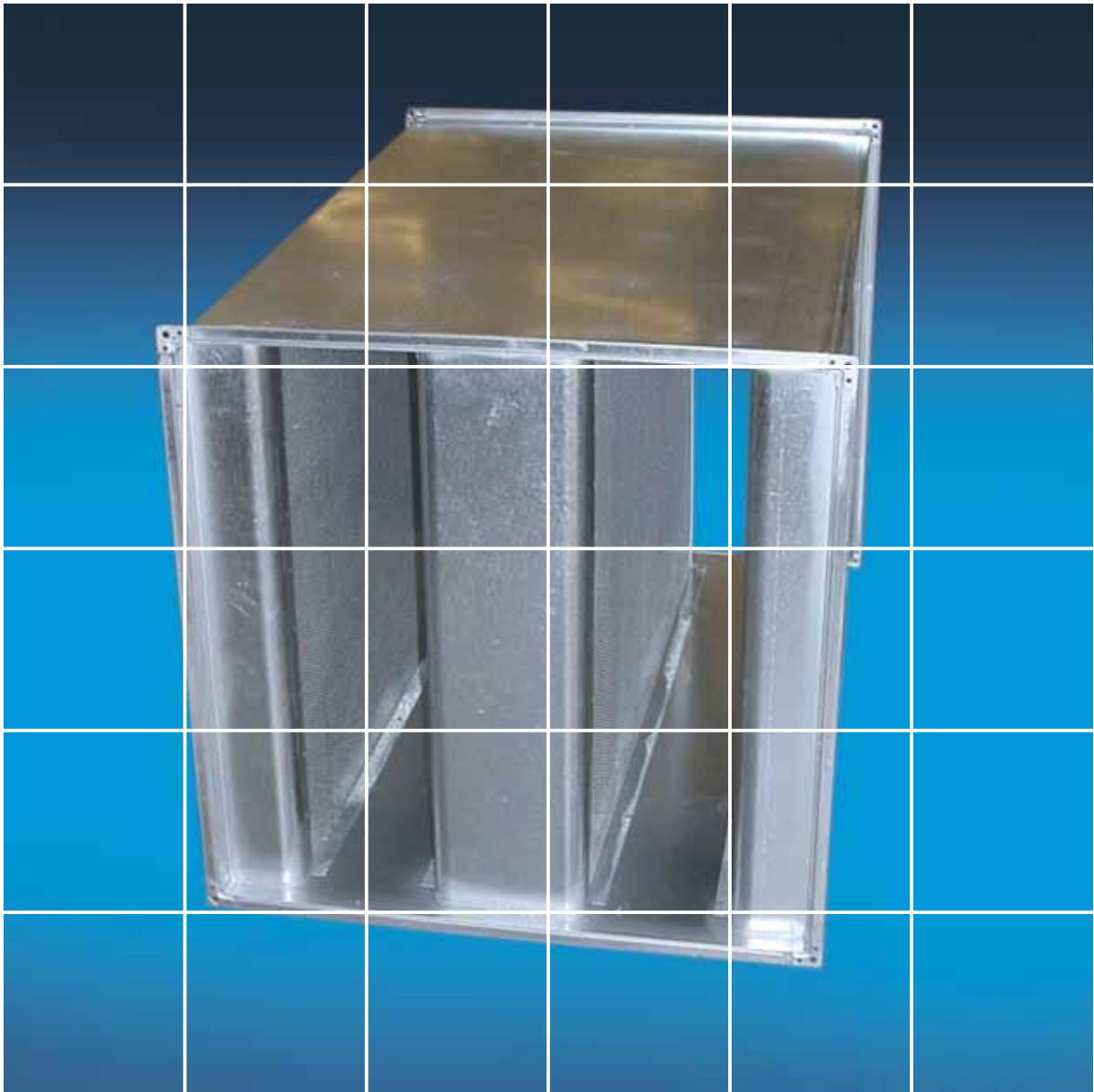




**HA<sub>2</sub>**  
**HOTCHKISS**  
AIR ACOUSTICS



R A F   R e c t a n g u l a r   A t t e n u a t o r s  
7   S e r i e s

## Description

Hotchkiss Air Acoustics offer a new range of rectangular duct attenuators for HVCA applications. These attenuators incorporate an innovative new acoustic splitter construction, which offers significantly improved mechanical integrity of the acoustic media containment envelope.

