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### **Quiz 1**

1. Which of the following is not a factor in the proper sizing of a vent system for a Category I appliance?
  - appliance input rating
  - vent gas temperature
  - appliance color
  - vent connector type
  - number of elbows in the venting system
2. An appliance equipped with an integral mechanical means to either draw or force products of combustion through the combustion chamber or heat exchanger is known as a \_\_\_\_\_.
  - fan-assisted combustion system
  - natural draft system
  - unnatural draft system
  - breathable system
  - none of the answers provided
3. The term "NAT Max" refers to the maximum input rating of a Category I \_\_\_\_\_ attached to a vent or connector.
  - water heater
  - fan-assisted appliance
  - draft hood-equipped appliance
  - natural appliance
  - native appliance
4. A venting table that shows "\_\_\_\_\_" for a given vent configuration means that the configuration is not allowed due to potential for condensate formation or pressurization of the venting system, or not applicable due to physical or geometric restraints.
  - FAN+NAT
  - 1000
  - neither
  - NA
  - DQ

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5. The maximum capacity of a vent serving a listed appliance with a vent damper can be found in a venting table " \_\_\_\_\_ " column.
- NAT Min
  - NAT Max
  - FAN Max
  - FAN+FAN
  - none of the answers provided

## Quiz 2

1. Single-appliance venting configurations with zero (0) lateral lengths in Tables 504.2(1), 504.2(2) and 504.2(5) shall have \_\_\_\_\_ elbow(s) in the venting system.
- no more than two
  - at least one
  - one
  - zero
  - an odd number of
2. Using Table 504.2(1) for a single appliance connected directly to the vent, what is the FAN Max value for a 4" connector with a total vent height of 6 feet and 0 lateral length?
- 78,000 Btu/h
  - 152,000 Btu/h
  - 97,000 Btu/h
  - 251,000 Btu/h
  - 112,000 Btu/h
3. Using Table 504.2(1), what diameter vent is required for a natural draft appliance rated at 110,000 Btu/h if the total vent height available is 10 feet and the system contains no lateral venting or elbows?
- 6 inches
  - 10 inches
  - 3 inches
  - 5 inches
  - 4.5 inches
4. The venting tables for single appliance venting configurations with lateral lengths allow for \_\_\_\_\_ 90-degree elbow(s) in the system.
- zero
  - three
  - one
  - one and a half
  - two

5. For each additional elbow up to and including 45 degrees beyond the allowable two 90-degree elbows, the maximum capacity listed in the venting tables shall be reduced by \_\_\_\_\_.
- 5000 Btu/h
  - 5 percent
  - 10 percent
  - 10,000 Btu/h
  - none of the answers provided

## Quiz 3

1. Using Table 504.2(2), what is the capacity range of a 4" vent serving a fan-assisted appliance if the vent is 15 feet high with zero feet of lateral?
- 36,000 Btu/h to 93,000 Btu/h
  - this configuration is not allowed
  - 56,000 Btu/h to 190,000 Btu/h
  - 82,000 Btu/h to 293,000 Btu/h
  - 116,000 Btu/h to 499,000 Btu/h
2. Using Table 504.2(2) what is the FAN Min value of a 5" vent if the vent is 8 feet high with zero feet of lateral?
- 37,000 Btu/h
  - 83,000 Btu/h
  - 123,000 Btu/h
  - 69,000 Btu/h
  - none of the answers provided
3. Using Table 504.2(2), what is the maximum capacity in thousands of Btu/h of a 6" vent serving a fan-assisted appliance if the vent is 30 feet high with zero feet of lateral?
- 99
  - 211
  - 584
  - 429
  - 610
4. Gas appliances installed at high altitudes must have their input ratings increased in order to compensate for the lack of oxygen.
- True
  - False
5. For appliances with more than one input rate, the minimum vent capacity (FAN Min) determined from the tables shall be \_\_\_\_\_ the lowest appliance input rating.
- equal to
  - greater than or equal to
  - less than or equal to
  - less than
  - none of the answers provided

