

North American Gas Burners for High Temperature Applications

Bulletin 4425
Ref: Bulletin 4422

4425 Burners are designed specifically for higher temperature operations such as forge furnaces, ceramic kilns, metal and glass melters, heat treat furnaces, etc. They are the high temperature version of North American's 4422 Fire•All™ Burner, one of the most widely used industrial burners in the world.

4425's are particularly appropriate for applications that run at both high and low temperatures--an example is a batch type kiln in which early parts of the cycle run below 1200 F and require free oxygen in kiln atmosphere for raw material to process properly; then frequently the product must "soak" at temperatures above 2000 F. 4425 Burners handle this duty with ease due to their excess air flexibility and their construction that withstands radiant heat.

CONSTRUCTION

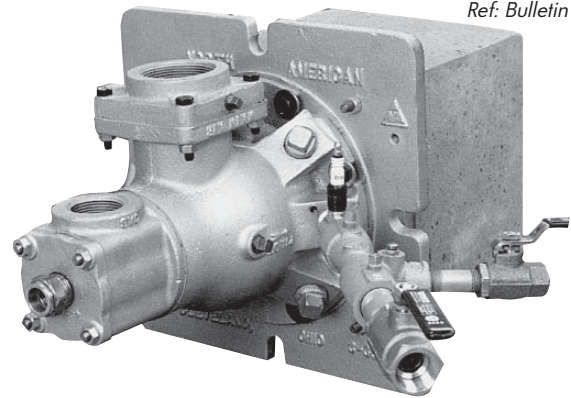
Metal parts are shielded by refractory: the tile and an insulating refractory "biscuit" covering face of burner. Mounting plate and burner body are made of heat resistant cast iron. Air tubes are high grade alloy.

In furnace chambers above 2000 F, combustion air should not be turned down below 2 osi (with or without gas on).

LIGHTING AND FLAME SUPERVISION

A 4011 Pilot Set is normally used to light 4425 Burners. A manual torch can be used in some applications. The burner can be direct spark ignited with either the 4055 Direct Spark Igniter (4055-D for 4425-2 through -6 and 4055-B for 4425-7 and -8 sizes) or the 4051-D Air Assisted Igniter. The 4051 Air Assisted Igniter is recommended because it ignites the burners over a wider operating range. If using direct spark ignition of main flame, use standard 6000 volt transformer. Half-wave ignition transformers can be used only with the 4055.

A flame rod or ultraviolet (UV) detector can be installed in one of three holes in the body, using an adapter listed in Bulletin 8832. UV scanners allow ignition with up to 14 osi main air. If flame rods are used, 4425-2 through -6 Burners must be ignited at 1 osi or more main air. Do not apply flame rods to -7 and -8 size burners. When using flame supervision, an interrupted pilot is required--do not use constant or intermittent pilots.



4425 Burner with pilot set (ordered separately).

Startup and Adjustment: Refer to Bulletin GB-M1 for startup and adjustment of a nozzle-mix burner with ratio regulator air/fuel ratio control.

