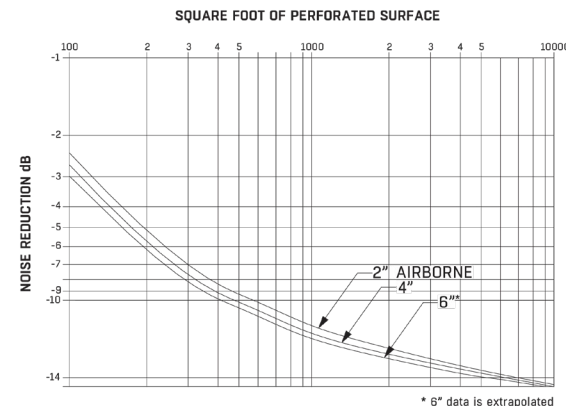
Acoustic and Thermal Performance

ASTM E90 TESTED!

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

Standard Panel Construction	2" Panel	4" Panel	6" Panel
Panel U-Factor	0.10	0.06	0.05

*All values based upon standard insulation.





ACOUSTIC



THERMAL

Features and Benefits:

- Excellent cost-to-performance ratio
- Factory-supplied cutouts, make a stronger structure while minimizing installation time
- Independently tested for acoustical, thermal, and structural performance
- Pre-formed corner panel reduces field labor while increasing overall unit strength



The SEMCO Panel Line: AT-PANEL



ACOUSTIC



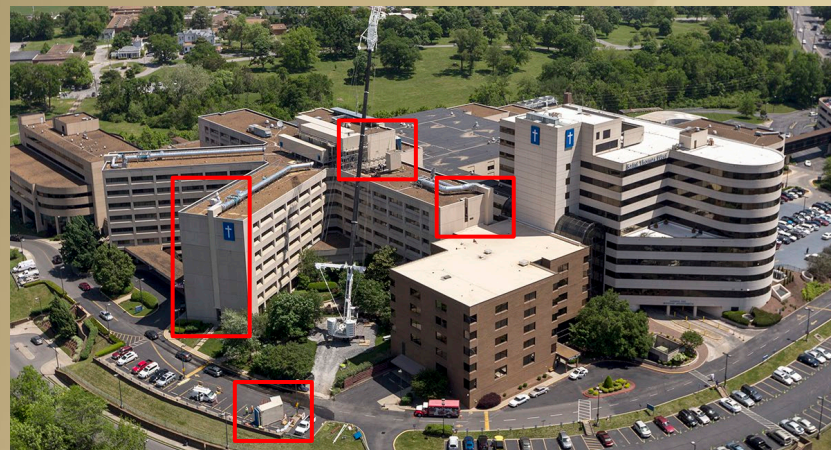
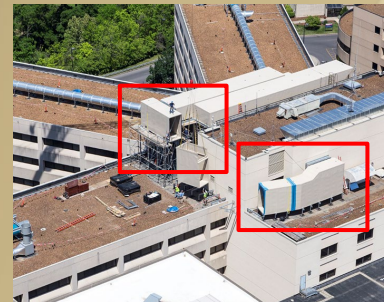
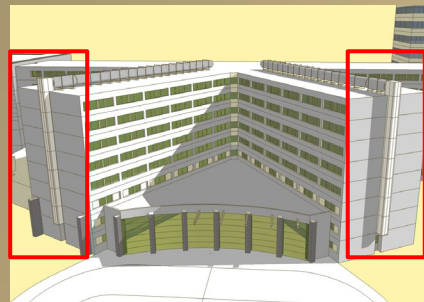
THERMAL

