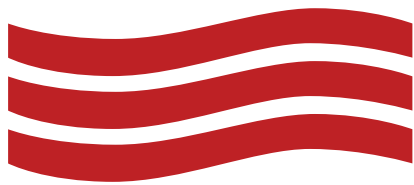


# AIRFOIL



GRILLES  
DUCT  
FITTINGS

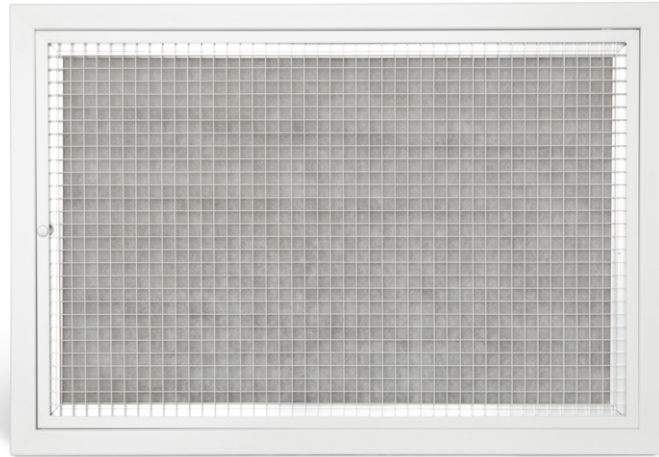
*making it happen sooner...*



Quality  
Endorsed  
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ISO 9001  
 SAI GLOBAL



**HINGED EGGCRATE GRILLE  
H-R5-F**



## HINGED EGGCRATE GRILLE H-R5-F

### PRODUCT DESCRIPTION AND APPLICATION

Airfoil's Hinged Eggcrate Grille (H-R5-F), proudly crafted in Australia, is the ideal choice for return and exhaust air applications. Customisable to any size, this grille is meticulously constructed from Airfoil's finest extruded aluminium, ensuring durability and efficiency. With a free area of approximately 90%, the H-R5-F can handle large air volumes while maintaining relatively low noise levels.

Featuring an internal aluminium channeled cubed hinged removable core of 13mm x 13mm x 13mm, the H-R5-F offers exceptional performance. This grille comes standard with a 12mm filter and frame, fitted via the C Channel extrusion at the rear of the grille. The filter can be easily removed, cleaned, or replaced depending on its condition over time.

The H-R5-F is delivered in two separate pieces: the first piece is a 25mm x 50mm outer frame, while the second piece is an inner core frame that utilizes a thumb screw for easy connection to the outer frame. Available in various stocked face sizes to suit metric T-Bar grid applications for commercial use, the H-R5-F can also be ordered with Airfoil's accompanying Return Air Plenum Box (RAB), offering a choice of premium insulations.

Available in both our standard powder-coated white range or Natural Anodised Silver finish, the H-R5-F can also be powder-coated to any specific colour upon request. Highly recommended for any commercial or domestic return or exhaust air application, the Hinged Eggcrate Grille (H-R5-F) combines efficiency with convenience.

