

# FIRE-ALL DUAL-FUEL BURNER



# WESMAN COMBUSTION EQUIPMENT

## SERIES 6514

**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 and 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 one-quarter of the combustion air pressure.



**AIR/FUEL RATIO** 6514 Dual-Fuel Burners are stable with at least 100% excess air. They also can operate with excess fuel without forming carbon, but additional air for complete combustion must be available in the furnace near the burner.

**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, an alloy burner nose should be specified if furnace temperature is above 800°C.

**PREHEATED AIR** 6514 Burners are designed for use with ambient air. They are suitable for some preheated air applications (up to 375°C preheat).

### TOTAL AIR CAPACITIES (INCLUDING MAIN AND ATOMIZING AIR)

BURNER DESIGNATION	16 osi pressure drop across the burner				24 osi pressure drop across the burner				Approximate flame lengths with 16 osi main air (in open furnace)	Sensitrol oil valve
	Air <sup>Ⓢ</sup> scfh	Light <sup>Ⓢ</sup> oil lph	Heavy <sup>Ⓢ</sup> oil lph	Gas <sup>Ⓢ</sup> cfh	Air scfh	Light oil lph	Heavy oil lph	Gas cfh		
6514-6	17,900	49	45	1,790	21,900	60	56	2,190	4' to 5'	1813-02C
6514-7	28,400	79	72	2,840	34,800	98	87	3,480	5' to 6'	1813-02D
6514-8A	48,900	136	125	4,890	60,000	166	151	6,000	8' to 9'	1813-02D
6514-8B	81,500	227	204	8,150	100,000	280	253	10,000	9' to 12'	1813-02D
6514-9	165,000	461	416	16,500	202,000	567	510	20,200	15' to 18'	1813-01
6514-10	247,000	692	624	24,700	303,000	847	764	30,300	20'	1813-01

Ⓢ For Btu/hr, multiply by 100

Ⓢ Light oil 35,670 Btu/gal

Ⓢ Heavy oil at 39,630 Btu/gal

Ⓢ Natural gas at 1000 Btu/cf

**FLAME SUPERVISION** An ultraviolet cell will monitor pilot or main flame on gas or oil. For safety, Wesman recommends uninterrupted pilots when flame safeguards are used — pilots should be on only for preset ignition period (usually 15 seconds), after which flame supervision detects main fire only.

**TILE/INSTALLATION** Burner tiles are cast refractory rated for 1500°C 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.

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.

**COMPLETE BURNERS** include tile, mounting plate, Sensitrol™ Oil Valve, and an observation port into which a small quantity of atomizing air is introduced to keep the glass clear. Pilot tips can be ordered separately.

**JACKETED TILES** 6514 Burners are available with support jackets around the tile for applications where 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 everyday 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	350°C	350°C
6514- -L4	304 stainless	800°C	750°C
6514- -L9	309 stainless	950°C	900°C

BURNER DESIGNATION	MAIN AIR CAPACITIES IN SCFH						ATOMIZING AIR CAPACITIES IN SCFH					
	AIR PRESSURE DROP ACROSS BURNER IN OSI						AIR PRESSURE DROP ACROSS BURNER IN OSI					
	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
6514-8A	10,600	23,700	26,000	30,000	36,700	42,400	6,050	6,500	7,000	7,300	7,600	7,850
6514-8B	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

BURNER DESIGNATION	CLEARANCE DIMENSIONS (Dimensions in inches)					
	A	B	C	D	E	F
6514-6	3	15	10 <sup>3</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>2</sub>	23 <sup>5</sup> / <sub>16</sub>	9
6514-7	4	16	11 <sup>3</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	9
6514-8A	6	17 <sup>3</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>8</sub>	22 <sup>3</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>16</sub>	10
6514-8B	6	19	13 <sup>1</sup> / <sub>2</sub>	24	35 <sup>1</sup> / <sub>16</sub>	13
6514-9	8	23	16	28	44 <sup>3</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>2</sub>
6514-10	10	27 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	50 <sup>3</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>

