WATERLOO
A Swegon Group Company

GRILLES

Adjustable Blade Grilles

Fixed Blade Grilles

Door Grilles

Floor Grilles

Aircell Polymer Range

Reliability

To reliably give your client the service and support they expect, you need confidence that your suppliers will compliment and support your own professionalism. Waterloo's World Class attitudes and beliefs provide this confidence.

World-Class is not a reflection of size or number of employees, it is to do with values such as flexibility, innovation, customer service, integrity, strength of character and good humour. These are the values that separate the outstanding from the ordinary.

Innovation

Some projects are common place, but as the possibilities of building design are pushed to wider and wider boundaries you need to continually search for technically and cost effective solutions to give satisfaction to your client. Waterloo is committed to constant innovation to provide you with those solutions.

We at Waterloo challenge accepted knowledge and use our understanding and learning to sustain our reputation for technical excellence and continually develop one of the widest ranges of air terminal devices in the world. For over 100 years Waterloo have actively pioneered the use of innovative manufacturing techniques, an approach that is still integral to the way we work today.

Quick Delivery

When you are working on fast track projects (or just dealing with unexpected site requirements) you need confidence that your supplier understands and can respond with the required urgency. To give you complete support, Waterloo obsessively maintains high delivery and quality performance.

Waterloo has a well justified reputation throughout the construction industry for very quick service – when others might offer four or six weeks delivery periods, Waterloo prides itself in delivering most small and medium orders in five (yes, five) days.

Flexibility

In an ideal world all projects would commence with the entire design complete and documented. Until then, to give your client maximum confidence and satisfaction, Waterloo's renowned flexibility is at your service.

Unanticipated design issues or site conditions might require complex but timely solutions to exceptional problems. Waterloo's flexibility is founded on our wealth of experience, the fluency and knowledge of our highly-skilled staff and our willingness to explore new ways of working, and our desire to share with you the benefits of our expertise in construction, design, management, planning, procurement and programming.

Specials as Standard

Architectural design is continually developing and the tasks of interpreting the requirements and providing cost effective and practical solutions become more important. Waterloo's complimentary made-to-order programme and fluency with the design and manufacture of bespoke air terminal devices will allow you to realise your vision or solve unanticipated problems on site.

Symbols Used

T	Maximum Throw (for air velocity of 0.15 m/s) in occupied zone in isothermal conditions (unless otherwise stated) [m]
v_t	Terminal Velocity [m/s]
v	Air Velocity 25 mm from the grille face [m/s]
L_{WA}	dBA level is based on a room absorption of 8 dB for sound power ref 10^{-12} W
q_v	Air Volume [l/s] or [m^3/h]
P_s	Static Pressure [Pa]
W	Width [mm]
H	Height [mm]

Contents

GRILLES

Adjustable Blade Grilles

1H / 1V / 2H / 2V

Introduction

The Waterloo adjustable, single and double deflection, grilles are suitable for duct, ceiling and sidewall applications in most commercial projects. The grille vanes are individually adjustable to allow jet spread or deflection to be set within 45° of the duct axis.

Product Description

1H	Single set of horizontal blades
1V	Single set of vertical blades
2H	Double set of blades with front set horizontal
2V	Double set of blades with front set vertical
OBSS	Allen key operated opposed blade damper
ED	Equalising deflector
DT-2M	Adjustable duct turn (Installed in duct)

Features

- Single or double deflection for complete air pattern control
- Teardrop blade for quiet operation but maximum induction

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours or anodised finish available on request

Weights

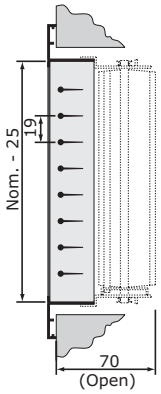
1H /1V	8.5 kg/m² face area
2H/2V	12.0 kg/m² face area
OBSS/ED	9.5 kg/m² face area
DT2M	9.0 kg/m² face area

Sizes

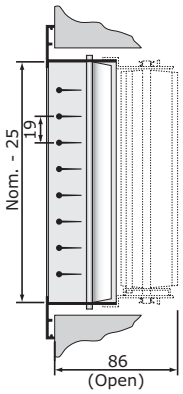
Minimum Size - 75 x 75
Maximum Size - 1500 x 1200

Fixing Options

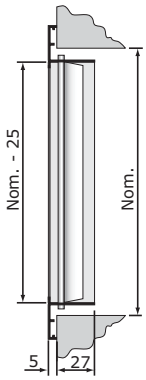
SF	CF	CRB	VS	AFVS
PFVS	RCHS	AFHS	AFCF	RCCF
BSSBD				
BSSBP (NOT for 2H or 2V)				



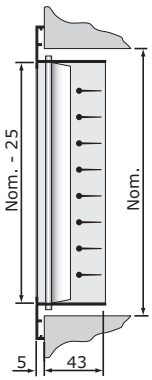
1H + OBSS



2H + OBSS



1V



2V

Free Area	
1H/1V	2H/2V
74%	66%

Order Example

1H/300/300/R25/SF/9010-Matt/OBSS

- Type
- Nominal Width
- Nominal Height
- Border
- Fixing
- Finish
- Options (Damper)

Please refer to pages 46 - 49 for full details of:
Fixing Options
Control Options
Sub Frames
Sizing Implications
Border Options

Adjustable Blade Grilles

1H / 1V / 2H / 2V

Selection Criteria

Performance data is based on grilles situated within 0.3m of ceiling with supply air at a 10°C cooling differential. Throw is the horizontal distance from the grille face to the point at which the velocity of the airstream has retarded to 0.4m/s.
For grilles situated 0.3m or more below ceiling level reduce throw by 1/3. dBA is based on a room absorption of 8 dB for sound power ref 10^{-12} W.

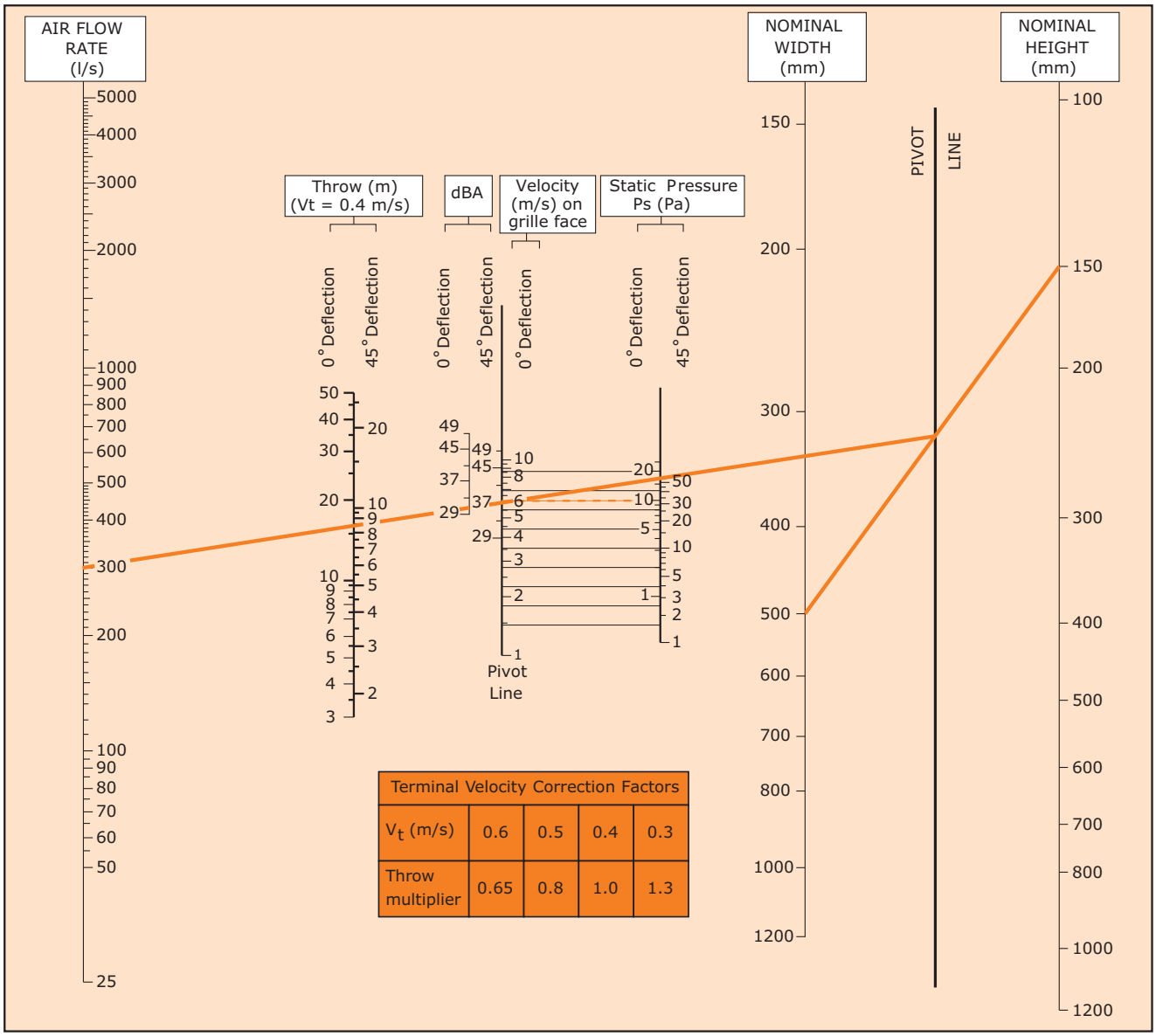
Selection Example 2H/500/150/25T/SF

Air Volume 300 l/s
Grille @ 0° deflection
Throw 16m, Velocity 6.1m/s, dBA 31, P_s 10
Grille @ 45° deflection
Throw 8.5m, Velocity 6.1m/s, dBA 37, P_s 32
Grille with damper @ 0° deflection
Throw 16m, Velocity 6.1m/s, dBA 35, P_s 16
Grille with damper @ 45° deflection
Throw 8.5m, Velocity 6.1m/s, dBA 41, P_s 51

dBA and Static Pressure (P_s) Correction Factors for Grilles with an Open Damper

Grille Width	100+	125+	150+	200+	250+	300+	350+	450+	550+	600+	700+	850+	>1000
L_w Addition (C_L)	10	9	8	7	6	5	4	4	4	3	3	3	2
P_s Multiplier (C_P)	2.5	2.4	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.2

Performance Nomogram



Terminal Velocity Correction Factors				
V_t (m/s)	0.6	0.5	0.4	0.3
Throw multiplier	0.65	0.8	1.0	1.3

Lever-operated Adjustable Blade Grilles

1HM / 1VM / 2HM / 2VM

Introduction

The Waterloo Series M grille range features a linked multi-blade damper (open/closed position) which doubles as a set of adjustable blades (for directional air control). These grilles are typically used for domestic projects but have wider commercial applications where practical on/off air control or spot cooling/ heating are necessary.

The damper and directional blades may be visible or they can be incorporated behind a set of fixed or adjustable blades.

Product Description

1HM One set of horizontal linked multi-shutter damper blades

1VM One set of vertical linked multi-shutter damper blades

2HM Front individually adjustable horizontal blades plus rear multi-shutter damper

2VM Front individually adjustable vertical blades plus rear multi-shutter damper

Others Cores from series 3 and Airline range with rear multi-shutter damper (see full Specification on pages 16 and 20)

Features

- Manually operable face lever
- Fully open to closed damper facility
- Wide variety core/blade styles available
- Multi-blade directional control of air

High quality aluminium construction

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours available on request

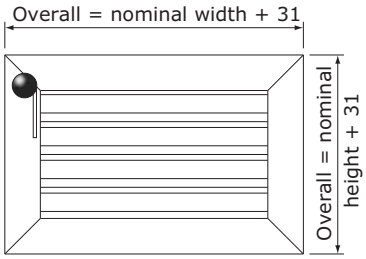
Selection

Use series 1 & 2 or Airline selection nomograms plus damper correction

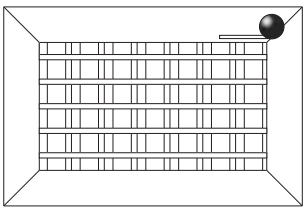
Sizes

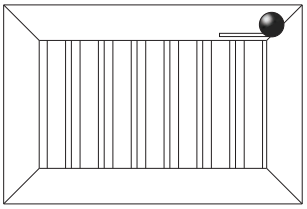
Units are available in the following standard sizes (width x height)

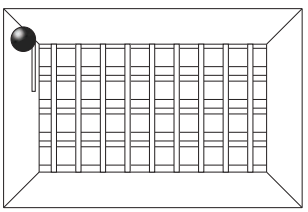
1HM, 2VM	**All others**
200 x 200	200 x 200
300 x 200	300 x 200
500 x 200	300 x 300
300 x 300	300 x 500
500 x 300	



1HM


2HM


1VM

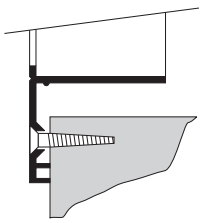

2VM

Order Example

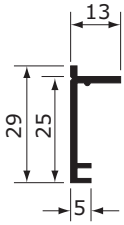
1HM/300/300/R25/SF/9010-Matt

Type
Length
Width
Border
Fixing (Screw Fix as standard)
Finish

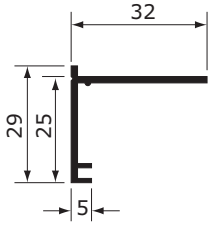
Fixing


Screw fix (SF) only

Borders



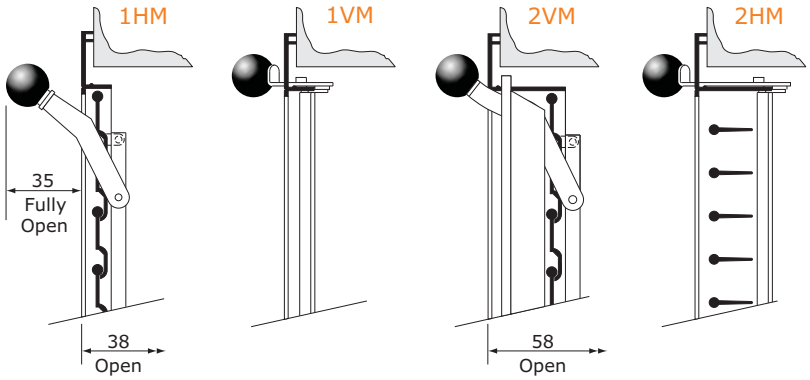
Type 1HM, 1VM

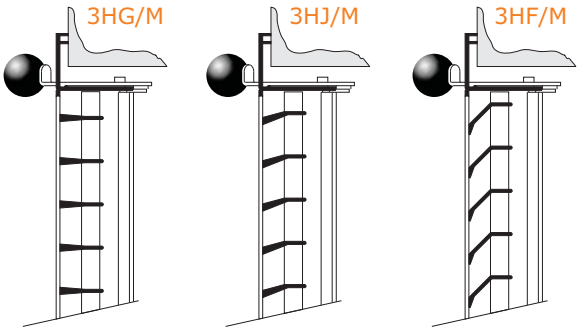


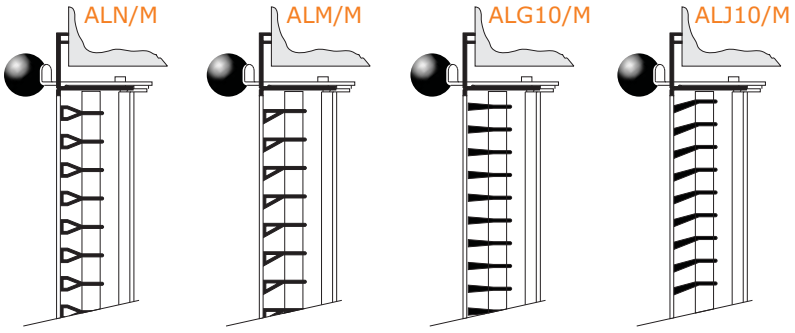
All other types

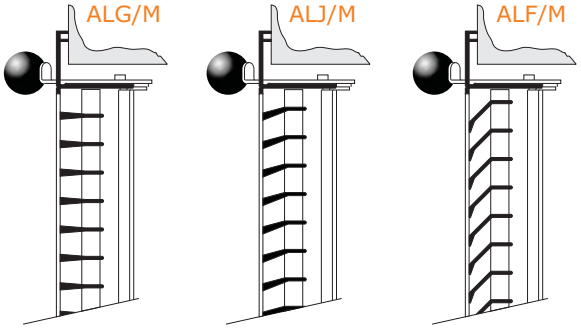
Lever-operated Adjustable Blade Grilles

1HM / 1VM / 2HM / 2VM









Heavy Duty Adjustable Blade Grilles

1KH / 1KV / 2KH / 2KV

Introduction

The Waterloo Series K adjustable, single and double deflection, grilles have been designed for industrial and heavy commercial applications and may be used for supply and exhaust systems. The vanes are screw fixed through nylon bearings to eliminate vane rattle - even at very high supply velocities; the vanes can also be tightened on site to suit individual applications. Grille vanes are individually adjustable to allow jet spread or deflection to be set within 45° of the duct axis.

Product Description

1KH	Heavy duty single set of horizontal blades
1KV	Heavy duty single set of vertical blades
2KH	Heavy duty double set of blades with front set horizontal
2KV	Heavy duty double set of blades with front set vertical
OBSS	Allen key operated opposed blade damper
SF	Screw fixing

Features

- Aluminium alloy extrusions with welded mitred frames
- Heavy duty frames and vanes for robust construction
- Single or double deflection for optimum air pattern adjustment
- Vibration free vane fixing to maintain setting and eliminate blade rattle
- Adjustable blade tension to suit low/high velocity applications

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours available on request

Weights

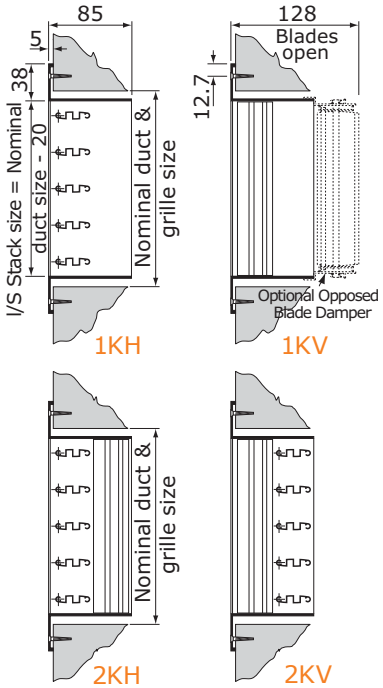
Series 1K	11 kg/m² face area
Series 2K	17 kg/m² face area
OBSS/ED	9.5 kg/m² face area

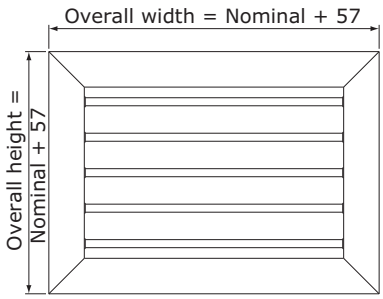
Sizes

Minimum Size - 200 x 200
Maximum Size - 1100 x 1100
Standard increments 50/100 mm

Fixing

Screw through flange only with a 38 mm border.





Order Example

1KH/600/200/R38/SF/9010-Matt /OBSS

- Type
- Length
- Height
- Border
- Fixing (Screw Fix as standard)
- Finish
- Damper

Heavy Duty Adjustable Blade Grilles

1KH / 1KV / 2KH / 2KV

Selection Criteria

Data presented below is based on isothermal supply air conditions with 0° spread. Data may be corrected for other applications.
dBA is based on a room absorption of 8 dB for sound power ref 10^{-12} w.
P_s is static pressure loss (Pa).
Throw is the forward distance travelled by the jet to where the velocity has retarded to 0.5m/s.
Data is based on free jet application. If grille is located within 400mm of the ceiling throw is increased by 50%. For exhaust applications multiply
P_s x 1.5 and add 3 dB to dBA.

Terminal velocity correction factors					
V_t (m/s)	1.0	0.8	0.5	0.4	0.3
Throw multiplier	0.5	0.6	1.0	1.3	1.7

Spectrum correction factors						
Frequency(Hz)	125	250	500	1k	2k	4k
0° Blades	+10	+11	+11	+9	+8	0
45° Blades	+17	+17	+16	+14	+12	0

Correction factors for grilles with an open damper					
Smallest grille size	200+	250+	300+	600+	1000+
dBA addition	9	8	7	4	3
P_s multiplier	2.0	1.9	1.8	1.5	1.2

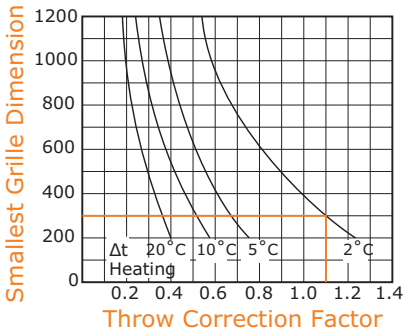
Selection Example 2KH/300/300/SF

Air Volume 250 l/s
- Grille @ 0° deflection

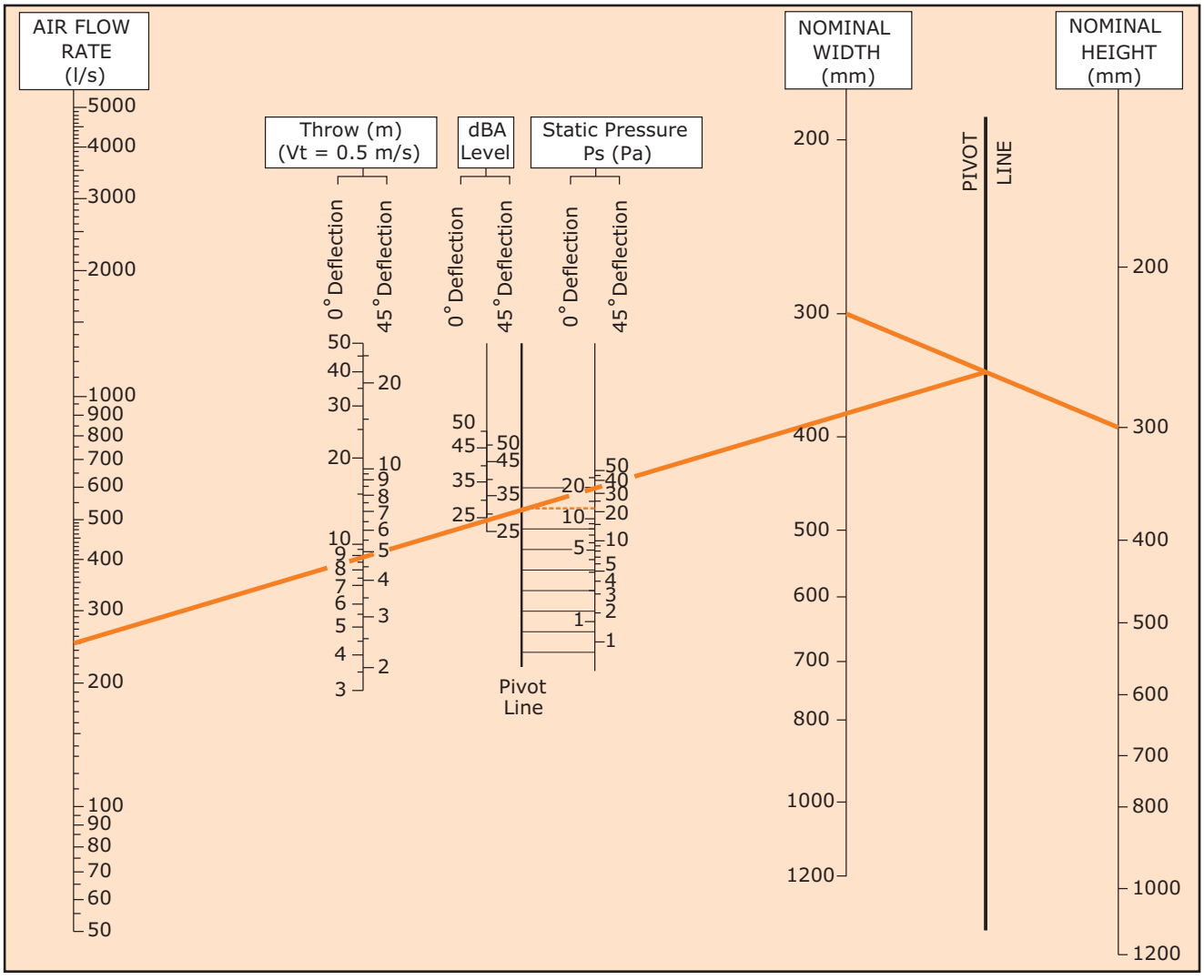
Throw 8.8 m dBA 24 P_s 13 Pa

Vertical projection heating

Using the graph determine the throw correction factor to be applied to the tabulated data, based on the smallest nominal grille dimension and the heating differential.
For example: 600 x 300 grille Discharging at a 2°C heating differential results in a correction factor of 1.1. When applied to the nomogram the maximum downward projection is established.

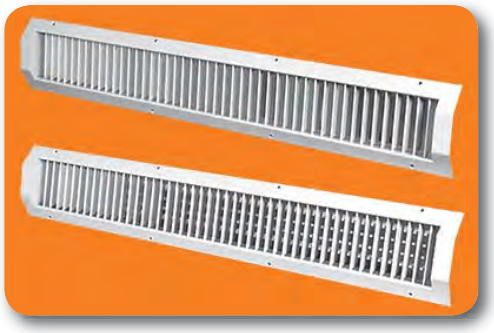


Performance Nomogram



Adjustable Duct Grilles

1RV / 2RV



Introduction

The Waterloo 1RV & 2RV are designed to fit directly onto the side of an exposed circular duct without the need for a stub duct or transition piece. The flange is supplied complete with a foam sealing gasket on all 4 sides. These units can be provided with either a single row of vertical blades, or a set of vertical blades at the front and a set of horizontal blades at the rear. There are a range of sizes for each grille to suit ducts from Ø125 - Ø1500. Each grille can be supplied with an aluminium opposed blade damper if required.

