

RECTANGULAR DUCT ATTENUATORS



DESCRIPTION

Fantech Rectangular Attenuators are available in different models to suit a variety of applications and duct dimensions. They can be made in different widths and heights, and each model number denotes a different percentage open area and length combination.

The rectangular attenuators are available in the following models:

RT Series - Rectangular Attenuators

The RT series is ideal for general HVAC purposes and suitable for industrial applications. These attenuators deliver good acoustic attenuation properties across a broad spectrum of sound frequencies while maintaining low air flow pressure drops through the attenuator. This range is suitable for dry applications. Refer to the RT..QS series for applications where moisture may be present in the air stream.

RT..QS Series - Rectangular Q-Seal Attenuators

The Rectangular Q-Seal attenuator includes the qualities of the RT series attenuator and incorporates an infill system fully wrapped in an impermeable plastic membrane/film. The RT..QS Series is suitable in medical and clean room applications and any sensitive ventilation systems requiring a wrapped infill material to prevent the possibility of insulation fibre ingress into the airstream. They are also suitable where the insulation medium is directly exposed to weather, grease, liquid or dusts. Attenuators of this model type may also be cleaned periodically by low-pressure steam or pressure washer equipment.

HOW TO ORDER

RT - Tapered splitter

R3T - Wide tapered splitter

Airway width code

07 - 75mm	15 - 150mm	22 - 225mm
10 - 100mm	17 - 175mm	25 - 250mm
12 - 125mm	20 - 200mm	30 - 300mm

Length code

A - 600mm	D - 1500mm	G - 2400mm
B - 900mm	E - 1800mm	
C - 1200mm	F - 2100mm	

QS - with Q-seal

(Default is standard construction)

Casing width in cm. _____

Casing height in cm. _____



R3T Series - Rectangular Thick Wall Attenuators

The R3T series of attenuators is suitable for HVAC purposes and ideal for industrial applications. They have wider splitters providing better low-frequency attenuation than the standard RT series. This makes them more suitable for the control of low-frequency noise emissions such as those from generator sets and pump systems.

Sectional Representation



RT Series
Standard splitters

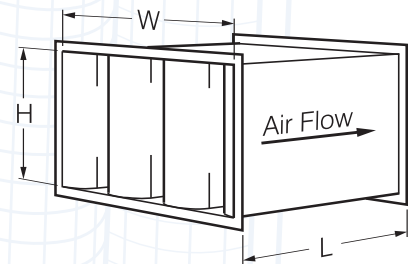


RT..QS Series
Splitters with infill wrapped in impermeable film



R3T Series
Thicker splitters

DIMENSIONS



CONSTRUCTION

- Casing and splitters made from Z275 coated galvanized steel.
- Infill from bio-soluble acoustic grade glasswool or mineral wool, encased behind finely perforated galvanized steel. Infill is hygroscopic and incombustible.
- RT and R3T Series have a fiberglass membrane between infill and perforated steel layer to minimize fibre egress from the infill into the air stream.
- Q-Seal (QS) variants have infill material fully wrapped in liquid impermeable Melinex® PET Plastic Film.
- Standard construction rated to duct pressures between -500Pa and +1kPa relative to atmosphere.

SECTIONAL SIZING AND JOINING FLANGE INFORMATION

- Flanges 35mm TDF or compatible up to a maximum height or width of 1200mm. Above these sizes 40mm or 50mm steel angle section frames used, supplied undrilled.
- Matching flanges for attaching to accompanying ductwork can also be supplied.
- Rectangular attenuators will typically be made in a single piece up to a maximum of 2250mm in width, length or height. Above this dimension attenuators will be split into multiple sections in the dimension(s) exceeding the 2250mm limit noted.
- As a special request, attenuators may be divided into smaller sized sections than standard to fit through small spaces, before they are reassembled as a single unit on site.

CUSTOMISED ATTENUATOR OPTIONS

The following are available as special options when ordering Fantech rectangular attenuators:

- Different materials of construction such as Stainless Steel Grades 304 and 316.
- Paints / protective coatings such as epoxy paint, Chlorinated Rubber etc.
- Flange material/dimensions profile can be specified e.g. Ductmate, TDF, Plain Steel Angle.
- Access doors for easy cleaning (e.g. in Kitchen Exhaust Applications).

