

# Linear Radiant Ceiling Panels



## Submittal Data

English Language, IP Units

Heating

Cooling

Fresh Air

Clean Air

### Submittal data

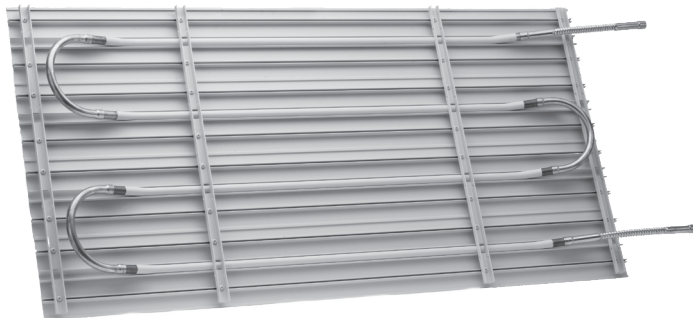
Project
Job number
Architect
Engineer
Contractor

### Performance data: heating

Mean water temperature	°F
Design room temperature	°F
Heating capacity	BTU/hr ft

### Performance data: cooling

Mean water temperature	°F
Design room temperature	°F
Cooling capacity	BTU/hr ft <sup>2</sup>



# Linear Radiant Ceiling Panels Submittal Data

English, IP Units

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## Standard unit features

Summary of all features, some features may not be specific to every project.

- Constructed of 6" wide, 0.0725" thick extruded aluminum panels.
- Tube saddles are an integral part of aluminum extrusions.
- Hot water tubing is 1/2" nominal type L (5/8" OD) copper tubing, snapped into tube saddle and mechanically fastened to aluminum extrusion.
- Extruded aluminum panels interlock using tongue and groove connection and are mechanically held together with steel cross braces.
- Panels have a durable, attractive electrostatic epoxy powder coating. Color is textured white, low gloss.

# Linear Radiant Ceiling Panels Submittal Data

English, IP Units

General data

## Heating performance

		Panel Width						BTU/hr ft <sup>2</sup>
		6" 1 Tube	12" 2 Tubes	18" 3 Tubes	24" 4 Tubes	30" 5 Tubes	36" 6 Tubes	
Mean Water Temperature (°F)	120	53	77	109	163	195	223	68
	125	61	93	127	186	225	257	76
	130	71	106	148	213	257	290	85
	135	80	120	165	237	286	325	97
	140	86	134	187	264	315	361	107
	145	96	148	204	288	345	393	115
	150	103	162	225	313	376	427	124
	155	112	178	246	339	405	462	135
	160	121	190	262	362	436	498	146
	165	128	206	282	389	465	532	156
	170	136	219	303	414	496	565	164
	175	146	233	321	437	527	598	176
	180	154	245	339	463	555	632	187
	185	161	261	359	488	587	668	198
	190	172	274	380	512	615	702	209
	195	179	289	397	538	646	737	219
	200	188	303	416	562	676	770	230
	205	195	316	436	588	704	804	241
210	203	329	455	613	734	838	253	
215	212	345	473	637	764	874	264	
220	220	359	491	653	793	908	275	

■ 70 °F air temperature

■ Heating performance values in BTU/hr ft of panel

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# Linear Radiant Ceiling Panels Submittal Data

English, IP Units

General data

## Cooling performance

T* (F°)	Room interior	Perimeter panels exterior wall conditions					
		0% Glass full sun	25% Glass full sun	50% Glass full sun	75% Glass full sun	100% Glass full sun	100% Glass full shade
		BTU / hr ft <sup>2</sup>					
10	18	21	28	34	38	40	21
11	20	23	31	36	41	42	23
12	21	25	32	37	42	43	25
13	22	26	33	39	43	45	26
14	25	28	35	41	45	47	28
15	27	31	37	43	47	49	31
16	28	32	39	45	48	51	32
17	30	34	41	46	50	52	34
18	32	36	42	48	52	54	36
19	34	38	44	50	54	56	38
20	35	40	46	52	55	57	40
21	37	42	48	53	57	59	42
22	38	44	49	55	59	60	44
23	40	45	51	57	61	62	45
24	42	47	53	59	62	64	47
25	44	49	55	60	64	65	49
26	46	51	56	62	66	67	51
27	48	53	58	63	67	69	53
28	49	54	60	65	69	71	54
29	51	56	62	67	71	72	56
30	52	58	64	69	73	74	58

