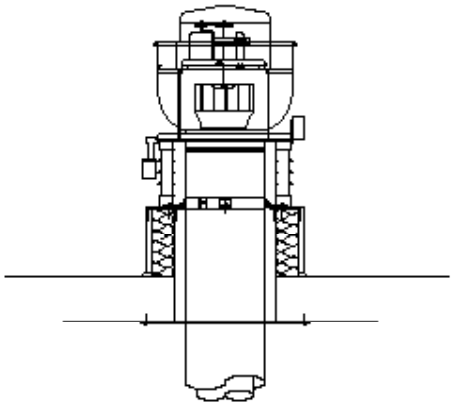
GREASE DUCT SYSTEMS

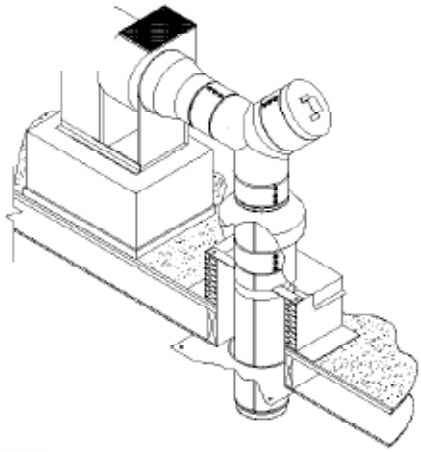
SINGLE AND DOUBLE WALL CONSTRUCTION POSITIVE PRESSURE PIPING SYSTEMS

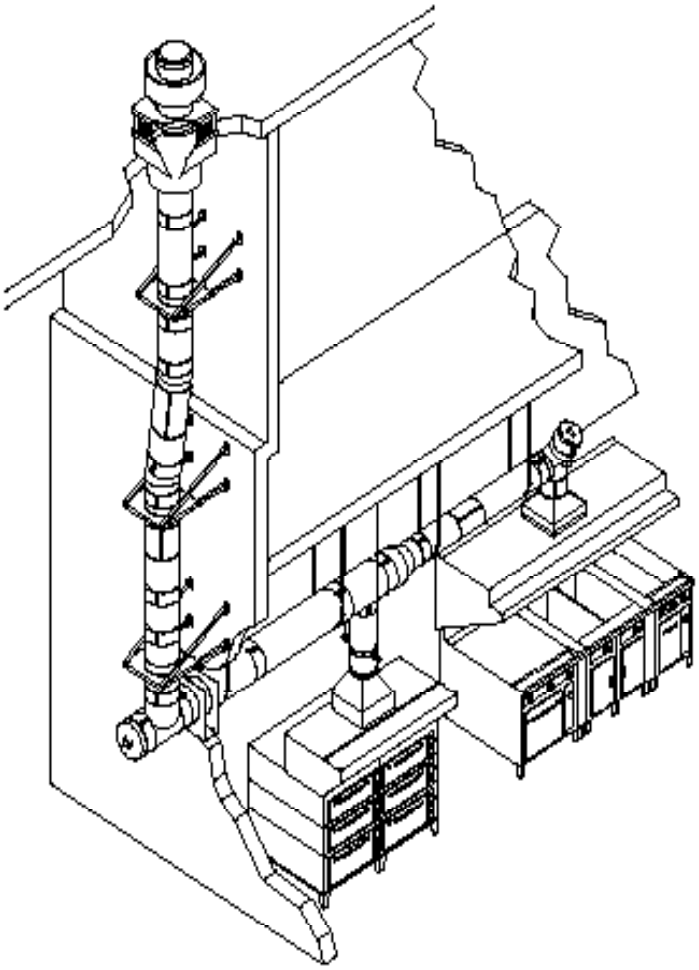
Installation Instructions

Models

CBG
CBGL
CBGL2F
CBGL4F







c UL LISTED
43 PN

These symbols show that grease ducts models CBG, CBGL,CBGL2F and CBGL4F are listed by Underwriters Laboratories Inc. under file MH26661. Tests are made in accordance with UL 1978 standard for grease ducts. These models are certified for use in the US and Canada.

A MAJOR CAUSE OF GREASE DUCT RELATED FIRES IS FAILURE TO MAINTAIN REQUIRED CLEARANCES (AIR SPACES) TO COMBUSTIBLE MATERIALS. IT IS OF UTMOST IMPORTANCE THAT THIS GREASE DUCT BE INSTALLED ONLY IN ACCORDANCE WITH THESE INSTRUCTIONS.

CleaverBrooks

INDEX

General Information

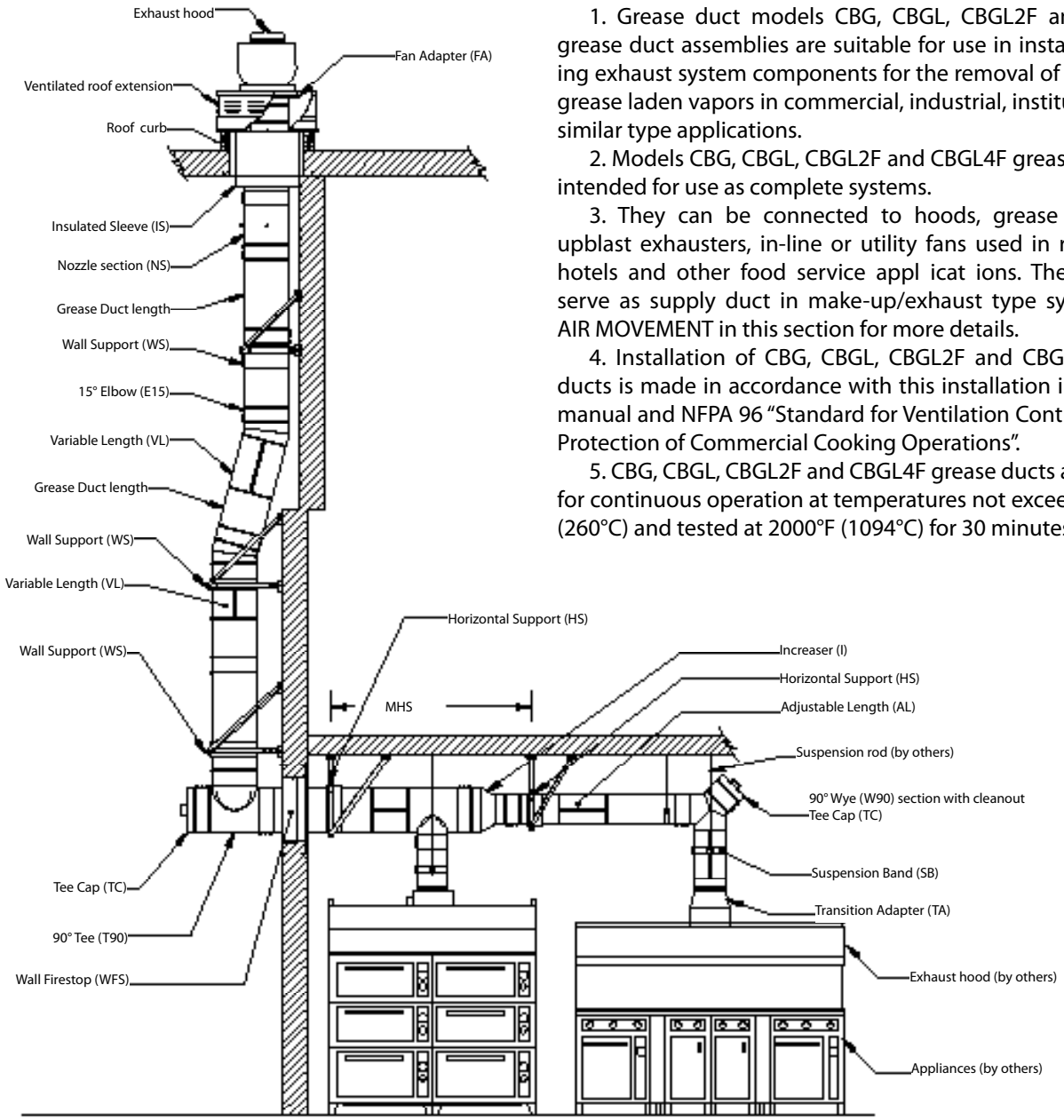
UNDERWRITERS LABORATORIES LISTINGS:

Grease ducts models CBG, CBGL, CBGL2F and CBGL4F are listed by Underwriters laboratories, inc. (UL) under File MH26661 and tested in accordance with UL 1978 Standard for Grease ducts.

FEATURES

Models CBG, CBGL, CBGL2F and CBGL4F Grease ducts are prefabricated modular venting systems designed for quick assembly and using a continuous welded joint stainless steel inner wall. Given that all parts have a male and female end, each model part fit into one another, thus eliminating the need for all kinds of adapters. This unique method of coupling provides an incomparable flexibility in selecting models for grease duct systems design and planning. Model CBG is a single wall construction. Model CBGL is a double wall construction with 2" air space between walls. Model CBGL2F and CBGL4F as 2" and 4" of high temperature ceramic insulation. The high quality of stainless steel inner wall construction using a continuous welded joint method for the longitudinal joint provides a high strength-to-weight ratio and low friction losses.

Fig. A-1 - Grease Ducts models CBG/CBGL/CBGL2F/GPL4F



APPLICATION

UL 1978

1. Grease duct models CBG, CBGL, CBGL2F and CBGL4F grease duct assemblies are suitable for use in installations using exhaust system components for the removal of smoke and grease laden vapors in commercial, industrial, institutional and similar type applications.

2. Models CBG, CBGL, CBGL2F and CBGL4F grease ducts are intended for use as complete systems.

3. They can be connected to hoods, grease extractors, upblast exhausters, in-line or utility fans used in restaurants, hotels and other food service appl icat ions. They can also serve as supply duct in make-up/exhaust type systems. See AIR MOVEMENT in this section for more details.

4. Installation of CBG, CBGL, CBGL2F and CBGL4F grease ducts is made in accordance with this installation instructions manual and NFPA 96 "Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations".

5. CBG, CBGL, CBGL2F and CBGL4F grease ducts are suitable for continuous operation at temperatures not exceeding 500°F (260°C) and tested at 2000°F (1094°C) for 30 minutes.

SURROUNDINGS / ENCLOSURES

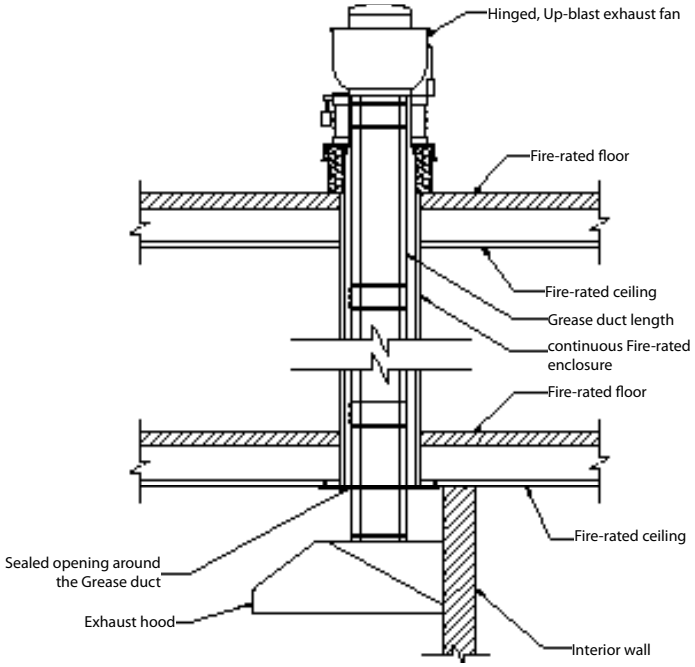
1. Models CBG, CBGL, CBGL2F and CBGL4F grease ducts are primari ly intended for instal lat ion in noncombust ible surroundings or in unenclosed installations.

2. Where models CBG, CBGL, GPDL2F and CBGL4F grease ducts are instal led in an open room and an enclosure is not required, the minimum clearance to adjacent combustible walls shall be as shown in this section (see "CLEARANCES"). The duct ing may be located in a corner formed by two wal ls of combustible construction, if the conditions above are met.

3. Other interior installations in all buildings should be as follows:

a) Where a grease ductpenetrates a wall or ceiling rated for fire resistance, it should be enclosed with a continuous enclosure extending from the lowest fire-rated ceiling or floor above the hood, through any concealed space, to or through the roof so as to maintain the integrity of the fire separations required by the applicable building code provisions (see Fig. A-2). The enclosure shall be sealed around the duct at the point of pene tration of the lowest fire-rated ceiling or floor above the hood, in order to maintain the fire resistance rating of the enclosure and shall be extended to the exterior of the building through weather-protected openings (see Fig. A-2).

Fig. A-2 - Typical grease duct enclosure for two stories or more with fire-rated ceiling and floor



b) A grease duct penetrating a ceiling, floor or wall which does not have a fire resistance rating does not require to be enclosed, if the clearances to combustibles are at the correct minimum for unenclosed installations (see fig. A-3, 4, 5).

c) Where models CBG, CBGL, CBGL2F and CBGL4F grease ducts extend through any story of a building above the floor on which the connected appliances are located, they shall be enclosed in the upper stories with walls having a fire resistance rating of not less than one hour for buildings of two or three stories. If the building is four stories or more, the enclosure wall shall have a fire resistance rating of not less than two hours (see fig. A-2).

Fig. A-3 - Typical Grease Duct enclosure for one story building with fire-rated roof-ceiling assembly

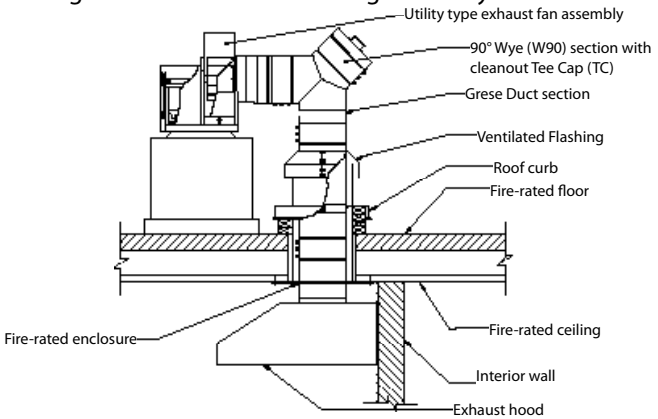


Fig. A-4 - Typical Grease Duct enclosure for two stoires or more with non fire-rated ceiling and fire-rated floor

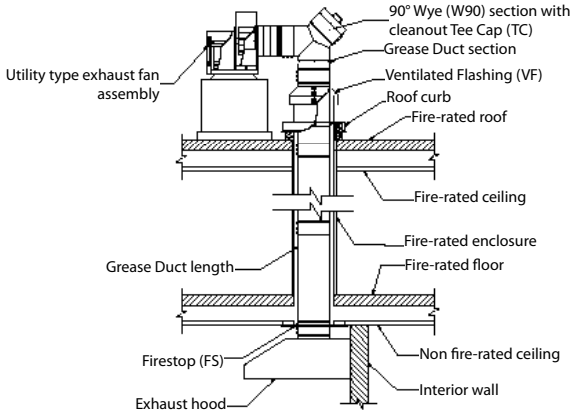
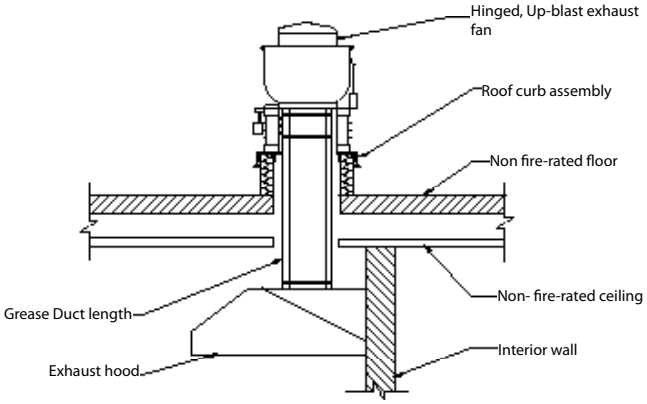


Fig. A-5 - typical Grease Duct enclosure for one story buildong without fire-rated roof ceiling assembly



4. Models CBGL, CBGL2F and CBGL4F grease ducts may penetrate a roof or wall made of combustible material using either the Flat Flashing (F) roof assembly or the Ventilated Flashing (VF) roof assembly. For wall penetrations use of the Insulated Wall Firestop (IFS) or Wall Firestop (WFS) assembly is required. These are the only parts intended for use with combustible construction. All other parts such as Wall Supports (WS), Anchor Plates (AP), Wall (WG) and Floor Guides (FG) are for attachment to non-combustible construction (see Section C for details).

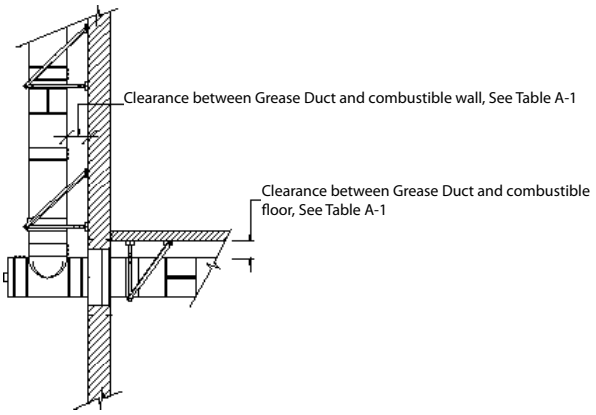
General Information

CLEARANCE

Table A-1 - Minimum air space clearance-to-combustible construction

	CBG	CBGL	CBGL2F	CBGL4F
6″	18″	14″	4″	0″
8″	18″	14″	4″	0″
10″	18″	14″	4″	0″
12″	18″	14″	4″	0″
14″	18″	14″	4″	0″
16″	18″	16″	6″	0″
18″	18″	16″	6″	0″
20″	18″	16″	6″	0″
22″	18″	16″	6″	0″
24″	18″	18″	8″	0″
26″	18″	18″	8″	0″
28″	18″	18″	8″	0″
30″	18″	18″	8″	0″
32″	18″	18″	8″	0″
34″	18″	20″	10″	0″
36″	18″	20″	10″	0″
38″	18″	20″	10″	0″
40″	18″	20″	10″	--
42″	18″	20″	12″	--
44″	18″	20″	12″	--
46″	18″	20″	12″	--
48″	18″	20″	12″	--

Fig. A-6 - Typical clearance for models CBG/CBGL/CBGL2F/GP-DL4F



PART NUMBERS

These instructions identify major models CBG, CBGL, GPDL2F and CBGL4F parts by part number.

Example no.1:

Number: CBG E45 18

Model	Description	Inside Diameter
Single wall	45° Elbow	18″

Example no.2:

Number: CBGL 48L 12

Model	Description	Inside Diameter
2″ air insulation	48″ Pipe section length	12″

Example no.3:

Number: CBGL2F T45 24

Model	Description	Inside Diameter
2″ Ceramic fiber* insulation	45° Tee section	24″

* High temperature insulation

SUPPORT METHOD/ HEIGHT LIMITS

1. Several support and guiding methods are used to anchor a grease duct against upward, downward and angular displacement.

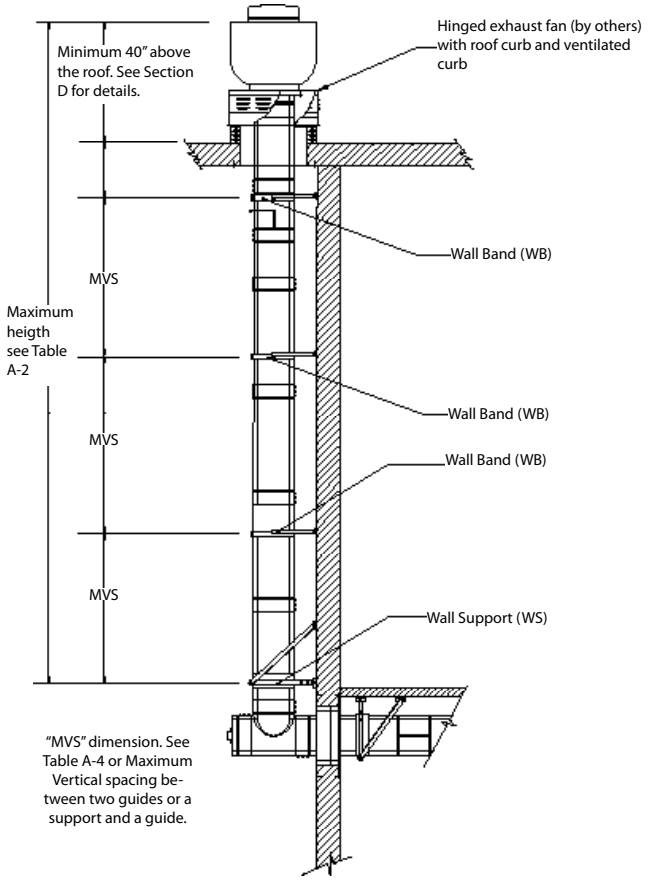
2. These supports and guides used with thermal expansion devices prevent bending stresses on the grease duct elbows and joints.

3. Supports and guiding methods and instal lat ion are described in Sect ion C. Some l imi tat ions apply for proper installation of supports and guides (see Table-A-2 and Table-A

Table A-2 - Maximum Grease Duct Height and Support Method for Models CBG/CBGL/CBGL2F/CBGL4F

Support method	code	CBG	CBGL	CBGL2F	CBGL4F
Wall Support assembly	WS				
Size 6″ thru 12″		70′	70′	55′	33′
Size 14″ thru 24″		45′	45′	35′	23′
Size 26″ thru 36″		35′	35′	30′	21′
Size 38″ thru 38″		30′	30′	23′	16′
Anchor Plate Assembly	AP				
Size 6″ thru 48″		50′	50′	30′	18′
Tee Section	T				
Size 6″ thru 24″		26′	26′	20′	12′
Size 26″ thru 48″		20′	20′	15′	10′
Roff Support	RS				
Size 6″ thru 48″		12′	12′	8′	4′
Suspension Band	SB				
Size 6″ thru 48″		16′	16′	10′	6′

Fig. A-7 - Typical maximum Grease Duct height and support method



Note: When max. height from Table A-2 is exceeded; resupport using another support and expansion

General Information

PIPE AND FITTING JOINT ASSEMBLY

All components have a male and a female end. The installation orientation is indicated on the labeling of each pipe section with an arrow. The arrow indicates the direction of the flue. (See Fig. A-1) Clean all inner and outer surfaces of male and female ends with an appropriate organic solvent, such as acetone, Mek, or other commercial degreaser.