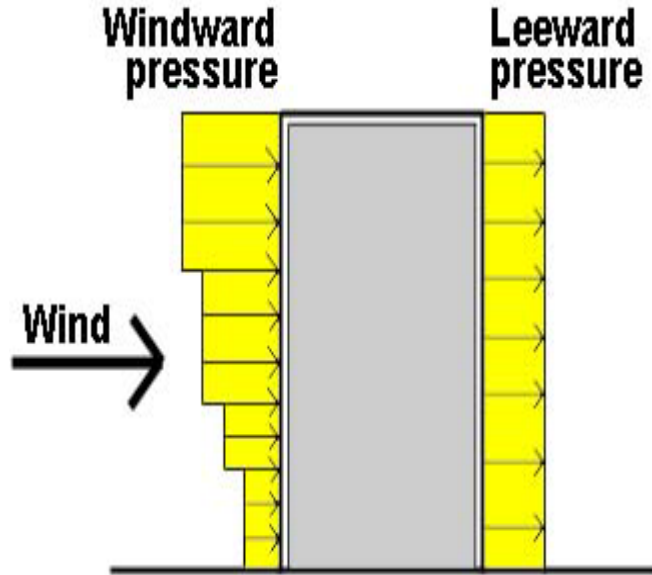
Applications:

- Standard built-up air handling units
- Rooftop equipment enclosures
- Extended plenums
- Material handling enclosures
- Supply/return chase plenums
- Mixing plenums
- Outdoor air plenums
- Clean rooms
- Louver blank-offs



The SEMCO Panel Line: MD-PANEL





MD-PANELs are CUSTOM designed to take environmental factors into account:

- Environmental Load:

$$\text{Force} = \text{Mass} * \text{Acceleration}$$

$$F_{\text{wind}} = \text{Pressure} * \text{Area} (C_d)$$

- Dead loads – weight of the structure itself – can it support itself?
- Live loads – temporary or moving loads; variable forces
- Other loads – other actions that may effect a structure - fire, explosion, impact



The SEMCO Panel Line: MD-PANEL

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

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



Features and Benefits:

- More efficient and affordable way to install large double wall rectangular duct extending beyond a plenum or housing
- Designed with an integrated structure eliminating much of the expensive structural steel and fabrication labor required for large field-built dual wall duct
- Can be powder coated to match the building façade



Application:

- Ductwork exceeding 96"
 - modular 4' sections
- Ductwork between 46" – 96"
 - modular sections 4' - 12' long utilizing preformed corners
- Rectangular ductwork less than 45"
 - Modular up to 16' sections
- Integrated reinforcement
 - High pressure systems
 - Stringent load requirements



STRUCTURAL



NOISE BARRIER



STRUCTURAL



NOISE BARRIER





Structural load conversions

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	40	5	5
1.5	50	8	8
2	60	10	10
3	80	16	16
4	90	21	21
5	100	26	26
6	110	31	31
7	120	36	36
8	130	42	42
9	135	47	47
10	140	52	52
11	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 your FlaktGroup SEMCO Regional Sales Manager.



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

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



Features and Benefits:

- No screws through panel joints eliminates possibility of air and noise leaks
- Removable panels allows easy replacement of component parts
- Protect the surroundings from noise pollution to meet industry guidelines and regulations



STRUCTURAL



NOISE BARRIER

Applications:

- Barrier walls
- Modular buildings
- In-plant noise abatement
- Turbine enclosures
- Chiller enclosures
- Equipment enclosures
- Pump enclosures
- Generator/compressor enclosures



NFPA-CERTIFIED



INTEGRATED STRUCTURE

The SEMCO Panel Line: FR-PANEL

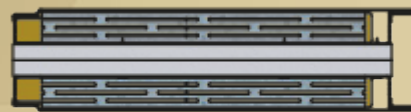
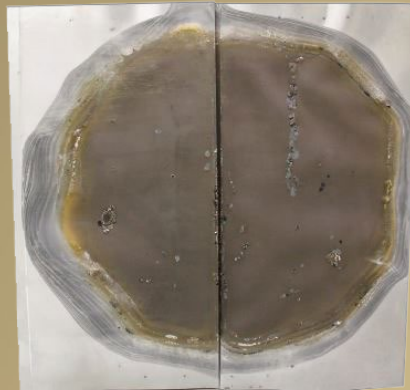


NFPA-CERTIFIED



INTEGRATED STRUCTURE

TWO SIDES OF THE SAME PANEL AFTER A
2+-HOUR, 1800°F FLAME TEST.





