



Multi-service foil

Heating and cooling, lighting, acoustics and additional services



Multi-service foil

Zehnder in conjunction with Whitecroft Lighting

Product Information

The evolutionary multi-service foil panel combines radiant heating and cooling, lighting and additional features to deliver a groundbreaking new solution.

Ideal for projects where mechanical and electrical designers can work together with the main contractor to deliver a fully integrated solution. Combining services uses less ceiling space than separate systems and reduces the number of installers, reducing risk and improving project delivery time.

The multi-service foil is a culmination of Zehnder's expertise in radiant heating and cooling and Whitecroft Lighting's market-leading capabilities in lighting manufacture.

The multi-service foil incorporates LED lighting and acoustics into a Radiant Heating and Cooling sail; other controls, detectors and functions can be integrated as required.

The foil offers a slim aesthetic constructed from steel and can be easily disassembled for future upgrades and replacement of components, making a truly sustainable solution for educational and commercial spaces.

In addition, it aids those involved in the project lifecycle ensuring ease of specification, reduced installation time and low maintenance.

ADVANTAGES

Design Installation Operation Delivers on sound absorption Easy to install with **Responsive and** and acoustic performance plug 'n' play energy efficient through the perforated surface connections can reduce CO2 emissions by up to 25% Suitable for both heating Developed with the and cooling installer in mind: Activated on both cable management, sides of the foil to lighting module integration, hanging ensure heating and Fully integrated design, cooling output is and levelling of the incorporating all services within maximised panel and ease of one panel to deliver a clean, hydraulic connection symmetrical and aesthetically pleasing design Ease of maintenance integrates comfortably with Complies with Building Bulletin **Building Maintenance** 93 Acoustic Design of School Programmes Standards High efficiency LED lighting with low glare optics ensure

compliance with industry standards

Bespoke design ensures best performance

Integrated services deliver on heating, cooling, acoustics and lighting output



Product Dimensions

Length:	2,200 mm
Width:	900 mm
Height:	85 mm
Weight:	35 kg per panel

Lighting controls







Public address



Sprinkler heads



Smoke detection

Technical data at-a-glance Heating and Cooling Performance

Heating Performance

К	7.3161				
n	1.1466				
∆t (K)	Output	∆t(K)	Output	∆t (K)	Output
70	955	48	619	24	280
68	923	46	590	22	253
66	892	44	561	20	227
64	861	42	531	18	201
62	831	40	503	16	176
60	800	38	474	14	151
58	770	36	445	12	126
56	739	34	417	10	103
55	724	32	389		
54	709	30	361		
52	679	28	334		
50	649	26	307		

Cooling Performance

к	9.2275
n	1.083
Δ t (K)	Output
15	173
14	161
13	148
12	136
11	124
10	112
9	100
8	88
7	76
6	64
5	53
4	41
3	30
2	20
1	9

ESFA Technical Standards and Performance in Schools

When referring to the ESFA (Education & Skills Funding Agency's) Output Specification "Annex 2F Mechanical Services and PHE (Technical Annex) v7", it is important to note that the Radiant Temperature Asymmetry (RTA) within each space should be calculated considering the radiant panel 'active area' and not the entire panel area if only part of the panel is active. For the Zehnder Foil product, there is the option of activating either one (single) or two (dual) sides of the panel; this is equivalent to either 33% or 66% of the panel face area being active, so in the case of our standard 2,200 x 900 mm panel (1.98m² total face area), the active areas shall take into account formulae in BS 7726 or reference tables in Annex 2F with 0.65m² for the single activation panel or 1.3m² for dual sided activation.

For a seated person, the difference in plane radiant temperature between the upper and lower parts of the space shall be taken with respect to a small horizontal plane 0.6m above floor level in accordance with CIBSE Guide A Section 1.6.6.4 (2015 Edition). RTA should not exceed 7K for sedentary activity the only exception should be for vulnerable pupils e.g. those with low mobility. To that end, the RTA should be reduced to 5K.

See Table 1 Radiant Temperature Asymmetry, right;

Table 1 Radiant Temperature Asymmetry, RTA = 7K					
RTA = 7K RTA = 5K					
		Panel width (mm)	Panel width (mm)		
Flow/Return	Assumed	900	900		
Temperature (°C)	Emitter Temperature (°C)	Minimum panel height above finished floor level (m)	Minimum panel height above finished floor level (m)		
50/30	40	< 2.4	< 2.4		
60/40	50	2.55	3.20		
70/40	55	2.85	3.55		
70/50	60	3.2	4.0		
80/60	70	3.75	4.60		
82/71	76.5	4.1	5.0		

Operating Information

Maximum working temperature: 80°C Maximum test pressure: 7.8 bar Maximum working pressure: 6 bar Tested to EN14037, EN12464 and ISO 354