1. Before fitting the male and female ends in one another, a sealant is applied on the male end, at the gap between the inner band and the inner pipe. (See Fig. A-1 and A-3). Table A- 4 for Sealant.
2. After joining the male and female ends together, a layer of sealant is applied inside the V-groove of the Assembly Band (AB) prior to its installation over the joint (See Fig. A-3). Table A-4 for Sealant.
3. The Assembly Band (AB)(Fig.A-2 and A-3) is installed and clamped in place with the 4 screws (supplied).
4. Insert the insulation strip around the inner joint assembly for insulated models CBGL2F and CBGL4F.
5. The Finishing Band (FB) is then installed by slipping the edges of the band into the outer pipe edges and clamping it with the 3 screws (supplied).
6. Where the chimney passes outdoor, a exterior sealant (ES) is applied at the joint of the Finishing Band (FB) and the outer wall of the pipe for weather protection (see Fig.A-3) Table-A-4 for sealant.

CAUTIONS

A. THE FINISHING BANDS (FB) ARE DESIGNED TO SLIDE IN THEIR MATING GROOVES. DO NOT ATTACH BY SCREWS INTO THE OUTER CASING. THE SCREWS SUPPLIED ARE THE ONLY ONES NEEDED FOR PROPER ASSEMBLY.

B. DO NOT ALLOW SCREWS TO PENETRATE THE INNER PIPE. THIS CAN CAUSE CORROSION, GAS LEAKAGE OR EXPANSION FAILURE.

C. NEVER USE SCREWS THROUGH THE OUTER JACKET OF A VARIABLE (VL) AND AN AJUSTABLE (AL) LENGTH OR BE LOWS EXPANSION JOINT (EJ).

D. OBSERVE ADEQUATE SAFETY MESURES WHEN USING A DEGREASER.

Fig. A-1 - Models IPPL / IPPL2F / IPPL4F Flue Direction

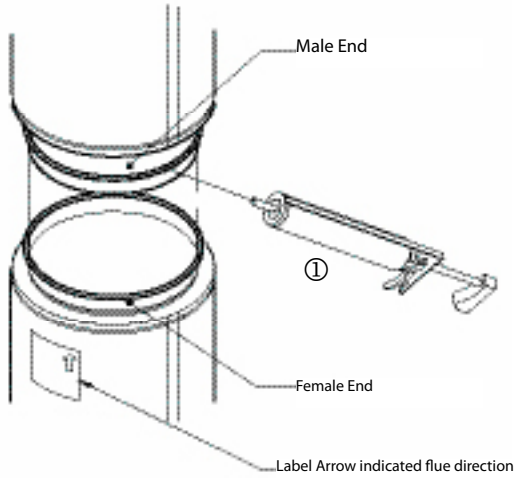


Table A-4. Sealant Usage

Sealant Application	Supplier	Model	Color	Max. Temp.
1st Inner Joint	Adchem	X-Trasil H.T. 4706_3	red	500°F continuous 600°F intermitent
alternate	Dow Corning	RTV-736	red	500°F continuous 600°F intermitent
2nd Inner Joint	Imperial	IMGKK0076	black	2100°F
Outer Joint	—		—	—
Inside Installation	n/a	n/a	n/a	n/a
Exterior Installation	Adchem	Adsil 4809	gray	375°F
alternate	Dow Corning	RTV-732	gray	375°F

Fig. A-2 - Joint components Models CBGL / CBGL2F / CBGL4F

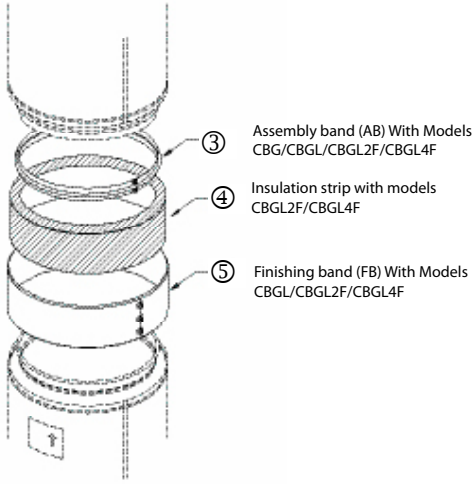
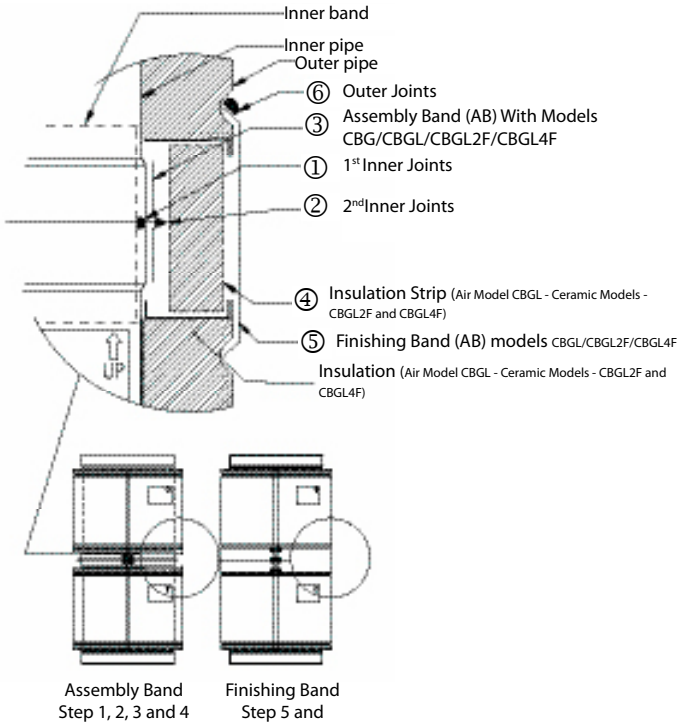


Fig. A-3 - Assembled Models CBG / CBGL / CBGL2F / CBGL4F joint



General Information

SUPPORT AND GUIDING SPACER

Table A-4 - Maximum spacing between two guides or a support and a guide for models CBG/CBGL/CBGL2F/CBGL4F

Maximun Spacing (feet)	CBG	CBGL	CBGL2F	CBGL4F
Inside diameter (in.)	MVS*	MVS*	MVS*	MVS*
6″	11′-0″	11′-0″	10′-0″	10′-0″
8″	11′-4″	11′-4″	10′-4″	10′-4″
10″	11′-8″	11′-8″	10′-8″	10′-8″
12″	12-′0″	12′-0″	11′-0″	11′-0″
14″	12′-4″	12′-4″	11′-4″	11′-4″
16″	12′-8″	12′-8″	11′-8″	11′-8″
18″	13′-0″	13′-0″	12′-0″	12′-0″
20″	13′-4″	13′-4″	12′-4″	12′-4″
22″	13′-8″	13′-8″	12′-8″	12′-8″
24″	14′-0″	14′-0″	13′-0″	13′-0″
26″	14′-4″	14′-4″	13′-4″	13′-4″
28″	14′-8″	14′-8″	13′-8″	13′-8″
30″	15′-0″	15′-0″	14′-0″	14′-0″
32″	15′-4″	15′-4″	14′-4″	14′-4″
34″	15′-8″	15′-8″	14′-8″	14′-8″
36″	16′-0″	16′-0″	15′-0″	15′-0″
38″	15′-0″	15′-0″	14′-0″	14′-0″
40″	14′-8″	14′-8″	13′-8″	13′-8″
42″	14′-0″	14′-0″	13′-0″	13′-0″
44″	13′-0″	13′-0″	12′-0″	12′-0″
46″	12′-4″	12′-4″	11′-4″	11′-4″
48″	11′-8″	11′-8″	10′-8″	10′-8″

*MVS = Maximum Vertical Spacing between two guides or a support and a guide in vertical position.

MHS = Maximum Horizontal Spacing between two guides or a support and a guide is 10 Feet (see Fig. A-1). Exception for Hanger Bracket assembly (HB) where max. spacing is 5 feet (see Fig. C-1).

THERMAL EXPANSION

Good installation practice requires that any length of e xhaust system between two fixed points subject to more than 1/4″ expansion must have an Variable Langth (VL) to compensate for expansion. CBG, CBGL, CBGL2F and CBGL4F will expand approx. 1 inch per 100° temperature rise per 100 feet of pipe.

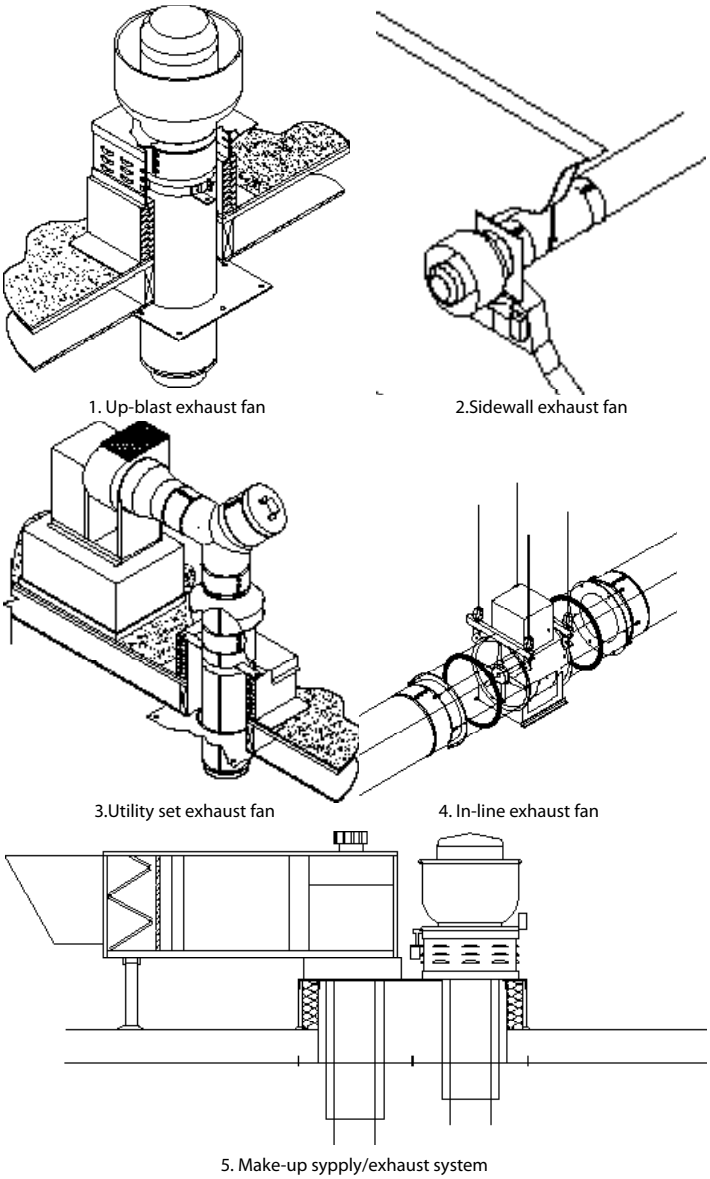
It is essential that these parts be properly installed and provided with adequate support and guidance to prevent binding or bending moments (see detai led instal lat ion informat ion contained in Section F).

AIR MOVEMENT

Models CBG, CBGL, CBGL2F and CBGL4F grease duct systems can be connected to various types of approved equipment for the removal of grease or grease laden vapors. Models CBG, CBGL, CBGL2F and CBGL4F grease duct systems offer a variety of specialized parts to adapt with up-blast exhaust fans, in-line exhaust fans, utility set fans and sidewall exhaust fans. They can also be used as supply ducts in supply/exhaust make-up air systems. The fol lowing i l lustrat ions show these different arrangements and equipment (see Fig. A-8).

Models CBG, CBGL, CBGL2F and CBGL4F grease duct systems can connect the supply opening of a make-up air supply/exhaust system in commercial and institutional cooking applications. For more details about installation of grease ducts for the above applications, see Section D.

Fig. A-8 - Typical exhaust fans for commercial cooking application

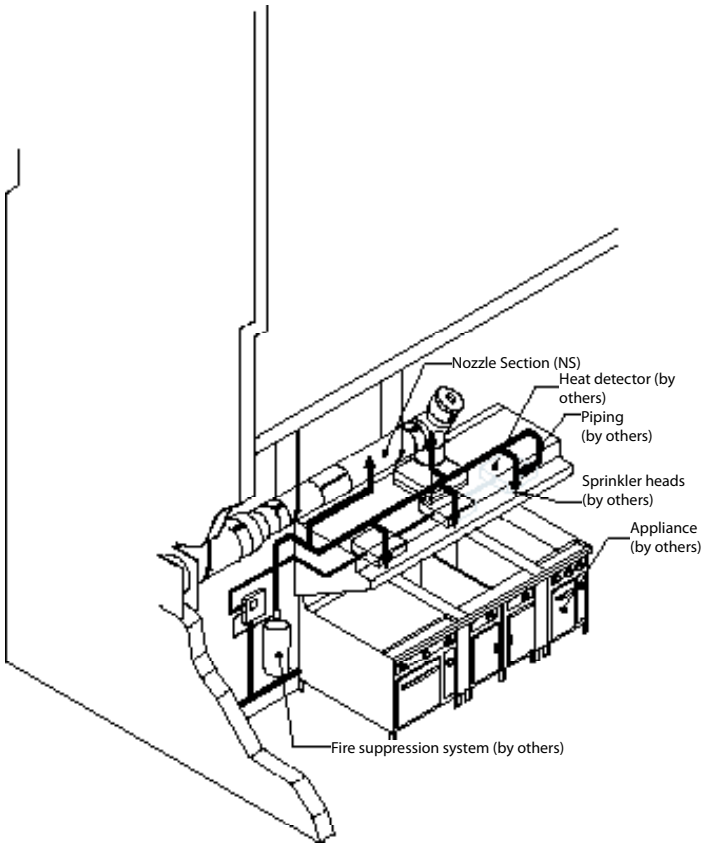


1. Up-blast exhaust fan
2.Sidewall exhaust fan
3.Utility set exhaust fan
4. In-line exhaust fan
5. Make-up sypply/exhaust system

FIRE PROTECTION

NFPA No. 96 standard requires that fire-ext inguishing equipment be provided for the protection of duct systems, grease removal devices and hoods. Models CBG, CBGL, CBGL2F and CBGL4F grease ducts offer a variety of specialized parts for the integration of fire extinguishing equipment into the ductwork. Each component comes standard with a 1″ NPT coupling to allow for easy connections. The use of Nozzle Section (NS) allows for various types of fire extinguishing equipment to be integrated in the grease ductwork. Some of the various types are: 1) CO2 extinguishing systems. 2) Sprinkler systems, 3) Foam-water sprinkler/*spray systems, and 4) Dry cleanout extinguishing systems. See Fig. A-9 for typical fire extinguishing system with integrated specialized parts.

Fig. A-9 - Typical fire extinguishing system integrating Grease Duct specialized parts

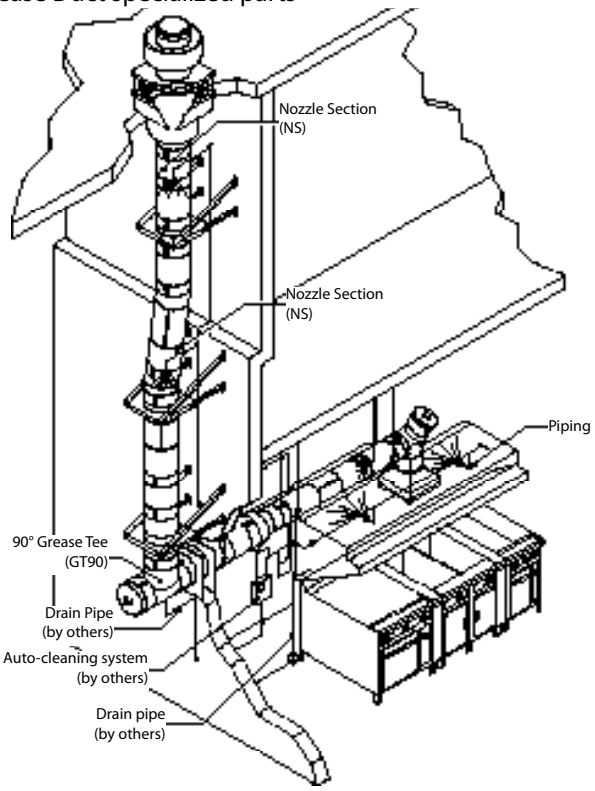


Note: This drawing is only an illustration. It is not to be construed as a detailed schematic for construction or inspection purposes.

AUTOMATIC CLEANING

Integration of an automatic hot water/detergent injection system can be integrated into the CBG, CBGL, CBGL2F and CBGL4F grease duct system by using the dual-purpose Nozzle Section (NS), Duct Drain (DD) and Grease Tee 90º (GT90) sections. All of these related parts have standard NPT hardware so that conventional nozzles and piping can easily be attached. Keep in mind that if plumbing is connected to cleanout inspect ion caps, flexible high temperature, high pressure plumbing must be provided, with shut-off valves, so that the inspection process can be completed on a regular basis. A typical installation would provide hot water at approximately 160ºF and use a detergent injected by conventional hardware so that the entire grease duct system can be scrubbed down daily, using jet spray characteristics for the removal of grease, dirt and dust. Normally, the automatic cleaning system is designed as a unit; however a modular design would prove satisfactory. Automatic cleaning implies that the grease drains are connected to appropriate hardware, so that the residues of the cleaning process are piped directly to drains and not grease traps or fixed size buckets.

Fig. A-10 - Typical automatic cleaning system integrating Grease Duct specialized parts



Note: This drawing is only an illustration. It is not to be construed as a detailed schematic for construction or inspection purposes.

MAINTENANCE AND SAFETY

Models CBG, CBGL, CBGL2F and CBGL4F grease duct system has specialized parts that are specially designed to create a safe and reliable system.

These special parts are:

1. A dual purpose Nozzle Section (NS) to integrate a fire suppression system or act as an interface for hot water/detergent maintenance section.
2. A special Wye 90º (W90) section with Tee Cap (TC) that provides easy access for cleaning of ductwork.
3. A 90º Grease Tee (GT90) section, which provides a drainage nozzle to collect water and residue from cleaning and a cleanout door with a 1-1/2″ dam for cleaning and inspection.

NFPA no.96 contains some very specific requirements concerning the safety features that must be incorporated into grease duct systems. Chapter 8 of NFPA no.96 lists some guidelines to be followed related to the operation, inspection and cleaning of grease ducts.

A) Operation Procedures:

1. Exhaust systems shall be operated whenever cooking equi ment is turned on.
2. Openings provided for replacing air exhausted through ventilating equipment shall not be restricted by covers, dampers, or any other means that would reduce the operat ing efficiency of the exhaust system.
3. Filter equipped exhaust systems shall not be operated with filters removed.

4. Instructions for manually operating the fire-extinguishing system shall be posted conspicuously in the kitchen and shall be reviewed periodical ly wi th employees by the management.
5. Listed exhaust hoods shall be operated in accordance with the terms of their listings and the manufacturer instructions.
6. Cooking equipment shall not be operated while its fireextin guishing system or exhaust system is not working or other wise impaired.

B) Inspection Procedures

1. An inspect ion and servicing of the fire-ext inguishing system and listed exhaust hoods containing a constant or fire-actu ated water system shall be done at least every 6 months by properly trained and qualified persons.
2. All actuation components, including remote manual pull sta tions, mechanical or electrical devices, detectors, actuators, and fire-actuated dampers, shall be checked for proper op eration during the inspection in accordance with the manu facturer l isted procedures. In addi t ion to these require ments, the specific inspection, requirements of the applicable NFPA standard shall also be followed.
3. Fusible l inks (including fusible l inks on fire-actuated damper assemblies) and automatic sprinkler heads shall be replaced at least annually, or more frequently if necessary, to ensure proper operation of the system. Other detection devices shall be serviced or replaced in accordance with the manufac turer recommendations. Exception is made for bulb-type sprinklers or spray nozzles, where annual examination shows no buildup of grease or other material on the sprinkler or spray nozzles.
4. If required, certificates of inspection and maintenance shall be forwarded to the authority having jurisdiction.

C) Cleaning Procedures:

Hoods, grease removal devices, fans, ducts, and other appurtenances shall be cleaned to bare metal at frequent intervals prior to surfaces becoming heavily contaminated with grease or oily sludge. After the exhaust system is cleaned to bare metal, it shall not be coated with powder or other substance. The entire exhaust system shal l be inspected by a properly trained, qualified, and certified company or person(s) acceptable to the authority having jurisdiction, in accordance with Table-A-5.

Table A-5 - Exhaust system inspection schedule

Type or volume of cooking	Inspection Frequency
Systems serving solid fuel cooking operations	Monthly
Systems serving high volume cooking operations such as 24 hour cooking, charbroiling or wok cooking	Quarterly
Systems serving moderate volume cooking operations	Semiannually
System serving low volume cooking operations, such as churches, day camps, seasonal businesses, or senior centers	Annually

Note: The maintenance and safety, as well as the cleaning and inspection procedures described above, are written in accordance with NFPA 96 and do not supersede NFPA 96 recommendations or other recommendations from local authorities having jurisdiction in your area.

PIPE WEIGHT

Pipe weight is given in pounds per foot of pipe for each diameter. It is important to know the weight of the grease duct section for grease duct support or guiding. Pipe weight (Table- A-6) along with maximum grease duct height (Table-A-2) are necessary to calculate the proper anchor strength needed with Wall Supports (WS), Anchor Plate (AP) supports, Wall Guides (WG), Wall Bands (WB) and Suspension Bands (SB).

Table A-6 - Pipe weight in lb/ft

	Model			
Inside Diameter	CBG	CBGL	CBGL2F	CBGL4F
6″	3.4	5.7	8.8	14.6
8″	4.5	7.2	11.1	17.7
10″	5.7	8.8	13.4	20.7
12″	6.8	10.3	15.6	23.8
14″	7.9	11.8	17.9	26.8
16″	9.0	13.3	20.2	29.9
18″	10.2	14.8	17.9	32.9
20″	11.3	16.3	24.7	35.9
22″	12.4	17.8	27.0	38.9
24″	13.5	19.3	29.3	42.0
26″	14.7	20.8	31.6	45.1
28″	15.8	22,3	33.9	48.1
30″	17.0	23.8	36.1	51.2
32″	18.1	25.4	38.4	54.2
34″	19.2	26.9	40.7	57.3
36″	20.3	28.4	43.0	60.3
38″	21.5	29.9	45.2	63.3
40″	22.6	31.4	47.5	66.4
42″	23.7	31.4	47.5	83.3
44″	24.9	48.3	66.0	86.9
46″	26.0	50.4	68.9	90.6
48″	27.1	52.5	71.7	94.3

Ex.: Model CBGL2F 6″ diameter section of 25 ft in length
From Table-A-6, weight in lb/ft = 8.8
Total weight = 8.8 x 25 = 185 lbs

SYSTEM SIZING

Complete system sizing and capacity may be obtained from chapter 31, "ASHRAE Handbook", Fundamentals Volume, or Chapter 3, "Air Pol lut ion Engineering Manual of the U.S. Environmental Protection Agency" or contact your CLEAVER-BROOKS representative. Not following these instructions may result in inadequate grease duct performance and/or a violation of the equipment manufacturer installation requirements.