NFPA-CERTIFIED



INTEGRATED STRUCTURE

Fire Testing:

- ASTM E119 – Fire test
 - 2 Hour fire rating in accordance with UL-263
- ASTM E84 – Surface burning
 - Class A
 - Flame spread: 0
 - Smoke developed: 5
- NFPA 251 Compliant



NFPA-CERTIFIED



INTEGRATED STRUCTURE

Structural Testing:

- ASTM E72
 - 12' Vertical compression
 - 11,129 lbs.
 - Horizontal 4' compression
 - 15,000 lbs.
 - Deflection; L/240
 - 0.6 in



NFPA-CERTIFIED



INTEGRATED STRUCTURE

Thermal Testing:

- ASTM C1363 – R-Value
 - 7.86
- ASTM C236 – U-Value
 - 0.13



NFPA-CERTIFIED



INTEGRATED STRUCTURE

Additional Testing:

- ASTM E283 – Air Leakage
 - <0.01 cfm/ft² @ 20 psf
- ASTM E331 – Water Penetration
 - No leakage @ 20 psf



 NFPA-CERTIFIED

 INTEGRATED STRUCTURE

Applications:

- Interior Walls
- Elevator Shaft
- Stairwell Chase
- Equipment Rooms
- Power generating enclosures
- Ductwork
- Building Envelope/Penthouse
- Data Center



NFPA-CERTIFIED



INTEGRATED STRUCTURE

Features and Benefits:

- Third-party certification ASTM-E119 2-hour Fire Rating
- *ONLY certified fire protection panel that's also building code-compliant for use in structural, acoustical and thermal applications*
- Significantly low thermal transfer rate

COMMON BUILD FEATURES





Access Doors

- Full wrap-around frame
- 2", 4", and 6" thicknesses
- Large 24x66" standard doors
- 12x12" double pane wire-glass windows available
- 3 lb mineral glass fiber
- Up to 36x84" single, 72x84" double
- Removable





- 2", 4", 6" Inch Thickness
- Up to 45-1/2" width
- Up to 20' length
- Pre-formed corners to 12' length
- Galvanized, stainless or aluminum
- Mineral wool, fiberglass, and custom insulation available
- Vapor barrier available
- Pre-punched base channels
- Circular cuts
- Semi-circular cuts
- Panel interior cuts
- Panel notching
- Standard pre-hung doors
- Custom doors and hardware

Fire safety:

AT-PANEL, MD-PANEL, IN-PANEL

- Flame Spread = 15
(per ASTM E84)
- Smoke Development = 0
(per ASTM E84)
- Insulation is corrosion and moisture resistant
- Rated noncombustible as defined by NFPA Standard 220 when tested in accordance with ASTM E136.



Confidence of Design

- Fully engineered, project-specific product and performance

Structural analysis – ensuring integrity of design

SEMCO Wind load calculator

ASCE Version
ASCE 7-05 ATC Wind Velocity Lookup

Wind Loads Panel Enclosure Wind Loads On Freestanding Walls and Signs

Units in Imperial (MPH, ft)

V = 90 Basic wind speed in mph, 3 second gust velocity

I = II, Other than III and IV (Typical) Importance factor for wind (CAT II-I=1.0 typical, CAT III/IV I=1.15)

h = 32 Mean roof height of structure

w = 200 Least horizontal dimension of structure

L = 200 Length of structure in plan

Zmax = 32 Maximum height above ground level (typically same as h unless on top of a building)

PLW = 500 Length of wall panel in plan

PWW = 1 Width of wall panel in plan

PLR = 500 Length of roof panel in plan

PWR = 1 Width of roof panel in plan

GCpi = Partially Enclosed Enclosure Classification (Partially Enclosed, Fully Enclosed)

Src = B Exposure Category (B, C or D)

Calculate About Exit

Wind Loads Results

Calculate Wind Loads Panel Enclosure "Components and cladding"

Input

V =	90	Basic wind speed in mph, 3 second gust velocity
I =	1	Importance factor for wind (CAT II-I=1.0 typical, CAT III/IV I=1.15)
h =	32	Mean roof height of structure
w =	200	Least horizontal dimension of structure
L =	200	Length of structure in plan
Zmax =	32	Maximum height above ground level (typically same as h unless on top of a building)
PLW =	500	Length of wall panel in plan
PWW =	1	Width of wall panel in plan
PLR =	500	Length of roof panel in plan
PWR =	1	Width of roof panel in plan
GCpi =	Partially Enclosed	Enclosure Classification (Partially Enclosed, Fully Enclosed)
Src =	B	Exposure Category (B, C or D)