Product Description

1RV Single vertical set of blades
2RV One set vertical, one set of horizontal blades
OBSS Allen key operated opposed blade damper
DT-2MG Adjustable duct turns

Features

- Supply and exhaust applications for warm or cooled air
- Adjustable blades
- Suitable for large range of duct sizes

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours available on request

Weights

1RV	8.5 kg/m² face area
2RV	12.0 kg/m² face area
OBSS	9.5 kg/m² face area
DT-2MG	9.0 kg/m² face area

Sizes

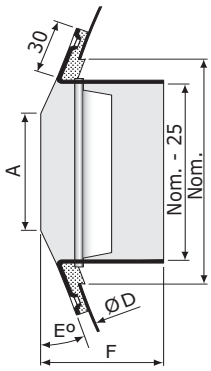
Nom. W 225mm - 1225mm in 100 mm increments
Nom. H 75mm - 225mm in 50 mm increments

Fixing

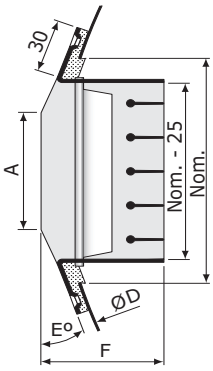
SF Only - Screw through face flange

Advantages

- Large size range
- High air handling capacity
- Fully adjustable throws
- No need for transition piece on ducts



1RV



2RV

Please refer to page 47 for full details of:
Control Options (OBSS / DT-2MG)

Free Area	
1RV	2RV
74%	66%

Order Example

1RV/250/325/75/SF/9010-Matt/OBSS

Type
Duct Diameter
Duct Opening Length
Duct Opening Height
Fixing
Finish
Options (Damper)

Sizes Dimensions and Angles						
W	H	ØD min	ØD max	Eº	A	F
225-1225	75	125	150	45	53	55
225-1225	75	151	200	35	53	55
225-1225	75	201	300	30	53	55
225-1225	75	301	400	25	53	55
225-1225	125	200	300	35	66	69
225-1225	125	301	400	30	80	63
225-1225	125	401	550	25	80	61
225-1225	125	551	900	15	80	59
225-1225	175	450	550	25	101	68
225-1225	175	551	900	20	101	65
225-1225	175	901	1250	12.5	101	61
225-1225	225	500	600	30	135	76
225-1225	225	601	900	25	135	72
225-1225	225	901	1500	15	135	65

Adjustable Duct Grilles

1RV / 2RV

Selection Criteria

Temperature Differential -11K
Noise level is based on grilles sound power level less 8dB room absorption.
Throw is based on a free jet application

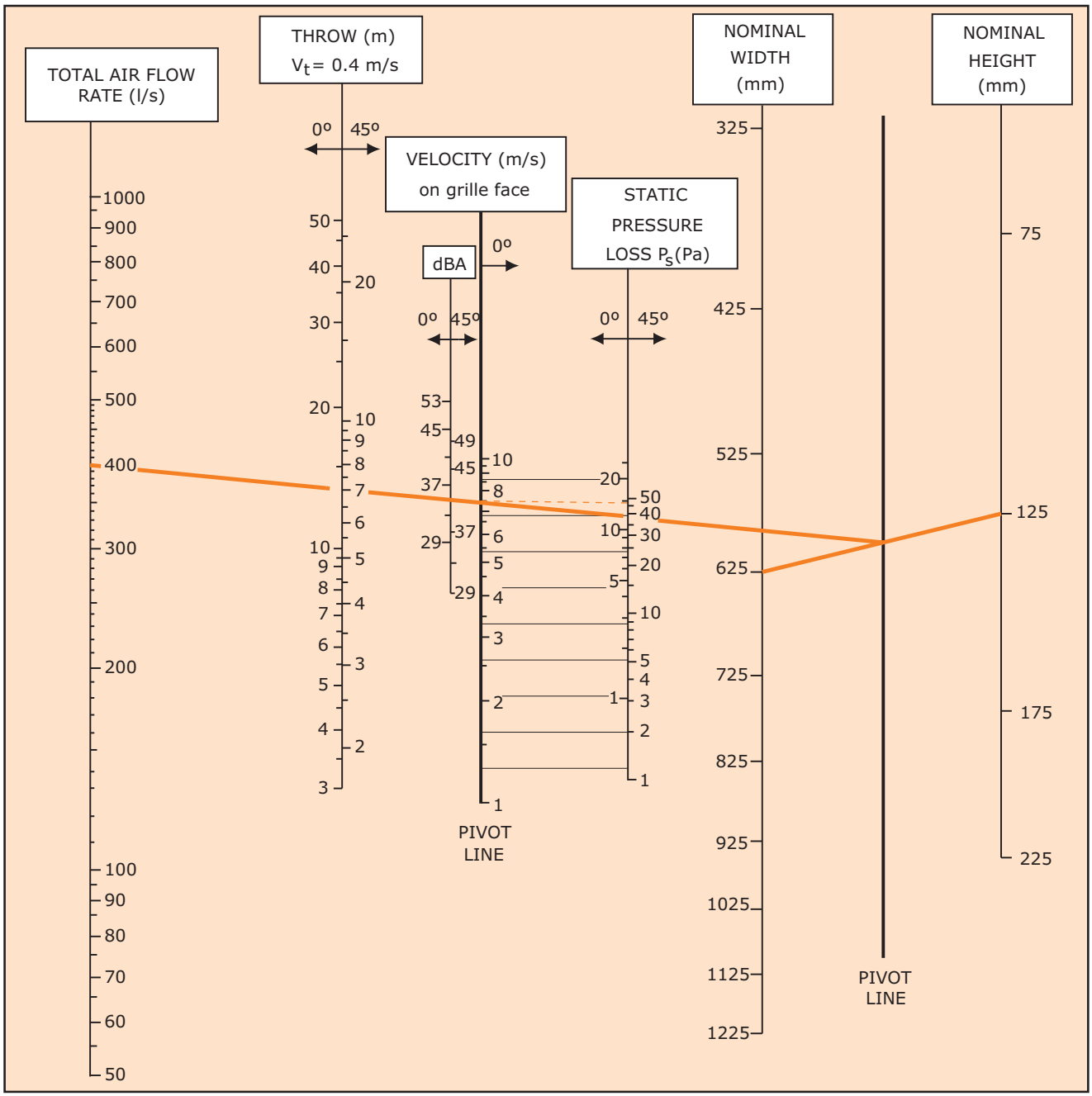
Selection Example

1RV/625/125 at 0° spread

Air Volume 400 l/s
Throw 14 m
Pressure Drop 15 Pa
Noise Level 35 dBA
Face Velocity 7.5 m/s

Jet Terminal Velocity Correction Factors			
0.6 m/s x 0.65	0.5 m/s x 0.80	0.4 m/s x 1.0	0.3 m/s x 1.3

Performance Nomogram



Reversible Core Grilles

(R)RTC / 2(R)RTC

Introduction

Waterloo's reversible core grilles have been designed for commercial projects requiring aesthetically attractive grilles but with a superior performance. The specially designed close pitch vanes produce high levels of induction and mixing with ambient air resulting in more even air diffusion in the occupied zone.

The core is removable and may be rotated or reversed to provide either 5° or 15° deflection upwards or downwards; in addition the core can easily be cleaned before replacing in the frame. Alternatively any of the Exhaust grille's or Airline Linear grille's cores may be specified.

Product Description

RTC	Reversible core grille
2RTC	Reversible core grille with rear vertical blades
RRTC	Same as RTC grille with frame suitable for round ducts
2RRTC	Same as 2RTC grille with frame suitable for round ducts
RTC(C)	Reversible core only (no frame)
OBSS	Allen key operated opposed blade damper
DT-2MG	Adjustable Air Turn (fixed on grille)
DT-2M	Adjustable Air Turn (fixed in duct)

Features

- Turbulator vanes provide high induction and mixing with room air
- Core removable for access and cleaning
- One core provides 5° or 15° deflection, up or down
- Rear set of vanes available as an option for horizontal spread/deflection control
- Available in 6mm or 12mm blade pitch

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours or anodised finish available on request
(Anodised finish unavailable on (2)RRTC)

Weights

R(R)TC	14 kg/m² face area
2R(R)TC	18.0 kg/m² face area
OBSS/ED	9.5 kg/m² face area
DT2M(G)	9.0 kg/m² face area

Sizes

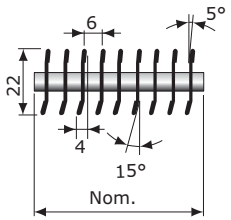
Minimum Size - 100 x 75 mm
Maximum Size - 1500 x 450mm

Free Area			
RTC-6 RRTC-6 RTCC-6	2RTC-6 2RRTC-6	RTC-12 RRTC-12 RTCC-12	2RTC-12 2RRTC-12
74%	66%	87%	79%

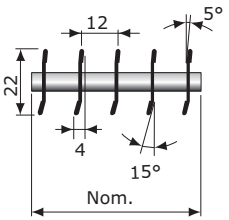
Order Example

RTC-6/500/250/R16/STS/9010-Matt/OBSS

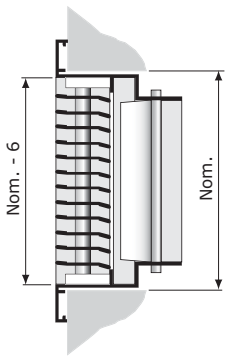
- Type
- Nominal Width
- Nominal Height
- Border
- Fixing
- Finish
- Options (Damper)



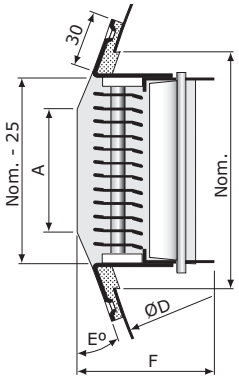
RTC(C)-6



RTC(C)-12



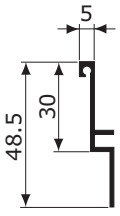
2RTC-6



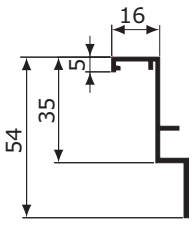
2RRTC-6

For sizes E and F see 1RV/2RV

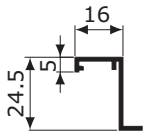
Border Types



R5



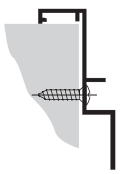
R16



R16-24

Fixings

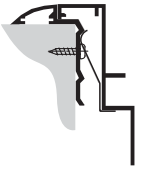
- STS
- RCCF
- SF only for (2)RRTC
- BSSBD
- BSSBP



R16 + STS

R5 + STS

R16-24 + STS



R16 + RCCF

Reversible Core Grilles

(R)RTC / 2(R)RTC

Selection Example

RTC-6/425/125

Spread 0°
Air Volume 83 l/s
Throw 4.7 m
Pressure Drop 5 Pa
Noise Level 18 dBA

Note!

Maximum Throws in the following tables are for an air terminal velocity of 0.15m/s within the comfort zone.

RTC is at 0° spread.

2RTC spread at 0° and 30° using rear blades.

Performance Table

RTC-6 / 2RTC-6			Supply																			
			325x125		425x125		525x125		625x125		425x225		525x225		625x225		825x225		625x325		825x325	
m³/h	l/s		0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°
100	28	T	2.9	2.3																		
		P_S	1	2																		
		L_W	-	-																		
150	42	T	3.4	2.6	3.1	2.1																
		P_S	2	3	1	2																
		L_W	-	-	-	-																
200	56	T	4.5	3.4	3.9	2.9	3.5	2.7	3.2	2.4												
		P_S	4	6	2	3	1	3	1	2												
		L_W	-	-	-	-	-	-	-	-												
300	83	T	5.5	4.3	4.7	3.6	4.2	3.2	3.8	3.0	3.5	2.8										
		P_S	10	15	5	8	3	4	2	3	1	2										
		L_W	24	29	18	22	-	-	-	-	-	-										
400	111	T	8.2	6.9	7.3	5.7	6.3	5.0	5.6	4.3	5.0	4.1	4.6	3.6								
		P_S	17	25	10	15	5	8	4	6	2	4	1	2								
		L_W	30	36	25	30	20	25	17	21	-	-	-	-								
500	139	T			8.2	6.7	7.4	6.1	6.8	5.5	6.3	5.0	5.5	4.3	4.8	3.8						
		P_S			16	25	10	14	7	10	3	6	2	3	1	2						
		L_W			30	35	26	30	22	27	-	21	-	-	-	-						
600	167	T					9.4	7.8	8.6	6.8	7.4	5.8	6.4	5.4	5.9	4.8	5.5	4.5				
		P_S					15	23	11	19	6	8	3	5	2	3	1	2				
		L_W					31	36	27	32	20	25	-	19	-	-	-	-				
750	208	T							11.1	9.1	9.8	7.6	8.2	6.6	7.5	6.0	6.7	5.3	6.0	5.0		
		P_S							18	26	8	13	5	8	3	5	2	3	1	2		
		L_W							33	38	26	30	22	27	18	22	-	-	-	-		
1000	278	T									13.4	10.6	11.3	9.2	10.1	8.0	8.9	7.1	7.9	6.3	6.7	5.3
		P_S									16	25	10	15	7	10	3	5	2	3	1	2
		L_W									33	38	28	33	24	29	17	22	-	19	-	-
1250	347	T											14.8	12.0	12.9	10.2	11.3	9.4	10.5	8.1	8.9	7.3
		P_S											16	24	10	15	4	7	3	5	2	3
		L_W											34	39	29	34	23	27	20	25	-	-
1500	417	T													17.0	13.5	14.4	12.0	13.0	10.4	11.4	9.1
		P_S													17	25	9	12	6	10	4	6
		L_W													35	40	28	33	26	31	18	24
2000	556	T															18.0	15.1	17.1	13.4	14.5	11.7
		P_S															16	24	11	16	6	10
		L_W															36	40	33	38	27	32
2500	694	T																	20.5	16.9	17.4	14.1
		P_S																	14	22	10	15
		L_W																	40	45	33	37
3000	833	T																			20.5	16.8
		P_S																			16	25
		L_W																			39	44

Reversible Core Grilles

(R)RTC / 2(R)RTC

Performance Table Nom. H =75 mm Suitable for round ducts Ø 150 up to Ø 400																
RRTC-6 2RRTC-6			Supply / Exhaust													
			325 X 75		425 X 75		525 X 75		625 X 75		825 X 75		1025 X 75		1225 X 75	
m³/h	l/s		0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°
100	28	T	3.6	2.8	3.4	2.7	3.2	2.5	2.9	2.3						
		P_s	4	6	2	3	1	3	1	2						
		L_w	-	-	-	-	-	-	-	-						
150	42	T	4.1	3.3	3.9	3.1	3.7	2.9	3.4	2.6	3.1	2.1				
		P_s	11	16	6	9	3	5	2	3	1	2				
		L_w	24	29	16	19	-	-	-	-	-	-				
200	56	T	6.0	4.7	5.3	4.2	4.9	3.9	4.5	3.4	3.9	2.9	3.5	2.7	3.2	2.4
		P_s	19	27	11	16	7	10	4	6	2	3	1	3	1	2
		L_w	31	37	24	29	18	21	-	-	-	-	-	-	-	-
300	83	T			6.5	5.1	5.9	4.6	5.5	4.3	4.7	3.6	4.2	3.2	3.8	3.0
		P_s			24	32	15	21	10	15	5	8	3	4	2	3
		L_w			37	43	28	34	24	29	18	22	-	-	-	-
400	111	T							8.2	6.9	7.3	5.7	6.3	5.0	5.6	4.3
		P_s							17	25	10	15	5	8	4	6
		L_w							30	36	25	30	20	25	17	21
500	139	T									8.2	6.7	7.4	6.1	6.8	5.5
		P_s									16	25	10	14	7	10
		L_w									30	35	26	31	22	27
600	167	T											9.4	7.8	8.6	6.8
		P_s											15	23	11	19
		L_w											31	36	27	32
750	208	T													11.1	9.1
		P_s													18	26
		L_w													33	38

Selection Example 2RRTC-6/825/75

Spread 0°
Air Volume 83 l/s
Throw 4.7 m
Pressure Drop 5 Pa
Noise Level 18 dBA

Ceiling Height Throw Correction Factors				
Ceiling Height (m)	2.5	2.7	3.0	3.5
Maximum Throw (m)	2.5	3.3	4.5	6.3

Performance Table Nom. H =125 mm Suitable for round ducts Ø 300 up to Ø 900																
RTC-6 2RTC-6			Supply / Exhaust													
			325 X 125		425 X 125		525 X 125		625 X 125		825 X 125		1025 X 125		1225 X 125	
m³/h	l/s		0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°
100	28	T	2.9	2.3												
		P_s	1	2												
		L_w	-	-												
150	42	T	3.4	2.6	3.1	2.1										
		P_s	2	3	1	2										
		L_w	-	-	-	-										
200	56	T	4.5	3.4	3.9	2.9	3.5	2.7	3.2	2.4						
		P_s	4	6	2	3	1	3	1	2						
		L_w	-	-	-	-	-	-	-	-						
300	83	T	5.5	4.3	4.7	3.6	4.2	3.2	3.8	3.0	3.5	2.8				
		P_s	10	15	5	8	3	4	2	3	1	2				
		L_w	24	29	18	22	-	-	-	-	-	-				
400	111	T	8.2	6.9	7.3	5.7	6.3	5.0	5.6	4.3	5.0	4.1	4.6	3.6		
		P_s	17	25	10	15	5	8	4	6	2	4	1	2		
		L_w	30	31	25	30	20	25	17	21	-	-	-	-		
500	139	T			8.2	6.7	7.4	6.1	6.8	5.5	6.3	5.0	5.5	4.3	4.8	3.8
		P_s			16	25	10	14	7	10	3	6	2	3	1	2
		L_w			30	35	26	30	22	27	-	16	-	-	-	-
600	167	T					9.4	7.8	8.6	6.8	7.4	5.8	6.4	5.4	5.9	4.8
		P_s					15	23	11	19	6	8	3	5	2	3
		L_w					31	36	27	32	20	25	-	19	-	-
750	208	T							11.1	9.1	9.8	7.6	8.2	6.6	7.5	6.0
		P_s							18	26	8	13	5	8	3	5
		L_w							33	38	26	30	22	27	18	22
1000	278	T									13.4	10.6	11.3	9.2	10.1	8.0
		P_s									16	25	10	15	7	10
		L_w									33	38	28	33	24	29
1250	347	T											14.8	12.0	12.9	10.2
		P_s											16	24	10	15
		L_w											34	39	29	34
1500	417	T													17.0	13.5
		P_s													17	25
		L_w													35	40

Selection Example 2RRTC-6/425/125

Spread 0°
Air Volume 83 l/s
Throw 4.7 m
Pressure Drop 5 Pa
Noise Level 18 dBA

Ceiling Height Throw Correction Factors				
Ceiling Height (m)	2.5	2.7	3.0	3.5
Maximum Throw (m)	2.5	3.3	4.5	6.3

Reversible Core Grilles

(R)RTC / 2(R)RTC

Performance Table Nom. H =175 mm Suitable for round ducts Ø 450 up to Ø 1250 (Supply / Exhaust)																
RRTC-6 / 2RRTC-6			325 X 175		425 X 175		525 X 175		625 X 175		825 X 175		1025 X 175		1225 X 175	
m³/h	l/s		0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°
200	56	T	3.5	2.7	3.1	2.3										
		P_s	1	3	1	2										
		L_w	-	-	-	-										
300	83	T	4.5	3.3	3.8	3.0	3.5	2.7								
		P_s	3	5	1	3	1	2								
		L_w	-	-	-	-	-	-								
400	111	T	6.1	5.0	5.6	4.4	5.1	4.1	4.9	3.8						
		P_s	8	12	4	6	2	3	1	2						
		L_w	22	26	17	21	-	-	-	-						
500	139	T	7.8	6.1	6.8	5.5	6.3	5.1	5.8	4.5	4.8	3.8				
		P_s	13	20	7	10	4	6	2	4	1	2				
		L_w	27	32	22	27	19	21	-	18	-	-				
600	167	T	9.9	7.9	8.6	6.8	7.7	6.2	7.1	5.4	5.9	4.8	5.2	4.0		
		P_s	21	34	11	19	7	9	4	7	2	3	1	2		
		L_w	37	41	27	35	22	26	18	23	-	-	-	-		
750	208	T			11.1	9.2	10.1	8.2	9.1	7.0	7.5	6.0	6.6	5.4	6.0	5.0
		P_s			18	26	10	15	7	11	3	5	2	3	1	2
		L_w			33	38	28	32	24	29	18	22	-	-	-	-
1000	278	T					14.1	11.5	12.6	9.7	10.1	8.0	8.9	7.1	7.9	6.3
		P_s					19	29	13	19	7	10	3	5	2	3
		L_w					36	41	30	35	24	29	19	23	-	19
1250	347	T							16.1	12.5	12.9	10.2	11.3	9.3	10.5	8.1
		P_s							23	35	10	15	6	9	3	5
		L_w							38	43	29	34	25	29	20	25
1500	417	T									17.0	13.5	14.7	11.9	13.0	10.4
		P_s									17	25	11	15	6	10
		L_w									35	40	30	34	26	31
2000	556	T											19.6	16.1	17.1	13.4
		P_s											18	27	11	16
		L_w											35	42	33	38
2500	694	T													20.5	16.9
		P_s													14	22
		L_w													40	45

Selection Example 2RRTC-6/425/175

Spread 0°
Air Volume 111 l/s
Throw 5.6 m
Pressure Drop 4 Pa
Noise Level 17 dBA

Ceiling Height Throw Correction Factors				
Ceiling Height (m)	2.5	2.7	3.0	3.5
Maximum Throw (m)	2.5	3.3	4.5	6.3

Performance Table Nom. H = 225 mm Suitable for round ducts Ø 600 up to Ø 1500 (Supply / Exhaust)																
RRTC-6 / 2RRTC-6			325 X 225		425 X 225		525 X 225		625 X 225		825 X 225		1025 X 225		1225 X 225	
m³/h	l/s		0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°	0°	30°
200	56	T	3.1	2.3												
		P_s	1	2												
		L_w	-	-												
300	83	T	3.8	3.0	3.5	2.8										
		P_s	2	3	1	2										
		L_w	-	-	-	-										
400	111	T	5.6	4.4	5.0	4.1	4.6	3.6								
		P_s	4	6	2	4	1	2								
		L_w	17	21	-	-	-	-								
500	139	T	6.8	5.5	6.3	5.0	5.5	4.3	4.8	3.8						
		P_s	7	10	3	6	2	3	1	2						
		L_w	22	27	-	21	-	-	-	-						
600	167	T	8.6	6.8	7.4	5.8	6.4	5.4	5.9	4.8	5.5	4.5				
		P_s	11	19	6	8	3	5	2	3	1	2				
		L_w	27	32	20	25	-	19	-	-	-	-				
750	208	T	11.1	9.1	9.8	7.6	8.2	6.6	7.5	6.0	6.7	5.3	6.0	4.7		
		P_s	18	26	8	13	5	8	3	5	2	3	1	2		
		L_w	33	38	26	30	22	27	18	22	-	-	-	-		
1000	278	T			13.4	10.6	11.3	9.2	10.1	8.0	8.9	7.1	8.0	5.9	6.7	5.3
		P_s			16	25	10	15	7	10	3	5	2	3	1	2
		L_w			33	38	28	33	24	29	17	22	-	-	-	-
1250	347	T					14.8	12.0	12.9	10.2	11.3	9.4	10.1	8.1	8.9	7.3
		P_s					16	24	10	15	4	7	3	5	2	3
		L_w					34	39	29	34	23	27	16	22	-	-
1500	417	T							17.0	13.5	14.4	12.0	12.9	10.5	11.4	9.1
		P_s							17	25	9	12	5	8	4	6
		L_w							35	40	28	33	23	28	18	24
2000	556	T									18.0	15.1	16.3	13.4	14.5	11.7
		P_s									16	24	10	16	6	10
		L_w									36	40	30	35	27	32
2500	694	T											19.4	16.1	17.4	14.1
		P_s											16	24	10	15
		L_w											36	41	33	37
3000	833	T													20.5	16.8
		P_s													16	25
		L_w													39	44

Selection Example 2RRTC-6/425/225

Spread 30°
Air Volume 139 l/s
Throw 5.0 m
Pressure Drop 6 Pa
Noise Level 21 dBA

Ceiling Height Throw Correction Factors				
Ceiling Height (m)	2.5	2.7	3.0	3.5
Maximum Throw (m)	2.5	3.3	4.5	6.3

Exhaust Grilles

3HG / 3HJ / 3HF / GC5 / PER

Introduction

The Waterloo 3 Series vane grilles, GC5 eggcrate and PER mesh grilles have been designed to satisfy all exhaust applications in H & V systems.

The various cores may be selected to satisfy both engineering and architectural requirements. Cores are constructed from aluminium extrusions supported on integral aluminium tubes; mesh cores are perforated aluminium sheet.

The frames are constructed from aluminium extrusions which are mitred and welded or cleated.

