CleaverBrooks®

PROFIRE®
D SERIES BURNERS

4.2 TO 42.0 MMBTU/HR

High-efficiency burner technology for the most stringent emissions requirements.

Integration starts with the burner.

Only Cleaver-Brooks offers complete boiler systems, from fuel inlet to stack outlet, that are completely designed, engineered, manufactured, integrated, and serviced by one company. And our experience extends to integrating our burners with virtually any boiler, regardless of manufacturer, maintaining peak efficiency and low emissions.

Quality, heavy construction packed with innovation and flexibility.

ProFire is the global leader in commercial burners, with a full line of high quality, low- and ultra-low-emissions burners specifically engineered to increase your boiler's efficiency and decrease fuel costs and emissions. With innovative features like swing-away housings for easy access and proprietary oil nozzles, compressors, and metering pumps, the ProFire line can improve the performance of any boiler, even if it's not a Cleaver-Brooks boiler.

Suitable Boiler Applications

	Cast Iron	Hot Air Furnace	Commercial Watertube	Firebox	Thermal Fluid Heater	Firetube	Industrial Watertube
D Series				■		■	
LND Series				■		■	
NTD Series				■	■	■	■

Note: All applications based on "Best Selection." Other applications may be considered, based on specific details.

Suitable Industry Segments

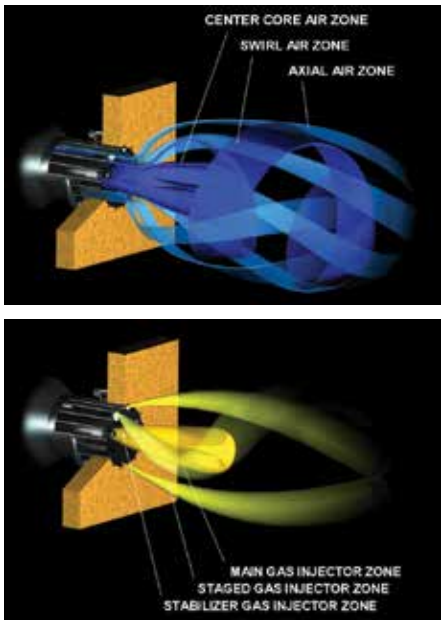
	Light Commercial	Commercial	Light Industrial		Industrial		Heavy Industrial	
MMBTU (Input)	1.3	8.4	16.8	25.2	33.6	42	63	92.4
BHP (BHP = 33,475 BTU/hr)	30	200	400	600	800	1,000	1,500	2,200

D Series		■	■	■	■	■		
LND Series		■	■	■	■			
NTD Series			■	■	■			

Proper burner design minimizes emissions and maximizes efficiency.

Computational Fluid Dynamics (CFD) modeling helps design the heat delivery and transfer components into a seamlessly matched package for optimum heat transfer, highest efficiency, and burner longevity. Absolute compatibility of the burner and furnace is critical to achieving our super-high standard of efficiency.

Featuring ultra-low-NOx emissions, from less than 15 ppm and less than 9 ppm NOx on natural gas at 3% O_2, each ProFire burner has a special intake box, with a rotary air damper and FGR modulating valve, that allows a precise amount of induced FGR and fuel-to-air ratio control throughout the firing range.



Advanced CFD modeling on every burner

A burner this precise deserves a superior control.

ProFire burners are designed to reach their full potential when paired with our Hawk integrated control system. Only through proper control can the burner cycle and fire at peak efficiency. Cleaver-Brooks has turnkey control solutions for every boiler room and application, each designed to help save on fuel costs and maintain emissions levels. It offers full metering and includes options for O_2 trim and variable-speed drive.

High oil prices and stricter emissions requirements make upgrading your existing boiler smart.

With the average lifespan of a boiler being 20 years or more, most boilers will need to upgrade their burners two or three times to maintain optimum efficiency. If your existing burner is more than 10 years old, even if it's a low-NOx burner, recent advancements in technology make your burner a candidate for replacement. Turnkey conversions and retrofits make it easy to bring virtually any system back up to its original specs or even better.

