2016 | **OXY-THERM FHR BURNER OVERVIEW**

Honeywell

ECLIPSE · krom schröder · MAXON

Honeywell Industrial & Commercial Thermal Overview

The Industrial & Commercial Thermal (ICT) Family of Products Include:

Honeywell

Honeywell ECLIPSE

Honeywell krom schroder

Honeywell MAXON

Honeywell brand commercial combustion products provide solutions for HVAC and burner and boiler control systems to help streamline integration, installation, and end-user interaction while improving efficiency and performance. Our key products include programmers and primaries, valves and actuators, limits and pressure controls, communications and software. Applications include burners, boilers, furnaces, packaged rooftop units, kilns, water heaters and more.

Honeywell Eclipse offers a comprehensive range of gas, oxygen, and oil burners, recuperators, heat exchangers,   and fully engineered combustion systems. Eclipse products deliver safe, reliable, efficient, and clean heat for high and low temperature applications in all types of industrial heating processes. Eclipse application engineers can design custom solutions that are configured to meet specific customer requirements. Our team of factory authorized technicians provides an extensive range of customer support services.

Honeywell Kromschröder manufactures gas combustion and controls serving both Heating and Process applications. Kromschröder's wide product portfolio encompasses the entire combustion safety and control system. From filters and regulators, to safety shut-off and control valves, to the burner management system; Kromschroder offers controls and solutions to provide safe and reliable combustion with progressive and energy efficient technology.

Honeywell Maxon provides integrated burner solutions and engineered combustion systems for industrial process heating applications. Maxon's complete line of combustion solutions equipment includes gas and oil burners, gas and oil valves, hazardous area shut off valves, low NOx and Ultra low NOx burners, and flow control technologies. Maxon products are utilized by almost every manufacturing industry including oil and gas, pulp and paper, automotive, textile, building materials, metals, glass and ceramics, foods and agriculture.

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OXY-THERM® FHR Overview

- Dual-Fuel Oxygen Burner
- Next generation in oxy-fuel technology
- Improves radiant heat transfer in high temperature applications
- Significantly reduced NOx emissions
- Flat Flame Shape with high aspect ratio
    - Greater furnace coverage
    - Radiant flame pattern, optimized for effective heat transfer
- Fuel Savings compared to air-fuel burners
- Increase production throughput by as much as 20%
- Cut flue gas volume by as much as 75%
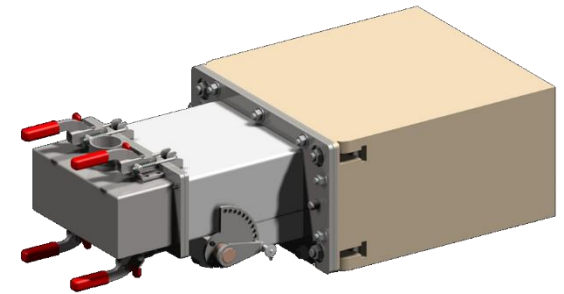
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OXY-THERM® FHR Applications

- Glass Furnaces
- Re-heat Furnaces
- Metals Processing
- Linear and Rotary Hearth Furnaces

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OXY-THERM® FHR Specifications (Gas)

Typical burner data Fuel: natural gas at 60°F with 1000 Btu/ft^3 (st) HHV - sg = 0.6 [1] propane at 60°F with 2500 Btu/ft^3 HHV - sg 1.57 [1] Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality.					
OXY-THERM® FHR gas burners		OXY-THERM® FHR gas burner size			
		Small (S)	Medium (M)	Large (L)	Extra Large (XL)
Maximum capacity range	MBtu/h	1.0 - 3.2	2.9 - 6.3	6.0 - 13.1	10.0 - 24.0
Turndown		3 to 1			
Pressures required to burner inlet for maximum capacities	Oxygen (@ 50% staged)	< 1.0 psig	< 1.0 psig	< 1.0 psig	< 1.4 psig
	Natural gas psig	1.2			
	Propane psig	2.5			
Typical oxygen to fuel volumetric ratios	To natural gas	2.05 to 1			
	To propane	5.1 to 1			
Approximate flame size	Length	See graphs on page 3-18.4-9			