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## Quiz 4

1. A Type B vent or listed chimney lining system passing through an unused masonry chimney flue shall not be considered to be exposed to the outdoors.
  - True
  - False
2. Where vents extend outdoors above the roof more than 5 feet higher than required by Figure 503.6.4, and where vents terminate in accordance with Section 503.6.4, Item 2, \_\_\_\_\_.
  - the outdoor portion of the vent shall be enclosed
  - the vent height must be reduced to comply with Figure 503.6.4
  - the outdoor portion of the vent must be Type B double wall
  - the entire vent system must be Type B double wall
  - none of the answers provided
3. A Type B vent shall not be considered to be exposed to the outdoors where it passes through an unventilated enclosure or chase insulated to a value of \_\_\_\_\_.
  - R5
  - less than R8
  - not less than R8
  - at least R7 or R8
  - no more than R7
4. Which of the following is not a requirement to use Table 504.2(3) in combination with Table 504.2(6) to size vents for clay-tile-lined exterior masonry chimneys?
  - The vent connector is a Type B double wall
  - The vent connector length is limited to 12 feet per inch of vent connector diameter
  - The appliance is draft-hood equipped
  - The input rating is less than the maximum capacity given by Table 504.2(3)
  - For a water heater, the outdoor design temperature is not less than 5°F
5. Corrugated vent connectors \_\_\_\_\_ the listed appliance categorized vent diameter, flue collar diameter or draft hood outlet diameter.
  - must be the same size as
  - are permitted to be one size smaller than
  - shall not be the same size as
  - must be smaller than
  - shall be the same size or larger than

## Quiz 5

1. The maximum capacity of a vent connector serving a listed appliance with a vent damper can be found in the \_\_\_\_\_ column of the venting tables.
  - NAT Min
  - FAN Max
  - FAN+FAN
  - NAT Max
  - Appliance Input Rating Limit
2. The maximum capacity of a vertical vent with a vent damper that serves two listed appliances with draft hoods can be found in the \_\_\_\_\_ column of the venting tables.
  - NAT Max
  - NAT+NAT
  - NAT Damp
  - FAN+FAN
  - FAN Max
3. The minimum capacity of a vent connector serving a listed appliance with a vent damper can be found in the \_\_\_\_\_ column of the venting tables.
  - NAT Min
  - NAT+NAT
  - FAN Max
  - FAN Min
  - none of the answers provided
4. A vent connector shall be routed to the vent utilizing \_\_\_\_\_.
  - the shortest possible route
  - the maximum number of elbows
  - at least two different types of vents
  - a uniform cross section
  - metallic piping
5. According to Table 504.3.2, what is the maximum permissible lateral distance for a 6-inch diameter vent connector?
  - 6 feet
  - 7-1/2 feet
  - 8 feet
  - 9 feet
  - 12 feet

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## Quiz 6

1. At the point where tee or wye fittings connect to a common vent, the opening size of the fitting shall be \_\_\_\_\_.
  - equal to the size of the common vent
  - no less than 4 inches
  - equal to the size of the vent connector
  - no more than double the size of the vent connector
  - none of the answers provided
2. \_\_\_\_\_ for each appliance connector shall be measured from the draft hood outlet or flue collar to the centerline where the vent gas streams come together.
  - Input capacity
  - Altitude derating
  - Maximum lateral
  - Connector diameter
  - Connector rise
3. For multiple appliances located on one floor, available total height (H) shall be measured from the highest draft hood outlet or flue collar up to \_\_\_\_\_.
  - the level where the common vent passes through the roof
  - the level where the common vent passes through the next floor
  - a location determined by the venting tables
  - the level of the outlet of the common vent
  - none of the answers provided
4. According to Table 504.3(1), what is the maximum permissible vent connector rise for a total vent height of 15 feet?
  - 1 foot
  - 1.5 feet
  - 3 feet
  - 2 feet
  - 5 feet
5. Using Table 504.3(1) to size a vent system with two 40,000 Btu/h natural draft water heaters, both with 2 feet of connector rise and total vent height of 10 feet, what is the minimum vent connector size for each of the water heaters?
  - 3 inches
  - 4 inches
  - 4.5 inches
  - 5 inches
  - 6 inches

