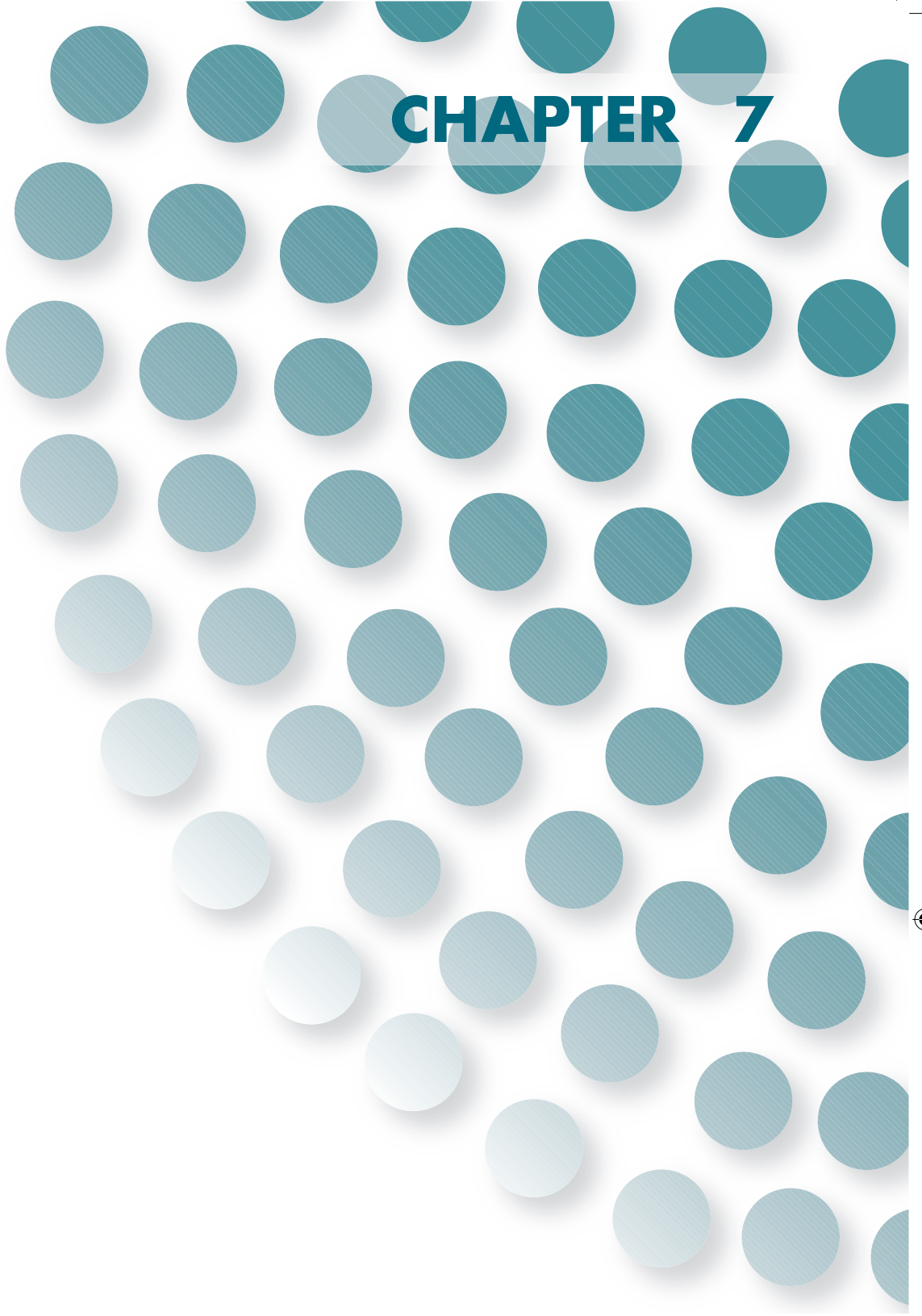


CHAPTER 7



**EXHAUST AND
FRESH AIR LOUVERS**



EXHAUST AND FRESH AIR LOUVERS

CONTENTS

Introduction, Features & Characteristics.

Models, Exhaust Air Louvers.

Models, Fresh Air Louvers.

Profiles used in Exhaust & Fresh Air Louvers, Available Fixing Mounting.