## Construction

RAF rectangular duct attenuator casings are manufactured generally in accordance with DW144 using high quality galvanised sheet steel material with a variety of options for fixing frames, flanges or spigot connections, with stiffening frames for high pressure applications.

## Acoustic Splitters

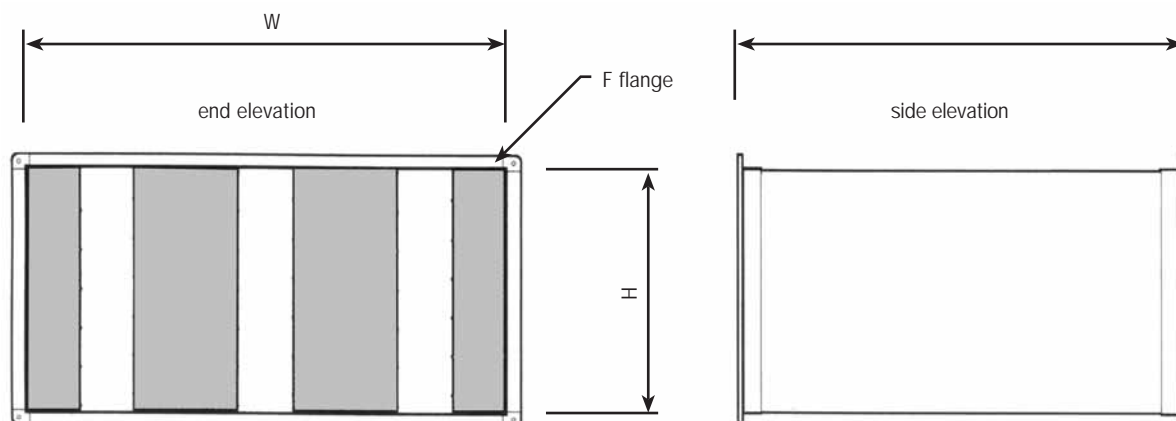
Hotchkiss RAF attenuators are manufactured using the innovative design acoustic splitter construction. The mechanical strength which results from the perforated metal design, is significantly superior to accepted "traditional" acoustic splitter construction. The aerodynamic profile of the splitter design ensures that pressure losses for air passing through the attenuator, are minimised.

The acoustic splitter infill comprises crown slab density acoustic media, with a surface particulate membrane. This material has a Class 1 rating for surface spread of flame when measured to BS 476 (part 7 1971) and is suitable for surface velocities up to 30 m/s.

Sidewall acoustic splitters of similar design, materials and construction are included to minimise the potential for "noise breakout" along the unit casing.

## Casing Flanges/Fixings

The RAF range of attenuators are offered with a variety of proprietary or rolled steel angle flange/fixings options. Straight and stepped spigot duct connections are also available as options for smaller duct sizes.



## Special Finishes

Where required RAF range attenuators can be supplied in the following finish options:-

- Stainless steel to required grade
- Heavy-duty case construction
- External polyester powder coat paint finish, to BS/RAL standard colour range



## Attenuator Performance

The RAF range attenuator performance tables shown overleaf are static insertion loss values, when tested in accordance with the parameters as defined within BS 4718.

Hotchkiss Air Acoustics acknowledge that the dynamic insertion loss value for any attenuator will vary with airflow, i.e. the higher the flow rate for air passing through the attenuator airways, the lower the dynamic insertion loss for that attenuator. However, for the airflow rate values indicated by this data sheet, dynamic and static insertion loss values achieved for a given attenuator, indicated a variation not exceeding 2dB over the intended application range, hence, the tabulated data indicated for this publication only relates to static insertion loss values.

Tests have shown that dynamic insertion losses only vary dramatically at volocities of 20m/s and above.

