

**COMPANY**

# MODEL GRS

**Single Wall Grease Duct Installation Guidelines**

**Tested to UL1978/ULCS662**

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## LISTING & CODE COMPLIANCE

Van-Packer's Model GRS grease ducts are listed by UL as *18 inch clearance to combustibles grease duct assembly* and as *"Grease Ducts for Restaurant Cooking Appliances"* when installed in accordance with these instructions and the National Fire Protection Association's standard NFPA 96 *"Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations,"* International Mechanical Code, Uniform Mechanical Code, or other local codes.

## TESTING, CLASSIFICATION, & APPLICATIONS

Model GRS has been tested in accordance with the procedures and methods set forth by UL 1978/ULC S662 (*Standard for Grease Ducts/Standard for Factory-Build Grease Ducts*). Model GRS is classified for continuous operation at 18 inch clearance to combustibles. Model GRS grease ducts are suitable for the removal of smoke and grease laden vapors from commercial, industrial, institutional, and similar cooking applications where continuous operating temperatures are 500° F (260° C) or less and for intermittent temperatures not exceeding 2000° F (1093° C). Model GRS grease ducts are intended to be part of a complete grease duct system which connects the hood or grease extractor with the outdoors by means of an exhaustor or blower system.

## GENERAL INFORMATION

### CLEARANCES & ADDITIONAL ENCLOSURES

The clearance to non-combustible materials is zero inches and the clearance to combustible materials is 18 inches.

**WARNING:** Code compliant clearances must be followed where any components that are in direct contact with the liner. Examples of this would be support assemblies, drain pipes, or any other similar items. Do not install these items near combustible material.

When installed in accordance with these instructions and codes, Model GRS grease ducts are equivalent to a field fabricated fire rated grease duct systems. Do not apply wraps or enclosure materials in direct contact with Van-Packer's products in a manner that adds additional weight to our duct. Model GRS has not been tested, listed, designed, etc. to carry additional weight from such materials.

### CODES & AUTHORITIES

Installation must be made in accordance with local and national code requirements. Follow these instructions carefully and contact local building and fire officials about restrictions and installation inspection in your area. Refer to NFPA 96 (*Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*) and additional NFPA standards as required

### INSTALLATION CONSIDERATIONS

Follow Van-Packer's written installation instructions carefully. Each part of the grease duct system must be installed correctly. Improper or lack of installation of required parts may result in the improper function of the grease duct system

The grease duct layout should be carefully planned to allow adequate space for assembly, installation of supports, connection of support framing, access for cleanouts, accommodate standard fitting dimensions, rough openings for penetrations, etc. Do not assume all equipment producing smoke or grease laden vapors within a facility can be exhausted with a single grease duct system. Consult a grease duct design professional as required.

One prime coat and finish coat of appropriate heat resistant paint is recommended on exposed installations which are subject to routine cleaning (*e.g. kitchen area*) and wherever exposed to the weather when the sections or accessories is constructed from aluminized steel

## **GENERAL INFORMATION-CONTINUED**

### **MIXING SYSTEMS & PARTS**

Do not connect a grease duct system with any other building ventilation or exhaust system. Do not connect parts from other grease duct manufacturers with Model GRS components without the expressed consent of Van-Packer.

Components from other Van-Packer product lines, (for example Model GZ or GRZ), may be mixed with Model GRS components to complete a grease duct system as long as: clearances, limitations, codes, etc. are followed. Contact Van-Packer for more information concerning product lines which are listed for use as grease ducts.

Van-Packer grease duct components are designed to complete the entire system. However, we realize conditions occur where systems must be mixed. In these cases, in accordance with *good construction methods and codes* it is permissible to transition to/from a code compliant grease duct system (by others) to/from Van-Packer grease duct components. Connection must be an approved joint assembly method as described within installation instructions, and/or applicable codes. Transition (by others) cannot connect in a manner that adds additional weight/stress to our duct. Van-Packer's products have not been tested, listed, designed, etc. to carry additional weight from such transitions. **WARNING:** Listings / warranties may be affected when transitioning to / from grease ducts by others; consult Van-Packer technical service department for additional information.

### **DUCT SIZE & SLOPE**

Model GRS grease ducts must be installed accordingly to comply with the requirements as described in order to maintain a listed installation. UL states that these grease ducts must comply with requirements as set forth by UL 1978 (*Standard for Grease Ducts*), NFPA 96 (*Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*), and the International Mechanical Code. Model GRS grease ducts should be installed at a slope not less than one-fourth unit vertical in 12 units horizontal toward the hood or toward a grease reservoir. Where horizontal ducts exceed 75 feet in length, the slope shall be not less than one unit vertical in 12 units horizontal. Most Model GRS components will permit a small amount of slope as the system is being installed. However, some installations may require elbow / transition type pieces to allow for proper orientation of fittings at the vertical risers prior to and after long horizontal runs. Contact Van-Packer for additional information.

