

North American 4419/6419 Low Emissions Multihearth Furnace "MHF" Burner

The 4419/6419 MHF Advantage:

- Minimized plugging problems
- Quick cleanout when needed
- Recessed construction
- Direct spark ignition
- Convertible to dual fuel
- Sturdy industrial construction
- Flexible air and gas piping options



FEATURES

The 4419/6419 MHF burner was designed specifically to meet the requirements of multiple hearth furnaces. The MHF burner enhances the circulation of furnace gases and eliminates or reduces many common problems found in sludge burning incinerators and carbon regeneration furnaces. It is well suited for modernization projects and new multiple hearth furnace installations.

RECESSED CONSTRUCTION

The burner body is recessed into the wall so that the flame initiation is 8" from the inside of the furnace chamber instead of the usual 18-24". As a result, the furnace outer shell and the back of the burner operate at lower temperatures, reducing shell overheating problems and stress on UV detectors, ignition transformers and cables.

Because a mounting flange can be welded anywhere on the extension tube, the burner can be adapted to various wall constructions. The tile itself is formed in the field by the installer with a mandrel and becomes an integral part of the refractory wall. Various mounting flanges are available as options to fit individual applications.

MINIMIZED PLUGGING PROBLEMS

To minimize plugging problems, the burner refractory tile is tapered to a small discharge port which provides a medium velocity flame. There is no shelf or wide opening as with a conventional tile exit. The discharge velocity of the burner, combined with the small opening into the furnace, discourages the build up of material in front of or within the burner tile.

SUPERIOR INCINERATION

The reduced port tile increases the velocity of the products of combustion exiting the tile. This causes a significant increase in turbulence and encourages entrainment of more furnace gases into the flame envelope. The mixing on the hearth increases while tempering the flame, which results in more uniform heat release without hot spots.

QUICK CLEANOUT and INSPECTION

If cleanout of the burner tile is required, the burner body design allows for quick and easy access to the burner internals. Disconnect the ignition cable and UV cell, and loosen the eight hex-head bolts that hold the backplate in place. Rotate the backplate a few degrees with the built-in handles and the burner internals can be pulled out, leaving a clear passage to the burner tunnel for easy maintenance and cleaning.

The main air and gas piping connections do not need to be disconnected to gain access to the burner tunnel. On the dual fuel version of the burner, the small oil and atomizing air lines must also be removed, so quick connect fittings are recommended.

DIRECT SPARK IGNITION

The 4419 has direct spark ignition, eliminating the need for gas pilots, mixers and other premix pilot support parts. Maintenance of the burner is also reduced with fewer components to adjust and maintain. The ground wire and the igniter tips on the 4419/6419 are easily replaced without special tools, and without requiring the purchase of a new igniter plug body.

ORDERING INFORMATION

419 -		Size Code	Air Inlet	Air capacity at 16 osi
Fuel Selection	4 for Gas Only	-6-A	3"	11,000 scfh
	6 for dual Fuel (Gas and #2 Oil)	-6-B	3"	16,000 scfh
Examples:	4419-6-A Gas Only 11,000 cfh Air at 16 osi	-7-A	4"	26,300 scfh
	6419-7-A Dual Fuel 27,500 cfh Air at 16 osi	-7-B	4"	36,000 scfh

LIGHTING ARRANGEMENTS

The burner air should be turned to low fire, and the spark turned on, before opening the burner gas valve. After the burner is lit, the spark must be turned off for proper burner operation. During the ignition period, a continuous 6000 volt (minimum) spark is required. Spark distributor systems cannot be used reliably with 4419 Burners. When burning #2 oil, the burner should be lit with a small amount of gas first, which is turned off after the oil lights.

FLAME SUPERVISION

The North American 4419/6419 has an internally purged flame supervision tube that runs from the backplate to the stabilizer. The sight line of the tube is angled to minimize the sensing of flame outside the tile by the attached U.V. cell. It is recommended that the UV connection be located at the 12 o'clock position for most installations. To optimize the flame signal during low fire oil applications, it may be necessary to have the UV tube sight line point to the "short side" of the angled wall as shown. The connection on the 4419/6419 U.V. tube is a 1/2" male fitting. Refer to Bulletin 8832 for choices of U.V. flame detectors and adapters.