## RAF 720 Rectangular Attenuators

The RAF 720 range of attenuators offer high attenuation characteristics, but have lower free area than the RAF 730 & RAF 740 ranges

### Table A - RAF 720

#### Attenuator Performance (Static Insertion Loss)

Attenuator	Octave band mid frequencies							
	63	125	250	500	1k	2k	4k	8k
Code-L	63	125	250	500	1k	2k	4k	8k
RA 720-06	8	11	20	29	35	33	25	17
RA 720-09	10	14	25	34	40	41	31	20
RA 720-12	11	19	30	39	47	47	38	24
RA 720-15	13	24	33	44	50	50	45	29
RA 720-18	14	27	37	49	50	50	49	32
RA 720-21	16	30	41	50	50	50	50	36
RA 720-24	18	33	44	50	50	50	50	38



## Table B - RAF 720

### Attenuator Pressure Loss

The airflow/pressure loss data shown below is based upon BS4718:1971 and assumes uniform airflow across the attenuator face entering and leaving the attenuator. Attenuators installed with poor aerodynamic entry and exit conditions (close to fan outlets, system bends or transformations) may impose pressure loss values considerably higher than those indicated below.

Attenuator case dimensions		Air Volume i/s against imposed resistance pa					
w	h	10pa	20pa	30pa	40pa	50pa	60pa
400	450	194	274	335	387	433	474
400	600	258	365	447	516	577	632
400	750	323	456	559	645	722	791
400	900	387	548	671	775	866	949
700	450	411	581	712	822	919	1006
700	600	548	775	949	1095	1225	1342
700	750	685	968	1186	1369	1531	1677
700	900	822	1162	1423	1643	1837	2012
700	1050	959	1356	1660	1917	2143	2348
700	1200	1095	1549	1897	2191	2449	2683
1050	600	822	1162	1423	1643	1837	2120
1050	750	1027	1452	1779	2054	2296	2516
1050	900	1232	1743	2135	2465	2756	3019
1050	1050	1438	2033	2490	2876	3215	3522
1050	1200	1643	2324	2846	3286	3674	4025
1050	1350	1849	2614	3202	3697	4134	4528
1050	1500	2054	2905	3558	4108	4593	5031
1450	750	1369	1936	2372	2739	3062	3354
1450	900	1624	2324	2846	3286	3674	4025
1450	1050	1917	2711	3320	3834	4287	4696
1450	1200	2191	3098	3795	4382	4899	5367
1450	1350	2465	3486	4269	4930	5511	6037
1450	1500	2739	3873	4743	5477	6124	6708
1450	1650	3012	4260	5218	6025	6736	7379
1450	1800	3286	4648	5692	6573	7348	8050
1850	900	2054	2905	3558	4108	4593	5031
1850	1050	2396	3389	4150	4793	5358	5870
1850	1200	2739	3873	4743	5477	6124	6708
1850	1350	3081	4357	5336	6162	6889	7547
1850	1500	3423	4841	5929	6847	7655	8385
1850	1650	3766	5325	6522	7531	8420	9224
1850	1800	4108	5809	7115	8216	9186	10062
2250	900	2465	3486	4269	4930	5511	6037
2250	1050	2876	4067	4981	5751	6430	7044
2250	1200	3286	4648	5692	6573	7348	8050
2250	1350	3697	5229	6404	7394	8267	9056
2250	1500	4108	5809	7115	8216	9186	10062
2250	1650	4496	6319	7890	9027	10037	11069
2250	1800	4930	6971	8538	9859	11023	12075

