

6514 FIRE•ALL Dual-Fuel Burners are nozzle mix, sealed-in burners for gas, light oil, or heavy oil. Capable of efficient operation throughout a wide temperature range, these burners are equally at home on low temperature ovens and high temperature forge and melting furnaces.

Ruggedly built for sustained, maintenance-free operation, 6514 Burners also provide for quick change of fuels without disturbing process operations.

Sealed mountings help maintain furnace pressure, controlled atmosphere, and closer air/fuel ratio control—all contributing to better product quality.

Fire•All Burners have been used for years on all types of furnaces with great success.

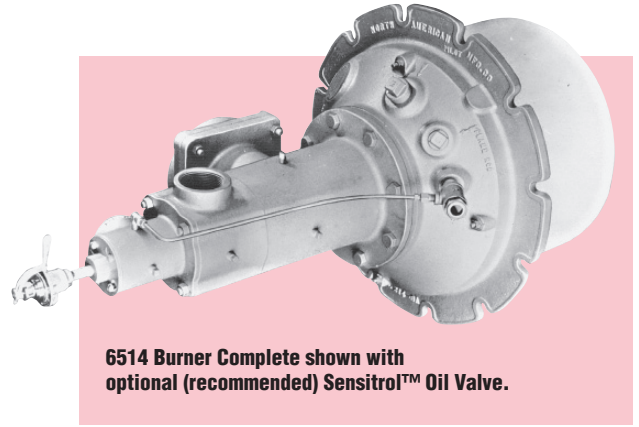
COMBUSTION CHARACTERISTICS

Oil. Oil viscosity at the burners must not exceed 100 SSU. Minimum atomizing air pressure at the burners is 14 osi for light oil, 22 osi for heavy oil.

Gas. Atomizing air (4 osi minimum) should be left on to protect the atomizer. Maximum required natural gas pressure at the burner for stoichiometric ratio is about 1/4 of the combustion air pressure.

Air/Fuel Ratio. 6514 Dual-Fuel Burners are stable throughout a wide range from excess fuel to excess air. They can operate with excess fuel without forming carbon, but additional air for complete combustion must be available in the furnace near the burner.

For limits in a specific case, either rich or lean, consult Fives North American.



6514 Burner Complete shown with optional (recommended) Sensitrol™ Oil Valve.

Turndown. Fire•All Burners can be turned down to atomizing air only (with fuel to match) except when burning residual oils in a cold, tight furnace. For prolonged operation on atomizing air only, specify an alloy burner nose if furnace temperature is above 1600 F.

Preheated Air. 6514 Burners are designed for use with ambient air. They are suitable for some preheated air applications (up to 700 F preheat). Consult Fives North American.

**Total air capacities
(including main and atomizing air)**

Burner designation	16 osi air pressure drop across the burner				24 osi air pressure drop across the burner				Approx. flame lengths with 16 osi main air (in open furnace)
	Air ^① scfh	Light oil ^② gph	Heavy oil ^③ gph	Gas ^④ scfh	Air scfh	Light oil gph	Heavy oil gph	Gas scfh	
6514-6	17 900	13	12	1 790	21 900	16	15	2 190	4' - 5'
6514-7	28 400	21	19	2 840	34 800	26	23	3 480	5' - 6'
6514-8-A	48 900	36	33	4 890	60 000	44	40	6 000	8' - 9'
6514-8-B	81 500	60	54	8 150	100 000	74	67	10 000	9' - 12'
6514-9	165 000	122	110	16 500	202 000	150	135	20 200	15' - 18'
6514-10	247 000	183	165	24 700	303 000	224	202	30 300	20'

① For Btu/hr, multiply by 100

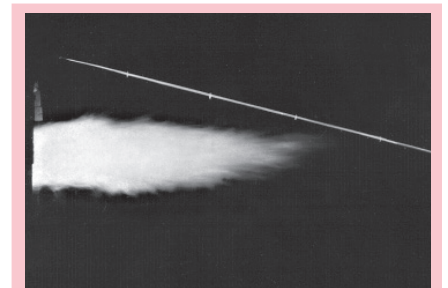
② Light oil at 135 000 Btu/gal.

③ Heavy oil at 150 000 Btu/gal.

④ Natural gas at 1000 Btu/cf.



Gas (left) and light oil flames for 6514-6 Dual-Fuel Burner with 16 osi main and atomizing air pressure drop across burner. White lines on pipe above flame indicate 1' intervals.



SPECIFICATIONS

Flame Supervision. An ultraviolet cell† will monitor pilot or main flame on gas or oil. For maximum safety, North American urges **interrupted** pilots when flame safeguards are used—pilots should be on only for a preset ignition period (usually 15 seconds), after which flame supervision detects main fire only. Adapters for mounting flame detection devices on 6514 Burners are tabulated on Bulletin 8832.

Tile/Installation. Burner tiles are cast refractory rated for 2800F furnace temperature. They should be supported securely in the furnace wall by castable refractory (not insulation) at least 9" thick all around the tile, extending back to the furnace shell and securely anchored to it. (See Supplement DF-M1.)

Tiles are replaceable in the field except for the 6514-10, whose mounting must be returned to the factory for tile replacement (or purchase a spare mounting plate with a tile cast onto it).

For furnace walls thicker than the length of the tile, the tunnel beyond the end of the tile should be flared at a 30° (included) angle, starting at the OD of the tile. If this is not practical, consult North American for specific recommendations.

