

Grease Duct

- Pizza Oven Chimney
- BBQ Chimney/Exhaust

TOLL FREE: (800)854-3267

Kitchen Ventilation System



Models SW-NAKS and DW-NAKS Installation Instructions





These Instructions are applicable for the following variations:

SW-NAKS & DW-NAKS

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

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INTRODUCTION

These instructions must be followed in all details. Failure to do so may result in a hazardous installation. Contact NAKS if there are any questions regarding these instructions.

The safe operation of a factory-built grease duct assembly is based on the use of parts supplied by NAKS and the performance of the assembly may be affected if the combination of these parts is not used in actual building construction. Compliance with local code, acceptance by the local code authority (AHJ) and warranty coverage is contingent upon the SW-NAKS / DW-NAKS system being installed and maintained in strict accordance with these installation and maintenance instructions.

Contact Local Building or Fire Officials about restrictions and installation inspection in your area.

SW-NAKS & DW-NAKS OVERVIEW

SW-NAKS is the designation model number for NAKS Single Wall Grease Duct system. DW-NAKS is the designation model number for the Double Wall option.

APPLICATIONS & USES

Models SW-NAKS and DW-NAKS factory-built grease ducts are suitable for use in the removal of smoke and grease laden vapors from commercial, institutional, industrial, and similar type of applications. Each model and/or variation may be intermixed in the same exhaust or chimney system assuming proper clearances and other installation guidelines are maintained for each system.

See UL Listings and Clearances sections for maximum temperatures and required clearances to combustibles at different operating temperatures.

Models SW-NAKS and DW-NAKS are intended for use in connecting Type 1 and 2 kitchen hoods, cooking ovens, and heating or hot water appliances to the outdoors.

USE AND INSTALLATION OF INDIVIDUAL COMPONENTS

These instructions comprise both general and specific requirements for all parts in the product line. Before specifying a design or beginning an installation, these instructions should be carefully reviewed.

TERMINATION REQUIREMENTS

Strictly follow NFPA-96 for the termination requirements for Grease Duct and/or kitchen exhaust duct systems.

UL & cUL LISTINGS

UL-1978 Standard, Grease Duct – under this Listing, Models SW-NAKS and DW-NAKS have been determined suitable for Grease Ducts as defined by NFPA-96, the "Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations". UL confirmed proper minimum air space clearance to combustibles for 500°F continuous exhaust gas temperatures and 2000°F exhaust gas temperature for 30 minutes simulating a kitchen exhaust fire. UL also confirmed that the installed joints are grease and smoke tight.

ULC-S662, (Canadian) Standard for Factory-Built Grease Ducts – under this (c-UL) Listing, Models SW-NAKS and DW-NAKS have been determined suitable for Grease Duct applications in accordance with the National Building Code -2010.

SLOPE

Mechanical codes and good practice require that some slope (back to a grease reservoir or kitchen hood) be created to prevent pooling of grease within horizontal portions of grease duct systems. Per code, grease duct systems are required to incorporate a minimum 1/4" per foot slope. Some codes require $\frac{1}{4}$ " per foot for runs less than 75' in length and 1" per foot for runs of 75' and more.

While such slopes are critically important for flat bottom grease ducts in order to prevent pooling, it is well acknowledged that cylindrical ducts prevent pooling with far less slope.

Engineering analysis, including hydraulic fluid calculations and tests confirm that pooling of grease within factory-built, cylindrical grease duct systems can be achieved with far less slope compared to flat bottomed systems, due to the physical characteristics of their construction.

As such, per the terms of the UL Listing and in accordance with UL1978, NAKS recommends a minimum slope of 1/16" per foot (0.3 degrees) for horizontal segments of the SW-NAKS and DW-NAKS grease duct systems. Normal system components will permit such slopes to be achieved on horizontal offsets of at least 2' in dimension. Shorter runs require no slope. Where a specific slope is desired, NAKS offers various options including 1.5°, 3° and 87° elbows as well as 87° tees.

FEATURES & BENEFITS

Models SW-NAKS and DW-NAKS are cylindrical, factory built, modular exhaust systems.

SW-NAKS Diameters 8" to 16" incorporate a steel to steel conical joint and clamp system for quick and easy assembly in the field. The conical joint is tapped in place creating a gas and liquid tight seal where sealant is not needed.

The conical joints have a 2.2" wide steel to steel surface overlap area at each connection allowing greater stiffness, sealing and durability.

SW-NAKS Diameter 18" and larger and all double-wall DW-NAKS systems incorporate a steel to steel <u>flange</u> joint and v-band clamp system for quick and easy assembly in the field. Sealant is used to create a gas and liquid tight seal.

The double wall Model DW-NAKS is insulated with $1^{\prime}\!$ thick compressed fiber.

Further features of Model DW-NAKS double wall and fiber insulated include:

- a) Easier to clean than field welded rectangular
- b) Reduced clearance to combustibles
- c) Reduced outer pipe skin temperatures
- d) Reduced building heat gain
- e) Increased efficiencies of energy recovery systems
- f) Reduced noise levels caused by high velocity exhausts

In Grease Ducts, the single wall Model SW-NAKS is intended to be an alternative option to field welded kitchen exhaust ducts as defined by NFPA-96. Model SW-NAKS has the same air space clearance to combustibles as field welded.

Figure 1-2, Model SW-NAKS Assembly Detail



Further features of Model SW-NAKS single wall include:

- No field welding a)
- All-stainless steel construction b)
- Smooth flowing inner liner c)
- Wide array of accessories such as supports and drains d)
- May be connected to and from DW-NAKS e)

PART NUMBER IDENTIFICATIONS

These instructions identify Model SW-NAKS and DW-NAKS item code in text and illustrations. Actual part numbers include the Model (SW-NAKS or DW-NAKS), diameter & item code.

Example 1: DWNAKS8-36L for an 8 inch inner diameter Model DW-NAKS double wall 36 inch length of pipe.

Example 2: SWNAKS10-90WT for a 10 inch inner diameter Model SW-NAKS single wall 90° Wye Tee.

Example 3: DWNAKS12-87BT for a 12 inch inner diameter Model DW-NAKS double wall 87° Boot Tee.

JOINT ASSEMBLY - Conical

For steel to steel conical joint assembly follow Steps 1 through 4.

Figure 1-3, Model DW-NAKS Assembly

Step 1

Clean the inner side of the female end and the outer side of the male end of each inner liner. Apply the KL Paste to the female end.

Step 2

Use your hands to center both pipes in alignment. Connect both pipes and press them together as much as possible by hand.

Step 3

Use the wood plate (supplied with shipment) and place it on the end of the assembly.

Tap 2-3 times. Make sure to press both inner and outer pipes together; the inner should not be more than 1/8" longer than the outer pipe once the male/female conical ends are engaged.

Step 4

ensure the connection is completely in place, the Locking Band has to be perfectly fitted in both grooves.

Install and fix the

Locking Band (LB). To



KL PASTE

KL Paste is a ceramic lubricating and assembly paste. The purpose is to help guide the pipe connections to assure the best steel to steel connection. It also seals the joint by allowing the ceramic to fill any microscopic steel imperfections. On fittings it will help the installer rotate to the correct position before tapping in place.

Use approximately 1 teaspoon of paste per 24" length of joint perimeter. Example: 10 inch diameter has 31" of perimeter length, so use about 1.3 teaspoons per each 10 inch joint connection. Below table allows for a 20% waste.

Table 1-1, No. (#) of Joints per 3.5 oz. Tube

ø	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"
#	42.6	32.0	25.6	21.3	18.2	16.0	14.2	12.8	11.6	10.6	9.8
14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"
9.1	8.0	7.1	6.4	5.8	5.3	4.9	4.5	4.2	4.0	3.7	3.5



JOINT ASSEMBLY - Flange

The SW-NAKS 18" and larger and double-wall DW-NAKS design incorporate a flange-to-flange connection. The Pipe includes a spigot that engages into the adjacent pipe section. This spigot facilitates alignment of pipe sections, provides support during assembly and protects the sealed joint during cleaning. The spigot should always be positioned down, back toward the appliance. Follow the flow direction arrow on the product label. If necessary, it is permissible to remove the spigot (with a cutting wheel or similar) to allow FL to be installed in tight spaces.