## Table C - RAF 720

### Attenuator Weight Table

Attenuator case dimensions			RA720 Attenuator weights kg Attenuator Length Codes & Length Lmm							
w	h	f	-06 600	-09 900	-12 1200	-15 1500	-18 1825	-21 2100	-24 2400	
400	450	20	20	28	36	44	52	60	68	
400	600	20	25	35	45	55	65	75	85	
400	750	20	29	41	53	65	77	89	101	
400	900	30	34	47	61	75	89	102	116	
700	450	20	33	47	61	75	89	103	117	
700	600	20	41	58	76	93	111	129	149	
700	750	20	48	70	91	112	133	154	175	
700	900	30	56	81	105	130	154	179	203	
700	1050	30	64	92	120	148	176	204	232	
700	1200	30	72	101	134	165	195	227	261	
1050	600	30	58	83	109	134	160	185	210	
1050	750	30	69	99	130	160	191	221	252	
1050	900	30	70	115	151	171	223	257	293	
1050	1050	30	90	131	172	212	253	294	334	
1050	1200	30	101	147	193	238	284	330	375	
1050	1350	40	118	172	225	279	333	387	440	
1050	1500	40	134	194	255	315	375	441	498	
1450	750	40	80	116	152	187	223	259	294	
1450	900	40	95	138	181	223	266	309	352	
1450	1050	40	110	150	210	261	311	358	411	
1450	1200	40	125	182	239	296	353	410	476	
1450	1350	40	140	204	268	332	397	461	525	
1450	1500	40	155	226	297	369	440	511	583	
1450	1650	40	169	248	326	405	483	562	640	
1450	1800	40	184	270	356	441	527	612	698	
1850	900	40	117	169	222	275	328	381	434	
1850	1050	40	135	196	258	320	381	443	505	
1850	1200	40	153	223	294	364	435	505	576	
1850	1350	40	171	250	330	409	488	568	647	
1850	1500	40	189	277	366	454	542	630	718	
1850	1650	40	208	304	401	498	595	692	789	
1850	1800	40	226	332	437	543	649	754	860	
2250	900	40	139	203	266	329	393	456	520	
2250	1050	40	161	235	309	383	457	531	605	
2250	1200	40	183	267	352	436	521	605	690	
2250	1350	40	204	299	395	490	585	680	775	
2250	1500	40	226	332	437	543	649	754	860	
2250	1650	40	248	364	480	597	713	829	945	
2250	1800	40	270	396	523	650	777	904	1030	

### Selection

From table A, select a suitable RAF 720 code attenuator that best satisfies the acoustic performance requirement, this will determine attenuator length.

From table B select the width w and height h dimensions that provide the required resistance for the attenuator against the design airflow (interpolation may be required for intermediate values).

The attenuator weight is shown in table C.

Should any dimensional restrictions not suit a RAF 720 range attenuator, examine alternative options from the RAF 730 or RAF 740 ranges.



## RAF 730 Rectangular Attenuators

The RAF 730 range of attenuators offers high attenuation characteristics, with slightly lower acoustic performance but greater free area than the RAF 720 range and greater acoustic performance but lower free area than the RAF 740 range.

### Table A - RAF 730

#### Attenuator Performance (Static Insertion Loss)

Attenuator	Octave band mid frequencies							
Code-L	63	125	250	500	1k	2k	4k	8k
RA 730-06	7	10	16	24	29	25	18	15
RA 730-09	8	12	21	28	33	29	22	18
RA 730-12	10	15	24	34	37	33	27	20
RA 730-15	11	18	29	40	42	37	31	22
RA 730-18	12	21	31	46	49	43	34	25
RA 730-21	13	24	35	50	50	50	39	28
RA 730-24	15	26	38	50	50	50	43	30



## Table B - RAF 730

### Attenuator Pressure Loss

The airflow/pressure loss data shown below is based upon BS4718:1971 and assumes uniform airflow across the attenuator face entering and leaving the attenuator. Attenuators installed with poor aerodynamic entry and exit conditions (close to fan outlets, system bends or transformations) may impose pressure loss values considerably higher than those indicated below.