OXY-THERM® FHR Design (Gas)
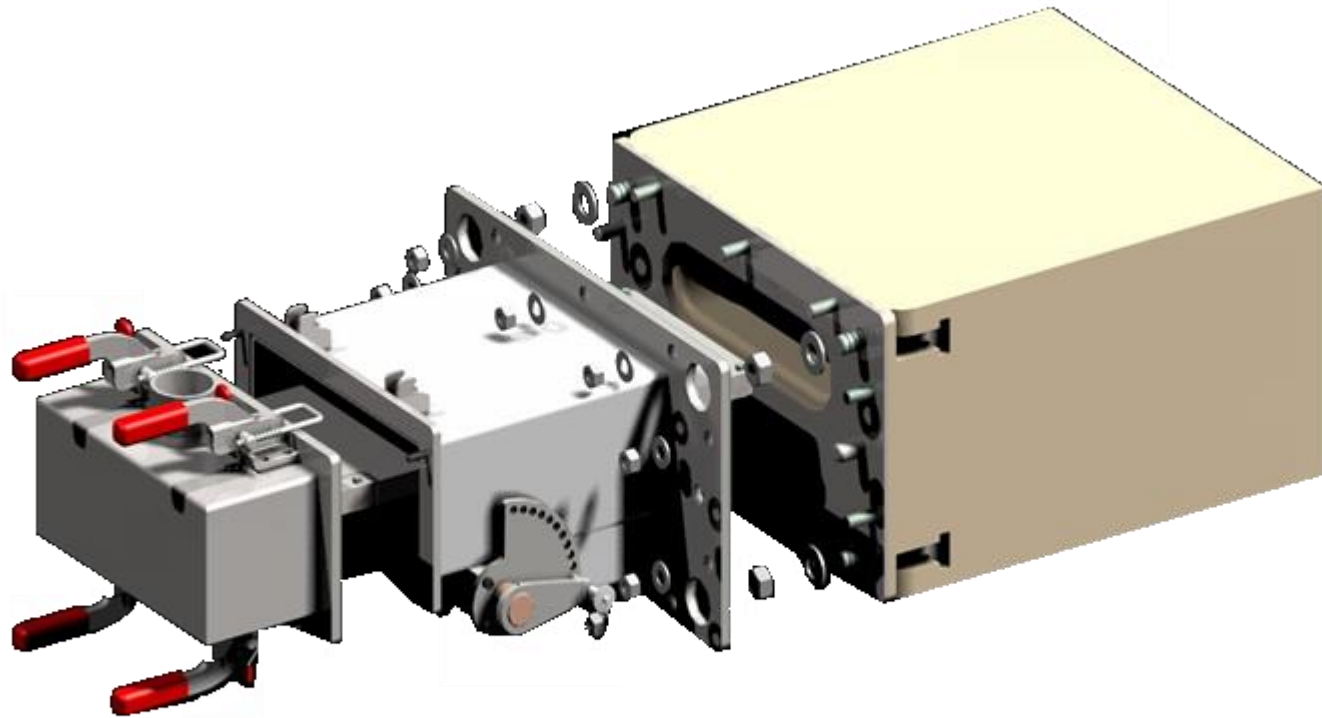
OXY-THERM® FHR Design (Gas)
