

SBC 8001 GAS PIPING. Approval of Materials and Appliances. No person shall install any material to connect same to any gas system, which material has not been approved by the administrative authority.

The administrative authority shall accept for installation any appliance or material which has been listed by a recognized national testing laboratory, until such time as experience in the field of actual service developing unforeseen factors warranting withdrawal of acceptance.

SBC 8002 Gas Piping Material, Connection. All pipe used for the distribution of natural or liquid petroleum gas shall be steel, wrought iron, copper or brass of full weight standard gauge and thickness. Steel and wrought iron pipe shall comply with A.S.A. B36.10. Steel and wrought iron piping run outside exposed above ground shall be galvanized, painted, or coated with an approved rust resistant material.

All steel and wrought iron pipe 2½ inch and larger shall be welded. Fittings on screw or flange piping, (except stopcocks and valves) shall be malleable iron, wrought iron or steel.

Copper tubing or approved steel tubing shall be of standard type K or L or equivalent, complying with A.S.T.M. B88 and having a minimum wall thickness for each tubing size in compliance with A.S.T.M. specifications. Joints shall be made by approved flared gas fittings or by brazing with a material having a melting point in excess of 1000° F. Compression type fittings shall not be used for this purpose. Copper or iron tubing shall not be used for piping within the burner heat zone to pilot burners.

SBC 8003 Flexible Gas Tubing Connections. No person shall install, use or maintain flexible gas connections between gas burning devices and the supply piping except on specific approval of the administrative authority. When a flexible connection is made, a shut off valve must always be provided at the end where the flexible connector is attached to the rigid piping.

SBC 8004 New Materials. Any materials may be permitted other than as specified in this Code, if the administrative authority approves such materials as being of the same quality and performance as the material specified herein.

SBC 8005 Defective Pipe and Fittings. Defects in pipe or fittings shall in no case be repaired. All such defective pipe or fittings shall, when located, be removed and replaced with perfect material. All pipe and fittings shall be of perfect material, all pipe ends shall be reamed free of burrs and welding slag.

SBC 8006 Construction and Installation, Generally. All piping installed for the distribution of natural or liquid petroleum gas shall be so constructed and installed as to be durable, substantial and gas tight. It shall be run substantially square with the building construction in a neat orderly fashion.

SBC 8007 Piping Supports. Gas piping in buildings shall be supported with pipe hooks, metal pipe straps, bands or hangers suitable for the size of piping, and of adequate strength and quality and located at proper intervals

so the piping cannot be moved accidentally from the installed position. Gas piping shall not be supported by or used to support other piping. Spacing of supports in piping installations shall not be greater than the following:

$\frac{3}{8}$ inch	4 feet
$\frac{1}{2}$ inch	6 feet
$\frac{3}{4}$ inch or 1 inch.....	10 feet

Vertical piping shall be supported at every floor by a specific means of support.

SBC 8008 Outside Exposed Piping. Gas piping may be run inside or outside the building regardless of temperature changes. Provision shall be made to allow for expansion and contraction of the piping.

SBC 8009 Drips. Condensate drips are not required when using natural or liquid petroleum gas.

A tee fitting with the bottom outlet plugged or capped shall be installed at the base of supply piping when dropping down to an automatically controlled gas burner or appliance, where dirt or foreign material could cause an automatic gas valve to malfunction.

SBC 8010 Pipe Threads

(1) **SPECIFICATIONS FOR PIPE THREADS.** Pipe and fitting threads shall comply with the American Standard for Pipe Threads (except Dryseal), B 2.1.

(2) **DAMAGED THREADS.** Pipe with threads which are stripped, chipped, corroded, or otherwise damaged shall not be used.

(3) **NUMBER OF THREADS.** Pipe shall be threaded in accordance with Table 3.

SPECIFICATIONS FOR THREADING PIPE

Iron Pipe Size (Inches)	Approximate Length of Threaded Portion (Inches)	Approximate No. of Threads to be Cut
$\frac{1}{2}$	$\frac{3}{4}$	10
$\frac{3}{4}$	$\frac{3}{4}$	10
1	$\frac{7}{8}$	10
$1\frac{1}{4}$	1	11
$1\frac{1}{2}$	1	11
2	1	11
$2\frac{1}{2}$	$1\frac{1}{2}$	12
3	$1\frac{1}{2}$	12
4	$1\frac{5}{8}$	13

SBC 8011 Bending Prohibited. Pipe shall not be bent. Fittings shall be used when making turns in the gas piping. Proper bends will be allowable with copper tubing.

SBC 8012 Joint Compounds. Joint compounds (pipe dope) shall be applied sparingly and only to the male threads of pipe joints. Such compounds shall be resistant to the action of liquified petroleum gases.

SBC 8013 Structure Protection. The building structure shall not be weakened by the installation of any gas piping. Before the beams or joists are cut or notched, special permission shall be obtained from the administrative authority.

SBC 8014 Piping Protection. Pipes passing through concrete, or other corrosive materials, shall pass through sleeves, casings or be suitably coated to protect against corrosion and mechanical damage.