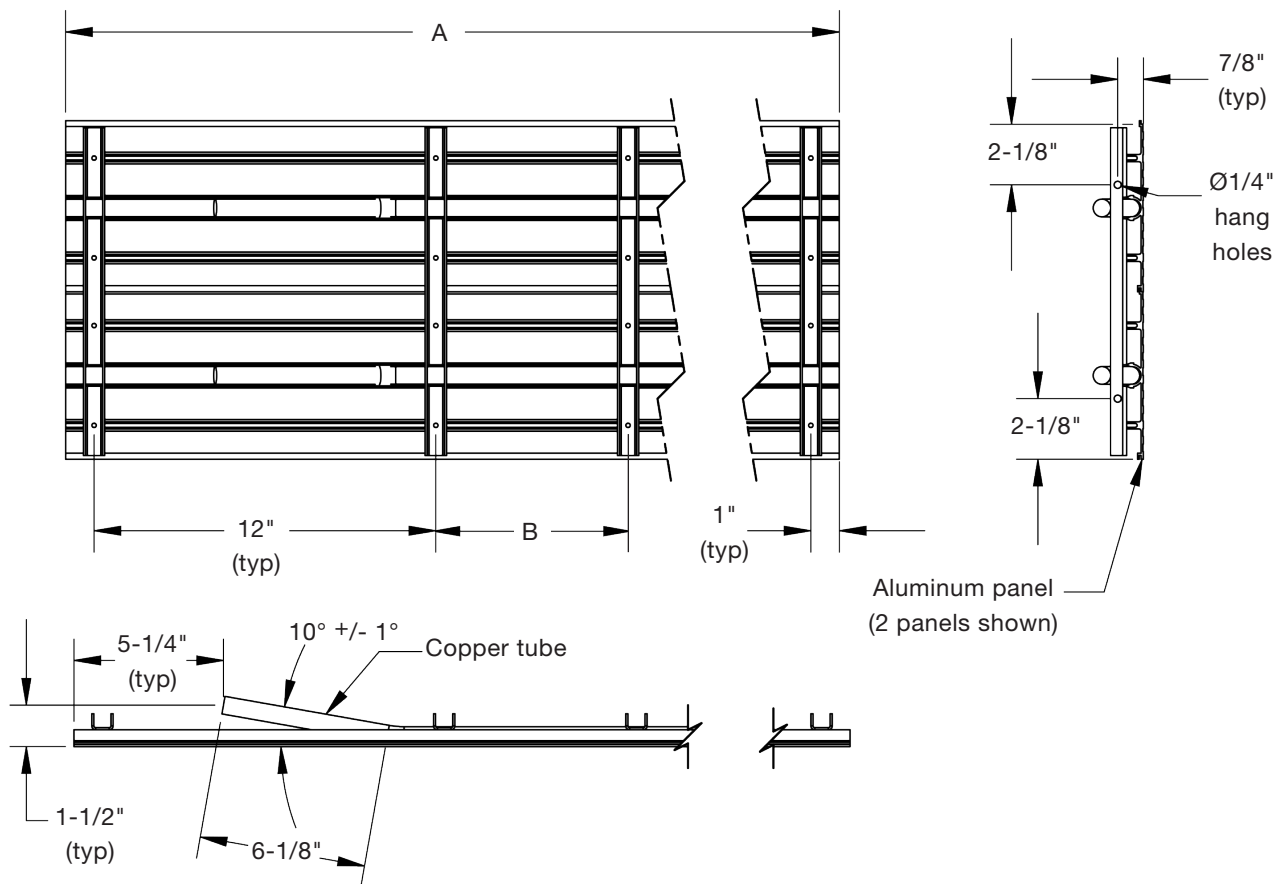
- \*(Room temperature) - (Mean water temperature)
- Due to actual conditions, stated performance values can vary plus or minus 3%