## Quiz 7

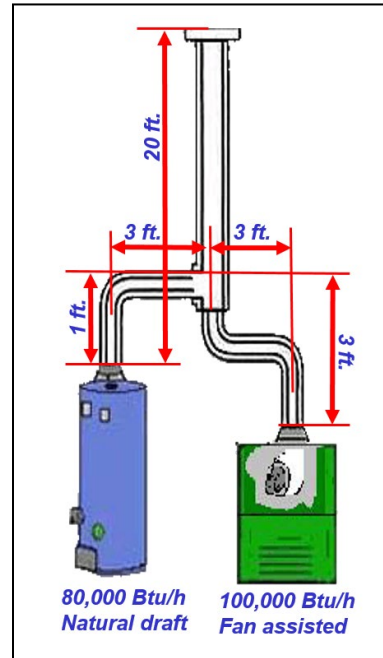
1. For multistory installations, available total height for each segment of the system shall be the vertical distance between the highest draft hood outlet or flue collar entering that segment and \_\_\_\_\_.
  - the common vent outlet
  - the centerline of the next higher interconnection tee
  - the bottom of the next higher interconnection tee
  - the level of the vent penetration into the ceiling
  - none of the answers provided
2. Where used in multistory systems, vertical common vents shall be \_\_\_\_\_, and shall be installed with a listed vent cap.
  - single-wall
  - corrugated metal
  - tile-lined masonry chimney
  - Type B double wall
  - Type L
3. How many offsets are permitted in the vertical vent of a multistory vent system?
  - one
  - two
  - one and a half
  - three
  - zero
4. Which of the following is NOT a requirement of an offset in a multistory vent system?
  - The offset angle shall not exceed 45 degrees from vertical.
  - The horizontal length of the offset shall not exceed 1-1/2 feet for each inch of common vent diameter of the segment in which the offset is located.
  - A multistory common vent shall be reduced no more than one size above the offset.
  - For the segment of the common vertical vent containing the offset, the common vent capacity listed in the common venting tables shall be reduced by 20 percent.
  - A multistory common vent shall not be reduced in size above the offset.

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5. Using Table 504.3(1), what is the capacity in thousands of Btu/h of a 6-inch diameter multistory common vent with an offset and a total height of 20 feet that serves two fan-assisted furnaces?
- 229
  - 255
  - 314
  - 183
  - 215

Use the diagram below and Tables 504.3(1) and Expanded Table 504.3.2 to answer the next four questions. All vents are Type B.



## Quiz 8

1. Where two or more appliances are connected to a chimney, the flow area of the largest section of vertical vent or chimney shall not exceed \_\_\_\_\_ times the smallest listed appliance categorized vent areas, flue collar area or draft hood outlet area unless designed in accordance with approved engineering methods.
- two
  - five
  - six
  - four
  - none of the answers provided

Diameter (inches)	3	4	5	6	7	8	10	12	14	16	18
Area (sq. inches)	7.1	12.6	19.6	28.3	38.5	50.2	78.5	113.0	153.9	201.0	254.3

2. Where two appliances are connected with 4-inch diameter connectors to a common vertical vent, what is the maximum permissible diameter of the common vent?
- 6 inches
  - 7 inches
  - 8 inches
  - 10 inches
  - 12 inches

3. What is the minimum diameter of the water heater vent connector?
- 3 inches
  - 4 inches
  - 5 inches
  - 6 inches
  - none of the answers provided
4. What is the minimum diameter of the furnace vent connector?
- 6 inches
  - 4 inches
  - 2 inches
  - 5 inches
  - 3 inches
5. A 4 inches vent connector has a horizontal length of 10 ft. The capacity of the connector must be \_\_\_\_\_ Hint – See Table 504.3.2 Maximum Vent Connector Length
- increased 20%.
  - decreased 20%.
  - increased 10%.
  - decreased 10%.
  - the same since horizontal length does not change capacity.