SBC 8015 Restricted Pipe Runs. Gas pipes inside any building shall not be run in or through an air duct, clothes chute, chimney or flue, ventilating duct, dumb waiter or elevator shaft or be run in false ceilings when the space is used as an air plenum. Pipe shafts specifically designed for this purpose will be acceptable.

SBC 8016 Restrictions on Concealed Piping. Piping run in inaccessible or concealed spaces in or under buildings shall be constructed and installed to prevent a hazardous accumulation of gas. Concealed piping in walls should be located in hollow rather than solid partitions.

Piping run underground inside the building, or run in solid floors such as concrete, shall be run in conduits or casings. Piping may be laid in channels in the floor that have removable covers to permit access to the piping with a minimum of damage to the building. Such casings, conduits or channels shall be left open into an accessible location or be vented so a leak will be readily detected.

Piping run underground inside the building and extending underground outside the building shall be encased in a gas-tight conduit. The conduit shall extend into a normally usable and accessible portion of the building and at the point where the conduit terminates in the building, the space between the conduit and gas pipe shall be sealed to prevent the possible entrance of any gas leakage. The conduit shall be vented above grade to the outside and the vent terminal shall be screened and hooded to prevent accidental closure. The conduit shall extend at least four inches (4") beyond the outside building wall or any adjacent paved area, except the conduit need not exceed ten feet (10') in distance from the building under any paved area. The space between the gas pipe and the conduit at the underground end shall be left open.

Concealed tubing run through joists, studs, plates, or other wood construction within 2 inches of the rough surface, shall be protected from physical damage by steel plates or sleeves of at least 20 gauge thickness.

Unions, flared or compression fittings, running threads, right and left couplings, or bushings shall not be used on concealed gas piping inside the building.

SBC 8017 Depth of Piping Outside Underground. Any gas piping to be run underground outside the building shall have not less than 6 inches of ground cover unless otherwise approved by the administrative authority.

SBC 8018 Piping Underground Outside. Any gas piping to be run underground outside the building shall be copper, steel, or wrought iron.

Steel or wrought iron pipe shall have an approved outside protective coating of polyethylene, polyvinyl, or its equivalent of 10 mil thickness or greater. The pipe shall not be threaded, but shall be joined by welding or mechanical joints, and such joints shall be suitably wrapped with an approved protective coating.

SBC 8019 Meter Location

(1) The meter location shall be such that the meter can be easily read and the connections are readily accessible for servicing. Location, space requirements, dimensions, and type of installation shall be acceptable to the servicing gas supplier.

SBC 8020 Meter Support. Meters shall be adequately supported from the structure or shall be on a substantial slab and so connected to the piping as not to exert undue strain on the connection.

SBC 8021 Meter Room Ventilation. Meter room shall be ventilated, when necessary, through adequate grills in doors, walls or local ventilation to outer air. Grills in doors or walls shall not be open into building interiors.

SBC 8022 Main Gas Supply Shut-off. When meters are installed inside the building, a main shut-off valve shall be installed in a readily accessible location inside the building on the street side of the meter.

When meter or meters are installed on the exterior of the building walls, a main shut-off valve, same size as the main building gas supply shall be installed on the inside of the building between the meter and the first branch gas line. This shut-off valve shall be installed in the first readily accessible location for use and operation and shall have a permanently attached handle. In multiple dwellings this main shut-off valve shall not be located in an apartment or locked room, but shall be in the utility room or otherwise so located in an apartment or locked room, but shall be in the utility room or otherwise so located as to be readily accessible to all occupants of the building at all times. All valves shall be clearly visible or of easy access.

All Main shut-off valves shall be approved lubricated plug-type, ball type, or of a type approved by the administrative authority.

SBC 8023 Gas Valves. For each burning device there shall be provided, in the pipe supplying same, and adjacent thereto, an independent shut-off valve, placed in an accessible location.

Every valve shall be readily accessible for operation and repair. All gas valves shall be of lever handle type. Inputs exceeding 1,000,000 BTU per hour, or where metering or regulating pressure exceeds 14 inches water column, the valve shall be an approved lubricated plug type, ball type, or of a type approved by the administrative authority.

(1) Accessibility of Gas Valves. Main shut-off valves controlling several gas piping systems shall be placed an adequate distance from each other so they will be easily accessible for operation and shall be installed so as to be protected from physical damage. It is recommended that they be plainly marked with a metal tag attached by the installing agency so that the gas piping systems supplied through them can be readily identified. It is advisable to place a shut-off valve at every point where safety, convenience of operation, and maintenance demands.

(2) Shut-off Valves for Multiple House Lines.

(a) In multiple tenant buildings supplied through a master meter or one service regulator when a meter is not provided, or where meters or service regulators are not readily accessible from the appliance location, an individual shut-off valve for each apartment, or for each separate house line, shall be provided at a convenient point of general accessibility.

(b) In a common system serving a number of individual buildings, shut-off valves shall be installed at each building.

SBC 8024 Electrical Grounding

(a) A gas piping system within a building shall not be used as a grounding electrode.

(b) Underground gas service piping shall not be used as a grounding electrode.