Summary of Loads (ASCE 7-05)

q(z) =	12.6	Base Pressure
Pw_wf =	14.8	Max Position Wall Pressure Zones 4 & 5
Pw_L_4f =	-16.0	Max Negative Wall Pressure Zone 4
Pw_L_5f =	-16.0	Max Negative Wall Pressure Zone 5
Prf_pos =	10.0	Max Roof Wall Pressure all zones
Prf_neg_1f =	-18.2	Max Negative Roof Pressure Zone 1
Prf_neg_2f =	-20.8	Max Negative Roof Pressure Zone 2
Prf_neg_3f =	-20.8	Max Negative Roof Pressure Zone 3
a =	12.8	Width of Pressure Coefficient

Print Exit

Powder coating

- Variety of colors
 - Standard RAL colors
 - Custom brand colors
- Textured finishes
 - Hammertone
 - Rough finish
 - Antique/vein
- Durable
 - Indoor/outdoor
 - UV and corrosion resistant

Field Paint

Standard Mill Finishes



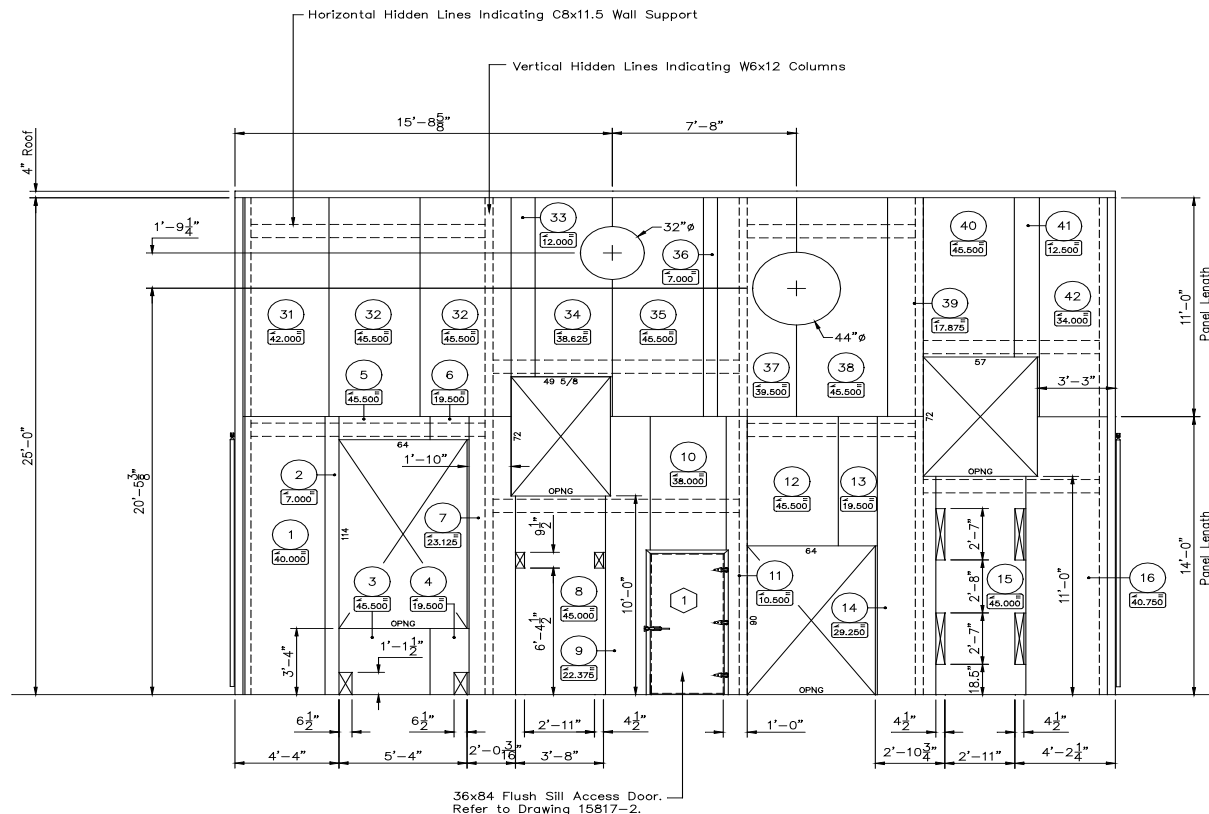
Before powder coating



After powder coating

- Approval drawings
- Fabrication drawings
- Assembly drawings
- 1/4" scale