Effective Area Values for Exhaust and Fresh Air Louvers.

Tabular Selection for Exhaust and Fresh Air Louvers.

Air Flow Resistance Diagram, Selection Procedure.

Ordering Data.

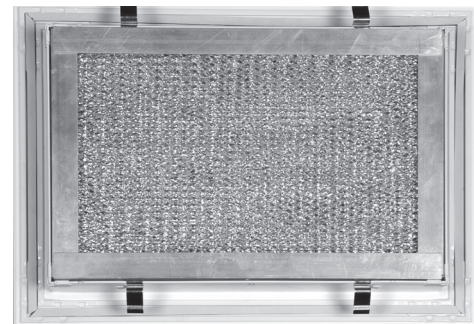


The Aluminium Exhaust and Fresh Air Louvers of **BCI** are used both internally and externally in buildings for the extraction of re – cycled air, intake of external fresh air or the expulsion of contaminated air. The quality of the material used and the particular inclination of the blades at 60° angle downward offer a weather resistant Louvers which gives good protection against the direct ingress of rain water, leaves and birds. Can also be used directly installed on walls for the ventilation of industrial areas. Also suitable for the use with an adjustable or overpressure damper for air flow and pressure control.



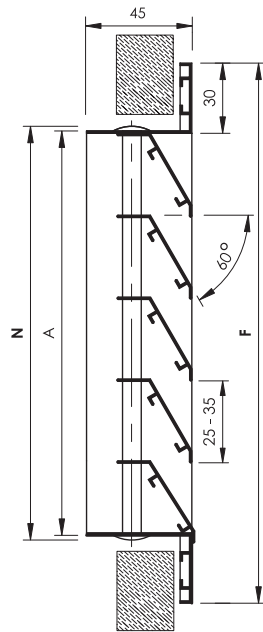
Features & Characteristics :

- Construction : Frame & blades are made of high quality Extruded Aluminium Profiles of 6063 Alloy.
- Frame Flange width : 30 mm.
- Blades : Fixed Louver type arranged horizontally and inclined downward to 60 ° angle in order to :
 - prevent the ingress of rain water.
 - Prevent the ingress of light.
 - Block vision while straight viewing.
 - Be suitable for external walls and screening applications.
- The blades are positioned on 25 mm minimum centers up to 35 mm maximum centers resulting in a high free area to provide minimum resistance to air flow.
- Available in wide variety of neck sizes with 100 x 100 mm minimum single section size and 2 mtr maximum single section height. Louvers height exceeding 2 mtr to be fabricated and supplied in multiple sections depending on length and height dimensions as well as site conditions.
- The assembly of multiple sections is unlimited, where each section operates independently.
- Multiple sections : Supplied as separate sections and assembly by others on site.
- The Fresh Air Louver is suitable for the use in air inlet of fresh air ducts and air handling units. It's also suitable for the use at dirty air exhaust discharge.
- Wire Mesh screen of galvanized steel is attached to the interior face of the louver as an option, mesh size 3 x 3 mm.
- Exhaust Air Louvers are available with different type of attachments such as :
 - Opposed Blade Damper (Model EAL + D).
 - Aluminium Filter (Model FAL c/w Filter).
 - Both the Damper and Filter (Model FAL + D c/w Filter).
- Available with Foam type Rubber Gasket for air sealing (provided as an option).
- Mounting instructions : see page No. EL-04
- Surface Finishes : see page No. EL-08.



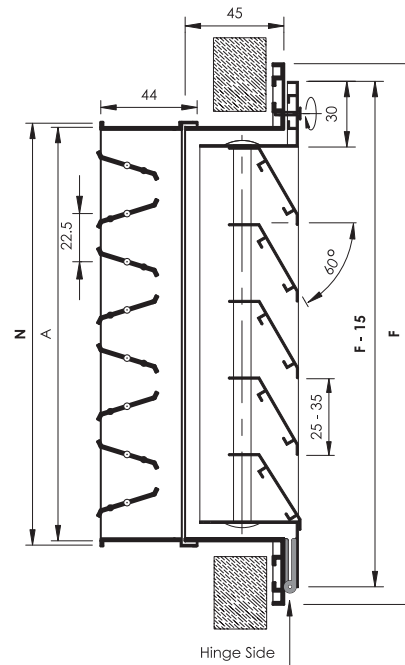
Exhaust Air Louvers Construction and Dimensional Details

Model EAL



- Wire Mesh (optional).