Our proprietary Boiler Operation Optimization Savings Test (BOOST^{SM}) program can help by showing you the exact upgrades your system needs to help lower fuel costs, and provide the numbers to back it up. By installing the right burners, controls, and heat recovery equipment, you can realize substantial savings immediately – savings that can make the upgrades pay for themselves.

Uncontrolled Emissions Configuration

The Cleaver-Brooks ProFire D series burner forced draft design allows for trouble-free operation and superior efficiency on boiler, heater, furnace, kiln, and dryer applications. The uncontrolled configuration offers multi-fuel versatility. The ProFire D is an excellent choice when firing alternative fuels such as digester, waste oil, and biodiesel.

ProFire D

Low-pressure air atomizing system on oil with rotary vane compressor purges air through the large nozzle orifice after each burner cycle to prevent after-drip and fouling.

Piston-type positive displacement oil metering system.

Cam Trim 14-point adjustment range on FGR feature adjusts the burner for consistent and precise fuel-to-air ratios throughout the firing range. Excess air is controlled to a minimum through the full adjustment range.

Parallel Positioning available for optimal control throughout the firing range.

Nozzle Line Electric Heater standard on medium- to heavy-oil burners.

Rotary Air Damper provides precise fuel-to-air ratios.

Hinged Air Housing provides easy access to the nozzle, scanner, pilot, and diffuser for inspection or removal. No disconnection of fuel or power lines required.

Gas Manifold on oil burners standard for easy upgrade to combination units.

Backward-Curved Impeller provides adequate combustion air for various furnace pressure and high-altitude applications and avoids the dust collection that is common with forward-curved blowers.

UL & ULc listed.

Frame	Model Range	Boiler HP	Capacities		Mode of Operation	Fuel	Parallel Positioning
			MBH	GPH			
Size 1–8	42–420	100–1,000	4,200–42,000	30–300	Full Modulation	Gas, Oil, Comb.	Optional

Low-NOx Configuration

The Cleaver-Brooks ProFire LND series burner offers natural gas, propane gas, air atomized #2 and #6 oil, and combination gas and oil fuel options from 3.4 to 42.0 MMBTU per hour, with full modulation operation and standard cam trim for greater efficiency and cost savings. The ProFire LND is an low-NOx burner capable of less than 30 ppm NOx emissions.

ProFire LND

In addition to all the features listed under the ProFire D, the ProFire LND has these features:

Available to <30 ppm NOx.

Induced FGR modulating valve and shutoff valve.

Cam Trim 14-point adjustment range on FGR feature adjusts the burner for consistent and precise fuel-to-air ratios throughout the firing range. Excess air is controlled to a minimum through the full adjustment range.

Parallel Positioning available for optimal control throughout the firing range.

#2 Oil capability for backup fuel.

Rotary Air Damper provides precise fuel-to-air ratios.

Hinged Air Housing for easy access to internal components for maintenance and upgrades.

Backward-Curved Impeller provides adequate combustion air for various furnace pressure and high-altitude applications.

UL & ULc listed.

Frame	Model Range	Boiler HP	Capacities		Mode of Operation	Fuel	Parallel Positioning
			MBH	GPH			
Size 1–8	34–420	80–1,000	3,360–42,000	24–300	Full Modulation	Gas/ Comb.	Optional

Ultra-Low-NOx Configuration

The ProFire NTD was designed and developed with a Flue Gas Recirculation system which has been proven to be the benchmark in the industry. Emissions reduction, fuel savings, performance, and reliability make the ProFire NTD an excellent choice. The Cleaver-Brooks ProFire NTD series burner offers natural gas, propane air mix, air atomized #2 oil, and combination gas and oil fuel options from 12.6 to 33.5 MMBTU per hour, with full modulation operation and parallel positioning for greater efficiency and cost savings. The ProFire NTD is an ultra-low-NOx burner capable of less than 9 ppm NOx emissions.

ProFire NTD

In addition to all the features listed under the ProFire D, the ProFire NTD has these features:

Available to <9 ppm NOx.

Induced FGR modulating valve and shutoff valve.

Parallel Positioning available for optimal control throughout the firing range.

#2 Oil capability for backup fuel.

Rotary Air Damper precise fuel-to-air ratios.

Hinged Air Housing for easy access to internal components.

