

Force Class Load Determination Sample (Tables 1 and 1A)



KINETICS NOISE CONTROL, INC.
6300 IRELAN PLACE
DUBLIN, OHIO 43017
ph 614 889-0480

Max
Force (lb)
Force Class

Horizontal Force Class

0	1 to 250	251 to 500	501 to 1000	1001 to 2000	2001 to 5000	5001 to 10000
-	I	II	III	IV	V	VI

G's by Building Elevation listed below

0-112	0-149	0-186	0-224	0-261	0-298	0-336
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Table 1

Site Specific Force Class Load Determination Tables (IBC)

Project	Project	
Mapped Ss:	0.5	Ip: 1.5
Fa:	1.4	Rp: 2.5

Typical Wts / Ft (lb)

Pipe Size	Filled Pipe	Steam Pipe
1	2.7	2.3
1.5	4.4	3.5
2	6.1	4.6
2.5	9	7
3	12	9
4	18	12
5	26	18
6	35	22
8	55	33
10	80	46
12	108	60
14	121	61
16	150	70
18	190	90
20	214	88
24	290	106

Typical Wts / Ft (lb)

Duct Size	Wt/ft
30 x 30	17
42 x 42	29
54 x 54	46
60 x 60	54
84 x 84	103
96 x 96	129
54 x 28	34
60 x 30	39
84 x 42	74
96 x 48	97
108 x 54	110
120 x 60	121

- Instructions for Use**
- Determine the max restraint spacing, from the geometry of the installation but do not exceed values listed in Table 2.
 - Determine the weight of the pipe or duct component(s) from the tables above (adding trapezoid items together.)
 - Use the tables at right to determine the Horiz force class (I-VI) based on Restraint Spg
 - Select restraint hardware appropriate for the Horizontal force class requirements.
- (Force Class Units are LRFD [Strength] Based)*

Wt/Ft (lb)

Horizontal Force Class for Restraints Located **10 ft OC**
Elevation in Structure (% of total Building Height)

Grade	16%	33%	50%	66%	84%	Roof
10	I	I	I	I	I	I
25	I	I	I	I	I	I
50	I	I	I	I	I	I
100	I	I	I	II	II	II
150	I	II	II	II	II	III
200	I	II	II	III	III	III
250	II	II	III	III	III	III
300	II	II	III	III	III	IV

Wt/Ft (lb)

Horizontal Force Class for Restraints Located **20 ft OC**
Elevation in Structure (% of total Building Height)

Grade	16%	33%	50%	66%	84%	Roof
10	I	I	I	I	I	I
25	I	I	I	I	I	I
50	I	I	I	II	II	II
100	I	II	II	III	III	III
150	II	II	III	III	III	IV
200	II	III	III	IV	IV	IV
250	III	III	IV	IV	IV	IV
300	III	III	IV	IV	IV	V

Wt/Ft (lb)

Horizontal Force Class for Restraints Located **30 ft OC**
Elevation in Structure (% of total Building Height)

Grade	16%	33%	50%	66%	84%	Roof
10	I	I	I	I	I	I
25	I	I	I	I	I	II
50	I	I	II	II	II	III
100	II	II	III	III	III	IV
150	III	III	IV	IV	IV	IV
200	III	III	IV	IV	IV	V
250	III	IV	IV	IV	V	V
300	IV	IV	IV	V	V	V

Wt/Ft (lb)

Horizontal Force Class for Restraints Located **40 ft OC**
Elevation in Structure (% of total Building Height)

Grade	16%	33%	50%	66%	84%	Roof
10	I	I	I	I	I	I
25	I	I	I	I	II	II
50	I	II	II	II	III	III
100	II	III	III	III	IV	IV
150	III	III	IV	IV	IV	V
200	III	IV	IV	IV	V	V
250	IV	IV	IV	V	V	V
300	IV	IV	V	V	V	V

Wt/Ft (lb)

Horizontal Force Class for Restraints Located **60 ft OC**
Elevation in Structure (% of total Building Height)

Grade	16%	33%	50%	66%	84%	Roof
10	I	I	I	I	I	I
25	I	I	II	II	II	III
50	II	II	III	III	III	IV
100	III	III	IV	IV	IV	V
150	IV	IV	IV	V	V	V
200	IV	IV	V	V	V	V
250	IV	V	V	V	V	VI
300	V	V	V	V	VI	VI

Wt/Ft (lb)

Horizontal Force Class for Restraints Located **80 ft OC**
Elevation in Structure (% of total Building Height)

Grade	16%	33%	50%	66%	84%	Roof
10	I	I	I	I	I	II
25	I	II	II	II	III	III
50	II	III	III	III	IV	IV
100	III	IV	IV	IV	V	V
150	IV	IV	V	V	V	V
200	IV	V	V	V	V	VI
250	V	V	V	VI	VI	VI
300	V	V	V	VI	VI	VI