DUAL FUEL OPTION and OPERATION

The North American 6419 is the dual fuel version of the MHF burner for firing #2 fuel oil or gas. The gas only 4419 MHF burner can be easily converted to a 6419 in the field by adding an atomizer. An 1813 Sensitrol™ Oil Valve is optional, but recommended.

When operating with #2 oil, the atomizer should be operated with a constant 20 osi air pressure. During gas operation, use at least 4 osi atomizing air to cool atomizer (full atomizing air may be used); or for extended periods of operation on gas, the atomizer can be partially withdrawn or completely removed and stored: Use a blanking disk and gasket to seal the burner if the atomizer is removed (see Dimensions & Parts List 4419-1). Use the stop collar on the atomizer assembly to return the atomizer to the correct position when reinstalling the atomizer.

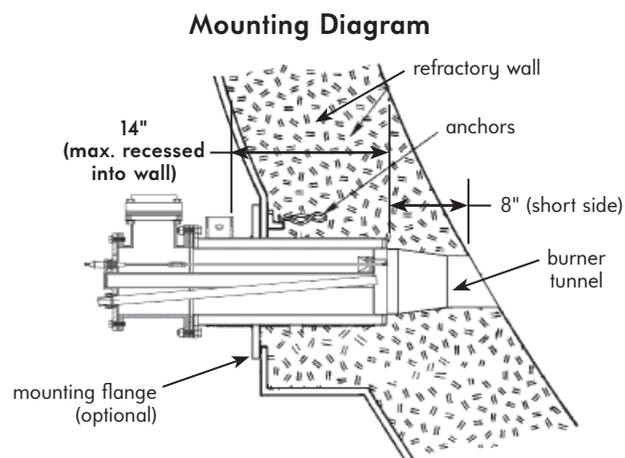
RATIO CONTROL and OPERATION

The 4419/6419 burner fuel/air ratio can be controlled with a simple cross connected ratio regulator such as the Fives North American Combustion, Inc. 7216 for gas or the 7052 Ratiotrol for oil. Accurate fuel / air ratios can be determined by using 8697 Metering Orifices in the fuel gas and air lines.

If furnace temperatures after shutdown rise above 1600 F, pass some air through burner to prevent overheating.

CONSTRUCTION

The burner body, backplate and flanges are fabricated of steel, the extension tubes and flame stabilizer from stainless steel. The gas inlet coupling on the extension tube can be rotated independently of the air connection flange in 45° increments to aid in gas piping.



Engineering Data / Operating Limits

Burner Size	Main Air Capacity (scfh) at various Air Pressures					Natural Gas Pressure at 16 osi, 10% XSA
	.5 osi	1 osi	4 osi	9 osi	16 osi	
4419-6-A	1,400	1,950	5,350	8,300	11,000	3.4 osi
4419-6-B	2,700	3,800	7,600	10,750	16,000	6.0 osi
4419-7-A	3,800	6,700	11,320	16,250	26,300	5.3 osi
4419-7-B	7,200	8,150	15,800	24,500	36,000	7.1 osi

Burner Size	Excess Air Limits for Gas and (#2 Oil)	Excess Fuel Limits, Gas and (Oil) 16 osi	Flame Length Gas and (Oil) Feet 16 osi Air P. 10% XSA
4419-6-B	400 (100)	20 (30)	4 (5)
4419-7-A	600 (100)	20 (30)	5 (6)
4419-7-B	800 (100)	15 (30)	6 (6)

Oil Atomizer Pressure/Flow Data

Oil Flow gal/hr	Oil Press. psi	Atom. Air at 20 osi scfh
28	5.9	255
26	5.4	280
24	4.8	285
22	4.3	320
20	3.9	345
18	3.3	360
16	2.9	370
14	2.4	385
12	2.1	395
10	1.8	410
8	1.5	420
6	1.3	435
5	1.1	435
4	1.0	445
3	0.9	450
2	0.8	460
1	0.65	470

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and Insurance Underwriters' recommendations, and care in operation.



CONTACT US:
Fives North American Combustion, Inc.
 4455 East 71st Street - Cleveland, OH 44105 - USA
 Tel: +1 216 271 6000 - Fax: +1 216 373 4237
 Email: fna.sales@fivesgroup.com

www.fivesgroup.com