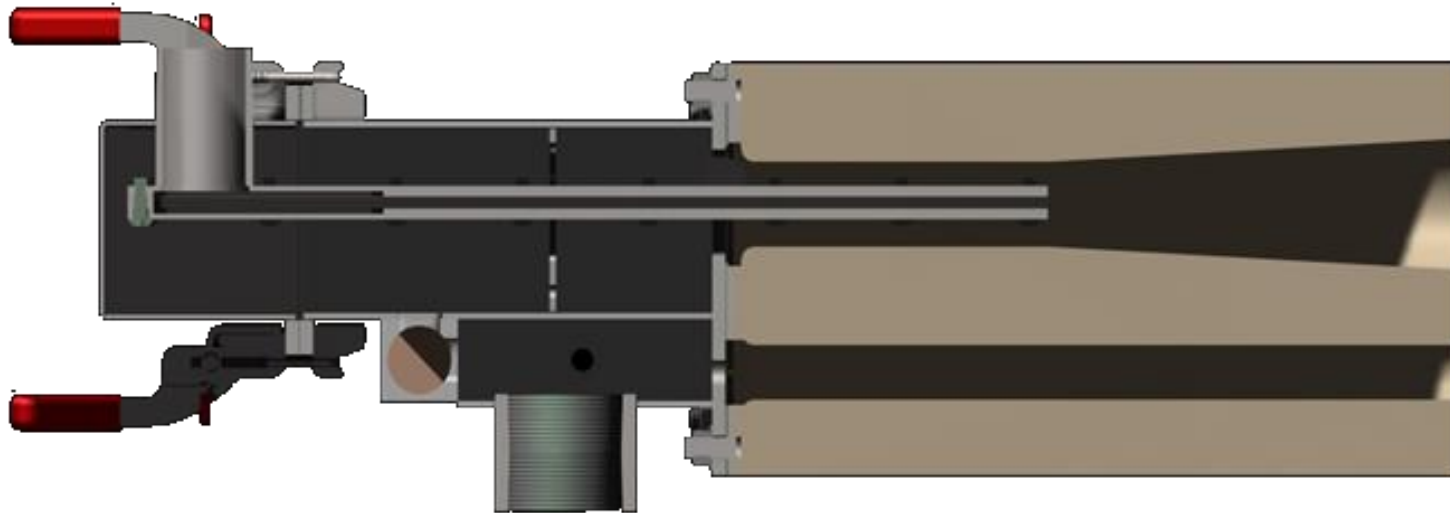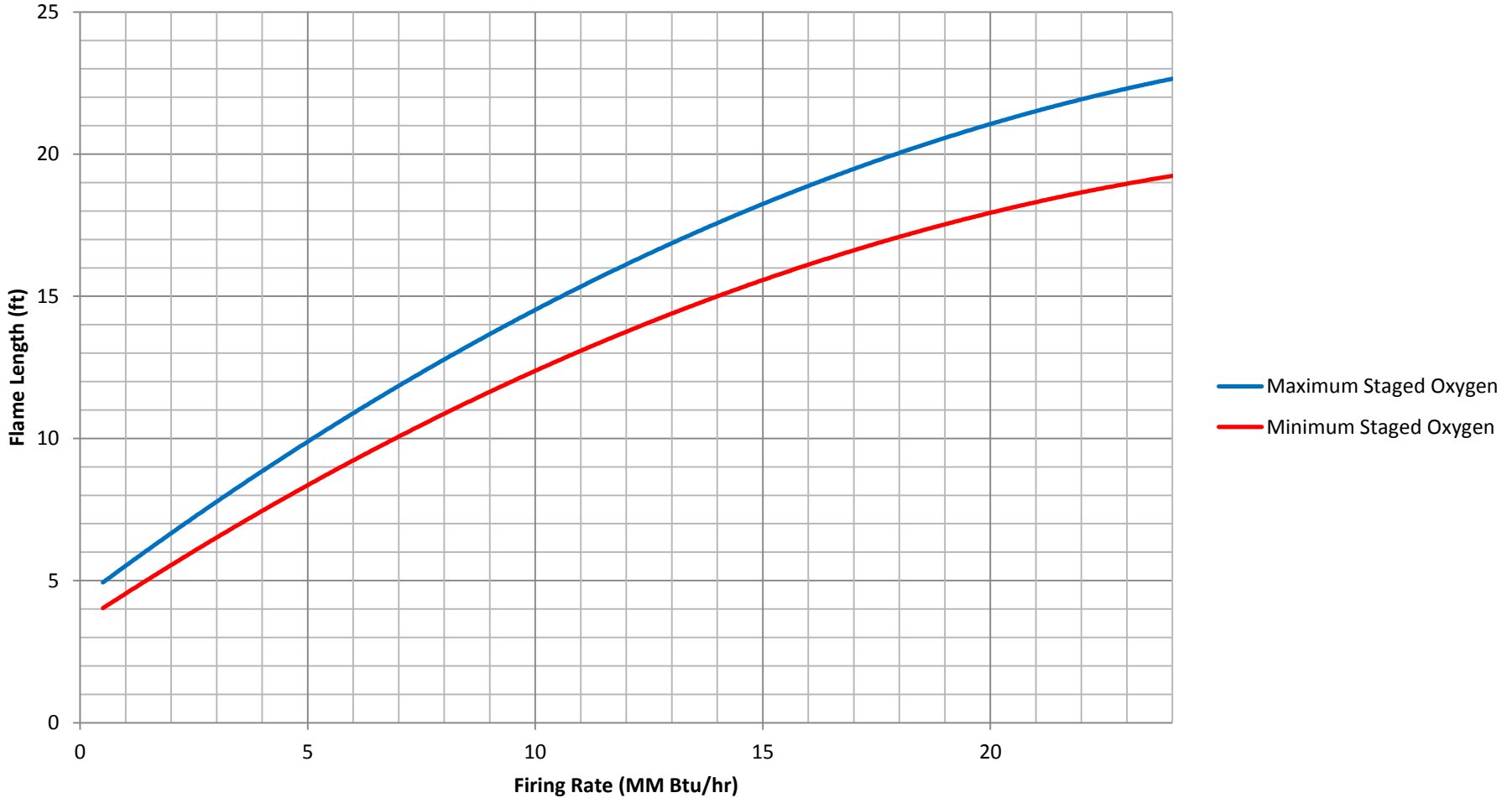
OXY-THERM® FHR Flame Length