Product Description

3HG	0° fixed blade grille
3HJ	15° fixed blade grille
3HF	45° fixed blade grille
GC5	12.5 x 12.5 x 12.5 eggcrate grille
GC5-RCG	Removable core grille (GC5)
(C)	Core only
PER	Perforated plate grille
RB	Reverse border
OBSS	Allen key operated opposed blade damper. If used with RCG, OBSS is mounted in duct or plenum.
ED	Equalising deflector

Weights

Series 3	7 kg/m² face area
GC5	5 kg/m² face area
GC5-RCG	6.5 kg/m² face area
OBSS/ED	9.5 kg/m² face area
PER	6.0 kg/m² face area

Sizes

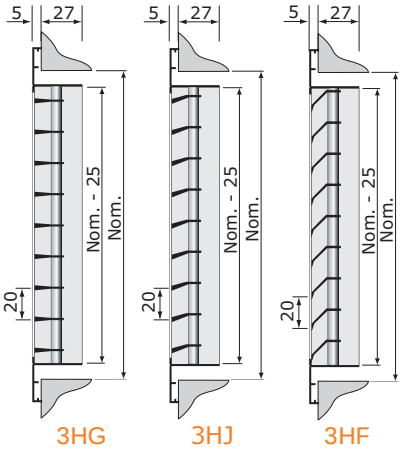
Minimum Size - 100 x 75
Maximum Size - 2000 x 1500
(Maximum GC5 any x 2000)
Maximum GC5-RCG 600 x 600

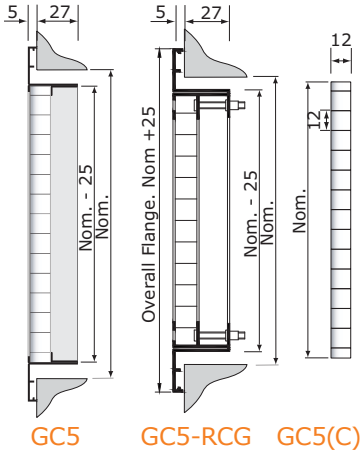
Fixing Options

SF	CF	CRB	VS	AFVS
PFVS	RCHS	AFHS	AFCF	RCCF
BSSBD	BSSBP	GC5-RCG		

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours or anodised finish available on request
GC5/(C) Core is mill finished as standard



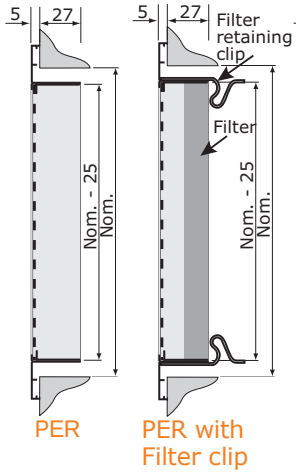


Free Area					
3HG	3HJ	3HF	GC5	GC5-RCG	PER
84%	84%	54%	91%	83%	51%

Order Example

3HG/300/300/R25T32/SF/9010-Matt/OBSS

Type
Nominal width
Nominal height
Border
Fixing
Finish
Options



Please refer to pages 46 - 49 for full details of:
Fixing Options
Control Options
Sub Frames
Sizing Implications
Border Options

Exhaust Grilles

3HG / 3HJ / 3HF / GC5 / PER

Selection Example

500/400 Grille Handling 600 l/s

- 3HJ grille

Noise level = 32 dBA P_s = 11 Pa

- PER grille

Noise level = 35 dBA P_s = 20 Pa

- 3HJ with open damper

Noise level = 37 dBA P_s = 17 Pa

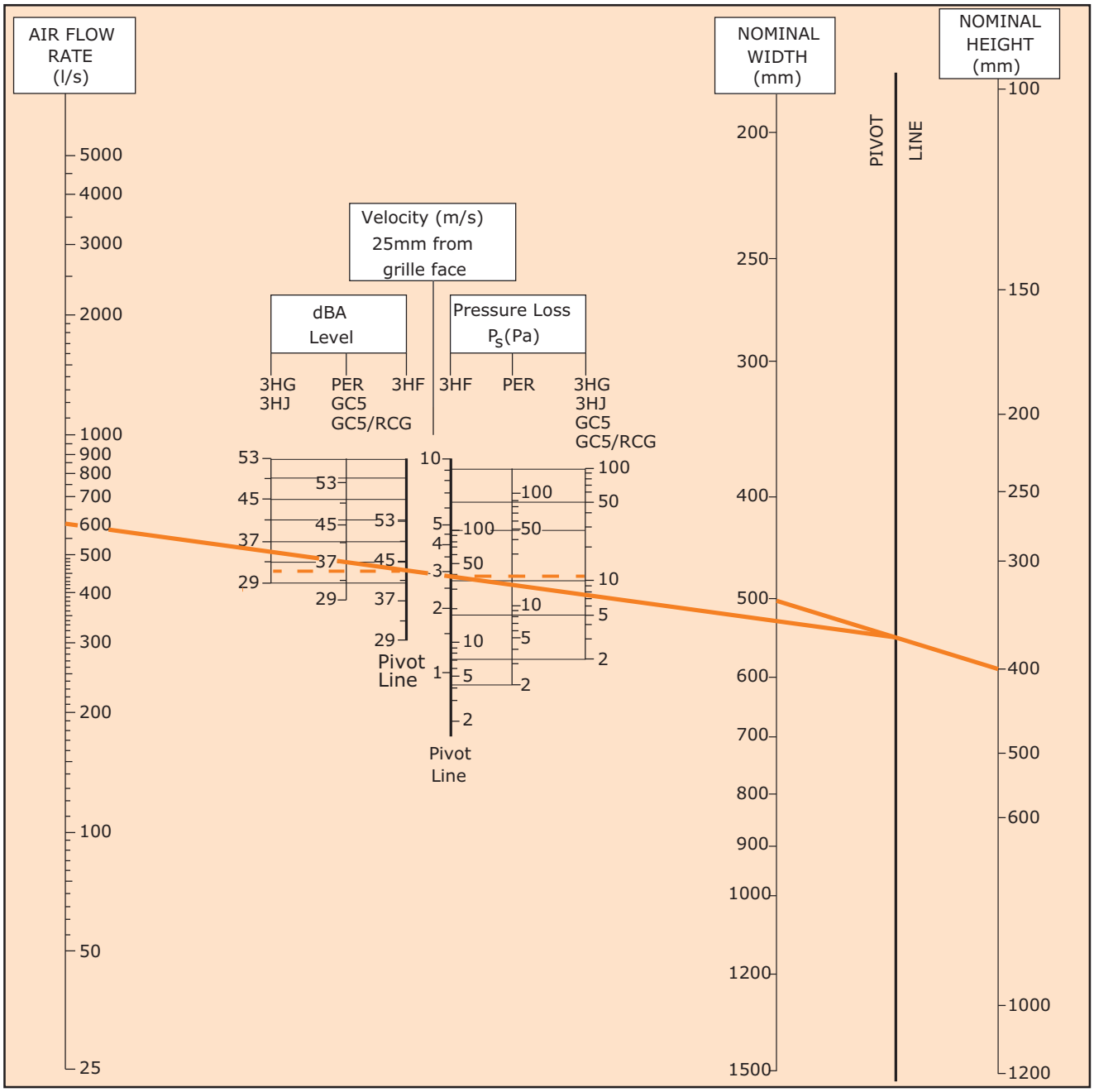
- PER with open damper

Noise level = 40 dBA P_s = 31 Pa

dBA (L_p) and Static Pressure (P_s) Correction Factors for Grilles with an Open Damper

Grille Width	100+	125+	150+	200+	250+	300+	350+	450+	550+	600+	700+	850+	>1000
L_w Addition (C_L)	12	11	10	9	8	7	6	5	5	4	4	4	3
P_s Multiplier (C_P)	2.5	2.4	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.2

Performance Nomogram



Security Grilles

SG1 / SG2 / SG3

Introduction

The Waterloo SG series security grilles have been designed in conjunction with the prison service for supply and extract of air in places where security is a priority - from prison institutions, courts and police stations to young offenders institutions and secure buildings.
Manufactured from 3mm thick mild steel plate, SG series grilles are available in three versions - SG1, SG2 and SG3 - able to meet ventilation needs in high, medium or low security applications. The series offers rectangular or square size options from 100mm up to 600mm.

Product Description

SG1	High Security Grille With Rear Fixing
SG2	Medium Security Grille With Face and Rear Fixing
SG3	Low Security Grille With Face Fixing
OBSS	Allen Key Operated Opposed Blade Damper
PB	Plenum Box

Features

- Low, Medium or High Security Applications
- Side or Top Entry Connections Available
- 3mm Perforated Face-plate

Sizes

Minimum size - 75 x 75
Maximum size - 1000 x 600

Fixing

Security fixings by others

Finishes

Zintec coating as standard.
PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours available on request

Weights

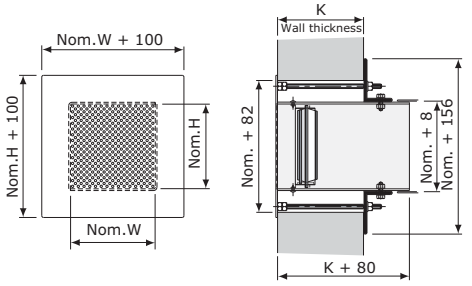
SG1 - SG2 for the approximated weight use the formula below:
((W+100)(H+100) + 250(W+H+100) + 2(W+H)(K+80) - 0.35WH) 2.4 x 10^{-5} Kg

SG3 for the approximated weight use the formula below:
((W+50)(H+50) + 100(W+H) - 0.35WH)) 2.4 x 10^{-5} Kg

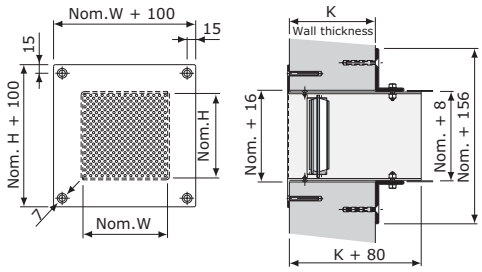
Specification of Perforations in Front Face

Perforations are 3mm diameter at a 5mm pitch.
Please note that security grilles with face fix are not supplied with screws.

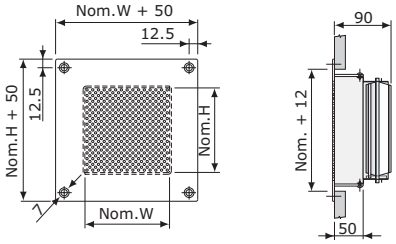
SG1 + OBSS



SG2 + OBSS



SG3 + OBSS



Free Area
35%

Please refer to pages 46 - 47 for full details of:
Plenum box

Order Example

SG1/300/300/150/OBSS/9010-Matt

Type
Nominal Width
Nominal Height
Depth (k)
Damper
Finish

Security Grilles

SG1 / SG2 / SG3

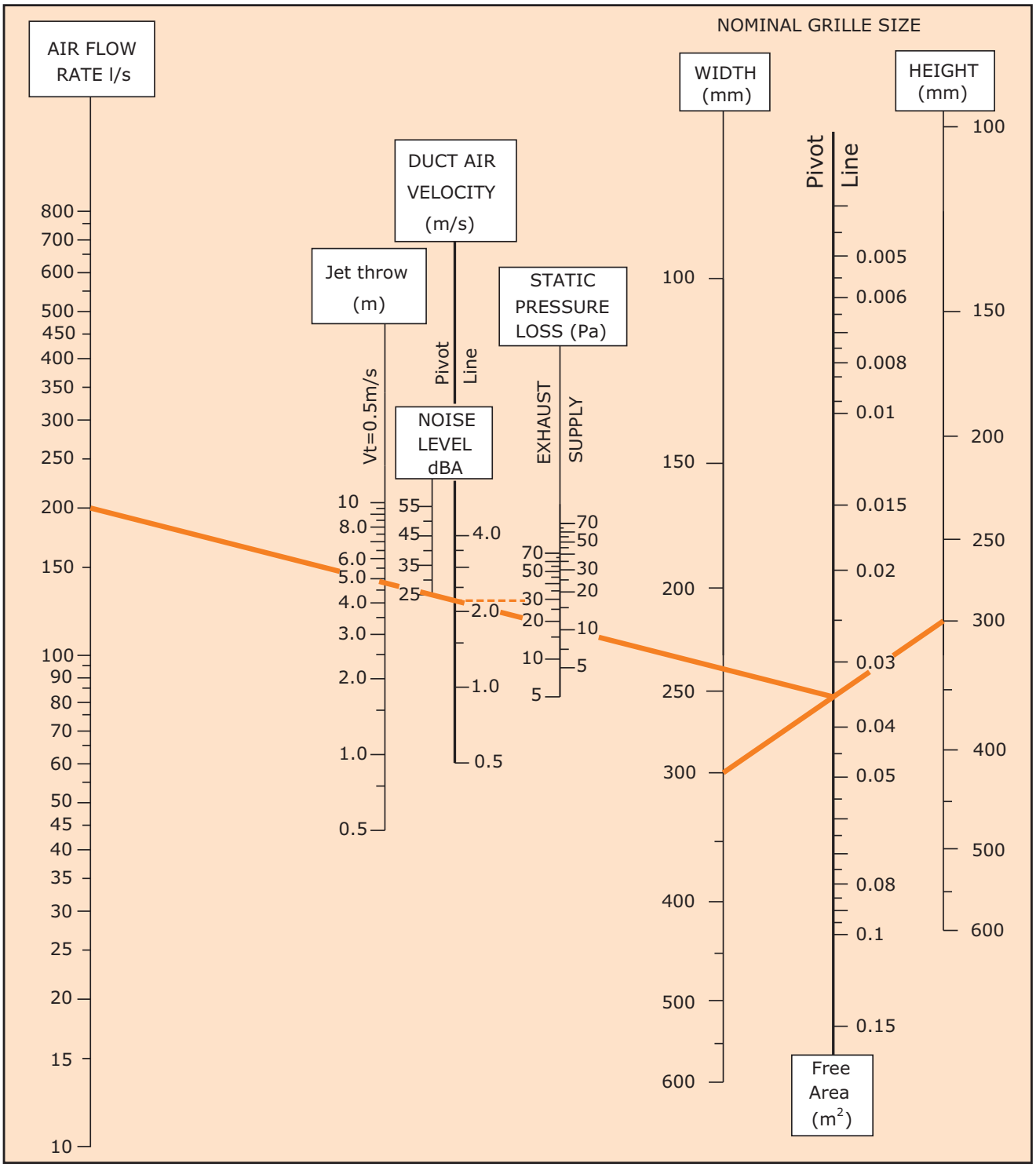
Selection Criteria

Throw data is based on a free jet under isothermal conditions and is presented for a terminal velocity of 0.5m/s.
Jet throws to a terminal velocity of 0.25m/s can be obtained by applying a factor of 1.5.
Noise data is presented in terms of sound power based dBA levels and is valid for supply and exhaust applications

Selection Example SG1/300/300 for an Supply application

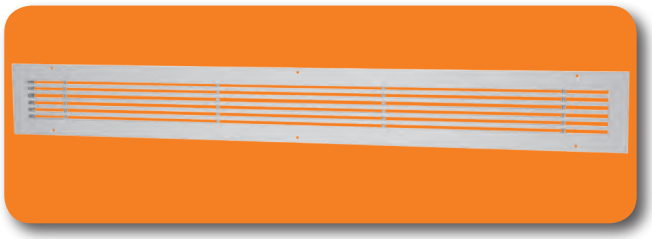
Air flow rate 200 l/s
Jet throw 4.8 m
Pressure loss 18 Pa
Noise level <25 dBA

Performance Nomogram



Airline Linear Grilles

ALN / ALM / ALF / ALG / ALJ



Introduction

Waterloo Airline Linear grilles have been designed to satisfy air diffusion and engineering requirements as well as architectural specifications. Airline grilles may be used in modular or continuous (ALN, ALM) situations for ceiling (return air only), sidewall, cill or bulkhead applications. The range is available with a wide variety of special options and fabrications to suit most project requirements. Grilles may be supplied with or without frames and borders - cores are represented with a suffix "(C)".

Product Description

ALN	0° 6mm thick blade, 12.5mm pitch
ALM	15° 6mm thick blade, 12.5mm pitch
ALF	45° 4.5mm thick blade, 12.5mm pitch
ALG	0° 3mm thick blade, 12.5mm pitch
ALJ	15° 3mm thick blade, 12.5mm pitch
ALG10	0° 3mm thick blade, 10mm pitch
ALJ10	15° 3mm thick blade, 10mm pitch
ALG(2)	As above with a rear set of adjustable blades
ALJ(2)	As above with a rear set of adjustable blades
ALN(2)	As above with a rear set of adjustable blades
ALM(2)	As above with a rear set of adjustable blades
2ALF	2 way cores are available on angled blade designs (Suffix M, F or J)
AFG	3mm border frame (any blade can be specified)
OBSS	Allen Key operated opposed blade damper
ED	Equalising deflector
DT-2M	Adjustable duct turn (Installed in duct)
ALF-RB	Reverse Border (Any blade can be specified)

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours or anodised finish available on request

Weights

ALG	14 kg/m² face area
Others	10 kg/m² face area
OBSS/ED	9.5 kg/m² face area
DT2M(G)	9.0 kg/m² face area

Sizes

Minimum size - 150 x 75mm
Maximum sizes for ALG / ALJ / ALF - 2000 x 1500mm
Maximum sizes for ALN / ALM - any x 1500mm
Maximum single section of cores - 2000 x 1500mm
Refer to head office for borders up to 4 meters in one piece
Continuous grilles are supplied in sections for butt jointing on site.

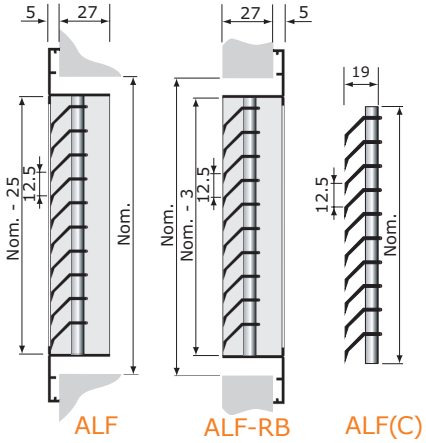
Fixing Options

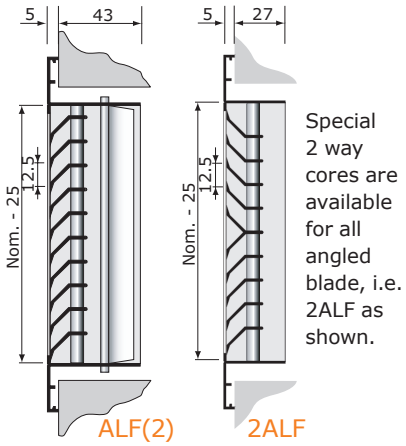
SF	CF	CRB	VS	AFVS
PFVS	RCHS	AFHS	AFCF	RCCF
BSSBD	BSSBP			

The following fixings are not compatible with the ALF blade

CRB	RCHS	AFHS	BSSBD

BSSBP - Not suitable for grilles with a rear blade or ALF blade
BSSBD - recommended for AFG frame if wall mounted (plasterboard)





Special 2 way cores are available for all angled blade, i.e. 2ALF as shown.

Order Example

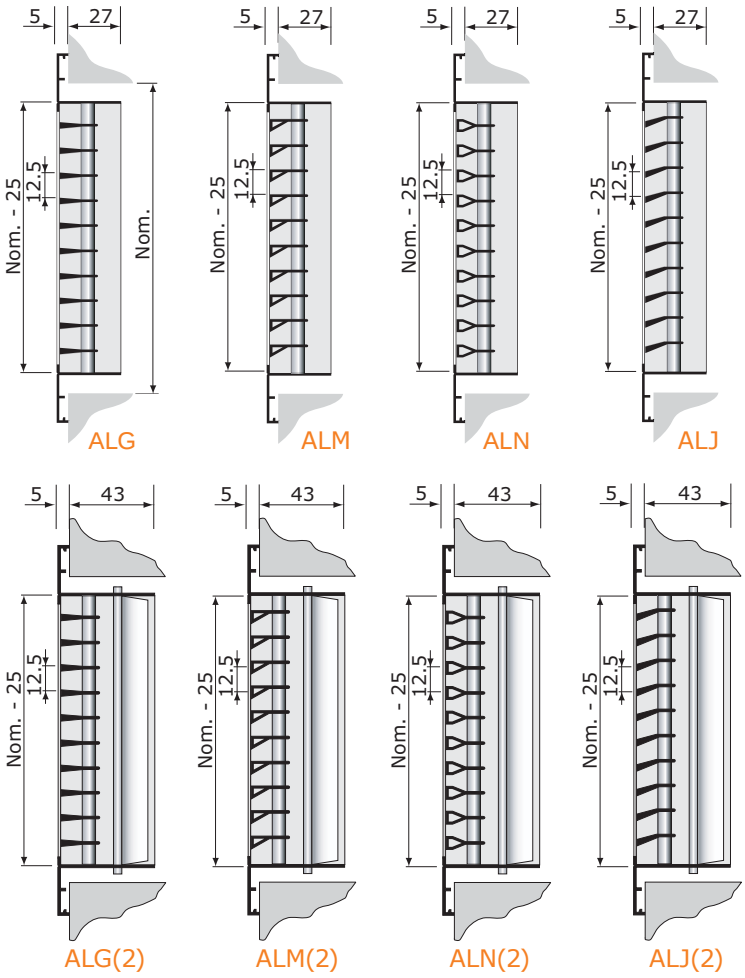
ALN/1000/150/R25T32/SF/9010-Matt/OBSS

- Type
- Nominal width
- Nominal height
- Border
- Fixing
- Finish
- Damper

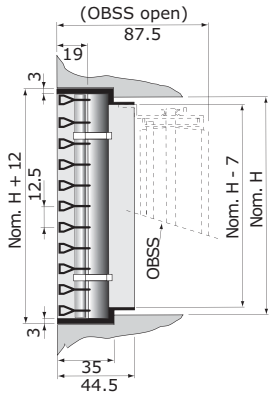
Free Area					
Pitch	Type				
	ALG	ALJ	ALF	ALM	ALN
10mm	68%	68%			
12.5mm	74%	74%	44%	49%	49%

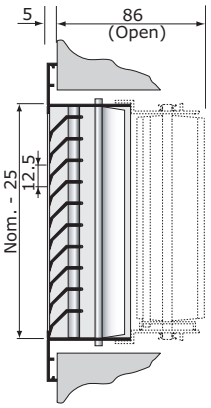
Airline Linear Grilles

ALN / ALM / ALF / ALG / ALJ

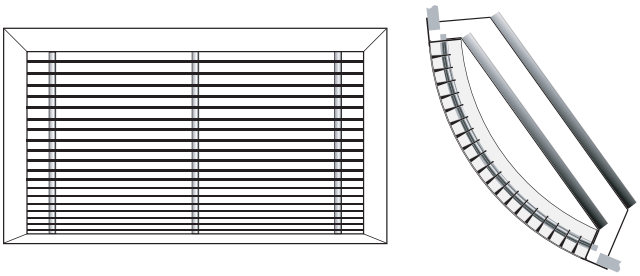


AFG frame shown with ALN blade + OBSS





ALF(2) + OBSS



Curved ALG Grille

Airline Linear Grilles

ALN / ALM / ALF / ALG / ALJ

Selection Criteria

Performance data is derived from tests carried out at isothermal conditions for a 1.25m long grille mounted 0.2m below a ceiling surface.
Throw is the horizontal distance to where the envelope velocity equals 0.5m/s.