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## Quiz 9

1. Tables 504.3(1), 504.3(2), 504.3(3), 504.3(4) and 504.3(5) shall be used only for chimneys and vents not exposed to the outdoors \_\_\_\_\_.
  - at any time
  - in areas with typical winter temperatures below freezing
  - below the roof line
  - unless insulated to R6 or greater
  - more than 5 feet
2. Where vents extend outdoors above the roof more than \_\_\_\_\_ feet higher than required by Figure 503.6.4 and where vents terminate in accordance with Section 503.6.4, Item 2, the outdoor portion of the vent shall be enclosed as required by this section for vents not considered to be exposed to the outdoors, or such venting system shall be engineered.
  - 10
  - 5
  - 8
  - 14
  - 6
3. In order to use the venting tables for clay-tile-lined exterior masonry chimneys, it is required that all vent connectors are \_\_\_\_\_.
  - Type B double-wall
  - horizontal
  - at least 5 inches in diameter
  - Type L-W
  - lined with clay tile
4. A requirement for using the venting tables for clay-tile-lined exterior masonry chimneys is that \_\_\_\_\_ of the appliances must be equipped with a draft hood.
  - none
  - no more than two
  - at least one
  - no less than two
  - no more than one
5. In order to use the venting tables to size the chimney, the total appliance input ratings of two natural draft water heaters connected with Type B vents to a clay-tile-lined exterior masonry must be \_\_\_\_\_ the maximum capacity given by Table 504.3(6a) for NAT+NAT.
  - equal to
  - greater than or equal to
  - not exceed
  - less than or equal to
  - greater than

## Quiz 10

1. Where a table permits more than one diameter of pipe to be used for a connector or vent, \_\_\_\_\_.
  - the largest diameter must be selected
  - the smallest diameter must be selected
  - any two diameters are permitted to be used
  - the calculations must be repeated to correct the error
  - all the permitted sizes shall be permitted to be used
2. Extrapolation beyond the venting table entries \_\_\_\_\_.
  - shall be permitted
  - is permitted, provided the values are within 10% of the table capacities
  - shall not be permitted without prior approval from the Authority Having Jurisdiction
  - shall not be permitted
  - can be calculated in the same way as interpolating between the table values
3. For vent heights less than 6 feet and greater than shown in the tables, \_\_\_\_\_ shall be used to calculate vent capacities.
  - interpolation
  - engineering methods
  - estimation
  - extrapolation
  - computer simulation
4. Where the actual height of a vent falls between entries in the height column of the applicable table, it is acceptable to use the \_\_\_\_\_.
  - extrapolated capacity
  - higher appliance input rating shown in the table for FAN Max and NAT Max column values
  - lower appliance input rating shown in the table for FAN Max and NAT Max column values
  - value that falls halfway between the FAN Max and NAT Max column values
  - estimated capacity based on the table values
5. Where the actual height of a vent falls between entries in the height column of the applicable table, it is acceptable to use the \_\_\_\_\_.
  - higher appliance input rating for the FAN Min column values
  - lower appliance input rating for the FAN Min column values
  - value that falls halfway between the FAN Min column values
  - estimated capacity based on the table values
  - value interpolated between the FAN Min and FAN Max values