(c) Gas piping shall be grounded to an NEC approved ground. See Z 21:30.

SBC 8025 Gas Pressure Regulators

(1) General. All relief devices or regulators equipped with relief devices shall be vented to the outside atmosphere.

When the gas supply pressure is higher than the pressure at which the burner or appliance is designed to operate, a gas pressure regulator shall be installed.

(2) High Pressure Gas Regulators. Gas regulators designed to regulate from pounds inlet pressure to pounds outlet pressure shall:

(a) Have a pressure rating of not less than the protected metering pressure.

(b) Be of the full lock up type.

(c) All such regulators shall be vented to the outside of the building.

* (3) High Pressure to Low Pressure Regulators. Gas regulators designed to regulate pounds inlet pressure to low outlet pressure shall:

(a) Have a pressure rating of not less than the protected metering pressure.

(b) Be of the full lock up type.

(c) All such regulators shall be vented to the outside of the building, except that regulators equipped with vent limiting devices, to limit the escape of gas from the vent opening in the event of diaphragm failure, may be used without outside vents when approved by the administrative authority.

(4) Low Pressure Regulators. Gas regulators designed to regulate from low inlet pressure to lower outlet pressure shall:

(a) Low pressure regulators are not required to be vented to the outside of the building unless the connected load exceeds 1,000,000 BTU per hour.

(b) Low pressure regulator vents shall be protected from stoppage by dirt and foreign matter.

(c) Low pressure regulator vents shall not be vented into a combustion chamber that is equipped with an intermittent pilot.

(5) **Regulator Installation.** All regulator installations shall comply with the following:

(a) Regulators shall be installed in accordance with the manufacturer's instructions.

(b) Regulators shall be rated to supply the total load required.

(c) Regulators shall be readily accessible for servicing in no case shall said regulators be covered by ceiling or other types of unventilated construction.

(d) All regulators shall be provided with an accessible shut-off valve for servicing the regulator.

(e) High gas pressure protection shall be provided when using a high pressure regulator or a high pressure to low pressure regulator unless otherwise approved by the administrative authority. The protection device may be incorporated as part of the regulator or by separate pressure limiting mechanism.

(f) When regulators are required to be vented to the outside of the building, such vent piping shall be sized in accordance with the manufacturer's instructions. Vent piping shall terminate a minimum of six feet away from combustion or any air inlet to the building and shall be suitably screened and hooded so as to prevent accidental closure of the vent pipe.

(g) Regulators shall be vented individually unless otherwise approved by the administrative authority.

(h) Regular vents shall not terminate into a vent connector, breeching, stack, or chimney.

SBC 8026 Size of Piping to Gas Appliances

(1) Gas piping shall be of such size and so installed as to provide a supply of gas sufficient to meet the maximum demand without undue loss of pressure between the meter, or service regulator when a meter is not provided, and the appliance or appliances. The size of the gas piping depends upon the following factors:

(a) Allowable loss in pressure from meter, or service regulator when a meter is not provided, to appliances.

(b) Maximum gas consumption to be provided.

(c) Length of piping and number of fittings.

(d) Specific gravity of the gas.

(e) Diversity factor.

(f) Manufacturers minimum pressure requirement at the appliance.

SBC 8027 Gas Consumption

(1) The quantity of gas to be provided at each outlet shall be determined, whenever possible, directly from the manufacturer's BTU rating of the appliance which will be installed. In case the ratings of the appliances to be installed are not known, Table 1, is given to show the approximate consumption of average appliances of certain types in BTU per hour.

(2) To obtain the cubic feet per hour of gas required, divide the total BTU input of all appliances by the average BTU heating value per cubic foot of gas (1,000 BTU per hour.) for natural gas.

APPENDIX C

Chapter 9

Sizing of Venting Systems Serving Appliances Equipped with Draft Hoods and Appliances Listed for Use with Type B Vents

See Sections 103 and 901, Uniform Mechanical Code.

Use of Tables

Sec. 918. (a) General. Gas-venting systems serving appliances equipped with draft hoods and appliances listed for use with Type B vents may be sized in accordance with tables in this chapter, when such design method has been approved by the building official.

(b) Symbols. Symbols used in Tables Nos. C-9-A, C-9-B and C-9-C are as indicated in Figures Nos. 1 and 2. Symbols used in Tables Nos. C-9-D, C-9-E and C-9-F are as indicated in Figures Nos. 3 and 4.

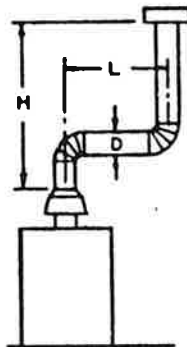


FIGURE NO. 1

Double-wall or asbestos cement
Type B vent serving a single
appliance. (See Tables Nos. C-9-A
and C-9-B.)

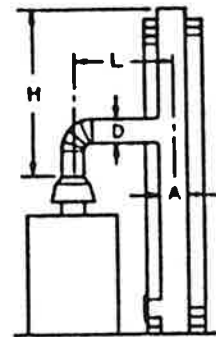


FIGURE NO. 2

Masonry chimney serving a
single appliance. (See Table No.
C-9-C.)