## HINGED EGGCRATE GRILLE H-R5-F

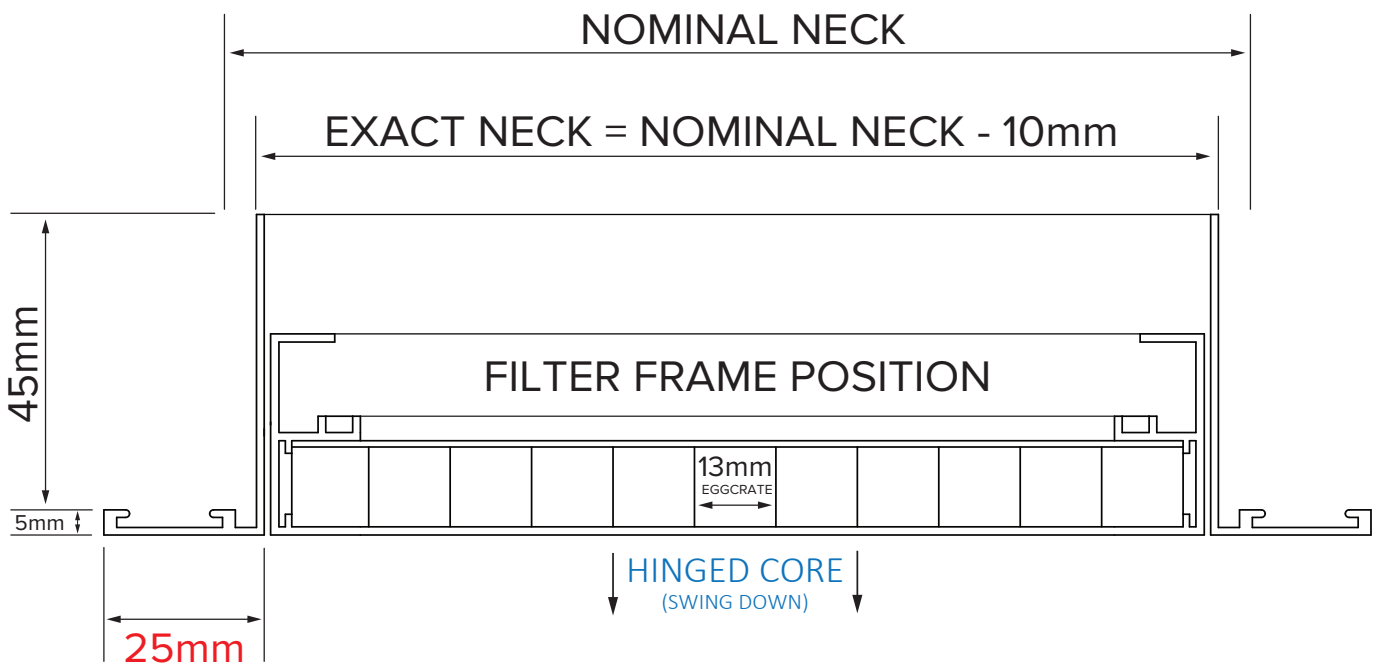
### PRODUCT SPECIFICATIONS AND INFORMATION

- **Product ordering code – H-R5-F**
- Australian Made
- Aluminium Construction
- Manufactured to any size
- Removable Hinged Core for easy installation
- 12mm Filter included as standard
- Fixed Frame 25mm
- Frame Depth 45mm
- Channelled Cubed Hinged Core 13mm x 13mm x 13mm
- Complete with thumb screw for easy connection to the outer frame
- Comes in various stocked face sizes to suit metric T-Bar grid applications
- Approximately 90% free area
- Flush mounted to ceiling
- Capable of handling large air volumes with relatively low noise levels
- Optional Airfoil Return Air Plenum Box (RAB) with choice of premium insulation
- Available in standard white powder-coated range
- Available in our Natural Anodised Silver finish
- Can be powder-coated to any colour on request
- Product suitable for any domestic or commercial return and exhaust air applications
- Airfoil tested information available
- **The following metric performance data has been derived from exhaustive testing in elaborate laboratories of acoustic and vibrational engineers Louis A. Challis and Associates Proprietary Limited. Darling Street, Sydney 2000**



## HINGED EGGCRATE GRILLE H-R5-F

### CROSS SECTIONAL DIAGRAM



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## HINGED EGGCRATE GRILLE H-R5-F

