



## Ceiling Radiant Panels Solutions

Freedom comes from innovation

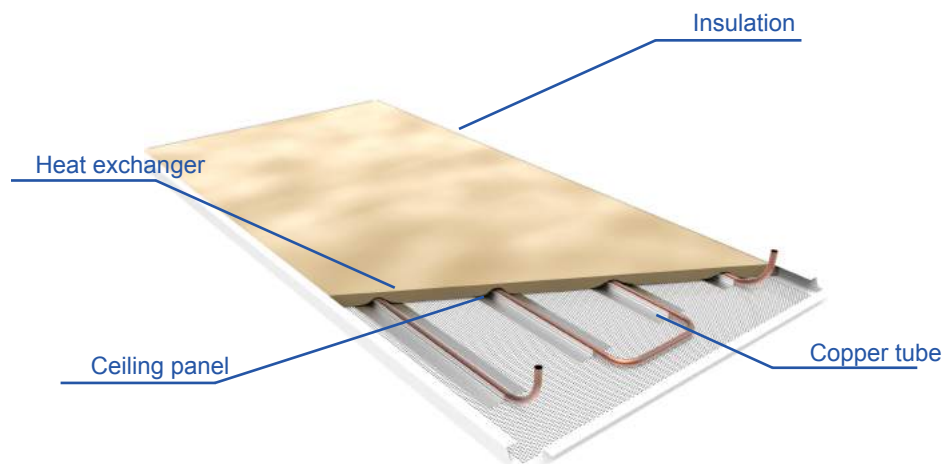
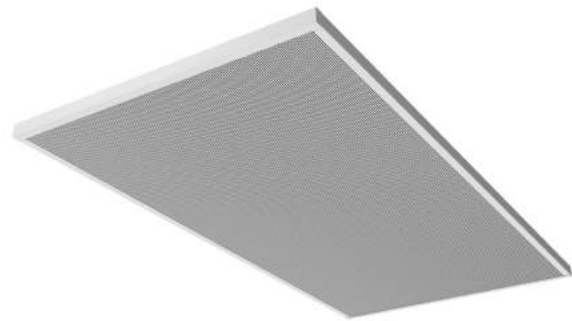
Freedom (Zhengzhou) Industry Co., Ltd

# Introduction

## Radiant Ceiling Panels

Freedom hydronic ceilings provide sustainable heating and cooling with circulate hot or cold water through concealed copper tubes, which is widely applied for office building, hospitals and such areas that requires high comfort and low noise.

- ◇ Radiant Ceilings for heating and cooling  
Attention: Cold water temperature must be higher than the room dew temperature to avoid the possible condensation.
- ◇ Decorative metal ceiling panels that can be combined with lighting for individual option.
- ◇ Without electrical parts for low noise and power consumption
- ◇ Green building design with radiant ceiling systems , and the metal mesh ceiling panels to absorb the noise, for high comfort.
- ◇ Different panel shapes and sizes(types) can be realized and offer design freedom.



## Model Description

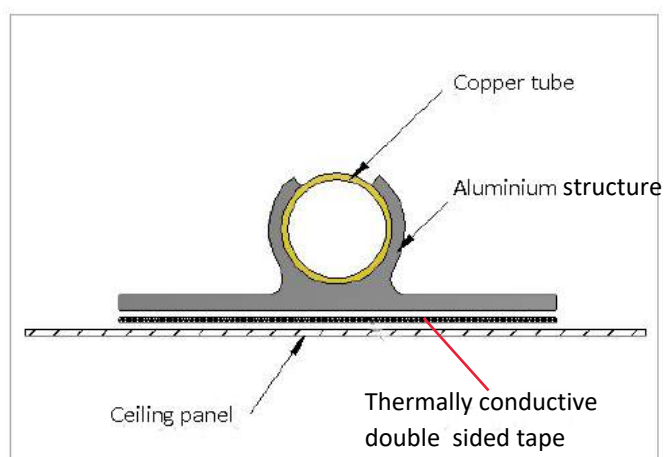
FCRP-W×L-N-S

FCRP—Freedom radiant ceiling panel W  
—Radiant ceiling panel width  
L—Radiant ceiling panel length  
N—Row of Aluminum heat exchanger  
S—Standard configuration, without  
cotton insulation OR C with insulation