To Install:

- 1. Position the pipe so the UP/FLOW arrow is in the direction of the flue gas flow
- Prepare flange surfaces where sealant will be applied. Be sure all surfaces are clean of dirt and oil. Follow instructions included with corresponding sealant.
- Apply J-600 Sealant continuously (1/8" bead minimum) to the flange surface of the pipe (See Fig 2)
- 4. Join Flanged surfaces together. Ensure the Flow arrows are in the direction of the flue gas flow
- Apply sealant to the inner groove of the V-Band (see Fig 2)
 Position the V-Band around the joint, capturing the flanges
- in the groove of the V-Band (See Fig 3) 7. Install fasteners in V-Band retainer and tighten hardware
- Wrap the joint with insulation (provided) (See Fig 3)
- Whap the joint with instalation (provided) (see Fig 5)
 Position the Locking Band (LB) around the outer pipe (DW-NAKS Only)
- 10. Tighten hardware on Locking Band to secure
- For exterior installations, apply Dow 732 (grey) sealant around the circumference of the locking band seam (See Fig 3.)





Diameter	# of Joints
3 - 6"	10
8 - 10"	9
11 - 12"	8
13 - 16"	7
18 - 20"	6
22 - 24"	5
26 - 28"	4
30 - 32"	3
34 - 36"	2

Table 2. Sealant Usage ChartNumber of Joints sealed per tube.



ENCLOSURES & CLEARANCES

Model DW-NAKS Building Heating Appliance Chimney and Grease Duct is intended to be installed unenclosed or with non-combustible enclosures, and is not for use in one or two story family dwellings.

If the Chimney or Grease Duct passes through any zone or story of a building outside of which the connected appliance or hood is located, it is to be enclosed in non-combustible construction having a fire rating equal to or greater than that of the wall or ceiling though which it passes. Check with the local code authority (AHJ) for material with an appropriate fire rating.

Where, according to local code, no chase enclosure is required, Model DW-NAKS may be installed adjacent to a wall of combustible construction at the minimum airspace clearance specified on each pipe section and in the individual Listing as shown in the following tables.

Table	1-2,	DW-NAKS	&	SW-NAKS	Airspace	Clearances	to
Combu	stible	3					

Inside Diameter	SW-NAKS Single-Wall Grease Duct	DW-NAKS Double-Wall Grease Dut
3 " (76mm) - 6 " (152mm)	18" (457.2mm)	2" (50.8mm)
7" (178mm) - 14" (456mm)	18" (457.2mm)	2" (50.8mm)
16" (406mm) - 36" (914mm)	18" (457.2mm)	2" (50.8mm)

For clearances to combustibles for other items such as thimbles, see PART 6 – THIMBLE & FLASHINGS in these instructions.

Do not wrap or place any type of insulation in the required clearances space surrounding the Chimney in an effort to reduce the clearance to combustibles or to create some sort of fire protective enclosure.

Follow NFPA-96 regarding methods of reduced clearances for Grease Ducts.

Clearance to non-combustibles:

As required for installation, access, inspection, or per local code.

PIPE WEIGHT

The approximate installed weight of the SW-NAKS and DW-NAKS exhaust systems can be found using this table. This table does not include accessories such as supports and guides, nor shipping packaging or palletizing weight.

Table 1-3, SW-NAKS & DW-NAKS Installed Weight in Lb/ft (kg/m)

Inside Diameter	SW-NAKS	DW-NAKS
3" (76mm)	1.1 (1.7)	3.5 (5.1)
4" (102mm)	1.5 (2.2)	4.4 (6.5)
5 " (127mm)	1.9 (2.8)	5.3 (7.9)
6" (152mm)	2.2 (3.3)	6.3 (9.3)
7 " (178 mm)	2.6 (3.9)	7.2 (10.7)
8 " (203mm)	3.0 (4.4)	8.1 (12.1)
9 " (229mm)	3.4 (5.0)	9.1 (13.5)
10 " (254mm)	3.7 (5.6)	10.0 (14.9)
11 " (249mm)	4.1 (6.1)	10.9 (16.3)
12 " (305mm)	4.5 (6.7)	11.9 (17.7)
13 " (330mm)	4.9 (7.2)	12.8 (19.1)
14 " (356mm)	5.2 (7.8)	13.8 (20.5)
16 " (406mm)	6.0 (8.9)	15.6 (23.2)
18 " (457mm)	6.7 (10.0)	17.5 (26.0)
20 " (508mm)	7.5 (11.1)	19.4 (28.8)
22 " (559mm)	8.2 (12.2)	21.3 (31.6)
24 " (610mm)	9.0 (13.3)	23.1 (34.3)
26" (660mm)	9.5 (14.1)	23.7 (35.3)
28 " (711mm)	10.3 (15.3)	25.5 (37.9)
30 " (762mm)	11.0 (16.4)	27.2 (40.5)
32" (812mm)	11.7 (17.4)	29.0 (43.2)
34 " (863mm)	12.5 (18.6)	30.7 (45.7)
36 " (914mm)	13.2 (19.6)	32.5 (48.4)

ACCESS FOR CLEANING GREASE DUCTS

Follow NFPA-96 for required openings in Grease Duct for accessibility required for thorough cleaning.

Following are some openings requirements as mentioned in NFPA-96:

- 1) Openings at changes of direction, if not accessible from the duct entry or discharge.
- Access panel openings for installation and servicing of fireextinguishing systems.
- 3) Access for cleaning and inspection where fans with ductwork connected on both sides within 3' of each side of fan.

Horizontal grease ducts only:

 Opening for thorough cleaning at 12' intervals, where opening is not large enough for personnel entry.

Vertical grease ducts only:

- 5) Access at the top of a vertical riser to accommodate personnel descent.
- 6) Where personnel entry is not possible, access at every floor.

Model SW-NAKS and DW-NAKS have two standard options for access panels in Grease Duct systems. These are no-tool in design and specifically tested and Listed for Grease Duct use.

- Inline Access Door (IAD), see Section 3.
- Grease Duct Tee Cap Access (GTCA), see Section 4.

For Model SW-NAKS single wall installations, it is permissible to install Listed Grease Duct Access Doors provided they are installed in accordance with the manufacturer's installation instructions.

INTERCONNECTION WITH FIELD WELDED GREASE DUCTS

Model SW-NAKS and DW-NAKS systems are intended to be installed as a complete system without the use of other manufacturer or field fabricated components. However, NAKS recognizes the occasional requirement for a rectangular portion of grease duct due to space constraints at certain locations in a system, or when making modifications or additions to an existing grease duct. In such a case, it is permissible to transition to and from Model SW-NAKS and DW-NAKS Grease Duct to a code compliant, rectangular or round, welded steel grease duct and back again. In such a case, NAKS will manufacture and supply a custom single wall stainless steel transition, meeting code thickness requirements, that permits field welding to or from the field welded duct section(s).

Maintain the minimum air space to combustibles of 18" with these custom transitions. Follow NFPA-96 regarding methods for reduced clearances for these single wall custom transitions as well as the field fabricated grease ducts.

PART 2 – SUPPORT & GUIDING

SUPPORT AND GUIDE OPTIONS

Models SW-NAKS and DW-NAKS are very versatile in nature so there are many options for supporting and guiding, see in great details each option later in this section:

- 1) Anchor Plate Support (APS)
- 2) Heavy Duty Base for Support/Ring (HDB)
- 3) Wall Brackets for Support/Ring (WB)
- 4) Light Support Band (LSB)
- 5) Full Angle Ring (FAR)
- 6) Half Angle Ring (HAR)
- 7) Guy Wires band (GWB)

VERTICAL SUPPORT SPACING & LIMITS

Figure 2-1 provides the maximum vertical support spacing for various support options (Dimension A). See Table 2-1 for maximum distances.

Figure 2-1, Maximum Vertical Support Spacing



NOTE: See PART 3 "Lengths for Thermal Expansion" in these instructions for important use of expansion joints between anchor plate support locations.