### **CLEANOUTS, DRAINS, & GREASE TRAPS**

Many Model GRS sections, accessories, and combinations can be used for cleanout and inspection access of the grease duct system. Access panel sections, 90° tee sections with end caps, and many other combinations of components can serve as cleanout doors or openings as described by NFPA 96. Grease ducts must be provided with adequate cleanout doors or openings to allow for the inspection and cleaning of the entire grease duct system. Refer to NFPA 96 for specific requirements.

Cleanout, drain, and grease trap requirements may change when grease duct systems are equipped with automatic cleaning and / or some types of fire suppression equipment. Refer to NFPA 96 and additional codes / authorities having jurisdiction for specific duct system requirements.

### **WASH DOWN & FIRE SUPPRESSION**

Automatic hot water / detergent wash down and fire suppression systems can be integrated into a Model GRS grease duct system by using various components which are readily available (or by request sections can be factory fit) with threaded pipe nipples, couplings, etc.

Van-Packer does not provide, design, specify, etc. wash down and fire suppression equipment or systems. Refer to NFPA 96 and additional codes / authorities having jurisdiction for specific fire suppression system requirements. Some of the various types of fire extinguishing equipment / systems are: Carbon Dioxide (NFPA 12), Sprinkler (NFPA 13), Foam-Water (NFPA 16), and Dry Chemical (NFPA 17).

## RECEIVING INSPECTION

Compare the packing list items and quantities with the contents of the containers to ensure completeness of the shipment. If the shipment is missing components, please contact Van-Packer's order entry department at 888 877 8225.

## TYPICAL COMPONENT LOCATIONS

Straight sections, fittings, etc. will be positioned and stacked accordingly to fill the shipping container. Sections of smaller dimensions may be slipped into sections of larger dimensions. Bags of fasteners, sealant, etc. may also be located inside the liner of the various pieces.

## FREIGHT DAMAGE

Inspect each box as it is unloaded from the carrier for damage which may have occurred during transit. Should there be any damaged components, the delivery receipt must be signed damaged in order for Van-Packer to file a claim with the carrier. If the delivery receipt is signed damaged contact Van-Packer immediately. If there are damaged parts and the delivery receipt is not signed damaged, Van-Packer or the carrier will not be liable, and damaged parts will be replaced at the customer's expense.

## PART IDENTIFICATION & MATERIAL CODES

Model GRS part numbers will typically have the letter "GRS" prefix, followed by the duct size inside dimension (I.D.), then the part description code, next a special qualifier code(s) and last the liner designation. Part description codes are generally three characters and are either alpha or alpha numeric. Qualifier codes are most often used to designate section lengths, tee projection dimensions, and the large I.D. end of increasers. The following are a couple examples of part numbers with their associated description and part number breakdown.

### GRS12X10STR30A

Refers to a Model GRS 12"x10" I.D., 30" long straight section constructed with a 304 S.S. liner.

**GRS** = Model GRS  
**12x10** = Section I.D.  
**STR** = Part Code, Straight Section  
**30** = Section length, 30" long  
**A** = Liner Code, 304 S.S.

### GRS12X1290T08X08B

Refers to a Model GRS 12"x12" I.D. 90 degree centered tee section with an 08" x 08" I.D. projection constructed with a 316 S.S. liner.

**GRS** = Model GRS  
**12x12** = Tee Body, 12"x12" I.D.  
**90T** = Part Code, 90 Degree Tee Section  
**08x08** = Tee Projection, 08"x08" I.D.  
**B** = Liner Code, 316 S.S.

## LINER MATERIAL CODES

**A** = 304 S.S.  
**B** = 316 S.S.  
**C** = 430 S.S.

## JOINT ASSEMBLY

According to NFPA 96, all grease ducts are to be liquid tight. The following steps are to be used to ensure this requirement is met.

Use high temperature silicone sealant, Van-Packer part number 101087A. **WARNING:** Do not substitute any type of water soluble sealants in the flange area.