Selection Example (Supply)

150mm high grille supplying 400 l/s/m

- **ALG 10**

P_s = 16 Pa 32 dBA

- **ALG**

P_s = 15 Pa 31 dBA

- **ALG 10/OBSS**

P_s = 24 Pa 35 dBA

- **ALG/OBSS**

P_s = 22.5 Pa 34 dBA

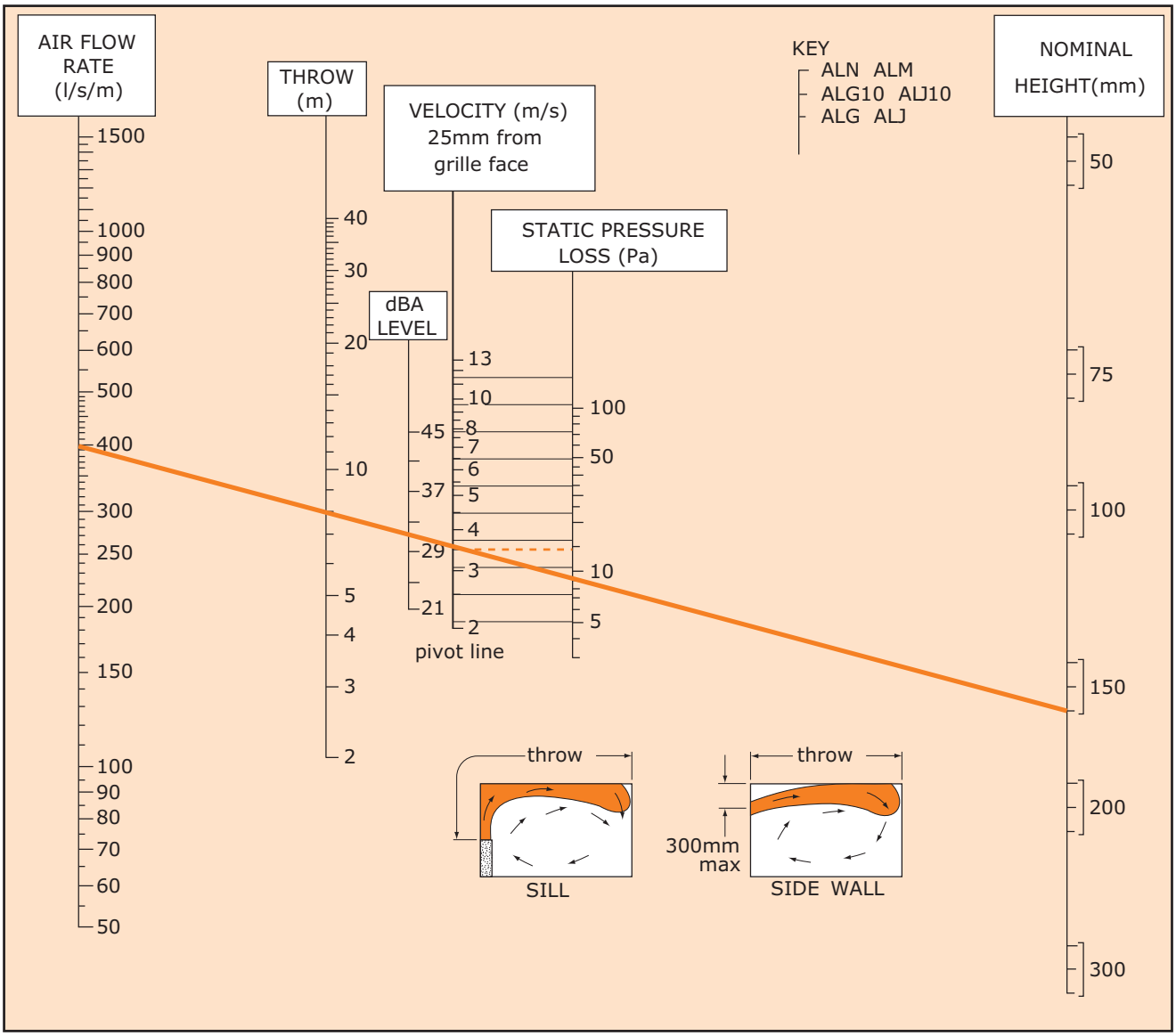
Correction Factors

Grille Length Correction Factors						
Length (m)	0.25	0.5	1.25	2	2.5	3
L_w	- 6	- 3	0	+2	+3	+5
Throw	x 0.9	x 0.9	x 1.0	x 1.0	x 1.1	x 1.1

Non-isothermal Jet Correction Factors			
Differential	10°c cooling	0°c	10°c warming
Sidewall throw	x 0.9	x 1.0	x 1.1
Cill throw	x 0.9	x 1.0	x 1.1

Terminal Velocity Correction Factors				
V_t (m/s)	0.6	0.5	0.4	0.3
Throw multiplier	x 0.8	x 1.0	x 1.3	x 1.66

Performance Nomogram (Supply)



Airline Linear Grilles

ALN / ALM / ALF / ALG / ALJ

Selection Example (Exhaust)

100mm high grille supplying 200 l/s/m

- **ALF**

P_s = 46 Pa 40 dBA

- **ALN**

P_s = 15 Pa 31 dBA

- **ALF/OBSS**

P_s = 69 Pa 43 dBA

- **ALN/OBSS**

P_s = 23 Pa 34 dBA

Notes

For grilles with OBSS opposed blade damper (open), multiply the pressure loss by 1.5 and add 3dB to the Noise level.

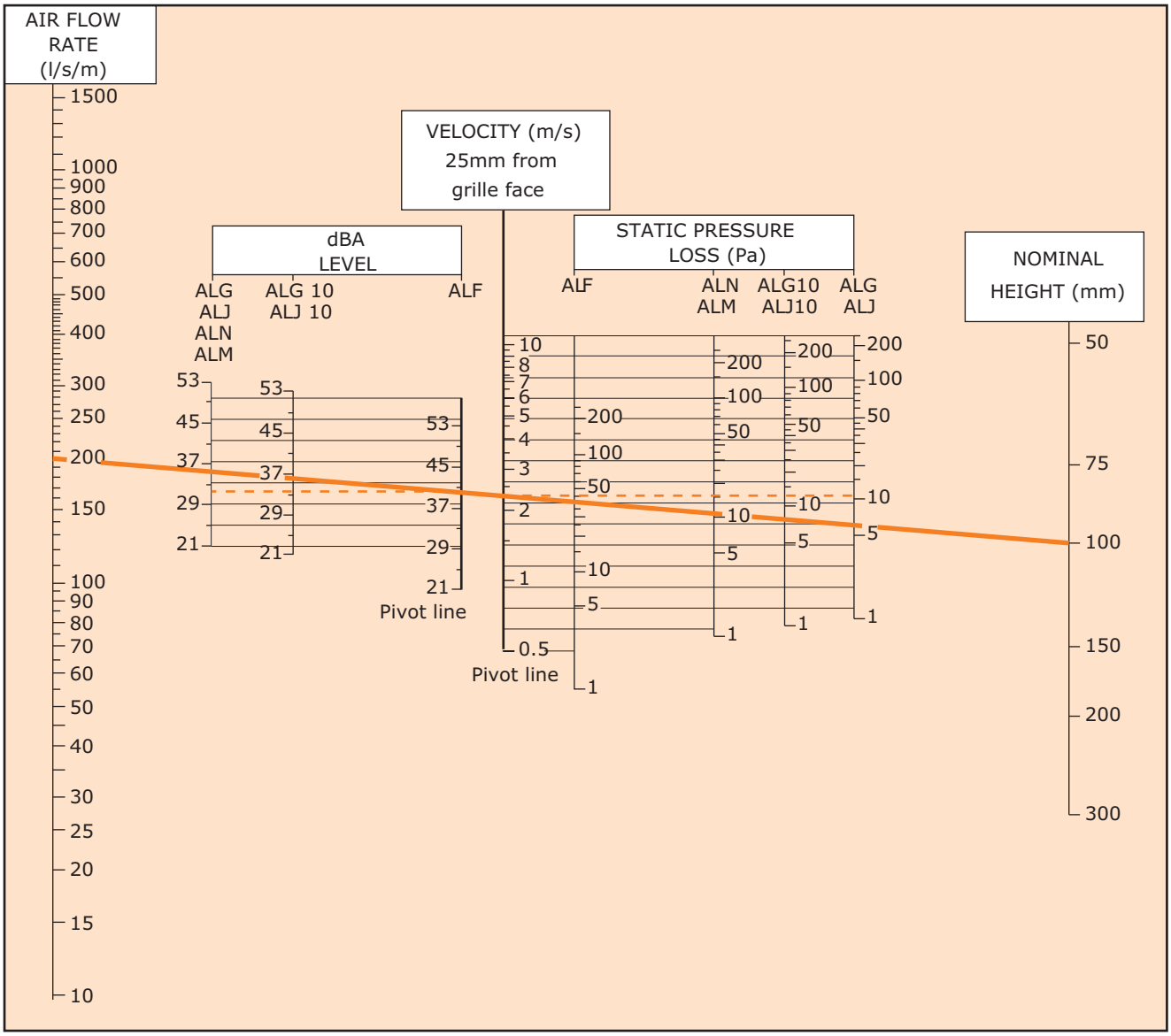
Where AL2 grilles are used multiply P_s x 3.0 and add 6dB to Noise level.

Grille selections for sidewall and cill applications should be based on a minimum discharge velocity of 2m/s.

For sidewall grilles that are to be mounted more than 0.2m from the ceiling, it is preferable to use a 15° blade format.

For sidewall grilles mounted 0.3m or more below ceiling level the throw is reduced by $^1/_3$.

Performance Nomogram (Exhaust)



Airline Linear Grilles

Curved Grilles

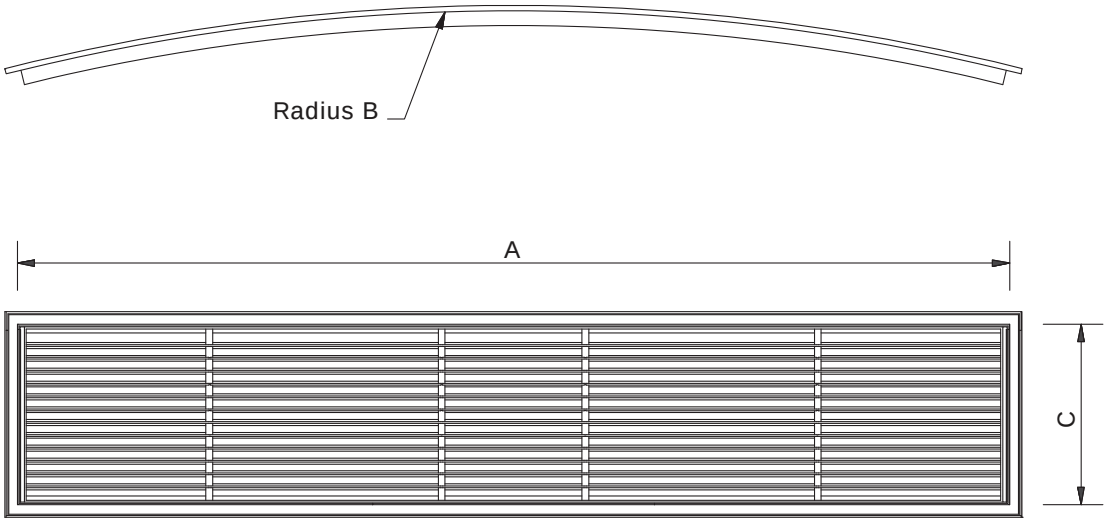
Introduction

Waterloo Airline Linear grilles with R16, R25 frames are available in 5 curved formats for types.

- Convex linear curve
- Concave linear curve
- Fanned curve
- Convex barrel curve
- Concave barrel curve

Convex linear curve

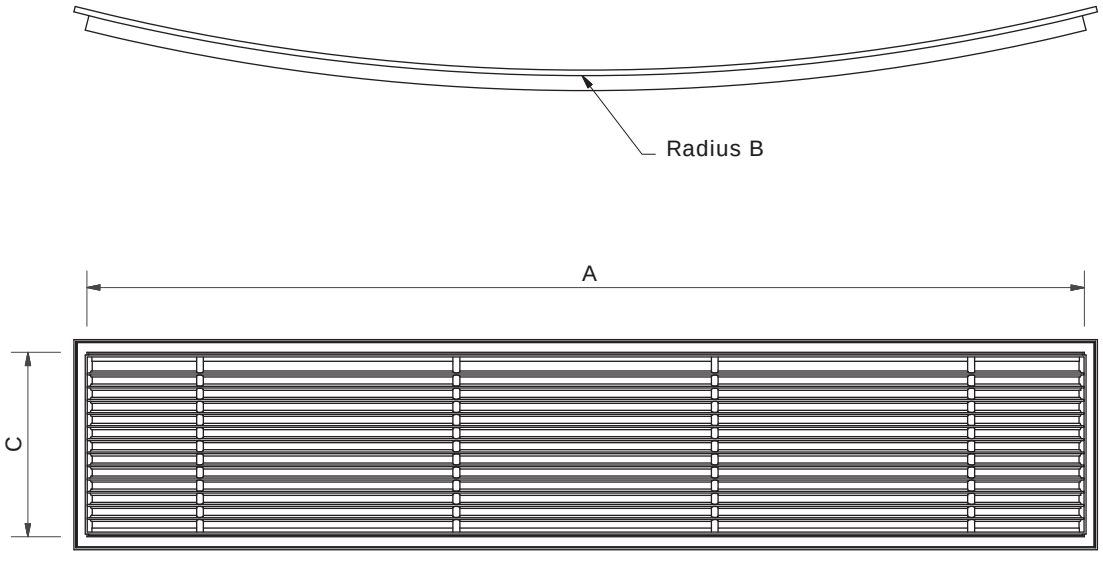
ALG, ALN Blades available



Radius over 1.75m in a single section

Concave linear curve

ALG, ALN Blades available



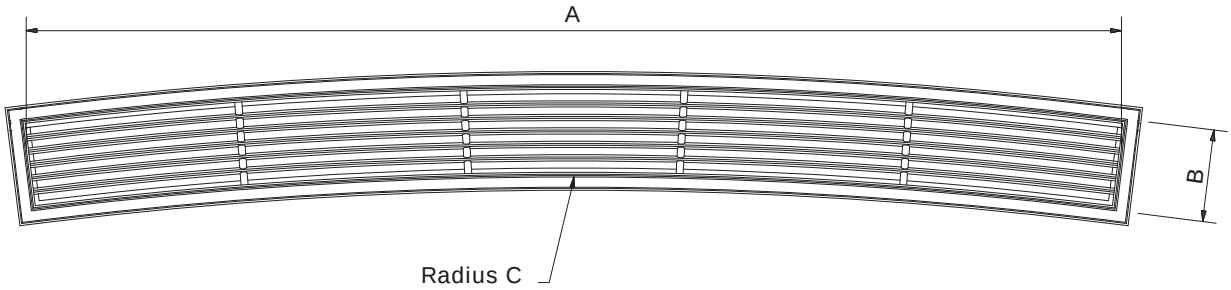
Radius over 1.75m in a single section

Airline Linear Grilles

Curved Grilles

Fanned curve

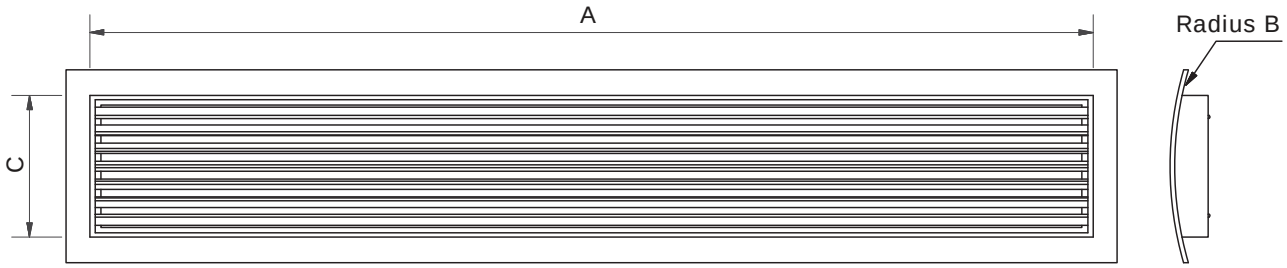
ALG, ALN Blades available



Radius over 1.75m in a single section

Convex barrel curve

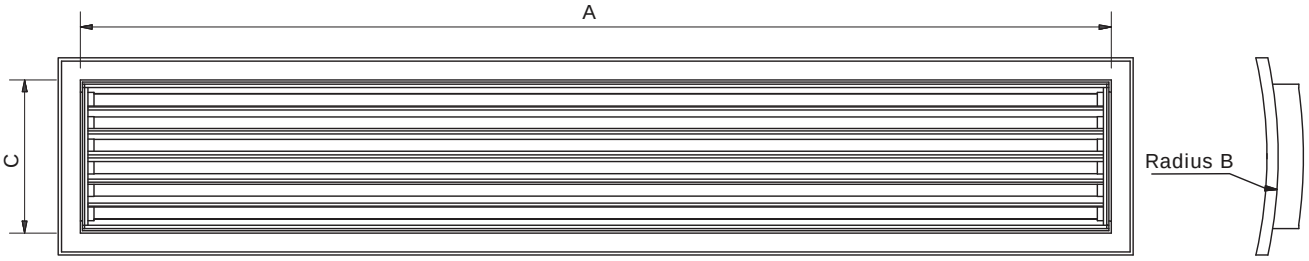
ALG, ALM, ALN Blades available



Radius over 1.25m (Fabricated from sheet metal)

Concave barrel curve

ALG, ALM, ALN Blades available



Radius over 1.25m (Fabricated from sheet metal)

Plasterline Linear Grilles

APN / APM / APG / APJ / APF

Introduction

Waterloo Plasterline Linear Grilles have been designed to satisfy air diffusion and engineering requirements while providing a narrow plaster-in border to meet architectural specifications. Plasterline grilles may be used in modular or continuous situations for sidewall, cill or bulkhead applications. The range is available with a wide variety of special options and fabrications to suit most project requirements. Ceiling applications can be achieved with the use of a non standard fixed core version.

Product Description

APN	0° 6mm thick blade, 12.5mm pitch
APN2	APN with rear set of adjustable blades
APM	15° 6mm thick blade, 12.5mm pitch
APM2	APM with rear set of adjustable blades
2APM	APM with 2 way core
APG	0° 3mm thick blade, 12.5mm pitch
APG2	APG with rear set of adjustable blades
APG10	APG with 10mm pitch blades
APJ	15° 3mm thick blade, 12.5mm pitch
APJ2	APJ with rear set of adjustable blades
2APJ	APJ with 2 way core
APJ10	APJ with 10mm pitch blades
APF	45° 5mm thick blade, 12.5mm pitch
2APF	APF with 2 way core
ED	Equalising deflector
OBSS	Allen Key operated opposed blade damper

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)

PPM9010 (RAL 9010 Matt - 20% Gloss White)

PPM9006 (RAL 9006 Matt - 30% Gloss Silver)

Other colours available on request

Sizes

Because of their nature, the sizing for Plasterline grilles is exceptional in that measurements are for the internal opening at the front face. Opening cut-out in the substrate should be 6 more than the stated nominal grille size.

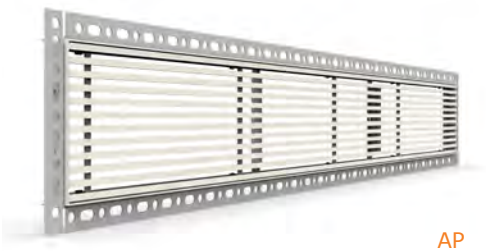
Minimum size: 150 wide x 50 high
Maximum size: 2000 wide x 500 high
Continuous grilles can be supplied in sections for butt joining on site. Refer to Head Office for widths up to 3000 in one piece.

Free Area					
Pitch	Type				
	APG	APJ	APF	APM	APN
10mm	68%	68%	-	-	-
12.5mm	74%	74%	44%	49%	49%

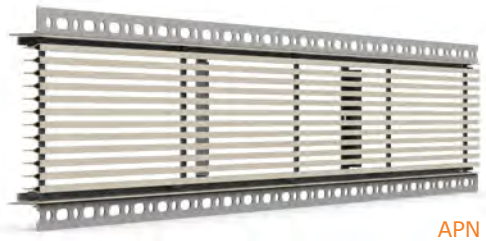
Order Example

APG/1000/150/SF/9010-Matt/OBSS

- Type
- Nominal width
- Nominal height
- Fixing
- Finish
- Damper



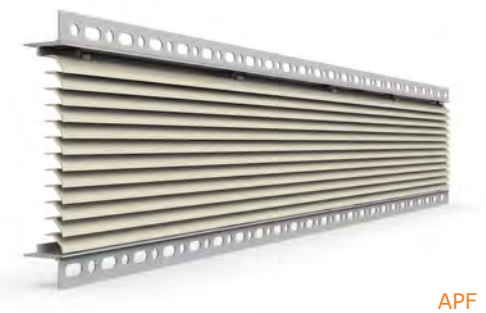
AP



APN

APG

APJ



APF

Plasterline Linear Grilles

APN / APM / APG / APJ / APF

Selection Criteria

Performance data is derived from tests carried out at isothermal conditions for a 1.25m long grille mounted 0.2m below a ceiling surface. Throw is the horizontal distance to where the envelope velocity equals 0.5m/s.

Correction Factors

Grille Length Correction Factors						
Length (m)	0.25	0.5	1.25	2	2.5	3
L_w	- 6	- 3	0	+2	+3	+5
Throw	x 0.9	x 0.9	x 1.0	x 1.0	x 1.1	x 1.1

Non-isothermal Jet Correction Factors			
Differential	10°c cooling	0°c	10°c warming
Sidewall throw	x 0.9	x 1.0	x 1.1
Cill throw	x 0.9	x 1.0	x 1.1

Terminal Velocity Correction Factors				
V_t (m/s)	0.6	0.5	0.4	0.3
Throw multiplier	x 0.8	x 1.0	x 1.3	x 1.66

Selection Example (Supply)

150mm high grille supplying 400 l/s/m

- **APG 10**

P_s = 16 Pa 32 dBA

- **APG**

P_s = 15 Pa 31 dBA

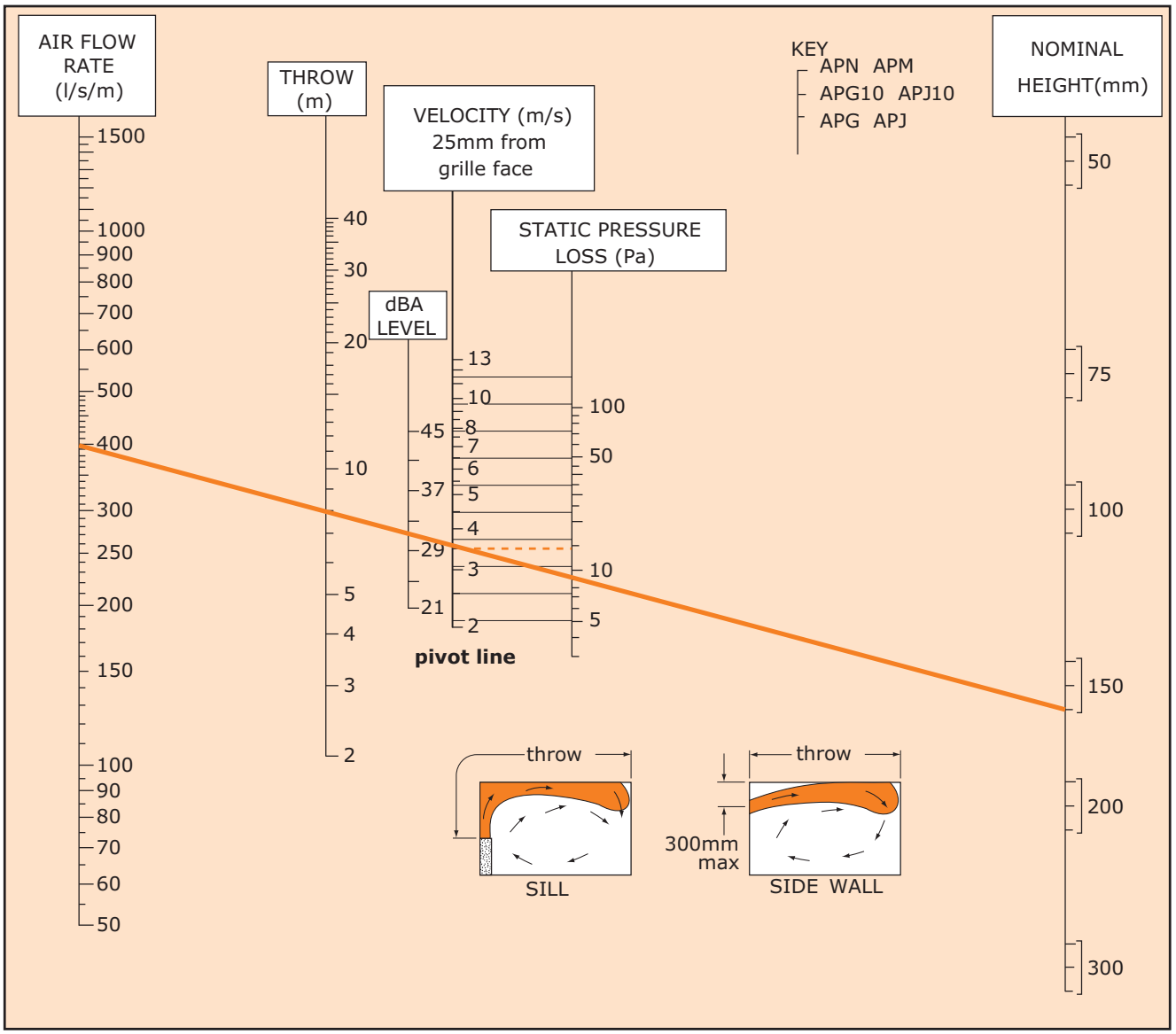
- **APG 10/OBSS**

P_s = 24 Pa 35 dBA

- **APG/OBSS**

P_s = 22.5 Pa 34 dBA

Performance Nomogram (Supply)



Plasterline Linear Grilles

APN / APM / APG / APJ / APF

Selection Example (Exhaust)

100mm high grille supplying 200 l/s/m

- **APF**

P_s = 46 Pa 40 dBA

- **APN**

P_s = 15 Pa 31 dBA

- **APF/OBSS**

P_s = 69 Pa 43 dBA

- **APN/OBSS**

P_s = 23 Pa 34 dBA

Notes

For grilles with OBSS opposed blade damper (open), multiply the pressure loss by 1.5 and add 3dB to the Noise level.