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**ABBREVIATED TABLE 504.2(1) TYPE B DOUBLE-WALL GAS VENT**

Number of Appliances		Single												
Appliance Type		Category I												
Appliance Vent Connection		Connected directly to vent												
HEIGHT (H) (feet)	LATERAL (L) (feet)	VENT DIAMETER (D) (inches)												
		3			4			5			6			
		APPLIANCE INPUT RATING IN THOUSANDS OF BTU/H												
		FAN		NAT	FAN		NAT	FAN		NAT	FAN		NAT	
Min	Max	Max	Min	Max	Max	Min	Max	Max	Min	Max	Max	Min	Max	Max
6	0	0	78	46	0	152	86	0	251	141	0	375	205	
	2	12	51	36	18	97	67	27	157	105	32	232	157	
	4	21	49	34	30	94	64	39	153	103	50	227	153	
	6	25	46	32	36	91	61	47	149	100	59	223	149	
8	0	0	84	50	0	165	94	0	276	155	0	415	235	
	2	12	57	40	16	109	75	25	178	120	28	263	180	
	5	23	53	38	32	103	71	42	171	115	53	255	173	
	8	28	49	35	39	98	66	51	164	109	64	247	165	
10	0	0	88	53	0	175	100	0	295	166	0	447	255	
	2	12	61	42	17	118	81	23	194	129	26	289	195	
	5	23	57	40	32	113	77	41	187	124	52	280	188	
	10	30	51	36	41	104	70	54	176	115	67	267	175	
15	0	0	94	58	0	191	112	0	327	187	0	502	285	
	2	11	69	48	15	136	93	20	226	150	22	339	225	
	5	22	65	45	30	130	87	39	219	142	49	330	217	
	10	29	59	41	40	121	82	51	206	135	64	315	208	
	15	35	53	37	48	112	76	61	195	128	76	301	198	
20	0	0	97	61	0	202	119	0	349	202	0	540	307	
	2	10	75	51	14	149	100	18	250	166	20	337	249	
	5	21	71	48	29	143	96	38	242	160	47	367	241	
	10	28	64	44	38	133	89	50	229	150	62	351	228	
	15	34	58	40	46	124	84	59	217	142	73	337	217	
	20	48	52	35	55	116	78	69	206	134	84	322	206	

**EXPANDED TABLE 504.3.2 MAXIMUM VENT CONNECTOR LENGTH**

CONNECTOR DIAMETER (inches)	CONNECTOR MAX HORIZONTAL LENGTH (feet)	VENT CAPACITY REDUCED 10%	VENT CAPACITY REDUCED 20%
		CONNECTOR MAX HORIZ LENGTH (feet)	
3	4-1/2	9	13-1/2
4	6	12	18
5	7-1/2	15	22-1/2
6	9	18	27
7	10-1/2	21	30-1/2
8	12	24	36
9	13-1/2	27	40-1/2
10	15	30	45
12	18	36	54
14	21	42	63
16	24	48	72
18	27	54	81
20	30	60	90
22	33	66	99
24	36	72	108

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<b>ABBREVIATED TABLE 504.2(2) TYPE B DOUBLE-WALL GAS VENT</b>																
		Number of Appliances: <b>Single</b>														
		Appliance Type: <b>Category I</b>														
		Appliance Vent Connection: <b>Single Wall Metal Connector</b>														
		Vent Diameter – <i>D</i> (in.)														
		3			4			5			6			7		
		Appliance Input Rating in Thousands of Btu per Hour														
Height (ft)	Lateral (ft)	FAN		NAT	FAN		NAT	FAN		NAT	FAN		NAT	FAN		NAT
		Min	Max	Max	Min	Max	Max	Min	Max	Max	Min	Max	Max	Min	Max	Max
6	0	38	77	45	59	151	85	85	249	140	126	373	204	165	522	284
	2	39	51	36	60	96	66	85	156	104	123	231	256	159	320	213
	4	NA	NA	33	74	92	63	102	152	102	146	225	152	187	313	208
	6	NA	NA	31	83	89	60	114	147	99	163	220	148	207	307	203
8	0	37	83	50	58	164	93	83	273	154	123	412	234	161	580	319
	2	39	56	39	59	108	75	83	176	119	121	261	179	155	363	246
	5	NA	NA	37	77	102	69	107	168	114	151	252	171	193	353	235
	8	NA	NA	33	90	95	64	122	161	107	175	243	163	223	342	225
10	0	37	87	53	57	174	99	82	293	165	120	444	254	158	628	344
	2	39	61	41	59	117	80	82	193	128	119	287	194	153	400	272
	5	52	56	39	76	11	76	105	185	122	148	277	186	190	388	261
	10	NA	NA	34	97	100	68	132	171	112	188	261	171	237	369	241
15	0	36	93	57	56	190	111	80	325	186	116	499	283	153	713	388
	2	38	69	47	57	136	93	80	225	149	115	337	224	148	473	314
	5	51	63	44	75	128	86	102	216	140	144	326	217	182	459	298
	10	NA	NA	39	95	116	79	128	201	131	182	308	203	228	438	284
	15	NA	NA	NA	NA	NA	72	158	186	124	220	290	192	272	418	269
20	0	35	96	60	54	200	118	78	346	201	114	537	306	149	772	428
	2	37	74	50	56	148	99	78	248	165	113	375	248	144	528	344
	5	50	68	47	73	140	94	100	239	1158	141	363	239	178	514	334
	10	NA	NA	41	93	129	86	125	223	146	177	344	224	222	491	316
	15	NA	NA	NA	NA	NA	80	155	208	136	216	325	210	264	469	301
	20	NA	NA	NA	NA	NA	NA	186	192	126	254	306	196	309	448	285
30	0	34	99	63	53	211	127	76	372	210	110	584	334	144	849	472
	2	37	80	56	55	164	111	76	281	183	109	429	279	139	610	392
	5	49	74	52	72	157	106	98	271	173	136	417	271	171	595	382
	10	NA	NA	NA	91	144	98	122	255	168	171	397	257	213	570	367
	15	NA	NA	NA	115	131	NA	151	239	157	208	377	242	255	547	349



