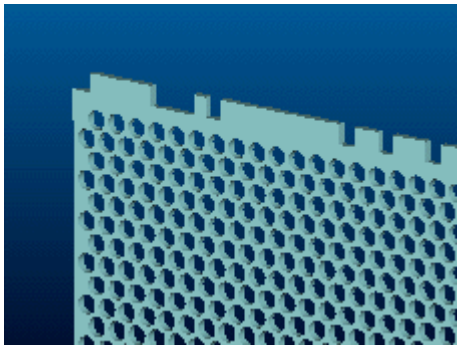
RESISTANCE OF PERFORATED PLATES

$$\zeta = \frac{\Delta p}{\rho w_1^2/2} = [\,0.707\,(1 - f)^{0.5} + 1 - f]^2\, f^{-2}$$

Resistance coefficients for thin-walled perforated sheet or grid of strips with sharp edged orifices (according to Fried & Idelchik).



Conditions:

Range of sheet length to hole diameter ratio, $0 < l/D_h < 0.015$
Reynolds number, $Re > 10^5$

Where:

$$d_h = \frac{4 f_{or}}{\Pi_o}$$

f_{or} is the area of one orifice.

The resistance coefficient is given by:

Open Area	Resistance Coefficient	Open Area	Resistance Coefficient
0.01	28677.936	0.51	3.729
0.02	7055.112	0.52	3.478
0.03	3085.115	0.53	3.245
0.04	1707.168	0.54	3.027
0.05	1074.657	0.55	2.824
0.06	733.924	0.56	2.635
0.07	530.188	0.57	2.458
0.08	399.066	0.58	2.293
0.09	309.930	0.59	2.138
0.10	246.716	0.60	1.993
0.11	200.347	0.61	1.858
0.12	165.385	0.62	1.731

0.13	138.414	0.63	1.613
0.14	117.203	0.64	1.501
0.15	100.243	0.65	1.397
0.16	86.487	0.66	1.299
0.17	75.190	0.67	1.207
0.18	65.810	0.68	1.121
0.19	57.944	0.69	1.040
0.20	51.291	0.70	0.964
0.21	45.620	0.71	0.892
0.22	40.751	0.72	0.825
0.23	36.544	0.73	0.762
0.24	32.888	0.74	0.703
0.25	29.693	0.75	0.647
0.26	26.888	0.76	0.595
0.27	24.413	0.77	0.546
0.28	22.221	0.78	0.500
0.29	20.273	0.79	0.457
0.30	18.534	0.80	0.416
0.31	16.976	0.81	0.378
0.32	15.578	0.82	0.343
0.33	14.318	0.83	0.309
0.34	13.181	0.84	0.278
0.35	12.150	0.85	0.249
0.36	11.215	0.86	0.221
0.37	10.364	0.87	0.196
0.38	9.589	0.88	0.172
0.39	8.880	0.89	0.150
0.40	8.232	0.90	0.129
0.41	7.637	0.91	0.110
0.42	7.091	0.92	0.093
0.43	6.589	0.93	0.076
0.44	6.126	0.94	0.062
0.45	5.700	0.95	0.048
0.46	5.305	0.96	0.036
0.47	4.941	0.97	0.025
0.48	4.603	0.98	0.015
0.49	4.290	0.99	0.007
0.50	3.999	1.00	0.000

An enclosure vent is an example where these coefficients are applicable.

REFERENCE: Fried & Idelchik, Flow Resistance: A Design Guide for Engineers; Hemisphere Publishing Corporation, 1989; Diagram 8.1