

SCOPE

- I 1.1 This practice covers the design, fabrication, and installation of sootblowers for fired heaters, boilers, and other fired equipment.
- I 1.2 **An asterisk (*)** indicates that a decision by the Purchaser is required, or that additional information is furnished by the Purchaser.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I 2.1 **Table 1** lists the practices which shall be used with this standard.

TABLE 1

PRACTICES	
IP 3-4-1	Piping for Fired Equipment
IP 15-11-1	Instrument Control Panels
IP 16-9-1	Low Voltage A-C Motors Up to 200 HP (150 kW)

DOCUMENTATION

PROPOSAL INFORMATION

- I ↗ *3.1 The vendor shall submit as a minimum the following information with his proposal:
 - a. Complete description of sootblower including model number and type.
 - b. Outline drawing of unit showing mounting (including wall box and wall support bearing/bracket).
 - c. Materials of construction of lance, feed tube, nozzle, and valve components.
 - d. Lance travel speed and steam consumption rate at sootblower valve inlet flange pressure.
 - e. Proposed method and utility requirements for purge, sealing, and aspirating air, when specified.
 - f. Maximum pressure/temperature rating of valve and other pressure-containing components.
 - g. Specification for drive motors, motor starters, and switchgear including NEMA rating and area electrical classification.
 - h. Proposed sootblower control scheme.
 - i. Details of control panel, including electrical classification.

REVIEW INFORMATION

- I 3.2 The vendor shall submit, as a minimum, the following information for review by the Owner's Engineer:
 - a. Updated proposal information.
 - b. Details of vendor-supplied instruments and control valves.
 - c. Control panel and motor starter console arrangement drawings, wiring diagrams, and interconnecting wiring diagrams.
 - d. Installation, operating, and maintenance manuals.
 - e. Thrust calculation.

FINAL RECORDS

- I 3.3 The following information shall be submitted for final records:
 - a. Complete "as-built" documentation issued for review.
 - b. Spare parts lists.

IP 7-3-1		Sootblowers for Fired Equipment	
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(This practice is appropriate for attachment to Inquiry or Purchase Document)

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DESIGN

GENERAL DESIGN

- O,R ♦ *4.1 **Sootblowers shall be of automatic retractable design** with electric motor drive, automatic warm-up and condensate draining facilities unless otherwise specified, such as for steam generating boilers, etc.
- O,R ♦ *4.2 Types of **sootblowers which are acceptable** include: Clyde Mark F. H. or 400 series; Diamond Power Model 4M or IK Series, and Vulcan T Series. Use of other makes of sootblowers must be approved by the Owner's Engineer.
- O ♦ *4.3 **Blowing medium shall be steam** unless otherwise specified
- O ♦ *4.4 Sootblower shall be selected to **achieve a minimum thrust of 130 lbf (580 N)** with the specified media pressure and temperature at the sootblower valve inlet flange. Thrust shall be calculated from the following equation:

$$T = C W \sqrt{h_i - h_e}$$

where: C = 6.95 English units (70.9 metric units)

W = mass flow rate through nozzle, lb/sec (kg/sec)

h_i = inlet enthalpy, Btu/lb (MJ/kg)

h_e = exit enthalpy, Btu/lb (MJ/kg) - determined from steam tables assuming isentropic expansion through the nozzle with pressure equal to atmospheric
- O ♦ *4.5 Sootblowers shall **not** be supplied with integral blowing steam pressure-reducing disc, linkage, or other device unless specified by the Purchaser.
- R,M ♦ *4.6 **Packing** used for the joint between the steam feed tube and steam lance, and for the sootblower valve itself, shall be graphite with corrosion inhibitors unless otherwise specified.
- O,R ♦ 4.7 **Sootblower lance tube shall be provided with** holes near the tip for drainage of condensate.
- R ♦ 4.8 All sootblower valves shall be provided with an **air purge connection** equipped with a check valve.
- R 4.9 **Wall box design** shall minimize leakage of air and flue gas between the fired equipment and atmosphere.
- O,R 4.10 **Sootblower mounting** shall allow for elevation adjustments to maintain the required slope.
- S ♦ 4.11 **Removable guards or other means of protection** shall be provided, which fully enclose all gears, chains, and moving pinch points.
- O,R 4.12 **Fixed position rotary** sootblowers shall:
 - a. Be supported at both ends and within the flue gas stream by brackets attached to the tubes.
 - b. Provide one nozzle per space between tube rows.

DESIGN OF ELECTRICAL COMPONENTS

- R,M 4.13 **Sootblower motor** shall be of TEFC/TENV type.
- O,R 4.14 A **Control panel** shall be provided for each set of sootblowers which provides the following functions:
 - a. Ability to operate all or individually selected sootblowers in automatic sequence as determined by selector switches.
 - b. Manual operation of any sootblower.
 - c. Indication of forward and reverse travel, along with sequence finish, for each sootblower.
 - d. Indication of any fault which stops the sequence.
 - e. Ability to test integrity of all lamps on or off line.