### STEP 1

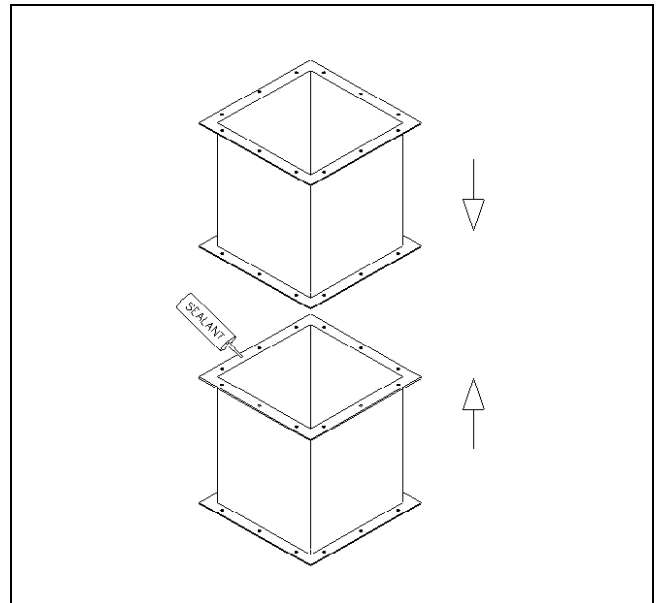
Inspect all liner flanges, and draw bands and straighten any mild deformations that may have occurred during shipping.

### STEP 2

To ensure sealant adhesion, degrease and remove any dirt and debris from the liner flanges. Use an acetone based cleaner sprayed on a rag.

### STEP 3

Apply a continuous bead of sealant (1/8" to 1/4") to one or both of the liner flanges to be joined.



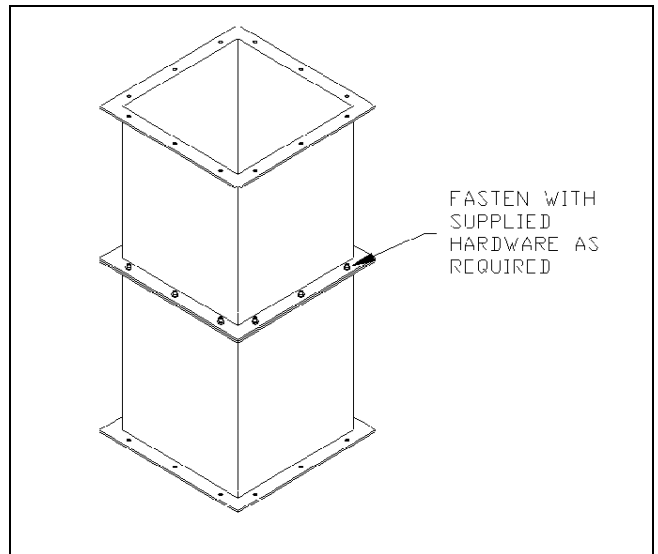
### STEP 4

Butt the flanged ends of the sections being joined, being careful not to smear off the sealant.

Install all supplied bolts/nuts finger tight. After all bolt/nuts are installed on a joint snug them up. After everything is snug finish tightening all bolts to an approx. torque of 4 lb-ft, per bolt manufactures recommended bolt torque.

Remove / wipe smooth any excess sealant on the inside of the assembled duct.

Allow sealant to cure 72 hour before use. Sealant will not bond to flanges if moisture is introduced into system before sealant has cured.



## FLANGE

The fasteners provided with the flange are standard 1/4"-20 hex bolts and nuts.

**SEALANT USAGE**

DUCT INTERNAL AREA SQ IN (INSIDE DIMENSION)	JOINTS PER TUBE
36 (6"X6")	20
72 (6"X12")	13
108 (6"X18")	10
144 (6"X24")	8
216 (6"X36")	6
288 (12"X24")	5

DUCT INTERNAL AREA SQ IN (INSIDE DIMENSION)	JOINTS PER TUBE
432 (12"x36")	5
648 (18"x36")	4
864 (24"x36")	4
1088 (32"x34")	3
1296 (36"x36")	3
2304 (48"x48")	2

**APPROXIMATE INSTALLED WEIGHT PER FOOT**

DUCT INTERNAL AREA SQ IN (INSIDE DIMENSION)	POUNDS
36 (6"X6")	8
72 (6"X12")	12
108 (6"X18")	16
144 (6"X24")	19
216 (6"X36")	27
288 (12"X24")	23

DUCT INTERNAL AREA SQ IN (INSIDE DIMENSION)	POUNDS
432 (12"x36")	31
648 (18"x36")	35
864 (24"x36")	39
1088 (32"x34")	44
1296 (36"x36")	46
2304 (48"x48")	61