CAUTION

Grease duct systems are not to be interconnected with any other building ventilating or exhaust system. Some special provisions for grease ducts are necessary and, in part icular, cleanout openings must be provided. Cleanout openings should:

1. Be provided at each change in direction of grease ducts, unless the entire length of duct can be inspected and cleaned from either the hood or discharge end or from both ends,
2. Be located on the sides of the duct, and
3. Have the lower edge of the opening at least 1-1/2 inches from the bottom of the duct.

Tees, Elbows, Increasers

90° GREASE TEE (GT90)

1. Generally used to connect the horizontal length from anappliance to the vertical length in grease duct systems. The 90ºGrease Tee (GT90) is also used as a cleanout section in both vertical or horizontal sections. Cleanout sections should be installed every 6 feet in horizontal ductwork.

2. The assembly includes a Finishing Band (FB); Assembly Band (AB) and insulat ion strip (where appl icable). Joint assembly for the tee, elbow, tee cap and connection to the pipe sections is done in the same manner as described in Section A, Piping and Fitting Assembly.

3. A tee cap is used to block one of the openings for purposes of cleaning, inspection or drainage (see Fig. B1-a).

4. When placed too close to a vertical wall, the Tee Cap (TC) becomes inaccessible and is difficult to remove. Thus, a 90º Elbow (E90) with a 90º Tee (T90) on either sides may be used when access is desired (see Fig. B-1b and B-2b).

Note: Good practice suggests that an opening be provided at each change of direction and cleanout sections be installed every 12 feet in horizontal ductwork. Also on vertical ductwork, adequate access for cleaning shall be provided on each floor.

90° GREASE TEE (GT90) SUPPORT

When designing a grease duct system, special care will be observed in supporting tees and elbows. Following are design guidelines for this purpose.

1. Use Variable length (VL) in al l horizontal or lateral breechings.
2. Provide access for easy removal of Tee Cap (TC).
3. Never use the grease duct outer casing for support.
4. Design system so that sliding of Variable lengths (VL) takes place, rather than bending at tees or elbows.
5. Single Axis Support: In short laterals where no more than 1/4" of thermal expansion (see Table-B-1) is expected in the horizontal run between an appl iance connect ion and a tee, use single axis vertical support as described in Table-B-2.
6. Two Axis Support: Where thermal expansion in the horizontal run between an appliance connection and a tee is more than 1/4" the assembly needs to be supported both vertically and horizontally to allow the Variable Length (VL) to absorb expansion movement and prevent damage to the tee (see Table–B-3).

Table B-1. Maximum allowable length for single axis support

Gas Temperature Rise	Maximum Length	Expansion
200ºF	12'-0"	1/4"
300ºF	8'-0"	1/4"
400ºF	6'-0"	1/4"
500ºF	5'-0"	1/4"

Note: 70°F ambient T°

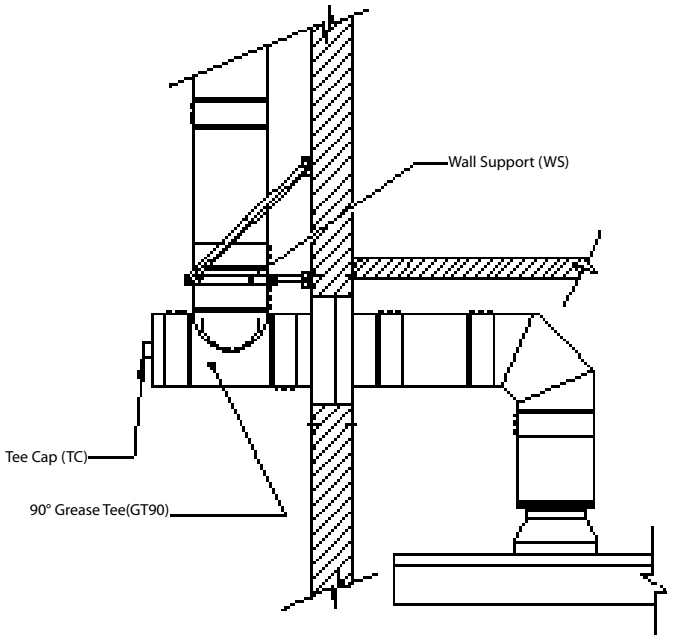
Note: Where expansion is more than 1/4", install a Variable Length(VL)

Table B-2 Single axis suport for 90° tee (T90)

Tee location

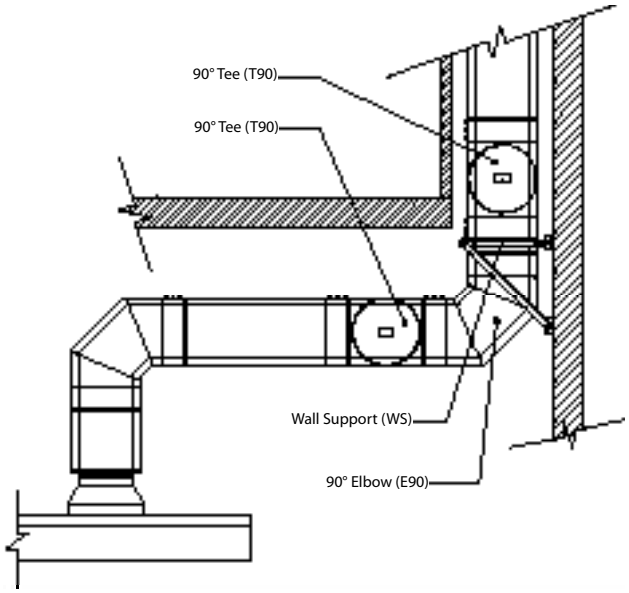
Adjacent to:	Interior	Exterior	Use Support Type	Detail
Wall		x	Wall Support (WS)	See Fig B-1a
Wall	x		Wall Support (WS)	See Fig B-1b
Floor	x		Anchor Plate (AP)	See Fig B-1c

Fig. B-1a - Single axis support for 90° Tee (T90 and GT90) on exterior wall



Note: Less than 1/4" expansion in horizontal run.

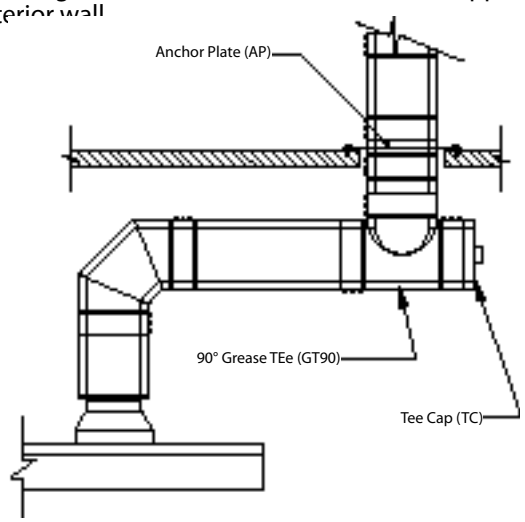
Fig. B-1b - Single axis support for 90° Tee (T90 and GT90) from interior wall



Note: Less than 1/4" expansion in horizontal run.

Tees, Elbows, Increasers

Fig B-1c - Single axis for 90° Tee (T90 and GT90) support from interior wall



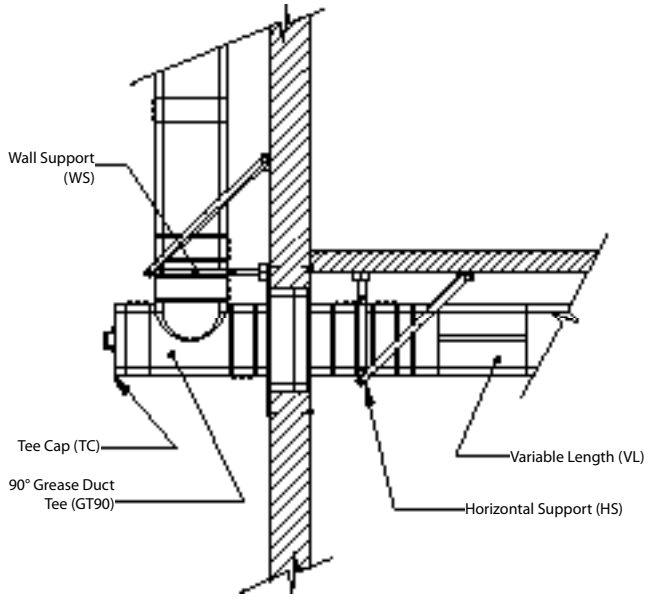
Note: less than 1/4" expansion in horizontal run.

Table B-3 - Two axis support for 90° Tee (T45) and Grease Duct Tee (GT90)

Tee location

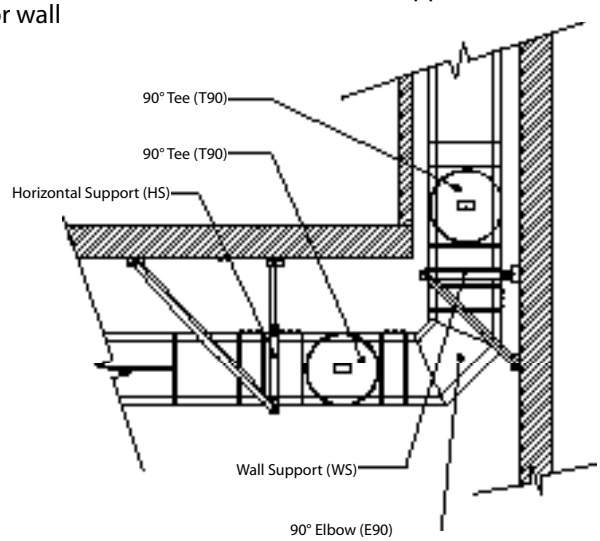
Adjacent to:	Interior	Exterior	Use Support Type	Detail
Wall		x	Horizontal (HS) and Wall Support (WS)	Fig B-2a
Wall	x		Horizontal (HS) and Wall Support (AP)	Fig B-2b
Floor	x		Horizontal (HS) and Wall Support (WS)	Fig B-2c

Fig. B-2a - Two axis Tee (T90 and GT90) support from exterior wall



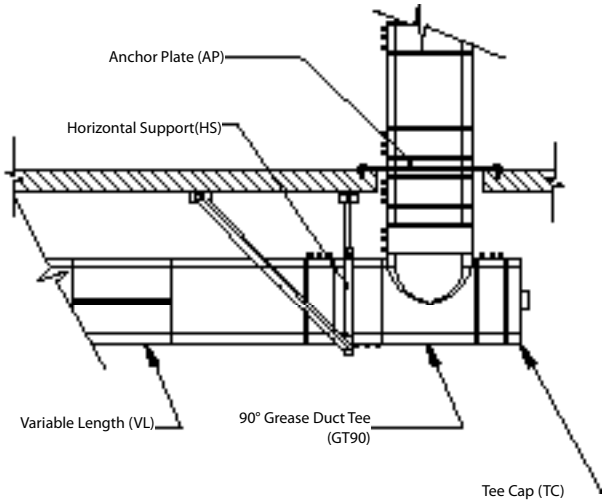
Note: Where expansion is more than 1/4", install Variable Length (VL) to absorb expansion in horizontal or lateral breechings. See Section D for details of Variable Length (VL).

Fig. B-2b Two axis 90° Tee (T90 and GT90) support from interior wall



Note: Where expansion is more than 1/4", install Variable Length (VL) to absorb expansion in horizontal or lateral breechings. See Section D for details of Variable Length (VL).

Fig. B-2c - Two axis Tee (T90 and GT90) support from interior floor



Note: Where expansion is more than 1/4", install Variable Length (VL) to absorb expansion in horizontal or lateral breechings. See Section D for details of Variable Length (VL).

Tees, Elbows, Increasers

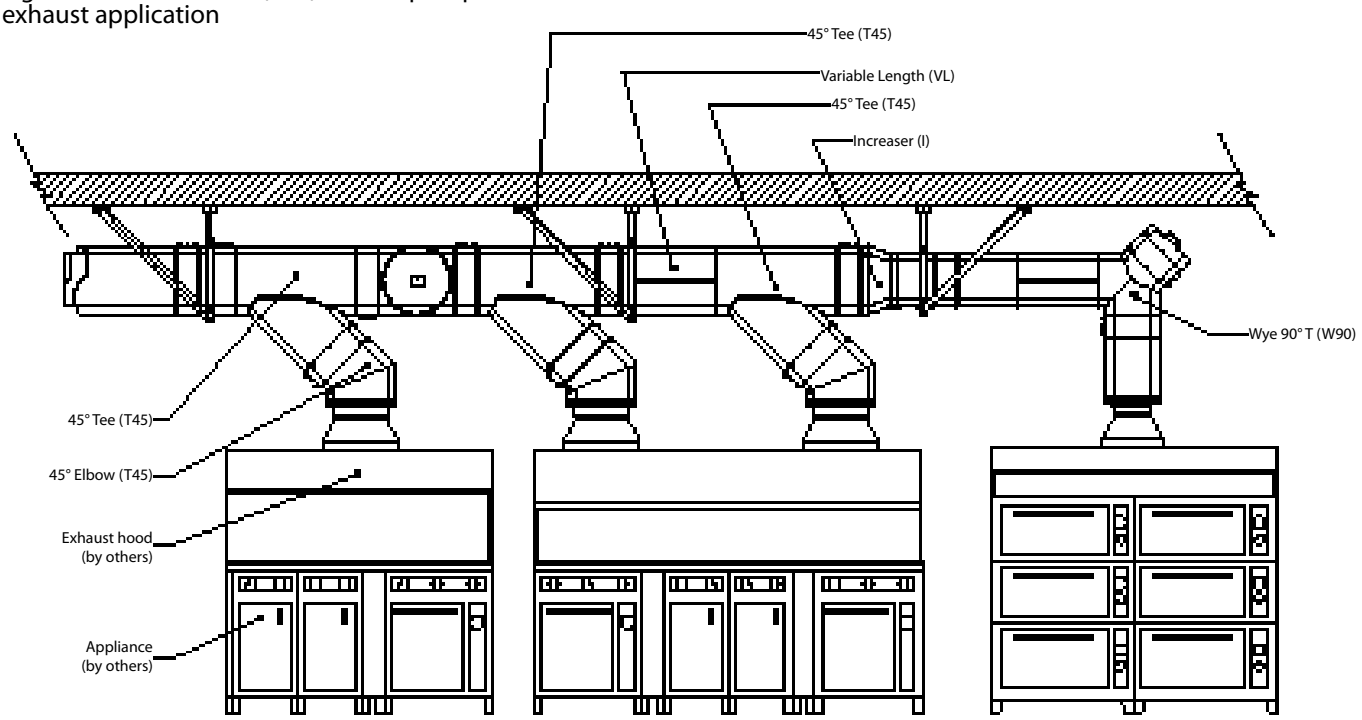
45° TEE (T45)

1. The use of this part will require an additional 45º Elbow (E45) to provide the low resistance 90º flow direction change (see Fig.B-3).

2. The 45º Tee (T45) is also used for multiple appliance exhaust in manifold breeching. It allows lower friction losses, those resulting in smaller manifold diameter (see Fig.B-3).

3. Joint assembly for the tee, elbow, connection to the pipe sections is done in the same manner as described in Section A Piping and Fitting Assembly.

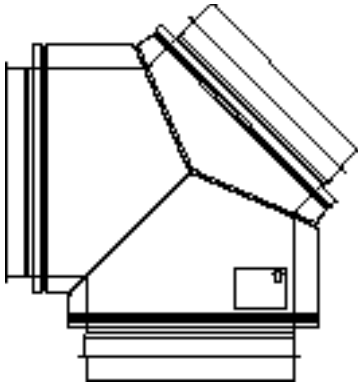
Fig. B-3 - Use of 45° Tee (T45) in multiple apliance exhaust application



WYE 90° (W90)

Used for inspection or for pipe cleaning. The Wye 90° (W90) is generally used at the intersection an horizontal and vertical runs (see Fig. B-3). Use Tee Cap (TC) to provide access (see Fig.B-4).

Fig. B-4 - Wye 90° (W90)



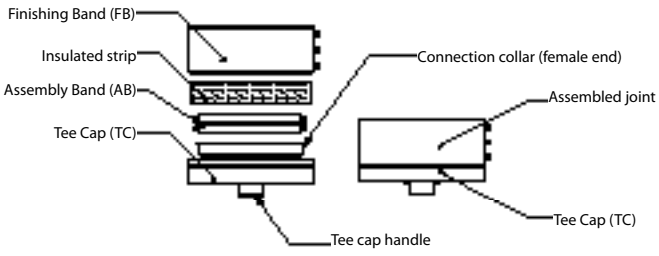
TEE CAP (TC)

1. Used to block one of the openings of horizontal or vertical tee. Removable, i t faci l i tates access for inspect ion and maintenance of the grease duct.

2. The assembly includes a Finishing Band (FB), Assembly Band (AB) and insulation strips (where applicable).

3. Joint assembly between the Tee Cap (TC) and the tee is done in the same manner as described in Section A Piping and Fitting Assembly.

Fig. B-5 - Tee Cap (TC)



Tees, Elbows, Increasers

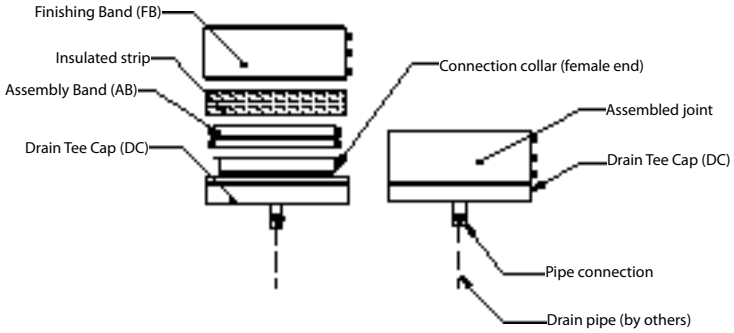
DRAIN TEE CAP

1. Used to block the lower vertical opening of a tee. It serves to collect rainwater that may enter the grease duct or water caused by condensation, or to collect water from the cleaning process.

2. To be connected to a drain of 3/4" diameter-NPT. It is connected to the tee with the joint assembly.

3. Joint assembly between the Drain Tee Cap (DC) and the tee is done in the same manner as described in Section A Piping and Fitting Assembly.

Fig. B-6 - Drain Tee Cap (DC)



INCREASER (I)

1. Used to increase the diameter of the flue or chimney.

2. The Increaser (I) can be connected directly to a 45º Tee (T45). (See Fig.B-7b) and can be used in a multiple appliance manifold. (See Fig.B-8)

3. The Increaser (I) includes a transition section tapered at a 14º angle, which provides a lower friction loss coefficient. (See Fig.B-7a Detail B)

4. Larger diameter Increasers (I) are available on order or as specified. The angle of the Increaser (I) is standard but the length of the fitting varies depending on the diameter to be increased.

5. Joint assembly between the Increaser (I) and the flue is done in the same manner as described in Section A Piping and Fitting Assembly.

Fig. B-7a - 4" and 2" diameter increased

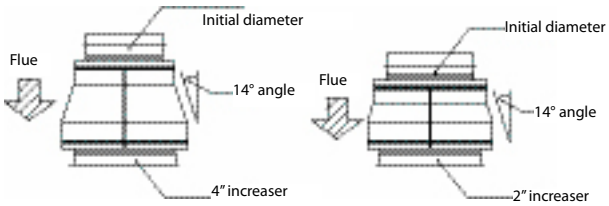
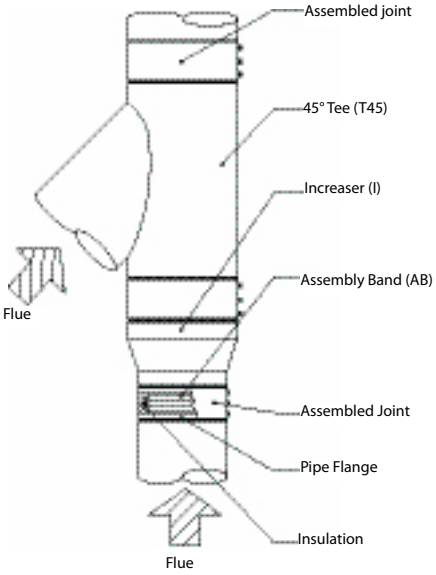


Fig B-7b - Increaser (I) with 45° Tee (T45)



REDUCER (R)

1. Used to reduce the diameter of the flue. It is used mainly at the inlet of the chimney.

2. Specify the diameter of the inlet and outlet of the fitting. It is connected to the flue in the same manner as for Increaser (I) model except that the ends are inverted.

3. Joint assembly between the Reducer (R) and the flue is done in the same manner as described in Section A Piping and Fitting Assembly.

ELBOWS

1. Elbows are used for changes in direction in horizontal or vertical portions of a chimney system.

2. All elbows feature the standard joint assembly as described in Section A Piping and Fitting Assembly.

3. Elbows are used in combination to make up different angles ranging from 5º to 90º in horizontal and vertical breechings of the chimney system.

4. When elbows are used for offsets in the main vertical portion of the chimney, caution should be exercised to prevent excessive bending forces and/or design problems. (See OFFSETS in this Section for details)

Tees, Elbows, Increasers

5° ELBOW (E5)

1. Used for offset or deviation of the horizontal part of Grease Duct by 5°
2. May be used to slope a conduit to facilitate the run-off of condensation water from the Grease Duct. (See fig. B-8b)

Fig. B-8a - 5° Offset using 2 x 5° Elbows (E5)

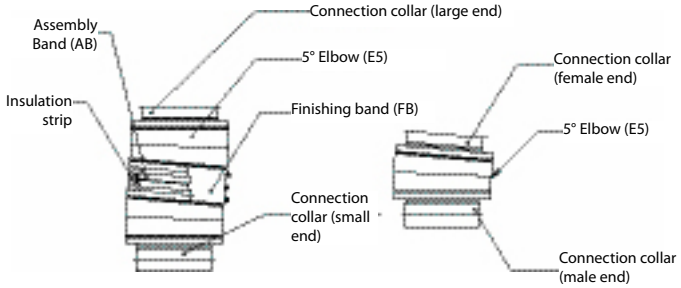
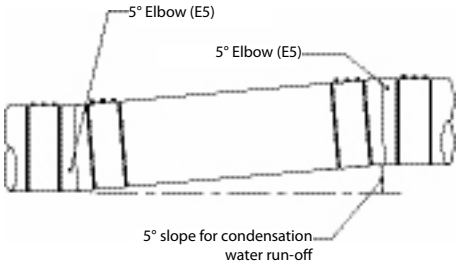


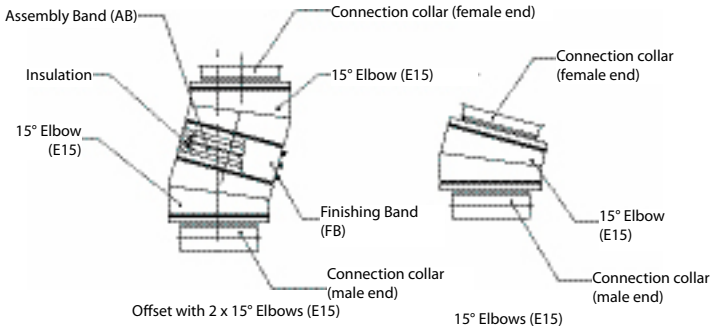
Fig. B-8b - 5° Horizontal slope for condensation Water run-off using 5° elbows (E5)



15 ELBOW (E15)

Used for offset or deviation of the flue or chimney by 15°.