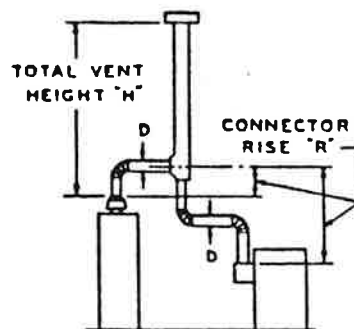


FIGURE NO. 3

Double-wall or asbestos cement
Type B vents serving two or more
appliances. (See Tables Nos.
C-9-D and C-9-E.)

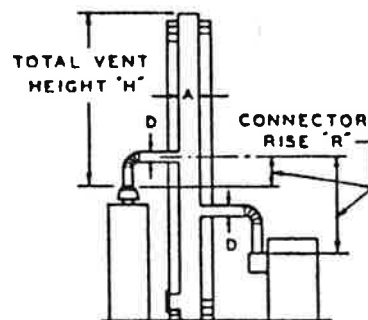


FIGURE NO. 4

Masonry chimney serving two or
more appliances. (See Table No.
C-9-F.)

(c) **Notes For Tables Nos. C-9-A, C-9-B and C-9-C.** Notes for appliance vents covered in Tables Nos. C-9-A, C-9-B and C-9-C are as indicated below:

1. When the specified diameter of the draft hood supplied by the manufacturer or the diameter of the appliance vent collar is larger than the vent size determined from Tables Nos. C-9-A, C-9-B or C-9-C, a one-size-smaller vent may be used, provided the height "H" is at least 10 feet (10 inches to 8 inches is a one-size reduction).

EXCEPTION: Irrespective of the required vent size obtained from the tables, 4-inch draft hoods shall not be connected to 3-inch vents.

2. Only vertical vent connectors rising from top-outlet draft hoods may employ zero lateral capacities.

3. High-altitude installations shall be sized based on sea level input ratings.

(d) **Notes for Tables Nos. C-9-D, C-9-E and C-9-F.** Notes for multiple appliance vents covered in Tables Nos. C-9-D, C-9-E and C-9-F are as indicated below:

1. The connector length shall not exceed 1½ feet for every inch of connector diameter.

2. The connector capacity shall be reduced 10 percent for each 90-degree turn in excess of two.

3. The common vent capacity shall be reduced by 10 percent for each 90-degree turn in excess of two.

4. Connectors shall be equal to or larger than draft hood outlets.

5. If both connectors are the same size, the common vent shall be at least one size larger, regardless of tabulated capacity.

6. The common vent shall be equal to or larger than the largest connector.

7. Interconnection fittings shall be the same size as the common vent.

8. High-altitude installations shall be sized based on sea level input rating.

**TABLE NO. C-9-A—CAPACITY OF DOUBLE-WALL OR ASBESTOS
CEMENT TYPE B VENTS WITH SINGLE-WALL CONNECTORS
SERVING A SINGLE APPLIANCE**

Total Vent Height H (feet)	Lateral L (feet)	Vent Diameter – D (Inches)							
		3	4	5	6	7	8	10	12
		Maximum Appliance Input Rating in Thousands of Btu/h							
6	0	39	70	116	170	232	312	500	750
	2	31	55	94	141	194	260	415	620
	5	28	51	88	128	177	242	390	600
8	0	42	76	126	185	252	340	542	815
	2	32	61	102	154	210	284	451	680
	5	29	56	95	141	194	264	430	648
	10		49	86	131	180	250	406	625
10	0	45	84	138	202	279	372	606	912
	2	35	67	111	168	233	311	505	760
	5	32	61	104	153	215	289	480	724
	10		54	94	143	200	274	455	700
	15			84	130	186	258	432	666
15	0	49	91	151	223	312	420	684	1040
	2	39	72	122	186	260	350	570	865
	5		67	110	170	240	325	540	825
	10			103	158	223	308	514	795
	15				144	207	291	488	760
	20					195	273	466	726
20	0		101	163	252	342	470	770	1190
	2		80	136	210	286	392	641	990
	5			123	192	264	364	610	945
	10				178	246	345	571	910
	15				163	228	326	550	870
	20						306	525	832
30	0			183	276	384	529	878	1370
	2				230	320	441	730	1140
	5				210	296	410	694	1080
	10					274	388	656	1050
	15						366	625	1000
	20						344	596	960
	30							540	890
50	0						590	980	1550
	2						492	820	1290
	5						474	780	1230
	10							730	1190
	15							705	1130
	20								1080
	30								1010

See Figure No. 1 for single-appliance vents.