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# Linear Radiant Ceiling Panels Submittal Data

English, IP Units

Dimensions and data: assembly



A	B	# of cross channels
4'	n/a	4
5'	17"	5
6'	23"	5
7'	29"	5
8'	23.3"	6
9'	27.3"	6
10'	31.3"	6
11'	26.5"	7
12'	29.5"	7
13'	26"	8
14'	28.4"	8
15'	25.7"	9
16'	27.7"	9

Nominal Width	Actual Width	Panels	Weight (lb/ft)
6"	6"	1	1.1
12"	11-7/8"	2	2.2
18"	17-3/4"	3	3.3
24"	23-5/8"	4	4.4
30"	29-1/2"	5	5.5
36"	35-3/8"	6	6.6

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## Mechanical specifications

### 1.0 General

#### 1.1 Scope

- .1 To provide an extruded Linear Ceiling Panel system per plans and specifications.

#### 1.2 Manufacturers

- .1 Zehnder Rittling
- .2 Alternate manufacturers shall be equal or better than Zehnder Rittling in regard to rows of tubes, capacity, water pressure drop, piping connections and finish.

#### 1.3 Quality

- .1 Manufacturer shall be regularly involved in the production of Linear Radiant Ceiling Panel and have available published performance data.
- .2 Submittal drawings shall include supply and return field connection locations along with interconnecting details.

### 2.0 Finished product

- .1 Constructed of 6" wide, 0.0725" thick extruded aluminum panels.
- .2 Total width and number of tubes per design specifications.
- .3 Tube saddles shall be an integral part of aluminum extrusion
- .4 Hot water tubing shall be 1/2" nominal Type L (5/8" OD) copper tubing, snapped into tube saddle and mechanically fastened to aluminum extrusion.
- .5 Extruded aluminum panels shall interlock using tongue and groove connection and mechanically held together with steel cross braces.
- .6 All interlocking of extruded aluminum panels, assembly of cross braces and installation of copper tubes to be done at factory.
- .7 Panels shall be degreased and chemically phosphatized before application of a durable, attractive electrostatic epoxy powder coating. Color is textured white, low gloss, Protech HX611W565
- .8 Units shall be manufactured in accordance with conformance to ISO 9001:2008 standards.

### 3.0 Equipment Schedule

#### 3.1 Linear Radiant Ceiling Panel

- .1 Manufacturer: Zehnder Rittling
- .2 Model: Linear
- .3 Performance: BTUH/Lin. ft. or W/Lin. m
- .4 Width: Specify
- .5 Length: Specify

- .6 Output based on \_\_\_°F or \_\_\_°C mean water temperature and 70°F (21°C) air temperature.

- .7 The maximum water pressure drops shall be as follows:

- .5 gpm - 0.75 ft. of water per 100 ft. tube.
- 1.0 gpm - 2.45 ft. of water per 100 ft. tube.
- 1.5 gpm - 4.93 ft. of water per 100 ft. tube.
- 2.0 gpm - 8.11 ft. of water per 100 ft. tube.
- 2.5 gpm - 11.98 ft. of water per 100 ft. tube.
- 3.0 gpm - 16.48 ft. of water per 100 ft. tube.