OXYTHERM FHR Flame Length - Gas

OXY-THERM® FHR Specifications (Oil)

OXY-THERM® FHR oil burners		(LFO) = Light Fuel Oil; (HFO) = Heavy Fuel Oil [1]												
Housing size		Small (S)			Medium (M)			Large (L)				Extra Large (XL)		
Oil nozzle		115	125	156	188	218	250	281	312	328	344	391	422	438
Maximum flow	liters/h	41	58	68	99	134	193	217	251	313	358	462	500	568
Fuel oil pressure @ maximum (LFO)	mbar	5171												
Fuel oil pressure @ maximum (HFO)	mbar	6550												
Turndown		3 to 1												
Atomizing pressure (LFO)	mbar	4137												
Atomizing pressure (HFO)	mbar	5515												
Flame length range @ maximum	meters	1.2-1.7	1.2-1.7	1.4-1.8	1.5-2	1.5-2	2.4-3.0	3.0-3.7	3.0-3.7	3.3-4	3.7-4.3	4-4.6	4.3-4.9	4.6-5.2

[1] Heavy fuel oils require heating to obtain proper viscosity (less than 100 SSU or 21 cs) for optimal atomization. Temperature of HFO should be measured at burner inlet, not HFO storage tank or oil heater outlet.
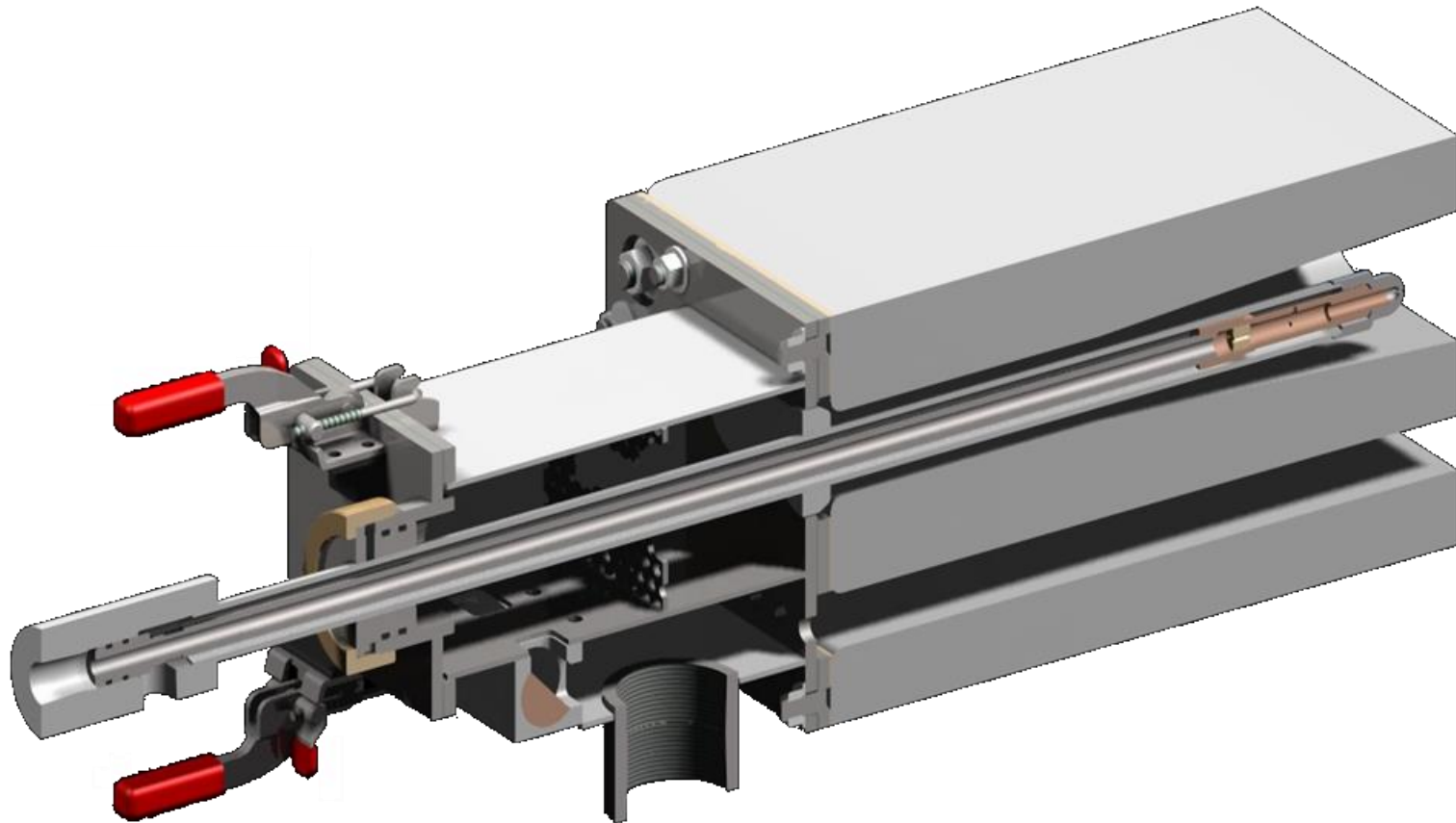
OXY-THERM® FHR Design (Oil)
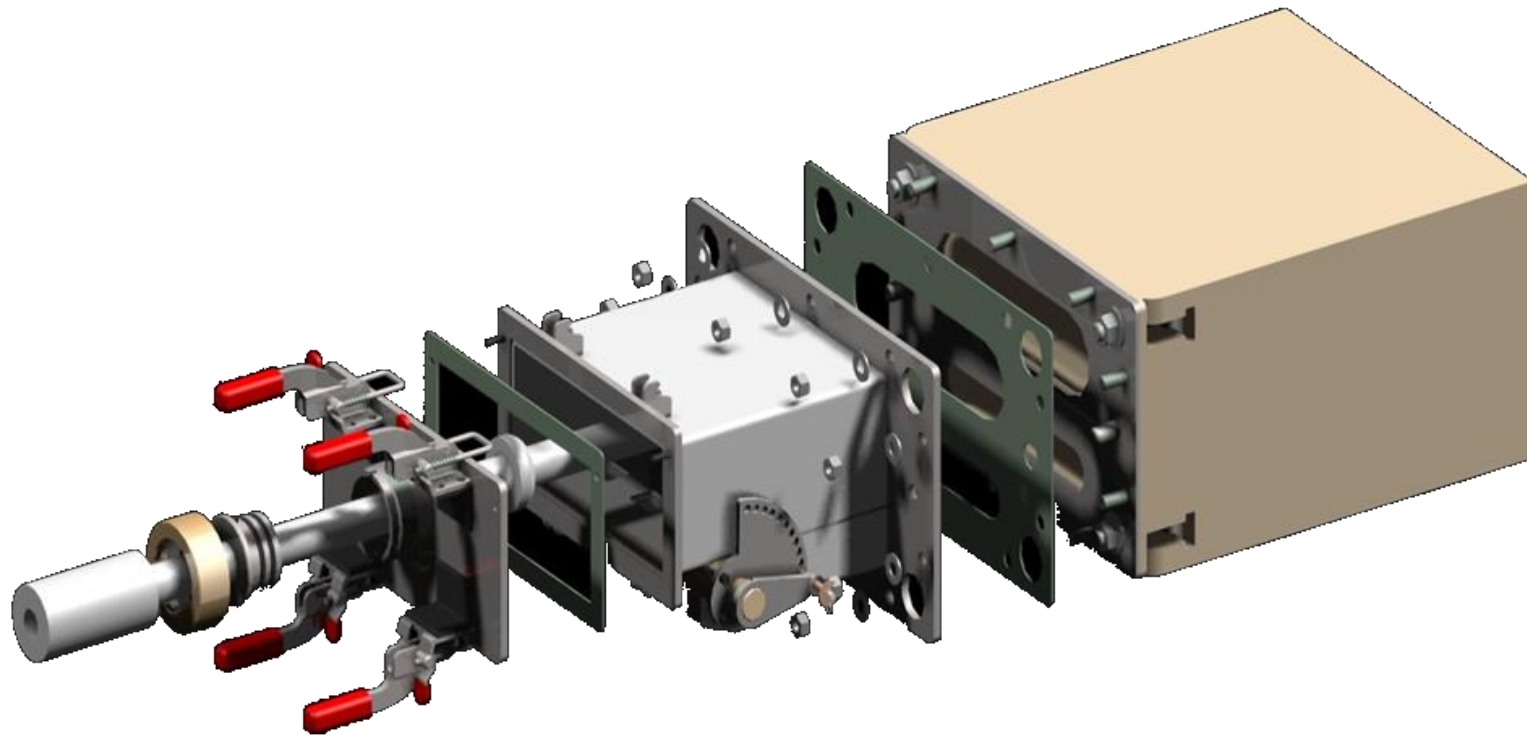
# OXY-THERM® FHR Design (Oil)