**SUPPORT LOAD LIMITATIONS**

**Plate Support Assembly (PLS)** can hold a maximum of 2,400 pounds.

**Flange Support Assembly (FSA)** can hold a maximum of 3,400 pounds.

**Wall Brackets**, please see chart below

BRACKET SIZE	LBS.
4"-32"	1300
34"	1255
36"	1180

BRACKET SIZE	LBS.
38"	1147
40"	1101
42"	1022

BRACKET SIZE	LBS.
44"	977
46"	906
48"	894

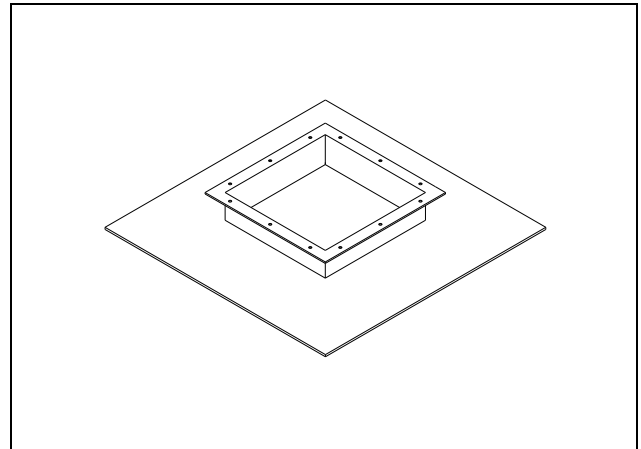
Please use chart above for converting pounds into maximum feet. Please note installed weights above are based on straight runs, please take into consideration weight per foot may vary for some fittings etc.

## DUCT SECTIONS & FITTINGS

Van-Packer makes a wide range of prefabricated adapters, fittings, elbows, wye's, tee's, transitions, increasers, terminations, etc. Refer to the Model GRS brochure for additional information on part number designations and the wide range of parts and fittings we offer to complete a system from start to finish. In general all sections are assembled with a bolt flange connection; however, below are a few examples of parts that may require special attention.

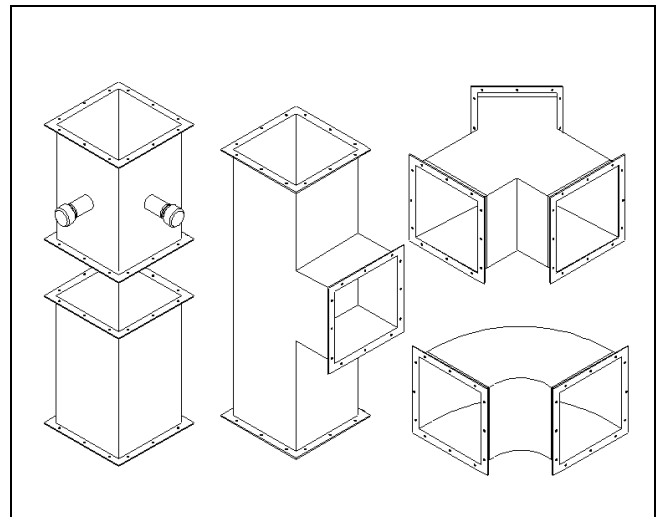
### FAN/HOOD ADAPTER ASSEMBLY – PART FAA

The fan adapter assembly is intended to be used with a “traditional” roof curb (provided by others) and connection to a hood or an exhaust fan. The FAA is comprised of a fan adapter plate (specify plate size at time of purchase) with a factory installed starter section that assembles to a standard fitting. Field connect the plate to the hood, curb or fan by (drilling / fasteners & sealant by others as required). Refer to the hood, fan unit or the roof curb manufacturer's installation requirements.



### FITTINGS & STRAIGHT SECTIONS

Fittings and Straight sections are fixed degrees, lengths, etc., joined together to complete desired grease duct runs. These sections may also be equipped (must be factory installed) with nipples or couplings to accommodate test probes, fire suppression nozzles, sprinkler heads, drainage, etc. Refer to the Model GRS brochure for designation of part lengths and options for adding pipe nipples / couplings.