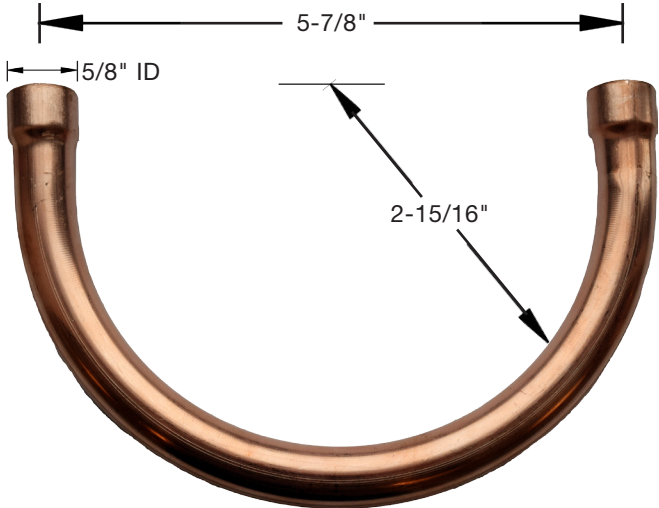
### 4.0 Installation

- .1 The mechanical contractor shall cooperate with all other trades to ensure an aesthetically pleasing ceiling installation.
- .2 All interconnecting of radiant panels by the mechanical contractor shall consist of 1/2" nominal (5/8" OD) flexible copper interconnects and return U-bends, supplied by Zehnder Rittling.
- .3 Hot water supply tubing to connect first to panel closest to perimeter wall. Multiple panels are to be connected to ensure serpentine flow across entire zone. Individual serpentine panels connected in series are unacceptable for multiple panel zones.
- .4 All radiant panels shall be installed continuously from wall-to-wall. All radiant panels shall be trimmed in the field to allow enough room for expansion while maintaining adequate panel end coverage with architectural moldings.
- .5 All radiant ceiling panels shall be installed by workers wearing clean, white gloves.
- .6 All system piping shall be thoroughly cleaned, flushed, drained and refilled before radiant ceiling panels are connected to system
- .7 Panels to be pressure tested per engineer's specifications.
- .8 All active panels shall be covered with a 1" minimum thickness of 1 pound density insulation after connection and testing of panels is complete.
- .9 Minimum of one wire hanger per cross brace. Minimum of two per panel.

 6" U-bend

**Material**

- 1/2" nominal type L copper tubing
- 0.040" tube wall thickness
- 4800 psi working pressure at 250°F



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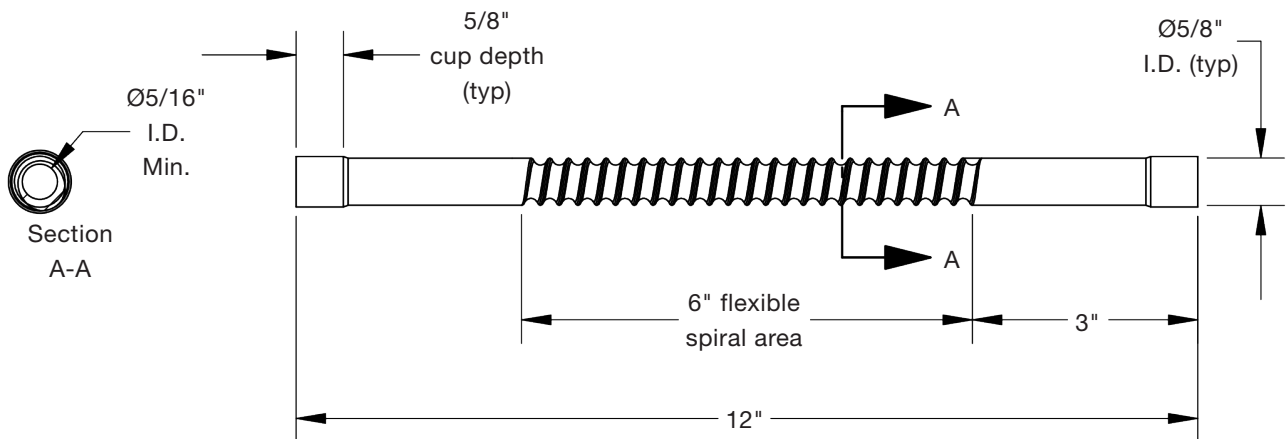
# Linear Radiant Ceiling Panels Submittal Data

English, IP Units

 12" interconnector

## Material

- 1/2" nominal type L copper tubing
- 4800 psi working pressure at 250°F



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## Fiberglass insulation

### Description

Flexible duct liner insulation is made from strong, glass fibers bonded with a thermosetting resin. The airstream surface is protected with a reinforced coating system, which combines a state-of-the-art acrylic coating with a flexible glass mat reinforcement to provide a smooth airstream surface.

