

Maximum volume of enclosure that can be protected by the FireDETEC 3.0 lb. HFC-227ea system.



Table 4 - Maximum Volume Enclosure for 3 lb. System

Min. enclosure temperature	Design concentration number									
	7.5	8	9	10	11	12	13	14	15	16
0 °F	69.7	65.0	57.2	50.9	45.8	41.5	37.8	34.7	32.0	29.7
10 °F	71.3	66.5	58.4	52.0	46.8	42.4	38.7	35.5	32.7	30.3
20 °F	73.0	68.1	59.9	53.3	47.9	43.4	39.6	36.4	33.6	31.1
30 °F	74.8	69.7	61.3	54.6	49.1	44.5	40.6	37.2	34.4	31.8
40 °F	76.5	71.3	62.7	55.8	50.2	45.5	41.5	38.1	35.2	32.6
50 °F	78.2	73.0	64.1	57.1	51.3	46.5	42.5	39.0	35.9	33.3
60 °F	80.0	74.6	65.6	58.4	52.5	47.5	43.4	39.8	36.7	34.0
70 °F	81.7	76.2	67.0	59.6	53.6	48.6	44.3	40.7	37.5	34.8
80 °F	83.4	77.8	68.4	60.9	54.7	49.6	45.2	41.5	38.3	35.5
90 °F	85.1	79.3	69.7	62.1	55.8	50.6	46.2	42.4	39.1	36.2
100 °F	86.8	80.9	71.1	63.3	56.9	51.6	47.1	43.2	39.9	36.9
110 °F	88.5	82.5	72.5	64.6	58.0	52.6	48.0	44.1	40.7	37.7
120 °F	90.2	84.1	73.9	65.8	59.1	53.6	48.9	44.9	41.4	38.4
130 °F	91.8	85.6	75.3	67.0	60.2	54.6	49.8	45.7	42.2	39.1

Maximum volume of enclosure that can be protected by the FireDETEC 7.0 lb. HFC-227ea system.



Table 5 - Maximum Volume Enclosure for 7 lb. System

Min. enclosure temperature	Design concentration number									
	7.5	8	9	10	11	12	13	14	15	16
0 °F	162.7	151.7	133.4	118.8	106.8	96.8	88.3	81.1	74.8	69.3
10 °F	166.3	155.1	136.3	121.4	109.1	98.9	90.2	82.8	76.4	70.8
20 °F	170.4	158.9	139.7	124.3	111.8	101.3	92.5	84.9	78.3	72.5
30 °F	174.5	162.7	143.0	127.3	114.5	103.7	94.7	86.9	80.2	74.3
40 °F	178.5	166.5	146.4	130.3	117.1	106.1	96.9	88.9	82.0	76.0
50 °F	182.6	170.2	149.7	133.2	119.8	108.5	99.1	90.9	83.9	77.7
60 °F	186.6	174.0	153.0	136.2	122.4	110.9	101.2	92.9	85.7	79.4
70 °F	190.6	177.7	156.2	139.1	125.0	113.3	103.4	94.9	87.6	81.1
80 °F	194.6	181.4	159.5	142.0	127.6	115.7	105.6	96.9	89.4	82.8
90 °F	198.5	185.1	162.7	144.9	130.2	118.0	107.7	98.9	91.2	84.5
100 °F	202.5	188.8	166.0	147.7	132.8	120.4	109.9	100.8	93.0	86.2
110 °F	206.4	192.5	169.2	150.6	135.4	122.7	112.0	102.8	94.9	87.9
120 °F	210.4	196.1	172.5	153.5	138.0	125.1	114.1	104.8	96.7	89.5
130 °F	214.3	199.8	175.7	156.4	140.6	127.4	116.3	106.7	98.5	91.2

Maximum volume of enclosure that can be protected by the FireDETEC 14.0 lb. HFC-227ea system.



Table 6 - Maximum Volume Enclosure for 14 lb. System

Min. enclosure temperature	Design concentration number									
	7.5	8	9	10	11	12	13	14	15	16
0 °F	325.5	303.5	266.8	237.5	213.5	193.5	176.6	162.1	149.5	138.5
10 °F	332.6	310.2	272.7	242.7	218.2	197.8	180.5	165.7	152.8	141.6
20 °F	340.8	317.7	279.4	248.7	223.6	202.6	184.9	169.7	156.6	145.1
30 °F	349.0	325.4	286.1	254.6	228.9	207.5	189.4	173.8	160.3	148.5
40 °F	357.0	332.9	292.7	260.5	234.2	212.3	193.7	177.8	164.0	152.0
50 °F	365.1	340.5	299.3	266.4	239.5	217.1	198.1	181.9	167.8	155.4
60 °F	373.2	348.0	305.9	272.3	244.8	221.9	202.5	185.9	171.5	158.8
70 °F	381.2	355.4	312.5	278.1	250.0	226.6	206.8	189.8	175.1	162.3
80 °F	389.2	362.9	319.0	284.0	255.3	231.4	211.2	193.8	178.8	165.7
90 °F	397.0	370.2	325.5	289.7	260.5	236.1	215.4	197.7	182.4	169.0
100 °F	404.9	377.6	332.0	295.5	265.6	240.8	219.7	201.7	186.1	172.4
110 °F	412.9	385.0	338.5	301.3	270.9	245.5	224.0	205.6	189.7	175.8
120 °F	420.7	392.3	344.9	307.0	276.0	250.2	228.3	209.5	193.3	179.1
130 °F	428.6	399.6	351.3	312.7	281.1	254.8	232.5	213.5	196.9	182.4



HFC-227ea
CLEAN AGENT

Pre-engineered System
Calculation Guide

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How to determine the correct HFC- 227ea FireDETEC system for your application.