SUGGESTED SPECIFICATION

Rectangular attenuators shall be of the RT, R3T or RT..QS Series as designed and manufactured by Fantech Pty. Ltd. and shall have the dimensions, acoustic attenuator insertion losses and pressure losses as scheduled. Acoustic Attenuator Insertion Loss data for the attenuators to be derived from tests in accordance to BS4718:1971.

The casing shall be manufactured from forming grade zinc-coated mild steel sheet with Pittsburgh corner seams. The infill material shall be either rockwool or fibreglass as specified by the manufacturer. The infill material shall be covered with a membrane to prevent erosion of the fibres, then encased in galvanised perforated sheet metal. Where attenuators are exposed to the weather they shall be of the RT..QS Series where all infill materials shall be lined with an impervious film to prevent the ingress of moisture.

The infill material when tested in accordance with AS1530.3:1989 shall have the following indices:-

Ignitability	0
Spread of flame	0
Heat evolved	0
Smoke developed	0

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Example: How to select a rectangular attenuator

For this scenario, noise from a car park exhaust fan results in a noise level of 83dB(A) in the car park it ventilates. The exhaust air volume passing through the fan is 7m³/s. The user would like to have a target noise level in the carpark of 60dB(A). Also, the attenuator can be no longer than 2200mm long, is not exposed to the weather, and can have no more than 20Pa of air flow resistance through it to avoid affecting the fan selection.

- 1 Select the appropriate noise reduction data column. Exhaust fan noise would be classified as 'General Fan noise'.
- 2 Choose the attenuator series required. Both the RT and R3T models would be appropriate as the internals of the attenuator are not exposed to the weather.
- 3 The noise reduction required is found by subtracting the target noise level from the current noise level.
 $83\text{dB(A)} \text{ Current noise level} - 60\text{dB(A)} \text{ Target noise level} = 23\text{dB(A)} \text{ reduction required.}$

Under the "General fan noise dB(A) reduction" columns for the attenuator series (RT & R3T) chosen earlier, follow the line sequence (Y) until the reduction noise (23 dB(A)) is found or marginally exceeds this number.

- 4 To achieve a 23 dB(A) noise reduction using the RT series, the following length and % open area combinations can be used; 2100mm/37%, 1800mm/33% and 1500mm/26%. For our example going forward, we will use the 2100mm long, 37% open area option. The selection closest to the top is normally the best from a price perspective. To evaluate other options, repeat the steps from 4 onwards.