### Advantages

- Improves indoor environmental quality by helping to control both temperature and sound.
- The tough, acrylic polymer coating helps guard against the incursion of dust or dirt into the substrate, minimizing the potential for biological growth.
- Coating is formulated with an immobilized, EPA-registered, protective agent to protect the coating from potential growth of fungus and bacteria. Duct liner meets all requirements for fungi and bacterial resistance. Tests were conducted in accordance with ASTM C 1338 and ASTM G 21 (fungi testing) and ASTM G 22 (bacteria resistance testing). **Note:** As with any type of surface, microbial growth may occur in accumulated duct system dirt, given certain conditions. This risk is minimized with proper design, filtration, maintenance and operation of the HVAC system.
- The reinforced coating surface provides superior resistance to penetration of incidental water into the fiber glass wool core.
- GREENGUARD® certification is proof that the product meets the Environmental Institute's indoor air quality standards for VOCs.

### Thermal performance

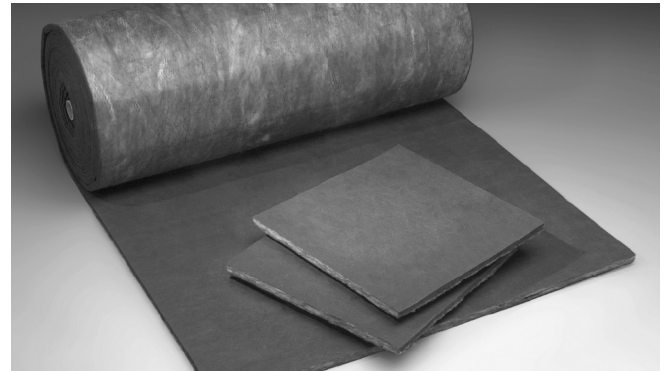
Thickness		R-value		Conductance	
in	mm	hr•ft <sup>2</sup> •°F/Btu	m <sup>2</sup> •°C/W	Btu/(hr•ft <sup>2</sup> •°F)	W/m <sup>2</sup> •°C
1/2	13	2.2	0.38	0.46	2.61

R-value and conductance are calculated from the material thermal conductivity tested in accordance with ASTM C 518 at 75 °F (24 °C) mean temperature

### Sound absorption coefficients (type "A" mounting)

Thickness		Sound absorption coefficient at frequency (cycles per second) of						
in	mm	125	250	500	1000	2000	4000	NRC
1/2	13	0.07	0.20	0.44	0.66	0.84	0.93	0.55

Coefficients were tested in accordance with Test Method ASTM C 423-90 and ASTM E 795



### General properties

- Operating temperature (max.): ASTM C 411 250 °F (121 °C)
- Air velocity (max.): ASTM C 1071 6,000 fpm (30.5 m/sec)
- Water repellency: INDA IST 80.6-92
- Fungi resistance: ASTM C 1338 Does not breed or promote
- Fungi resistance: ASTM G 21 No growth
- Bacteria resistance: ASTM G 22 No growth

### Surface burning characteristics

- Meets the surface burning characteristics and limited combustibility of the following standards: standard/test method
  - ◆ ASTM E 84
  - ◆ UL 723
  - ◆ NFPA 255
  - ◆ NFPA 90A and 90B, FHC 25/50 and limited combustibility
  - ◆ NFPA 259
  - ◆ CAN/ULC S102-M88
- Flame spread: not over 25
- Smoke developed: not over 50

### Specification compliance

- ASTM C 1071, Type I
- ASTM G 21 and G 22
- ICC Compliant
- California Title 24
- ASHRAE 62-2001
- SMACNA Application Standards for Duct Liners
- NAIMA Fibrous Glass Duct Liner Installation Standard
- Canada: CGSB 51-GP-11M and CAN/CGSB 51.11