Model EAL + D (Double Frame)



- Wire Mesh (optional).
- For Opposed Blade Damper details and construction refer to chapter (1) or (2).
- Double Frame Louvers are provided with door hinge from one side and screw from other side allowing the second frame (inner one) to act as an access door to the Opposed Blade Damper.

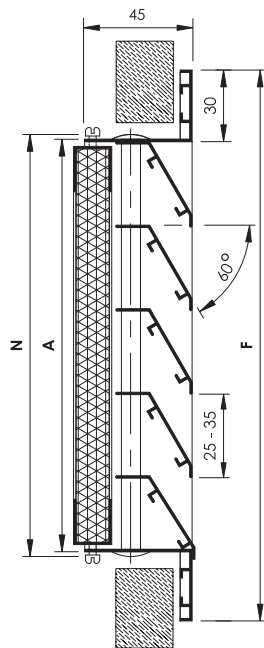


N : Nominal/Listed Size = Length (L) x Height (H)
A : Actual Size = (L-10) x (H-10)
F : Face Size = (L+50) x (H+50)

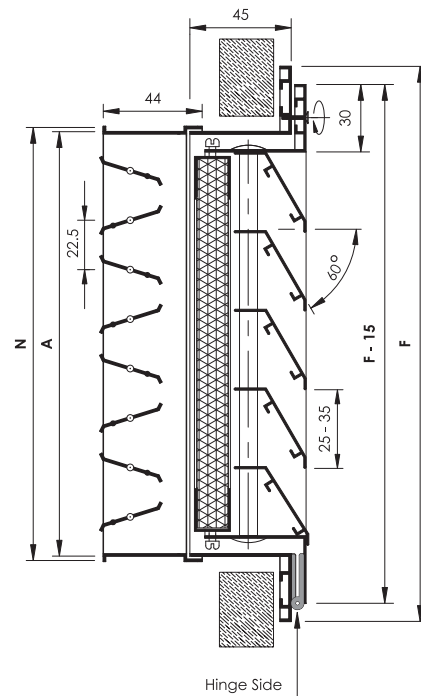
- Exhaust Air Louvers furnished approximately 10 mm less than the Nominal/Listed Size.
- All Dimensions are in mm and subject to ± 1 mm tolerance.

Fresh Air Louvers Construction and Dimensional Details

Model EAL FAL c/w Filter



Model FAL + D c/w Filter (Double Frame)



- Wire Mesh (optional).
- Filter : Aluminium Washable Filter Media of 1/2 " standard thickness (1" & 2 " thicknesses also available on request as an option).

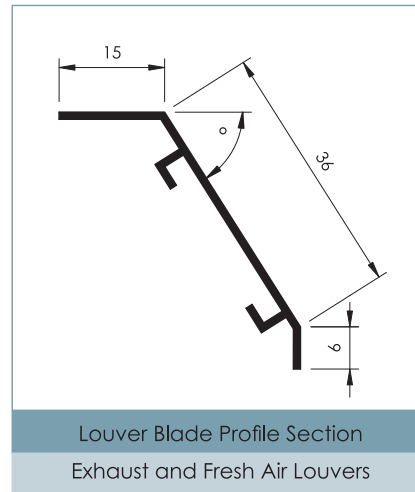
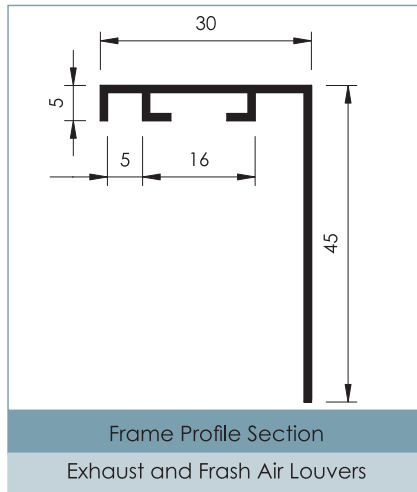
- Wire Mesh (optional).
- For Opposed Blade Damper details and construction refer to chapter (1) or (2).
- Filter : Aluminium Washable Filter Media of 1/2 " standard thickness (1" & 2 " thicknesses also available on request as an option).
- Double Frame Louvers are provided with door hinge from one side and screw from other side allowing the second frame (inner one) to act as an access door to the Filter and / or Opposed Blade Damper.