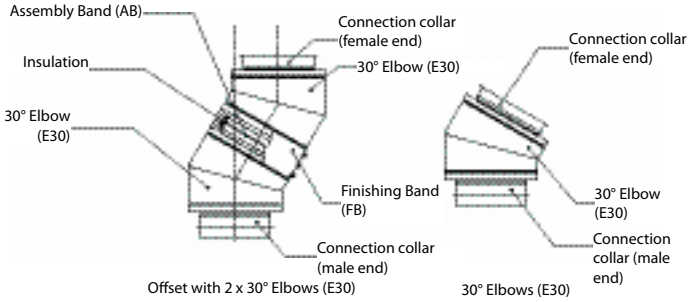
Fig. B-9 - 15° Elbow (E15)



30° ELBOW (E30)

Used for deviation of the flue or chimney by 30°.

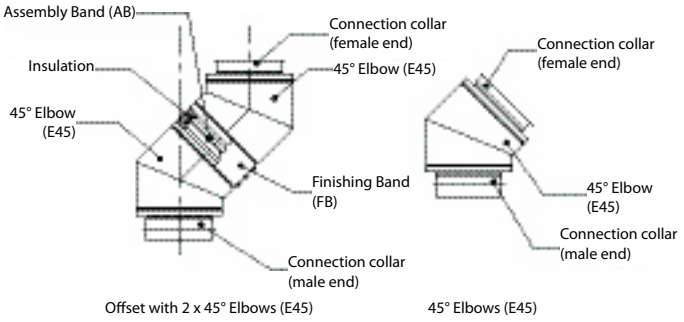
Fig. B-10 - 30° Elbow (E30)



45° ELBOW (E45)

Used for deviation of the flue or chimney by 45°. Can also form a 90° elbow by using two elbows. (See fig. B-8e)

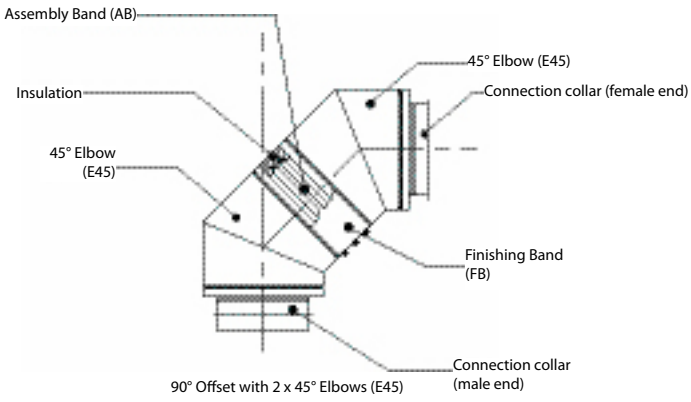
Fig. B-11 - 45° Elbow (E45)



90° ELBOW

Used deviation of the flue or chimney by 90°.

Fig. B-12 - 90° Elbow 2 x (E45) or also 1 piece 90° Elbow (E90)



Tees, Elbows, Increasers

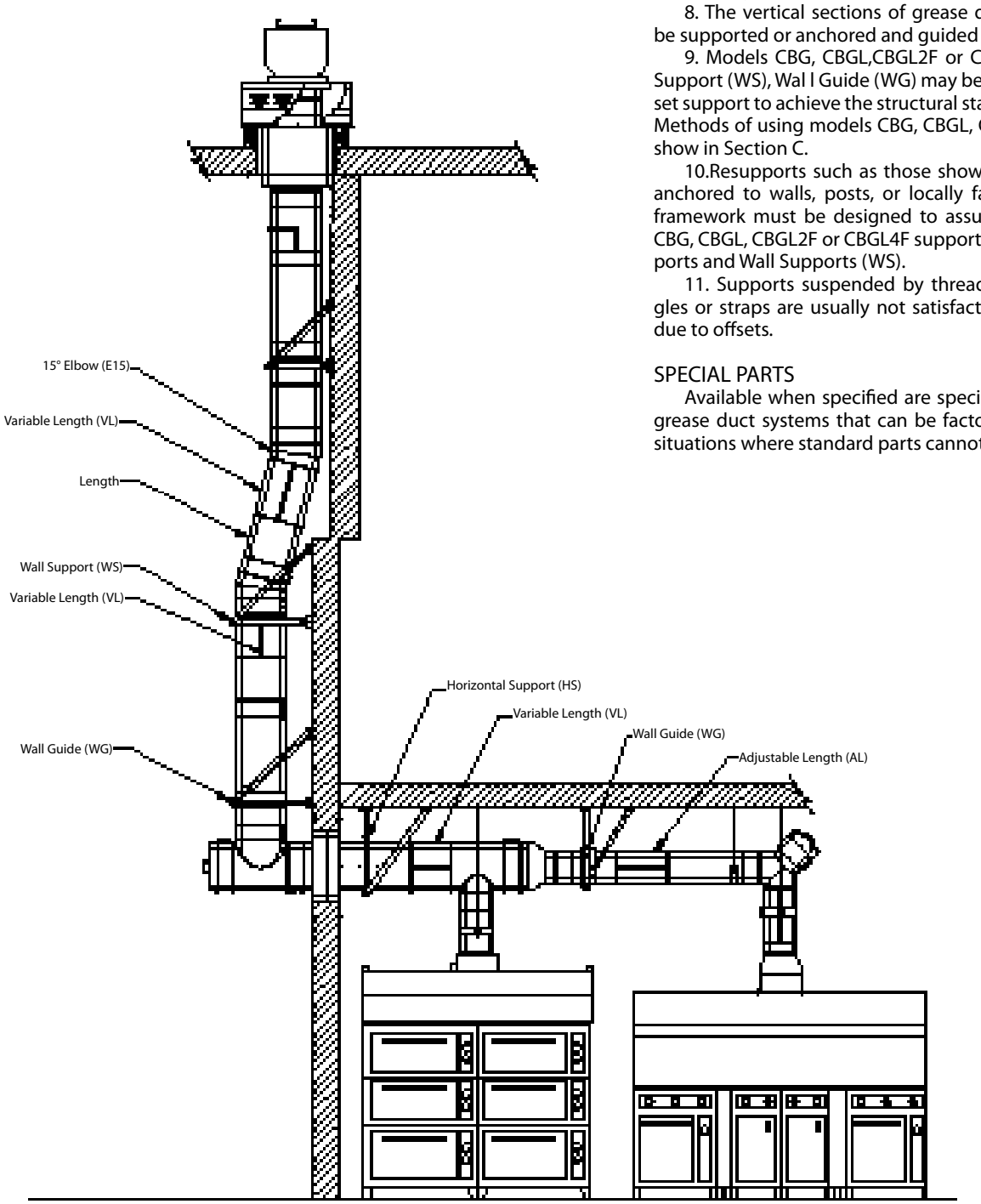
OFFSET

1. Except where absolutely necessary, sloped or horizontal offsets in the vert ical port ion of a grease duct above the breeching should be avoided.

2. Sloped offsets require more expansion joints and secure bracing above and below elbows.

3. Because elbows (and fittings) can only take limited forces due to any bending moments, special care should be exercised in designing the bracing for elbows.

Fig. B-13 - Horizontal offset



4. To assure proper guidance of expansion joints and to prevent unnecessary joint bending, use an adequate number of supports at closer intervals.

5. Use Variable Length (VL) below each support in offset runs. The carrying capacity of models CBG, CBGL, CBGL2F or CBGL4F supports and their structural attachments must take into account the weight of the offset plus whatever vert ical pipe is carried by that support.

6. Height limits for supports are tabulated in Section A of these instructions.

7. The ends of any sloped or horizontal offset must be anchored to prevent overstressing elbows and to assure proper operation of expansion joints.

8. The vertical sections of grease duct above the offset must also be supported or anchored and guided where necessary.

9. Models CBG, CBGL,CBGL2F or CBGL4F Roof Support (RS), Wal l Support (WS), Wal l Guide (WG) may be used in a variety of ways for offset support to achieve the structural stability of the grease duct system. Methods of using models CBG, CBGL, CBGL2F or CBGL4F supports are show in Section C.

10.Resupports such as those shown in Fig. B-13 must be securely anchored to walls, posts, or locally fabricated rigid framework. This framework must be designed to assure stability of attached models CBG, CBGL, CBGL2F or CBGL4F supports, such as Anchor Plate (AP) supports and Wall Supports (WS).

11. Supports suspended by threaded rods or from small size angles or straps are usually not satisfactory to resist bending moments due to offsets.

SPECIAL PARTS

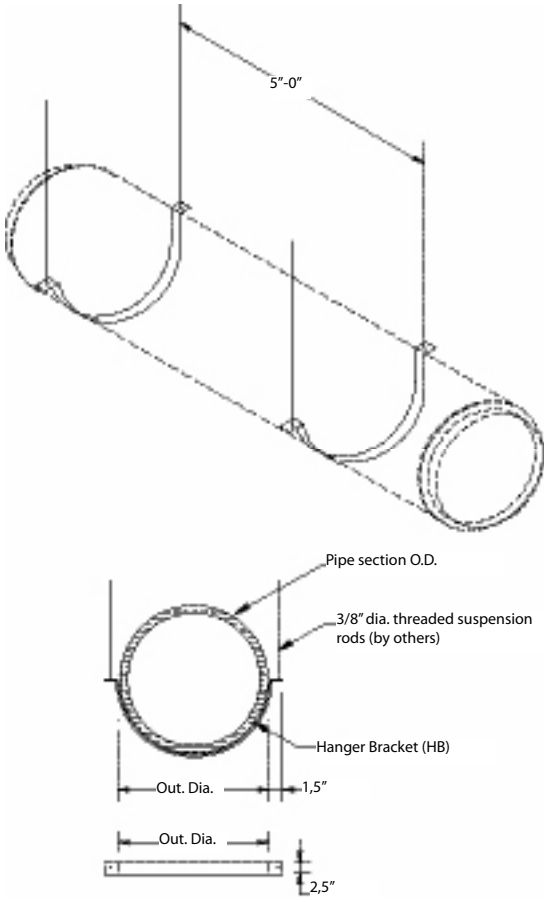
Available when specified are special parts or components used in grease duct systems that can be factory-buil t to accommodate field situations where standard parts cannot be used.

Structural Support and Guiding

HANGER BRACKET ASSEMBLY (HB)

Used to support the flue in horizontal runs. To be installed by means of 3/8" diameter threaded suspension rods (by others). Generally installed every 5'-0" of chimney section. (See Fig. C-1.)

Fig. C-1 - Hanger Bracket Support Assembly (HB)



WALL SUPPORT ASSEMBLY (WS)

1. The Wall Support (WS) assembly consists of a 12" grease duct section, plasma-welded to a square support plate.

2. The grease duct section, which extends both above and under the support plate is used as connection collars for quick and easy joint assembly.

3. The assembly is suppl ied wi th mount ing brackets and angle struts for diagonal bracing (see Fig .C-2), Assembly Band (AB) and Finishing Band (FB).

4. The grease duct sections are joined to the Wall Support (WS) in the same manner as described in Section A Pipe and Fitting Joint Assembly. Fig. A-7a, b and c. Also see Fig.C-2a in this Section.

5. Used to support the vert ical runs of grease duct , i t maintains the grease duct at an adjustable distance between 2.5" and 10" from the wall.

6. The diagonal braces may be attached to the wall either above or below the supporting plate.

7. The Wall Support (WS) is the maximum strength support for vertical CBG, CBGL, CBGL2F and CBGL4F models. It is used to maintain joint alignment and support for expansion joints.

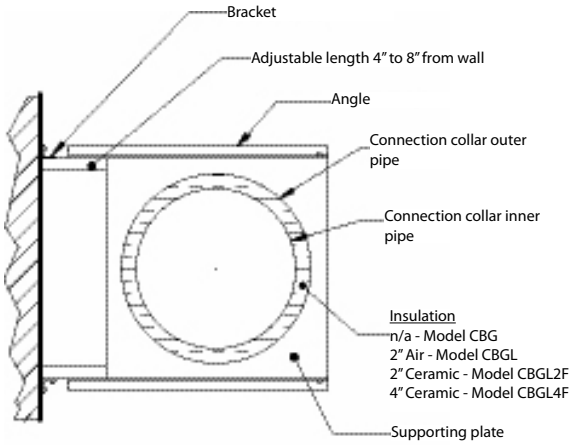
8. The support may be required to support both upstream and downstream parts of a tee, which will be protected from excessive bending stresses.

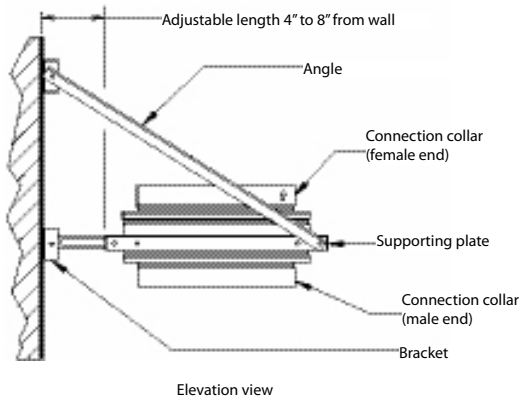
9. Greater heights may be obtained by adding Wall Supports (WS), using Variable Length (VL) each point of support.

10.The wall support method is intended only for attachment to NON-COMBUSTIBLE surroundings such as steel structure, concrete blocks or other masonry, with clearances adequate for access and assembly. Heat conduction can be reduced by means of spacers. Wall Support (WS) is not suitable for attachment to wood or combustible wall structures. Wall Support (WS) must be secured to the building with rigid structural framework.

Height Limit: See Section A Table A-2 for maximum height of Wall Support (WS)

Fig. C-2 - Wall Support Assembly (WS)

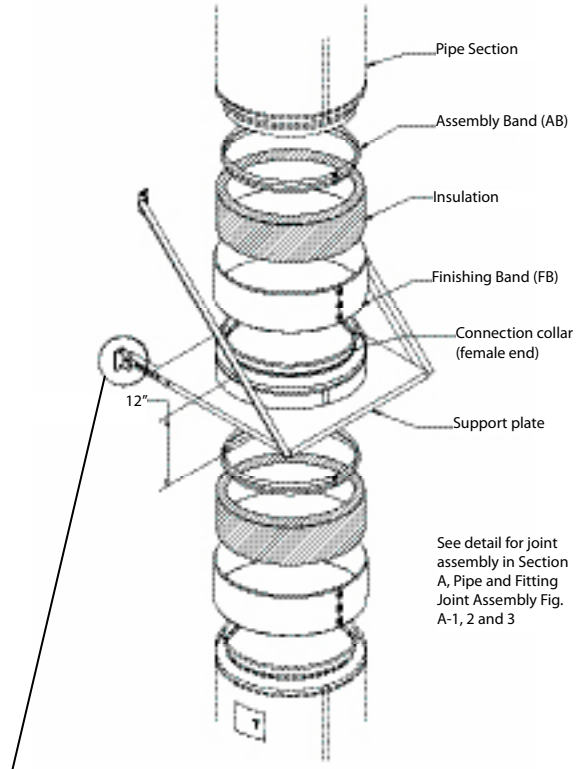




Note: For connection of the Wall Support (WS), Horizontal Support (HS) and Anchor Plate (AP) support to the Grease Duct system, see typical Installation detail (Fig. C-2a) on next page.

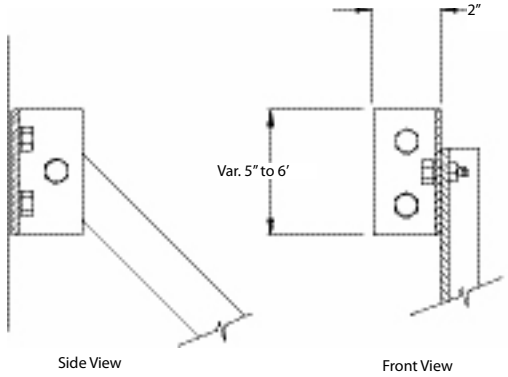
Structural Support and guiding

Fig. C-2a - Typical joint for Wall (WS), Horizontal (HS) and Anchor Plate support(AP)



Note: Minimum clearance between chimney and combustibles is 2.5" when installed with wall brackets only. Do not attach the supporting plate directly to combustible materials. Always use wall brackets. For more than 2.5" clearance, use wall brackets and adjustable angles.

Fig. C-2b - Wall Bracket Detail



HORIZONTAL SUPPORT (HS)

1. The Horizontal Support assembly (HS) consists of a 12" Grease Duct section, plasma-welded to a square support plate.

2. The Grease Duct section, which extends both ahead and behind the support plate, is used as connection collars for quick and easy joint assembly.

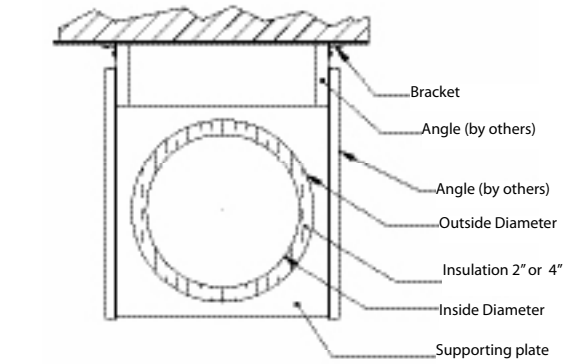
3. The assembly is supplied with mounting brackets, an Assembly (AB) and Finishing Band (FB). See Fig.C-3.

4. The Grease Duct sections are joined to the Horizontal Support (HS) in the same manner as described in Section A Pipe and Fitting Joint Assembly. Fig. A-1, 2 and 3. Also See Fig.C-2a in this Section.

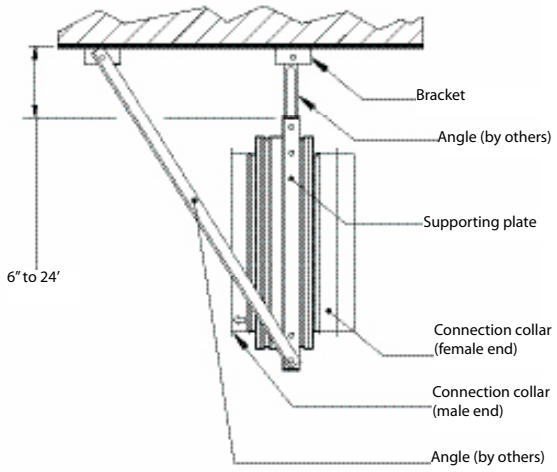
5. Used to support the flue in horizontal runs of the Grease Duct. It holds the flue at an adjustable distance from the ceiling. The diagonal braces may be attached to the ceiling either ahead or behind the supporting surface. See Fig. C-3.

6. The horizontal support must be secured to the building with a rigid structure. Under no circumstance should a horizontal support be secured with threaded suspension rods, since this will not prevent pipe sway.

Fig. C-3 - Horizontal Support Assembly (HS)



Front View



Side Elevation View

Structural Support and Guiding

ANCHOR PLATE ASSEMBLY (AP)

1. The anchor plate assembly consists basically of a 12" Grease Duct section that is welded to a steel plate.

2. The Grease Duct section that extends both above and under the plate is used as connection collars for quick and easy joint assembly to the pipe sections.

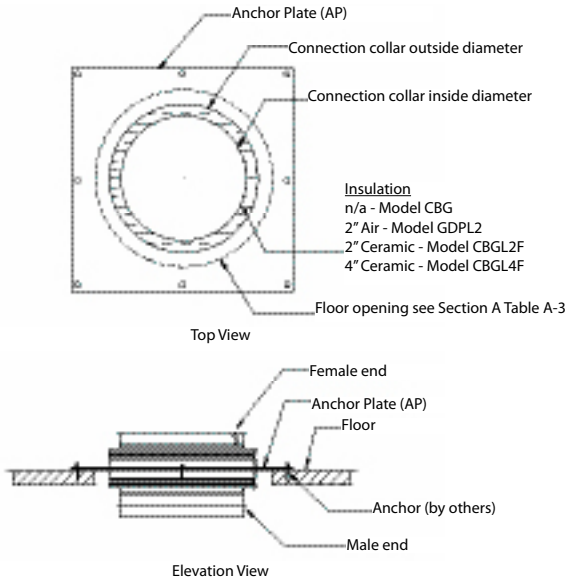
3. It is supplied with both an Assembly Band (AB) and Finishing Band (FB).

4. Used to support the chimney in vertical runs of Grease Duct. It is attached to the floor by means of anchors (by others) See Fig.C-4.

5. Pipe sections are then attached to the support collars in the same manner as described in Section A Pipe and Fitting. Joint Assembly Fig. A-1, 2 and 3. Also See Fig. C-2a in this Section

Height Limits: See Section A Table 5 for maximum support height of Anchor Plate (AP).

Fig. C-4 - Anchor Plate Assembly (AP)

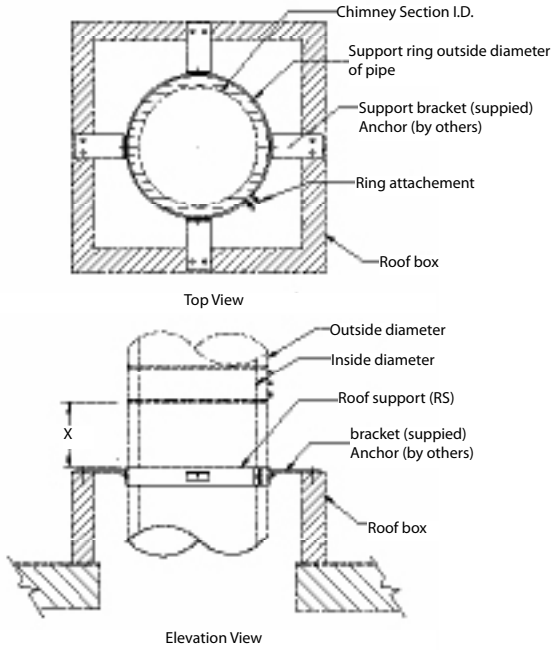


ROOF SUPPORT (RS)

Used to support and guide the portion of the Grease Duct, which extends to the roof. It is attached to the roof box by means of four angles (See Fig.C-5). It maintains a minimum distance between the chimney and combustible materials at the roof.