Step 1 Identify the hazard to protect and note the applicable design concentration number in Table 1 opposite. Round up to whole number.

Example: Hazard is Class C (Electrical) = 7.5. Round up to whole number = 8.

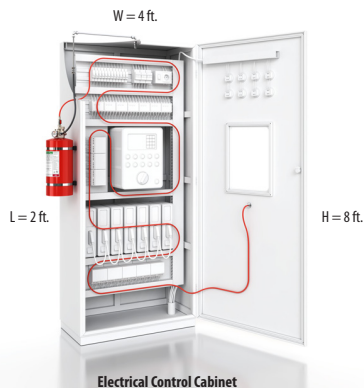


Table 1 - Hazards to Protect

Hazard to protect	Design Concentration
Acetone	10.0
Acetonitrille	7.0
Benzene	9.5
2.butoxyethanol	9.0
Butane	8.6
Commercial Heptane	8.7
Commercial Hexanes	9.0
Crude Oil	8.5
Cyclohexane	9.4
Cyclopentanone	9.6
Diesel	8.7
Diethyl Ether	9.8
Ethanol	12.6
Ethyl Acetate	8.9
Gasoline	9.0
N Heptane	9.6
Hydraulic Fluid	8.5
Hydraulic Oils	7.7
Isopropanol	9.8
JP 4	9.0
JP 5	9.0
Kerosene	9.6
Methanol	15.2
Methyl Ethyl Ketone	9.6
Methane	7.2
Propane	8.7
Toluene	7.6
Transformer Oil	9.5
Xylene	7.8
Class C (Electrical)	7.5
Class A Surface fires	7.0

Table 2 - Flooding Factor Numbers

Minimum Enclosure Temp	Design Concentration number														
	6	7	8	9	10	11	12	13	14	15					
130°F	0.0257	0.0303	0.0350	0.0398	0.0448	0.0498	0.0549	0.0602	0.0656	0.0711	0.0766	0.0821	0.0876	0.0931	0.0986
120°F	0.0262	0.0309	0.0357	0.0406	0.0456	0.0507	0.0560	0.0613	0.0668	0.0724	0.0779	0.0834	0.0889	0.0944	0.0999
110°F	0.0267	0.0315	0.0364	0.0414	0.0465	0.0517	0.0570	0.0625	0.0681	0.0738	0.0794	0.0850	0.0906	0.0962	0.1018
100°F	0.0272	0.0321	0.0371	0.0422	0.0474	0.0527	0.0581	0.0637	0.0694	0.0752	0.0809	0.0866	0.0923	0.0980	0.1037
90°F	0.0278	0.0327	0.0378	0.0430	0.0483	0.0538	0.0593	0.0650	0.0708	0.0767	0.0825	0.0883	0.0941	0.0999	0.1057
80°F	0.0283	0.0334	0.0386	0.0439	0.0493	0.0548	0.0605	0.0663	0.0722	0.0783	0.0843	0.0903	0.0963	0.1023	0.1083
70°F	0.0289	0.0341	0.0394	0.0448	0.0503	0.0560	0.0618	0.0677	0.0737	0.0799	0.0859	0.0919	0.0979	0.1039	0.1099
60°F	0.0295	0.0348	0.0402	0.0458	0.0514	0.0572	0.0631	0.0691	0.0753	0.0817	0.0880	0.0943	0.1006	0.1069	0.1132
50°F	0.0302	0.0356	0.0411	0.0468	0.0525	0.0584	0.0645	0.0707	0.0770	0.0835	0.0899	0.0963	0.1027	0.1091	0.1155
40°F	0.0309	0.0364	0.0421	0.0478	0.0537	0.0598	0.0659	0.0723	0.0787	0.0853	0.0918	0.0983	0.1048	0.1113	0.1178
30°F	0.0316	0.0372	0.0430	0.0489	0.0550	0.0612	0.0675	0.0739	0.0805	0.0873	0.0939	0.1005	0.1071	0.1137	0.1203

Step 2 To identify the flooding factors number determine the enclosure's minimum temperature and align this with the rounded up design concentration number in Table 2 left.

Example: Minimum temperature is 60°F, rounded up number is 8; therefore flooding factors number is 0.0402.

Step 3 Calculate cubic feet of enclosure by multiplying the width x length x height. To identify required system size multiply cubic feet of enclosure by the flooding factors number.

Example: Enclosure is 4 ft. W x 2 ft. L x 8 ft. H = 64 cubic feet. $64 \times 0.0402 = 2.5728$. **This would round up to the 3 lb. system.**

Step 4 Use Table 3 to double check that the enclosure to be protected does not exceed the **maximum area coverage** of the tested nozzles and the volume coverage does not exceed the **maximum hazard volume of enclosure** in Table 4.

Example: The enclosure area is 8 ft² and the max area coverage of the 3 lb. nozzle is 55.3 ft². The 3 lb. specified system can protect an enclosure up to 76.4 feet³ at a minimum temperature of 60°F, with a hazard design concentration of 8. Therefore we are well within the approved systems capabilities.

Table 3

System	Max Area Coverage
3 lb.	55.3 ft ²
7 lb.	129.0 ft ²
14 lb.	258.2 ft ²