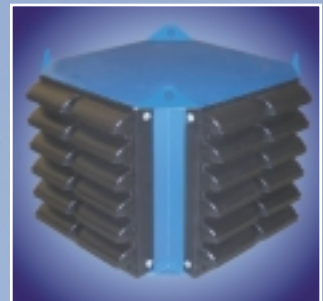
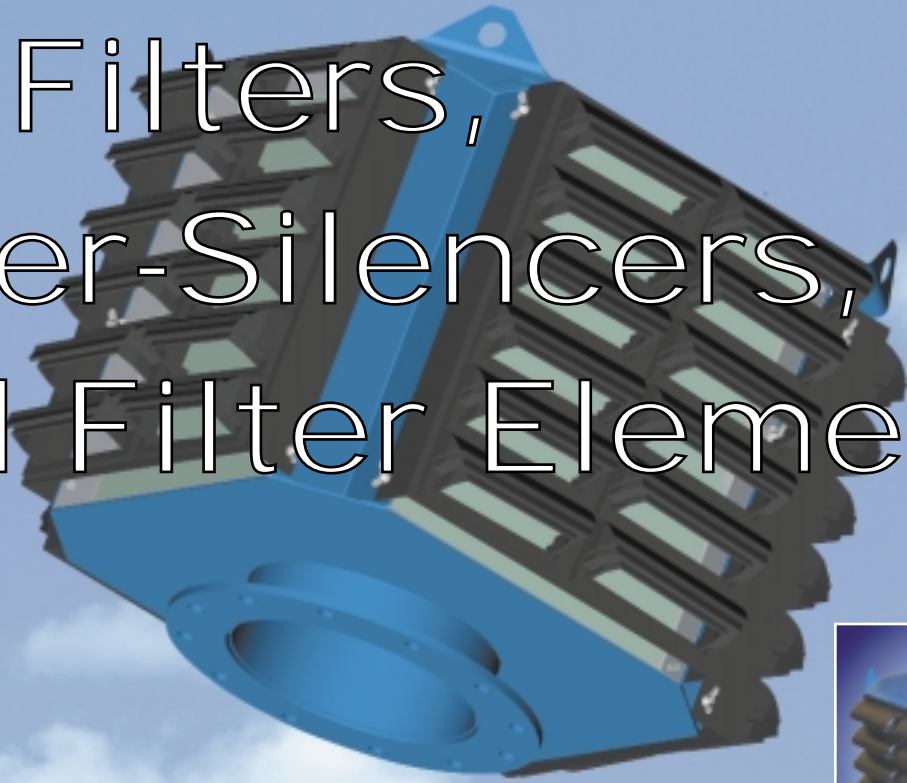


Air Filters, Filter-Silencers, and Filter Elements



High-efficiency Air Filtration and Silencing

- Choice of filter only or filter-silencer.
- High-efficiency air filtration to suit your application.
- Wide range of element options, including multistage filters.
- Removable weather louvers provide the ultimate protection for your filter.

Built to Suit Your Application

- Designed for application requirements, including easy installation and low maintenance.
- Optional design features for special production and assembly conditions.
- Special acoustic designs are available.
- Larger sizes are available.
- The air filter housings ship fully assembled with weather louvers.

Outstanding Construction

- Carbon steel construction with a high-quality blue enamel finish.
- Special materials such as stainless steel are available.

Immediate Availability

- Off-the-shelf delivery for replacement elements.

Quality You Can Count On

Universal Silencer's weather louvers are standard for units that use 20 in. x 25 in. filters. These rugged, lightweight weather louvers require less space than weatherhoods and make installation and element changeouts a snap.

For extended life, the weather louvers are made of black, UV-protected high-density polyethylene that resists any type of coating. No maintenance or painting is needed.

The louvers distribute the air flow, and load dust on the filters, more evenly than conventional steel weatherhoods. The slanted louvers effectively channel water away from the filters.



UNIVERSAL

Acoustic & Emission Technologies

FH SERIES FILTER

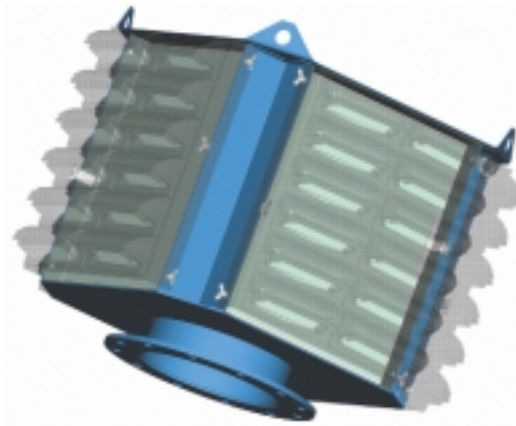
FSH SERIES FILTER-SILENCER

For centrifugal compressors, blowers, engines, and gas turbines. For reciprocating compressors, ask Universal Silencer for recommendations.