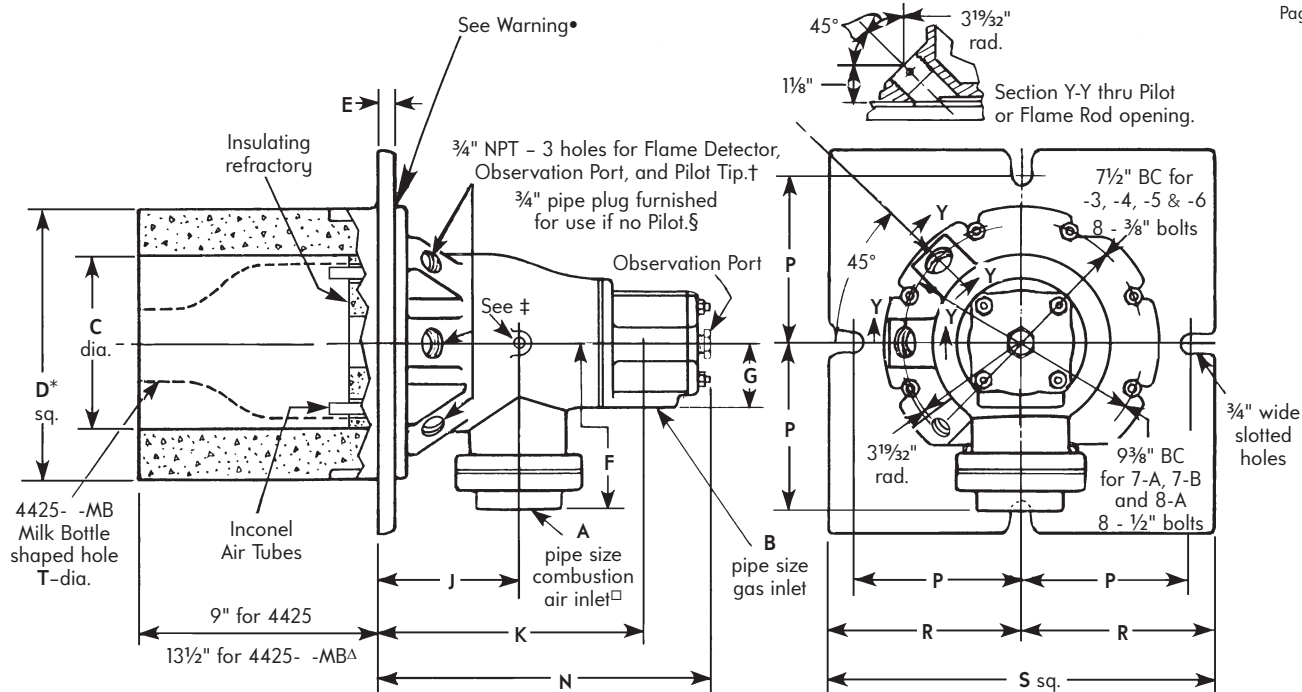
HIGH VELOCITY TILES

4425- -MB Burners have a 13½" "Milk Bottle" tile with reduced outlet; they produce higher velocity flames than the standard burner, also offer somewhat better protection for burner internals from furnace radiation. Good tile installation practice is important with any burner (see Supplements DF-M1 and -M2). It is critical with Milk Bottle tiles because of higher pressures developed in the tile, which can cause burner and furnace wall damage if not properly sealed into the wall.

Burner designation	Maximum % excess air			
	Air pressure across burner in osi			
	1	4	8	16
4425-2	850	1750	860	1250
4425-3	1500	2000	1780	1675
4425-4	1400	1500	1100	1500
4425-5	620	570	490	460
4425-6	730	1080	730	410
4425-7-A	2000	4000	1000	450
4425-7-B	2700	1200	875	500
4425-8-A	2000	2460	2210	1350

Burner designation	Combustion air capacities in scfh (for Btu/hr, multiply by 100)							Approx. flame lengths with 16 osi main air (in open furnace)
	Air pressure across the burner in osi							
	0.1	1	5	6	8	12	16	
4425-2	160	520	1160	1270	1470	1800	2100	1'
4425-3	280	890	1980	2160	2500	3050	3550	1½'
4425-4	460	1450	3240	3540	4100	5000	5800	2'
4425-5	750	2370	5300	5800	6700	8150	9450	3'
4425-6	1180	3700	8300	9100	10500	12900	14800	3'
4425-7-A	2070	6550	14600	16000	18500	22700	26200	6'
4425-7-B	2550	8150	18200	19900	23000	28200	32600	6'
4425-8-A	3350	10600	23700	26000	30000	36700	42400	7'

All ratings are based on operation without pilot in a cold open furnace. Burners can be lighted at any of the ratings listed. If a thicker refractory "biscuit" is used for higher temperature service, excess air limits are lower.



NOTE: For 4425-8-A, the air and gas connections cannot be piped in the same plane, as shown on other side, because the "flower pot" type air connection flange would interfere with the 2 1/2" gas line.

DIMENSIONS SHOWN ARE SUBJECT TO CHANGE. PLEASE OBTAIN CERTIFIED PRINTS FROM FIVES NORTH AMERICAN COMBUSTION, INC. IF SPACE LIMITATIONS OR OTHER CONSIDERATIONS MAKE EXACT DIMENSION(S) CRITICAL.

Burner designation	dimensions in inches														Wt, lb	Recommended Pilot Set
	A	B	C	D	E	F	G	J	K	N	P	R	S	T		
4425-2	1 1/4	1	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	4011-11 or 4011-12
4425-3	1 1/2	1	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-4	2	1 1/4	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-5	2 1/2	1 1/2	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-6	3	1 1/2	5	8 1/2	1/2	5 9/16	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-7-A	4	2 1/2	7	10	5/16	6 15/16	2 5/8	5 7/8	11	14 1/16	6 1/8	6 3/4	13 1/2	4 1/2	130	
4425-7-B	4	2 1/2	7	10	5/16	6 15/16	2 5/8	5 7/8	11	14 1/16	6 1/8	6 3/4	13 1/2	4 1/2	130	
4425-8-A	6 □	2 1/2	7	10	5/16	10 11/16 □	2 5/8	5 7/8	11	14 1/16	6 1/8	6 3/4	13 1/2	—	139	

* Opening in furnace shell or outer wall must be 1/2" larger than dimension "D" to allow for mounting plate fillet and draft.

• **Warning:** Mounting plate and tile can be separated from burner body for convenience during furnace construction; but for -2 through -6 sizes, tile must be set in wall with notches for pilot and flame rod in proper position relative to desired air pipe direction.

† Pilot, Flame Detector, and Observation Port positions are interchangeable as long as Pilot and Flame Detector are in adjacent holes.

‡ 1/4" air pressure tap on -2, -3, -4, -5 and -6. 1/8" air pressure tap on -7-A, -7-B and -8-A.

□ "Flower pot" type flange for -8-A. Note larger F dimension.

§ For 4425- -MB Burners, a second observation port is substituted for the Pipe Plug.

△ The milk bottle tile is not offered with the 4425-8-A Burner.

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.

Tiles for 4425 Burners

Burner designation	Standard		Milk Bottle*	
	Standard	PN	Milk Bottle*	PN
4425-2 thru -6	70% Alumina	4-2121-2	80% Alumina	OC4-2332-1
4425-7-A, -7-B, -8-A	70% Alumina	4-2142-2	80% Alumina	OC4-2547-2

* All tiles are pre-fired.

Maximum recommended use limit temperature is 3200 F for all tiles.



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