Table 2-1,	Vertical	Support	Spacing	Limitations	(Dim A))
,					· · ·	

Vertical Support Method / Part Nos.	Dim A - Maximum Support Height				
Diameter	SW-NAKS	DW-NAKS			
Anchor Plate Support / APS					
3" - 6" (76 - 152mm)	300' (91.4m)	300' (914m)			
7" - 10 " (178 - 254mm)	300' (91.4m)	208' (63.3m)			
11" - 13 " (279 - 330mm)	300' (91.4m)	162' (49.3m)			
14" - 18 " (356 - 457mm)	300' (91.4m)	119' (36.2m)			
20" - 24" (508 - 610mm)	231' (70.4m)	90' (27.4m)			
26" - 30" (660 - 762mm)	222' (67.7m)	88' (26.8m)			
32" - 36 " (813 - 914mm)	213' (64.9m)	86' (26.2m)			
Plate Support / PS					
3" - 6" (76 - 152mm)	300' (914m)	270' (82.3m)			
7" - 10 " (178 - 254mm)	300' (914m)	191' (58.2m)			
11" - 13 " (279 - 330mm)	300' (914m)	137' (418m)			
14" - 18 " (356 - 457mm)	270' (82.3m)	101' (30.8m)			
20" - 24 " (508 - 610mm)	205' (62.5m)	84' (25.6m)			
26" - 30 " (660 - 762mm)	164' (50.0m)	62' (18.9m)			
32" - 36 " (813 - 914mm)	136' (41.5m)	52' (15.8m)			
Anchor Plate Support with Heavy Duty	y Base / APS & HDB				
3" - 6" (76 - 152mm)	300' (914m)	300' (914m)			
7" - 10" (178 - 254mm)	300' (914m)	300' (914m)			
11" - 13 " (279 - 330mm)	300' (914m)	300' (914m)			
14" - 18 " (356 - 457mm)	300' (914m)	224' (68.2m)			
20" - 24 " (508 - 610mm)	300' (914m)	170' (518m)			
26" - 30 " (660 - 762mm)	275' (83.3m)	111' (33.8m)			
32" - 36" (813 - 914mm)	230' (70.1m)	93' (28.3m)			
Anchor Plate Support with Wall Brack	et / APS & WB				
3" - 6" (76 - 152mm)	200' (60.9m)	70' (21.3m)			
7" - 10" (178 - 254mm)	119' (36.2m)	44' (13.4m)			
11" - 13 " (279 - 330mm)	90' (27.4m)	34' (10.3m)			
14" - 18 " (356 - 457mm)	66' (20.1m)	25' (7.6m)			
20" - 24 " (508 - 610mm)	49' (14.9m)	19' (5.7m)			
26" - 30 " (660 - 762mm)	29' (8.8m)	12' (3.7m)			
32" - 36" (813 - 914mm)	24' (7.3m)	10' (3.0m)			

VERTICAL GUIDE SPACING

Table 2-2 provides the maximum vertical guide spacing (Dimension B) for all guide options. Also shown is the maximum freestanding distance above the last support or guide (Dimension C).

Applicable vertical guides are FAR Full Angle Ring, LSB Light Support Band, and GWB Guy Wires Band

Table 2-2, Vertical Guide Spacing (Dim B and C)

Vertical Support	SW-NAKS & DW-NAKS			
Spacing	Dim 'B'	Dim 'C'		
3" - 24" (76 - 610mm)	19'6" (5.9m)	10' (3.0m)		
26" - 36" (660 - 914mm)	20' 4" (6.2m)	8' 2" (2.5m)		

PART 2 – SUPPORT & GUIDING

HORIZONTAL SUPPORT SPACING

Table 2-3 provides the maximum unsupported horizontal spacing (distance) between guides for an exhaust installed inside the building.

Applicable horizontal supports are FAR Full Angle Ring, HAR Half Angle Ring, LSB Light Support Band, and GWB Guy Wires Band.

Table 2-3, Horizontal Support Spacing

Maximum Unsupported Horizontal Spacing	SW-NAKS & DW-NAKS		
3" - 14" (76 - 356mm)	15' (4.5m)		
16" - 24" (406 - 610mm)	12' (3.7m)		
26" - 36 " (660 - 914mm)	9' (2.7m)		

ANCHOR PLATE SUPPORT (APS)

The Anchor Support Plate consists of a short length of pipe that has a single heavy plate factory welded to the inner pipe. It is intended to provide maximum support to vertical sections and to provide an anchor support for horizontal sections.

Figure 2-2, Anchor Plate Dimensions



The plate must be braced back to the building structure or support with rigid structural members by the installing contractor. The structural project engineer should select support members in accordance with good engineering practice to suit each specific application, or follow the guidelines to meet the following figures.

Figure 2-3, Anchor Plate Support for Vertical



Figure 2-4, Anchor Plate Support for Horizontal



The Anchor Plate Support may only be attached to non-combustible construction such as block, concrete, or steel.

DO NOT ATTACH THE ANCHOR SUPPORT PLATE TO COMBUSTIBLE MATERIALS.

PLATE SUPPORT (PS)

The Model FL Plate Support (PŚ) is intended to provide support to vertical sections and provide an anchor support for horizontal sections. The PS consists of Crescent-Flanges and Plates bolted together, sandwiching the V-band & Flange joint in the middle. The Plate Supports must be anchored with rigid structural members by the installing contractor. The structural project engineer should select support members in accordance with good engineering practice to suit each specific application, or follow the guidelines to meet the following figures. See Table 2-1 for Maximum Support height.

- 1. Complete pipe joint and secure V-Band (see Joint Assembly Section).
- 2. Position Plate Support below V-Band. Align clearance notch in Plate Support with Clamps on V-Band
- Position Crescent Flange above V-Band. Align clearance notch in Crescent Flange with Clamps on V-Band. The Crescent Flanges should overlap the seam between Plate Supports. (See Fig. 2-5)
- Install bolts through pilot holes in Crescent Flange and Plate Support, sandwiching V-Band joint in the middle. (See Fig 2-6)
- 5. Install Nuts and Tighten bolts.
- Wrap inner flue pipe with insulation provided (DW-NAKS only)
- 7. Position Finishing Band so formed edge engages with Bead on outer and tighten worm gear(DW-NAKS only). See Fig 2-
- 8. Anchor Plate Support to Structural Members

PART 2 - SUPPORT & GUIDING



Fig 2-6. Plate Support – Detail View



HEAVY DUTY BASE (HDB)

This is a factory-built base and framework for the Anchor Plate Support allows quick and easy installations when bracing the support back to the building structure. The installing contractor only provides the channel as Heavy Duty Base acts as the framework. Hardware for attaching the APS Anchor Plate Support to the HDB Heavy Duty Base is supplied with the base.

Figure 2-5, Heavy Duty Base Support for Vertical







WALL BRACKETS FOR SUPPORT (WB)

These Wall Brackets will conveniently support the Anchor Plate Support back to a non-combustible wall.

Figure 2-7, Wall Brackets



Hardware for attaching the Anchor Plate Support to the Wall Brackets is supplied with the brackets.

However, hardware for attaching these Wall Brackets to the wall is by others. The structural engineer should select hardware and in accordance with good engineering practice to suit each specific application.

Figure 2-8, Wall Brackets for Anchor Plate Support

PART 2 – SUPPORT & GUIDING



Figure 2-10, Heavy Duty Base for Full Angle Ring Example



FULL ANGLE RING (FAR)

The Full Angle Ring is used as a vertical guide and is braced to the building structure by the installing contractor. It can also be used in horizontal configurations where exposed to weather (wind) or on vibrating or high pressure applications such as engine exhaust.

Figure 2-9, Full Angle Ring



Also see Figures 2-10 and 2-11, the Heavy Duty Base or Wall Brackets may also be used to help support the Full Angle Ring back to the building structure.

PART 2 – SUPPORT & GUIDING

Figure 2-11, Wall Brackets for Full Angle Ring Example



HALF ANGLE RING (HAR)

The Half Angle Ring is used to support/guide horizontal installations and may be suspended by threaded rods. See Full Angle Ring (FAR) for outdoor or vibrating installations.



Figure 2-12, Half Angle Ring

LIGHT SUPPORT BAND (LSB)

The Light Support Band can be used on low pressure and low temperature applications such as heating boiler stacks and grease ducts (not for use with engine or turbine exhaust) for support/guide in horizontal or vertical installations.

The band firmly clamps around the pipe outer jacket and includes four (4) $\frac{1}{4}$ x 20 stainless steel nuts and bolts. Remaining hole in the middle is where wires or threaded rods (by the installing contractor) are used for support or guiding back to the building structure.