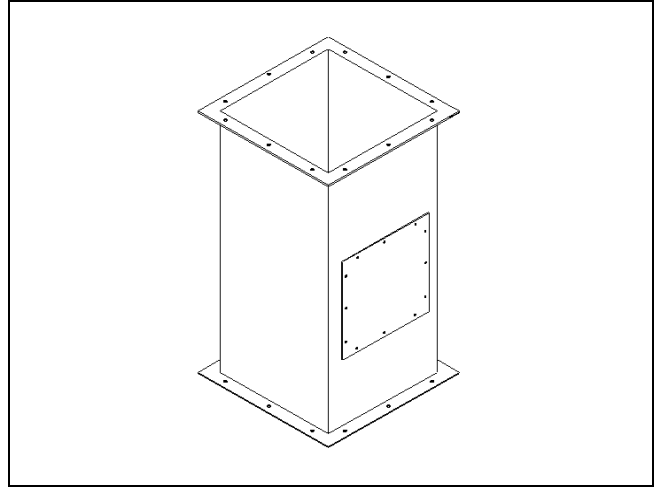




**DUCT SECTIONS & FITTINGS  
CONTINUED**

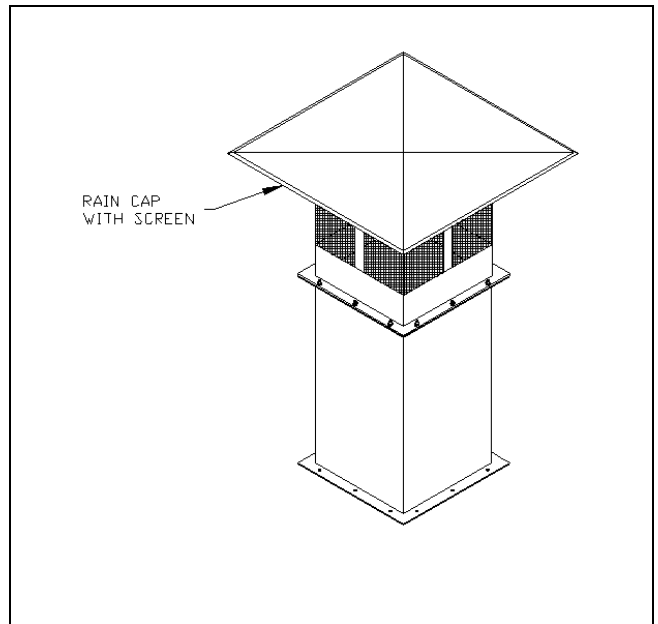
**ACCESS PANEL SECTION – PART APS**

This part is intended to be used for clean out access. When the access panel section is installed in a horizontal position, it must be orientated in accordance with applicable codes. Please refer to the Model GRS brochure for additional information and part number designation.



**RAIN CAP – PARTS RCS**

Rain caps connect to the liner flange per the joint assembly instructions.



## SUPPORTS & GUIDES

NOTES: The structural engineer for the project should select support member channels, beams, rods, wires/cables, etc. and joining methods in accordance with *Good Engineering Practices* to suite each specific application. Rods, wires/cables should only be used for hangers, NOT supports. Van-Packer accepts no responsibility for the design and/or modification of buildings or structures to accept the given load. All support framing, anchoring methods, etc. are by others.

### STRUCTURAL SUPPORTS

#### PLATE SUPPORT ASSEMBLY – PART PLS

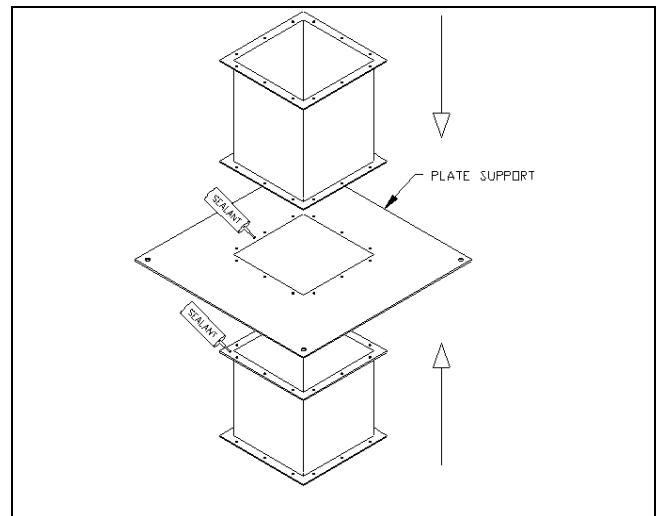
Plate support assemblies are used for vertical & horizontal (breaching anchor) structural support applications. The PLS is to be used with structural support members, which are designed by the building structural engineer not Van-Packer. Refer to page 7 for structural support limitations.

##### STEP 1

Carefully follow the joint assembly instructions on page 6, steps 1 thru 4, with the exception of adding the plate support in-between the flanges. Refer to chart for load limitations. Do not install near combustible material.