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FORCE CLASS LOAD DETERMINATION SAMPLE (TABLES 1 AND 1A)

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Toll Free (USA only): 800-959-1229
International: 614-889-0480
Fax: 614-889-0540
World Wide Web: www.kineticsnoise.com
Email: sales@kineticsnoise.com

DOCUMENT:

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Max Force (lb)
Force Class

Horizontal Force Class

0	1 to 250	251 to 500	501 to 1000	1001 to 2000	2001 to 5000	5001 to 10000
-	I	II	III	IV	V	VI

G's by Building Elevation listed below

0.112	0.149	0.186	0.224	0.261	0.298	0.336
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Table 1A

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2.5	9	7
3	12	9
4	18	12
5	26	18
6	35	22
8	55	33
10	80	48
12	108	60
14	121	61
16	150	70
18	190	90
20	214	88
24	290	106

Typical Wts / Ft (lb)	
Duct Size	Wt/ft
30 x 30	17
42 x 42	29
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108 x 54	110
120 x 60	121

- Instructions for Use**
- Determine the max restraint spacing, from the geometry of the installation but do not exceed values listed in Table 2.
 - Determine the weight of the pipe or duct component(s) from the tables above (adding trapezoid items together.)
 - Use the tables at right to determine the Horizontal force based on the Restraint Spacing
 - Select restraint hardware appropriate for the Horizontal force requirements.
- (Force Class Units are LRFD [Strength] Based)*

Wt/Ft (lb)
10
25
50
100
150
200
250
300

Horizontal Force for Restraints Located 10 ft OC						
Elevation in Structure (% of total Building Height)						
Grade	16%	33%	50%	66%	84%	Roof
11	15	19	22	26	30	34
28	37	46	56	65	74	84
56	74	93	112	130	149	168
112	149	186	224	261	298	336
168	223	279	336	391	447	504
224	298	372	448	522	596	672
280	372	465	560	652	745	840
336	447	558	672	783	894	1008

Wt/Ft (lb)
10
25
50
100
150
200
250
300

Horizontal Force for Restraints Located 20 ft OC						
Elevation in Structure (% of total Building Height)						
Grade	16%	33%	50%	66%	84%	Roof
22	30	37	45	52	60	67
56	74	93	112	130	149	168
112	149	186	224	261	298	336
224	298	372	448	522	596	672
336	447	558	672	783	894	1008
448	596	744	896	1044	1192	1344
560	745	930	1120	1305	1489	1680
672	894	1115	1344	1566	1787	2016

Wt/Ft (lb)
10
25
50
100
150
200
250
300

Horizontal Force for Restraints Located 30 ft OC						
Elevation in Structure (% of total Building Height)						
Grade	16%	33%	50%	66%	84%	Roof
34	45	56	67	78	89	101
84	112	139	168	196	223	252
168	223	279	336	391	447	504
336	447	558	672	783	894	1008
504	670	837	1008	1174	1341	1512
672	894	1115	1344	1566	1787	2016
840	1117	1394	1680	1957	2234	2520
1008	1341	1673	2016	2348	2681	3024

Wt/Ft (lb)
10
25
50
100
150
200
250
300

Horizontal Force for Restraints Located 40 ft OC						
Elevation in Structure (% of total Building Height)						
Grade	16%	33%	50%	66%	84%	Roof
45	60	74	90	104	119	134
112	149	186	224	261	298	336
224	298	372	448	522	596	672
448	596	744	896	1044	1192	1344
672	894	1115	1344	1566	1787	2016
896	1192	1487	1792	2087	2383	2688
1120	1489	1859	2240	2609	2979	3360
1344	1787	2231	2688	3131	3575	4032

Wt/Ft (lb)
10
25
50
100
150
200
250
300

Horizontal Force for Restraints Located 60 ft OC						
Elevation in Structure (% of total Building Height)						
Grade	16%	33%	50%	66%	84%	Roof
67	89	112	134	157	179	202
168	223	279	336	391	447	504
336	447	558	672	783	894	1008
672	894	1115	1344	1566	1787	2016
1008	1341	1673	2016	2348	2681	3024
1344	1787	2231	2688	3131	3575	4032
1680	2234	2789	3360	3914	4468	5039
2016	2681	3346	4032	4697	5362	6047

Wt/Ft (lb)
10
25
50
100
150
200
250
300

Horizontal Force for Restraints Located 80 ft OC						
Elevation in Structure (% of total Building Height)						
Grade	16%	33%	50%	66%	84%	Roof
90	119	149	179	209	238	269
224	298	372	448	522	596	672
448	596	744	896	1044	1192	1344
896	1192	1487	1792	2087	2383	2688
1344	1787	2231	2688	3131	3575	4032
1792	2383	2974	3584	4175	4766	5375
2240	2979	3718	4480	5219	5958	6719
2688	3575	4462	5375	6262	7149	8063

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