### PERFORMANCE DATA

#### STATIC PRESSURE AT VARIOUS AIR QUANTITIES AND NECK AREAS

Typical Sizes	300 x 300 600 x 150	450 x 300 900 x 150	600 x 300 900 x 200	750 x 300 600 x 375	900 x 300 600 x 450	1200 x 300 600 x 600
Neck Area M <sup>2</sup> (l/s)	0.090	0.0135	0.180	0.225	0.270	0.360
50						
75	2					
100	3					
125	5					
150	7.5	2.5				
175	9	3				
200	11	4				
250	12.5	5	2.5			
300	20	7.5	2.5	2.5		
350	25	10	5	2.5	2.5	
400	42.5	12	7.5	5	2.5	
450	57.5	12.5	8.5	5	3	2.5
500		15	10	6	5	3
600		22.5	12.5	7	6	5
700		27.5	15	7.5	7.5	6
800		35	20	12.5	10	7.5
900		42.5	25	17.5	12	10
1000		55	32.5	22.5	12.5	10
1500			40	25	15	12.5
2000					42.5	25
2500						42.5

Typical Sizes	900 x 450 675 x 600	1200 x 450 900 x 600	900 x 900 1350 x 600	1000 x 1000 2000 x 500	1500 x 1000 1225 x 1225	2000 x 1000 1600 x 1250
Neck Area M <sup>2</sup> (l/s)	0.405	0.540	0.810	1.000	1.500	2.000
450	2.5					
500	2.5	2.5				
600	2.5	2.5				
700	5	2.5				
800	6	2.5	2.5			
900	7	5	2.5			
1000	7.5	6	2.5	2.5		
1500	10	7.5	5	2.5		
2000	20	15	10	7.5	5	5
2500	42.5	25	15	10	7.5	5
3000	40	27.5	17.5	15	7.5	5
4000			47.5	30	10	7.5
5000				40	12.5	10

## HINGED EGGCRATE GRILLE H-R5-F

### PERFORMANCE DATA

#### VARIOUS NECK VELOCITIES GIVEN AIR FLOW VS NECK AREAS

Typical Sizes	300 x 300 600 x 150	450 x 300 900 x 150	600 x 300 900 x 200	750 x 300 600 x 375	900 x 300 600 x 450	1200 x 300 600 x 600
Neck Area M <sup>2</sup> (l/s)	0.090	0.0135	0.180	0.225	0.270	0.360
50	0.5					
75	1.0	0.5				
100			0.5			
125		1.0		0.5		
150	2.0				0.5	
175			1.0			0.5
200				1.0		
250	3.0	2.0			1.0	
300	4.0		2.0			
350	4.5	3.0				1.0
400	5.0			2.0		
450		3.5			2.0	
500		4.0	3.0			
600		5.0	4.0	3.0		
700			4.5	3.5	3.0	2.0
800			5.0	4.0	3.5	2.5
900				4.5	4.0	3.0
1000				5.0	4.5	3.5
1500					5.0	4.5
2000						5.5