Attenuator case dimensions		Air Volume l/s against imposed resistance pa					
w	h	10pa	20pa	30pa	40pa	50pa	60pa
450	450	314	444	544	628	702	769
450	600	419	592	725	837	936	1026
450	750	523	740	907	1047	1170	1282
450	900	628	888	1088	1256	1404	1538
800	450	645	912	1117	1290	1442	1580
800	600	860	1216	1490	1720	1923	2107
800	750	1075	1520	1862	2150	2404	2633
800	900	1290	1824	2235	2580	2885	3160
800	1050	1505	2129	2607	3010	3366	3687
800	1200	1720	2433	2979	3440	3846	4213
1200	600	1290	1824	2235	2580	2885	3160
1200	750	1613	2281	2793	3225	3606	3950
1200	900	1935	2737	3352	3870	4327	4740
1200	1050	2258	3193	3910	4515	5048	5530
1200	1200	2580	3649	4469	5160	5770	6320
1200	1350	2903	4105	5028	5805	6491	7110
1200	1500	3225	4561	5568	6451	7212	7900
1650	750	2150	3041	3724	4300	4808	5267
1650	900	2580	3649	4469	5160	5770	6320
1650	1050	3010	4257	5214	6021	6731	7374
1650	1200	3440	4865	5969	6881	7693	8427
1650	1350	3870	5473	6704	7741	8654	9480
1650	1500	4300	6082	7448	8601	9616	10534
1650	1650	4730	6690	8193	9461	10578	11587
1650	1800	5160	7298	8938	10321	11539	12640
2100	900	3225	4561	5586	6451	7212	7900
2100	1050	3763	5321	6517	7526	8414	9217
2100	1200	4300	6082	7448	8601	9616	10534
2100	1350	4838	6842	8380	9676	10818	11850
2100	1500	5375	7602	9311	10751	12020	13167
2100	1650	5913	8362	10242	11826	13222	14484
2100	1800	6451	9122	11173	12901	14424	15801
2550	900	3870	5473	6704	7741	8654	9480
2550	1050	4515	6386	7821	9031	10097	11060
2550	1200	5160	7298	8938	10321	11539	12640
2550	1350	5805	8210	10055	11611	12981	14220
2550	1500	6451	9122	11173	12901	14424	15801
2550	1650	7096	10035	12290	14191	15866	17381
2550	1800	7741	10947	13407	15481	17309	18961

## Table C - RAF 730

### Attenuator Weight Table

Attenuator case dimensions			RA730 Attenuator weights kg Attenuator Length Codes & Length Lmm							
w	h	f	-06 600	-09 900	-12 1200	-15 1500	-18 1825	-21 2100	-24 2400	
450	450	20	21	29	37	46	54	62	71	
450	600	20	26	36	46	57	67	77	88	
450	750	20	30	43	55	68	80	93	105	
450	900	30	35	49	65	79	92	106	119	
800	450	20	35	49	64	79	93	108	122	
800	600	20	43	61	79	97	116	134	152	
800	750	20	51	72	94	116	138	160	182	
800	900	30	58	84	110	135	161	186	212	
800	1050	30	66	96	125	154	183	212	242	
800	1200	30	72	107	138	170	201	237	267	
1200	600	30	61	87	114	140	167	193	220	
1200	750	30	72	104	135	167	199	231	262	
1200	900	30	78	120	155	194	231	268	304	
1200	1050	30	94	137	179	221	264	306	348	
1200	1200	30	105	153	201	248	296	344	391	
1200	1350	40	123	180	236	292	349	405	461	
1200	1500	40	138	205	264	330	395	459	511	
1650	750	40	84	122	159	196	234	271	309	
1650	900	40	100	145	190	234	279	324	369	
1650	1050	40	115	168	220	272	325	377	429	
1650	1200	40	131	191	251	310	370	430	490	
1650	1350	40	147	214	281	348	416	483	550	
1650	1500	40	162	237	312	386	461	536	611	
1650	1650	40	178	260	342	424	507	589	671	
1650	1800	40	193	283	373	462	552	642	731	
2100	900	40	121	176	231	286	341	396	451	
2100	1050	40	140	204	268	332	396	460	524	
2100	1200	40	159	232	306	379	452	525	598	
2100	1350	40	178	260	343	425	507	590	672	
2100	1500	40	197	288	380	471	563	665	746	
2100	1650	40	216	316	417	518	618	719	820	
2100	1800	40	235	345	454	564	674	784	893	
2550	900	40	146	213	279	346	412	479	545	
2550	1050	40	169	247	324	402	479	557	634	
2550	1200	40	192	281	369	458	546	635	724	
2550	1350	40	215	314	414	514	613	713	813	
2550	1500	40	237	348	459	570	680	791	902	
2550	1650	40	260	382	504	626	748	869	991	
2550	1800	40	283	416	549	682	815	947	1080	

### Selection

From table A, select a suitable RAF 730 code attenuator that best satisfies the acoustic performance requirement, this will determine attenuator length.