Complete burners include tile, mounting plate, and an observation port into which a small quantity of atomizing air is introduced to keep the glass clear. Order pilot tips and Sensitrol™ Oil Valve separately.

SPECIAL OPTIONS

The following options are available for the 6514 burner but require consultation with your North American field engineer for application and ordering information.

1. **Increased capacities** - most sizes are available with up to 30% extra capacity.
2. **Hinged bodies** for easy access to internals.
3. **Short flame** versions are available in most sizes.
4. Special **high pressure oil atomizers** are available.

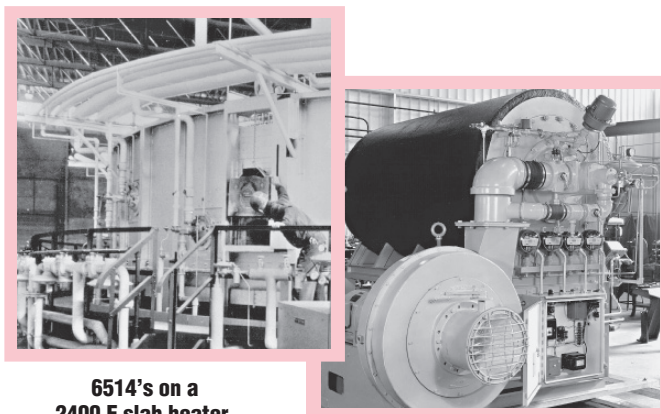
† Cleaning air must be introduced into the port downstream of the sensor to keep oil and poc's off the lens.

Jacketed Tiles. 6514 Burners are available with support jackets around the tile for applications where the tile is not supported by furnace refractory.

Jackets are available in three different metals and have maximum temperature ratings for each. They must be protected with sufficient insulation so as not to exceed rated temperature.

Maximum temperature rating for jacket metals depends upon frequency of heat-up/cool-down cycles. As an example, batch annealing furnaces that are heated and cooled every day should use the "intermittent exposure" ratings. Continuous annealing furnaces that remain at the same temperature for months at a time, can use the higher "continuous" rating.

Designation	Jacket Metal	Continuous max.temp.	Intermittent exposure
6514- -LC	carbon steel	700 F	700 F
6514- -L4	304 stainless	1600 F	1500 F
6514- -L9	309 stainless	1900 F	1800 F



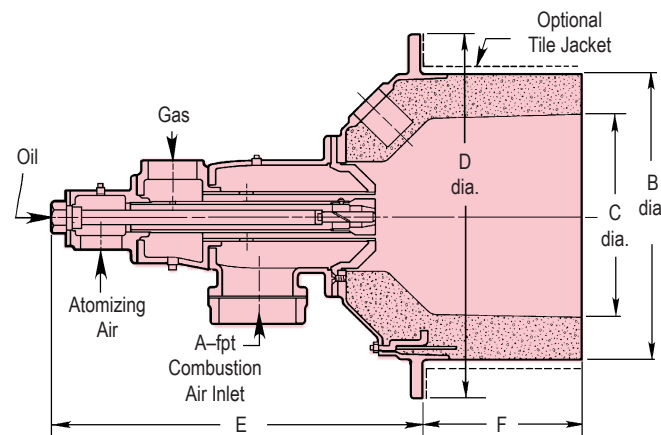
6514's on a 2400 F slab heater.

6514 on a 600 F air heater.

Burner designation	Main air capacities in scfh						Atomizing air capacities in scfh					
	Air pressure drop across the burner in psi						Air pressure drop across the burner in psi					
	1	5	6	8	12	16	14	16	18	20	22	24
6514-6	3 710	8 300	9 100	10 500	12 900	14 900	2 800	3 000	3 180	3 360	3 510	3 660
6514-7	6 100	13 600	15 000	17 200	21 000	24 400	3 770	4 030	4 270	4 500	4 720	4 900
6514-8-A	10 600	23 700	26 000	30 000	36 700	42 400	6 050	6 500	7 000	7 300	7 600	7 850
6514-8-B	17 600	39 200	43 000	49 600	60 500	70 000	10 600	11 300	12 000	12 700	13 200	13 800
6514-9	36 600	82 000	89 500	104 000	127 000	146 000	17 200	18 400	19 600	20 700	21 600	22 500
6514-10	54 500	122 000	135 000	154 000	189 000	218 000	27 200	29 100	30 900	32 600	34 100	35 500

CLEARANCE DIMENSIONS (for details, see Dimensions 6514)

Burner designation	dimensions in inches					
	A	B	C	D	E	F
6514 & 6514-6-L	3	15	10 ³ / ₈	19 ¹ / ₂	23 ⁵ / ₁₆	9
6514 & 6514-7-L	4	16	11 ³ / ₈	20 ¹ / ₂	25 ¹ / ₂	9
6514 & 6514-8-AL	6	17 ³ / ₄	12 ³ / ₈	22 ³ / ₄	32 ¹ / ₁₆	10
6514 & 6514-8-BL	6	19	13 ¹ / ₂	24	35 ¹⁵ / ₁₆	13
6514 & 6514-9-L	8	23	16	28	44 ³ / ₁₆	13 ¹ / ₂
6514 & 6514-10-L	10	27 ¹ / ₂	20 ¹ / ₂	32 ¹ / ₂	50 ⁹ / ₁₆	13 ¹ / ₁₆



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.

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of a 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 urges compliance with National Safety Standards and insurance Underwriters recommendations, and care in operation.

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