Gas Injectors are a low-NOx, lance-style, hammerhead design, with all gas injectors mounted to an internal gas manifold assembly.

Backward-Curved Impeller provides adequate combustion air for various furnace pressure and high-altitude applications.

Frame	Model Range	Boiler HP	Capacities		Mode of Operation	Fuel	Parallel Positioning
			MBH	GPH			
Size 5–8	126–336	300–800	12,600–33,500	90–239	Full Modulation	Gas, Oil, Comb.	Standard

Capacities and Ratings

Uncontrolled Emissions Configuration (DL, DG, DLG)

Burner Sizes	42	54	63	84	105	145	175	210	252	300	315	336	378	420
Gas Input (MBTU/hr)	4,200	5,400	6,550	8,400	10,500	15,000	17,500	21,000	25,200	30,000	31,500	33,600	37,800	42,000
Oil Input (US gal/hr)	30	39	47	60	75	107	125	150	180	215	225	240	270	300
Boiler HP @ 80% Eff.	100	129	156	200	250	357	417	500	600	714	750	800	900	1,000
Blower Motor HP (S)	3	3	5	5	7 1/2	15	20	20	25	40	-	-	-	-
Blower Motor HP (P)	3	5[1]	5	7 1/2	10	15	20	25	30	40	60	60	75	75
DL, DLG Integral Oil/Air Unit Motor HP	1	1	1	1	2	2	-	-	-	-	-	-	-	-
DL, DLG Compressor Motor HP	-	-	-	-	-	-	5	5	7 1/2	7 1/2	7 1/2	7 1/2	15	15
DL, DLG Oil Metering Unit Motor HP	-	-	-	-	-	-	1/2	3/4	3/4	3/4	3/4	3/4	1	1
DM, DMG Integral Oil/Air Unit Motor HP	1	1	2	2	2	2	-	-	-	-	-	-	-	-
DM, DMG Compressor Motor HP	-	-	-	-	-	-	5	5	7 1/2	7 1/2	7 1/2	7 1/2	15	15
DM, DMG Oil Metering Unit Motor HP	-	-	-	-	-	-	1/2	3/4	3/4	3/4	3/4	3/4	1	1
DE, DEG Compressor Motor HP	3	3	3	3	3	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	15	15
DE, DEG Oil Metering Unit Motor HP	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Shipping Weight	1,000	1,100	1,200	1,300	1,400	1,850	2,250	2,750	3,100	3,500	3,600	3,800	4,000	4,200

Input is based on fuel Btu content and altitude of 2,000 feet or less. If altitude > 2,000 feet and < 8,000 feet, derate capacity 4% per 1,000 feet over 2,000. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 Btu/cu.ft., 0.60 gravity, 0" w.c. furnace pressure and the aforementioned conditions. Oil input based on 140,000 Btu/gal and the aforementioned conditions. Use model "S" for up to 1.5" w.c. furnace pressure and model "P" for up to 4.0" w.c. furnace pressure. Consult factory for 50Hz. applications.

Less than 30 ppm Low-NOx Configuration (LNDG, LNDLG)

Burner Model Number & Frame Size	34-1	42-1	54-1	63-2	74-2	84-2	105-3	125-3	145-4	175-5	210-6	252-6	300-6.5	315-7	336-8	378-8	420-8
Gas Input (MBtu/hr)	3,360	4,200	5,250	6,300	7,350	8,400	10,500	12,600	14,700	16,800	21,000	25,200	30,000	31,500	33,600	37,800	42,000
Oil Input (US gph)	24	30	38	45	53	60	75	90	105	120	150	180	215	225	240	270	300
Boiler HP @ 80% Eff.	80	100	125	150	175	200	250	300	350	400	500	600	714	750	800	900	1,000
Blower Motor HP	3	5	5	5	7 1/2	10	15	15	20	25	30	40	60	60	75	75	75
Integral Oil/Air Unit Motor HP	1	1	1	1	1	1	2	2	-	-	-	-	-	-	-	-	-
Compressor Motor HP	-	-	-	-	-	-	-	-	5	5	5	7 1/2	7 1/2	7 1/2	15	15	15
Oil Metering Unit Motor HP	-	-	-	-	-	-	-	-	1/2	1/2	3/4	3/4	3/4	3/4	1	1	1
Furnace Pressure ("w.c.)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Shipping Weight	1,000	1,275	1,275	1,500	1,500	1,500	1,850	1,850	2,250	2,850	3,500	3,750	3,800	4,000	4,750	5,000	5,550