For example

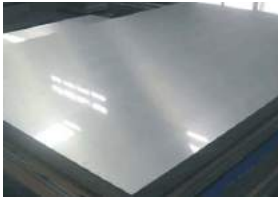
FCRP—600 × 1200—4—C

Freedom Radiant Ceiling Panel:  
Width: 600mm, Length: 1200mm  
Heat exchanger: 4 rows  
C: With cotton insulation



Heat exchanger Cross-section

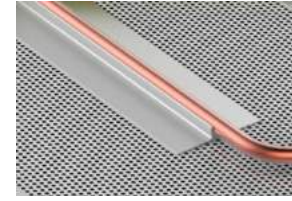
## Product Structure



Ceiling panels are made of 0.7mm thickness cold rolled steel with stamping and welding process and surface powder coating technology. With 2.5mm diameter holes and 6-15mm hole spacing on the surface, which will reduce the noise for low noise. Meanwhile, the various style of holes will achieve different decorative effect.



Heat exchanger is made of 0.5mm thickness, 10mm od fine seamless copper tube and precision Aluminum material by expansion technology. The design will make minimum thermal resistance possible and ensure a good thermal conductivity.



Freedom radiant ceilings are a combination of heat exchanger elements and ceiling panel that apply high-efficiency double-sided thermal tapes and special technology for strong strength and stable performance for high temperature resistance and thermal conductivity. Insulation material is also available.

## Technical parameters

### ◇ Cooling

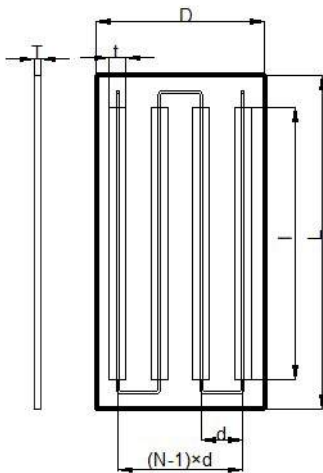
For cooling, cold water temperature must be at least 0.5°C higher than room dew temperature to minimize the risk of condensation for a comfort room climate. When the temperature difference between the average chilled water and room temperature is 10°C, the cooling output can be 95W/㎡

### ◇ Heating

For heating, when temperature difference between the average hot water and room temperature is 45°C, cooling output can be 150W/㎡

### ◇ Working Pressure

Maximum working pressure is 1.6MPa. Testing pressure is 2.4MPa before shipment from the factory.



### • Radiant Ceiling Panel Cooling Output

Radiant Ceiling		W/mm	300			600		
		L/mm	1200	1800	2400	1200	1800	2400
Average Temp. Difference (°C)	Cooling Output (W)	7°C	23	34	45	45	67	88
		8°C	25	38	50	50	75	100
		9°C	29	43	57	57	85	114
		10°C	32	48	64	64	95	125
		11°C	35	52	70	70	103	138
		12°C	39	57	76	76	114	150

### • Radiant Ceiling Panel Heating Output

Radiant Ceiling		W/mm	300			600		
		L/mm	1200	1800	2400	1200	1800	2400
Average Temp. Difference (°C)	Heating Output (W)	10°C	21	32	43	43	64	85
		13°C	28	42	56	56	82	108
		16°C	34	50	68	68	100	136
		19°C	40	60	80	80	120	160
		22°C	46	69	94	94	140	185
		25°C	54	80	105	105	158	210

Size: mm

Panel Width	W	300	300	600	600
Panel Length	L	1200	1800	1200	1800
Pipe Distance	d	150	150	150	150
Exchanger Width	t	60	60	60	60
Exchanger Length	l	1100	1600	1100	1600
Exchanger Rows	N	2	2	4	4
Thickness	T	20	20	25	25

## Installation and Connection

Freedom Radiant Ceilings with modular design consists of 4 types of standard radiant ceiling units This enables the flexibility for HVAC design. Also, individual design option is available.

Space-saving ceiling system with that can flexibly combine thermally active and passive area.

For some building with similar situation, the copper thread-head can be designed for fastening connection or welded process.

In case the radiant ceilings need to be moved or dismantled for final site installation, the easy-to-connection brass thread-head and flexible hoses are recommended for the connection.

# Technology Changes Life

Freedom (Zhengzhou) Industry Co., Ltd

Address: NO.3 Building, NUST, NO. 11  
Changchun Rd, High-tech District,  
Zhengzhou, China

Tel : 086-0371-63582158/63582118

Fax:086-0371-63582314

E-mail: [info@freedom-hvac.com](mailto:info@freedom-hvac.com)

Web:[www.freedom-hvac.com](http://www.freedom-hvac.com)