**TABLE NO. C-9-B—CAPACITY OF TYPE B DOUBLE-WALL VENTS WITH TYPE B DOUBLE-WALL CONNECTORS
SERVING A SINGLE APPLIANCE**

Total Vent		Vent Diameter — (Inches)																Maximum Appliance Input Rating in Thousands of Btu/h			
Height H (feet)	Lateral L (feet)	3	4	5	6	7	8	10	12	14	16	18	20	22	24						
6	0	46	86	141	205	285	370	570	850	1170	1530	1960	2430	2950	3520						
	2	36	67	105	157	217	285	455	650	890	1170	1480	1850	2220	2670						
	6	32	61	100	149	205	273	435	630	870	1150	1470	1820	2210	2650						
	12	28	55	91	137	190	255	406	610	840	1110	1430	1795	2180	2600						
8	0	50	94	155	235	320	415	660	970	1320	1740	2220	2750	3360	4010						
	2	40	75	120	180	247	322	515	745	1020	1340	1700	2110	2560	3050						
	8	35	66	109	165	227	303	490	720	1000	1320	1670	2070	2530	3030						
	16	28	58	96	148	206	281	458	685	950	1260	1600	2035	2470	2960						
10	0	53	100	166	255	345	450	720	1060	1450	1925	2450	3050	3710	4450						
	2	42	81	129	195	273	355	560	850	1130	1480	1890	2340	2840	3390						
	10	36	70	115	175	245	330	525	795	1080	1430	1840	2280	2780	3340						
	20		60	100	154	217	300	486	735	1030	1360	1780	2230	2720	3250						
15	0	58	112	187	285	390	525	840	1240	1720	2270	2900	3620	4410	5300						
	2	48	93	150	225	316	414	675	985	1350	1770	2260	2800	3410	4080						
	15	37	76	128	198	275	373	610	905	1250	1675	2150	2700	3300	3980						
	30		60	107	169	243	328	553	845	1180	1550	2050	2620	3210	3840						
20	0	61	119	202	307	430	575	930	1350	1900	2520	3250	4060	4980	6000						
	2	51	100	166	249	346	470	755	1100	1520	2000	2570	3200	3910	4700						
	10	44	89	150	228	321	443	710	1045	1460	1940	2500	3130	3830	4600						
	20	35	78	134	206	295	410	665	990	1390	1880	2430	3050	3760	4550						
	30		68	120	186	273	380	626	945	1270	1700	2330	2980	3650	4390						

3 4

30	0 2 20 40	64 56	128 112 90	220 185 154	336 280 237 200	475 394 343 298	650 535 473 415	1060 865 784 705	1550 1310 1185 1075	2170 1800 1650 1520	2920 2380 2200 2060	3770 3050 2870 2700	4750 3810 3650 3480	5850 4650 4480 4270	7060 5600 5310 5140
40	0 2 20 40	66 59	132 118 96	228 198 167	353 298 261 223	500 420 377 333	685 579 516 460	1140 960 860 785	1730 1420 1310 1205	2400 2000 1830 1710	3230 2660 2460 2310	4180 3420 3200 3020	5270 4300 4050 3840	6500 5260 5000 4780	7860 6320 6070 5820
60	0 2 30 60		136 125	236 213 170	373 330 275	535 470 397 334	730 650 555 475	1250 1060 930 830	1920 1605 1440 1285	2700 2250 2050 1870	3650 3020 2780 2560	4740 3920 3640 3380	6000 4960 4700 4330	7380 6130 5730 5420	9000 7400 7000 6600
80	0 2 40 80			239 217	384 350 275	550 495 404	755 683 570	1290 1145 980 850	2020 1740 1515 1420	2880 2460 2180 2000	3900 3320 2980 2750	5100 4310 3920 3640	6450 5450 5000 4680	8000 6740 6270 5850	9750 8200 7650 7200
100	0 2 50 100				400 375	560 510 405	770 700 575	1310 1170 1000 870	2050 1820 1550 1430	2950 2550 2250 2050	4050 3500 3100 2850	5300 4600 4050 3750	6700 5800 5300 4900	8600 7200 6600 6100	10300 8800 8100 7500

APPENDIX C

UNIFORM MECHANICAL CODE

NOT APPLICABLE IN MINN.

TABLE NO. C-9-C—CAPACITY OF MASONRY CHIMNEYS AND SINGLE-WALL VENT CONNECTORS SERVING A SINGLE APPLIANCE

Total Vent Height H (feet)	Lateral L (feet)	Single-Wall Vent Connector Diameter—D (Inches)							
		To be used with chimney areas not less than those at bottom							
		3	4	5	6	7	8	10	12
		Maximum Appliance Input Rating in Thousands of Btu/h							
6	2	28	52	86	130	180	247	400	580
	5		48	81	118	164	230	375	560
8	2	29	55	93	145	197	265	445	650
	5		51	87	133	182	246	422	638
	10			79	123	169	233	400	598
10	2	31	61	102	161	220	297	490	722
	5		56	95	147	203	276	465	710
	10			86	137	189	261	441	665
	15				125	175	246	421	634
15	2		67	113	178	249	335	560	840
	5		61	106	163	230	312	531	825
	10			96	151	214	294	504	774
	15				138	198	278	481	738
	20					184	261	459	706
20	2		73	123	200	273	374	625	950
	5			115	183	252	348	594	930
	10				170	235	330	562	875
	15				156	217	311	536	835
	20					202	292	510	800
30	2			136	215	302	420	715	1110
	5				196	279	391	680	1090
	10					260	370	644	1020
	15						349	615	975
	20						327	585	932
50	30							544	865
	2							810	1240
	5							770	1220
	10							728	1140
	15							695	1090
	20								1040
	30								970
Minimum Internal Area of Chimney-A Square Inches		19	28	38	50	63	95	132	

See Table No. C-9-G for masonry chimney liner sizes.