Figure 2-13, Light Support Band





GUY WIRES BAND (GWB)

The Guy Wires Band permits easy connection for three (3) guy wires at 120 degrees apart. The band firmly clamps around the pipe outer jacket and includes three (3) $\frac{1}{4}$ x 20 stainless steel nuts and bolts.

The actual guy wires are by others, the structural engineer should select wire size in accordance with good engineering practice to suit each specific application.

Figure 2-15, Guy Wires Band



Figure 2-16, Guy Wire Band Installation Example

Figure 2-14, Light Support Band Installation Example



6", 9", 12", 18", 24", 30", 36", 42", & 48" FIXED PIPE LENGTHS (__L)

Models SW-NAKS and DW-NAKS have various fixed lengths of pipe. 6" length is only available in SW-NAKS.

Any custom length may be ordered from NAKS.

Figure 3-1, Fixed Pipe Lengths



equipment inside the pipe. Standard is one 1" NPT nipple, but any size can be factory installed and in multiple configurations.

All ports are continuously welded to the inner pipe. Gaskets or sealant used to connect other equipment and supporting of this equipment is by others.

Figure 3-3, Test/Nozzle Port Section



INLINE ACCESS DOOR LENGTH (IAD)

The Inline Access Door is for the Grease Duct application and provides an easy and no-tool access to the inside exhaust for cleaning and inspection. The Inline Access Door ships fully assembled and no modifications are required in the field.

To open the door, and gain access to the Grease Duct, follow these steps:

- Unlatch the outer jacket clips and open the door (hinges are on the opposite side of the clips).
- 2) Remove the precut insulation blanket.
- 3) Loosen and remove the wing nuts.
- 4) Remove the inner door.
- 5) Access the Grease Duct.

Reverse the steps to close the door.

Figure 3-4, Inline Access Door



TEST/NOZZLE PORT LENGTH (TPL)

A Test/Nozzle Port Length can be used for monitoring flue gases, horizontal Grease Duct drain, or implementing internal cleaning

18" & 30" CUT PIPE LENGTHS (CL)

Cut Pipe Lengths are specifically engineered to be field cut to desired length. This permits the greatest flexibility for complicated installations.

- The minimum installed length of 18CL and 30CL is 5.3".
- The maximum installed length of the 18CL is 15.8".
- The maximum installed length of the 30CL is 27.8".

Cut Pipe Lengths are used in all applications and have been evaluated by UL and confirmed suitable for positive internal pressures up to 60" W.C. (15000 Pa).

IMPORTANT: Proper installation of the Cut Pipe Length involves a procedure of very careful measurement and cutting (either in the field or shop) of the outlet end(s) of the Cut Pipe Length with appropriate equipment and technique to achieve a clean, burr free, straight end(s). Experienced sheet metal tradesmen are familiar with such equipment and techniques and should be used for such purpose.

Examples of equipment commonly used for such purpose include:

Type 27 Right Angle Grinder Cutting Wheels for stainless steel and NOGA Model DB1000 double edge deburring tool for thin sheet metal.

Figure 3-5, Cut Pipe Length Installation



CUT PIPE LENGTH SHIPS AS A STAND ALONE ITEM. ARROW SHOWS DIRECTION OF FLUE GAS FLOW, OR UP DIRECTION.

INSTALLATION STEPS:

1) FIELD MEASURE REQUIRED DISTANCE TO FILL BETWEEN TWO PIPE ENDS. 2) ADD 4.4" TO DETERMINE THE OVERALL CUT



3) MEASURING UP FROM THE INLET END OF THE CUT LENGTH, MARK AND CREATE A LINE AROUND THE PERIMETER OF THE CUT LENGTH AT THE DESIRED LOCATION FOR THE CUT.

OVERALL PERMITTED LENGTH IS 7.5".

4) USING THE LINE AS A GUIDE, CUT THE EXTRA MATERIAL (OUTER WALL, INSULATION, AND INNER LINER) AWAY LEAVING THE DESIRED OVERALL LENGTH.

5) DEBURR THE EDGES OF THE INNER AND OUTER CUT.



6) ON THE OUTER WALL OF THE CL, MEASURE AND CREATE A SECOND LINE 2.2" BACK FROM THE CUT END.

7) APPLY KL PASTE TO THE OUTER SURFACE OF THE CONNECTING INNER PIPE



8) TAP THE ADJOINING LENGTH OR CUT LENGTH INTO PLACE USING THE SUPPLIED WOOD PLATE. PROPER ENGAGEMENT IS ACHIEVED WHEN THIS DIMENSION (*) BECOMES ZERO.



9) INSTALL THE LOCKING BAND (LB) FROM THE ADJOINING PIPE SECTION OVER THE FIELD CUT JOINT LOCATION.

Figure 3-6, Cut Pipe Length Joint Detail





SEE STEP 7 MARK 2.2" FROM THE END OF CUT BEFORE BEING INSERTED INTO THE CONNECTING PIPE CONICAL INLET.







CUT END IS FULLY ENGAGED (2.2") BY TAPPING THE PIPES TOGETHER UNTIL THE OUTLET END OF THE CUT LENGTH IS FULLY ENGAGED (CREATING A TIGHT SEAL) INTO THE CONICAL INLET OF THE CONNECTING PIPE.

LOCKING BAND IS NOT SHOWN FOR CLARITY

LENGTHS FOR THERMAL EXPANSION

Models SW-NAKS and DW-NAKS assembled lengths act like a continuous steel pipe, so thermal expansion must be compensated for between anchored or fixed supports.

Any expansion of the inner in excess of 0.375" (9mm) requires one of the following expansion capable lengths between fixed anchor points:

- 1) Adjustable Length (18AL or 30AL)
- 2) Adjustable Length with Graphite Packing (18ALG or 30ALG)

18" & 30" ADJUSTABLE LENGTHS (__AL)

Adjustable Lengths incorporate a telescoping length that compensates inner thermal expansion. These adjustable lengths ship completely assembled, and no modifications are required in the field.

- The minimum installed length of the 18AL is 10.5".
- The maximum installed length of the 18AL is 15.5".
- The minimum installed length of the 30AL is 22.5".
- The maximum installed length of the 30AL is 27.5".

IMPORTANT: Adjustable Lengths (AL) are intended to be used in negative internal Chimney applications only. For Grease Duct or other pressure applications use the Adjustable Lengths w/ Graphite Packing (18ALG or 30ALG).

Figure 3-7, 18" & 30: Adjustable Lengths



18" & 30" ADJUSTABLE LENGTHS W/ GRAPHITE PACKING (__ALG)

W/ GRAPHITE PACKING (__ALG) Adjustable Lengths with Graphite Packing have two functions: to serve as an expansion joint and to make up for a required odd length. The adjustable length incorporates a telescoping inner liner that accommodates thermal expansion in longer runs of pipe. It telescopes into a larger diameter stationary length and is sealed by a heavy gage clamp/graphite packing sealing system. It is finished off with a clam shell outer jacket.

Adjustable Lengths ship completely assembled at the "maximum Installed Length" shown herein, and no modifications are required in the field when used only as an expansion joint.

When also using the Adjustable Length to make up for an odd length, you must remove the outer jacket and loosen the clamp/graphite seal to allow the telescoping inner to easily slide further into the stationary length. The insulation may need to be trimmed back also. Tighten the sealing system back in place.

To assure correct engagement of the inlet and outlet ends, the Adjustable Length must be installed to the connecting pipe or fitting while the graphite seal is tightened (either before loosening as the adjustable ships or after tightening when used to make up an odd length).

The Adjustable Length with Graphite Packing has been evaluated by UL and confirmed suitable for positive internal static pressures up to 8" WC" (2000 Pa).

Figure 3-8, ALG Adjustable Length Model DW-NAKS Assembly



Figure 3-9, Adjustable Length Clamp/Graphite Sealing System Detail



Figure 3-10, 18" & 30" ALG Adjustable Length Dimensions



- The minimum Installed Length of the 18ALG is 11.6"
- The maximum Installed Length of the 18ALG is 15.8"
- The minimum Installed Length of the 30ALG is 15.8"
- The maximum Installed Length of the 30ALG is 27.8"

The above figure shows Model SW-NAKS inner liner.

Do NOT extend the telescoping inner outwards further away from the stationary length than the above "maximum Installed Length".