The FH and FSH series use standard panel filters, which are available from Universal Silencer in a variety of types and efficiencies. The supports for the filter frames inside the housings accommodate conventional 2-in. deep single-panel filters or, for critical service, two single-panel filters staged in series. In the case of dual-stage systems, the usual preference is to use a high-efficiency final filter and a less efficient prefilter. The FSH series has an integrated silencing section for applications that require moderate noise reduction.

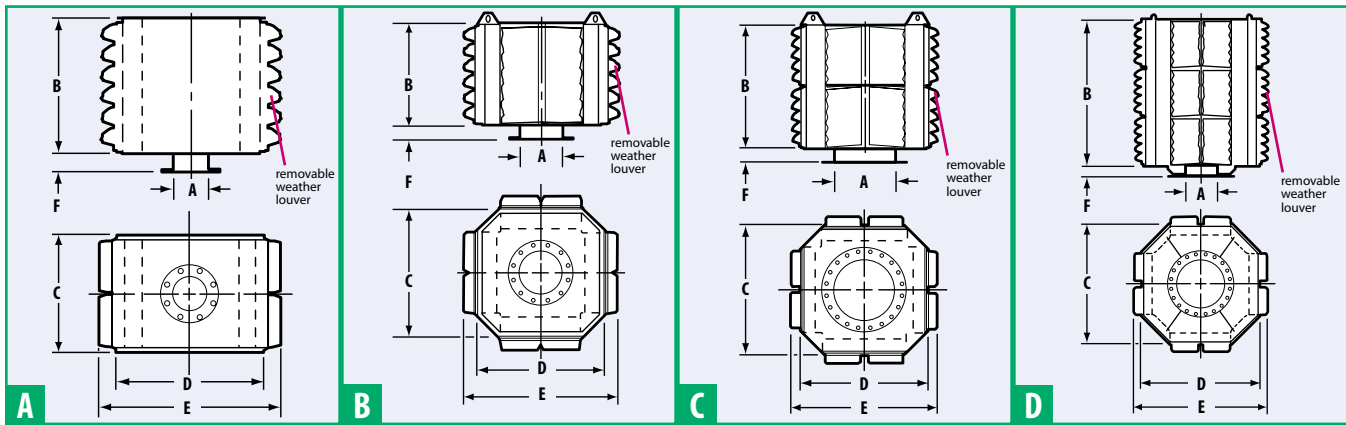
All units are fabricated of steel sheet and plate, welded throughout to provide a rugged, long-lasting, trouble-free air filtering component. All models are equipped with a pressure tap and flange drilled to match 125/150-lb ANSI specifications. Inside and outside housing surfaces are primed and given a finish coat of enamel paint. Suitable mounting legs may be fitted in the field or will be quoted upon application.

All housings come with low-profile, UV-stabilized high-density polyethylene weather louvers.



NOISE ATTENUATION, FSH SERIES FILTER-SILENCERS

Octave Band Center Frequency, Hz	63	125	250	500	1 K	2 K	4 K	8 K
Attenuation, dB	2	3	4	5	8	13	14	13