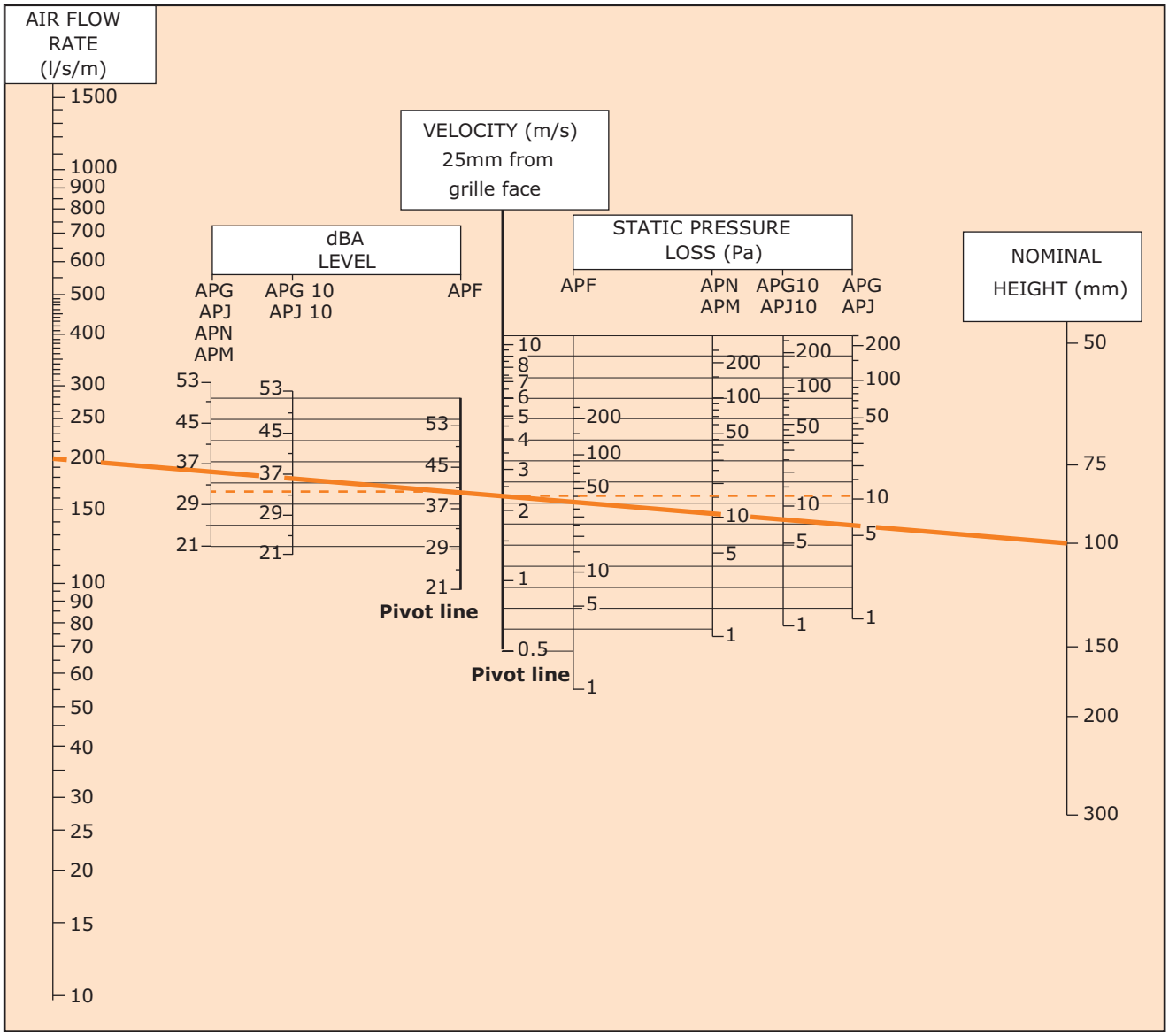
Where AP2 grilles are used multiply P_s x 3.0 and add 6dB to Noise level.

Grille selections for sidewall and cill applications should be based on a minimum discharge velocity of 2m/s.

For sidewall grilles that are to be mounted more than 0.2m from the ceiling, it is preferable to use a 15° blade format.

For sidewall grilles mounted 0.3m or more below ceiling level the throw is reduced by $^1/_3$.

Performance Nomogram (Exhaust)



Control Options - Grille Mounted

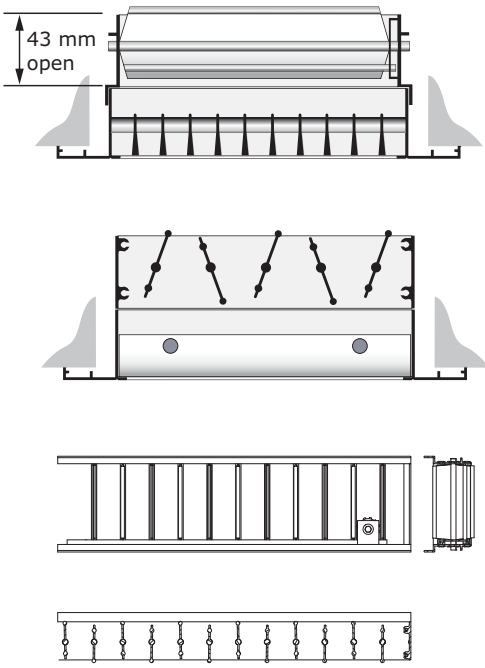
OBSS Opposed Blade Damper (Volume Control Damper)

Introduction

Waterloo OB Opposed Blade Dampers are manufactured to suit virtually the whole of our square / rectangular Air Terminal range and can be fitted to the neck of the terminals or inside plenum box.

They are adjustable from the front of the Grille or Diffuser with a screwdriver as standard, but are also available with cord- or lever-operation.

Manufactured with linked aluminium extruded blades, in sizes to suit any Waterloo Grille or Diffuser, they are useful for fine airflow regulation and can be adjusted from fully open to closed low-leakage position.



Product Description

OBSS Opposed Blade Damper, Screwdriver operated

OBCO Opposed Blade Damper, Cord operated

OBSL Opposed Blade Damper, Short Lever operated

OBLL Opposed Blade Damper, Long Lever operated

BLACK Painted black to prevent through vision

Features

- Linked aluminium extrusions for limited extra weight
- Large choice of adjustments to suit any configuration
- Can be fitted to virtually any Waterloo Grille or Diffuser

Finishes

Extruded aluminium blades

Sizes

Minimum Size - 100 x 75

Minimum Size for Plasterline - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.

Order Example

OBSS/300/300/Black/ To suit a 1H

- Damper type
- Terminal length
- Terminal width
- Options
- Terminal type

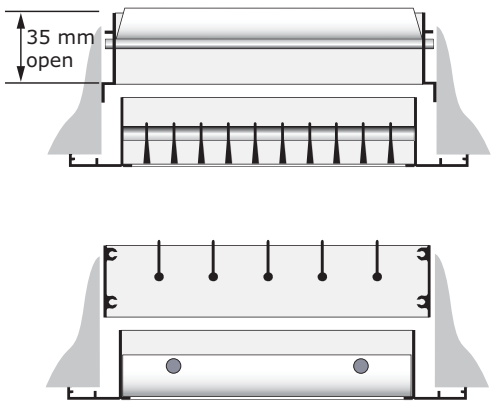
ED Equalising Dampers (Directional Blades Incapable of Shut Off)

Introduction

Waterloo ED Equalising Dampers are manufactured to suit virtually the whole of our square / rectangular Air Terminal range and can be fitted to the neck of the terminals or inside plenum box.

They are individually adjustable to control air direction and may be used for localised blanking.

Manufactured with aluminium extruded blades, in sizes to suit any Waterloo Grille or Diffuser, they can be adjusted manually by removing the Grille or Diffuser core.



Product Description

ED Equalising deflector

BLACK Painted black to prevent through vision

Features

- Aluminium extrusions for limited extra weight
- Individually adjustable for fine airflow regulation
- Can be fitted to virtually any Waterloo Grille or Diffuser

Finishes

Extruded aluminium blades

Sizes

Minimum Size - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.

Order Example

ED/300/300/Black/ To suit a 1H

- Damper type
- Terminal length
- Terminal width
- Options
- Terminal type

Urban Grilles

UC / UF / UE

Introduction

The Waterloo Urban Grille range has been designed with the industrial design aesthetic in mind, allowing for exposed duct work to become a feature of the building.

Product Description

1- Urban Curve

Curved to match oval or circular ducting. Flat blades only. For side fitting to radiused face of duct.

UCG	0°	3mm thick blade, 12.5mm pitch
UCN	0°	6mm thick blade, 12.5mm pitch
UCA	Adjustable horizontal or vertical blade	

(note: core is flat and not curved)

Options

- RAB Adjustable blades horizontal or vertical (Flat core)

2- Urban Flat

A flat grille to suit vertical throw when installed on the underside of ducting.
For flat face of duct. Blades parallel with centre-line of duct (See Airline Grilles for sizing, performance details and construction)

UFG	0°	3mm thick blade, 12.5mm pitch
UFJ	15°	3mm thick blade, 12.5mm pitch
UFN	0°	6mm thick blade, 12.5mm pitch
UFM	15°	6mm thick blade, 12.5mm pitch
UFF	45°	5mm thick blade, 12.5mm pitch
2UFJ	2 way 15°	3mm thick blade, 12.5mm pitch
2UFF	2 way 45°	5mm thick blade, 12.5mm pitch
2UFM	2 way 45°	6mm thick blade, 12.5mm pitch

Options

- 10mm blade pitch available with 3mm blades

3- Urban End

Designed to fit into the vertical end of flat oval duct or round. Blades are available in various angles to suit the throw characteristics required from the installation.

UEG	0°	3mm thick blade, 12.5mm pitch
UEJ	15°	3mm thick blade, 12.5mm pitch
UEN	0°	6mm thick blade, 12.5mm pitch
UEM	15°	6mm thick blade, 12.5mm pitch
UEF	45°	5mm thick blade, 12.5mm pitch

Options

- HB Horizontal blades
- VB Vertical blades

Features

- The grilles are left in their raw finish to complement the popular 'Urban' style which includes exposed duct work.
- Urban grilles are available is 3 styles which allows for installation into any air distribution design.

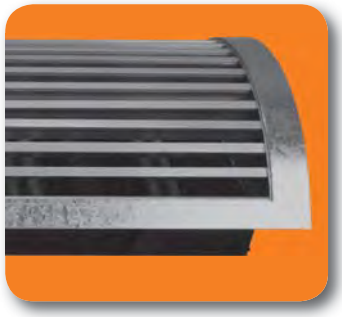
Finishes

Raw unfinished.

Order Example

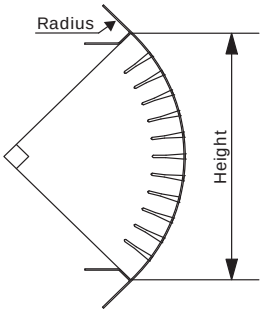
UCG/320/250/R25/SF/OBSS

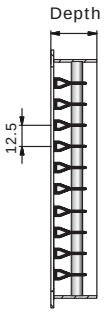
- Type
- Nominal Width
- Duct size
- Border
- Fixing
- Options

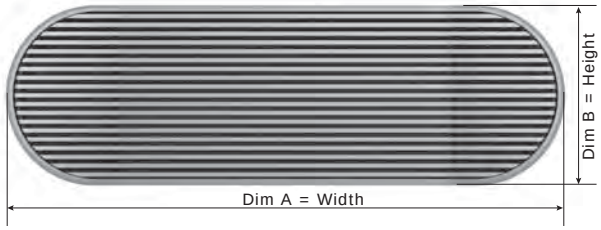


Urban Curve

Urban End







Free Area					
Pitch	UCG UFG UEG	UFJ UEJ	UCN UFN UEN	UFM UEM	UFF UEF
12.5mm	74%	74%	44%	49%	49%

Flat oval duct sizing										
Standard ISO R20 duct size range		Height of duct mm								
Dim B		76	102	127	152	203	254	305	356	406
160	Width of duct mm (Dim A)	320								
180		401								
200		521	386							
224			467	371						
250				452	399					
280					478					
315					638					
355					800	610				
400					1039	770	582			
450						932	742	632		
500						1171	902	792		
560							1143	955	846	737
630							1626	1196	1006	897
710							1950	1598	1326	1138
800									1727	1539
900										1941

Notes: Urban end grilles are built to suit standard duct dimensions but are available to fit any width requested.

Air Transfer Grilles

NS / DV / NSNL

Introduction

Waterloo transfer grilles are suitable for mounting in doors, partitions and walls to allow ventilation air to pass between adjacent rooms.
The NS series are small format grilles with a No-Sight feature, the DV series are large format grilles for door ventilator applications. The range is available with a wide variety of frame and fixing options to suit various design needs.

Product Description

NS	Core only grille for beading in place
NSA	Framed No-Sight grille with matching reverse frame
NSC	Framed No-Sight grille without a matching reverse frame
DV	Core only door ventilator for bead fixing
DVA	Framed door ventilator with matching reverse frame
DVC	Framed door ventilator without a matching reverse frame
NSNL	Core only No-Sight, No-Light grille for beading in place
NSNLA	Framed NSNL grille with matching reverse frame
NSNLC	Framed NSNL grille without matching reverse frame

Features

- Small, large or dark room formats to suit design requirements
- No-Sight (NS) option for room to room privacy
- Small, or large formats to suit design requirements
- Narrow core only for modern door systems (NS)
- Flange screw fixing provided
- Two border styles available

Finishes

NS/DV	PPG9010 (RAL 9010 Gloss - 80% Gloss White)
	PPM9010 (RAL 9010 Matt - 20% Gloss White)
	PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
NSNL	PPG9005 (RAL 9005 Matt - 30% Gloss Black)

Other colours or anodised finish available on request

Weights

NS	16 kg/m² face area
DV	19 kg/m² face area
NSNL	29 kg/m² face area

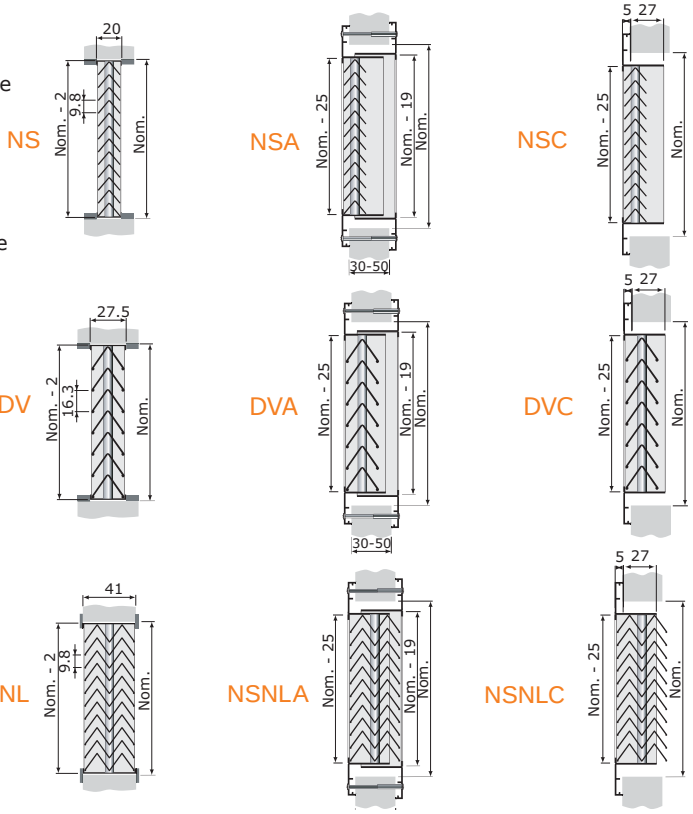
Sizes

Minimum size - 100 x 100mm
Maximum single section - 1200 x 1800mm

Fixings

Suffix C	SF only
Suffix A	PSF
	SF

All others have no fixing (NF).
See page 46 for details.



Free Area		
NS, NSA, NSC	DV, DVA, DVC	NSNL, NSNLA, NSNLC
41%	41%	34%

Order Example

NSA/300/300/25T/SF/9010-Matt

Type
Nominal width
Nominal height
Border
Fixing
Finish

Air Transfer Grilles

NS / DV / NSNL

Selection Criteria

dBA is noise level based on a room absorption of 8dB for sound power ref 10^{-12} W.

Selection Example

300 x 250 Grille Supplying 100 l/s

- **NS**

P_s = 10 Pa 31 dBA

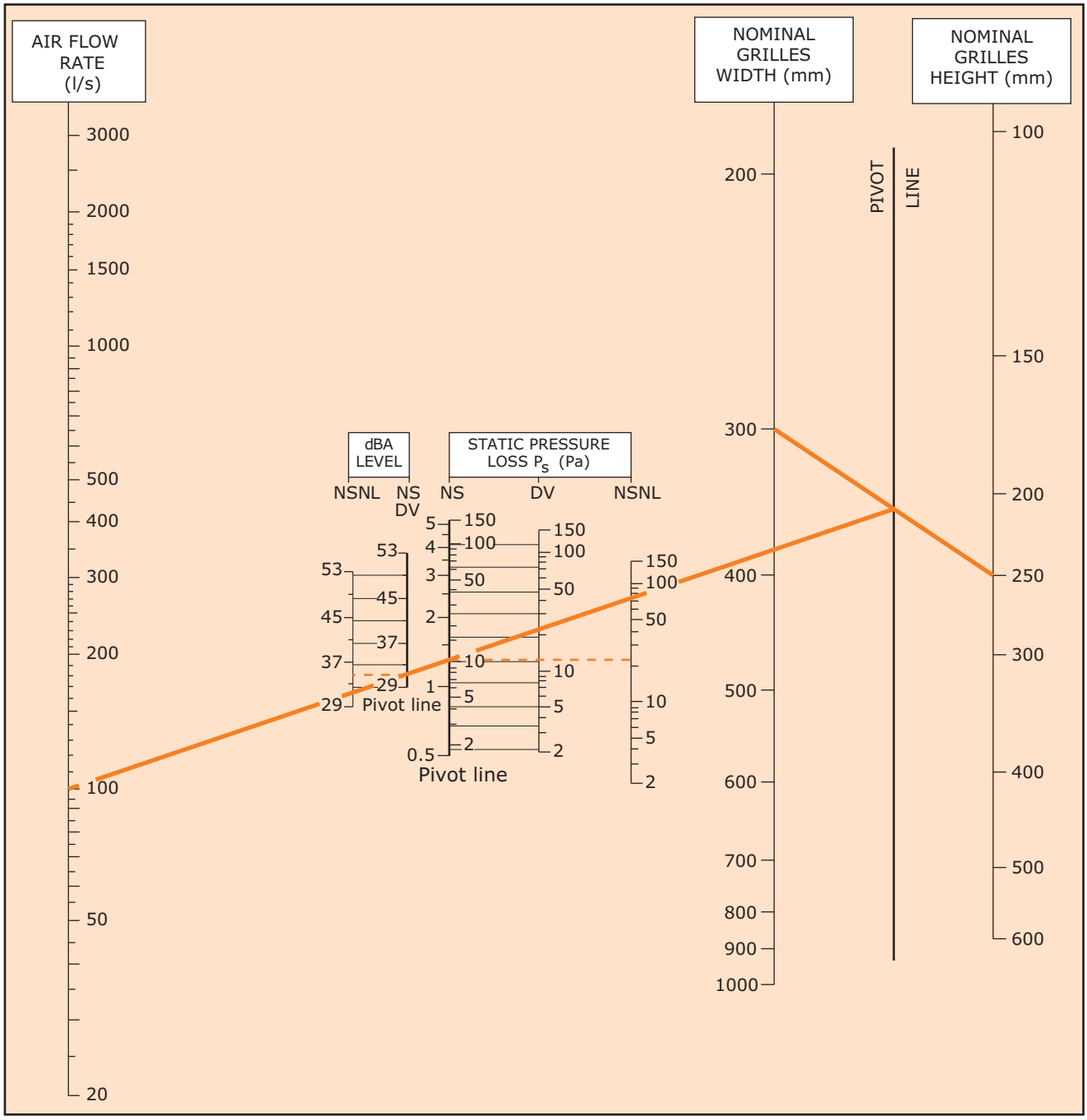
- **DV**

P_s = 13 Pa 31 dBA

- **NSNL**

P_s = 23 Pa 35 dBA

Performance Nomogram



Acoustic Transfer Grilles

DSR / DSRX

Introduction

The Waterloo DSR has been developed for use in partitions and doors where a reduction in noise transfer or "cross-talk" from one space to another is required, as well as ventilation air transfer.

The DSR is manufactured from high quality aluminium extrusions with channel section cores forming a labyrinth airway lined internally with acoustic damping media. The cores are retained within a flanged frame which is fitted with a sealing gasket. DSRX units are supplied with fixed border and matching adjustable rear border frame.

DSR units will only provide acoustic isolation improvements over that of a clear aperture. DSR units may be used in series to increase transmission loss.

Product Description

DSR Acoustic transfer grille

DSRX Acoustic transfer grille for variable depth partition of 40 to 100 mm with rear matching frame

DSR2 Back to back acoustic transfer grille

Features

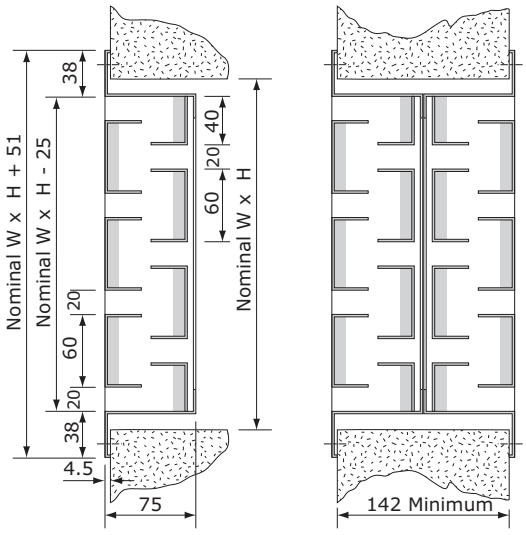
- Suitable for partition, wall or door mounting
- Easy to install
- Fits most standard doors and partitions
- Easy to clean
- Modular sizes

Finishes

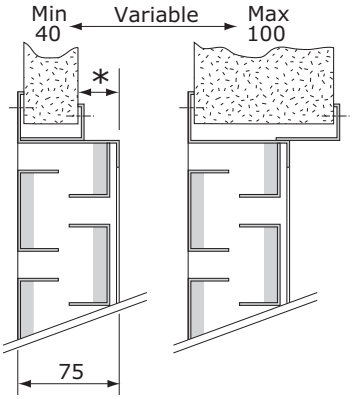
PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours available on request

Sizes

Width 150 minimum to 1025 maximum.
Height 125 minimum to 1005 maximum in 80mm increments.



DSR DSR2



DSRX

Door / Partition mounting 40 - 100mm thick
* Note: 30mm protrusion with minimum depth of door

Free Area
23%

Order Example

DSR/425/285/9010-Matt

Type
Nominal width
Nominal height
Finish

Acoustic Transfer Grilles

DSR / DSRX

Selection Criteria

Select a DSR grille to handle 70 l/s when mounted within a 100mm partition and a maximum permitted pressure loss of 20 Pa.

Spectrum Correction (Add to dBA)

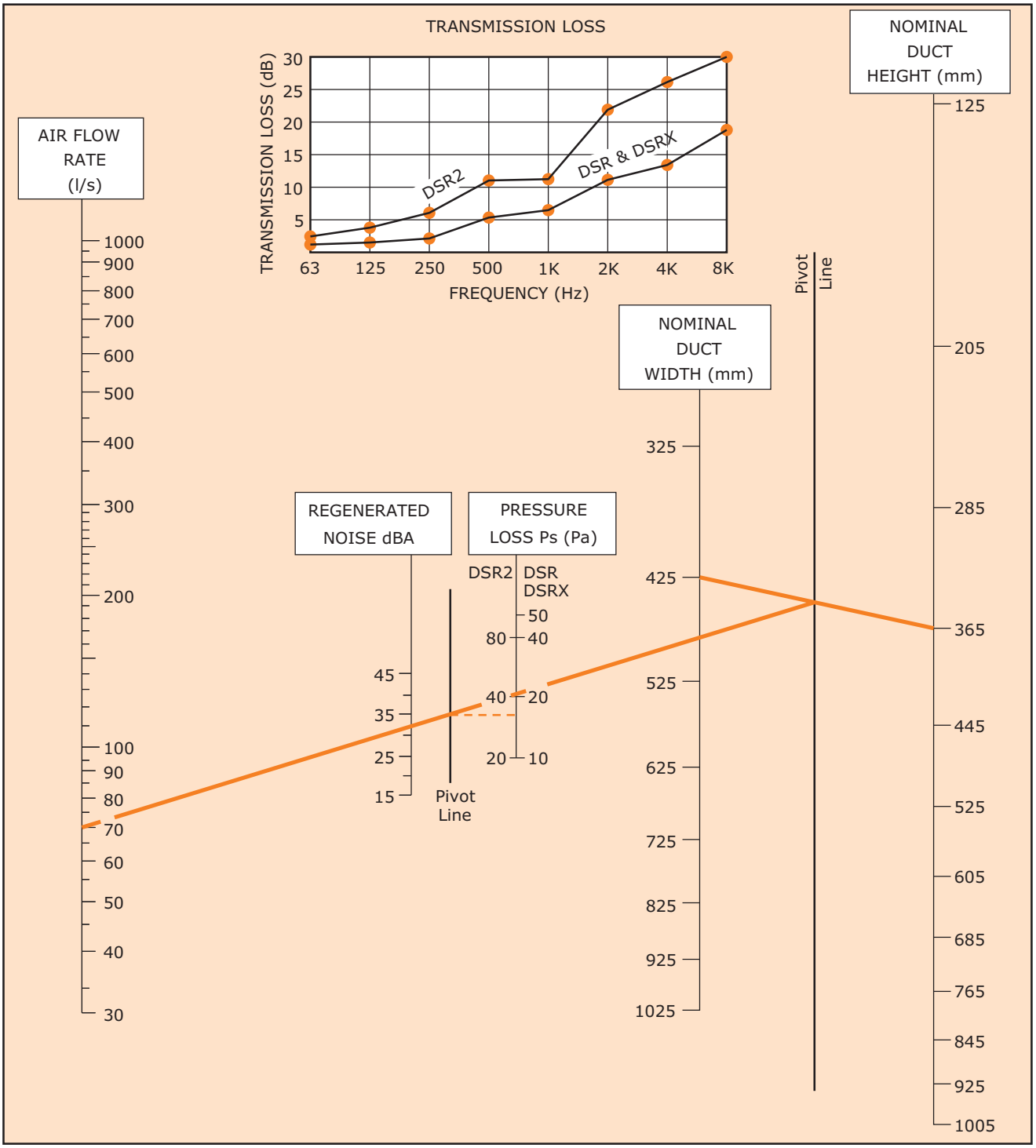
Frequency (Hz)					
125	250	500	1K	2K	4K
+1	+4	+3	0	-10	-16

From Nomogram Select Size 425 x 365

Pressure loss = 16 Pa (DSR)
31 dBA Sound Power Spectrum is:

Freq (Hz)	125	250	500	1K	2K	4K
SWL (dB)	32	35	34	31	21	15

Performance Nomogram



Sidewall Grilles

WPT

Introduction

The Waterloo WPT grille is a sidewall grille made with an aluminium frame and a steel perforated plate. Normally mounted at high level. The perforations on the plate are angled to supply air in a fixed direction.