In horizontal Adjustable Length installations, add guides near each end to assure correct alignment at all times. In vertical installations, place the Adjustable Length just below a Support as the Adjustable Length is not load bearing.

FLANGE RAW COLLAR OUTSIDE ADAPTER (FL-RCO)

The Raw Collar Outside Adapter is used to add a flange on an appliance outlet for connection purposes.

To Install (See Fig 3-11.):

- Select correct sealant based on flue gas and application (See Joint Assembly Section). Clean/Prepare all surfaces will sealant to be applied.
- 2. Apply sealant to the outside surface of the appliance outlet.
- 3. Clamp the RCO outside of appliance outlet.
- 4. Secured by tightening tensioner bolts.
- Refer to Joint Assembly section to install subsequent flange pipe sections.



FLANGE ADJUSTABLE LENGTH (FL-AL)

The NAKS Flange AL is used where odd length of vent is required. It includes a Slip Section, a RCO and a Clam-Shell style outer jacket (DW-NAKS only).

To Install (See Figs 3-12. & 3-13.):

- Loosen Clamp on RCO and adjust/slide the Flange to the required location.
- 2. Clean/Prepare surface and apply sealant between the Slip Section and RCO to create a seal.
- 3. Tighten RCO clamp to secure it in place.
- Install AL assembly to the adjacent pipe. The Slip Section will slide to the inside of the adjacent pipe. If the Slip Section is too long and interferes with elbow or other component, the extra length can be cut off.
- Join the flanged ends to the adjacent pipe sections with V-Band. Refer to Joint Assembly section for proper sealant usage and joint connection method.
- Wrap the inner flue with provided insulation (DW-NAKS options only)

 Install Clam-Shell style outer around AL(DW-NAKS options only). The outlet end of the Clam Shell has a flange that will seat in the bead. The Lower end of the Clam Shell is clamped flush against the outside of the pipe.





FLANGE ADJUSTABLE LENGTH WITH GRAPHITE (FL-ALG)

The Flange -ALG is used to accommodate for thermal expansion and where odd length of vent is required.

The Adjustable Length with Graphite Packing has been evaluated by UL and confirmed suitable for positive internal static pressures up to 8" WC (2000 Pa). CAUTION: ALG is limited to 8" WC (2000 Pa) positive pressure. ALG is not intended for use with oil or solid fuel

The adjustable length incorporates a telescoping inner liner that accommodates thermal expansion in longer runs of pipe. It telescopes into a larger diameter stationary length and is sealed by a heavy gage clamp/graphite packing sealing system. It is finished off with a clam shell outer jacket.

When also using the Adjustable Length to make up for an odd length, you must remove the outer jacket and loosen the clamp/graphite seal to allow the telescoping inner to easily slide further into the stationary length. The insulation may need to be trimmed back also. Tighten the sealing system back in place.

The maximum installed Length of the 24 ALG is 22". Do NOT extend the telescoping inner outwards beyond the maximum installed Length.

In horizontal Adjustable Length installations, add guides near each end to assure correct alignment at all times. In vertical installations, place the Adjustable Length just below a Support as the Adjustable Length is not load bearing.

To Install(See Fig 3-14 & 3-15):

- Remove bolts and separate the Lower 2-Piece ring from the Graphite sealing system.
- 2. Wrap the Lower 2-Piece ring around the inner liner (just below the flange) of the adjacent stationary section.
- Slide the Flange -ALG Slip Section down, inside the adjacent stationary length with Lower 2-Piece ring from Step 1.
- Join the Upper Ring with Containment Lip to the Lower Ring. The Graphite Band and Flange from Stationary Length should be sandwiched between Ring sections.
- 5. Secure Rings together with bolts provided
- 6. Tighten all hardware on Containment Rings.
- Wrap inner flue pipe with insulation provided (DW-NAKS only)
- 8. Install Outer Clam Shell





SPECIAL CONSIDERATION FOR INSTALLING FITTINGS

When tapping the pipe length into the fitting, 2nd person must hold the fitting in place from behind.

Figure 4-1, Special Consideration for Fittings



1.5°, 3°, 15°, 30°, 45°, 70°, 87°, & 90° ELBOW (__EL)

Elbows may be used singular or in combination to provide changes in direction.

Figure 4-2, 1.5°, 3°, 15°, 30°, 45°, 70°, 87°, & 90° Elbows



45°, 87°, & 90° TEE (___T)

Used as a manifold entry Tee, offset with one of the access cap options, or base Tee with one of the drain tee caps options. Snout can be same or any size smaller than the body.





NAKS Boot Tees offer the added 45-degree gore that directs the flue gases towards the outlet at a 45-degree angle. Most others still allow the flue gases to enter the outlet branch at 90-degrees. Snout can be same or any size smaller than the body.

Figure 4-4, 87° & 90° Boot Tee (__BT)



GREASE DUCT TEE (__GT & __GBT)

Grease Duct Tee fittings have a reversed shout that permits accessibility for cleaning. This is available in every tee option, the arrows below dictate exhaust flow.

Figure 4-5, 45°, 87°, & 90° Grease Duct Tee







PART 4 - FITTINGS, TEE CAPS & INCREASERS

45° DOUBLE TEE (45DT)

Used as a two-way manifold entry Tee, offset with one or two of the access cap options, or base Tee with one of the drain tee caps options. Snouts can be any size smaller than the body.

Figure 4-7, 45° Double Tee



90° WYE TEE (90WT)

Used for two-way entries where a tee cap or access cannot be used due to the application or as a 90° that can have an access cap at the middle.

Figure 4-8, 90° Wye Tee



DRAIN TEE CAPS (DCB & DCS)

Two styles of Drain Tee Caps are available. Each includes a 1" NPT Nipple for a drain line attachment by the installing contractor.

The DCB (B for Bottom) has the nipple at the base. The DCS (S for Side) has the nipple on the side which is convenient in certain applications where the horizontal appliance outlet is very low to the floor.

Figure 4-9, Drain Tee Caps



TEE CAP ACCESS (TCA)

Tee Cap Access permits access to the inside Chimney for inspection and/or cleaning. It can be placed at the end of a snout of any three or four-way fitting. This part is for Chimneys only, use the below Grease tee Cap Access for Grease Ducts.

Gasket and hardware are included so that the internal cap may be removed and reinstalled without tools.

Figure 4-10, Tee Cap Access



GREASE TEE CAP ACCESS (GTCA)

Grease Duct Tee Cap Access permits access to the inside Grease Duct for inspection and/or cleaning. It can be placed at the end of a snout of any three or four-way fitting and incorporates a 1½" tall dam to prevent liquid or grease from dropping out when opening.

Gasket and hardware are included so that the internal cap may be removed and reinstalled without tools.

Figure 4-11, Tee Cap Access



PART 4 - FITTINGS, TEE CAPS & INCREASERS

INCREASERS AND REDUCERS

Reduction fittings are typically used in manifold applications when needed. There are many options for increasers and reducers.

TAPERED INCREASER & REDUCER (TI & TR)

Tapered Increasers and Reducers keep the same centerline.

Be cautious of using these in the horizontal, due to increased or decreased diameter changes this will cause a low point in the exhaust where condensate can trap. Use the Eccentric increaser and reducer in horizontal installations instead.

Figure 4-12, Tapered Increaser and Reducer



TAPERED ECCENTRIC INCREASER & REDUCER (TEI & TER)

Tapered Eccentric Increasers and Reducers keep the same low point, or are flat on bottom. They also create a slight centerline offset if used in the vertical installation.

Figure 4-13, Eccentric Increaser and Reducer



STEPPED INCREASER & REDUCER

(SI & SR)

Stepped Increasers and Reducers can be used in tight situations and are available in all steps.

The Stepped Increasers and Reducers are non-structural parts and must not be subject to loads in either the axial or lateral directions.

Be cautious of using these in the horizontal. Increased or decreased diameter changes will cause a low point in the exhaust where condensation can trap. Use the Eccentric increaser and reducer parts in horizontal installations instead.

Figure 4-14, Stepped Increaser & Reducer



STEPPED ECCENTRIC INCREASER & REDUCER (SEI & SER)

Stepped Eccentric Increasers and Reducers can be used in tight situations and are available in all steps.

The Stepped Eccentric Increasers and Reducers are non-structural parts and must not be subject to loads in either the axial or lateral directions.