- 30x42"

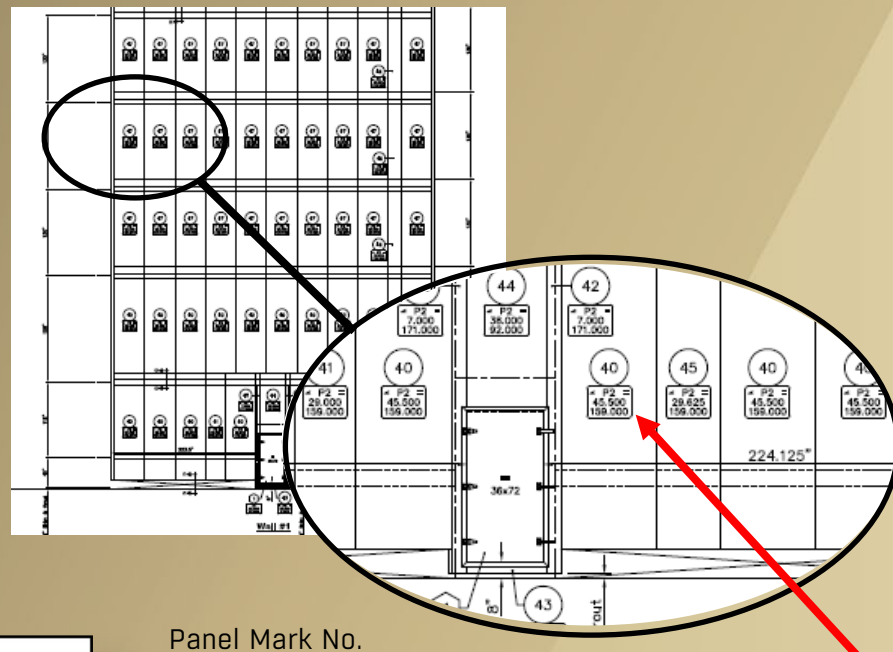
- Full Catalog of Standard details



- Detailed bill of materials
- Complete ¼" scale "D" size drawings ensure accurate system layout
- Flexibility is built into each design to allow for unexpected job site changes
- Individual panel piece-mark and assembly drawings



PANEL MARK :	40	A
56289-2 CR15822 RAS AZ ZAWR/72629		
SEMCO LLC - 1800 East Pointe Drive - Columbia, MO 65201 PHONE 573-443-1481 FAX 573-443-6021		



Panel Mark No.
Order No.
Project Name
Location /
Description

PANEL MARK :	40	A
56289-2 CR15822 RAS AZ ZAWR/72629		
SEMCO LLC - 1800 East Pointe Drive - Columbia, MO 65201 PHONE 573-443-1481 FAX 573-443-6021		



Level 2 packaging

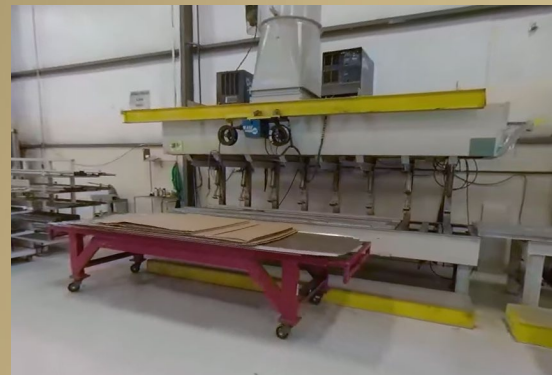


Shows Finished Top Skid

Level 1 Packaging



- Siemens Certified
- Automated Decoil
- Precision Roll Forming
- 2 Full-time Panel Lines