Filter		Filter-Silencer		Capacity, A	Config.	CFM	B	C	D	E	F	Weight		Number and Size of Filter Openings
Model	Part No.	Model	Part No.									FH	FSH	
FH-6-2	36-306-AAL	FSH-6-2	37-306-AAL	A	1,000	6	25.50	23.25	28.00	34.50	3.50	115	145	2-20x25x4
FH-8-2	36-308-AAL	FSH-8-2	37-308-AAL	A	1,750	8	25.50	23.25	28.00	34.50	3.50	125	150	2-20x25x4
FH-10-2	36-310-AAL	FSH-10-2	37-310-AAL	A	2,750	10	25.50	23.25	28.00	34.50	3.50	130	160	2-20x25x4
FH-10-4	36-510-AAL	FSH-10-4	37-510-AAL	B	2,750	10	25.50	32.00	32.00	38.50	3.50	170	200	4-20x25x4
FH-12-4	36-412-AAL	FSH-12-4	37-412-AAL	B	4,000	12	25.50	32.00	32.00	38.50	3.50	175	210	4-20x25x4
FH-14-4	36-314-AAL	FSH-14-4	37-314-AAL	B	5,400	14	25.50	32.00	32.00	38.50	3.50	180	220	4-20x25x4
FH-14-8	36-514-AAL	FSH-14-8	37-514-AAL	C	5,400	14	40.75	42.00	42.00	47.88	4.50	340	405	8-20x25x4
FH-16-8	36-416-AAL	FSH-16-8	37-416-AAL	C	7,000	16	40.75	42.00	42.00	47.88	4.50	350	420	8-20x25x4
FH-18-8	36-418-AAL	FSH-18-8	37-418-AAL	C	8,900	18	40.75	42.00	42.00	47.88	4.50	350	430	8-20x25x4
FH-20-8	36-320-AAL	FSH-20-8	37-320-AAL	C	11,000	20	40.75	42.00	42.00	47.88	4.50	365	440	8-20x25x4
FH-20-12	36-520-AAL	FSH-20-12	37-520-AAL	D	11,000	20	61.00	50.00	50.00	55.88	4.50	600	725	12-20x25x4
FH-24-12	36-424-AAL	FSH-24-12	37-424-AAL	D	16,000	24	61.00	50.00	50.00	55.88	4.50	610	765	12-20x25x4
FH-24-16	36-524-AAL	FSH-24-16	37-524-AAL	C	16,000	24	50.75	56.00	56.00	62.50	4.50	695	855	16-20x25x4
FH-30-16	36-330-AAL	FSH-30-16	37-330-AAL	C	20,500	30	50.75	56.00	56.00	62.50	4.50	795	960	16-20x25x4
FH-30-24	36-530-AAL	FSH-30-24	37-530-AAL	D	20,500	30	76.00	56.00	56.00	62.50	4.50	1,035	1,340	24-20x25x4
FH-36-24	36-336-AAL	FSH-36-24	37-336-AAL	D	35,500	36	76.00	56.00	56.00	62.50	4.50	1,085	1,670	24-20x25x4
FH-42-36	36-342-AAL	FSH-42-36	37-342-AAL	D	48,000	42	76.00	81.00	81.00	87.00	6.00	2,450	2,900	36-20x25x4
FH-48-48	36-348-AAL	FSH-48-48	37-348-AAL	D	63,000	48	101.38	81.00	81.00	87.00	6.00	2,870	3,565	48-20x25x4

- Dimensions are in inches, weights in pounds.
- Nominal capacity is based on an exit velocity of approximately 5,000 ft/min. Filter element capacity may be greater, but this is unrelated to actual unit capacity. For specific sizing and pressure drop data, see the back cover.
- 4-in.-deep filter frames will hold single elements or dual elements.
- Use the listed part numbers to order standard units with weather louvers. Please specify the type of filter elements (see catalog 241-B, page 10, for part numbers).
- Weights include the weights of weather louvers, but not the filter elements.

FRH SERIES FILTER FCRH SERIES FILTER-SILENCER

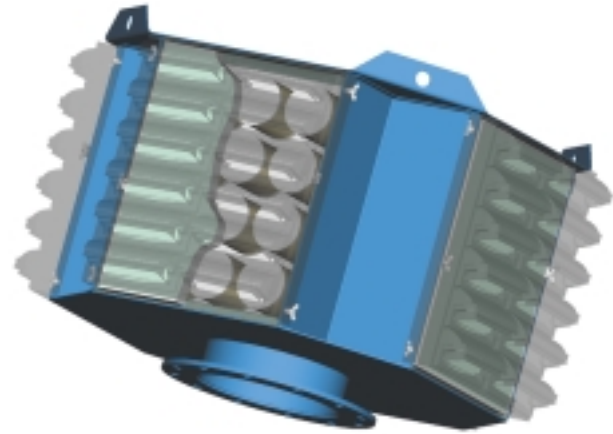
For centrifugal compressors, blowers, engines, and gas turbines. For reciprocating compressors, ask Universal Silencer for recommendations.

These products are similar in scope and application to the FH and FSH series, except that the FRH and FCRH series are two-stage filters. The second stage consists of one battery of 12 cartridge filters for each 20 in. x 25 in. x 2 in. prefilter.