Height Limits: See Section D Roof and Wall Penetration for complete Roof Support (RS) assembly details and use.

Fig. C-5 - Roof Support (RS)

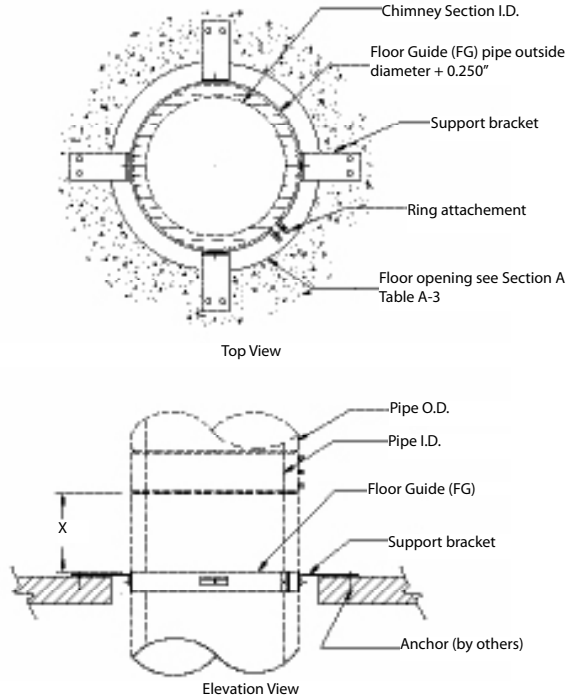


Keep joint away from suport X = 6" Min. above and under

FLOOR GUIDE ASSEMBLY (FG)

Used as a guide at a floor penetration. It is attached to the floor by means of 4 angle brackets. It maintains a minimum distance between the chimney and combustible floor material.

Fig. C-6 - Floor Guide assembly (FG)



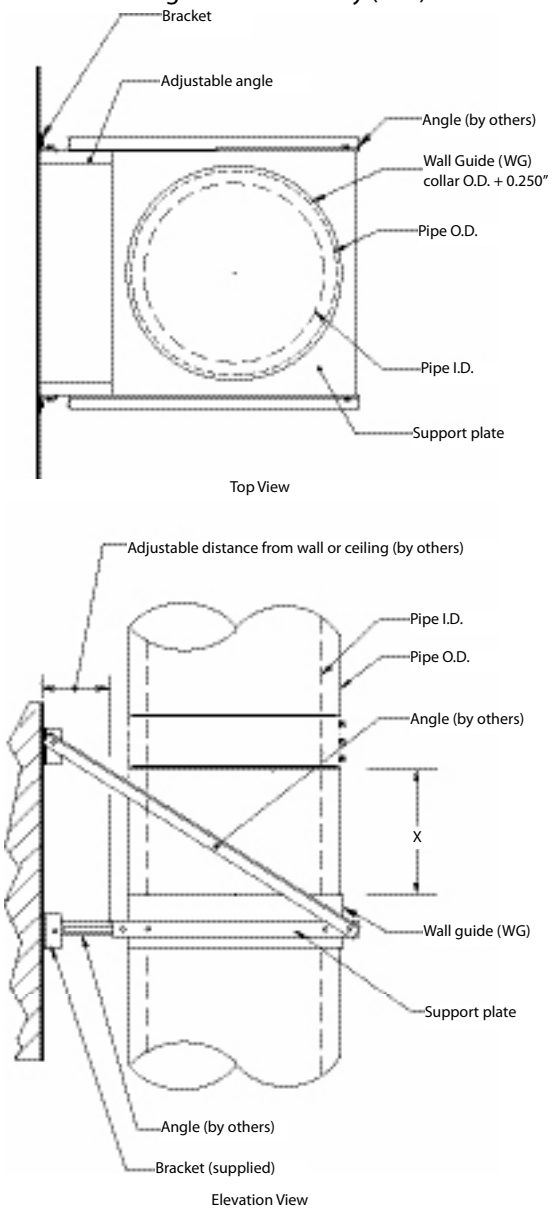
Keep joint away from suport X = 6" Min. above and under

Structural Support and guiding

WALL AND CEILING GUIDE ASSEMBLY (WG)

Used to guide and allow the expansion of the Grease Duct system. It holds the flue or chimney at an adjustable distance from ceiling or wall. The diagonal braces may be attached above or below the guide plate. The ring is 1/4 " larger than the outside diameter of the Grease Duct pipe to allow for sliding. (See Fig.C-7)

Fig. C-7 - Wall and Ceiling Guide Assembly (WG)



Keep joint away from suport X = 6" Min. above and under

WALL BAND ASSEMBLY (WB)

Stabilization of the Grease Duct along a vertical wall is obtained by the use of the Wall Band (WB) assembly. For maximum recommended distance between a Wall Band (WB) and another guide or support, see Table-A-6 "MVS".

Fig. C-8a - Wall Band Assembly (WB)

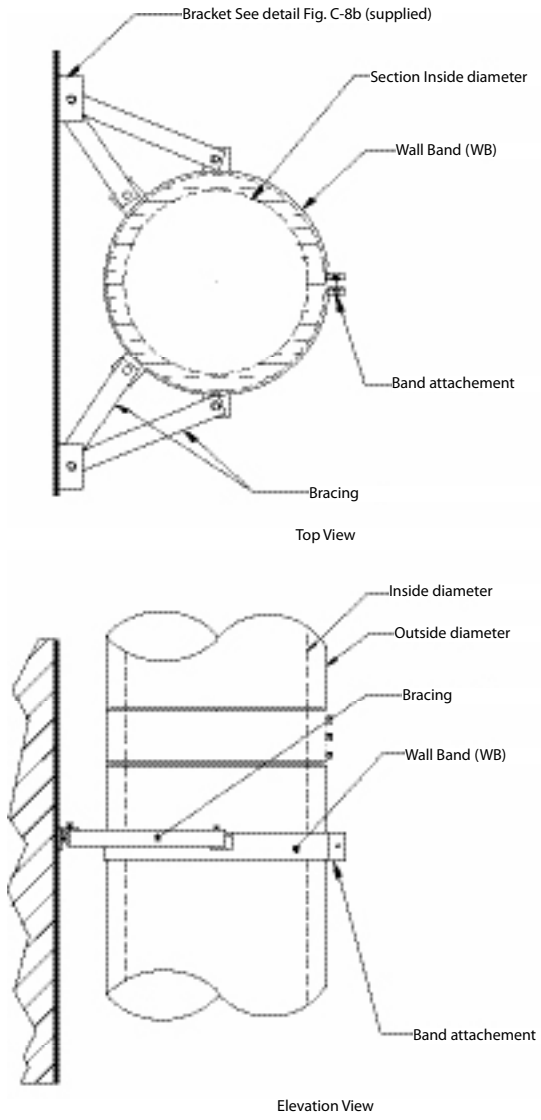
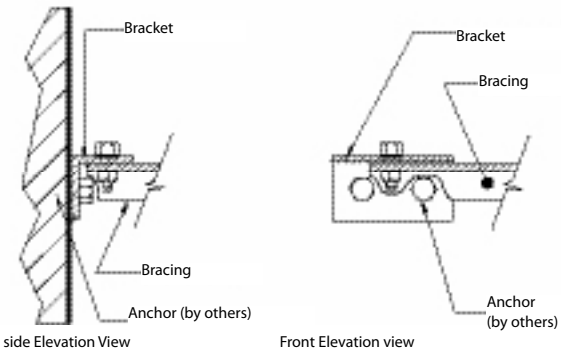


Fig. C-8b - Bracket Detail

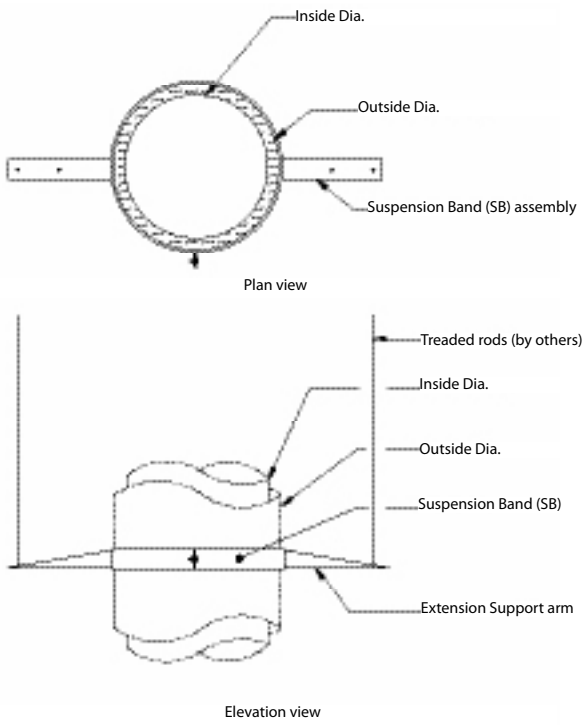


Structural Support and Guiding

SUSPENSION BAND (SB)

Used to stabilize and support the y in vertical Grease Duct runs. It avoids the transfer of the flue weight to the appliance. To be used with threaded rods (By others).

Fig. C-9 - Suspension Band (SB)



Height Limits: See Table A-5 for maximum height of chimney using Suspension Band (SB) support.

GUY WIRE BAND (GWB)

Used to stabilize a Grease Ductlaterally where it extends more than 10'- 0" beyond the roof or for places exposed to strong winds. It is attached to the Grease Duct and is designed to receive 3 guy cables 120º apart. It may be manufactured to receive 4 guy cables 90º apart. See Fig.C-10b.

Fig. C-10a - Guy Wire Band (GWB) Typical installation

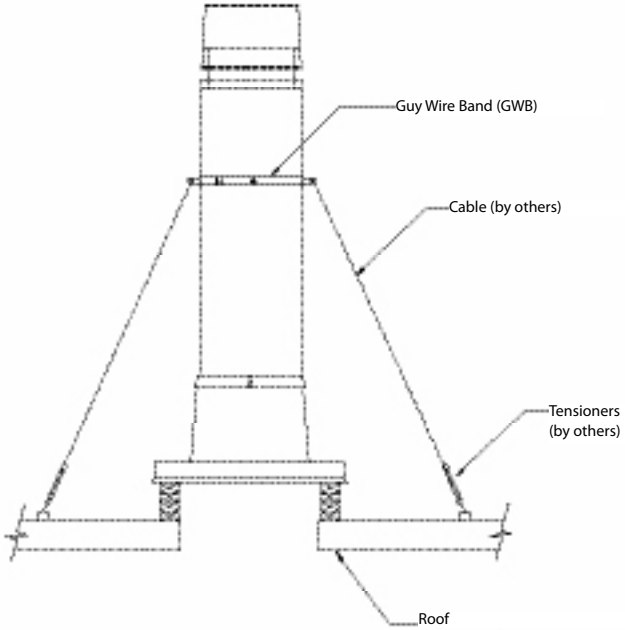
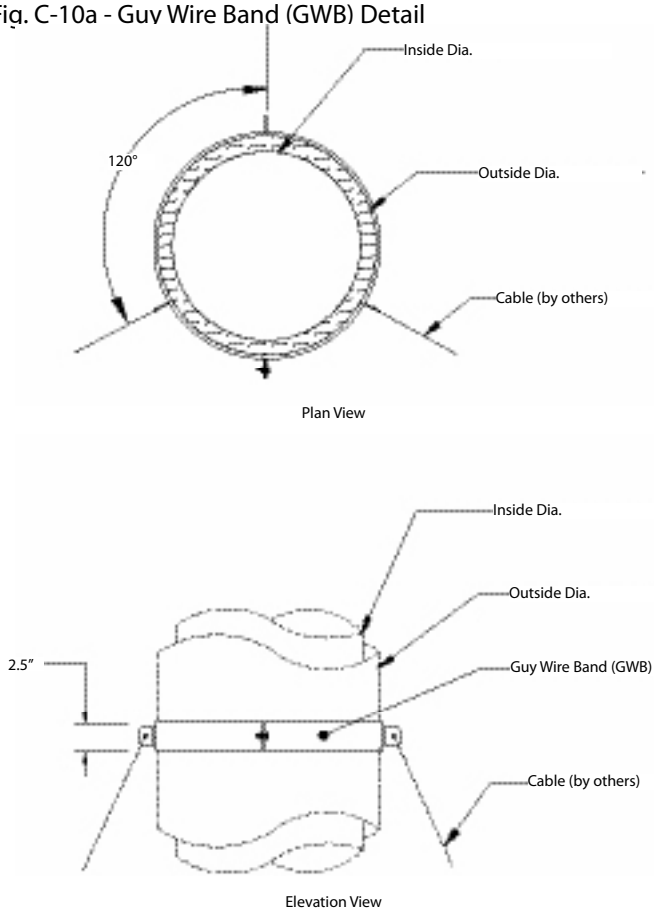


Fig. C-10a - Guy Wire Band (GWB) Detail

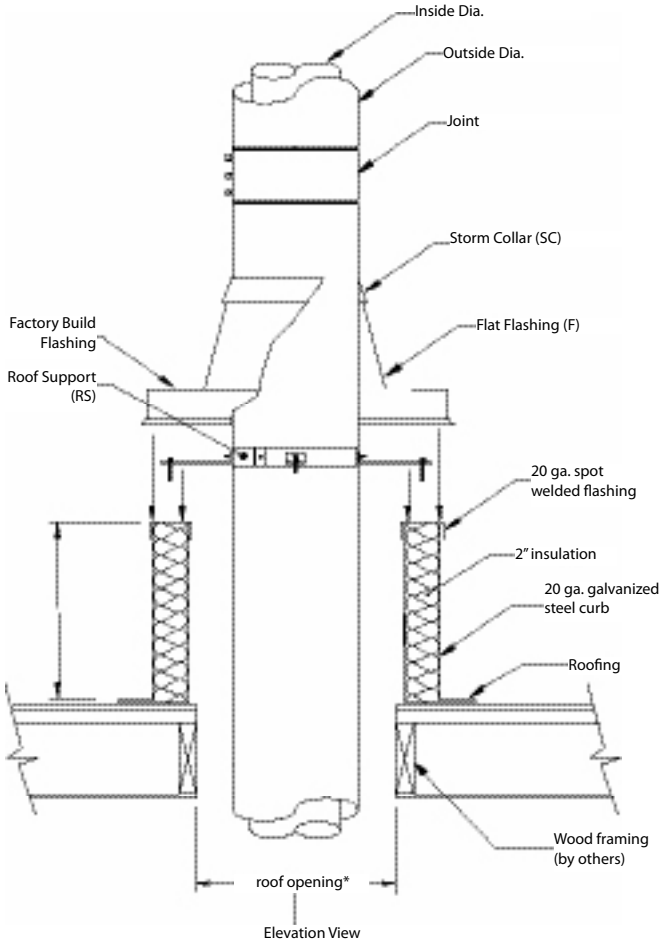


Roof and Wall Penetration

FLAT FLASHING ASSEMBLY (F)

The Flat Flashing assembly (VF) is primarily used where a grease duct section passes through a roof made of combustible material. It is designed to be installed on a flat roof curb of a minimum height of 12" (see Fig. D-1). For some areas, greater heights may be needed according to local code requirements. The roof framing dimension must provide sufficient opening to comply with the minimum clearance from combustibles. The Roof Support (RS) is used to secure the grease duct to the top of the roof curb using two 1/4" x 2 1/2" inch lag bolts in each support bracket (see Section C for detail of Roof Support (RS)). The Flat Flashing (F) is then lowered on to the curb and the Storm Collar (SC) secured to the grease duct section with the screws supplied. A Ventilated Flashing (VF) option is also available where air circulat ion between the grease duct and the roof structure is wanted. The Ventilated Flashing (VF) option may serve as a ventilation outlet in smaller areas with gravity air supply.

Fig. D-1 - Flat Flashing Roof Assembly (F)



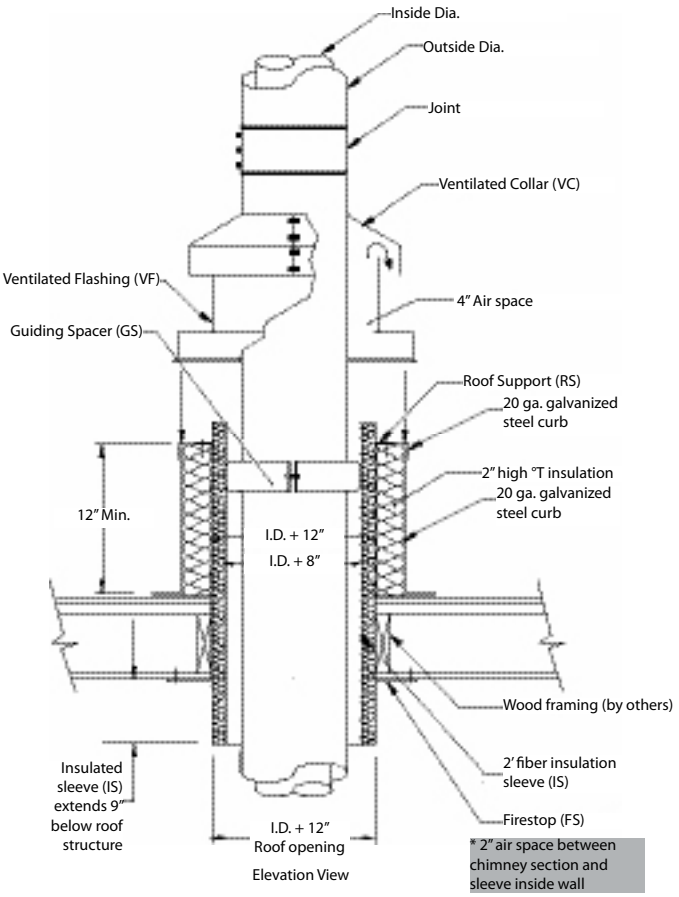
* Note: 1. May be used in non-combustible roof application, See Section A Table-A-3 for roof openings.
2. Framing of roof openings for combustible roof applications must meet specified clearances in Section A Table-A-3. Proper framing is the responsibility of the installing contractor.

VENTILATED FLASHING (VF) WITH INSULATED SLEEVE (IS)

The Ventilated Flashing assembly (VF) is primarily used where a grease duct sect ion passes through a roof made of combustible construction. It protects the structure against built up heat temperatures by allowing air circulation between the grease duct and the roof structure. It is designed to be installed on a flat roof curb of a minimum height of 12" (see Fig. D-2). For some areas, greater curb height may be needed according to local code requirements (see Fig. D-2 for curb and framing dimensions).

The Insulated Sleeve (IS) is secured to the top of the roof curb using two 1/4" x 2 1/2" inch lag bolts in each support bracket (see Fig. D-4 for detail of Insulated Sleeve (IS)). The Ventilated Flashing (VF) is then lowered on to the curb and the Ventilated Collar (VC) secured to the grease duct section with the screws supplied (also see Fig. D-5).

Fig. D-2 - Ventilated Flashing (VF) Roof Assembly with Insulated Sleeve (IS)



Note: Proper framing of openings for combustible roof applications must meet specified clearance I. D. +12" and is the responsibility of the installing contractor.

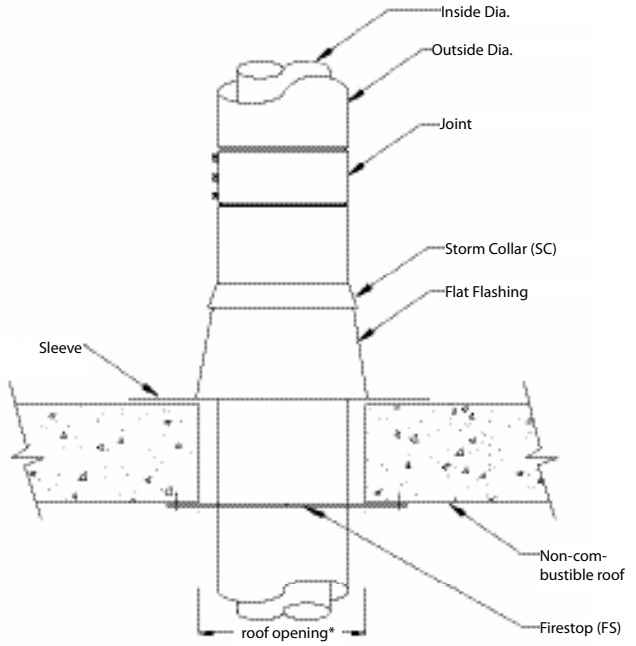
WARNING
DO NOT CAULK OR SEAL OR USE ANY TYPE OF INSULATION IN THE VENTILATING OPENINGS BETWEEN THE CHIMNEY AND THE INSULATED SLEEVE (IS) AS WELL AS BETWEEN THE ROOF CURB AND THE VENTILATED FLASHING (VF). ALLOW FOR FREE AIR CIRCULATION AT ALL TIMES.

Roof and Wall Penetration

FLAT FLASHING (F) WITHOUT ROOF CURB

The Flat Flashing (F) assembly is primari ly used for low temperature ex haus t where a grease duct sect ion passes through a roof made of non-combustible material. In areas with considerable amount of snow, a roof curb assembly is recommended to provide clearance from the roof (see Fig. D-5).

Fig. D-3 - Flat Flashing Roof Assembly (F)



INSULATED SLEEVE (IS)

1. Used with CBGL grease duct model to protect combustible materials where a flue or grease duct passes through a floor or roof. It can also be used with CBGL2F, when added security is needed to protect combustibles.