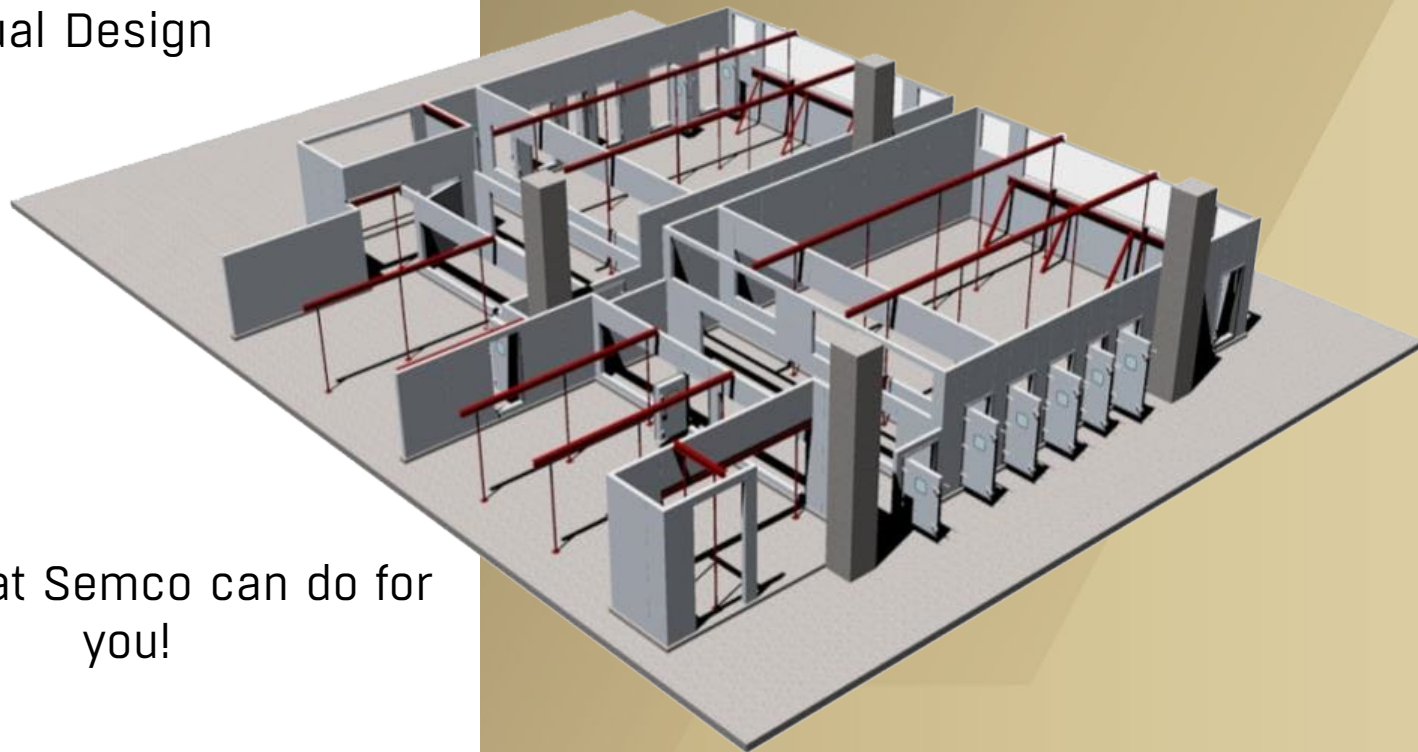
SIEMENS

Successfully passed Siemens
QC Audit and placement within
Siemens approved supplier list.



... SEMCO maintains our industry's shortest lead time
and most consistent on-time deliveries

Conceptual Design



See what Semco can do for
you!

SEMCO PANEL Solutions:

A competitive price – and much more



- Time savings
- Lowest Installed Cost
- Engineered performance
- Aesthetically Pleasing
- Simplified project management
- Quality Manufacturing