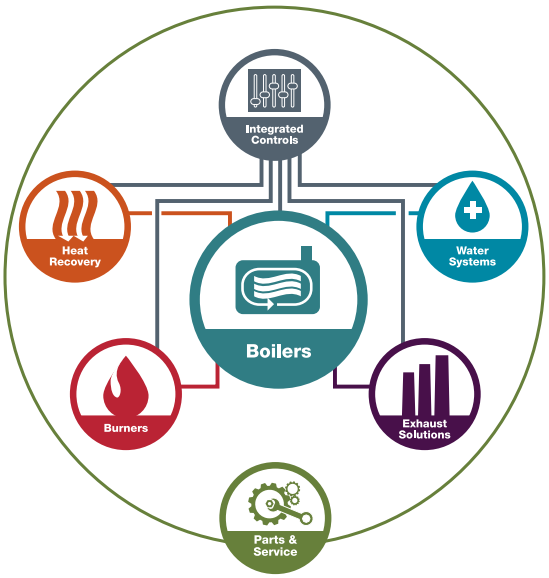
Input is based on fuel Btu content and altitude of 2,000 feet or less. If altitude > 2,000 feet and < 8,000 feet, derate capacity 4% per 1,000 feet over 2,000. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 Btu/cu.ft., 0.60 gravity, 0" w.c. furnace pressure and the aforementioned conditions. Oil input based on 140,000 Btu/gal and the aforementioned conditions.

Capacities and Ratings

Less than 15 ppm and less than 9 ppm Ultra-Low-NOx Configuration (NTDG, NTDLG)

Burner Sizes		126	147	168	210	252	294	315	336
Gas Input (MBTU/hr)		12,600	14,600	16,700	20,900	25,100	29,300	31,400	33,500
Oil Input (US gal/hr)		90	105	120	149	179	209	224	239
Boiler HP @ 80% Eff.		300	350	400	500	600	700	750	800
Remote Oil Pump Motor HP		1/2	1/2	3/4	3/4	3/4	3/4	3/4	3/4
Compressor Motor HP: C-B Showerhead Oil Nozzle		5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2
Compressor Motor HP: NATCOM Oil Nozzle		15	15	20	20	20	25	25	30
Min. Gas Pressure Req. (PSI)		6	6	6	6	8	8	8	8
<15 ppm	Frame Size	5	5	6	6	7	7	8	8
	Blower Motor HP	20	25	25	40	50	60	75	75
	FGR Line Piping (in.)	6	8	8	8	8	10	10	10
	Furnace Pressure (“w.c.)	3.3	4.6	5.2	3.0	4.6	6.2	7.1	8.0
<9 ppm	Frame Size	5	6	6	6	8	8	-	-
	Blower Motor HP	25	40	50	50	75	75	-	-
	FGR Line Piping (in.)	8	10	10	10	12	12	-	-
	Furnace Pressure (“w.c.)	4.1	5.7	6.4	3.7	5.7	7.7	-	-

Input is based on fuel BTU content and altitude of 2,000 feet or less. If altitude >2,000 feet and <8,000 feet, derate capacity 4% per 1,000 feet over 2,000. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 BTU/cu.ft., 0.60 gravity, 0 “w.c. furnace pressure and the aforementioned conditions. Oil input based on 140,000 BTU/gal and the aforementioned conditions. Consult factory for 50 Hz applications.



Total integration doesn’t stop with the burner.

Only Cleaver-Brooks offers complete boiler systems, from fuel inlet to stack outlet, that are completely designed, engineered, manufactured, integrated, and serviced by one company. That integration starts with the burner, and Cleaver-Brooks has been perfecting this integral element of the boiler system through innovation and expert engineering for more than 80 years.

CleaverBrooks®

Packaged Burner Systems
351 21st Street, Monroe, WI 53566 USA
608.325.3141 • info@cleaverbrooks.com
cleaverbrooks.com