Neck velocity - metres/sec

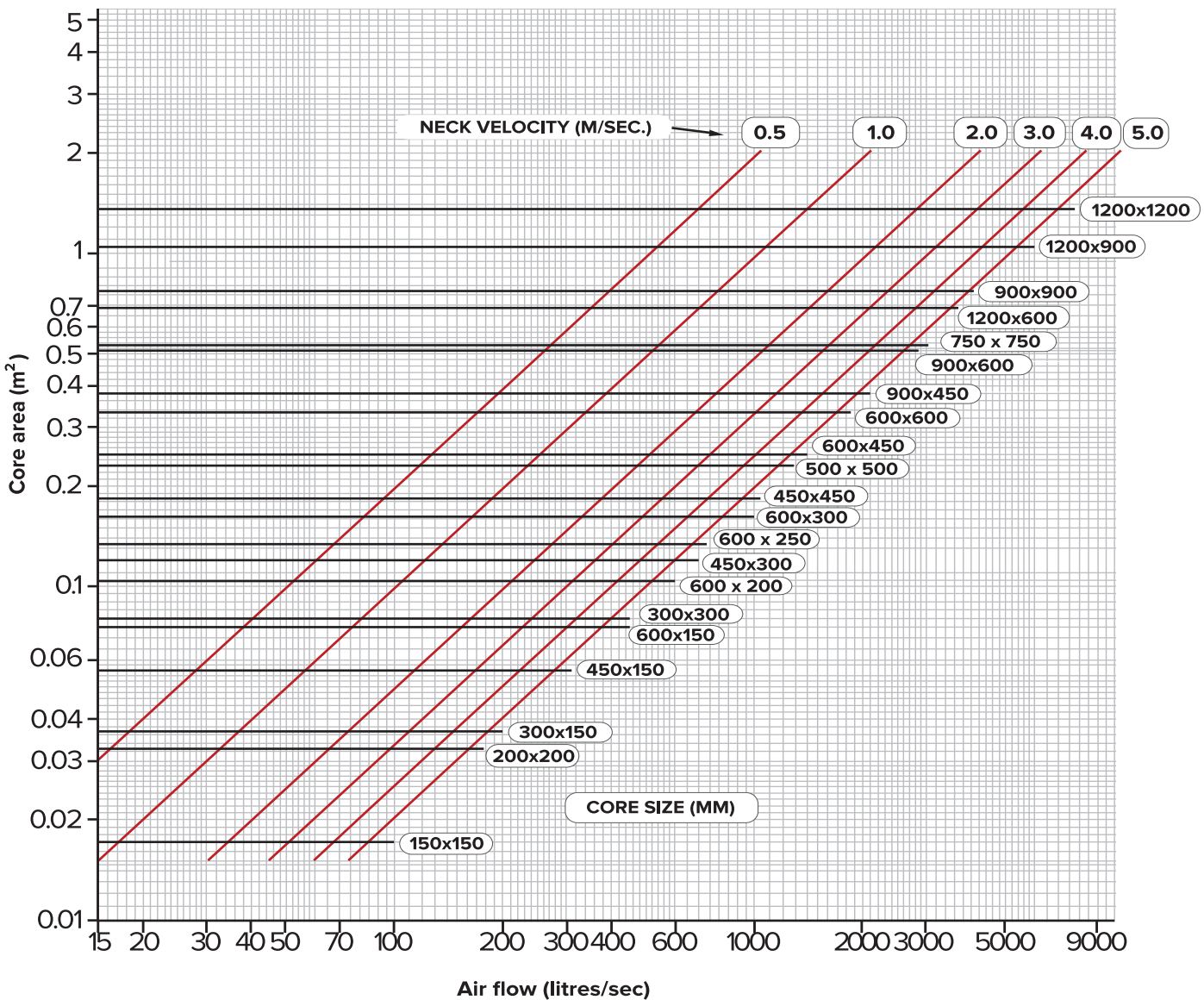
Typical Sizes	900 x 450 675 x 600	1200 x 450 900 x 600	900 x 900 1350 x 600	1000 x 1000 2000 x 500	1500 x 1000 1225 x 1225	2000 x 1000 1600 x 1250
Neck Area M <sup>2</sup> (l/s)	0.405	0.540	0.810	1.000	1.500	2.000
200	0.5					
250		0.5				
300						
350			0.5			
400	1.0					
450				0.5		
500		1.0				
600					0.5	
700			1.0			
800	2.0					
900						
1000	3.0	2.0		1.0		0.5
1500	4.0	3.0	2.0	1.5	1.0	
2000	4.5	4.0	3.0	2.0	1.5	
2500	5.5	5.0	3.5	2.5		
3000			4.0	3.0	2.0	1.0
3500			5.0	3.5	3.0	
4000				4.0		2.0
5000				5.0	3.5	3.0