N : Nominal/Listed Size = Length (L) x Height (H)
A : Actual Size = (L-10) x (H-10)
F : Face Size = (L+50) x (H+50)

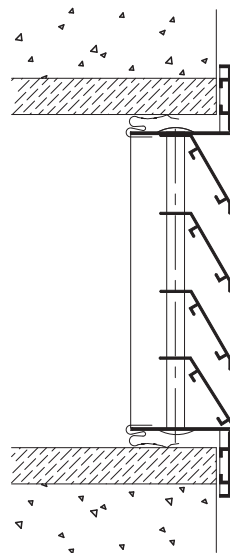
- Exhaust Air Louvers furnished approximately 10 mm less than the Nominal/Listed Size.
- All Dimensions are in mm and subject to ± 1 mm tolerance.

Cross Sectional Drawings for Profiles used in Exhaust and Fresh Air Louvers



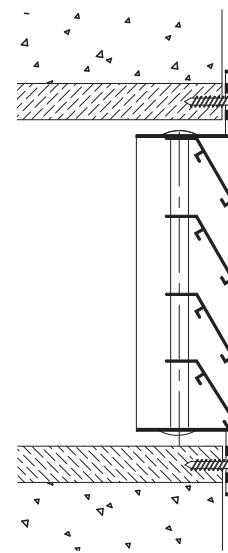
• All Dimensions are in mm and subject to ± 0.2 mm tolerance.

Available Fixing Mounting



A. Concealed Fixing (Spring Clip Mounting)

The Louver is fixed by means of spring clips to the wall or partition where no screws are visible.



B. Face Screw Fixing

The Louver is fixed to the wooden frame by means of visible screws.

• Note : For details of multiple sections consult **BCI**.

BCI reserves the right to make changes without prior notice.

Engineering and Performance Data

EFFECTIVE AREA VALUES FOR EXHAUST AND FRESH AIR LOUVERS IN (m²)

TABLE EL-01

L ↓	H ▶	100	150	200	250	300	350	400	450	500	550	600
100		0.004										
150		0.006	0.009									
200		0.008	0.012	0.016								
250		0.010	0.015	0.021	0.026							
300		0.012	0.018	0.025	0.031	0.037						
350		0.016	0.024	0.032	0.039	0.047	0.055					
400		0.018	0.027	0.036	0.045	0.054	0.063	0.072				
450		0.020	0.030	0.041	0.051	0.061	0.071	0.081	0.091			
500		0.025	0.038	0.050	0.063	0.075	0.088	0.100	0.113	0.125		
550		0.028	0.041	0.055	0.069	0.083	0.096	0.110	0.124	0.138	0.151	
600		0.033	0.050	0.066	0.083	0.099	0.116	0.132	0.149	0.165	0.182	0.198
650		0.036	0.054	0.072	0.089	0.107	0.125	0.143	0.161	0.179	0.197	0.215
700		0.041	0.061	0.081	0.102	0.122	0.142	0.162	0.183	0.203	0.223	0.244
750		0.044	0.065	0.087	0.109	0.131	0.152	0.174	0.196	0.218	0.239	0.261
800		0.048	0.072	0.096	0.120	0.144	0.168	0.192	0.216	0.240	0.264	0.288
850		0.051	0.077	0.102	0.128	0.153	0.179	0.204	0.230	0.255	0.281	0.306
900		0.057	0.085	0.113	0.142	0.170	0.198	0.227	0.255	0.284	0.312	0.340
950		0.060	0.090	0.120	0.150	0.180	0.209	0.239	0.269	0.299	0.329	0.359
1000		0.065	0.098	0.130	0.163	0.195	0.2289	0.260	0.293	0.325	0.358	0.390
1050		0.068	0.102	0.137	0.171	0.205	0.239	0.273	0.307	0.341	0.375	0.410
1100		0.068	0.107	0.143	0.179	0.215	0.250	0.286	0.322	0.358	0.393	0.429
1150		0.075	0.112	0.150	0.187	0.224	0.262	0.299	0.336	0.374	0.411	0.449
1200		0.078	0.117	0.156	0.195	0.234	0.273	0.312	0.35	0.390	0.429	0.468