The high-efficiency P-5 cartridge filters are equipped with threaded ends that are screwed into individual receptacles. As each P-5 filter is removed and replaced, only a small area less than 4 sq in. is exposed to the flow of unfiltered air, so "hot swap" changeouts while the system is in operation are an option for these units.

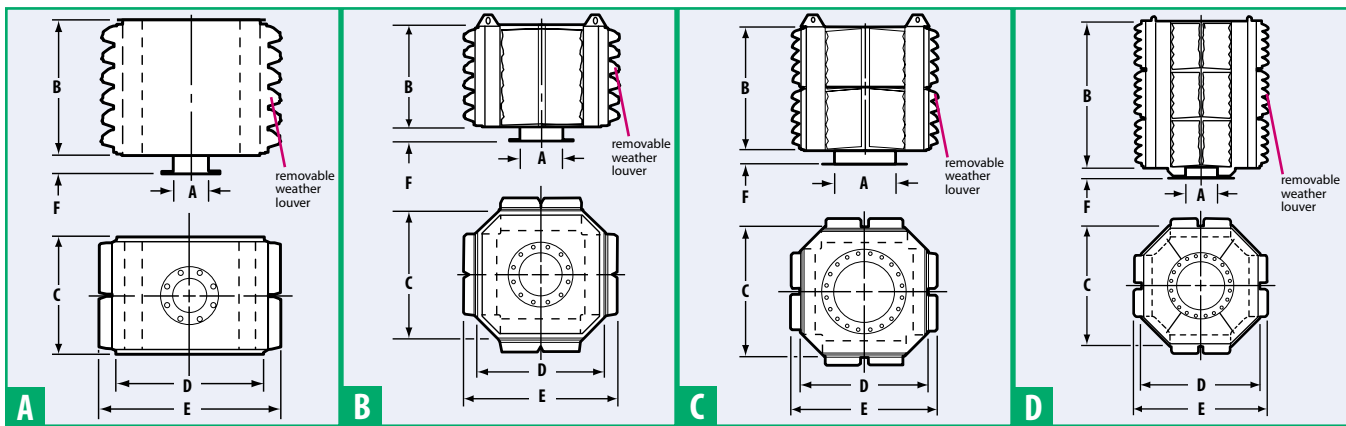
Usually, a moderately efficient filter panel is used as the first-stage element. The FCRH series has an integrated silencing section that provides moderate noise reduction.

All units are fabricated of steel sheet and plate, welded throughout to provide a rugged, long-lasting, trouble-free air filtering component. All models are equipped with a pressure tap and flange drilled to match 125/150-lb ANSI specifications. Inside and outside surfaces are primed and given a finish coat of enamel paint. All housings come with low-profile, UV-stabilized high-density polyethylene weather louvers.



NOISE ATTENUATION, FCRH SERIES FILTER-SILENCERS

Octave Band Center Frequency, Hz	63	125	250	500	1 K	2 K	4 K	8 K
Attenuation, dB	2	3	4	5	8	13	14	13