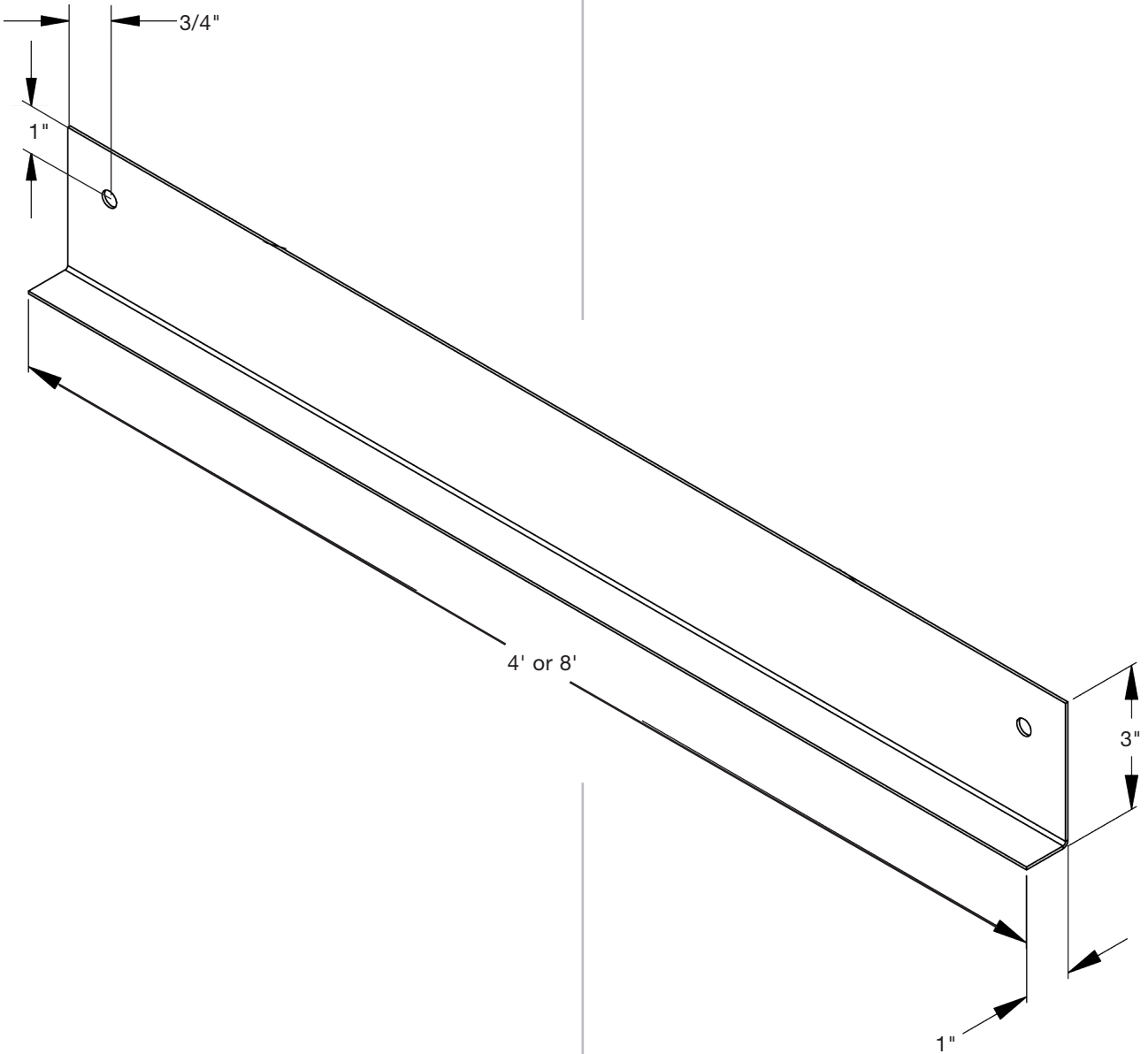
# Linear Radiant Ceiling Panels Submittal Data

English, IP Units

 Aluminum angle

## Material

- 18 Ga. aluminum



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## Warranty

Zehnder Rittling guarantees its products to be free from defects in material and workmanship for a period of two years from date of shipment from our Buffalo, NY factory, whichever comes first.

Should there be any defects in the good(s), the purchaser should promptly notify Zehnder Rittling. Upon receipt of written consent from Zehnder Rittling, the purchaser shall return the defective good(s) to the factory for inspection with freight prepaid. If inspection shows the goods to be defective, Zehnder Rittling will at its discretion repair or replace the said item(s).

Defects arising from damage due to shipment, improper installation, negligence or misuse by others are not covered by this warranty.

This warranty is extended only to the original purchaser from Zehnder Rittling.

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