## HINGED EGGCRATE GRILLE H-R5-F

### PERFORMANCE DATA

Neck Size	Neck Velocity m/s	1.5	2	2.5	3	3.5	4
200x200	Lit/sec	42	57	71	85	99	110
	NR	-	-	-	13	18	22
250x250	Lit/sec	66	87	110	130	150	170
	NR	-	-	-	16	21	25
600x300	Lit/sec	230	300	380	450	530	600
	NR	-	-	18	24	29	33
600x600	Lit/sec	510	680	850	1020	1190	1360
	NR	-	16	22	28	33	35
1200x600	Lit/sec	890	1180	1470	1770	2070	2360
	NR	13	20	26	32	37	41

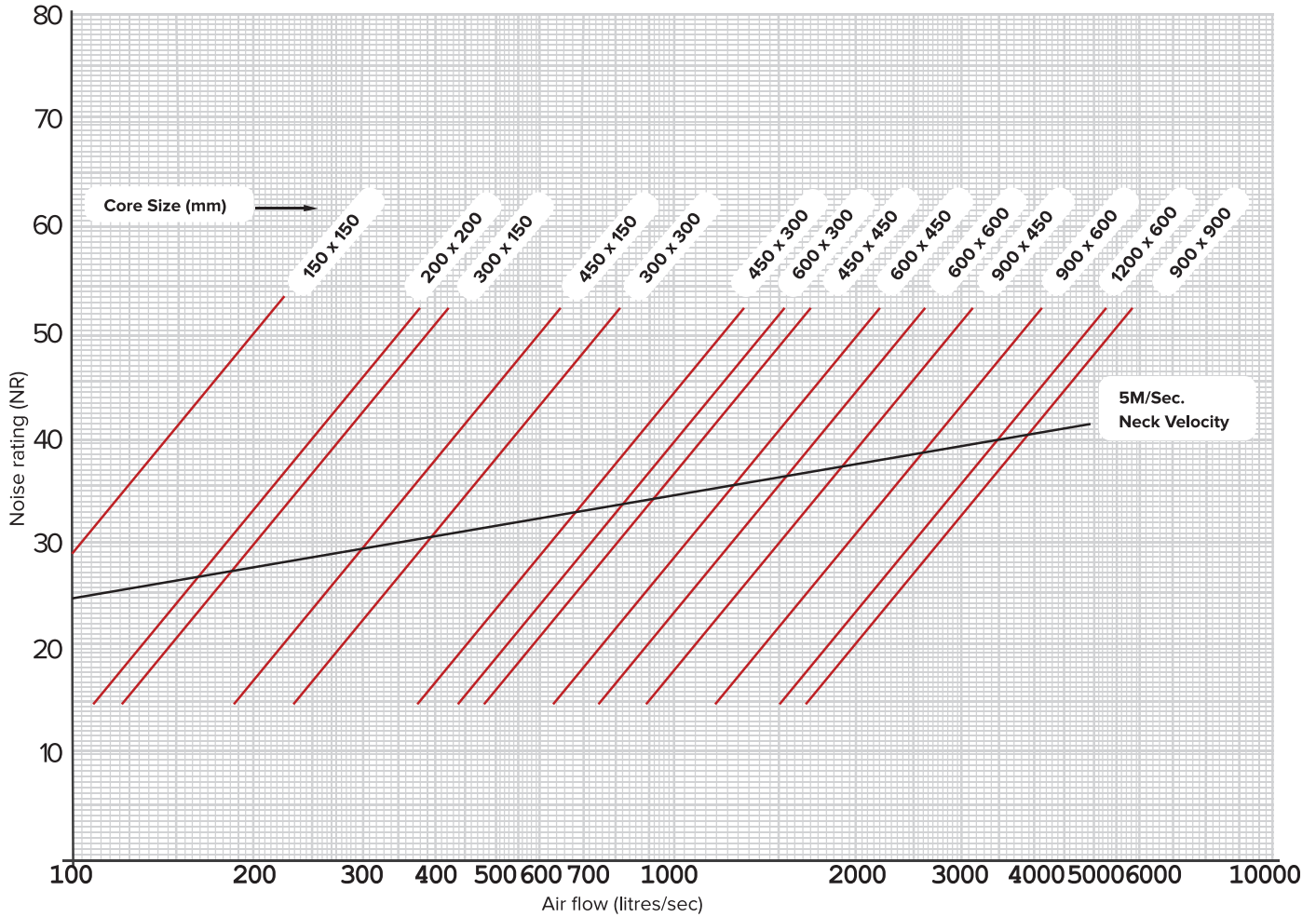
### AIR FLOW VS CORE SIZES FOR VARIOUS NECK VELOCITIES



## HINGED EGGCRATE GRILLE H-R5-F

### PERFORMANCE DATA

#### NOISE LEVEL VS AIR FLOW FOR VARIOUS CORE SIZES





## Measurement Procedures for Return Air Grilles – (H-R5-F)

### 1. Sound pressure level measurements

Sound pressure levels in the chamber were measured using the following equipment:

Microphone – Bruel & Kjaer 4144  
 Pre-amplifier - Bruel & Kjaer 2619  
 Power supply - Bruel & Kjaer 2807  
 Rotating boom – (1m radius, 1 min. cycle)  
 Precision Laboratory sound level meter HP8052A  
 Precision Octave Filter Set– H P8055A  
 Integrating voltmeter– Nebula type 1  
 Sound Power calibrator– Challis/Torin type 1

The microphone was mounted on a rotating boom which was used to provide space average in the chamber while the integrating voltmeter provided a time average of the sound pressure level. Averaging times ranging between 10 seconds and 100 seconds were used. This system was referenced level checked before and after each series of measurements using a reference source, Bruel & Kjaer type 4230, and system drift did not exceed 0.1 dB.

Equipment was calibrated in the Challis laboratory which currently holds N.A.T.A. certificates for compliance with AS1259 and ASZ41.

The volume of the reverberation is such as to allow measurements to be made with a high accuracy down to the 63Hz octave band. The accuracy claimed for the measurements of sound pressure level is +/-2 dB at 60Hz, +/- 1.5dB at 125Hz and 8kHz; and +/-1.0dB in octave bands from 250Hz to 4kHz.