2. It ensures a minimum space of 2″ from combust ible materials (see Fig. D-4).

3. Reduces excessive heat by means of its double wall 2″ high-temperature insulation.

4. It can be used with Ventilated Flashing (VF) roof assembly (see Fig .D-5).

Fig. D-4 - Insulated Sleeve (IS)

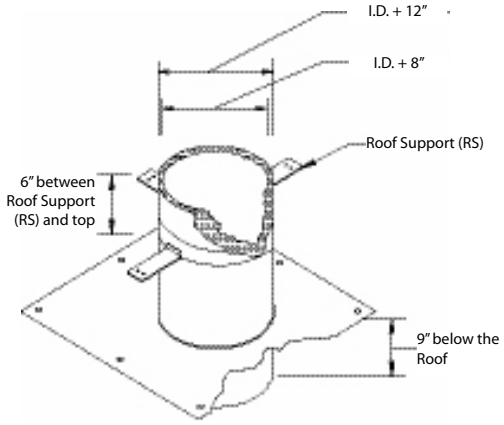
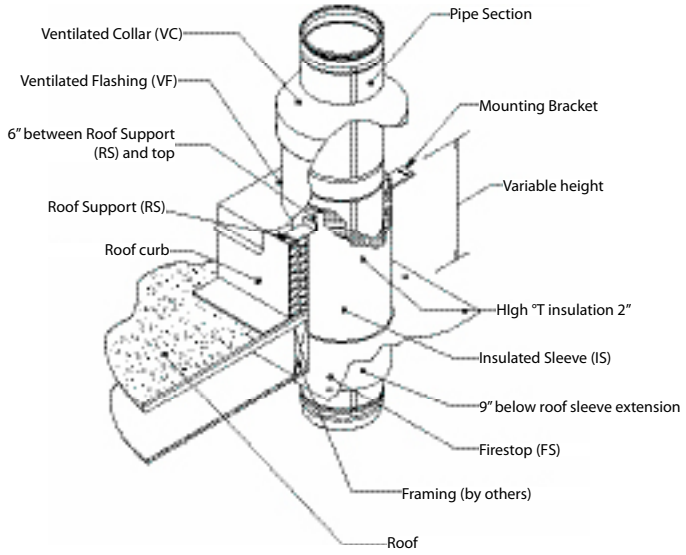


Fig. D-5 - Typical through the roof inistallation



INSTALLATION

1. Install roof curb over the roof opening.

2. Install the Guiding Spacer (GS) on the grease duct section passing through the roof to allow for expansion of the grease duct section by allowing it to slide in the Insulated Sleeve (IS) assembly.

3. Install Insulated Sleeve (IS) by sliding it in over the guide and grease duct section. Secure the sleeve to the roof curb with the mounting brackets or the Roof Support (RS).

4. Install the Ventilated Flashing (VF) over the roof curb and Insulated Sleeve (IS) assembly.

5. Install the Ventilated Collar (VC) by securing it to the pipe section leaving a 4″ gap between the collar and the top of the Ventilated Flashing (VF).

6. Install the firestop by sliding it over the Insulated Sleeve (IS) and securing it under the roof structure.

WALL PENETRATION

1. Where a grease duct section passes through a wall, the combust ible material in the wal l need to be protected from radiation heat from the grease duct.

2. Table-D-1 shows the different parts that provide sufficient clearance between the grease duct and the combustibles in the wall.

3. Table-D-1 also shows required clearance between the grease duct and the combustibles as well as the wall opening needed for each grease duct model.

Table-D-1 Wall Penetrations

Model	Wall Penetration Part Firestop Type	Max. Wall Thickness	Wall Opening	Clearance	See detail
CBGL	finishing collar	18″	I.D. + 12″	6″	Fig.D-6, 7, 8
CBGL2F	Non-insulated (WFS)	18″	Table A-3	Table A-2	Fig. D-9, 10, 11

Note: 1. Finishing collar is used only for exterior wall applications.
2. Clearances are calculated from I.D. to the combustibles.

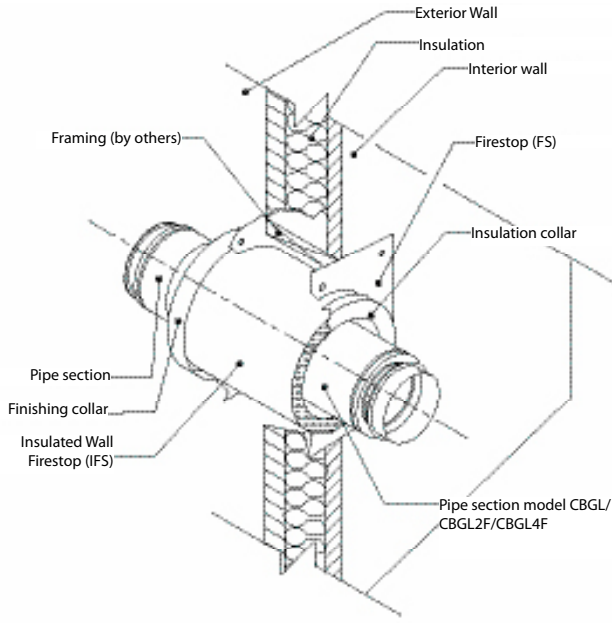
Roof and Wall Penetration

INSULATED WALL FIRESTOP (IFS)

1. The Insulated Wall Firestop (IFS) assembly is primarily used for wall penetration allowing a section to pass through a wall made of combust ible material . It is used to maintain a minimum clearance between the combustible wall material and the grease duct section passing through the wall (see Fig D-8). It protects the wall from heat radiated from the grease duct.

2. The Insulated Wall Firestop (IFS) is used with double wall non-insulated model CBGL. For other models see non-insulated Wall Firestop (WFS).

Fig. D-6 - Insulated Wall Firestop (IFS) assembly



Do not install insulation in the opening between the pipe outside wall and the firestop inner wall, allow for free air circulation at all times.

Fig. D-7 - Insulated Wall Firestop (IFS)

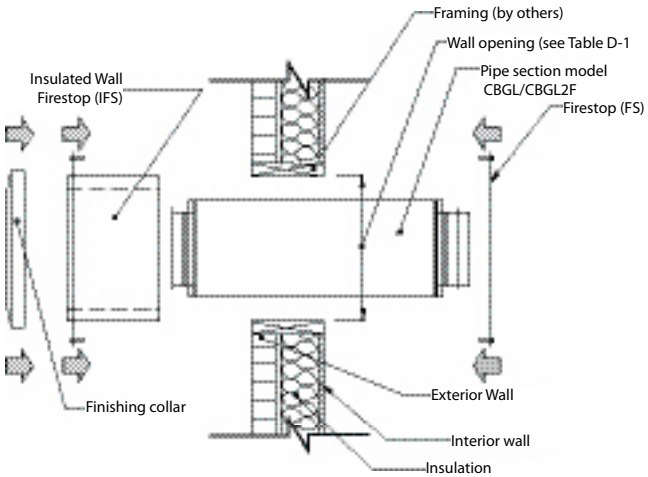
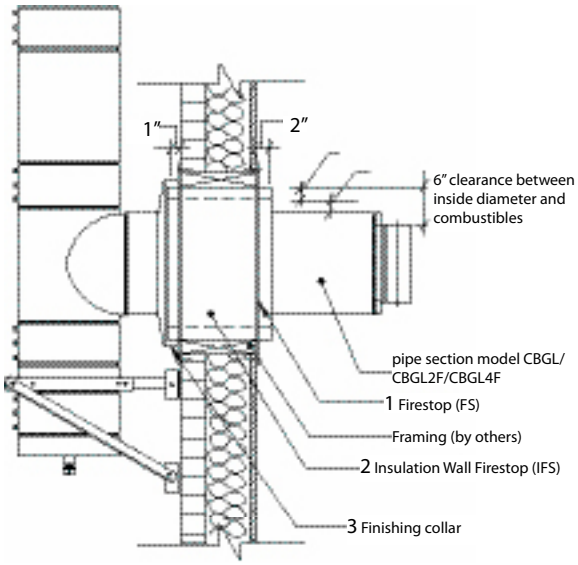


Fig. D-8 - Typical Insulated Wall Firestop (IFS) installation for exterior wall application CBGL/CBGL2F model



Do not install insulation in the opening between the pipe outside wall and the firestop inner wall, allow for free air circulation at all times.

INSTALLATION FOR EXTERIOR WALL

1. From Table-D-1 (in this sect ion) determine the wall opening for the grease duct model to be installed.

2. From the interior wall side, put the firestop (1) in place before passing the pipe section in the opening (see Fig. D-7).

3. From the exterior wal l side, sl ide the Insulated Wal l Firestop (IFS) (2) in the opening and secure to the exterior wall with anchors (by installer).

4. Install finishing collar (3) for an exterior wall application. Install flush with the wall surface and apply an outdoor sealant (see Fig. D-8).

5. From interior wall side, secure firestop (1) to inside wall with anchors (by installer).

INSTALLATION FOR INTERIOR WALL

1. From Table-D-1 (in this sect ion) determine the wal l opening for the grease duct model to be installed.

2. When grease duct passes through an interior wal l , the finishing collar is not needed.

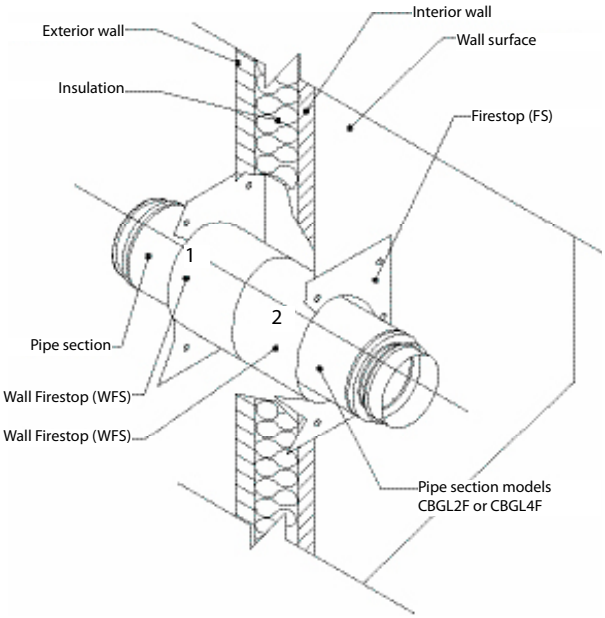
3. Repeat step 2, 3 and 5 as described in exterior wal l installation.

Roof and Wall Penetration

WALL FIRESTOP (WFS)

The Wall Firestop assembly (WFS) is primarily used for wall penetration allowing a section to pass through a wall made of combustible material. It is used to maintain a minimum clearance between the combustible wall material and the Grease Duct section passing through the wall.

Fig. D-9 - Wall Firestop assembly



Do not install insulation in the opening between the pipe outside wall and the firestop inner wall, allow for free air circulation at all times.

Fig. D-10 - Wall Firestop (WFS) assembly

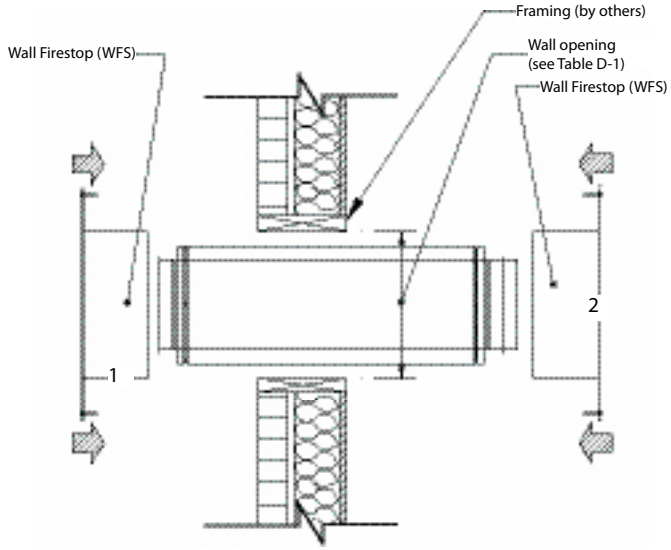
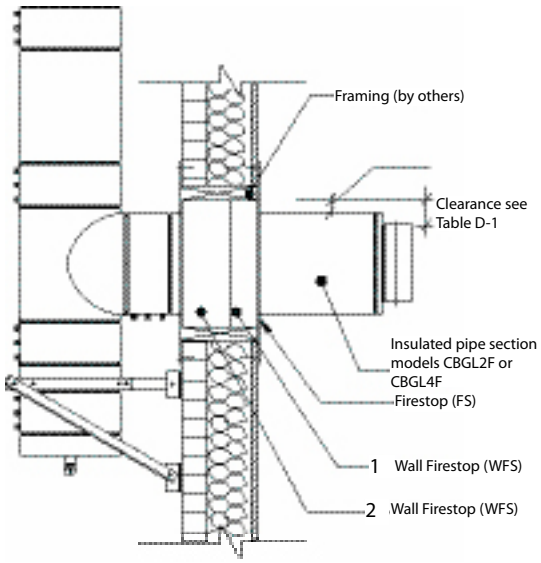


Fig. D-11 - Wall Firestop (WFS) assembly



Do not install insulation in the opening between the pipe outside wall and the firestop inner wall, allow for free air circulation at all times.

INSTALLATION FOR EXTERIOR WALL

1. From Table-D-1 (in this sect ion) determine the wal l opening for the grease duct model to be installed.
2. From the interior wall side, put the Wall Firestop (1) in place before passing the pipe section in the opening (see Fig. D-9 and D-10)
3. From the exterior wall side, slide the Wall Firestop (2) (WFS) in the opening and secure to the exterior wall with anchors (by installer).
4. From interior wall side, secure Wall Firestop (1) to inside wall with anchors (by installer).

INSTALLATION FOR INTERIOR WALL

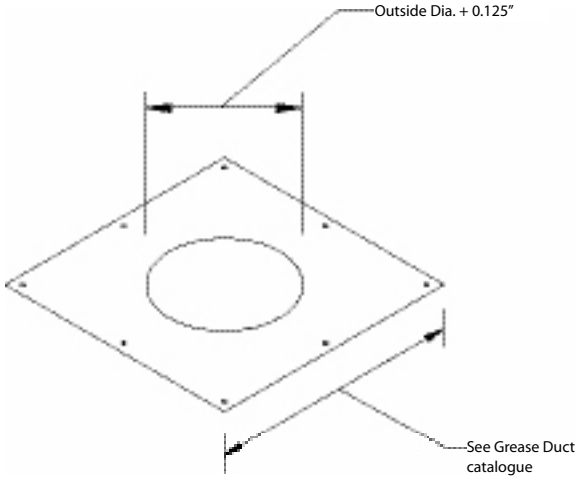
1. From Table-D-1 (in this section) determine the wall opening for the Grease Duct model to be installed.
2. Repeat steps 2, 3 and 4 as described in exterior wall installation.

Roof and Wall Penetration

FIRESTOP (FS)

Used to maintain a minimum space between any combustible material of a wall, floor or roof, where a flue or Grease Duct passes through.

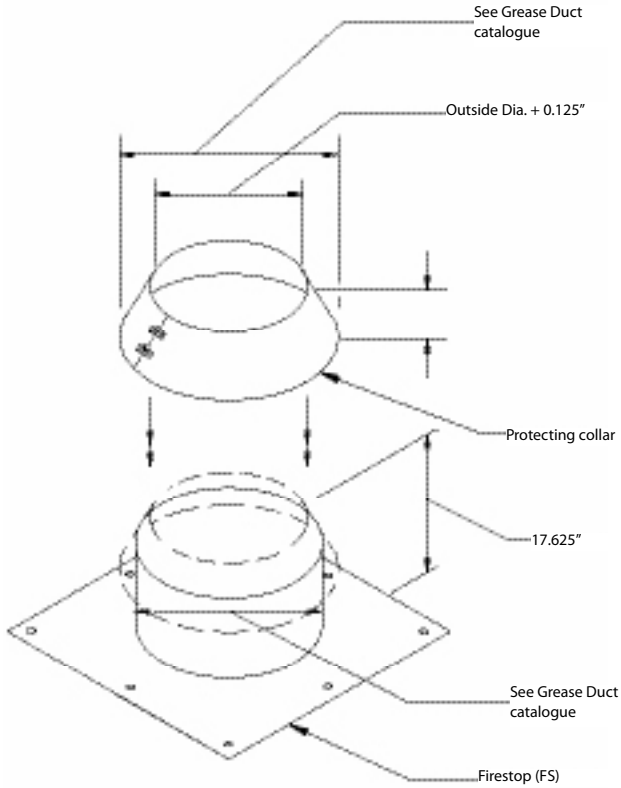
Fig. D-12 - Firestop (FS) Detail



RADIANT FIRESTOP (RFS)

Used to protect combustible materials where a Grease Duct passes through a floor, ceiling or attic. It ensures a minimum distance from combustible materials.

Fig. D-13 - Radiant Firestop (RFS) Detail



TERMINATIONS

Models CBG, CBGL, CBGL2F and CBGL4F grease duct systems include special parts designed to adapt to all types of exhaust systems and provide faster an easier field assembly. A variety of exhaust systems exist on the market for commercial cooking. These systems may require a terminat ion at the roof of the building or on an exterior wall.

Table-E-1 describes the most common systems and there terminations. It also shows the special parts available to adapt with those systems.

Table E-1 - Commercial Cooking exhaust systems termination

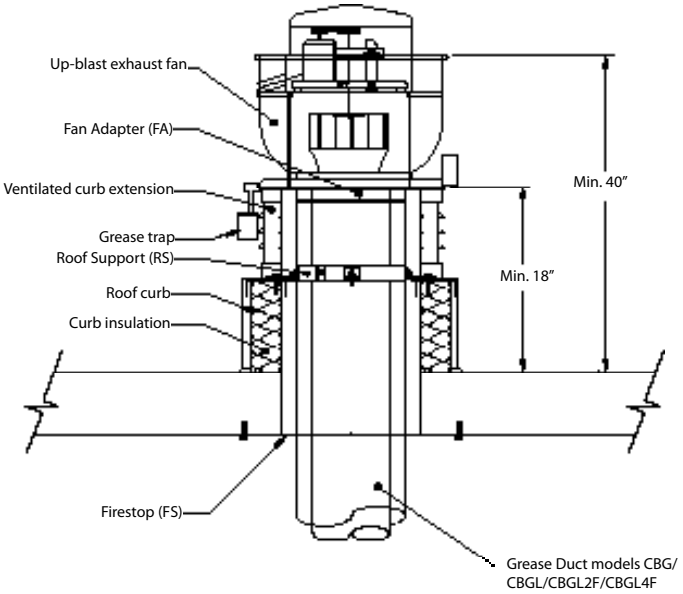
System type	Termination	Special Part	Also available
Up-blast Fan Exhaust	Roof	Fan Adapter (FA)	Roof curb
Utility Fan	Roof	Inlet adapter	Roof curb and fan base
Make-up Air Supply/ Exhaust	Roof	Fan Adapter (FA), supply duct	Roof curb and fan base
Side wall Exhaust fan	Wall	Fan Adapter (FA)	Adapter plate
In-Line Exhaust Fan	Wall	Inlet/outlet adapter	Wall Firestop (WFS) with wall cap

UP-BLAST FAN EXHAUST

When listed in accordance with NFPA 96, up-blast fan exhausts are specially designed for commercial cooking applications and are the most common ways to exhaust grease-laden vapors and fumes. NFPA 96 requires that rooftop terminations be arranged with or provide the following.

a) A minimum of 10 ft of clearance from the outlet to adjacent buildings, property lines, and air intakes.
b) The exhaust flow directed up, away from the surface of the roof and the fan discharge at a minimum of 40 in. above the roof surface (see Fig.E-1).
c) The ductwork must extend a minimum of 18 in. above the roof surface (see Fig. E-1).

Fig. E-1 - Up-blast Exhaust Fan Termination



INSTALLATION

1. Install roof curb over roof openings.
2. Install Roof Support (RS) on the roof curb.
3. Install ventilated curb extension on the roof curb. Use wood screws to lag in place.
4. Assemble Fan Adapter (FA) with the grease duct section, which passes through the roof and lower it on the ventilated curb extension. Use wood screws to lag in place.
5. Install the Firestop (FS) from the interior of the building.
6. Assemble the grease duct section to the vertical section be low the roof.
7. Instal l the up-blast exhaust fan according to the manufacturer instructions.

Fig. E-2 - Up-blast Fan Exhaust Finished Assembly

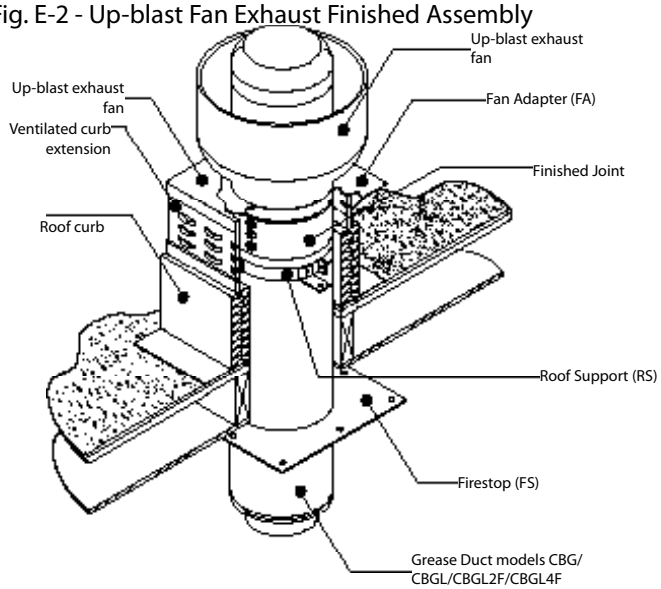
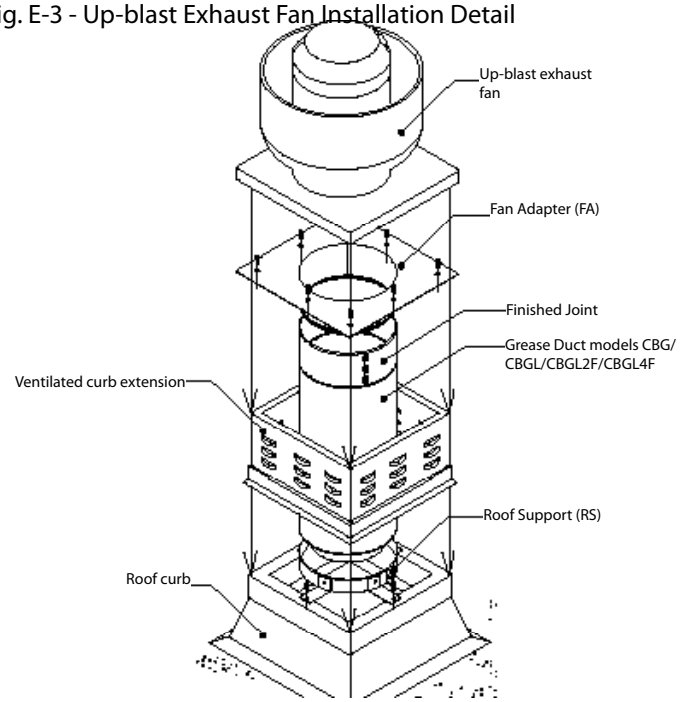


Fig. E-3 - Up-blast Exhaust Fan Installation Detail



UTILITY FAN EXHAUST

Utility fan exhausts are often used for commercial cooking applications and shall be Listed in accordance with NFPA 96 to exhaust grease-laden vapors and fumes. NFPA 96 requires that rooftop terminations be arranged with or provide the following.

a) A minimum of 10 ft of clearance from the outlet to adjacent buildings, property lines, and air intakes.
b) The exhaust flow directed up, away from the surface of the roof and the fan discharge at a minimum of 40 in. above the roof surface (see Fig.E-4).
c) The ductwork must extend a minimum of 18 in. above the roof surface (see Fig. E-4).