See Figure No. 2 for single-appliance vents.

**TABLE NO. C-9-D—CAPACITY OF TYPE B DOUBLE-WALL VENTS WITH TYPE B DOUBLE-WALL CONNECTORS
SERVING TWO OR MORE APPLIANCES**

Vent Connector Capacity																
Total Vent Height H (feet)	Connector Rise R (feet)	Vent Connector Diameter – D (Inches)														
		3	4	5	6	7	8	10	12	14	16	18	20	22	24	
		Maximum Appliance Input Rating in Thousands of Btu/h														
6	1	26	46	72	104	142	185	289	416	577	755	955	1180	1425	1700	
	2	31	55	86	124	168	220	345	496	653	853	1080	1335	1610	1920	
	3	35	62	96	139	189	248	386	556	740	967	1225	1510	1830	2180	
8	1	27	48	76	109	148	194	303	439	601	805	1015	1255	1520	1810	
	2	32	57	90	129	175	230	358	516	696	910	1150	1420	1720	2050	
	3	36	64	101	145	198	258	402	580	790	1030	1305	1610	1950	2320	
10	1	28	50	78	113	154	200	314	452	642	840	1060	1310	1585	1890	
	2	33	59	93	134	182	238	372	536	730	955	1205	1490	1800	2150	
	3	37	67	104	150	205	268	417	600	827	1080	1370	1690	2040	2430	
15	1	30	53	83	120	163	214	333	480	697	910	1150	1420	1720	2050	
	2	35	63	99	142	193	253	394	568	790	1030	1305	1610	1950	2320	
	3	40	71	111	160	218	286	444	640	898	1175	1485	1835	2220	2640	
20	1	31	56	87	125	171	224	347	500	740	965	1225	1510	1830	2190	
	2	37	66	104	149	202	265	414	596	840	1095	1385	1710	2070	2470	
	3	42	74	116	168	228	300	466	672	952	1245	1575	1945	2350	2800	
30	1	33	59	93	134	182	238	372	536	805	1050	1330	1645	1990	2370	
	2	39	70	110	158	215	282	439	632	910	1190	1500	1855	2240	2670	
	3	44	79	124	178	242	317	494	712	1035	1350	1710	2110	2550	3040	
40	1	35	62	97	140	190	248	389	560	850	1110	1405	1735	2100	2500	
	2	41	73	115	166	225	295	461	665	964	1260	1590	1965	2380	2830	
	3	46	83	129	187	253	331	520	748	1100	1435	1820	2240	2710	3230	
60 to 100	1	37	66	104	150	204	266	417	600	926	1210	1530	1890	2280	2720	
	2	44	79	123	178	242	316	494	712	1050	1370	1740	2150	2590	3090	
	3	50	89	138	200	272	355	555	800	1198	1565	1980	2450	2960	3520	

(Continued)

TABLE NO. C-9-D—CAPACITY OF TYPE B DOUBLE-WALL VENTS WITH TYPE B DOUBLE-WALL CONNECTORS
SERVING TWO OR MORE APPLIANCES—(Continued)

Common Vent Capacity														
Total Vent Height H (feet)	Common Vent Diameter—D (Inches)													
	3	4	5	6	7	8	10	12	14	16	18	20	22	24
	Combined Appliance Input Rating in Thousands of Btu/h													
6	—	65	103	147	200	260	410	588	815	1065	1345	1660	1970	2390
8	—	73	114	163	223	290	465	652	912	1190	1510	1860	2200	2680
10	—	79	124	178	242	315	495	712	995	1300	1645	2030	2400	2920
15	—	91	144	206	280	365	565	825	1158	1510	1910	2360	2790	3400
20	—	102	160	229	310	405	640	916	1290	1690	2140	2640	3120	3800
30	—	118	185	266	360	470	740	1025	1525	1990	2520	3110	3680	4480
40	—	131	203	295	405	525	820	1180	1715	2240	2830	3500	4150	5050
60	—	—	224	324	440	575	900	1380	2010	2620	3320	4100	4850	5900
80	—	—	—	344	468	610	955	1540	2250	2930	3710	4590	5420	6600
100	—	—	—	—	479	625	975	1670	2450	3200	4050	5000	5920	7200

See Figure No. 3 and notes for multiple-appliance vents.