Figure 4-15, Stepped Eccentric Increaser and Reducer



START & END ADAPTERS

Since Models SW-NAKS and DW-NAKS are directional with flow, both START and END adapters are typically used in every application.

The NAKS 2000°F rated gasket used in the Kitchen Inline Access Door KIAD (see Part 3) and Tee Cap Access TCA (see Part 4) may also be used to seal Grease Duct connections to Type I Hoods as detailed in NFPA-96 "Permitted Duct-to-Hood Collar Connection".

NO-WELD HOOD ADAPTER (NWHA)

Connects Models SW-NAKS and DW-NAKS to a kitchen exhaust hood without the need for field welding.

To Install(See Fig 5-0):

- 1. Using the Lower ring as a template, scribe and cut center hole and pilot holes in Appliance Hood
- 2. Align Flanged Pipe Collar on top of appliance hood
- 3. Apply Gasket between collar connection and appliance hood
- 4. Align 2-Piece Receiver on top of Flanged Pipe Collar
- 5. Install Bolts in the lower ring, through Appliance hood and into 2-piece receiver and tighten securely.





RAW COLLAR ADAPTER (INSIDE) START & END (RCIS & RCIE)

Connects Models SW-NAKS and DW-NAKS to a nominal collar via flashing inside the appliance collar. Has a support clamp around the outside that rigidly holds the adapter in place. Use approved sealant for gas tight connection.

Figure 5-1, Raw Collar Adapter (Inside) Start & End



RAW COLLAR ADAPTER (OUTSIDE) START & END (RCOS & RCOE)

Connects Models SW-NAKS and DW-NAKS to a nominal collar on the outside of the appliance collar. The adapter is split and uses hardware to tighten against the outside of the collar. Use approved sealant for gas tight connection.

Figure 5-2, Raw Collar Adapter (Outside) Start



FLANGE COLLAR ADAPTER START & END (FCS & FCE)

Connects SW-NAKS and DW-NAKS to any ½" flange, typical for many accessories and oven connections. An optional vee band may be added to secure the flange in place.

Table 5-3, Flange Collar Adapter with Optional Vee Band





½" FLANGES

PART 5 – ADAPTERS & TERMINATIONS

FLANGE COLLAR KIT (FCK)

Connects SW-NAKS and DW-NAKS to any flanged appliance outlet and includes a split plate and beam clamps. Use approved sealant for gas tight connection

Table 5-4, Flange Collar Kit



125/150 LB. ANSI FLANGE START & END (AFS & AFE)

125/150 ANSI Flange Start and End are typically used to connect to and from certain industrial auxiliary equipment and fans.

These items do not come with hardware and gasket for the ANSI flange connection. These are typically supplied by the equipment you are connecting to.

Figure 5-5, 125/150 Lb. ANSI Flange Start & End





SHOWN INSTALLED VERTICALLY

SHOWN INSTALLED HORIZONTALLY

TRANSITION TO ROUND START & END (TRS & TRE)

Used to connect to and from rectangular or square outlets on kitchen exhaust hoods, fans, or auxiliary equipment. Transitions are custom made to order for project requirements.

The rectangular or square base can be made in accordance with NFPA-96 no-weld hood connection, or may be field welded by the installing contractor. See part 1 "Interconnection with Field Welded Grease Ducts".

Figure 5-6, Transition to Round Start & End



FAN PLATE ADAPTER START & END (FPS & FPE)

This is a heavier gauge flat plate that can be used to start at a masonry fireplace outlet, or to attach a chimney fan or fan curb housing at the termination.

When used as a Fan Plate Adapter End (as shown in below Figure 5-7), the flat plate is designed to set directly on top of the roof curb (by others). The installing contractor uses bolts or screws through the plate into the curb.

Figure 5-7, Fan Plate Adapter End



SW-NAKS TO DW-NAKS & DW-NAKS TO SW-NAKS ADAPTERS (D2S & S2D)

These adapters allow a smooth transition to and from SW-NAKS single wall and DW-NAKS double wall. They may be installed vertically or horizontally.

Figure 5-8, DW-NAKS/SW-NAKS Adapters



PART 5 – ADAPTERS & TERMINATIONS

TERMINATIONS

See GENERAL INFORMATION for termination height above roof requirements.

There are two options to most terminations:

- 1) No Screen (<u>N</u>) or With Screen (<u>S</u>)
- 2) Low Temperature or High (<u>H</u>) Temperature

NAKS uses 1" x 1" x 0.059" thick stainless steel wire mesh for termination screens. The purpose of a screen is to not allow debris or personnel into the exhaust and also used to restrict rodents or birds from entering the exhaust.

OPEN TERMINATION (OT<u>N</u>, OT<u>NH</u>, OT<u>S</u>, & OT<u>SH</u>)

An Open Termination that is unrestrictive. Used in both vertical and sidewall scenarios. For Chimney applications, use the Universal Drain Length (UDL) or Drain Tee Cap (DCB or DCS) below to drain rainwater from the exhaust.

The open Termination connects to the Model SW-NAKS or DW-NAKS pipe using a standard Locking Band (LB)

Figure 5-9, Open Termination





OTN SHOWN INSTALLED VERTICALLY

OTN SHOWN INSTALLED

EXIT CONE (EC & ECH)

The Exit Cone increases velocity by 50%. For Chimney applications, use the Universal Drain Length (UDL) or Drain Tee Cap (DCB or DCS) below to drain rainwater from the exhaust.

The Exit Cone connects to the Model DW-NAKS or SW-NAKS pipe using a standard Locking Band (LB).

Figure 5-10, Exit Cone



FLAT TOP RAIN CAP (FT<u>N</u>, FT<u>NH</u>, FT<u>S</u>, & FT<u>SH</u>)

À basic flat top rain cap.

Part includes an Open Termination (OTN or OTNH) and shipped completely assembled. The top may be field removed if access is required

The Flat Top Rain Cap connects to the Model SW-NAKS or DW-NAKS pipe using a standard Locking Band (LB).

Figure 5-11, Flat Top Rain Cap options



HIGH WIND RAIN CAP (WRC)

This cap helps to reduce downdraft on gravity equipment and provides best rain protection.

The High Wind cap connects to the Model SW-NAKS or DW-NAKS pipe using a standard Locking Band (LB).

Figure 5-12, High Wind Cap



STACK CAP (SCN, SCNH, SCS, & SCSH)

An ASHRAE style of rain cap, also known as china cap, has an inverted cone to help disperse flue gases and to provide a lower pressure drop.

Part includes an Open Termination (OTN or OTNH) and shipped completely assembled. The top may be field removed if access is required.

The Stack Cap connects to the Model SW-NAKS or DW-NAKS using a standard Locking band (LB).

Figure 5-13, Stack Cap options

PART 6 – THIMBLE, FLASHINGS & SHIELD



of Governmental Industrial Hygienists (ACGIH) and American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) handbooks.

At present (June 2014), Underwriters Laboratories, Inc. (UL) has no safety standard for these devices so although they are shown in this document and condoned by NFPA, NAKS and others, UL has not independently investigated this product.

If the total height exceeds the freestanding distance (Dimensions C) as shown in Section 2 – Support and Guiding, the structural engineer should support and guy the No-Loss Weather Head in accordance with good engineering practice to suit each specific application.

The No-Loss Weather Head incorporates the Open Termination (OTN) at the base and connects to the SW-NAKS or DW-NAKS pipe using a normal Locking Band (LB).

Figure 5-15, No-Loss Weather Head

MITER CUT TERMINATION W/ SCREEN (MCS & MCSH)

The Miter Cut Termination is typically used in horizontal venting.

The Miter Cut Termination connects to the Model SW-NAKS or DW-NAKS using a standard Locking band (LB).

Figure 5-14, Miter Cut Termination



SW-NAKS OR DW-NAKS CONNECTION



NO-LOSS WEATHER HEAD (NLWH)

The No-Loss Weather Head (NLWH) incorporated as part of the NAKS Inc. SW-NAKS and DW-NAKS product offering is the same type and construction as no loss weather head style terminations used for chimney applications in North America and other parts of the world for decades.

It is a very popular style of termination that provides the unique combination of appreciable rain protection without any obstruction to the vertical exit of the flue gases. It is detailed in American Conference

THIMBLE IS FOR DOUBLE WALL ONLY

The thimble in this section is for Model DW-NAKS Double Wall only. Model SW-NAKS Single Wall has not been evaluated by UL for use with any thimble. See NFPA-96 for grease ducts and NFPA-211 for chimneys regarding requirements and limitations for SW-NAKS.