Fig. E-4 - Utility Fan Exhaust Termination

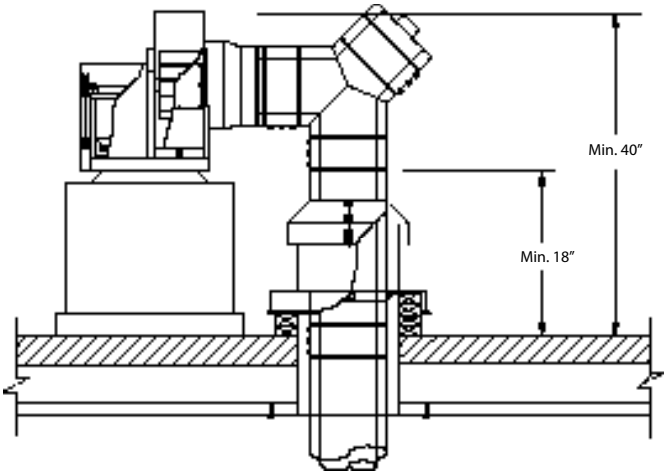
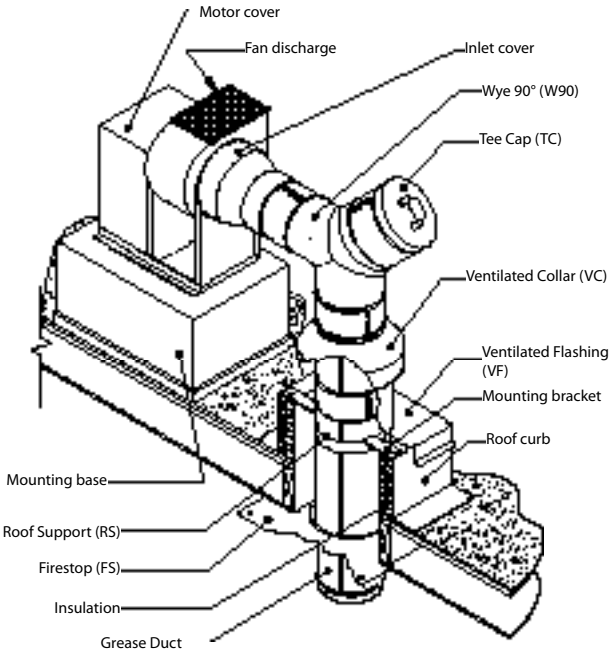


Fig. E-5 - Utility Fan Exhaust Finished Assembly



INSTALLATION

1. Install roof curb over roof opening.
2. Assemble grease duct sections to a minimum of 12″ above the roof curb.
3. Secure Roof Support (RS) on the roof curb.
4. Install ventilated flashing assembly.
5. Install storm collar assembly.
6. Install the Wye (W90) section and the required grease duct parts needed to complete the assembly (see Fig.E-6).
7. Install the Firestop (FS) from the interior of the building.

Fig. E-4 - Utility Fan Exhaust Installation

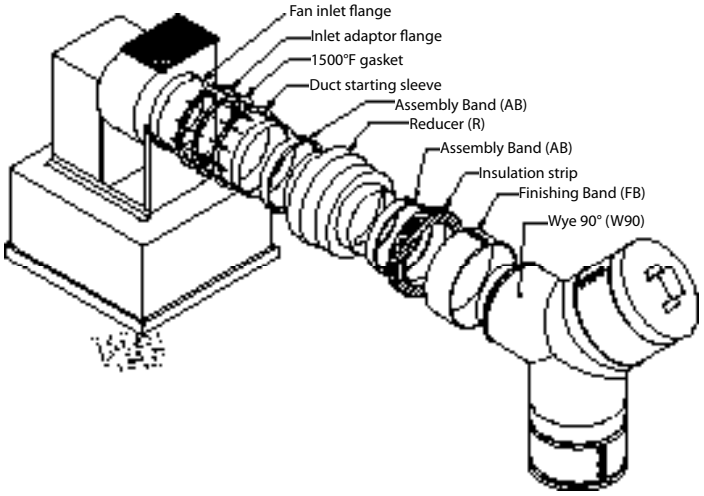
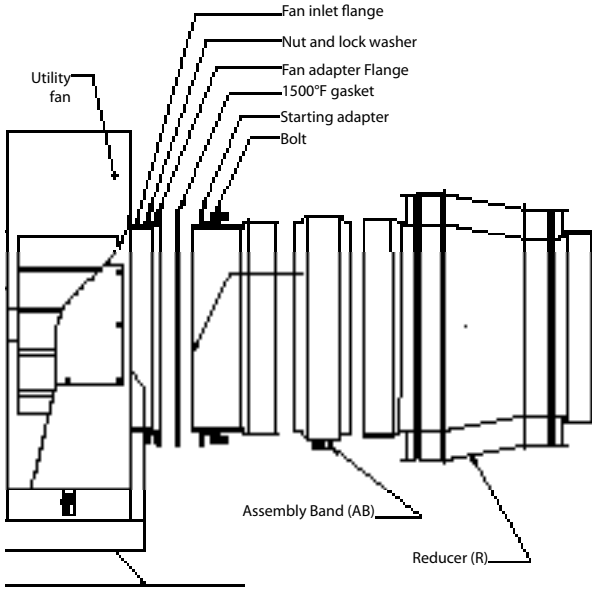


Fig. E-6a - Utility Exhaust Fan and Grease Duct Assembly



MAKE-UP AIR SUPPLY/EXHAUST

Make-up air supply/exhaust systems are often used for commercial cooking appl icat ions and shal l be l isted in accordance with NFPA 96 to exhaust grease-laden vapors and fumes. They are used in two types of appl icat ions. Wi th a supply/exhaust hood (see Fig. E-7) or to provide make-up air to an area where an exhaust hood system creates an in excessive negative air pressure (see Fig. E-8).

NFPA 96 requires that rooftop terminations be arranged with or provide the following.

a) A minimum of 10 ft of clearance from the outlet to adjacent buildings, property lines, and air intakes.
b) The exhaust flow directed up, away from the surface of the roof and the fan discharge at a minimum of 40 in. above the roof surface (see Fig. E-1).
c) The exhaust ductwork must extend a minimum of 18 in. above the roof surface (see Fig. E-1).

Fig. E-7 - Make-up Air with Supply/Exhaust Hood systen

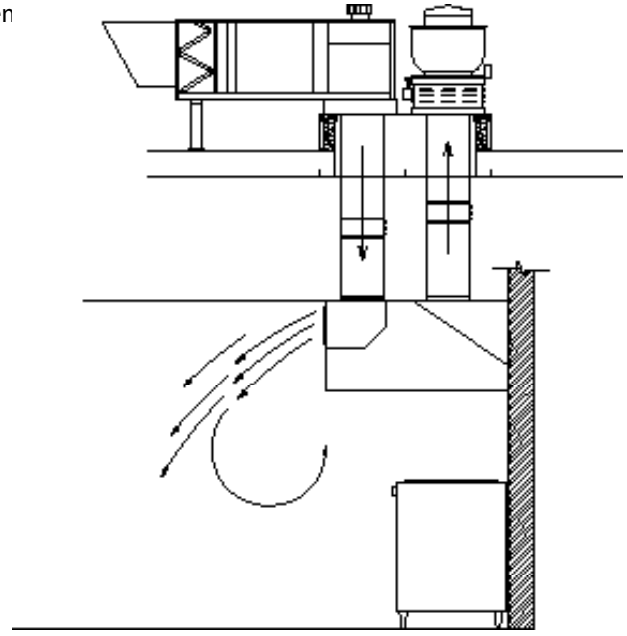
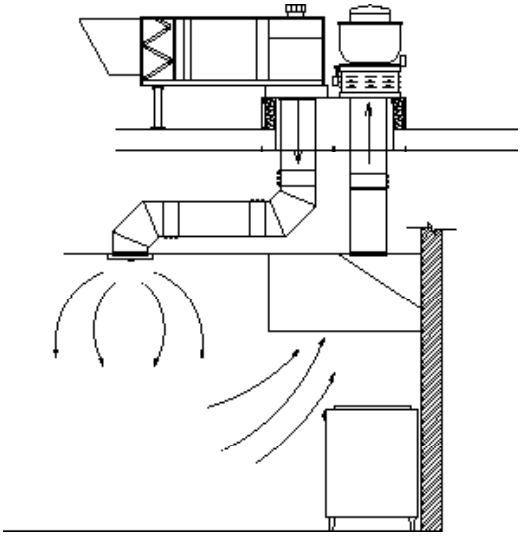


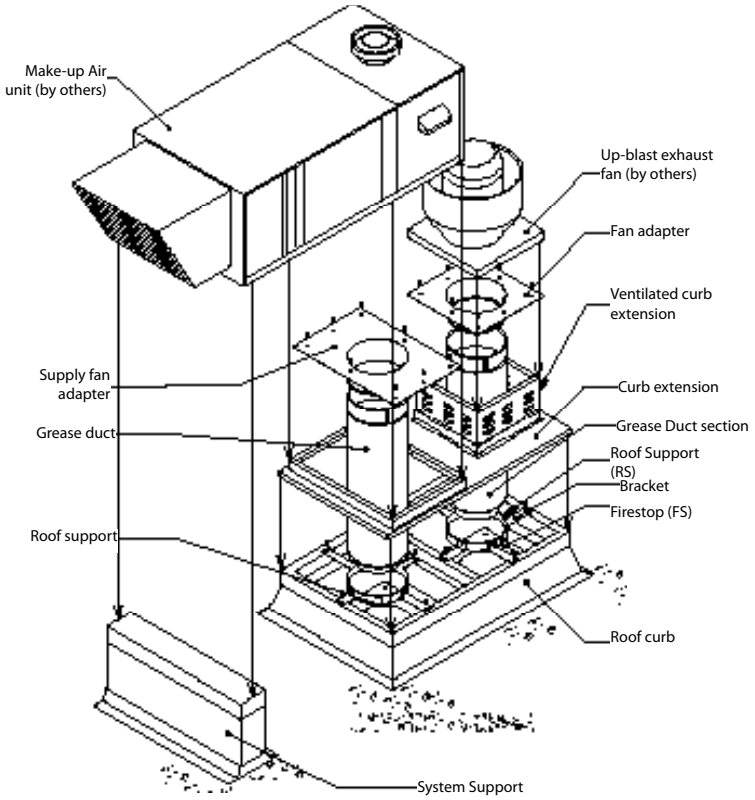
Fig. E-8 - Make-up Air with Exhaust Hood system



INSTALLATION

1. Install roof curb over roof opening (Fig. E-9).
2. Install Roof Supports (RS) on the roof curb.
3. Install ventilated curb extension on the roof curb.
4. Assemble Fan Adapter (FA) with the grease duct section, which passes through the roof and lower it on the ventilated curb extension.
5. Install the Firestop (FS) from the interior of the building.
6. Assemble the grease duct section to the vertical section below the roof.
7. Instal l the up-blast exhaust fan according to the manufacturer instructions.
8. Assemble supply Fan Adapter (FA) with the supply grease duct section, which passes through the roof, and lower it on the curb extension.
9. Instal l make-up air uni t in accordance wi th the manufacturer installation instructions.

Fig. E-9 - Make-up air Supply/Exhaust System Termination



SIDEWALL FAN EXHAUST

Sidewall exhausts fan are often used for commercial cooking applications and shall be listed in accordance with NFPA 96 to exhaust grease-laden vapors and fumes. NFPA 96 requires that sidewall terminations be arranged with or provide the following.

a) A minimum of 3 ft of clearance from the exhaust out let above any forced air inlet and/ or 10'-0" laterally from it.
b) Not less than 7'-0" above public walkways.

Fig. E-10 - Side Exhaust Fan Termination

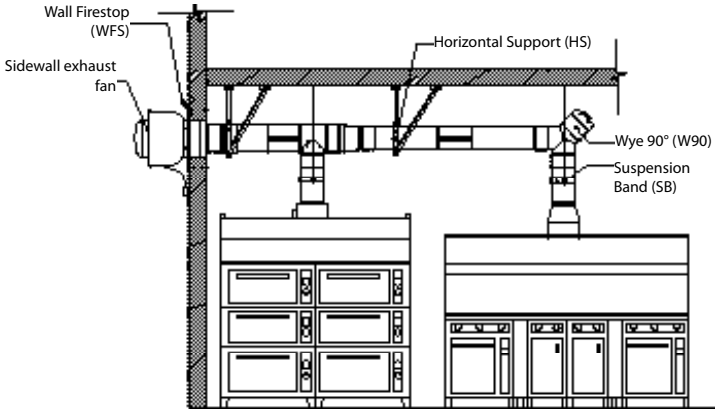
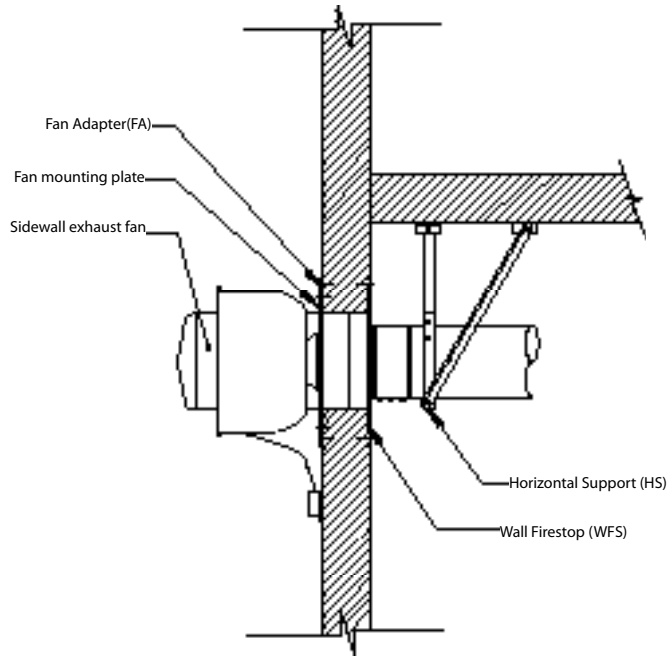


Fig. E-11 - Sidewall Exhaust Fan Termination



INSTALLATION

1. Install Wall Firestop assembly (WFS) in wall opening.
2. Install Fan Adapter (FA).
3. Install fan mounting plate (by fan manufacturer).
4. Assemble Fan Adapter (FA) with the grease duct section, which passes through the wall.
5. Install the firestop from the interior of the building.
6. Assemble the grease duct sect ion to the remaining horizontal assembly.
7. Install the sidewall exhaust fan in accordance with the manufacturers installation instructions.

Fig. E-12 - Sidewall Exhaust Fan Termination

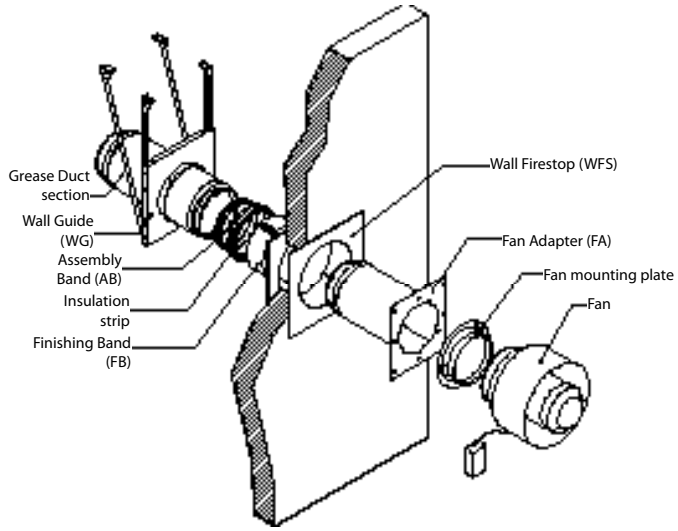
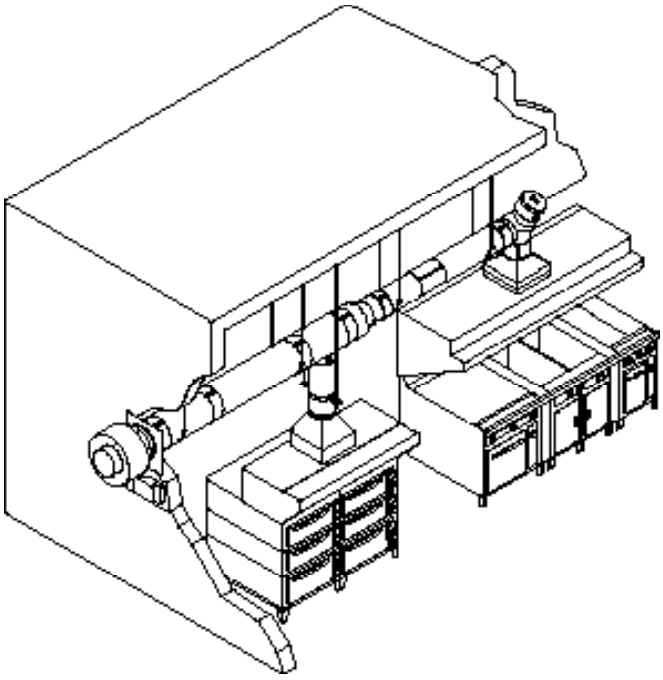


Fig. E-13 - Sidewall Exhaust Fan Termination System



IN-LINE FAN EXHAUST

In-l ine exhaust fans are somet imes used for commercial cooking applications and shall be listed in accordance with NFPA 96 to exhaust grease-laden vapors and fumes. NFPA 96 requires that rooftop terminations be arranged with or provide the following. Easy access for cleaning should be provided for the fan. Fan housing should be grease tight.

a) A minimum of 10 ft of clearance from the outlet to adjacent buildings, property lines, and air intakes.
b) The exhaust flow directed up, away from the surface of the roof and the fan discharge at a minimum of 40 in. above the roof surface (see Fig. E-1).
c) The ductwork must extend a minimum of 18 in. above the roof surface (see Fig. E-1).

Fig. E-14 - In-Line Fan Assembly

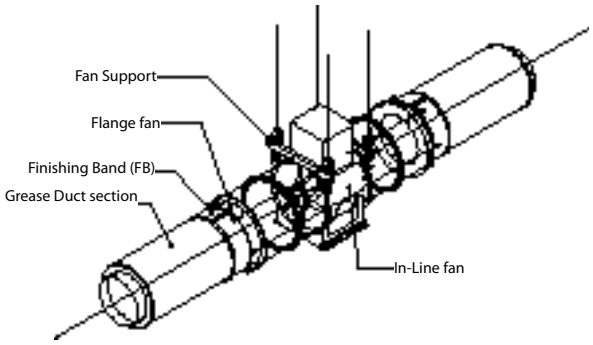
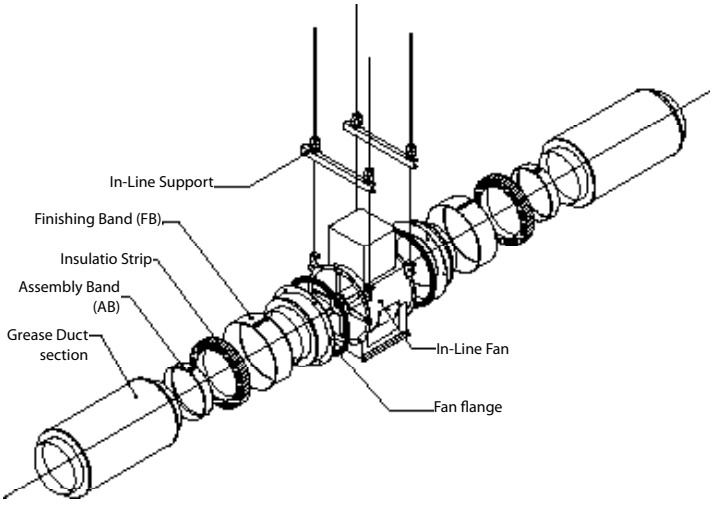


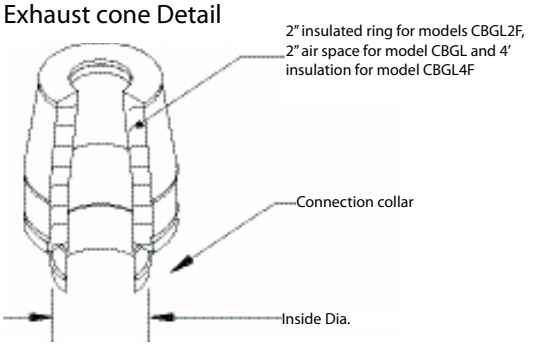
Fig. E-15 - In-Line fan Grease Duct assembly detail



EXHAUST CONE (EC)

Installed at the top the Grease Duct, it improves the draft and increases the speed of escaping gases by 50%. Installation of a Drain-Tee Cap (DC) at the base of the chimney is required to collect rainwater. For installation details Exhaust Cone (EC) (See Fig.E-12).

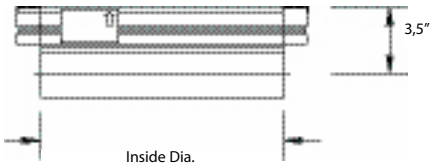
Fig. E-16 - Exhaust cone Detail



CLOSURE SECTION (SC)

Installed at the Grease Duct extremity. It protects the chimney against water infiltration in the insulation between the inner and outer wall of the Grease Duct. The use of the Drain Section (DS) or Drain Tee Cap (DC) is necessary with this piece to collect any excess rain that may enter the Grease Duct.

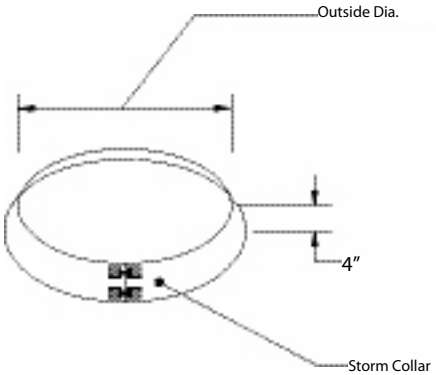
Fig. E-17 - Closure Section Detail



STORM COLLAR (SC)

Used for sealing the opening between the Grease Duct and flashing, the Storm Collar (SC) must be sealed to the chimney with silicone putty. It is supplied with the Flat Flashing (F) roof assembly or Adjustable Flashing (AF) roof assembly.

Fig. E-18 - Storm Collar (SC) Detail



VENTILATED COLLAR (VC)

Used for sealing the opening between the Grease Duct and Ventilated Flashing (VF), the Ventilated Collar (VC) must be sealed to the Grease Duct with silicone putty. It is supplied with the Ventilated Flashing (VF).