TABLE NO. C-9-E—CAPACITY OF DOUBLE-WALL AND ASBESTOS-CEMENT TYPE B VENTS WITH SINGLE-WALL CONNECTORS SERVING TWO OR MORE APPLIANCES

Single-wall Vent Connector Capacity							
Total Vent Height H (feet)	Connector Rise R (feet)	Vent Connector Diameter—D (Inches)					
		3	4	5	6	7	8
		Maximum Appliance Input Rating in Thousands of Btu/h					
6 to 8	1	21	40	68	102	146	205
	2	28	53	86	124	178	235
	3	34	61	98	147	204	275
15	1	23	44	77	117	179	240
	2	30	56	92	134	194	265
	3	35	64	102	155	216	298
30 and up	1	25	49	84	129	190	270
	2	31	58	97	145	211	295
	3	36	68	107	164	232	321
Common Vent Capacity							
Total Vent Height H (feet)	Common Vent Diameter (Inches)						
	4	5	6	7	8	10	12
	Combined Appliance Input Rating in Thousands of Btu/h						
6	48	78	111	155	205	320	NR
8	55	89	128	175	234	365	505
10	59	95	136	190	250	395	560
15	71	115	168	228	305	480	690
20	80	129	186	260	340	550	790
30		147	215	300	400	650	940
50				360	490	810	1190

See Figure No. 3 and notes for multiple-appliance vents.

TABLE NO. C-9-F—CAPACITY OF A MASONRY CHIMNEY AND SINGLE-WALL VENT CONNECTORS SERVING TWO OR MORE APPLIANCES

Single-Wall Vent Connector Capacity							
Total Vent Height H (feet)	Rise Connector R (feet)	Vent Connector Diameter—D (Inches)					
		3	4	5	6	7	8
		Maximum Appliance Input Rating in Thousands of Btu/h					
6 to 8	1	21	39	66	100	140	200
	2	28	52	84	123	172	231
	3	34	61	97	142	202	269
15	1	23	43	73	112	171	225
	2	30	54	88	132	189	256
	3	34	63	101	151	213	289
30 and up	1	24	47	80	124	183	250
	2	31	57	93	142	205	282
	3	35	65	105	160	229	312

Common Chimney Capacity							
Total Vent Height H (feet)	Minimum Internal Area of Chimney—A (Square Inches)						
	18	28	38	50	78	113	
	Combined Appliance Input Rating in Thousands of Btu/h						
6	45	71	102	142	245		
8	52	81	118	162	277	405	
10	56	89	129	175	300	450	
15	66	105	150	210	360	540	
20	74	120	170	240	415	640	
30		135	195	275	490	740	
50				325	600	910	

See Table No. C-9-G for masonry chimney liner sizes.

See Figure No. 4 and notes for multiple-appliance vents.

SIZING LINED MASONRY CHIMNEY
EQUAL TO DOUBLE WALL VENT

**TABLE NO. C-9-G—MASONRY CHIMNEY LINER DIMENSIONS
WITH CIRCULAR EQUIVALENTS¹**

Nominal Liner Size (Inches)	Inside Dimensions of Liner in (Inches)	Inside Diameter or Equivalent Diameter (Inches)	Equivalent Area (Square Inches)
4 x 8	2½ x 6½	4	12.2
		5	19.6
		6	28.3
		7	38.3
8 x 8	6¾ x 6¾	7.4	42.7
8 x 12	6½ x 10½	8	50.3
		9	63.6
		10	78.5
12 x 12	9¾ x 9¾	10.4	83.3
12 x 16	9½ x 13½	11	95
		11.8	107.5
		12	113.0
		14	153.9
16 x 16	13¼ x 13¼	14.5	162.9
16 x 20	13 x 17	15	176.7
		16.2	206.1
		18	254.4
20 x 20	16¾ x 16¾	18.2	260.2
20 x 24	16½ x 20½	20	314.1
		20.1	314.2
		22	380.1
24 x 24	20¼ x 20¼	22.1	380.1
24 x 28	20¼ x 24¼	24	452.3
		24.1	456.2
28 x 28	24¼ x 24¼	26.4	543.3
30 x 30	25½ x 25½	27	572.5
		27.9	607
		30	706.8
30 x 36	25½ x 31½	30.9	749.9
36 x 36	31½ x 31½	33	855.3
		34.4	929.4
		36	1017.9

¹When liner sizes differ dimensionally from those shown, equivalent diameters may be used.

1346.2226 TABLES NOS. 22-D-1; 22-D-2; 22-D-3; and 22-D-4.

Subpart 1. UMC Appendix B, Chapter 22, is amended by adding Table No. 22-D-1 to read as follows:

Maximum capacity of pipe in cubic feet of gas per hour based upon a pressure drop of 0.3 inch water column and .60 specific gravity gas.

— 3" WATER COLUMN

Length in Feet	NOMINAL IRON PIPE SIZE, INCHES								
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
10	132	278	520	1050	1600	3050	4800	8500	17500
20	92	190	350	730	1100	2100	3300	5900	12000
30	73	152	285	590	890	1650	2700	4700	9700
40	63	130	245	500	760	1450	2300	4100	8300
50	58	115	215	440	670	1270	2000	3600	7400
60	50	105	195	400	610	1150	1850	3250	6800
70	46	96	180	370	560	1050	1700	3000	6200
80	43	90	170	350	530	990	1600	2800	5800
90	40	84	160	320	490	930	1500	2600	5400
100	38	79	150	305	460	870	1400	2500	5100
125	34	72	130	275	410	780	1250	2200	4500
150	31	64	120	250	380	710	1130	2000	4100
175	28	59	110	225	350	650	1050	1850	3800
200	26	55	100	210	320	610	980	1700	3500

1346.2226 TABLES NOS. 22-D-1; 22-D-2; 22-D-3; and 22-D-4.

Subpart 1. UMC Appendix B, Chapter 22, is amended by adding Table No. 22-D-1 to read as follows:

Maximum capacity of pipe in cubic feet of gas per hour based upon a pressure drop of 0.3 inch water column and .60 specific gravity gas.