THIMBLE & FLASHINGS OPTIONS

Thimble, Flashings and Storm Collars - Use / Selection

- High Temperature Thimble (HTT) Required for all chimney 1)
- applications passing through combustible roofs. **Flat Roof Flashing** (FRF) For flat roofs. Fits over HTT and used for 2) 1000F max continuous applications. Also permitted for use when the entire roof penetration is non-combustible.
- Pitched Roof Flashing (PRF) For sloped roofs. Fits over HTT and 3) used for 1000F max continuous applications. Also permitted for use when the entire roof penetration is non-combustible.
- Storm Collar (SC) For use with FRF and PRF. 4)
- Flat Cone flashing (FCF) For flat roofs. Permitted for use when the 5) entire roof penetration is non-combustible.
- 6) Pitched Cone flashing (PCF) - For sloped roofs. Permitted for use when the entire roof penetration is non-combustible.
- Storm Collar for Coned Flashings (SCCF) For use with FCF and 7) PCF.

HIGH TEMPERATURE THIMBLE (HTT)

This roof thimble provides safe installation against combustible materials. It is part of the Unvented Roof Assembly (see Figure 6-5).

The thimble is fiber insulated and includes a lateral pipe guide with hardware at the top. The thimble extends down 12" from the installation brackets. Hardware to connect brackets to the roof is not included.

Figure 6-1, High Temperature Insulated Thimble (HTT)



Figure 6-2, Roof Framing for Insulated Thimble



ROOFS WITH A SLOPE OR PITCH

When using the roof thimble with sloped roof construction, the installing contractor has two choices:

- Fabricate a flat, horizontal curb for installation of the roof thimble 1) shown. The curb extends out from the high side of the roof opening.
- Order a special version of the roof thimble that has the brackets factory 2) installed to match the desired roof pitch.

In all cases, it is important to insure that the thimble body extends down at least 1" past the lowest portion of the roof framing when installed. Thimbles with extended length bodies are available on special request from the factory.

FLAT & PITCHED ROOF FLASHINGS (FRF & PRF) & STORM COLLAR (SC)

The Flat Roof Flashing and Pitched Roof Flashing can be used for noncombustible construction and also fit over the High Temperature Thimble (HTT) as part of the Roof Assembly with Thimble. The Storm Collar flashes above the roof flashing and is sealed to the outer jacket (but not attached to the flashing permitting expansion).

Figure 6-3, Flat & Pitched Roof Flashing and Storm Collar



UNVENTED ROOF ASSEMBLY

For all UL-103 and UL-1978 applications (1000°F maximum continuous temperature), UL has determined the High Temperature Insulated Thimble (HTT) alone, without ventilation, provides a safe installation through a combustible roof or wall. In this manner, the Flat Roof Flashing (FRF) in conjunction with the standard Storm Collar (SC) is used.

Figure 6-4, Unvented Roof Assembly



HIGH TEMPERATURE THIMBLE (HTT)

FLAT & PITCHED CONE FLASHINGS (FCF & PCF) & STORM COLLAR (SCCF)

The Flat Cone Flashing and Pitched Cone Flashing can be used for noncombustible construction. The Storm Collar for Coned Flashings flashes above the Cone Flashings and is sealed to the outer jacket (but not attached to the flashing permitting expansion).

Figure 6-5, Flat & Pitched Cone Flashings and Storm Collar



DW-NAKS COMMERCIAL GREASE DUCT 2X 14", INTO 20", 1X 8", INTO COMMON 24" GREASE DUCT



DW-NAKS PIZZA OVEN CHIMNEY & GREASE DUCT 10" I.D. / 121/2" O.D. CHIMNEY AND GREASE DUCT



PART 7 – SAMPLE SYSTEMS

DW-NAKS STAND-ALONE RESTAURANT EXHAUST

9" I.D. / 11½" O.D. Grease Duct from Wall Mounted Type I Hood





TERMS AND CONDITIONS OF SALE FOR GREASE DUCTS

THESE TERMS AND CONDITIONS OF SALE ("*TERMS*") CONTAIN VERY IMPORTANT INFORMATION REGARDING YOUR PURCHASE, AS WELL AS CONDITIONS, LIMITATIONS, AND EXCLUSIONS THAT APPLY TO YOU AND YOUR PURCHASE. PLEASE READ THEM CAREFULLY. YOUR PURCHASE IS EXPRESSLY LIMITED TO AND MADE CONDITIONAL UPON THE EXCLUSIVITY OF THESE TERMS. ANY PROPOSAL FOR DIFFERENT TERMS OR ANY ATTEMPT TO VARY, IN ANY DEGREE, ANY OF THESE TERMS IS EXPRESSLY REJECTED.

1. <u>Acceptance</u>. These Terms govern any purchase made from North American Kitchen Solutions Incorporated ("*NAKS*"). These Terms, the Manual in which they are contained, installation and maintenance instructions, the applicable invoice, and any documents incorporated or referred to herein or therein, including any future paper or electronic releases issued by NAKS, constitute the "Order." The Order is the entire contract between you, the buyer, and NAKS, the seller, for products purchased from NAKS. These Terms apply to the Order unless expressly modified or waived in writing by an officer of NAKS. An Order may only be cancelled by you upon payment of reasonable cancellation charges for expenses incurred or commitments made by NAKS. Captions in these Terms are for convenience only.

2. <u>Pricing</u>. The price for NAKS' grease ducts and grease duct accessories ("*Products*") is complete, and no deductions, credits, or offsets may be made without NAKS's express written consent. Prices are subject to change and surcharges in the event of cost increases in materials and transportation. All complete component accessory material manufactured by others and furnished with Products such as motors, drives, vibration equipment, controls, or other completely assembled component structures, are subject to adjustment to the price at time of shipment regardless of the date of original order entry.

3. <u>Sales and Similar Taxes</u>. NAKS' prices do not include sales, use, excise, or similar taxes. Present or future sales, use, excise, or other similar tax applicable to the sale of Products shall be paid you, unless an acceptable tax exemption certificate is provided to NAKS.

4. <u>Payment</u>. NAKS reserves the right to require full or partial payment in advance of any order if, in NAKS judgment, the financial condition of buyer does not justify continuation of manufacture or shipment. NAKS may require full or partial payment in advance. Pro-rata payments are due as shipments are made. Each shipment or delivery shall constitute a separate sale, and the default of any shipment or delivery shall constitute a separate sale, and the default of any shipment or delivery shall not vitiate the contract as to other shipments or deliveries.

5. <u>Return Policy – ALL SALES ARE FINAL.</u> Because we custom manufacture our hoods to each customer's specifications, ALL SALES ARE FINAL. We may accept the return of non-custom goods at our discretion, but a restocking fee of 30% will apply and all shipping costs are the responsibility of the purchaser or end user. No merchandise may be returned without a Return Goods Authorization (RGA). Items returned for warranty replacement or exchange will not be eligible for credit if not received within 14 days of the issuance of a Return Goods Authorization.

6. <u>Delivery</u>. Shipping and delivery dates are estimates only. No delay in delivery will subject NAKS to any costs, damages or fees for late delivery. Delivery of Products is made F.O.B. point of shipment, unless otherwise stated. NAKS shall not be liable for delay due to causes beyond its reasonable control (i.e., force majeure events). In the event of such a delay, the date of delivery shall be extended for a period equal to the time lost by reason of the delay.

7. <u>Changes</u>. NAKS may make changes, including improvements and additions, in the technical requirements, specifications, designs, materials, packaging, and place of delivery, method of transportation, quantities, or delivery schedules of the Products by notifying you.

8. <u>Safety</u>. The Products may be designed to serve multiple applications. NAKS offers a range of safety equipment, including guards and other devices, as may be required to meet customer specifications. Without exception, NAKS recommends that all orders include applicable safety devices. Use of Products ordered without applicable safety devices is your sole responsibility. You warrant that you have determined and acquired any and all safety devices required for the Products. Weather covers and guards for motor and V-belt drives, couplings, shafts and bearings, along with inlet and outlet screens, are optional accessories noted in the price list.