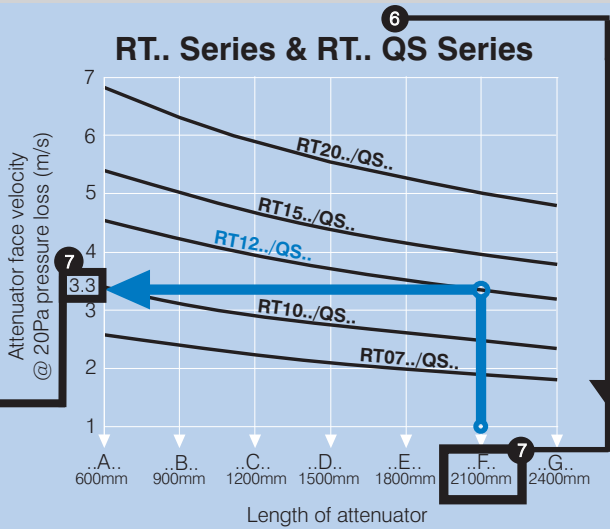
ACOUSTIC PERFORMANCE DATA		General fan noise dB(A) reduction			Low Frequency biased noise dB(A) reduction			Product Codes		
Length mm	% open area	R3T. Series	RT. Series	RT.QS Series	R3T. Series	RT. Series	RT.QS Series	R3T. Series	RT. Series	RT.QS Series
2400	26	32	28		24	19			RT07G	RT07GQS
	33	25	24		22	19		R3T15G	RT10G	RT10GQS
	37	22	24		20	17		R3T17G	RT12G	RT12GQS
	43	18	22		17	16		R3T22G	RT15G	RT15GQS
	50	14	19		15	14		R3T30G	RT20G	RT20GQS
2100	26	30	26		0	21			RT07F	RT07FQS
	33	24	26		19	17		R3T15F	RT10F	RT10FQS
	37	21	23		18	16		R3T17F	RT12F	RT12FQS
	43	17	21		16	15		R3T22F	RT15F	RT15FQS
	50	12	17		14	13		R3T30F	RT20F	RT20FQS
1800	26	27	24		18	16			RT07E	RT07EQS
	33	22	24		17	15		R3T15E	RT10E	RT10EQS
	37	19	21		16	14		R3T17E	RT12E	RT12EQS
	43	16	19		14	13		R3T22E	RT15E	RT15EQS
	50	12	16		12	11		R3T30E	RT20E	RT20EQS
1500	26	25	22		15	15			RT07D	RT07DQS
	33	20	22		15	13		R3T15D	RT10D	RT10DQS
	37	17	20		14	12		R3T17D	RT12D	RT12DQS
	43	14	18		12	11		R3T22D	RT15D	RT15DQS
	50	11	14		10	10		R3T30D	RT20D	RT20DQS
1200	26	22	19		12	12			RT07C	RT07CQS
	33	17	19		12	11		R3T15C	RT10C	RT10CQS
	37	15	17		11	10		R3T17C	RT12C	RT12CQS
	43	12	16		10	9		R3T22C	RT15C	RT15CQS
	50	9	13		9	8		R3T30C	RT20C	RT20CQS
900	26	18	15		10	10			RT07B	RT07BQS
	33	14	16		10	8		R3T15B	RT10B	RT10BQS
	37	12	14		9	8		R3T17B	RT12B	RT12BQS
	43	10	13		8	7		R3T22B	RT15B	RT15BQS
	50	7	10		7	6		R3T30B	RT20B	RT20BQS
600	26	14	10		6	6			RT07A	RT07AQS
	33	10	11		7	5		R3T15A	RT10A	RT10AQS
	37	9	10		6	5		R3T17A	RT12A	RT12AQS
	43	7	9		6	5		R3T22A	RT15A	RT15AQS
	50	6	7		5	4		R3T30A	RT20A	RT20AQS

Acoustic performance tests to ISO7235-2003 that have been simplified to single digit noise reduction levels are shown in table above. Detailed attenuator insertion loss (SIL) spectrums based on testing to the BS4718-1971 Standard can be obtained using the Fans by Fantech Product Selection Program.