##### Note:

Support all four sides of the support plate. Design support member and fasteners in accordance with good engineering practices to suit each specific application. Van-Packer assumes no responsibility for the design and/or modification of buildings or structures to accept the given loads

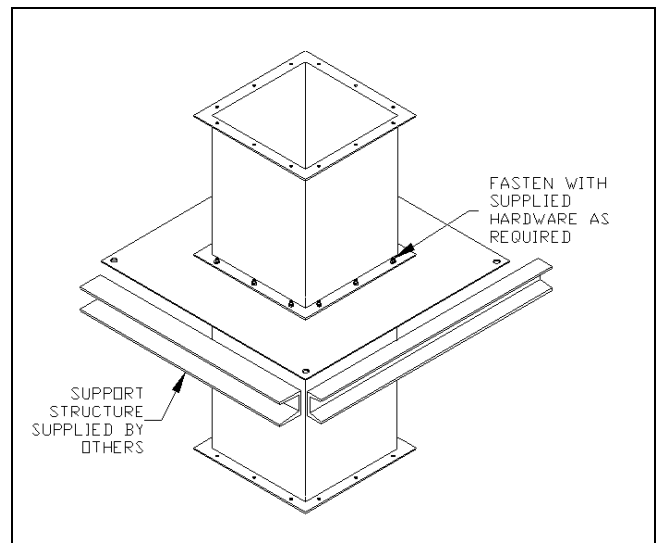


#### FLANGE SUPPORT ASSEMBLY – PART FSA

A Flange Support Assembly is a prefabricated section with a plate support installed at the factory for structural support applications. The FSA is to be used with structural support members, which are designed by the building structural engineer not Van-Packer. Refer to page 7 for structural support limitations.

##### Note:

Support all four sides of the support plate. Design support member and fasteners in accordance with good engineering practice to suit each specific application. Van-Packer assumes no responsibility for the design and/or modification of buildings or structures to accept the given loads. Refer to chart for load limitations. Do not install near combustible material.



## SUPPORTS & GUIDES

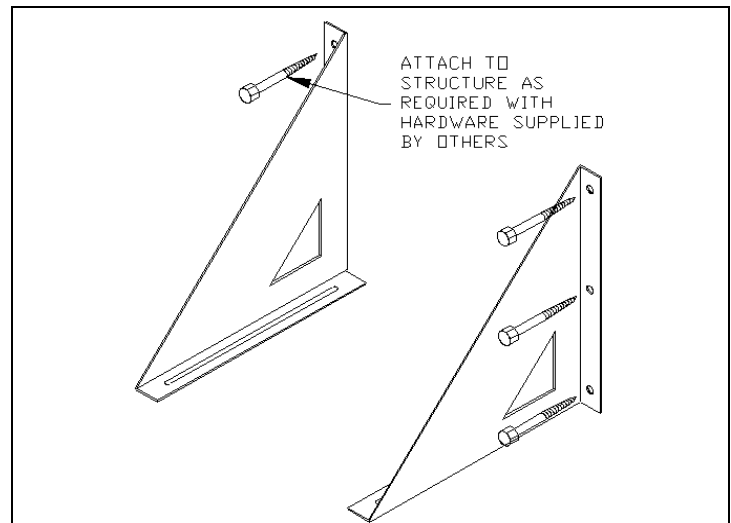
### STRUCTURAL SUPPORTS - CONTINUED

#### WALL BRACKETS – PART WBR

Wall brackets are used in conjunction with our vertical and horizontal structural and lateral supports. The WBR, in conjunction with anchor bolts or in some instances additional field fabricated support members from the wall brackets to the building or structure, is intended to provide a rigid (static) support location. This rigid support location is intended to withstand the weight of duct components, forces from thermal expansion & exhaust velocities, etc. The WBR is comprised of (2) wall brackets, (left and right) Refer to chart on page 7 for bracket support limitations.

#### STEP 1

Anchor the wall brackets to the wall or additional field fabricated support members accordingly. Design support member and fasteners in accordance with good engineering practices to suit each specific application. Van-Packer assumes no responsibility for the design and/or modification of buildings or structures to accept the given loads. Refer to chart for load limitations. Do not install near combustible material.