9. <u>Title</u>. Title and right of possession of Products remains with NAKS until all payments (including deferred payments whether evidenced by notes or otherwise) shall have been received to the satisfaction of NAKS and you agree to do all acts necessary to perfect and maintain such title and right in NAKS and not to subject any Products to any liens or encumbrances until such payment is made in full.

10. <u>Governing Law</u>. This Order shall be governed by and construed according to the laws of the State of Ohio (excluding the conflict of law provisions thereof). At NAKS' discretion, any action relating directly or indirectly to the Order shall be brought exclusively in the Common Pleas Court of Cuyahoga County, Ohio or the United States District Court for the Northern District of Ohio, Eastern Division, and you irrevocably waive any objection to the jurisdiction of, or venue in, either of these courts and agree that the acceptance of the Order constitutes doing business in the State of Ohio.

11. <u>Arbitration</u>. At NAKS' discretion, any dispute arising under or in connection with any Order may be submitted to binding arbitration administered by the American Arbitration Association under its Commercial Arbitration Rules, and judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. The dispute shall be resolved by one neutral arbitrator who shall have no affiliation with either you as the buyer or with NAKS and shall be selected by the American Arbitration office, and held in, Cleveland, Ohio.

WARNING. NAKS' Products are designed and manufactured to provide reliable performance but they are not guaranteed to be 100% free of defects. Even reliable products will experience occasional failures and this possibility should be recognized by the buyer and all end users. If Products are used in life support ventilation systems where failure could result in loss or injury, the buyer and all end users should provide adequate back-up ventilation, supplementary natural ventilation or failure alarm system, or acknowledge willingness to accept the risk of such loss or injury. **DO NOT USE IN HAZARDOUS ENVIRONMENTS** where a fan's electrical system could provide ignition to combustible or flammable materials unless unit is specifically built for hazardous environments. Comply with all local and national safety codes including the National Electrical Code (NEC) and National Fire Protection Act (NFPA).

CAUTION. Guards must be installed when fan is within reach of personnel or within eight (8) feet (2.5 m) of working level or when deemed advisable for safety.

DISCLAIMER. NAKS has made a diligent effort to illustrate and describe the Products accurately in all materials; however, such illustrations and descriptions are for the sole purpose of identification and do not express or imply any warranty.

LIFETIME LIMITED WARRANTY

WARRANTY AND DISCLAIMER. This lifetime limited warranty extends to the original purchaser only with proof of purchase. NAKS provides a lifetime limited warranty that the Products shall be free from original defects in workmanship and materials under normal use subject to the exclusions and limitations herein.

For a period of ten (10) years from the date of the original installation and subject to the exclusions and limitations herein, NAKS will replace for the original owner any Product proven to be defective with same or similar Product, free of charge. From the eleventh (11th) through fifteenth (15th) years from the date of original installation, NAKS will provide replacement Product to the original owner at cost of a 75% discount from the Manufacturer's Suggested List Price in effect on the date the claim was received. Beyond fifteen (15) years from the date of installation, NAKS will provide the original owner with replacement Product at a cost of a 50% discount from the Manufacturer's Suggested List Price in effect on the date the claim was received. This warranty provides no reimbursement for labor charges.

This warranty applies provided the Products a) were at all times operated and maintained in full compliance with the operation and maintenance instructions as published at the time of installation or as later provided by NAKS, b) have not been altered or repaired in any way so as, in NAKS' sole judgment, to affect their performance or reliability, and c) have not been improperly installed or subjected to misuse, negligence, accident, or used incorrectly in combination with other substances. This warranty does not apply to (i) damages to: wear parts, e.g. seals; demonstration units; paintwork; moving parts, including but not limited to compensators, flue gas dampers, draught regulators, chimney, doors; flexible piping; insulation; consumables, such as granulates; or (ii) minor Product deviations which do not effect functionality; or (iii) damages caused by: contamination of ambient air or combustion air by chlorinated hydrocarbons or other vapors which may cause excessively severe acid condensate to form within the Products; or (iv) merchandise provided by other manufacturers; or (v) installation, transport or commissioning; or (vi) Purchaser, an installer or other third parties; or (vii) normal wear and tear; or (viii) force majeure, including, but not limited to flood, fire or frost; or (ix) improper commissioning; or (x) use of the Products not in accordance with their intended purpose; or (xi) exposure of Products to any metals of an inferior quality; or (xii) contamination of the Products between unpacking and assembly; or (xiii) burning of wood other than unpainted, natural wood, which has been stored for at least 3 years and which moisture level does not exceed 20% or burning of chipboard or domestic waste.

LIMITATION OF REMEDY AND DAMAGES. All claims under this warranty must be made in writing and delivered by U.S. Mail to:

North American Kitchen Solutions 172 Reaser Court Elyria, OH 44035 Attn: WARRANTY CLAIMS DEPARTMENT

All Product claims must be made within 15 days after discovery of the defect and prior to the expiration of two years from the date of shipment. Claims made beyond that period are barred. Within 30 days after receipt of a timely claim, NAKS shall have the option either to inspect the Product at its location or request its return to NAKS at your expense. NAKS shall replace, or at its option repair, free of charge, any Product it determines to be defective, and it shall ship the repaired or replacement product to you F.O.B. point of shipment; provided, however, if in NAKS' judgment circumstances are such to prohibit repair or replacement to remedy the warranted defects, your sole and exclusive remedy shall be a refund of any part of the invoice price, paid to NAKS, for the defective Product or part.

NAKS is not responsible for the cost of removal of the defective Product or part, damages due to removal, or any expenses incurred in shipping the Product, or the installation of the repaired or replaced Product or part.

The warranties set forth above do not apply to any components, accessories, parts or attachments manufactured by other manufacturers; such being subject to the manufacturer's warranty, if any. To the extent not prohibited by the manufacturer's warranty, NAKS shall pass to you such manufacturer's warranty.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND WAIVED. THIS WARRANTY CONSTITUTES NAKS SOLE AND EXCLUSIVE WARRANTY FOR DEFECTIVE GOODS AND PURCHASER'S SOLE AND EXCLUSIVE REMEDY FOR DEFECTIVE PRODUCTS.

No employee, agent, dealer, or other person is authorized to give any warranties on behalf of NAKS or to assume for it any other liability in connection with any of its products except in writing and signed by an officer of NAKS.

LIMITATION OF LIABILITY. NAKS' cumulative liability to you and any other persons for all claims in any way relating to or arising out of the Products, including, but not limited to, any cause of action sounding in contract, tort, or strict liability, shall not exceed the total amount of the purchase price paid for those Products which are the subject of any such claim. This limitation of liability is intended to apply without regard to whether other provisions of this agreement have been breached or have proven ineffective even if NAKS has been advised of the possibility of such claims or demands. In no event shall NAKS be liable to you or any other person for any loss of profits or any incidental, special, exemplary, or consequential damages for any claims or demands brought by you or such other persons. BECAUSE SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THIS LIMITATION MAY NOT APPLY TO YOU.

NAKS' maximum liability to you and to any end user is as set forth above. NAKS makes no warranty to anyone for any products not manufactured by it and shall have no liability for any use or installation of any products (whether manufactured by NAKS or other manufacturers) not specifically authorized by this sale. You acknowledge various warnings by NAKS regarding the Products and their installation and use. If NAKS incurs any claims, lawsuits, settlements, or expenses (including attorney fees) for any loss, injury, death or property damage including, but not limited to, claims arising out of your or any end user's installation or use of the Products, you agree to indemnify and hold NAKS harmless.

REPLACEMENT PARTS. If replacement parts are ordered, purchaser warrants that the original components in which these replacement parts will be placed are in satisfactory working condition, and when said replacement parts are installed, the resultant installation will operate in a safe manner, at speeds and temperatures for which the original product was purchased.

TECHNICAL ADVICE AND RECOMMENDATIONS, DISCLAIMER. Notwithstanding any past practice or dealings or any custom of the trade, sales shall not include the furnishing of technical advice or assistance or system design. Any such assistance shall be at NAKS' sole option and may be subject to additional charge(s).

NAKS assumes no obligation or liability on account of any recommendations, opinions or advice as to the choice, installation or use of Products. Any such recommendations, opinions or advice are given and shall be accepted at your and the enduser's risk and shall not constitute any warranty or guarantee of such Products or their performance.

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NORTH AMERICAN KITCHEN SOLUTIONS

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