

SCOPE

- I 1.1 This practice covers the design, fabrication, and inspection of burners and related components for fired heaters in general refinery service. Burners covered under this practice include: premix and raw gas, natural and forced draft, combination gas/oil, conventional and low NO_x.
- I 1.2 **An asterisk (*)** indicates that a decision by the Purchaser is required, or that additional information is furnished by the Owner.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I 2.1 **Table 1** lists the practices and standards which shall be used with this practice.
- I * 2.2 **Table 2** lists the practices which shall be used with this practice as specified by the Purchaser.

TABLE 1

PRACTICES	
IP 2-1-1	Plant Noise Design Criteria
IP 15-1-1	Instrumentation For Fired Heaters
IP 18-12-1	Positive Materials Identification
IP 20-1-1	Inspection of Equipment and Materials
IP 3-16-1	Flanged Joints, Gaskets, and Bolting
IP 19-1-1	Paint and Protective Coating
STANDARDS	
ASME B1.20.1	Pipe Threads, General Purpose (inch)
API 560	Fired Heaters for General Refinery Service, Section 10 Burners and Auxiliary Equipment, Appendix A Burner Data Sheet, Appendix B Purchaser's Checklist

TABLE 2

PRACTICES	
IP 3-18-1	Piping Fabrication Shop or Field
IP 20-1-2	Administrative Procedures for Obtaining Inspection

DEFINITIONS

- I 3.1 **Gas Spud or Orifice** - is associated with premix burners. The orifice in conjunction with the venturi uses the kinetic energy (force) of the fuel to inspirate (primary) air.
- I 3.2 **Air Register** - an air inlet which is an integral part of a single burner and provides for regulation of air. Air registers are typically composed of concentric sliding parts which do not offer a tight shut off.
- I 3.3 **Air Doors** - air inlets which are an integral part of a single burner providing air regulation. Air doors are typically located symmetrically around the air plenum with each having a vertical axis. Air doors can provide a tight shut off.
- I 3.4 **Air Louvres** - multiple blades mounted with either horizontal or vertical axis; all blades operate in a parallel or opposed blade mode. Air louvres offer good air control and tight shut off.
- I 3.5 **Plenum** - an enclosure which normally houses one or multiple burners and provides for the distribution of air. A plenum is often used in the supply of pre-heated air. A plenum is sometimes called a windbox.
- I 3.6 **Fuel Injector** - is any device used to inject or direct fuel into the burner combustion zone.
- I 3.7 **Burner tip** - the burner component(s) by which the fuel is injected into the combustion zone(s).
- I 3.8 **Ports** - openings in tips.

DOCUMENTATION

- I ♦ 4.1 All information listed below shall be submitted by the vendor as indicated. All quantities related to firing rates should be expressed in both LHV and HHV. Units to be consistent with API-560 burner data sheet.

REQUIRED DOCUMENTATION	PROPOSAL INFORMATION REQUIRED WITH VENDOR PROPOSAL	APPROVAL INFORMATION SUBMIT FOR OWNER'S ENGINEER APPROVAL	FINAL "AS BUILT" RECORDS REQUIRED AS APPLICABLE
1. BURNER GENERAL ARRANGEMENT DRAWING Containing the following information:	X	X	X
a. Design firing rates	X	X	X
b. Operating fuel temperature and pressure	X	X	X
c. Combustion air conditions	X	X	X
d. Fuel heating value. SG and MW	X	X	X
e. Type of oil gun (if applicable)	X	X	X
f. Fuel oil and fuel gas orifice drilling size	X	X	X
g. Heater floor and plenum cutout or air inlet dimensions	X	X	X
h. Atomizing steam rate and conditions	X	X	X
i. Construction of air register	X	X	X
j. Bill of Material with component part number and material designation	—	X	X
k. Orientation and dimensional location of burner fuel injectors, pilot ignitor, pilot flame detector, tiles, and diffuser	—	X	X
2. DETAIL DRAWINGS Showing the following as applicable:	—	X	X
a. Burner tile geometry	—	X	X
b. Air diffuser or vane geometry	—	X	X
c. Geometry of fuel injectors	—	X	X
d. Cutaway of oil gun with each part identified	—	X	X
e. Burner mounting details showing all adjustment mechanisms	—	X	X
3. COMPLETE DOCUMENTATION OF BURNER TEST MATRIX	—	X	—
4. COMPLETE BURNER DATA SHEET	X	X	X
5. RECOMMENDED SPARE PARTS LIST	X	X	X
6. BURNER OPERATING CURVE FOR EACH FUEL Pressure vs. heat release LHV, including draft (and showing orifice size, steam rate and condition)	—	X	X
7. CERTIFIED TEST DATA Oil gun flow test, NO _x emissions, etc., as required by the job specification	—	X	Test Results
8. OPERATING & MAINTENANCE MANUAL	—	—	X
9. GUARANTEES			
a. Burner turndown and XS air	X	X	X
b. Noise Level	X	X	X
c. NO _x emissions for each fuel	X	X	X
d. CO emission for each fuel	X	X	X
e. Particulate emissions for each fuel	X	X	X
f. Total hydrocarbons	X	X	X
g. Flame length	X	X	X