The standard "plenum box" wall mounting that comes with a supply grille is angled so the air stream is trained vertically down the wall and along the floor. This floods the floor with fresh cool air using the displacement principle.

When used for extract the grille should be mounted flush with the wall.

This grille provides a good air distribution with low velocities, low sound levels and minimal air mixing.

Product Description

WPT-T Supply Grille (including inclined plenum)
WPT-R Extract Grille (including AF-subframe)

Features

- High levels of comfort due to low velocities
- No plenum assembly in the duct is necessary
- Low noise levels
- Minimal mixing of the air

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Other colours available on request

Sizes

Nom. W 225 to 925 mm in 100mm increments
Nom. H = 125 mm

Weights

WPT-T 15.0 kg/m² face area
WPT-R 14.5 kg/m² face area

Fixing Options

WPT-T Fixing plate
WPT-R AFCF (AF-subframe + clip fixing)

Selection Criteria

dBA is noise level based on a room absorption of 8dB for sound power ref 10^{-12} W.

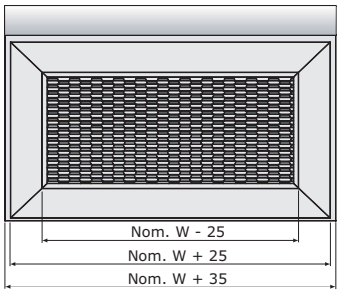
Selection Example

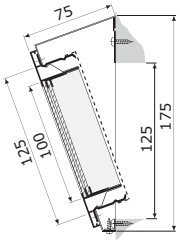
WPT-T/425/125

Air Volume 21 l/s
Throw on floor 2.6 m
Pressure Drop 6 Pa
Noise Level < 20 dBA

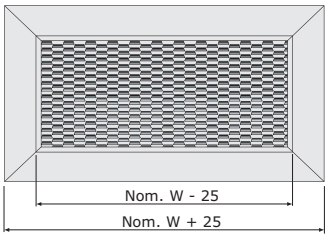
Free Area
35%

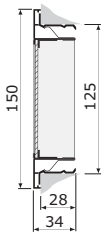
WPT-T





WPT-R





Performance Table

WPT			Supply							
m³/h	l/s		225 x 125	325 x 125	425 x 125	525 x 125	625 x 125	725 x 125	825 x 125	925 x 125
50	14	T	3.0							
		P_s	14							
		L_w	-							
75	21	T	4.0	3.0	2.6	2.4	2.2	2.0	1.6	
		P_s	26	12	6	4	3	3	2	
		L_w	31	-	-	-	-	-	-	
100	28	T		3.5	3.2	3.0	2.4	2.2	2.0	1.6
		P_s		20	12	9	6	5	4	4
		L_w		40	-	-	-	-	-	-
125	35	T			3.5	3.2	2.6	2.4	2.2	2.0
		P_s			18	14	9	8	6	5
		L_w			-	-	-	-	-	-
150	42	T			4.0	4.0	3.0	3.0	2.6	2.2
		P_s			26	20	13	12	8	7
		L_w			32	-	-	-	-	-
200	56	T					4.0	3.5	3.2	3.0
		P_s					22	19	14	12
		L_w					36	-	-	-
250	69	T						4.0	4.0	3.5
		P_s						31	22	18
		L_w						39	38	34
300	83	T								4.0
		P_s								26
		L_w								40

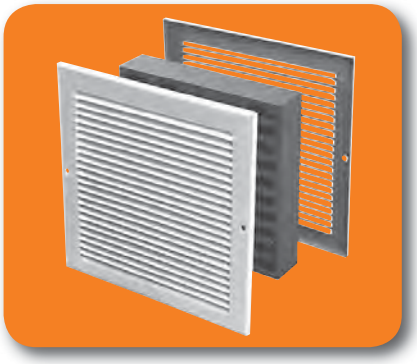
Order Example

WPT-T/425/125/9010-Matt

- Type
- Supply/Exhaust
- Nominal Width
- Nominal Height
- Finish

Fire Rated Transfer Grilles

WFV / WFVG



Introduction

The Waterloo fire rated ventilators are suitable for 1 hour rated doors and masonry partitions. The units, which satisfy BS 476 Part 22, incorporate intumescent elements which expand and carbonise when exposed to temperatures in excess of 150°C, thereby sealing off the ventilation opening. The ventilators may be beaded directly into the door/partition opening or covered by optional steel grilles to suit aesthetic requirements.

WFV units are constructed from hollow PVC extrusions enclosing PALUSOL 210 wire reinforced intumescent media. The extrusions are retained in a horizontal louvre pattern by reinforced vertical members and an enclosing frame system.

Product Description

WFV Core only fire rated ventilator
WFVG Fire rated ventilator complete with 2 matching steel grilles
WFG Singular steel grille only

Features

- 1 hour fire rating to BS 476 Part 22
- Available in 5 standard sizes
- Easy to install
- Attractive appearance
- Available as core only
- Available with covering steel grilles
- Suitable for door and masonry partition mounting
- Special assemblies available for partitions incorporating standard Waterloo grilles

Finishes

WFV - Silver PVC
Grilles - PPM 9010
Other colours available on request

Sizes

Width (W) and height (H) are nominal opening sizes

Minimum size - 150 x 150mm

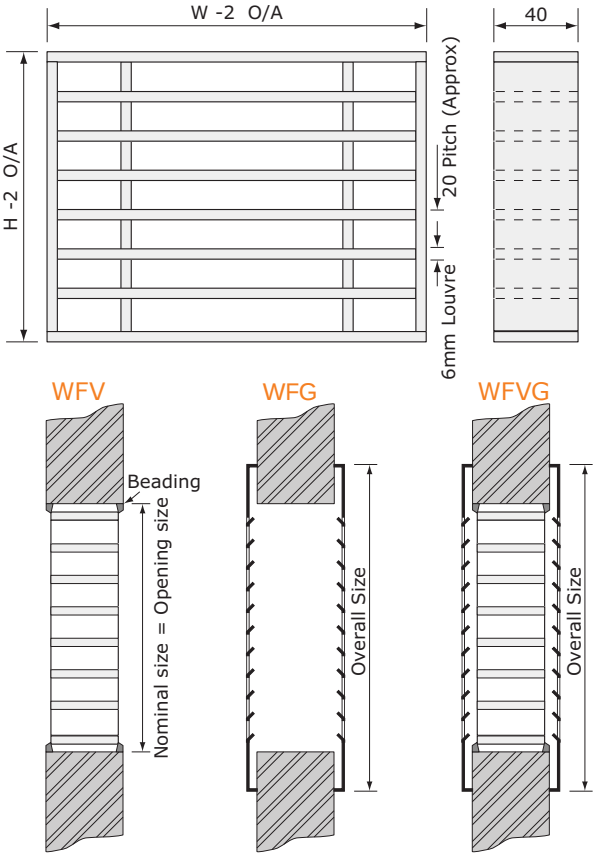
Maximum size - 600 x 600mm

Authority

Tested and Rated in accordance with BS 476 Part 22. Certificate number CF 564 (TS47).

Installation

WFV cores should be fitted into a cleanly cut aperture with a maximum gap of 5mm around the frames; gaps larger than this should be filled with intumescent paste. The cores may be retained by using a bead frame. If supplied, the pressed steel cover grilles should be screw fixed through the frame holes provided.



Order Example

WFG/300/300/9010-Matt

Type
Nominal width
Nominal height
Finish (If applicable)

Nominal Size mm W x H	Overall Size mm	Weight kg	Free Area Measured WFV
150 x 150	185 x 185	0.45	56%
200 x 200	235 x 235	0.80	58%
300 x 300	340 x 340	1.80	59%
600 x 300	645 x 340	3.60	60%
600 x 600	645 x 645	7.20	61%

Fire Rated Transfer Grilles

WFV / WFVG

Selection Criteria

Performance is based on a 'room to room' application with the WFV mounted in a partition or door.

Q = Air flow rate through the ventilator at the stated differential pressure.

ΔP (Differential pressure) = static pressure difference across the assembly.

dBA is noise level based on a room absorption of 8dB for sound power ref 10^{-12} W.

Selection Example

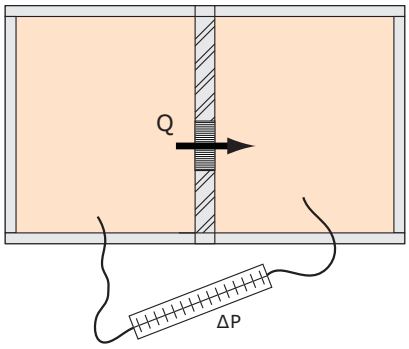
Select a WFV unit to handle 300 l/s with a maximum pressure loss of 25 Pa and Noise level of 35 dBA. Enter graph at

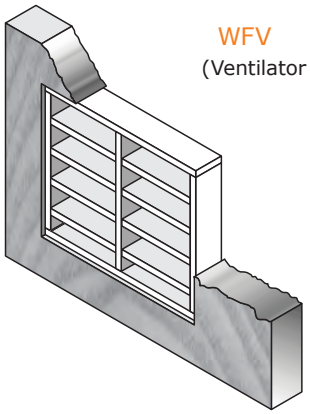
Q = 300 l/s and extend upwards until a standard size may be selected which satisfies pressure and noise level specified.

Size 300 x 300 WFV selected:

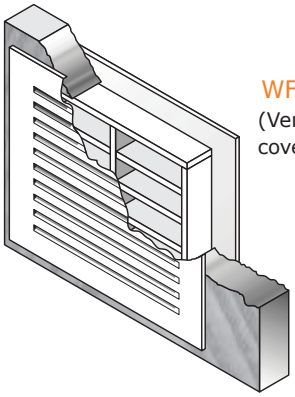
- Pressure Drop 22 Pa dBA Level = 29 dBA

Note: Not suitable for plasterboard portions.



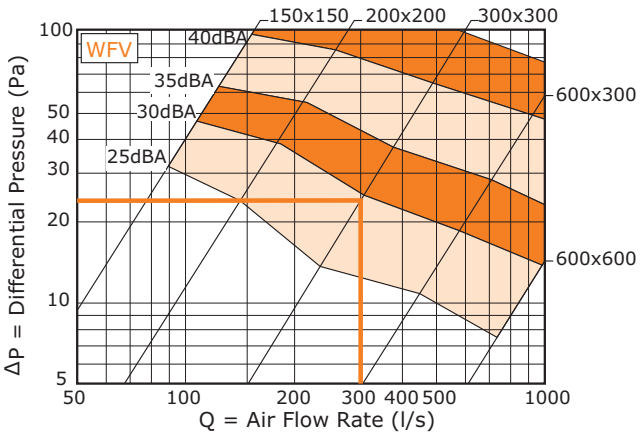


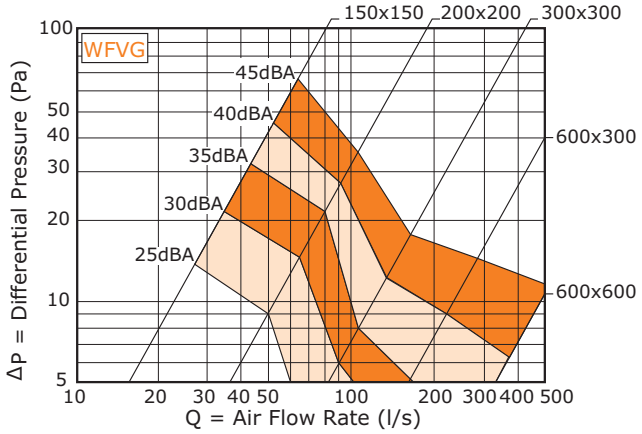
WFV
(Ventilator only)



WFVG
(Ventilator plus cover grilles)

Performance graph





Light Duty Floor Grilles

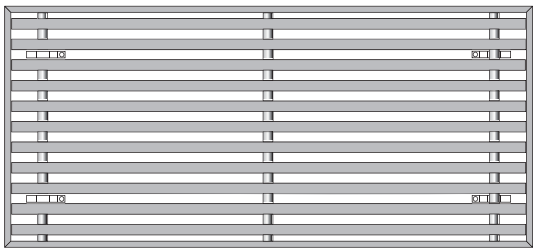
AFG

Introduction

The Waterloo Light Duty Floor Grille has been specifically designed for cill and floor applications where light foot traffic will be experienced.
In addition, the AFG is available with any of the Airline cores. This makes the product ideal for sidewall applications where reinforced recessed frames are necessary.
The AFG is constructed from aluminium alloy extrusions with tube type cores and fully welded frames. The core is supported by rear reinforcing bars.

Product Description

AFG Light Duty Floor Grille
OBSS Allen key operated opposed blade damper
ED Equalising Deflector
PBLG Plenum Box



Features

- Removable cores for easy access and cleaning
- Core retaining clips for security/safety
- Various core styles
- Recessed frame detail
- Robust enough for light foot traffic on floors or cills
- Suitable for low level sidewall applications
- Solid extruded blades

Finishes

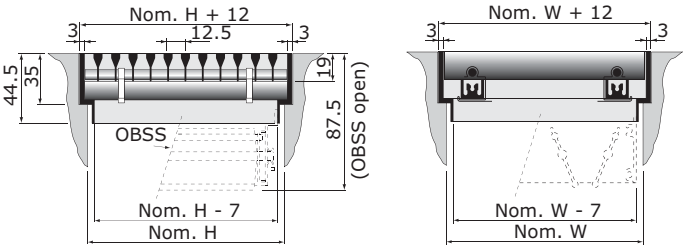
PPG9010 (RAL 9010 Gloss - 80% Gloss White)
PPM9010 (RAL 9010 Matt - 20% Gloss White)
PPM9006 (RAL 9006 Matt - 30% Gloss Silver)
Nylon Decanol
Other colours available on request

Weights

AFG 12 kg/m² face area
OBSS 9.5 kg/m² face area

Sizes

Minimum size - 150 x 50
Maximum size - N/A x 300
(Maximum single section 1800 x 200)



Free Area
49%

Order Example

AFG/1500/150/PPM9010

Type
Nominal Width
Nominal Height
Finish

Light Duty Floor Grilles

AFG

Selection Criteria

Performance data is based on isothermal conditions for a 1.25m long grille mounted adjacent to a wall surface. dBA is noise level based on a room absorption of 8dB for sound power ref 10^{-12} w. Throw is the distance to where the envelope velocity equals 0.5m/s. For grilles mounted more than 500mm from a wall reduce the throw by $^1/_3$.

Selection Example AFG/2000/150

Air Volume 200 l/s/m
Throw = 6 m
25 dBA + 2 dB length correction = 27 dBA
P_s = 8 Pa

Exhaust Air Correction Factors
Static pressure loss = supply pressure x 1.2
dBA level = supply + 4dB

Distributed load (typically foot traffic)		
Grille height (mm)	100	200
Max. static load (kg)	960	480
Max. shock load (kg)	384	192

Safety factors: Static load = 2, Shock load = 5

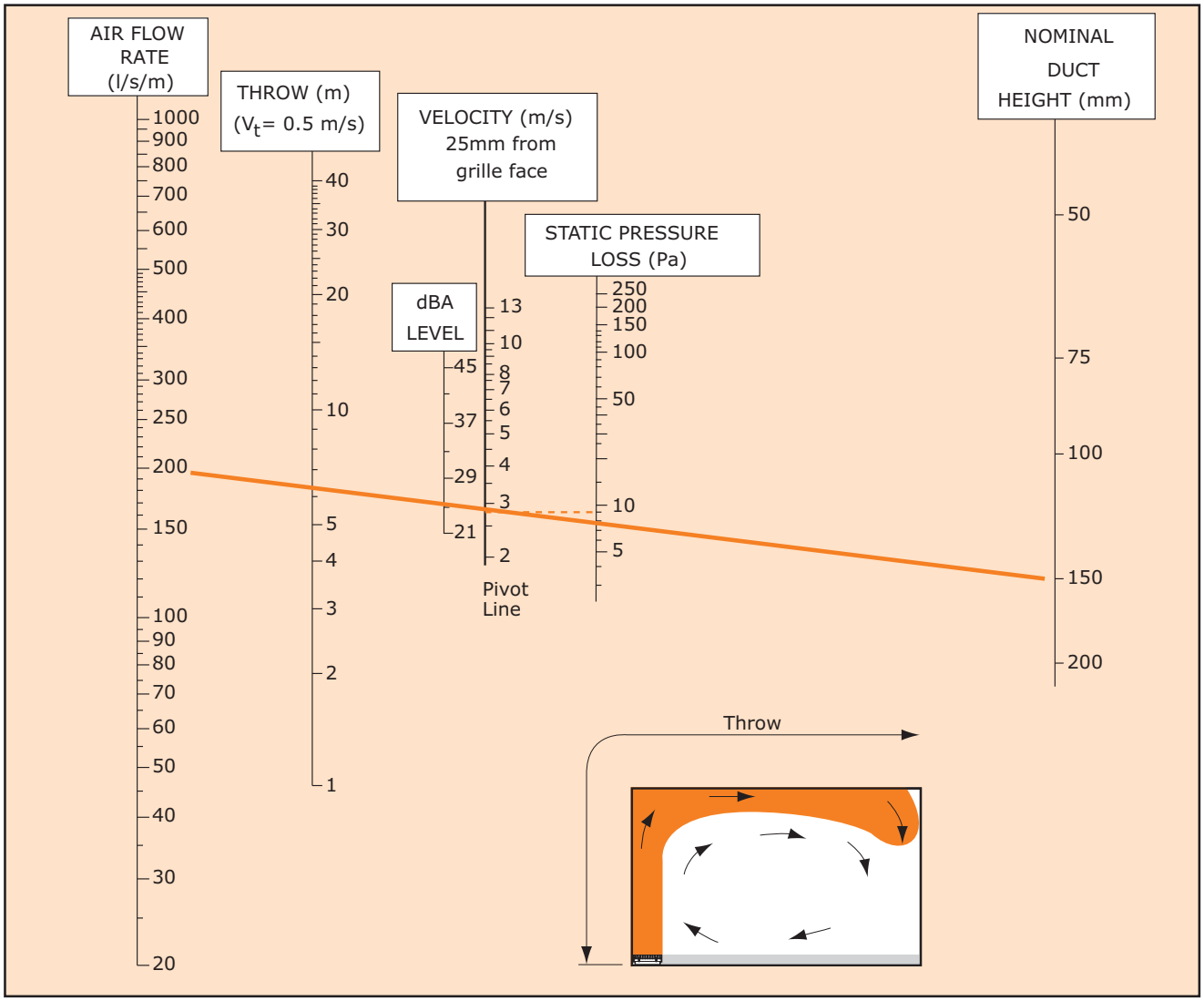
Terminal Velocity Correction Factors				
V_t (m/s)	0.6	0.5	0.4	0.3
Throw multiplier	0.8	1.0	1.3	1.66

Grille Length Correction Factors						
Length (m)	0.25	0.5	1.25	2	2.5	3
dBA addition	8	11	13	14	15	17
Throw x	0.9	0.9	1.0	1.0	1.1	1.1

Non-isothermal Jet Correction Factors			
Differential	10°c cooling	0°c	10°c heating
Sidewall throw	0.9	1.0	1.1
Cill throw	0.9	1.0	1.1

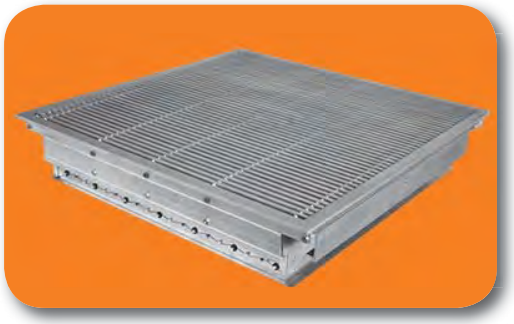
Point load (25x25mm point load over any 2 blades)	
Grille height (mm)	up to 200
Max. static load (kg)	105
Max. shock load (kg)	42

Performance Nomogram



Heavy Duty Floor Grille - Tile Replacement

HDFG



Introduction

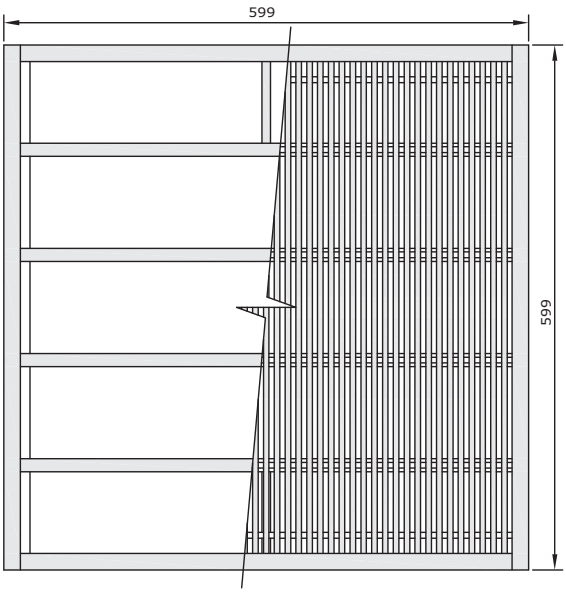
The Waterloo HDFG Heavy Duty Floor Grille has been designed for commercial and industrial applications where heavy foot traffic is experienced. The HDFG is a 600mm tile replacement, structurally complying to the Extra Heavy Duty Class of BS EN 13264-2001.

Product Description

HDFG Extra heavy duty floor grille, tile replacement.
OBSS Opposed blade damper
HMD Low height hit-and-miss damper
BL Blanking plate

Features

- Tested to, and complied with, BS EN 13264-2001 Ventilation for Buildings - Floor mounted Air Terminal Devices - Test for Structural Classification - Extra Heavy Structural Class.
- Improved additional strength design.
- Suitable for most pedestal flooring systems.
- Easy "Drop in" installation.
- Two choices of damper, including low height version
- Convenient damper adjustment.
- Dampers and blanking plate can be supplied factory-fitted, or can be retro-fitted on site if necessary.



Floor compatibility

- Matches most raised floor systems based upon 600mm x 600mm module.
- Configurable to match floor thickness's 30mm to 50mm.

Finish

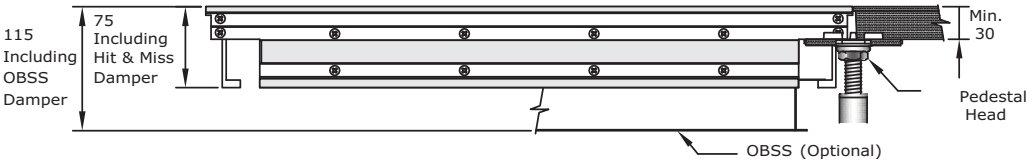
- Mill finish as standard.
- Powder or anti-static nylonic coating options available on request.

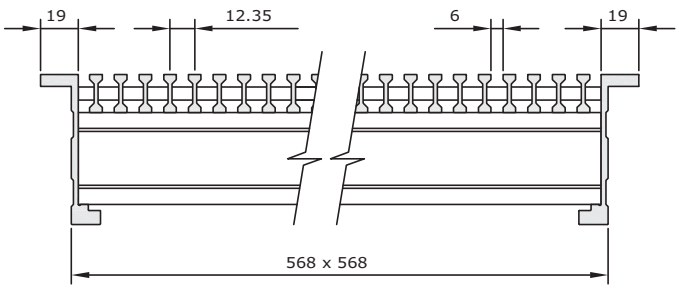
Weights

HDFG 10 kg per grille
OBSS 9.5 kg/m² face area

Sizes

Nominal 600mm x 600mm tile replacement (599mm x 599mm actual).





ΔT = 6°c
Throw (m) at 0.25 m/s

Free Area
33%

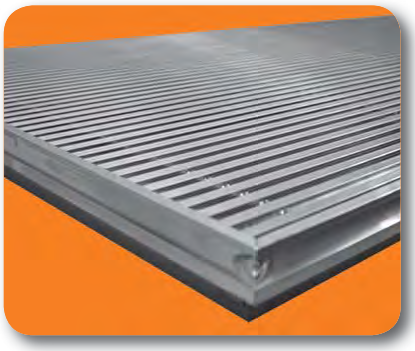
HDFG 600x600 Tile Replacement						
Flow rate (l/s)		No Damper	OBSS 100%	OBSS 50%	H & M 100%	H & M 50%
100	T	0.6	0.7	0.9	0.8	1.1
	P_S	1	2	4	3	5
	L_W	<20	<20	20	<20	21
200	T	1.1	1.2	1.7	1.5	2.0
	P_S	3	4	6	5	9
	L_W	<20	<20	21	21	23
300	T	1.9	2.0	2.7	2.4	3.2
	P_S	5	6	13	12	22
	L_W	21	21	25	25	31
400	T	3.0	3.2	3.9	3.6	4.4
	P_S	9	10	25	23	40
	L_W	27	28	33	32	41-
500	T	4.2	4.4	5.1	4.9	-
	P_S	13	15	40	34	-
	L_W	34	36	41	20	-
600	T	5.6	5.9	-	-	-
	P_S	17	22	-	-	-
	L_W	42	44	-	-	-

Order Example

HDFG/38/MILL/OBSS
Type
Floor Thickness
Finish
Option

Heavy Duty Floor Grilles - Linear

HDFG-L



Introduction

The Waterloo HDFG heavy duty floor grille has been designed for commercial and industrial applications where heavy foot traffic is experienced. The L type is for linear applications; it is available with a recessed border style. This improved design is suitable for use with most types of raised floor pedestal system.