OXY-THERM® FHR Adjustable Design

- Dual Fuel Capable: Simply change the nozzle to change the fuel
- Change fuel type without replacing housing assembly
- Adjust oxygen staging to vary flame length and radiant heat transfer
    - Locking pin and dial for easy adjustment
    - Staged oxygen adjustable from 30 to 70%
    - Increasing staged oxygen = higher radiative heat flux (1)
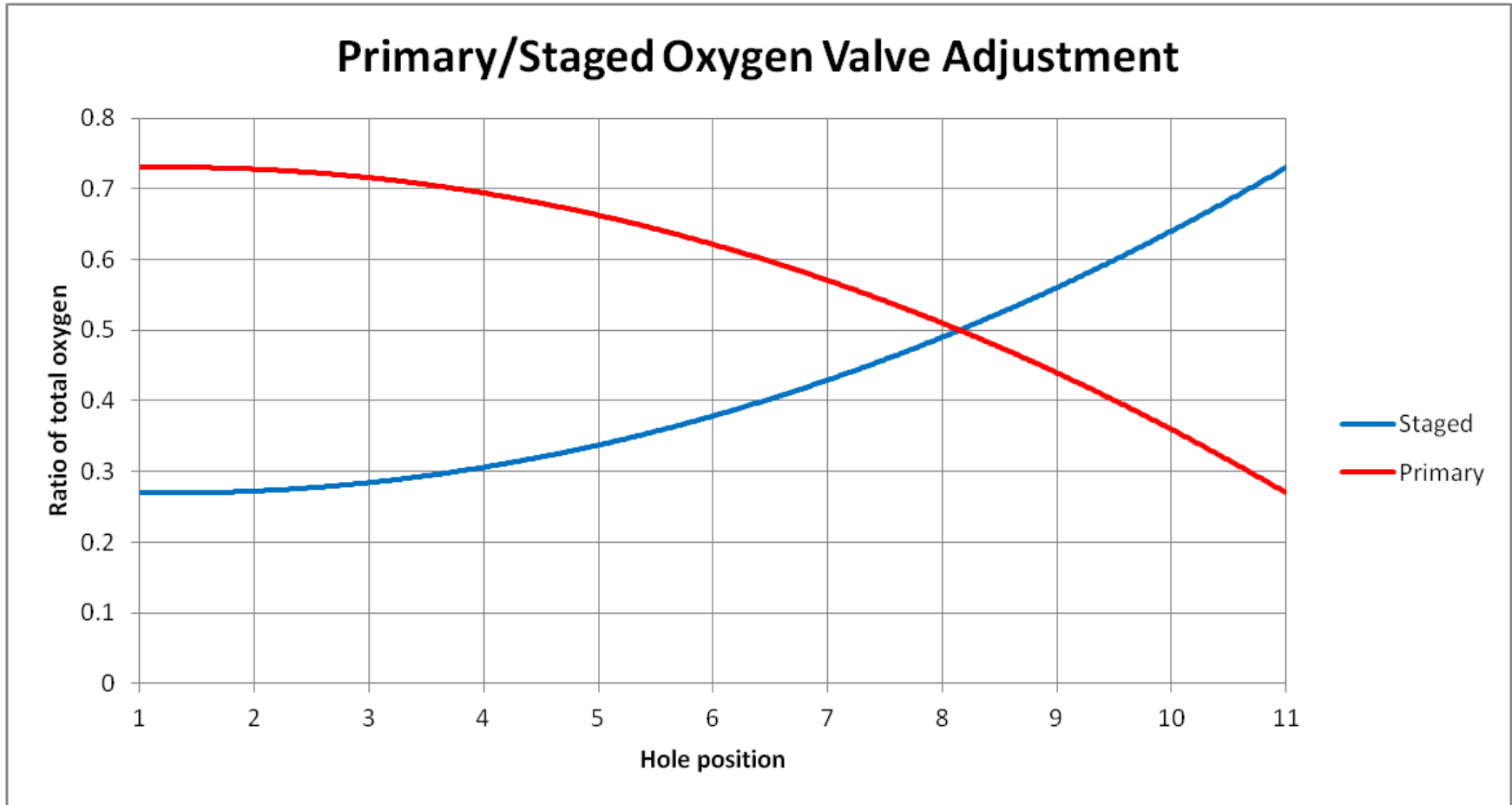   - Decreasing staged oxygen = lower radiative heat flux (2)
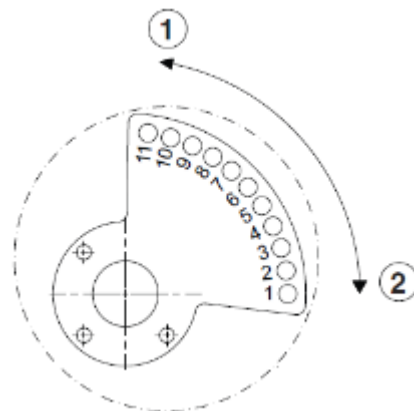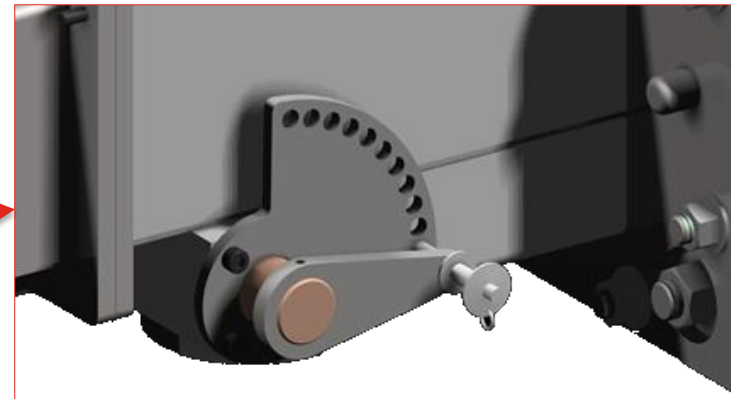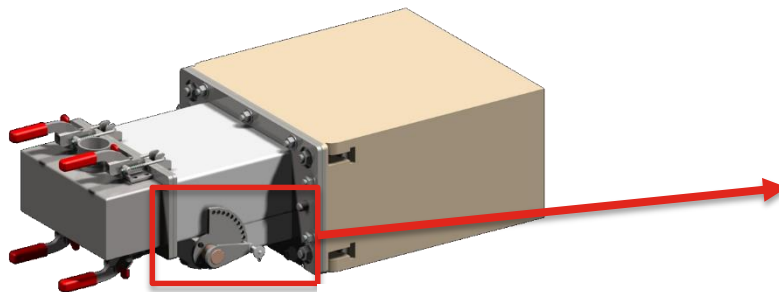
OXY-THERM® FHR Staged Oxygen