TABLE EL-02

L ↓	H ▶	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
650		0.232											
700		0.264	0.284										
750		0.283	0.305	0.326									
800		0.312	0.336	0.360	0.384								
850		0.332	0.357	0.383	0.408	0.434							
900		0.369	0.397	0.425	0.454	0.482	0.510						
950		0.389	0.419	0.449	0.479	0.509	0.539	0.569					
1000		0.423	0.455	0.488	0.520	0.553	0.585	0.618	0.650				
1050		0.444	0.478	0.512	0.546	0.580	0.614	0.648	0.683	0.717			
1100		0.465	0.501	0.536	0.572	0.608	0.644	0.679	0.715	0.751	0.787		
1150		0.486	0.523	0.561	0.635	0.635	0.673	0.710	0.748	0.785	0.822	0.860	
1200		0.507	0.546	0.585	0.624	0.663	0.702	0.741	0.780	0.819	0.858	0.897	0.936

- L & H Dimensions are in mm.
- Damper at full open position (if any).

Engineering and Performance Data

Tabular Selection for Exhaust and Fresh Air Louvers

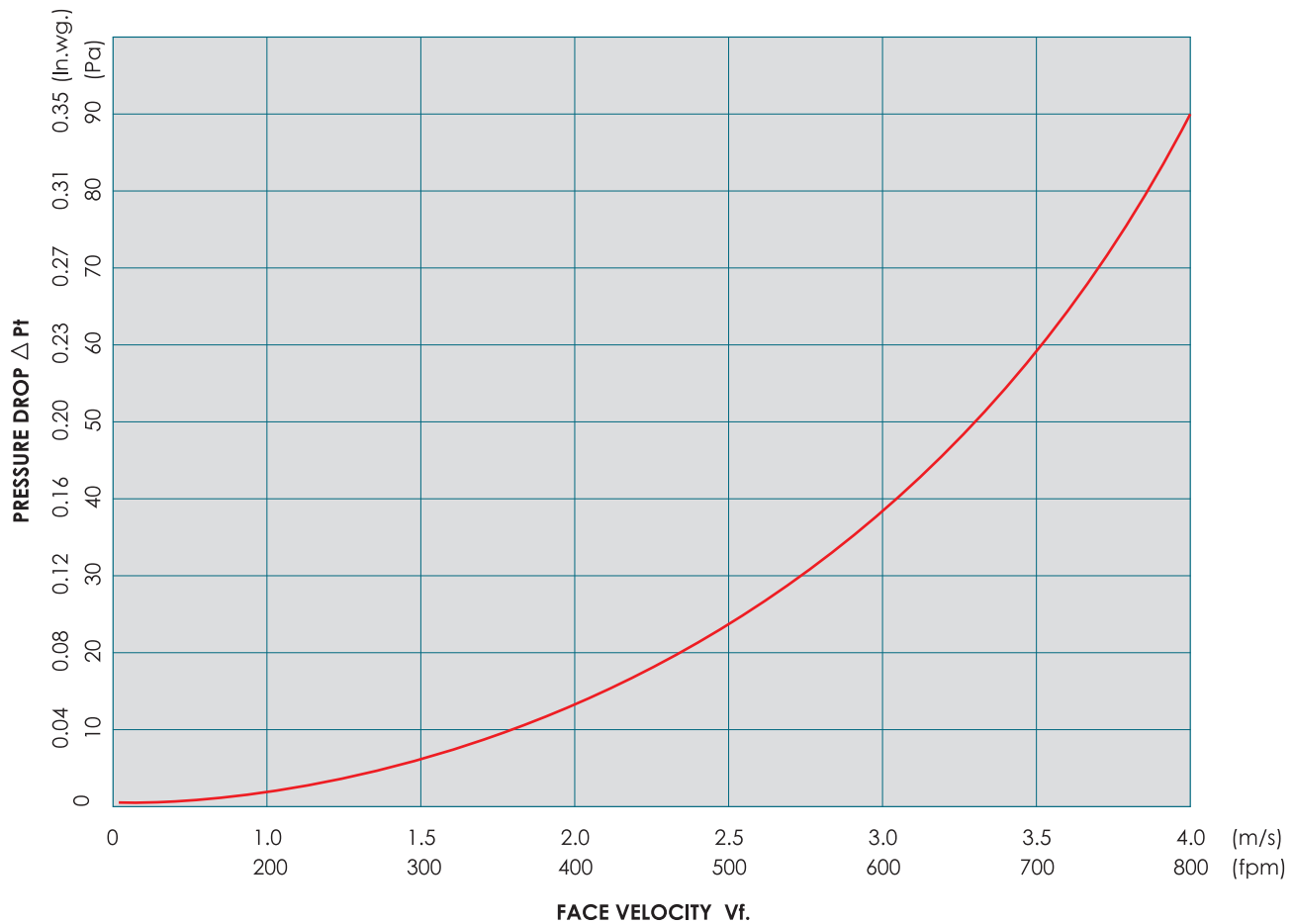
TABLE EL-03

Vf. m/s (FPM)	1.0 (200)	1.5 (300)	2.0 (400)	2.5 (500)	3.0 (600)	3.5 (700)	4.0 (800)
Δ Pt Pa (Inwg)	3.0 (0.01)	8.0 (0.03)	14 (0.05)	24 (0.09)	39 (0.15)	59 (0.23)	90 (0.35)
Flow Rate (L/s) cfm	A eff. (m ²)						
(12) 25	0.012	0.008	0.006	0.005	0.004	0.003	0.002
(24) 50	0.023	0.015	0.012	0.009	0.008	0.007	0.006
(47) 100	0.046	0.031	0.023	0.019	0.015	0.013	0.012
(71) 150	0.070	0.046	0.035	0.028	0.023	0.020	0.017
(94) 200	0.093	0.062	0.046	0.037	0.031	0.027	0.023
(118) 250	0.116	0.077	0.058	0.046	0.039	0.033	0.029
(142) 300	0.139	0.093	0.070	0.056	0.046	0.040	0.035
(165) 350	0.163	0.108	0.081	0.065	0.054	0.046	0.041
(189) 400	0.186	0.124	0.093	0.074	0.062	0.053	0.046
(212) 450	0.209	0.139	0.105	0.084	0.070	0.060	0.052