Additional factors to consider

- The design shall take account of the mean water temperature, size of radiant panels and the available mounting height
- The arrangement of panels should ensure an even distribution of heat
- Radiant panels shall 'not be located directly above teaching walls or ... (an occupant is) standing for prolonged periods of time' unless RTA calculations deem that the installation is suitable
- The option of integrating luminaires and acoustic absorbers within radiant panels shall be considered
- The surface temperature of ceiling mounted radiant panels in classrooms or offices shall be 'limited to meet BS EN 15251'

Full documents can be accessed at gov.uk/esfa

Technical data at-a-glance Lighting Performance - Typical 55m² Classroom

Lighting Performance

55m ² General Classroom				
Criteria Targets (SLL Lighting Guide LG5) Foil Radiant 3700 lumens				
Average lighting level	300 lux	376 lux		
Uniformity	0.60	0.68		
Wall illuminance	50% / 75 lux	50% / 188 lux		
Ceiling illuminance	30% / 50 lux	52% / 196 lux		
Cylindrical illuminance @ 1.2m	150	151		
Modelling	0.3 - 0.6	0.38		
UGR limit	19	< 19		
Maximum luminance cd/m ²	< 3000 (VDT use)	1986		



Acoustic Performance

Complies with DCSF Building Bulletin 93

Building Bulletin 93 clearly defines the acoustic performance standards for reverberation time. Most installations would include acoustic wall cladding to meet the requirement. Acoustic wall panels can be time consuming and costly to install. With acoustic material integrated into the Foil luminaire, significant savings can be made in both build programme and material cost.

900mm wide Foil Radiant with 30mm layer of compressed fibre acoustic material

Freq Hz	Equivalent Sound Absorption Area, m ²	Freq Hz	Equivalent Sound Absorption Area, m ²
50*	0.1	800	2.6
63*	0.6	1000	2.8
80*	0.3	1250	2.8
100	0.3	1600	2.5
125	0.6	2000	2.4
160	0.7	2500	2.2
200	0.9	3150	2.1
250	1.3	4000	2
315	1.6	5000	1.9
400	1.7	6300*	1.9
500	2.1	8000*	1.9
630	2.5	10000*	1.9

* Denotes frequencies outside the range covered by BS EN ISO 354:2003 (not UKAS accredited) Individual luminaire dimensions 2200 x 900 x 85mm at 800mm suspension height Full independent test reports available on request



Product codes and accessories

Product codes

Material codes	Description	
FLRL121YIP20*	Multi-service foil perforated in matt silver RAL 9006. Active radiant 2200 x 900mm with 3700 lumen, 30W, 1200mm LED luminaire and integrated acoustic material. Without flexible hoses	
FLRL121YIP20NA*	Multi-service foil perforated in matt silver RAL 9006. Non-active panel 2200 x 900mm with 3700 lumen, 30W, 1200mm LED luminaire and integrated acoustic material. Without flexible hoses	
FLRL122YIP20*	Multi-service foil perforated in matt silver RAL 9006. Active radiant 2200 x 900mm with 5600 lumen, 47W, 1200mm LED luminaire and integrated acoustic material. Without flexible hoses	
FLRL122YIP20NA*	Multi-service foil perforated in matt silver RAL 9006 Non-active panel 2200 x 900mm with 5600 lumen, 47W, 1200mm LED luminaire and integrated acoust material. Without flexible hoses	
FLRL400INF	Multi-service foil infill perforated in matt silver RAL 9006 L 400mm x W 900mm.	
FLRL800INF	Multi-service foil infill perforated in matt silver RAL 9006 L 800mm x W 900mm.	
FLRL1200INF	Multi-service foil infill perforated in matt silver RAL 9006 L 1200mm x W 900mm.	

 * Add suffix 'EM' for 3 hour emergency lighting, 'EP' for 3 hour DALI addressable emergency lighting



Accessories

Material codes	Description	
FLRLENDHOS	End of Row Kit – Containing 1 x 1m hose	
FLRLCONTHOS	Continuous Kit – Containing 2 x 1m hose	
FLRL400HOS	400mm Infill Kit – Containing 2 x 1m hose	
FLRL800HOS	800mm Infill Kit – Containing 2 x 1.5m hose	
FLRL1200HOS	1200mm Infill Kit – Containing 2 x 2.5m hose	
FLRLNAHOS	3000mm Infill Kit – Containing 2 x 3m hose	
FLRADSCLAMP	Sail connection clamp	
FLRSTARTHOS	1000mm Flexible Hose 12mm x 15mm	

For further information on lighting specification, visit www.whitecroftlighting.com/products/foil-radiant





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