3" WATER COLUMN

Length in Feet	NOMINAL IRON PIPE SIZE, INCHES								
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
10	132	278	520	1050	1600	3050	4800	8500	17500
20	92	190	350	730	1100	2100	3300	5900	12000
30	73	152	285	590	890	1650	2700	4700	9700
40	63	130	245	500	760	1450	2300	4100	8300
50	58	115	215	440	670	1270	2000	3600	7400
60	50	105	195	400	610	1150	1850	3250	6800
70	46	96	180	370	560	1050	1700	3000	6200
80	43	90	170	350	530	990	1600	2800	5800
90	40	84	160	320	490	930	1500	2600	5400
100	38	79	150	305	460	870	1400	2500	5100
125	34	72	130	275	410	780	1250	2200	4500
150	31	64	120	250	380	710	1130	2000	4100
175	28	59	110	225	350	650	1050	1850	3800
200	26	55	100	210	320	610	980	1700	3500

Subp. 3. UMC Apendix B, Chapter 22, is amended by adding Table No. 22-D-3 to read as follows:

Maximum capacity of pipe in cubic feet of gas per hour based upon a pressure drop of seven inches water column and .60 specific gravity gas.

7 1/4" PRESSURE SYSTEM WATER COLUMN

Length in Feet	NOMINAL PIPE OR I.D. TUBING SIZE										
	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
5	190	440	850	2300	2900	6000	9200	19000	30000	54000	110 M
10	128	296	570	1540	2000	4200	6300	13000	26000	38000	80000
15	100	235	450	1200	1650	3400	5300	10800	17500	31000	64000
20	85	200	380	1030	1400	2900	4000	9300	15000	27000	55000
30	67	100	300	820	1150	2400	3700	7000	12000	22000	45000
40	57	125	255	700	1000	2100	3200	6500	10500	19000	39000
50	50	117	225	610	900	1850	2850	5800	9400	17000	35000
60	46	108	206	550	820	1700	2600	5400	8600	15500	31000
70	41	96	185	500	760	1600	2450	5000	8000	14000	28500
80	38	90	173	470	710	1500	2250	4700	7500	13000	27500
90	36	84	162	440	660	1400	2150	4400	7000	12500	26000
100	34	79	152	410	625	1300	2000	4150	6700	12000	25000
125	30	69	135	360	570	1150	1800	3700	6000	10500	22000
150	27	63	122	325	520	1080	1650	3400	5400	9800	20000
175	25	58	112	300	480	1000	1550	3100	5000	9000	18500
200	23	53	102	280	450	940	1450	2900	4750	8400	17000
250	20	47	90	240	400	850	1300	2600	4300	7500	15500
300	18	42	81	220	370	760	1150	2400	3900	7000	14000

Subp. 4. UMC Appendix B, Chapter 22, is amended by adding Table No. 22-D-4 to read as follows:

2 LB GAS PIPING

Maximum capacity of pipe in cubic feet of gas per hour based upon a pressure drop of one and one-half pounds per square inch and .60 specific gravity gas.

Length in Feet	NOMINAL PIPE OR I.D. TUBING SIZE										
	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
5	540	1260	2400	6500	10500	21000	31000	58000	90000	150 M	310 M
10	360	850	1630	4350	7600	15000	22000	41000	64000	110 M	220 M
15	285	670	1280	3450	6200	12000	18000	34000	52000	90000	180 M
20	240	570	1080	2950	5400	10500	15000	29000	45000	79000	150 M
30	192	450	860	2300	4400	8600	13000	24000	36000	63000	125 M
40	163	380	730	2000	3800	7500	11000	20000	32000	55810	110 M
50	143	335	645	1750	3350	6700	9800	18000	28000	49000	97000
60	130	300	580	1560	3050	6100	9000	17000	26000	45900	90000
70	118	275	530	1430	2800	5600	8200	15000	24000	41000	82000
80	110	255	490	1330	2650	5200	7700	14000	22000	38000	77000
90	102	240	460	1230	2500	4900	7200	13500	21000	36500	72000
100	96	225	430	1160	2350	4700	6800	12500	20000	34500	70000
125	85	198	380	1025	2100	4150	6100	11300	18000	31000	62000
150	76	178	340	920	1900	3800	5600	10400	16000	28400	56000
175	69	164	315	845	1800	3550	5200	9700	15500	20000	53000
200	64	146	290	780	1700	3300	4900	9000	14000	24000	49000
250	58	140	255	690	1500	2950	4300	8100	12500	22600	44000
300	51	120	230	620	1350	2700	4000	7400	11500	19000	40000