The background noise levels due to external noise and system noise were measured at each test air flow and where necessary, corrections for background noise have been applied to the measured sound pressure levels.

In some cases, at the lowest air flows, the measured levels of regenerated noise at 63Hz and in the higher frequency bands were indistinguishable from the system noise level, and in these cases the sound power levels have been quoted as being 10dB below the measured value.

The background and their system noise level in the chamber was typically as follows:-

#### Sound Pressure Levels in dB (re 2x10<sup>-5</sup> Pascals)

Octave Band Centre Frequency (Hz)	63	125	250	500	1K	2K	4K	8K
Typical Air System Noise	45	36	27	20	16	14	8	9

The system allowed accurate measurements for the determination of NR figures down to NR 15.

### 2. Air flow measurements

Each unit was tested at three air flows, using either of two fan configurations:-

#### (a). Air flow is less than 1400 litres per second

These flows were provided by means of axial a series of axle fans or a large centrifugal fan. The desired airflows were measured by means of an ASTM triple nozzle system, installed in an acoustic plenum box incorporating an air straightening grid. The nozzle box was installed in the 600 mm x 600mm ductwork leading to the reverberation chamber, and provided air flows of an overall accuracy of better than +/- 5%.

#### (b). Air flows greater than 1400 litres per second

These flows were provided by means of the centrifugal fan, with air flows measured by means of a series of orifice plates installed in the 600 mm diameter inlet duct leading to the fan. This system is capable of measuring air flows over the range of 500 litres per second to 10,000 litres per second with an overall accuracy of +/- 5%.

### 3. Static pressure drop measurements

The static pressure drop across the test item was measured from a tapping point in the discharge duct of approximately 500 mm upstream of the unit, using an Inclined Manometer. This reads in steps of five Pascals (0.02”WG) and provides an overall accuracy of +/- 2.5 Pascals.