- Staged Oxygen provides
  - Uniform heat flux
  - Maximum flame radiation
- Maximum flame coverage
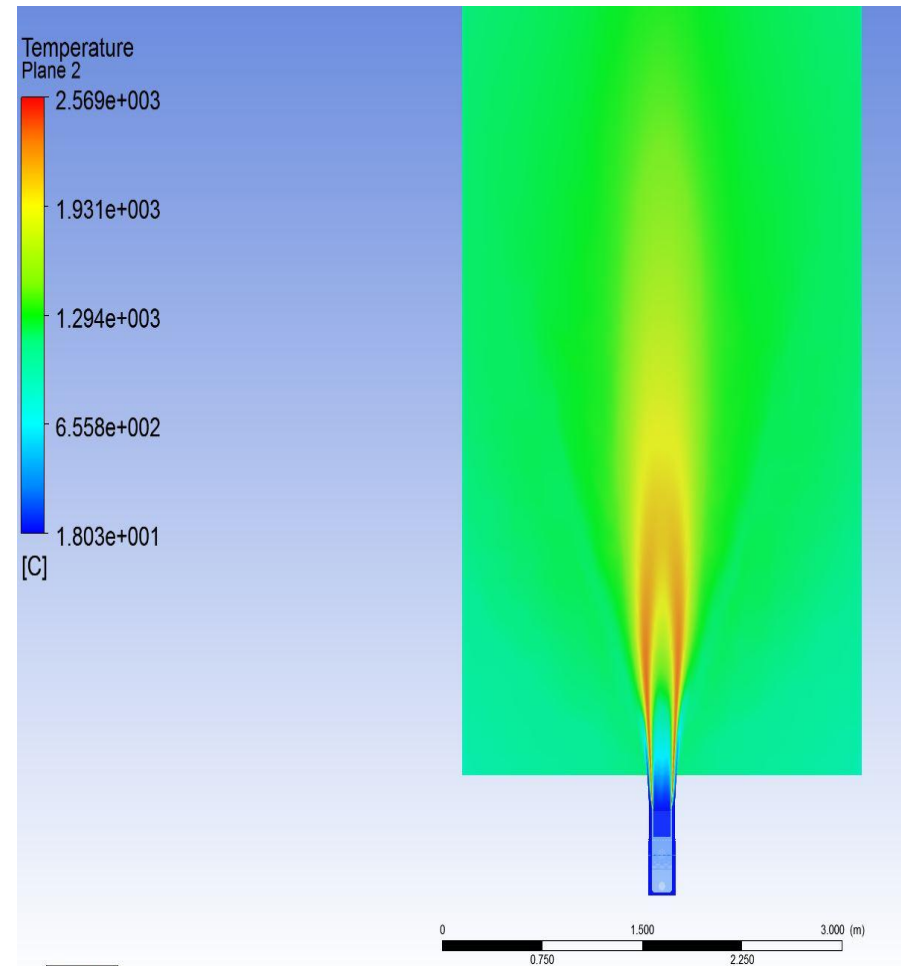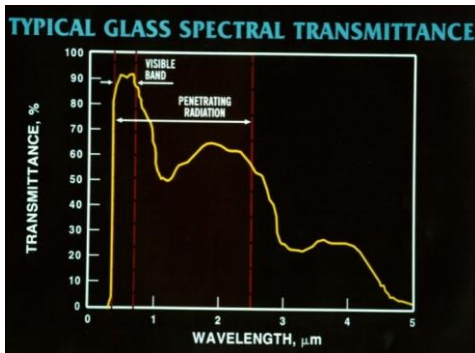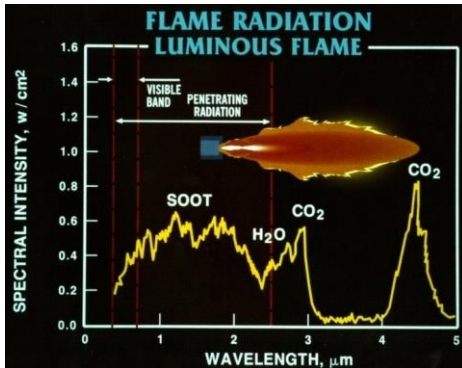
OXY-THERM® FHR Staged Oxygen

OXY-THERM® FHR Staged Oxygen

- 30 % Staged / 70% Primary O_2

OXY-THERM® FHR Staged Oxygen

- 50 % Staged / 50% Primary O_2

OXY-THERM® FHR Staged Oxygen

- 70 % Staged / 30% Primary O_2