From table B select the width w and height h dimensions that provide the required resistance for the attenuator against the design airflow (interpolation may be required for intermediate values).

The attenuator weight is shown in table C.

Should any dimensional restrictions not suit a RAF 730 range attenuator, examine alternative options from the RAF 720 or RAF 740 ranges.



## RAF 740 Rectangular Attenuators

The RAF 740 range of attenuators offer high attenuation characteristics, with slightly lower acoustic performance but greater free area than the RAF 720 and RAF 730 ranges.

### Table A - RAF 740

#### Attenuator Performance (Static Insertion Loss)

Attenuator	Octave band mid frequencies							
Code-L	63	125	250	500	1k	2k	4k	8k
RA 740-06	5	8	14	18	22	18	16	13
RA 740-09	7	10	17	24	28	22	19	15
RA 740-12	8	13	20	29	33	27	21	17
RA 740-15	10	15	24	34	39	31	23	18
RA 740-18	11	17	28	44	48	36	25	19
RA 740-21	12	19	30	47	50	41	28	21
RA 740-24	13	22	33	50	50	45	31	23



## Table B - RAF 740

### Attenuator Pressure Loss

The airflow/pressure loss data shown below is based upon BS4718:1971 and assumes uniform airflow across the attenuator face entering and leaving the attenuator. Attenuators installed with poor aerodynamic entry and exit conditions (close to fan outlets, system bends or transformations) may impose pressure loss values considerably higher than those indicated below.

Attenuator case dimensions		Air Volume l/s against imposed resistance pa					
w	h	10pa	20pa	30pa	40pa	50pa	60pa
500	450	474	671	822	949	1061	1162
500	600	632	894	1095	1265	1414	1549
500	750	791	1118	1369	1581	1768	1936
500	900	949	1342	1643	1897	2121	2324
900	450	1009	1427	1748	2019	2257	2472
900	600	1346	1903	2331	2692	3009	3297
900	750	1682	2379	2914	3365	3762	4121
900	900	2019	2855	3497	4038	4514	4945
900	1050	2355	3331	4079	4710	5266	5769
900	1200	2692	3807	4662	5383	6019	6593
1350	600	2019	2855	3497	4038	4514	4945
1350	750	2523	3569	4371	5047	5643	6181
1350	900	3028	4282	5245	6056	6771	7417
1350	1050	3533	4996	6119	7066	7900	8654
1350	1200	4038	5710	6993	8075	9028	9890
1350	1350	4542	6424	7867	9085	10157	11126
1350	1500	5047	7137	8742	10094	11285	12362
1850	750	3365	4728	5828	6729	7524	8242
1850	900	4038	5710	6993	8075	9028	9890
1850	1050	4710	6662	8159	9421	10533	11538
1850	1200	5383	7613	9324	10767	12038	13187
1850	1350	6056	8565	10490	12113	13542	14835
1850	1500	6729	9517	11655	13459	15047	16483
1850	1650	7402	10468	12821	14804	16552	18132
1850	1800	8075	11420	13987	16150	18057	19780
2350	900	5047	7137	8742	10094	11285	12362
2350	1050	5888	8327	10199	11776	13166	14423
2350	1200	6729	9517	11655	13459	15047	16483
2350	1350	7570	10706	13112	15141	16928	18544
2350	1500	8412	11896	14569	16823	18809	20604
2350	1650	9253	13085	16026	18505	20690	22664
2350	1800	10094	14275	17483	20188	22571	24725
2850	900	6056	8565	10490	12113	13542	14835
2850	1050	7066	9992	12238	14131	15799	17307
2850	1200	8075	11420	13987	16150	18057	19780
2850	1350	9085	12847	15735	18169	20314	22252
2850	1500	10094	14275	17483	20188	22571	24725
2850	1650	11103	15702	19231	22207	24828	27197
2850	1800	12113	17130	20980	24225	27085	29670