(236) 500	0.232	0.155	0.116	0.093	0.077	0.066	0.058
(260) 550	0.255	0.170	0.128	0.102	0.085	0.073	0.064
(283) 600	0.279	0.186	0.139	0.111	0.093	0.080	0.070
(307) 650	0.302	0.201	0.151	0.121	0.101	0.086	0.075
(330) 700	0.325	0.217	0.163	0.130	0.108	0.093	0.081
(354) 750	0.348	0.232	0.174	0.139	0.116	0.100	0.087
(378) 800	0.372	0.248	0.186	0.149	0.124	0.106	0.093
(401) 850	0.395	0.263	0.197	0.158	0.132	0.113	0.099
(425) 900	0.418	0.279	0.209	0.167	0.139	0.119	0.105
(448) 950	0.441	0.294	0.221	0.177	0.147	0.126	0.110
(472) 1000	0.465	0.310	0.232	0.186	0.155	0.133	0.116
(496) 1050	0.488	0.325	0.244	0.195	0.163	0.139	0.122
(519) 1100	0.511	0.341	0.255	0.204	0.170	0.146	0.128
(543) 1150	0.534	0.356	0.267	0.214	0.178	0.153	0.134
(566) 1200	0.557	0.372	0.279	0.223	0.186	0.159	0.139
(590) 1250	0.581	0.387	0.290	0.232	0.194	0.166	0.145
(613) 1300	0.604	0.403	0.302	0.242	0.201	0.173	0.151
(637) 1350	0.627	0.418	0.314	0.251	0.209	0.179	0.157
(661) 1400	0.650	0.434	0.325	0.260	0.217	0.186	0.163
(684) 1450	0.674	0.449	0.337	0.269	0.225	0.192	0.168
(708) 1500	0.697	0.465	0.348	0.279	0.232	0.199	0.174
(731) 1550	0.720	0.480	0.360	0.288	0.240	0.206	0.180
(755) 1600	0.743	0.495	0.372	0.297	0.248	0.212	0.186
(779) 1650	0.766	0.511	0.383	0.307	0.255	0.219	0.192
(802) 1700	0.790	0.526	0.395	0.316	0.263	0.226	0.197
(826) 1750	0.813	0.542	0.406	0.325	0.271	0.232	0.203
(849) 1800	0.836	0.557	0.418	0.334	0.279	0.239	0.209
(873) 1850	0.859	0.573	0.430	0.344	0.286	0.246	0.215
(897) 1900	0.883	0.588	0.441	0.353	0.294	0.252	0.221
(920) 1950	0.906	0.604	0.453	0.362	0.302	0.259	0.226
(944) 2000	0.929	0.619	0.465	0.372	0.310	0.265	0.232