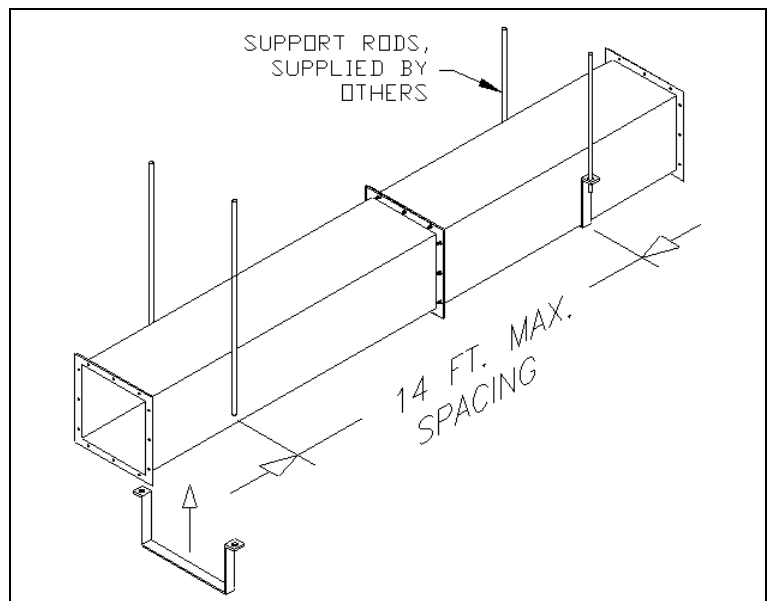


## SUPPORTS & GUIDES

### HORIZONTAL AND LATERAL SUPPORTS

#### HANGER BANDS – PART BHB

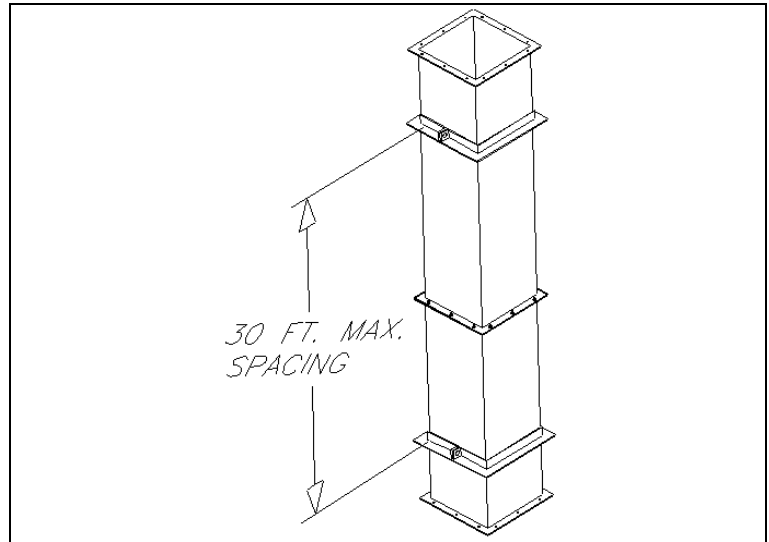
Hanger Bands, in conjunction with supports rods or other field fabricated support members from the BHB attached to the building or structure, are intended to support the weight of horizontal assembled duct lengths and also to maintain alignment as the duct expands and contracts. Position the BHB away from draw bands & covers to allow for the unrestricted expansion and contraction of the duct system. BHB's cannot be installed over draw bands.



## LATERAL BRACES

### FULL ANGLE SUPPORT – PART FAS

Full angle supports, in conjunction with field fabricated support members from the FAS attached to the building or structure, are intended to laterally brace the vertical assembled duct lengths from wind loads and to also maintain alignment as the duct expands and contracts. The FAS is comprised of (2) halves and when bolted together is a slight clearance fit to the duct. Position the FAS away from draw bands & covers as to allow for the unrestricted expansion and contraction of the duct system. FAS's cannot be installed over draw bands.



### GUY ATTACHMENT PLATE – PART GAP

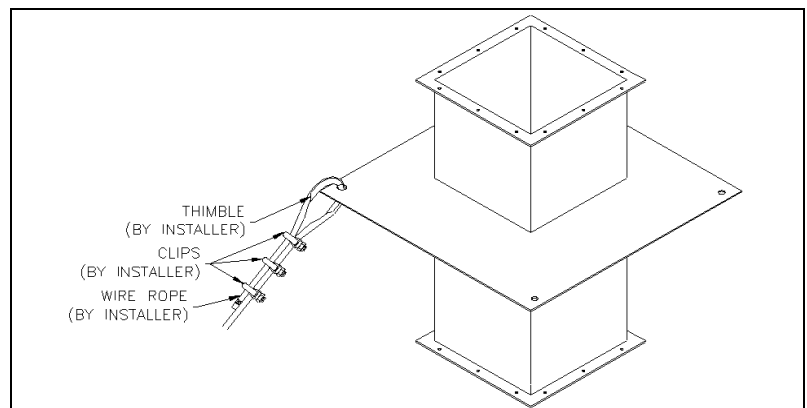
Guy attachment plate, in conjunction with wires, tensioners, anchors, and other miscellaneous hardware from the GAP attached to the building structure, are intended to laterally brace the vertical assembled duct lengths from wind loads and to also maintain alignment as the duct expands and contracts.

#### STEP 1

Carefully follow the joint assembly instructions on page 6, steps 1 thru 4, with the exception of adding the Guy attachment plate in-between the flanges.

#### Note:

Install the necessary wires, tensioners, anchors, miscellaneous hardware, etc. (by others) A minimum of (4) wires/cables equally spaced is recommended.