Product Description

HDFG-L Linear
OBSS Opposed blade damper
BL Blanking plate

Features

- Reversible core (0° or 15° discharge)
- Suitable for most pedestal flooring systems
- Facility for on site blanking
- Recessed border style
- Border alignment facility

Finish

Mill finish as standard, powder or antistatic nylonic coating options available on request.

Advantages

- Integrated design features - enabling tile and linear grille combinations for aesthetic continuity
- Improved additional strength design
- Easy "Drop in" installation
- Convenient damper adjustment

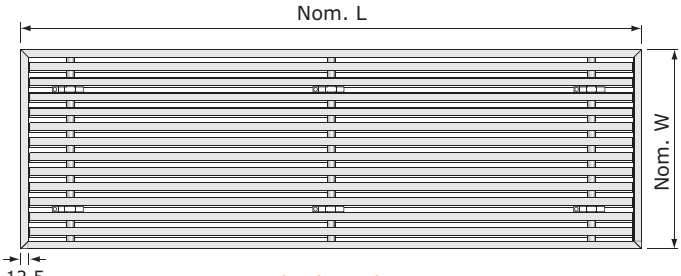
Weights

HDFG-L 18.0 kg/m² face area

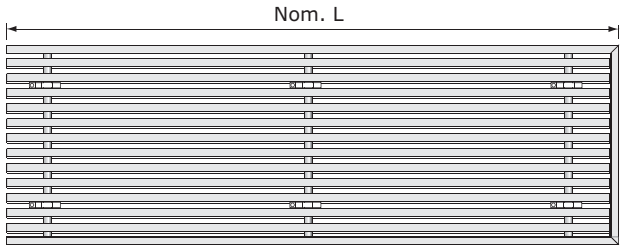
OBSS 9.5 kg/m² face area

Sizes

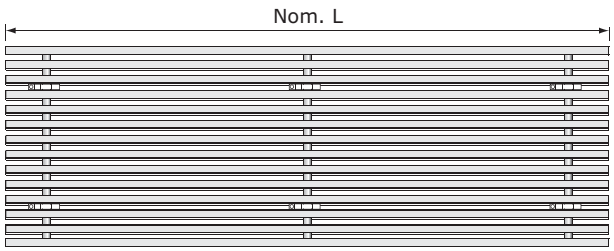
Length maximum single section 1000mm
Width minimum 100mm
maximum 600mm



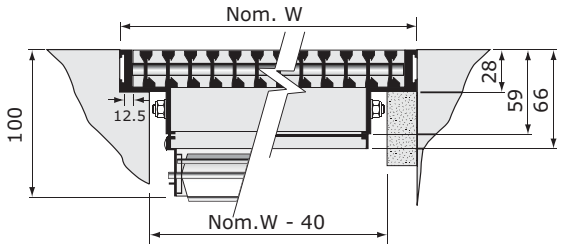
Single unit



End section



Intermediate section



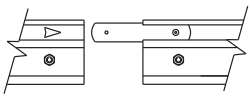
HDFG-L + OBSS / / HDFG-L + BL

Free Area
47%

Order Example

HDFG-L/1000/300/MILL/OBSS/BL

Type
Section Length
Section Width
Finish
Damper
Blanking Plate



2 alignment strips supplied with each section for site fixing.

Heavy Duty Floor Grilles - Linear

HDFG-L

Selection Example
HDFG-L / 1200x200

Air Volume 250 l/s/m
Throw 3.6 m
Pressure Drop 7 Pa
Noise Level 27 dBA

Spectrum Corrections						
Frequency (Hz)	125	250	500	1k	2k	4k
Supply	+9	+13	+12	+6	+2	-2
Exhaust	+9	+11	+12	0	-5	-11

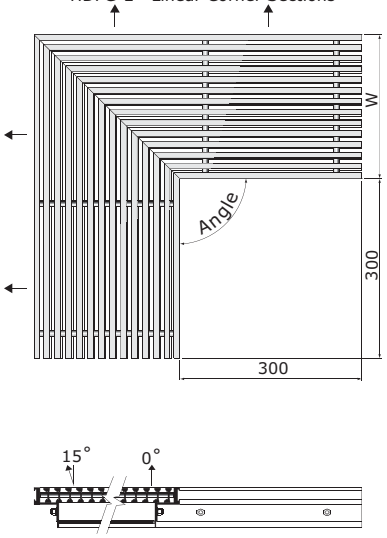
Load Deflection Characteristics

- **HDFG-L Floor Grille 300mm Wide** Load applied on grille centre line distributed over 25mm x 25mm point between blade supports. Maximum recommended point load 360kg.
- **HDFG-L Floor Grille 600mm Wide** Load applied on grille centre line distributed over 25mm x 25mm point between blade supports. Maximum recommended point load 180kg.

Performance Table

HDFG-L			Supply Nom. Grille Width (mm)						Extract Nom. Grille Width (mm)					
m³/h/m	l/s/m		100	150	200	300	450	600	100	150	200	300	450	600
180	50	T	1.8											
		P_s	2						3					
		L_w	<20						<20					
270	75	T	2.7	1.5										
		P_s	4	1					6	2				
		L_w	<20	<20					<20	<20				
360	100	T	3.6	2.3	1.3									
		P_s	7	3	1				13	4	2			
		L_w	27	<20	<20				32	<20	<20			
450	125	T	4.4	2.7	1.8									
		P_s	12	4	2				20	6	3			
		L_w	34	<20	<20				39	<20	<20			
540	150	T	5	3.2	2.3	1.3								
		P_s	16	6	3	1			28	9	4	2		
		L_w	37	25	<20	<20			44	28	<20	<20		
630	175	T	5.5	3.6	2.7	1.7								
		P_s	22	7	4	2			37	13	6	3		
		L_w	40	27	<20	<20			48	32	<20	<20		
720	200	T	6	4.2	3	2								
		P_s	29	10	6	3			50	17	9	4		
		L_w	44	31	<20	<20			52	37	26	<20		
900	250	T		4.9	3.6	2.5	1.3							
		P_s		16	7	4	1			28	13	5	2	
		L_w		37	27	<20	<20			43	32	<20	<20	
1080	300	T		5.5	4.3	2.7	1.8	1.2						
		P_s		22	11	4	2	1		37	18	6	3	2
		L_w		41	32	<20	<20	<20		48	37	<20	<20	<20
1440	400	T		7.3	5.7	4	2.7	2						
		P_s		32	22	10	4	2			39	17	6	3
		L_w		50	41	31	<20	<20			50	36	<20	<20
2160	600	T			7	5	3.6	2.7						
		P_s			44	17	7	4				30	13	6
		L_w			48	37	27	<20				48	32	<20
2880	800	T				6.2	4.5	3.4						
		P_s				30	13	7					22	10
		L_w				44	35	25					42	30
3600	1000	T				7.2	5.5	4.3						
		P_s				47	21	11					36	18
		L_w				49	42	33					50	40

HDFG-L - Linear Corner Sections



Note:

Orders for corner sections will be made to the configuration shown with a 90° angle. Requirements for angles other than 90° should be identified with a customer drawing or site template.

Orders for installations which include corner sections should clearly identify any preference for core discharge angle relative to the layout (0° or 15°). Unless specified otherwise, corners will be manufactured for 0° deflection.

Order Example

HDFG-L/300/90°/300/100/MILL

- Type
- Length 1
- Corner Angle
- Length 2
- Section Width (W)
- Finish

Aircell Polymer Grilles

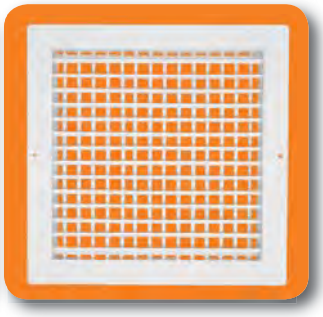
S / D / G / A / T / E

Introduction

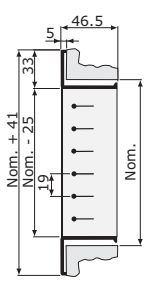
The Aircell range of supply & exhaust grilles are injection moulded in self-coloured white.
Aircell S (Single deflection) and **Aircell D** (Double deflection) have individually adjustable vanes on a 19mm pitch to allow jet spread or deflection to be set within 45° of the duct axis.
Aircell G (0° fixed blade) has horizontal 0° fixed blades on a 20mm pitch.
Aircell A (45° fixed blade) can be used as a wall or ceiling mounted grille.
Aircell T (45° fixed blade) are supplied as a pair of reduced stack Aircell A grilles for door mounting.
Aircell E (Eggcrate) has a lattice core with a 13mm pitch and is suitable for all exhaust applications.

All types are available in 5 standard sizes, plus an E600 which has been specifically designed for full ceiling tile replacement.
The E600 has an overall size of 596mm x 596mm and for the North American market 603mm x 603mm overall (E603) and for the German Market, 621mm x 621mm overall (E621).
Waterloo Aircell products can be used in any air distribution system where temperatures do not exceed 50°C.

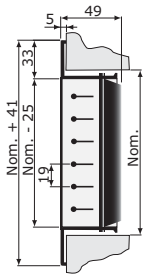
Aircell - S



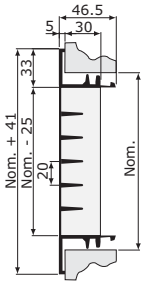
Aircell - D



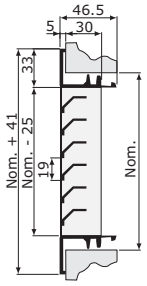
Aircell S



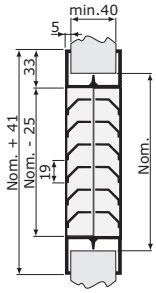
Aircell D



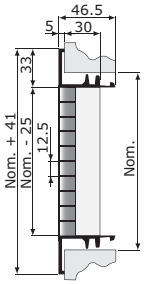
Aircell G



Aircell A



Aircell T



Aircell E

Product Description

Aircell S	Single deflection grille
Aircell D	Double deflection grille
Aircell G	0° fixed blade grille
Aircell A	45° fixed blade grille
Aircell T	45° fixed blade grilles for door transfer
Aircell E	13mm Eggcrate grille
GO	Opposed blade damper in black engineering polymer
N	Neck reducer in black engineering polymer
OBSS	Aluminium opposed blade damper for E600
NR	Steel neck reducer for E600

Features

- Consistent high quality
- Moulded in easy to clean engineering polymer
- Suitable for high-cleaning regime and chlorinated environments

Fixing

Screw through face flange

Finishes

Self-coloured white

Advantages

- Good size range
- Standard size neck reducers
- No visible mitres
- Available 'off the shelf'

Authority

Fire Rating: BS476 Pt 7 Class 0.

Weights	
S	7.0 Kg/m²
D	7.2 Kg/m²
G	7.7 Kg/m²
A	10.2 Kg/m²
T	7.7 Kg/m²
E	10.9 Kg/m²
GO	7.6 Kg/m²
N	6.4 Kg/m²

W x H
150 x 150
200 x 200
250 x 250
300 x 150
300 x 300

Order Example

Aircell G/300/300/GO/N

- Grille Type
- Nominal Width
- Nominal Height
- Option 1
- Option 2

Performance Table

Aircell G			Extract				
m³/h	l/s		150 x 150	200 x 200	250 x 250	300 x 150	300 x 300
90	25	P_s	2	1			
		L_w	<20	<20			
180	50	P_s	10	3	1	3	
		L_w	<20	<20	<20	<20	
360	100	P_s	39	13	5	10	2
		L_w	33	28	<20	<20	<20
540	150	P_s	90	30	10	23	5
		L_w	42	38	19	30	18
720	200	P_s		53	18	40	9
		L_w		45	26	36	25
900	250	P_s		85	29	63	15
		L_w		51	32	41	29
1080	300	P_s			42	90	22
		L_w			36	45	33
1440	400	P_s			72		40
		L_w			44		39

Aircell Polymer Grilles

S / D / G / A / T / E

Selection Example

Aircell D-250 x 250 with straight blades

Air Volume 250 l/s

Throw 13.0 m

Pressure Drop 15 Pa

Noise Level dBA 29

V_t = 0.4 m/s

11°c cooling differential

Aircell - G

Aircell - A

Performance Table

Aircell E			Extract					
m³/h	l/s		150 x 150	200 x 200	250 x 250	300 x 150	300 x 300	600 x 600
90	25	P_s	2					
		L_w	<20					
180	50	P_s	10	3		2		
		L_w	<20	<20		<20		
360	100	P_s	40	11	5	10	2	
		L_w	38	<20	<20	<20	<20	
540	150	P_s		26	11	22	5	
		L_w		32	<20	32	<20	
720	200	P_s		45	19	39	9	
		L_w		41	28	41	<20	
900	250	P_s		72	30	62	14	
		L_w		49	36	48	21	
1080	300	P_s			42	88	20	
		L_w			43	54	28	
1440	400	P_s			74		35	
		L_w			53		40	
1800	500	P_s					55	4
		L_w					49	<20
2700	750	P_s						8
		L_w						<20
3600	1000	P_s						14
		L_w						27
4500	1250	P_s						21
		L_w						36
5400	1500	P_s						30
		L_w						44

45° Blade Angle Correction Factors For S & D		
Throw multiplier	dBA addition	Pa multiplier
0.55	+8dB	3.1

Aircell S Aircell D			Supply				
m³/h	l/s		150 x 150	200 x 200	250 x 250	300 x 150	300 x 300
90	25	T	2.1				
		P_s	1				
		L_w	<20				
180	50	T	4.7	3.4	2.6	2.9	
		P_s	3	2	1	1	
		L_w	<20	<20	<20	<20	
360	100	T	8.5	6.4	5.1	6.0	4.3
		P_s	14	8	3	6	1
		L_w	34	<20	<20	<20	<20
540	150	T	14	9.4	7.7	9.4	6.4
		P_s	29	18	6	12	2
		L_w	46	26	<20	20	<20
720	200	T	18	12	10	12	9
		P_s	52	31	10	21	3
		L_w	54	35	22	33	<20
900	250	T		16	13	15	10
		P_s		48	15	32	5
		L_w		42	29	40	<20
1080	300	T		20	15	18	13
		P_s		66	21	45	7
		L_w		47	34	45	23
1440	400	T			20		17
		P_s			36		12
		L_w			43		30

Aircell Polymer Grilles

S / D / G / A / T / E

Performance Table

Aircell A			Extract				
m³/h	l/s		150 x 150	200 x 200	250 x 250	300 x 150	300 x 300
90	25	P_s	10	4	2	2	
		L_w	26	20	<20	<20	
180	50	P_s	40	15	6	10	3
		L_w	40	33	<20	30	<20
360	100	P_s		57	24	39	11
		L_w		47	33	43	25
540	150	P_s			50	88	25
		L_w			44	51	36
720	200	P_s					45
		L_w					44
900	250	P_s					70
		L_w					50

For performance of the **Aircell T** series, please multiply the above pressure loss by 2 and add 3db to the dBA level.

Please note that when using the N series neck reducer, air volumes must not exceed the following guidelines.

Grille W x H	Spigot ØD	Maximum Volume m³/h	l/s
150 x 150	97	99	28
200 x 200	147	223	62
250 x 250	197	396	110
300 x 150	97	99	28
300 x 300	247	619	172

Aircell - T

Aircell - E

Selection Criteria

Ceiling height 2.7m

dBA is noise level based on a room absorption of 8dB.

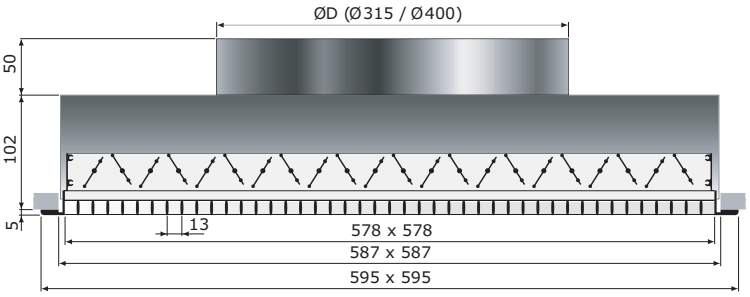
Selection Example Aircell A-200 x 200

Air Volume 50 l/s

Pressure Drop 15 Pa

Noise Level 33 dBA

Free Area						
	150 x 150	200 x 200	250 x 250	300 x 150	300 x 300	600 x 600
S	49%	53%	58%	53%	59%	-
D	49%	53%	58%	53%	59%	-
G	58%	60%	64%	62%	67%	-
A	32%	30%	37%	33%	36%	-
T	32%	30%	37%	33%	36%	-
E	44%	50%	51%	49%	53%	56%



E600 + OBSS + NR

Accessories

Aircell GO Opposed Blade Damper

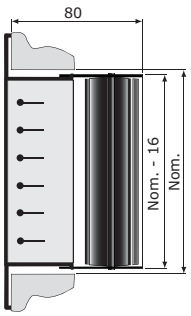
Aircell GO series opposed blade dampers are manufactured from injection moulded components in self-coloured black engineering polymer. Adjustable through the grille face, the damper can be clipped directly onto the grille without fixings.

Aircell N Neck Reducer

Aircell N series neck reducers are injection moulded in self coloured black engineering polymer. The units are available in five sizes to suit the grille range and are designed to snap fit over the opposed blade damper or directly onto the grille stack.
All reducers have standard size circular spigots related to the grille height (see dimensional details below).

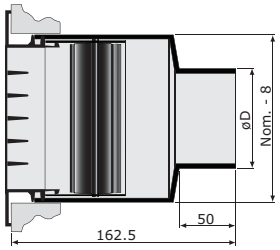
OBSS damper and NR neck reducer for E600 series

The OBSS aluminium opposed blade damper and NR steel neck reducer are available for the E600 series to allow volume control and circular duct connection directly onto the E600 grille.
Please state spigot size required when ordering.

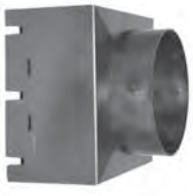


Aircell D + GO

GO Polymer Opposed Blade Dampers



Aircell G +GO+ N



N Polymer Neck Reducer

Grille Plenum Boxes

Introduction

Correct selection and sizing of distribution plenum boxes is critical because grille air resistance is very low relative to the distribution ductwork resistance. It is therefore recommended that whenever possible grilles are served by low velocity stub ducts from branch ducting systems fitted with correct balancing controls.
Where it is necessary to specify and use grille plenums a generous allowance for commissioned noise generation should be made.

Product Description

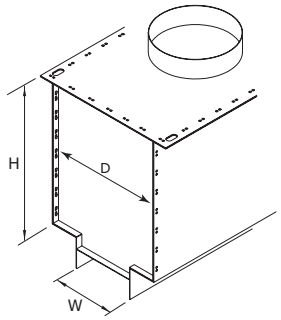
PBG	Individual grille plenum
PBG/LL	Low line grille plenum
NRG	Neck reducer
PBLG	Linear grille plenum
PBLG/LL	Low line linear grille plenum
PBSG	Security grille plenum

Spigot Options

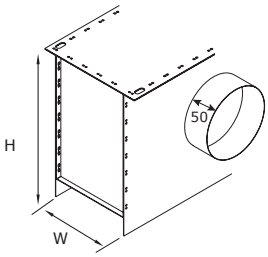
SE	Side Entry
TE	Top Entry
1CC	1- Circular Connection
1RC	1- Rectangular/Square Connection
1FO	1- Flat Oval Connection

Features

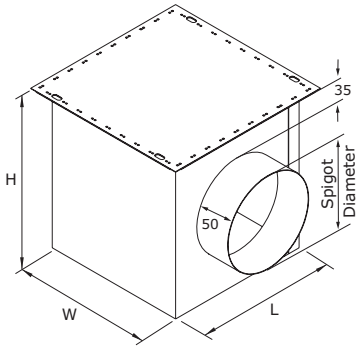
- Plated steel with stitched seam joints.
- Standard circular connection diameters: 97, 122, 157, 197, 247, 312 and 397 Ø
- Available with circular, square,rectangular or flat oval spigots in either top or side entry applications
- Standard or Low-line configurations
- Optional 6mm internal thermal/acoustic lining



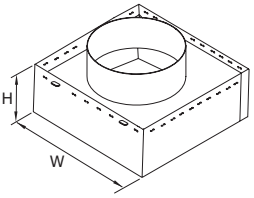
PBLG/LL - Top entry Low-line linear grille plenum box



PBLG - Side entry Linear grille plenum box



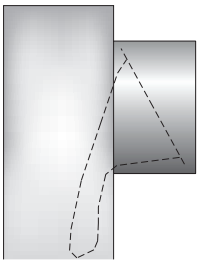
PBG - Side entry grille plenum box



NRG - Neck Reducer

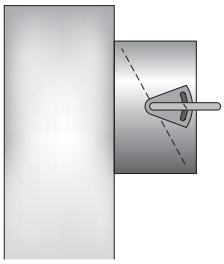
Note: The connection between the grille and plenum is adequately sealed for most installations, although secondary additional sealing may be required at the discretion of the installers, if the leakage rate required is particularly low.

Control Options



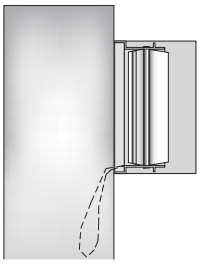
FDC

Cord operated flap damper for mounting within circular spigots to plenum boxes. The cord should be fed through the air terminal device ready for commissioning.



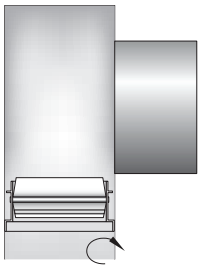
FDQ

Flap damper with external quadrant control for mounting within circular spigots to plenum boxes. The quadrant is accessible from outside the duct and the damper can be locked in any position.



OBCO

Cord operated opposed blade damper for installation within square or rectangular spigots to plenum boxes. The cord should be fed through the air terminal device ready for commissioning.



OBSS / ED

Standard opposed blade damper for diffuser or duct mounting. Adjustable by screwdriver inside the duct or through the face of the air terminal device. The ED is an individually adjustable blade device for equalising airflow across the diffuser.

Finish

PBG/NRG Galvanised sheet steel

Dimensions

Length	Extract Grille length
Width	Extract Grille width
Height	SE – Spigot diameter or height + 100mm as standard
	TE – as specified by customer (200mm minimum recommended)

Order

When ordering plenum boxes please specify length, width & height, spigot size and position (Top or Side Entry) and control options. Please note that the plenum height should in general be 100mm greater that the spigot diameter (Side Entry applications).