## Table C - RAF 740

### Attenuator Weight Table

Attenuator case dimensions			RA740 Attenuator weights kg Attenuator Length Codes & Length Lmm							
w	h	f	-06 600	-09 900	-12 1200	-15 1500	-18 1825	-21 2100	-24 2400	
500	450	20	22	30	39	47	56	64	73	
500	600	20	26	37	48	59	69	80	91	
500	750	20	31	44	57	70	83	96	109	
500	900	30	36	51	66	80	94	110	125	
900	450	30	36	51	67	82	97	112	127	
900	600	30	45	63	82	101	120	139	158	
900	750	30	53	75	98	121	144	166	189	
900	900	30	61	87	114	140	167	194	220	
900	1050	30	69	99	130	160	190	221	251	
900	1200	30	76	110	148	177	209	246	278	
1350	600	30	63	91	119	146	174	201	229	
1350	750	30	75	108	141	174	207	240	273	
1350	900	30	87	125	164	202	241	279	318	
1350	1050	30	98	142	186	230	274	318	363	
1350	1200	30	110	159	209	259	308	358	407	
1350	1350	40	129	188	247	306	365	423	482	
1350	1500	40	143	211	280	349	416	469	541	
1850	750	40	105	152	199	245	292	339	386	
1850	900	40	121	176	230	285	340	394	449	
1850	1050	40	137	200	262	325	387	450	512	
1850	1200	40	153	224	294	364	435	505	575	
1850	1350	40	170	248	326	404	482	560	638	
1850	1500	40	186	272	358	444	530	616	702	
1850	1650	40	202	296	390	483	577	671	765	
1850	1800	40	229	325	429	527	620	723	815	
2350	900	40	130	188	247	305	364	422	481	
2350	1050	40	150	218	286	355	423	491	559	
2350	1200	40	170	248	326	404	482	560	638	
2350	1350	40	190	278	365	453	541	628	716	
2350	1500	40	210	308	405	502	600	697	795	
2350	1650	40	230	337	445	552	659	766	873	
2350	1800	40	250	367	484	601	718	835	952	
2850	900	40	155	225	295	365	435	505	575	
2850	1050	40	179	261	342	424	506	587	669	
2850	1200	40	203	296	390	483	576	670	763	
2850	1350	40	227	332	437	542	647	752	857	
2850	1500	40	251	367	484	601	717	834	951	
2850	1650	40	275	403	531	660	788	916	1045	
2850	1800	40	299	439	579	719	859	999	1139	

### Selection

From table A, select a suitable RAF 740 code attenuator that best satisfies the acoustic performance requirement, this will determine attenuator length.

From table B select the width w and height h dimensions that provide the required resistance for the attenuator against the design airflow (interpolation may be required for intermediate values).

The attenuator weight is shown in table C.

Should any dimensional restrictions not suit a RAF 740 range attenuator, examine alternative options from the RAF 720 or RAF 730 ranges.

## Acoustic Product Range

### RAF Rectangular Attenuators & Splitters

Primary Plant Attenuators



### CR3 & CR4 Circular Attenuators

Circular Attenuators for Axial Fan Applications



### RAS Rectangular Attenuators

Cross Talk & Terminal Attenuators



### Ovaline Attenuators

Flat Oval Attenuators for flat oval ducted systems



### CR2 Circular Attenuators

Circular Attenuators for "small" Cross Talk & Terminal Applications



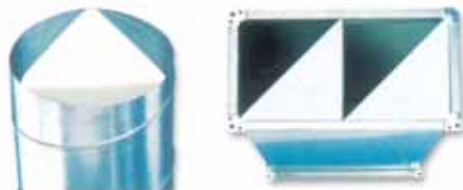
### LA Acoustic Louvres

External Acoustic Weather Louvres



### Soundpac

Innovative Acoustic Foam "Insert" for circular & rectangular "small" duct applications



#### Head Office:

Heath Mill Road, Wombourne,  
Wolverhampton,  
West Midlands, WV5 8AP  
Tel: (01902) 895161  
Fax: (01902) 892045

[www.hotchkissairsupply.co.uk](http://www.hotchkissairsupply.co.uk)  
[www.ha2.co.uk](http://www.ha2.co.uk)

email: [sales@hotchkissairsupply.co.uk](mailto:sales@hotchkissairsupply.co.uk)  
email: [sales@ha2.co.uk](mailto:sales@ha2.co.uk)