Fig. E-19 - Ventilated Collar (VC) Detail

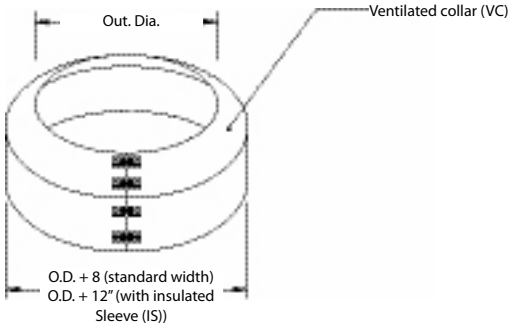


Fig. E-20a - Typical Installation for Exhaust Cone (EC)

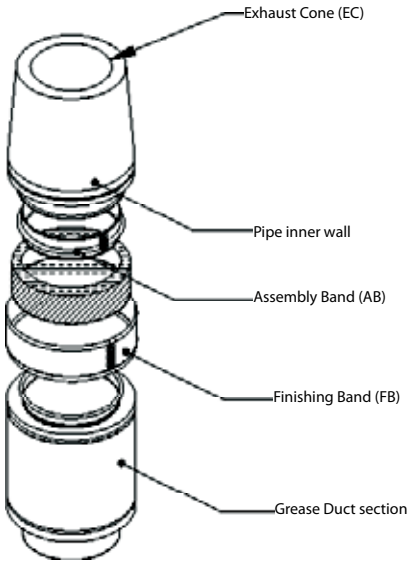
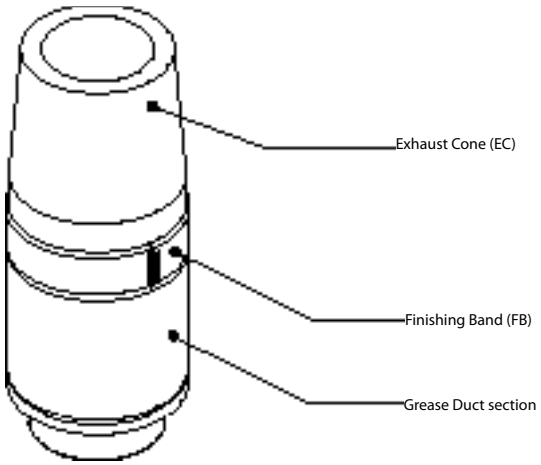


Fig. E-20b - Finished Assembly for Exhaust Cone (EC)



THERMAL EXPANSION

1. Elbows, tees, and joints are not designed to resist bending moment forces as a result of thermal expansion. The forces due to thermal expansion therefore need to be compensated by expansion joints.

2. Whether in the vertical or the horizontal run, the thermal expansion of the inner pipe is directly dependent on the internal wall temperature and the length of pipe between fixed points.

3. Proper installation practice requires that expansion greater than 1/4" will be compensated by using Variable Length (VL).

4. Models CBG, CBGL, CBGL2F and CBGL4F grease ducts have an expansion coefficient of 8, 9 in the formula (see Fig. F-1).

5. Though thermal expansion can be calculated from the formula, a rule of thumb for exhaust pipe expansion estimation is that the axial growth will be approximately 1" per 100'-0" of pipe length for each 100 ºF temperature difference between flue gas and surrounding air (see Table-F-1).

6. Because the amount of outer casing axial movements is the same as inner casing movement, the outer piping jackets must slide to avoid excessive forces on tees, elbows or fixed points. To accommodate outer casing movements, external guides along walls at floors, or in lateral breechings, must allow for movement of pipe.

7. When resupporting a high rise exhaust system, Variable Lengths (VL) must be used just below every support above the first to compensate for thermal expansion.

8. Spacing of guides and supports, when a thermal expansion part is used, should be not greater than specified in Section A
Table-A-4.

9. Proper guiding and support of expansion parts often requires closer spacing.

Fig. F-1 - Formula for Thermal Expansion

$$\Delta E \text{ (in.)} = \frac{EC\ (8,9) \times \Delta T\ (^\circ F) \times \text{Pipe Length (in.)}}{1\ 000\ 000}$$

Ex.: Thermal Expansion for 100' of pipe at 370 (° F)

$$\Delta E \text{ (in.)} = \frac{EC\ (8,9) \times * 300\ (^\circ F) \times 1200\ \text{(in.)}}{1\ 000\ 000}$$

$$\Delta E \text{ (in.)} = \frac{3\ 204\ 000}{1\ 000\ 000}$$

$$\Delta E \text{ (in.)} = 3.2 \text{ (in.)}$$

* ΔT (° F) = 370 (° F) - ambient temp. (For instance 70° F)
ΔT (° F) = 300(° F)

VARIABLE LENGTH (VL)

1. The Variable Length (VL) has two major funct ions: to make up odd lengths of pipe as needed in short runs, and in addition, to serve as an expansion joint for thermal expansion in longer runs of pipe.

2. The Variable Length (VL) may be used when pressures do not exceed 6" water column or in well ventilated areas. When used in systems of any orientation, it can perform both functions simultaneously.

3. The Variable Length (VL) includes a sliding inner section, a fixed outer pipe with gasket and a finishing outer jacket.

4. At the sl iding joint , the assembly as shipped is fi t ted with a special graphite packing seal.

5. The sliding outer jacket is the same thickness as that used on piping outer casings. It is placed around the sliding inner joint and must also slide in order to avoid expansion stresses.

6. For proper installation, a Variable Length (VL) must have adequate overlap and sufficient allowance for thermal expansion movement (see Fig. F-3) and Table-F-1.

7. A Variable Length (VL) sliding inner pipe may be trimmed to ensure correct mating to a fitting or other short part. Care must be exercised so that proper penetration is maintained at low temperatures and no interference occurs at high temperatures.

Fig. F-2 - Use of Variable Length (VL)and Adjustable Length (AL) in typical installation

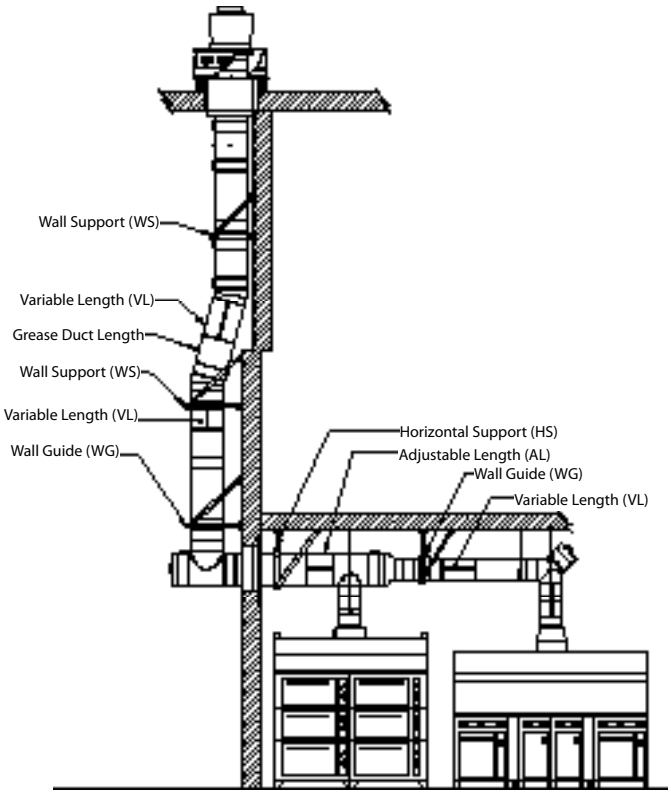


Fig. F-3 - Variable Length (VL)

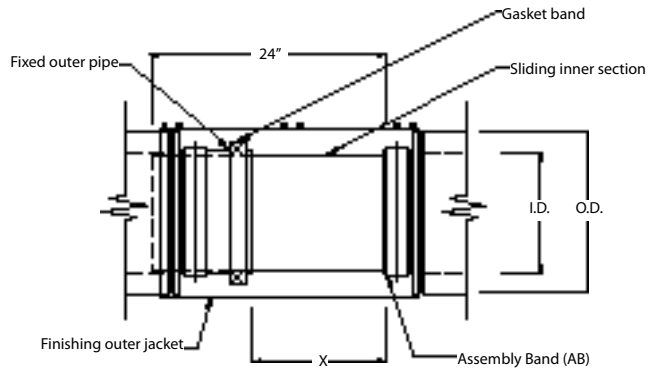


Table F-1 - Minimum X Dimension for Grease Duct length

*Opening Temperature (° F)	200°	300°	400°	500°
25'-0" length	0.4"	0.7"	0.9"	1.2"
50'-0" length	0.75"	1.3"	1.8"	2.4"
75'-0" length	1.0"	1.9"	2.7"	3.5"
100'-0" length	1.5"	2.5"	3.6"	4.7"

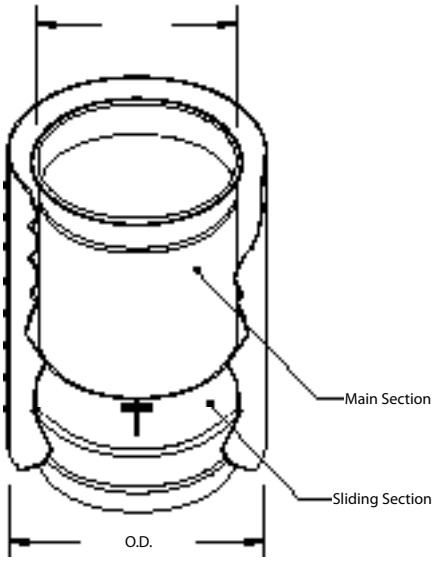
Ex.: For a grease duct run of 75'-0" at 500° F the grease duct will expand approximately 3.5". Thus the x dimension shall not be less than 3.5" to allow proper sliding of Variable Length (VL) inner sliding section.

* Note that assumed ambient temperature is 70° F. Temperature rise for 500° F is 430° F.

ADJUSTABLE LENGTH (AL)

1. Used in straight runs of models CBG, CBGL, CBGL2F and CBGL4F, the Adjustable Length (AL) serves two major functions:
a) to make up for odd lengths of pipe in short runs.
b) to provide for joint sealing.

Fig. F-4 - Adjustable Length (AL) Detail



2. This part adjusts to any needed exact length and has an internal joint, which must be sealed by working sealant under the seal ring, as well as between this ring and the flange to be joined by the finishing band

3. The Adjustable Length (AL) is comprised of a sliding inner section, flanged at one end only.

4. This sliding piece is sized to fit closely inside a standard pipe section

5. A seal ring is provided to prevent the inner section from slipping after assembly.

6. The sliding outer jacket is aluminized steel of the same thickness as that used on piping outer casings.

7. It is placed around the assembled liner and finishes the appearance of the Adjustable Length (AL).

8. For detai led methods of instal lat ion see instruct ions contained elsewhere in this section.

EXPANSION JOINTS INSTALLATION

Variable Length (VL) in vertical run

1. A Variable Length (VL) instal led vert ical ly should be installed directly below the highest support or one pipe length below between, fixed points (see Fig. F-2)

2. For expansion of Variable Length (VL) (see Table-F-1).

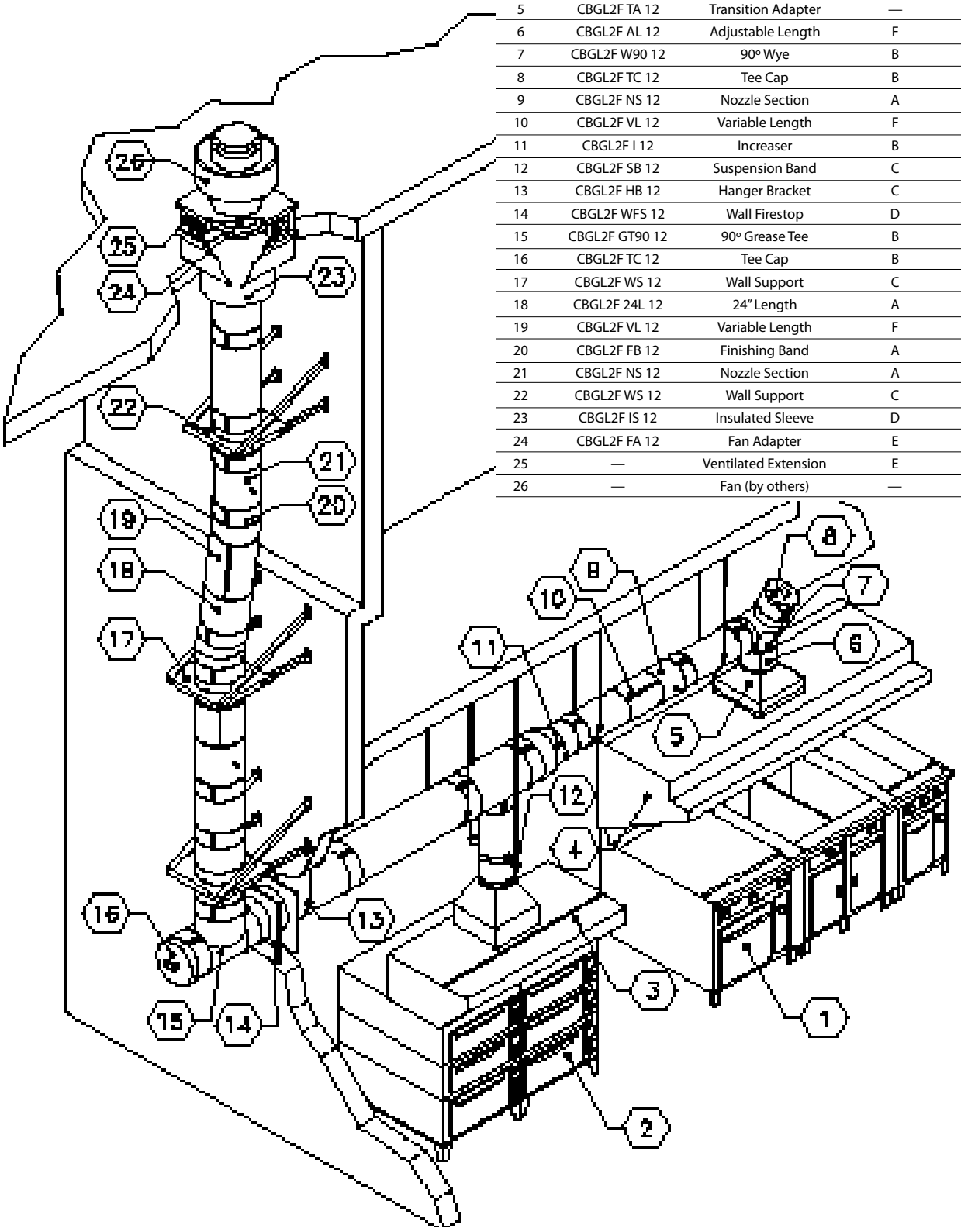
3. Install proper guiding between fixed points (supports) when using Variable Length (VL) to allow grease duct vertical movement due to expansion.

Variable Length (VL) in Horizontal run

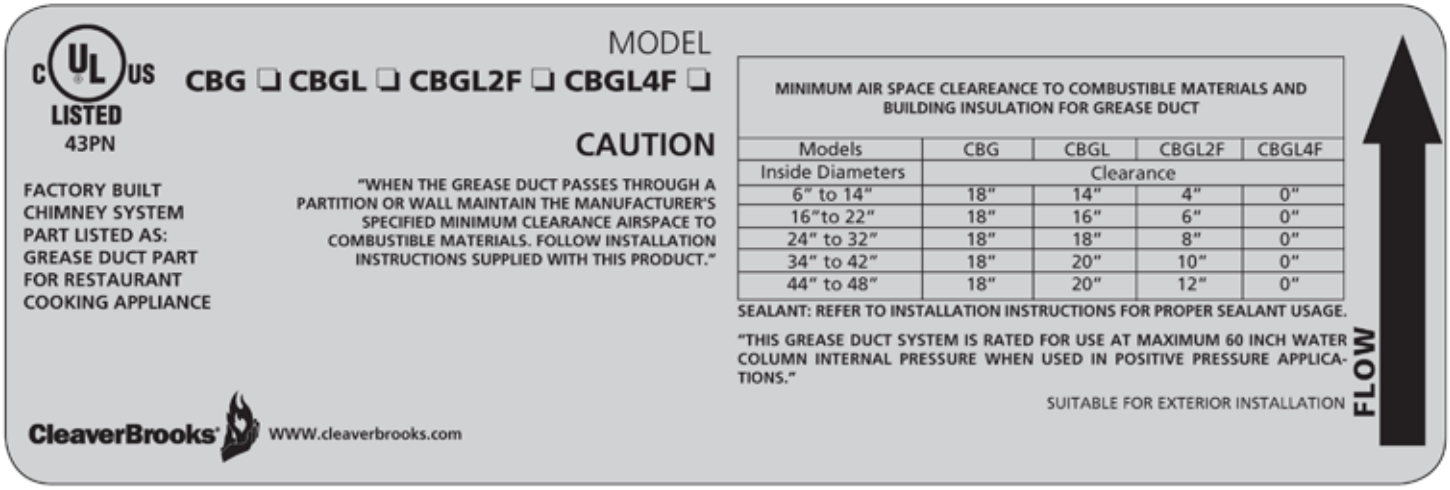
1. Same guidelines apply as for vertical run in regards with expansion estimate and proper support and guiding with the use of a Variable Length (VL).

2. Install sliding inner portion of Variable Length (VL) so that the fixed part is attached in the opposite direction of the conduit. The sliding inner part will then absorb expansion by sliding in the direction of the conduit.

No.	Part no.	Description	Section	Page	ref. Fig.
1	—	Appliance (by others)	—	—	—
2	—	Appliance (by others)	—	—	—
3	—	Exhaust hood	—	—	—
4	—	Exhaust hood	—	—	—
5	CBGL2F TA 12	Transition Adapter	—	—	—
6	CBGL2F AL 12	Adjustable Length	F	33	F-4
7	CBGL2F W90 12	90º Wye	B	12	B-4
8	CBGL2F TC 12	Tee Cap	B	12	B-5
9	CBGL2F NS 12	Nozzle Section	A	8	A-9, 10
10	CBGL2F VL 12	Variable Length	F	33	F-3
11	CBGL2F I 12	Increaser	B	13	B-7a
12	CBGL2F SB 12	Suspension Band	C	20	C-9
13	CBGL2F HB 12	Hanger Bracket	C	16	C-1
14	CBGL2F WFS 12	Wall Firestop	D	24	D-9
15	CBGL2F GT90 12	90º Grease Tee	B	10	B-1a
16	CBGL2F TC 12	Tee Cap	B	12	B-5
17	CBGL2F WS 12	Wall Support	C	16	C-2
18	CBGL2F 24L 12	24″ Length	A	6	A-7a,b,c
19	CBGL2F VL 12	Variable Length	F	33	F-3
20	CBGL2F FB 12	Finishing Band	A	6	A-7a,b
21	CBGL2F NS 12	Nozzle Section	A	8	A-9, 10
22	CBGL2F WS 12	Wall Support	C	16	C-2
23	CBGL2F IS 12	Insulated Sleeve	D	22	D-4, 5
24	CBGL2F FA 12	Fan Adapter	E	26, 28	E-3, 9
25	—	Ventilated Extension	E	—	E-3
26	—	Fan (by others)	—	—	—



Markings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LISTED
43PN
MODEL
CBG ❑ CBGL ❑ CBGL2F ❑ CBGL4F ❑
CAUTION
"WHEN THE GREASE DUCT PASSES THROUGH A PARTITION OR WALL MAINTAIN THE MANUFACTURER'S SPECIFIED MINIMUM CLEARANCE AIRSPACE TO COMBUSTIBLE MATERIALS. FOLLOW INSTALLATION INSTRUCTIONS SUPPLIED WITH THIS PRODUCT."
FACTORY BUILT CHIMNEY SYSTEM PART LISTED AS: GREASE DUCT PART FOR RESTAURANT COOKING APPLIANCE
MINIMUM AIR SPACE CLEAREANCE TO COMBUSTIBLE MATERIALS AND BUILDING INSULATION FOR GREASE DUCT
Models | CBG | CBGL | CBGL2F | CBGL4F
Inside Diameters | Clearance
6" to 14" | 18" | 14" | 4" | 0"
16"to 22" | 18" | 16" | 6" | 0"
24" to 32" | 18" | 18" | 8" | 0"
34" to 42" | 18" | 20" | 10" | 0"
44" to 48" | 18" | 20" | 12" | 0"
SEALANT: REFER TO INSTALLATION INSTRUCTIONS FOR PROPER SEALANT USAGE.
"THIS GREASE DUCT SYSTEM IS RATED FOR USE AT MAXIMUM 60 INCH WATER COLUMN INTERNAL PRESSURE WHEN USED IN POSITIVE PRESSURE APPLICATIONS."
SUITABLE FOR EXTERIOR INSTALLATION
FLOW
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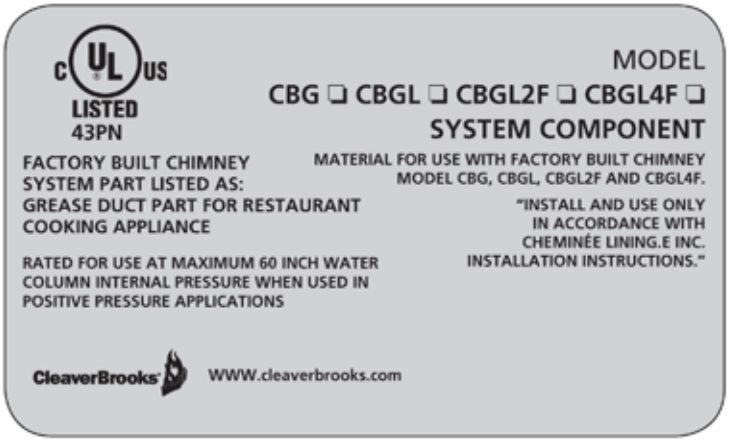
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MODEL
CBG ❑ CBGL ❑ CBGL2F ❑ CBGL4F ❑
SYSTEM COMPONENT
MATERIAL FOR USE WITH FACTORY BUILT CHIMNEY MODEL CBG, CBGL, CBGL2F AND CBGL4F.
"INSTALL AND USE ONLY IN ACCORDANCE WITH CHEMINÉE LINING.E INC. INSTALLATION INSTRUCTIONS."
FACTORY BUILT CHIMNEY SYSTEM PART LISTED AS: GREASE DUCT PART FOR RESTAURANT COOKING APPLIANCE
RATED FOR USE AT MAXIMUM 60 INCH WATER COLUMN INTERNAL PRESSURE WHEN USED IN POSITIVE PRESSURE APPLICATIONS
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