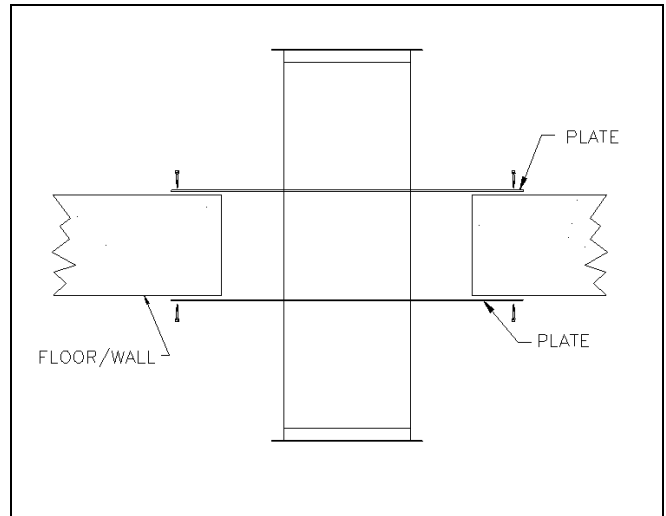
## PENETRATIONS

### FLOORS/CEILINGS & WALLS - FIRE RATING NOT REQUIRED

#### FINISHING PLATE - PART FPL

The finishing plate can be used when the duct passes through a floor/ceiling or wall where a fire rating is not required. The minimum rough opening (square or round opening allowed) must be enough to allow the duct to pass through, approximately duct O.D. +2". The maximum rough opening is duct O.D. +8" (Max. opening size when duct is centered through the opening). The FPL includes (1) plate assembly. Please note two plate assemblies shown below in the picture.

Cut the rough opening accordingly and assemble the duct through. Position the plate halves (allow slight clearance to the duct O.D. to accommodate any expansion as needed), Anchor the plates with appropriate fasteners (by others) at hole locations.



## ROOF PENETRATION

### FLASHING & COUNTER FLASHING - PARTS FLS & CFL

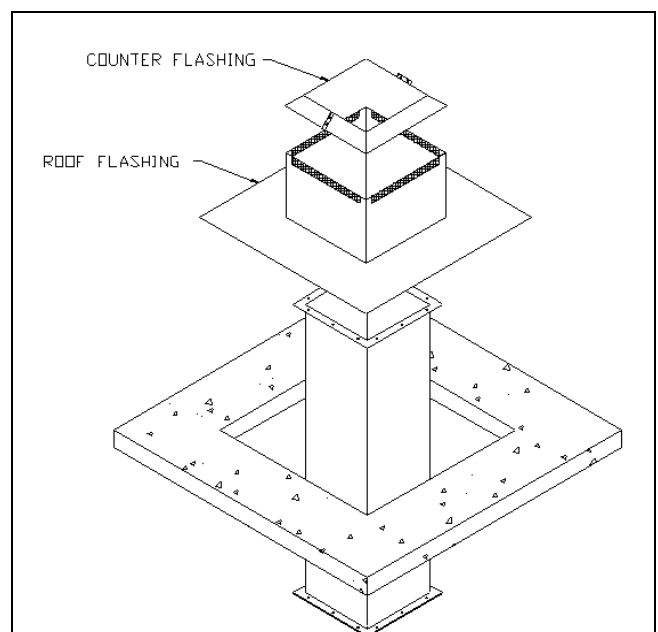
The flashing and counter flashing can be used when the duct passes through a roof or curb where a roof penetration thimble is not required. Pitched flashings are available please refer to the model GRS brochure accordingly. The minimum rough opening (square or rectangular opening allowed) must be enough to allow the duct to pass through, approximately duct O.D. +2". The maximum recommended rough opening is duct O.D. +8" (reflects flat roof only and duct centered through opening).

#### STEP 1

Cut the rough roof opening. Center the flashing around the opening and with appropriate fasteners attach it to the roof. Roofing materials to complete a weather tight seal should be installed over the square base of the flashing.

#### STEP 2

Assemble the duct through the flashing accordingly. Next, install the counter flashing by positioning it around the duct and against the screen at the top of the flashing. Then, with the provided fasteners draw up the counter flashing. Last, apply a bead of sealant at the seam of the counter flashing and duct. *Note: Roofing materials must not fill the entire space between the roof and the bottom of the counter flashing.*



## SYSTEM INSTALLATION EXAMPLES

Below shows an installation example. This example is intended to reflect general requirements for support locations, etc. with respect to, fittings, etc. to also show standard supports locations for an installation in accordance with it's design listing. This example may not reflect all necessary cleanouts, drains, etc. which may be required to meet applicable codes and to help ensure a well functioning grease duct system (refer to applicable codes as required).