Filter		Filter-Silencer		Capacity, CFM	A (nom.)	B	C	D	E	F	Approximate Weight		No. and Size of Filter Openings	No. of Final Filters	
Model	Part No.	Model	Part No.								FRH	FCRH			
FRH-8-2	38-308-AAL	FCRH-8-2	39-308-AAL	A	1,750	8	25.50	22.25	40.00	46.50	3.50	205	245	2-20x25x2	24
FRH-10-2	38-310-AAL	FCRH-10-2	39-310-AAL	A	2,750	10	25.50	22.25	40.00	46.50	3.50	210	255	2-20x25x2	24
FRH-10-4	38-510-AAL	FCRH-10-4	39-510-AAL	B	2,750	10	25.50	42.00	42.00	48.50	3.50	375	385	4-20x25x2	48
FRH-12-4	38-412-AAL	FCRH-12-4	39-412-AAL	B	4,000	12	25.50	42.00	42.00	48.50	3.50	380	435	4-20x25x2	48
FRH-14-4	38-314-AAL	FCRH-14-4	39-314-AAL	B	5,400	14	25.50	42.00	42.00	48.50	3.50	395	440	4-20x25x2	48
FRH-14-8	38-514-AAL	FCRH-14-8	39-514-AAL	C	5,400	14	40.75	52.00	52.00	57.88	4.50	655	735	8-20x25x2	96
FRH-16-8	38-416-AAL	FCRH-16-8	39-416-AAL	C	7,000	16	40.75	52.00	52.00	57.88	4.50	665	745	8-20x25x2	96
FRH-18-8	38-418-AAL	FCRH-18-8	39-418-AAL	C	8,900	18	40.75	52.00	52.00	57.88	4.50	665	755	8-20x25x2	96
FRH-20-8	38-320-AAL	FCRH-20-8	39-320-AAL	C	11,000	20	40.75	52.00	52.00	57.88	4.50	675	765	8-20x25x2	96
FRH-20-12	38-520-AAL	FCRH-20-12	39-520-AAL	D	11,000	20	61.00	60.00	60.00	65.88	4.50	1,265	1,515	12-20x25x2	144
FRH-24-12	38-424-AAL	FCRH-24-12	39-424-AAL	D	16,000	24	61.00	60.00	60.00	65.88	4.50	1,315	1,565	12-20x25x2	144
FRH-24-16	38-524-AAL	FCRH-24-16	39-524-AAL	C	16,000	24	50.75	66.00	66.00	72.50	4.50	1,440	1,640	16-20x25x2	192
FRH-30-16	38-330-AAL	FCRH-30-16	39-330-AAL	C	20,500	30	50.75	66.00	66.00	72.50	4.50	1,490	1,690	16-20x25x2	192
FRH-30-24	38-530-AAL	FCRH-30-24	39-530-AAL	D	20,500	30	76.00	72.00	72.00	78.50	4.50	2,130	2,480	24-20x25x2	288
FRH-36-24	38-336-AAL	FCRH-36-24	39-336-AAL	D	35,500	36	76.00	72.00	72.00	78.50	4.50	2,230	2,630	24-20x25x2	288

- Dimensions are in inches, weights in pounds.
- Please call for a design consultation on large filters.
- Nominal capacity is based on an exit velocity of approximately 5,000 ft/min. Filter element capacity may be greater, but this is unrelated to actual unit capacity. For specific sizing and pressure drop data, see the back cover.
- 2-in.-deep filter frames will hold a single prefilter.
- Use the listed part numbers to order standard units with weather louvers. Please specify the type of filter elements (see catalog 241-B, page 10, for part numbers).
- Weights include the weights of the W-2 and P-5 filter elements, and the weather louvers.

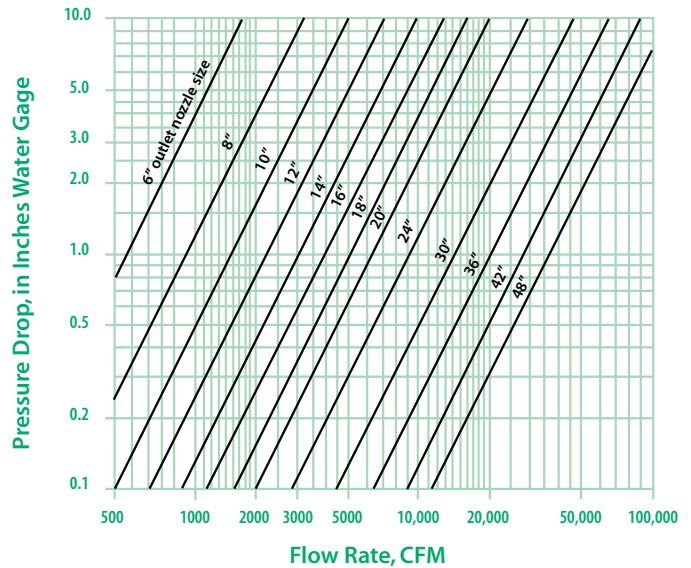
Calculating pressure drop

A variety of filter panels are suitable for use with the filters and filter-silencers described in this catalog. Each filter panel has its own pressure drop characteristics. To reflect that fact, the total pressure drop for a specific filter application is the sum of two values:

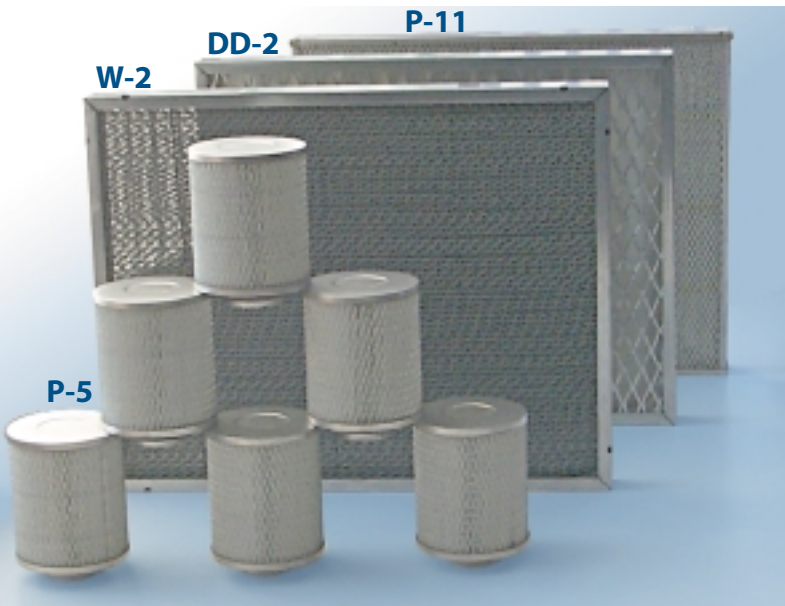
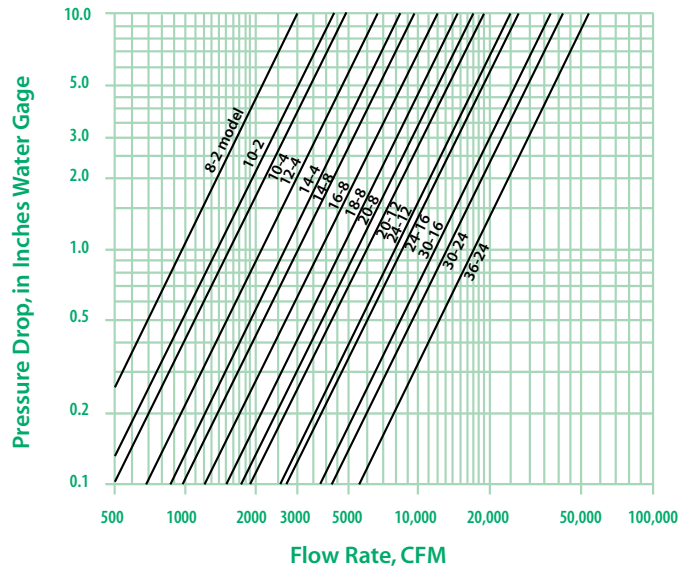
1. The pressure drop that can be attributed to the filter housing without filter elements. These values are taken from the graphs at right. The pressure drop values for the filter housings are listed in inches of water gage at various flow rates in CFM.
2. The pressure drop through the filter element media. This value is found in the table below.

The housing pressure drop is shown in graphical form as a function of air flow in CFM versus pressure drop in inches of water gage. For convenience, and to avoid confusion, pressure drop values in the graphs include pipe entrance pressure drops that are contributed by the atmospheric end of the inlet pipe. These drops are significant, contributing in some cases as much as 75% of the total pressure drop, and should not be attributed to the filter elements. Adding the filter elements to the system transfers these pressure losses to the interior of the filter housing. A pressure drop measurement read at the pressure tap on the filter outlet nozzle reflects the static pressure: pipe entrance loss, housing pressure drop, and filter element pressure drop.

PRESSURE DROP CURVES FOR FILTER HOUSINGS
FH AND FSH SERIES



PRESSURE DROP CURVES FOR FILTER HOUSINGS
FRH AND FCRH SERIES



PRESSURE DROP VALUES FOR UNIVERSAL SILENCER FILTER ELEMENTS, IN INCHES WATER GAGE

CFM per Filter	W-2	DD-2	P-11	W-2 and DD-2	W-2 and P-11	P-5	W-2 and P-5	DD-2 and P-5
500	0.01	0.06	0.09	0.07	0.10	0.28	0.29	0.34
600	0.02	0.08	0.13	0.10	0.15	0.35	0.37	0.43
700	0.03	0.11	0.16	0.14	0.19	0.42	0.45	0.53
800	0.03	0.14	0.21	0.17	0.24	0.49	0.52	0.63
900	0.04	0.17	0.25	0.21	0.29	0.56	0.60	0.73
1000	0.05	0.21	0.30	0.26	0.35	0.64	0.69	0.85
1250	0.08	0.31	0.44	0.39	0.52	0.83	0.91	1.14
1500	0.12	0.44	0.59	0.56	0.71	1.04	1.16	1.48