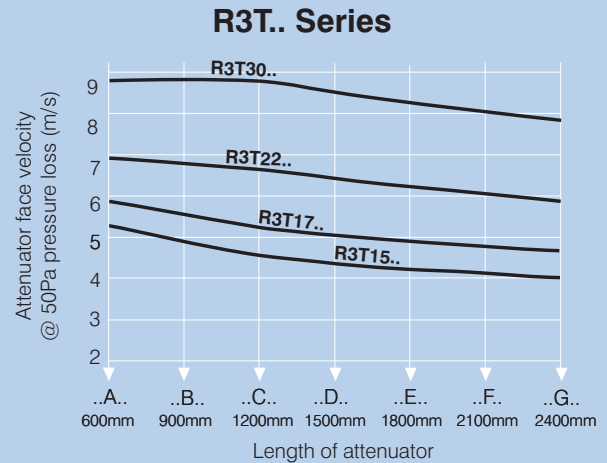
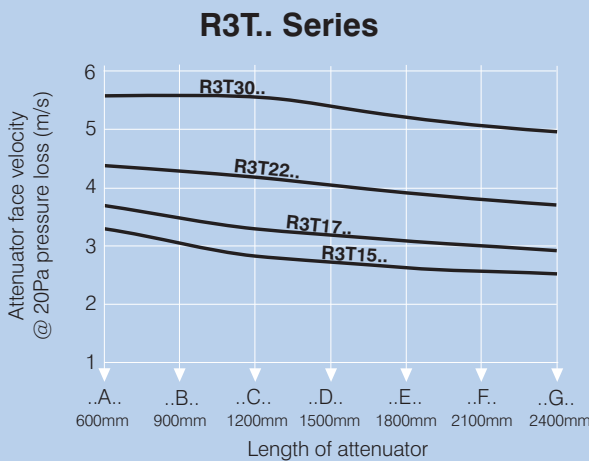
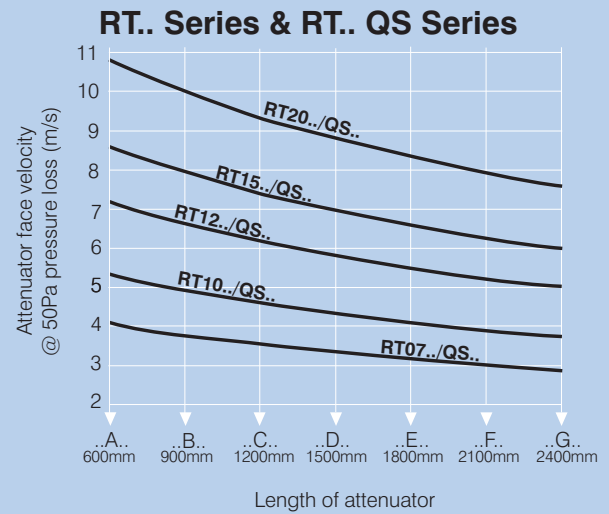
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- Select the product code which is aligned with the 2100mm long, 37% open, 23 dB(A). In this case the product code is RT12F.
- Refer to the correct pressure loss (20Pa) graph and attenuator series (RT Series for the RT12F model)
- Draw a vertical line on the graph that corresponds to the length of the attenuator model chosen at step 4 (i.e. 2100mm long or 'F' length code). The face velocity on the RT12../QS curve that corresponds to the model is 3.3m/s

6 Face Velocity at 20Pa Pressure Drop



Face Velocity at 50Pa Pressure Drop



8 Calculate the minimum face area for your attenuator selection; $\text{Face Area} = \frac{\text{Air flow}}{\text{Face Velocity}} = \frac{7.0\text{m}^3/\text{s}}{3.3\text{m}/\text{s}} = 2.12\text{m}^2$

9 To calculate the width of a rectangular attenuator of unknown dimensions, use the formula;

$$\text{Width} = \sqrt{\text{Face Area} \times \text{Aspect Ratio}} = \sqrt{2.12\text{m}^2 \times 1.5} = 1.78\text{m}$$

*Common aspect ratios vary between 0.5 and 3.0. When a silencer width is larger than its height aspect ratio >1.0. An aspect ratio of 1.5 is a good default.

In the width table below, pick the closest width available for a RT12.. series attenuator. In this case, 1.95m (1950mm) is the selected width.

To calculate the height of the attenuator, use the formula; $\text{Height} = \frac{\text{Face Area}}{\text{Width}} = \frac{2.12\text{m}^2}{1.95\text{m}} = 1.09\text{m}$

The final model code of the attenuator selected is RT12F-195-109

Width table

R3T.. Series (mm)			
R3T15..	R3T17..	R3T22..	R3T30..
450	475	525	600
900	950	1050	1200
1350	1425	1575	1800
1800	1900	2100	2400
2250	2375		

RT.. Series (mm)				
RT07..	RT10..	RT12..	RT15..	RT20..
275	300	325	350	400
550	600	650	700	800
825	900	975	1050	1200
1100	1200	1300	1400	1600
1375	1500	1625	1750	2000
1650	1800	1950	2100	2400
1925	2100	2275		
2200	2400			

RT.. Q Seal Series (mm)				
RT07.. QS	RT10.. QS	RT12.. QS	RT15.. QS	RT20.. QS
275	300	325	350	400
550	600	650	700	800
825	900	975	1050	1200
1100	1200	1300	1400	1600
1375	1500	1625	1750	2000
1650	1800	1950	2100	2400
1925	2100	2275		
2200	2400			