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**ABBREVIATED TABLE 504.3(1) TYPE B DOUBLE-WALL VENT**

<b>Number of Appliances</b>		Two or more													
<b>Appliance Type</b>		Category I													
<b>Appliance Vent Connection</b>		Type B double-wall connector													
VENT CONNECTOR CAPACITY															
HEIGHT (H) (feet)	CONNECTOR RISE (R) (feet)	TYPE B DOUBLE WALL VENT AND CONNECTOR DIAMETER (D) (inches)													
		3			4			5			6				
		APPLIANCE INPUT RATING LIMITS IN THOUSANDS OF BTU/H													
		FAN		NAT		FAN		NAT		FAN		NAT		FAN	
		Min	Max	Max	Min	Max	Max	Min	Max	Max	Min	Max	Max		
6	1	22	37	26	35	66	46	46	106	72	58	164	104		
	2	23	41	31	37	75	55	48	121	86	60	183	124		
	3	24	44	35	38	81	62	49	132	96	62	199	139		
8	1	22	40	27	35	72	48	49	114	76	64	176	109		
	2	23	44	32	36	80	57	51	128	90	66	195	129		
	3	24	47	36	37	87	64	53	139	101	67	210	145		
10	1	22	43	28	34	78	50	49	123	78	65	189	113		
	2	23	47	33	36	86	59	51	136	93	67	206	134		
	3	24	50	37	37	92	67	52	146	104	69	220	150		
15	1	21	50	30	33	89	53	47	142	83	64	220	120		
	2	22	53	35	35	96	63	49	153	99	66	235	142		
	3	24	55	40	36	102	71	51	163	111	68	248	160		
20	1	21	54	31	33	99	56	46	157	87	62	246	125		
	2	22	57	37	34	105	66	48	167	104	64	259	149		
	3	23	60	42	35	110	74	50	176	116	66	271	168		
30	1	20	62	33	31	113	59	45	181	93	60	288	134		
	2	21	64	39	33	118	70	47	190	110	62	299	158		
	3	22	66	44	34	123	79	48	198	124	64	309	178		

COMMON VENT CAPACITY									
VENT HEIGHT (H) (feet)									
	4			5			6		
	COMBINED APPLIANCE INPUT RATING IN THOUSANDS OF BTU/h								
	FAN	FAN	NAT	FAN	FAN	NAT	FAN	FAN	NAT
+FAN	+NAT	+NAT	+FAN	+NAT	+NAT	+FAN	+NAT	+NAT	
6	92	81	65	140	116	103	204	161	147
8	101	90	73	155	129	114	224	178	163
10	110	97	79	169	141	124	243	194	178
15	125	112	91	195	164	144	283	228	206
20	136	123	102	215	183	160	314	255	229
30	152	138	118	244	210	185	361	297	266