• Damper at full open position (if any).

Engineering and Performance Data

Air Flow Resistance Diagram (All Models) Pressure Drop (ΔPt) versus Face Velocity (V_f)



Selection Procedure

Case I :

Illustrative Example :

Given Data : Required Model : EAL

Air Flow Rate : 650 CFM (307 L/S)

Assume V_f not exceeding 1.5 m/s (300 FPM).

Refer to page No. EL-06 Table EL-03, @ 650 CFM and

$V_f = 1.5$ m/s to read the related data as below :

Pressure Drop = 8.0 Pa (0.03 Inwg)

$A_{eff.} = 0.201 \text{ m}^2$

By applying the $A_{eff.}$ value to table No. EL-01, simply you can select the size of 700 x 500 mm which is having the nearest area value to the required one.

Case II :

Illustrative Example :

Given Data : Required Model : FAL c/w Filter

Air Flow Rate : 3500 CFM (1652 L/S)

Assume V_f not exceeding 1.5 m/s (300 FPM).

Since the CFM given is out of the range of Table No.

EL-03 divide the (3500) by (2) to give 1750 CFM and

read the related data at this value as below :

Pressure Drop = 8.0 Pa (0.03 Inwg)

$A_{eff.} = 0.542 \text{ m}^2$

By applying the $A_{eff.}$ value to table No. EL-02, simply you can select the size of 950 x 900 mm which is having the nearest area value to the required one.

Now, to obtain the required 3500 CFM, double the area while maintaining the same height as below :

$(L \times 2) \times (H) = (950 \times 2) \times (900) \text{ mm}$

Final size = 1900 x 900 mm.

Ordering Data

- **Available Surface Finishes For Exhaust And Fresh Air Louvers :**

- Natural / Matt Silver Anodized .
- Powder Coating (Standard Colors are white RAL 9010 / 9016, other optional colors if required to be provided in RAL - No. only and charged extra).
- Aluminium in Mill Finish.
- Other Special Finishes (on request if available).

- **Available Surface Finishes For Opposed Blade Damper :**

- Aluminium in Mill Finish (standard).
- Matt Black Powder Coating (optional).

- **Ordering Specifications :**

Specify :

- 1 . Louver Description / Model (Exhaust or Fresh, with or w/o Opposed Blade Damper).
- 2 . Wire Mesh (only mention if required).
- 3 . Nominal / Neck size.
- 4 . Quantity.
- 5 . Exhaust / Fresh Air Louvers Surface Finish.
- 6 . RAL - No.(only mention if powder coating surface finish is required).
- 7 . Type of Fixing (Concealed or Face Screw Fixing).
- 8 . Thickness of Aluminium Filter for Fresh Air Louvers (only mention if optional 1 or 2 " thickness is required).
- 9 . Rubber Gasket (only mention if required).
- 10 . Remarks if any.

Example 1 :

1	2	3	4	5	6	7	8	9	10
EAL	+WM	8" x 8" 200 x 200 (mm)	25	Mill	-	Concealed	-	-	-

Example 2 :

1	2	3	4	5	6	7	8	9	10
FAL c/w Filter	-	16" x 10" 400 x 250 (mm)	7	Powder Coating	1013 (Optional)	Screw	-	With Rubber Gasket	-

Example 3 :

1	2	3	4	5	6	7	8	9	10
FAL c/w Filter + D	-	30" x 20" 750 x 500 (mm)	15	Silver Anodized	-	Concealed	2" (Optional)	-	(Double Frame)