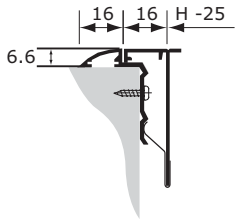
Order Example

PBG/570/570/400/1CC/SE/297dia/BLACK

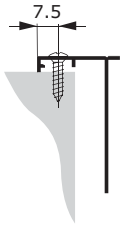
- Type
- Plenum Box Length
- Plenum Box Width
- Plenum Box Height
- Spigot Number / Shape
- Entry
- Spigot Size
- Option

Controls and Fixing Options

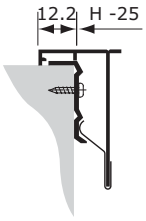
Fixing Options



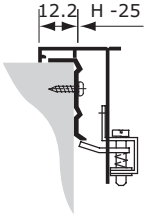
Frame: R16
Mounting: RCCF



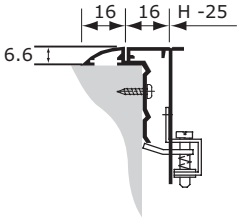
Frame: R25 / R32
Mounting: SF



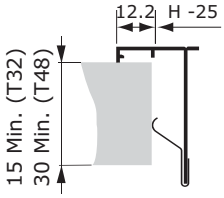
Frame: R25 / R32
Mounting: AFCF



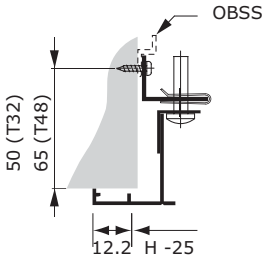
Frame: R25 / R32
Mounting: AFHS



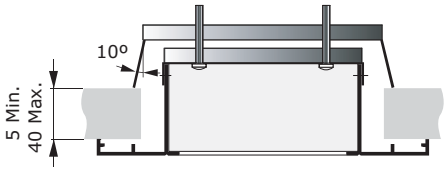
Frame: R16
Mounting: RCHS



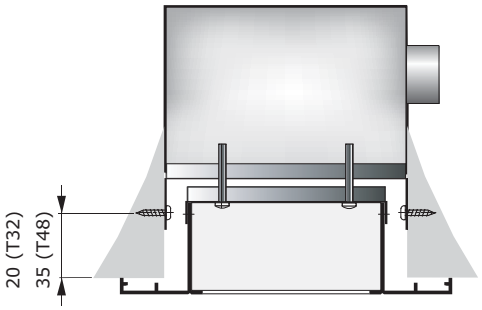
Frame: R16 / R25 / R32
Mounting: CF



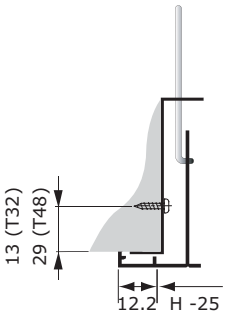
Frame: R16 / R25 / R32
Mounting: CRB



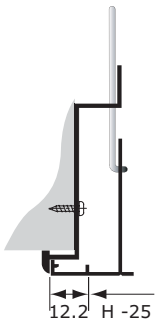
BSSBD (R16 / R25 / R32)
Duct / Plasterboard fixing



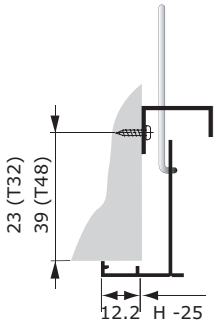
BSSBP (R16 / R25 / R32)
Plenum fixing (-15mm)



Frame: R25
Mounting: AFVS



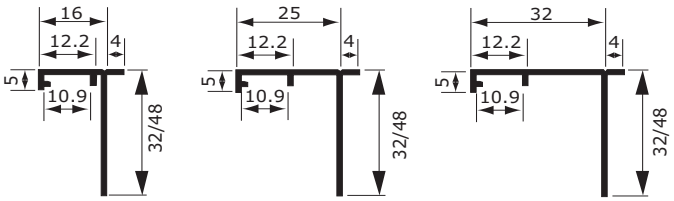
Frame: R25
Mounting: PFVS



Frame: R16 / R25 /R32
Mounting: VS

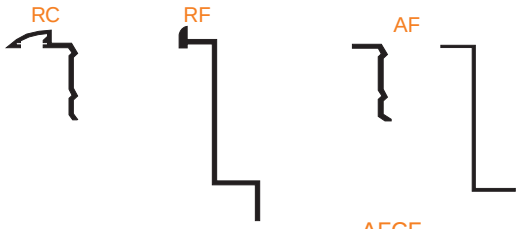
Standard Frames

Standard Frames



R16 R25 R32

Sub Frames



RCCF RCHS PFVS AFCF AFHS AFVS

Overall Grille Sizes
Grille with R16 = Nominal W/H + 7mm
Grille with R25 = Nominal W/H + 25mm
Grille with R32 = Nominal W/H + 39mm
Grille with RC = Nominal W/H + 39mm
Grille with PF = Nominal W/H + 21mm

Note:

AF and RC subframes can be made to a maximum size of 800mm in any direction in one piece. For sizes above that, we supply in parts for assembly on site by others.

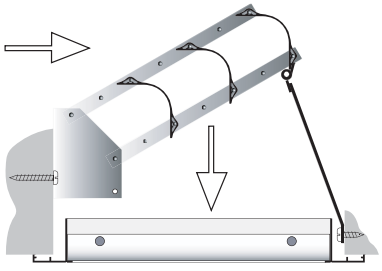
DT-2M - Duct Fitted

The hinged strip is used to calibrate the amount of air desired, by altering the angle of the blades and therefore altering the amount of disruption to the airflow.

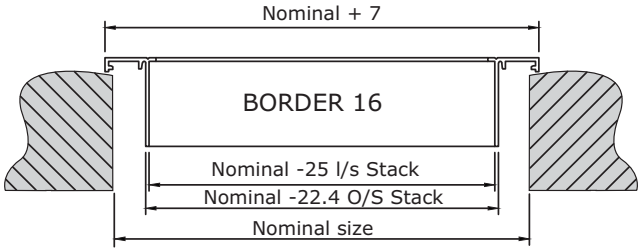
Sizes for DT-2M

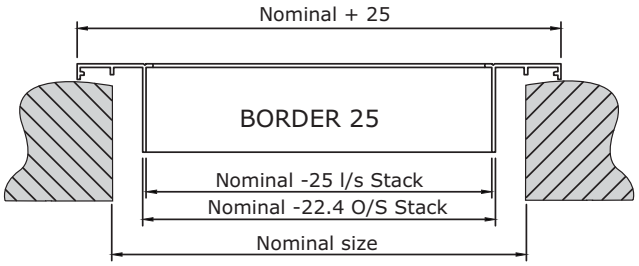
Width = 100 - 1225
Height = 75 - 425

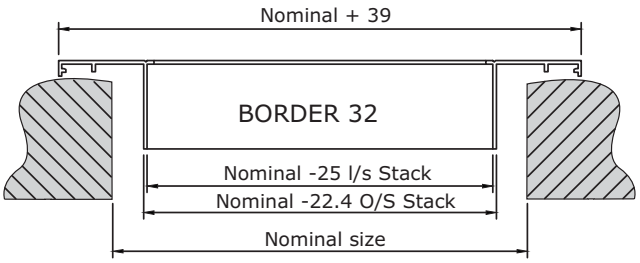
Correction for Grille + Damper		
Supply 0° spread	dBA + 2	P_S x 1.3
Supply 45° spread	dBA + 2	P_S x 1.1
Exhaust	dBA + 2	P_S x 1.2



Grille Nominal Sizes







Grille Fixing Selection

Types	SF	CF	CRB	VS	AFVS	PFVS	BSSB	AFCF	AFHS	RCCF	RCHS
1H / 2H / 1V / 2V	A/C	A	A/C	A/C	A/C	A/C	A/B/C	A	A/C	A	A/C
1KH / 2KH	A/C										
1KV / 2KV	A/C										
1HM / 2HM	A/C										
1VM / 2VM	A/C										
PER / 3HF	A/C	A		A/C	A/C	A/C		A		A	
GC5 / 3HG / 3HJ	A/C	A	A/C	A/C	A/C	A/C	A/B/C	A	A/C	A	A/C
ALF / 2ALF	A/C	A		A/C	A/C	A/C		A		A	
ALN / ALM / ALG / ALJ	A/C	A	A/C	A/C	A/C	A/C	A/B/C	A	A/C	A	A/C
ALG2 / ALJ2	A/C	A	A/C	A/C	A/C	A/C		A	A/C	A	A/C
ALM2 / ALN2	A/C	A	A/C	A/C	A/C	A/C		A	A/C	A	A/C
2ALM / 2ALJ / ALG10 / ALJ10	A/C	A		A/C	A/C	A/C		A		A	A/C
NSA / NSB / DVA / DVB	A/C										
DVC / NSC	A/C	A		A/C	A/C	A/C		A		A	
RTC / 2RTC	A/C										
BORDER STYLES	25T/32T	16T/25T/32T	16T/25T/32T	16T/25T/32T	25T/32T	25T	RTC/16T 25T/32T	25T/32T	25T/32T	16T/RTC-R16	16T/RTC-R16

A = SUITABLE FOR DUCTING AND WALL

B = SUITABLE FOR PLASTERBOARD

C = SUITABLE FOR CEILING

Removable Cores

Types	Removable	RCCF	RCHS	PFVS	AV	AFCF	AFHS	RTC	RCG - GC5	Special
1H/2H/1V/2V	Grille	B	B	B	N	N	N			
PER/GC5	Grille	B	B	B	N	N	N			
RCG - GC5	Core								B	
3HG/3HJ	Grille	B	B	B	N	N	N			
3HG/3HJ	Core							B		B
3HF/ALF	Grille	B		B	N	N				
3HF/3HJ	Core							B		B
ALN/ALM/ALG/ALJ	Grille	B	B	B	N	N	N			
ALN/ALM/ALG/ALJ	Core							B		B
APN/APM/APG/APJ	Core									
ALG10/ALJ10	Grille	B		B	N	N				
ALG10/ALJ10	Core							B		B
NSC/DVC	Grille	B		B	N	N				
RTC/2RTC	Grille	B								
RTC/2RTC	Core							B		

B = BEADED FRAME

N = NON BEADED FRAME

RTC = R5 OR R16 FRAME WITH CORE AND PACKERS

SPECIAL = PART 6200001 FRAME WITH CORE AND BRACKET INCORPORATING TERRY CLIP

Note: If OBSS or ED are selected access to the duct work will not be possible.

Control Options - Grille Mounted

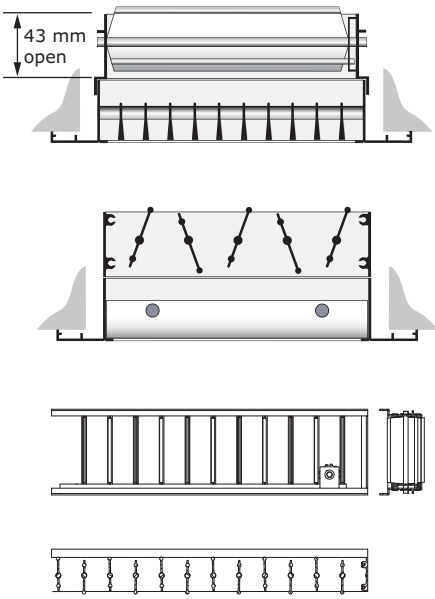
OBSS Opposed Blade Damper (Volume Control Damper)

Introduction

Waterloo OB Opposed Blade Dampers are manufactured to suit virtually the whole of our square / rectangular Air Terminal range and can be fitted to the neck of the terminals or inside plenum box.

They are adjustable from the front of the Grille or Diffuser with a screwdriver as standard, but are also available with cord- or lever-operation.

Manufactured with linked aluminium extruded blades, in sizes to suit any Waterloo Grille or Diffuser, they are useful for fine airflow regulation and can be adjusted from fully open to closed low-leakage position.



Product Description

OBSS Opposed Blade Damper, Screwdriver operated

OBCO Opposed Blade Damper, Cord operated

OBSL Opposed Blade Damper, Short Lever operated

OBLL Opposed Blade Damper, Long Lever operated

BLACK Painted black to prevent through vision

Features

- Linked aluminium extrusions for limited extra weight
- Large choice of adjustments to suit any configuration
- Can be fitted to virtually any Waterloo Grille or Diffuser

Finishes

Extruded aluminium blades

Sizes

Minimum Size - 100 x 75

Minimum Size for Plasterline - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.

Order Example

OBSS/300/300/Black/ To suit a 1H

Damper type
Terminal length
Terminal width
Options
Terminal type

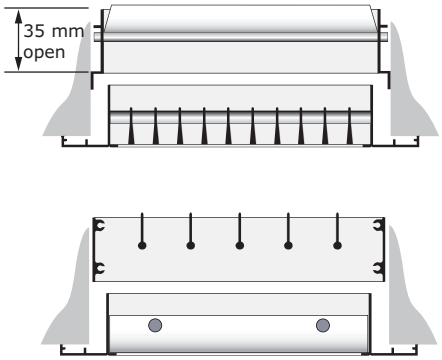
ED Equalising Dampers (Directional Blades Incapable of Shut Off)

Introduction

Waterloo ED Equalising Dampers are manufactured to suit virtually the whole of our square / rectangular Air Terminal range and can be fitted to the neck of the terminals or inside plenum box.

They are individually adjustable to control air direction and may be used for localised blanking.

Manufactured with aluminium extruded blades, in sizes to suit any Waterloo Grille or Diffuser, they can be adjusted manually by removing the Grille or Diffuser core.



Product Description

ED Equalising deflector

BLACK Painted black to prevent through vision

Features

- Aluminium extrusions for limited extra weight
- Individually adjustable for fine airflow regulation
- Can be fitted to virtually any Waterloo Grille or Diffuser

Finishes

Extruded aluminium blades

Sizes

Minimum Size - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.

Order Example

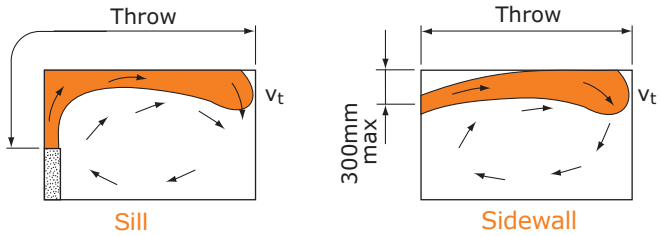
ED/300/300/Black/ To suit a 1H

Damper type
Terminal length
Terminal width
Options
Terminal type

Technical Information

Basis of Throw

Unless noted differently on the individual supply grille performance information, all Throw performance data is based on isothermal supply air conditions, to a terminal velocity (v_t), in the centre of the jet, of 0.5 m/s. See tables below for other conditions.



Remark:

If the distance between grille and ceiling is more than 300 mm, the throw will be reduced by 30%.

Jet Temperature Decay Characteristics

The following graph indicates the jet residual temperature at various throw distances.

Given throw = x (m) and supply air differential = ΔTo

Calculate √Ac = √Grille Area (m²)

Calculate x/√Ac

Enter graph at required value x/√Ac

Exit graph at value ΔTx /ΔTo

Calculate ΔTx = ΔTo x (ΔTx / ΔTo)

ΔTx = Residual temperature differential (°C)

Working Example for Temperature Decay Calculations

1H/300/150/R25/SF

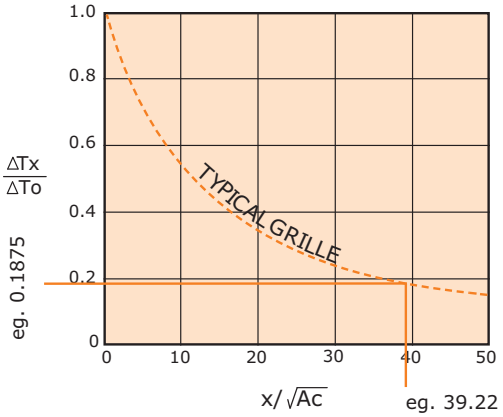
Supply Air Temp	= 18 °C
Room Temp	= 20 °C
ΔTo	= 2 °C
Air Volume	= 200 l/s

From Performance data see page 24

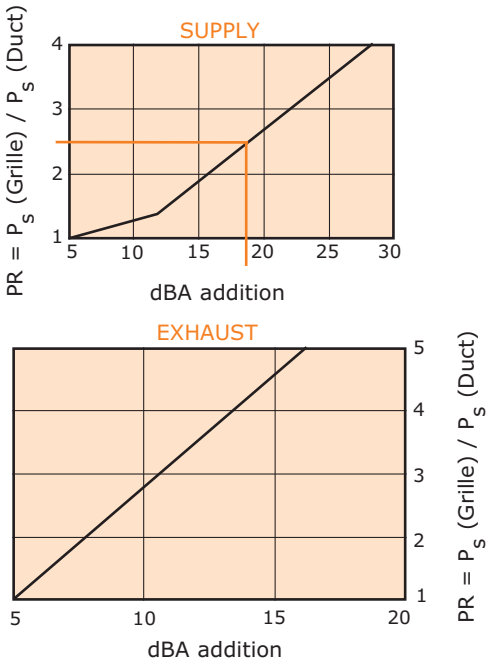
Throw = 8.32 m

x√Ac = 8.32/ √(0.3 x 0.15) = 39.22

Therefore = ΔTx = 0.375 °C and the air temperature at maximum throw (8.32 m) is = 19.6 (19.625) °C



Throttled Damper Factors



Example of Throttled Damper Factor Handling

Consider a Supply Grille with Damper

P_S (Grille) = 50 Pa

P_S (Duct) = 20 Pa

PR = 2.5

Therefore addition is = 18 dBA

Assume that we are using the same grille as in the Temperature Decay Calculation (above);

From the Performance data on page 8,

dBA = 30 + 18 = 48 dBA

Waterloo Product Range

GRILLES

A complete range of products suitable for all wall, ceiling and floor applications. Most grilles are made from aluminium and have a range of fixed or moveable blades designed to give performance whilst remaining aesthetically pleasing to the eye. Grilles are made to customer specified sizes and colours (PPM/G); standard colour PPM9010 (20% Gloss White). The range is complemented by the Aircell range of polymer Grilles.

DIFFUSERS

Designed to be installed in various ceiling systems, we have a complete range to suit both performance and aesthetical requirements. Most diffusers are made from aluminium and can be ordered with or without plenum boxes for easy duct work. Diffusers can be ordered in customer specified colours (PPM/G); standard colour is PPM 9010 (20% Gloss White). This range is complemented by the Aircell range of polymer Diffusers.

ACTIVE AND PASSIVE CHILLED BEAMS

The finest quality range of high output active beams, used for ventilated heating and cooling applications. These units have 4 pipe coils to allow heating and cooling circuits to run simultaneously, giving constant and responsive control. The design allows a large optimum capacity and also allows the customer to specify the nozzle type and pitch for individual circumstances.

Active beams are made from steel to a large range of customer specified sizes and as such are suitable for various different ceiling systems. Standard finish is PPM 9010, however other (PPM/G) colours are available on request.

AIR VOLUME CONTROL DAMPERS

Pressure independent Variable Air Volume and Constant Air Volume dampers made from zintec plate. Most volume dampers are regulated with an electronic motor and sensors and are calibrated to customer specifications before delivery.

The Constant Air Volume damper requires no power source as it is controlled via a mechanical device and calibrated before delivery. All volume dampers can be ordered with a single or double (insulation) skin.

EXTERNAL LOUVRES

A quality range of products for external wall applications. Made from aluminium, with birdscreen or insect screen options. All louvres are made to customer specified sizes and (PPM/G) colours; standard colour is PPM 9006.

DISPLACEMENT

A full range of recessed, semi-recessed, floor, wall and corner units providing high ventilation efficiency and excellent comfort. The very low pressure involved also offer quiet installations. Displacement units are available as wall or floor mounted, or indeed integrated within the architectural design.

Waterloo Air Products Ltd

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FM 27823

EMS 590755

Waterloo declare that, at the time of print, all products are in accordance with relevant directives, as identified by HEVAC and other European Organisations and will display the CE Marking where required.

July 2019

WATERLOO

A Swegon Group Company

Plasterline Linear Grilles

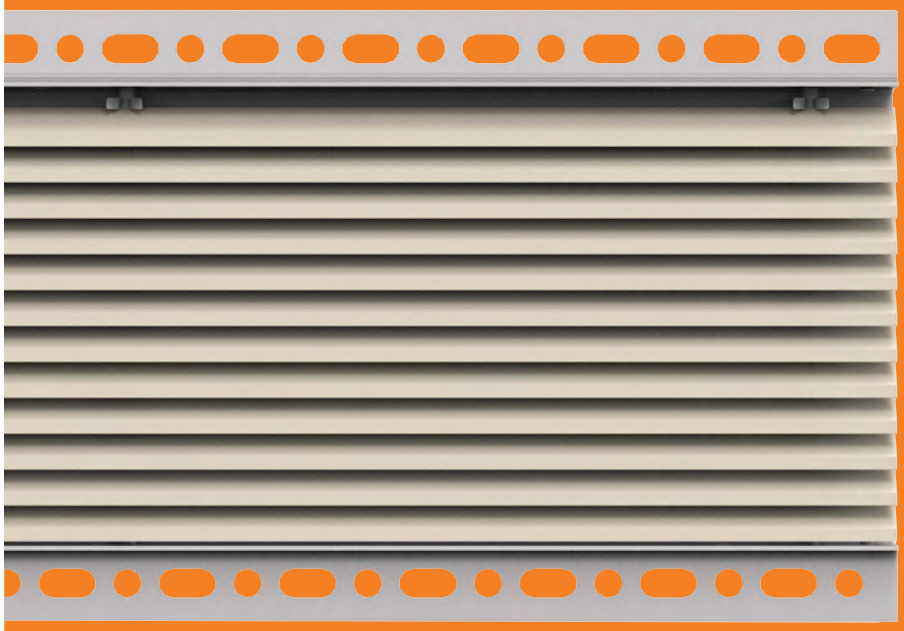
APN 0° 6mm thick blade, 12.5mm pitch

APM 15° 6mm thick blade, 12.5mm pitch

APF 45° 5mm thick blade, 12.5mm pitch

APG 0° 3mm thick blade, 12.5mm pitch

APJ 15° 3mm thick blade, 12.5mm pitch



Plasterline Linear Grilles

APN / APM / APG / APJ / APF

Introduction

Waterloo Plasterline Linear Grilles have been designed to satisfy air diffusion and engineering requirements while providing a narrow plaster-in border to meet architectural specifications. Plasterline grilles may be used in modular or continuous situations for sidewall, cill or bulkhead applications. The range is available with a wide variety of special options and fabrications to suit most project requirements. Ceiling applications can be achieved with the use of a non standard fixed core version.

Product Description

APN	0° 6mm thick blade, 12.5mm pitch
APN2	APN with rear set of adjustable blades
APM	15° 6mm thick blade, 12.5mm pitch
APM2	APM with rear set of adjustable blades
2APM	APM with 2 way core
APG	0° 3mm thick blade, 12.5mm pitch
APG2	APG with rear set of adjustable blades
APG10	APG with 10mm pitch blades
APJ	15° 3mm thick blade, 12.5mm pitch
APJ2	APJ with rear set of adjustable blades
2APJ	APJ with 2 way core
APJ10	APJ with 10mm pitch blades
APF	45° 5mm thick blade, 12.5mm pitch
2APF	APF with 2 way core
ED	Equalising deflector
OBSS	Allen Key operated opposed blade damper

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)

PPM9010 (RAL 9010 Matt - 20% Gloss White)

PPM9006 (RAL 9006 Matt - 30% Gloss Silver)

Other colours available on request

Sizes

Because of their nature, the sizing for Plasterline grilles is exceptional in that measurements are for the internal opening at the front face. Opening cut-out in the substrate should be 6 more than the stated nominal grille size.

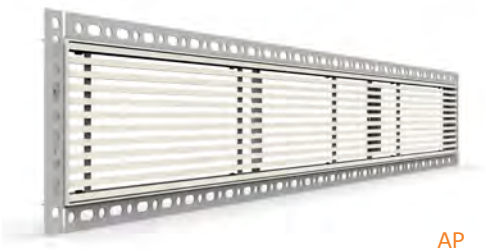
Minimum size: 150 wide x 50 high
Maximum size: 2000 wide x 500 high
Continuous grilles can be supplied in sections for butt joining on site. Refer to Head Office for widths up to 3000 in one piece.

Free Area					
Pitch	Type				
	APG	APJ	APF	APM	APN
10mm	68%	68%	-	-	-
12.5mm	74%	74%	44%	49%	49%

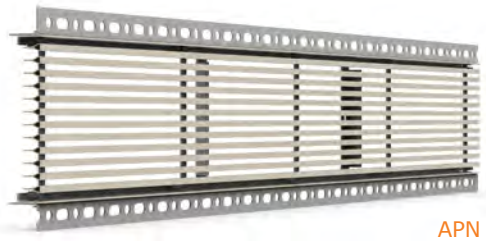
Order Example

APG/1000/150/SF/9010-Matt/OBSS

- Type
- Nominal width
- Nominal height
- Fixing
- Finish
- Damper



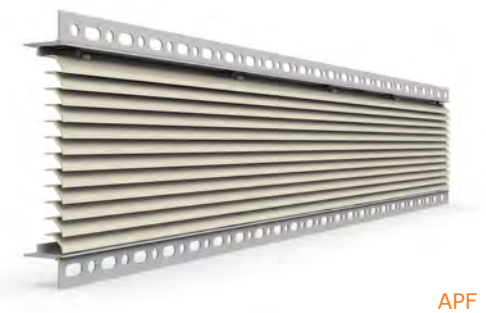
AP



APN

APG

APJ

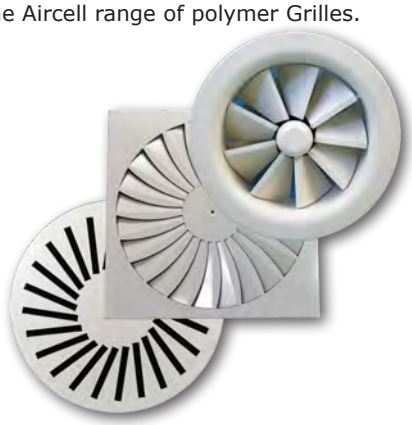


APF

Waterloo Product Range

GRILLES

A complete range of products suitable for all wall, ceiling and floor applications. Most grilles are made from aluminium and have a range of fixed or moveable blades designed to give performance whilst remaining aesthetically pleasing to the eye. Grilles are made to customer specified sizes and colours (PPM/G); standard colour PPM9010 (20% Gloss White). The range is complemented by the Aircell range of polymer Grilles.



DIFFUSERS

Designed to be installed in various ceiling systems, we have a complete range to suit both performance and aesthetical requirements. Most diffusers are made from aluminium and can be ordered with or without plenum boxes for easy duct work. Diffusers can be ordered in customer specified colours (PPM/G); standard colour is PPM 9010 (20% Gloss White). This range is complemented by the Aircell range of polymer Diffusers.

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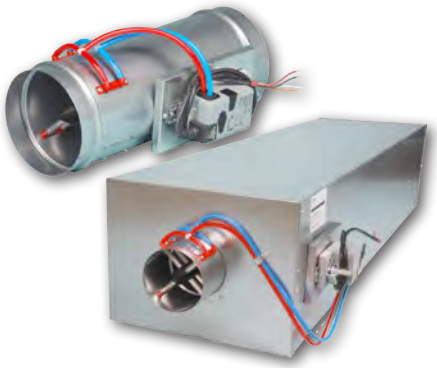

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bsi. ISO 9001:2015 Quality Management
FM 27823

bsi. ISO 14001:2015 Environmental Management
EMS 590755

All products conform to the Terms and Conditions of Waterloo Air Products plc a copy of which are available upon request. Due to our continuous research and development programme, Waterloo Air Products plc reserve the right to alter products and prices without prior notification.

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