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SAMPLE SPECIFICATIONS

The following sample specifications are provided by Superior Boiler Works to assist you in providing your customer with the specific needs for that application. The sample specification is normally used as the base template for the boiler specification.

MODEL: Ute 60 – 150 HP

- 1.0 Specification Overview
- 2.0 Structural Specifications
- 3.0 Connections
- 4.0 Boiler Trim
- 5.0 Factory Firetest

Ute 2-Pass Downfire Vertical Steam Boiler, 60-150HP, Section IV (0-15 PSI) and Section I (over 15 PSI)

The size and location of all connections, steam-disengaging area, furnace volume and steam storage volume can be found on Superior Boiler Works Form CAT-DVFT-S. (Issued October 2017).

Contact your local insurance carrier and State Boiler Inspector for the current insurance and code requirements.

Please contact Superior Boiler Works if you need assistance in completing the specification.

1.0 Specification Overview

- 1.1 The boiler shall be a 2-pass downfire vertical boiler manufactured by Superior Boiler Works. Model No. _____.
- 1.2 The boiler is to be mounted on a structural steel base with a forced draft burner and burner controls. The boiler is to be designed, constructed and tested in accordance with the latest edition and addenda of the A.S.M.E. Boiler and Pressure Vessel Code and shall be registered with the National Board of Boiler and Pressure Vessel Inspectors.
- 1.3 The boiler shall be designed for _____ PSI steam with an operating pressure of _____ in accordance with the latest edition and addenda of Section (I) or (IV), of the A.S.M.E. Boiler and Pressure Vessel Code.



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- 1.4 The steam boiler shall be completely pre-assembled and fire tested at the factory to check construction, controls and combustion characteristics of the unit.
- 1.5 Boilers are to be constructed to meet the requirements of CSD-1.

2.0 Structural Specification

- 2.1 The steam boiler is to be designed to produce a steam quality of 99% at all firing rates.
- 2.2 The furnace is to be located in the center of the boiler to provide even heat distribution through the boiler.
- 2.3 Boilers shall have a furnace volume of not less than _____ cubic feet.
- 2.4 All tubes are to have a minimum wall thickness of .105" and have an OD of 2-1/2".
- 2.5 The tubes in the lower tubesheet (hot end) are to be attached by flare rolling, beading the tubes, and then welding to the tubesheet.
- 2.6 The tubes in the upper tubesheet a Section I boiler are to be attached to the tube sheets by flare rolling and then beading the tubes to the tube sheet. The tubes in the upper tubesheet on a Section IV boiler are to be attached by flare rolling.
- 2.7 Turbulators shall be factory installed in all tubes to enhance the convective heat transfer coefficient.
- 2.8 The boiler shall be mounted on a structural steel base which allows for removing the bottom lid.
- 2.9 All heating surfaces must be fully accessible for inspection and cleaning without disturbing the burner equipment.
- 2.10 The bottom turnaround area, tubesheets, and refractory are to be fully accessible when the bottom door is removed.
- 2.11 The top doors are to be insulated with a 1" thick ceramic fiber blanket. The insulating blanket is to have a K-factor of .44 and is to be coated with a hardner to prevent erosion from the flue gases.



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- 2.12 All doors are to be held in place by lugs that are secured by replaceable brass nuts. The doors are to be sealed with a gas tight, non-proprietary ceramic fiber rope with a minimum density of 20 lbs. per cubic foot and a continuous use limit of 1800° F.
- 2.13 All necessary hand holes shall be provided in accordance with the A.S.M.E. Code.
- 2.14 The top and bottom tube sheets must be fully accessible for inspections or cleaning when the doors are opened. Fuel lines, linkages, and electrical connections shall not impede opening of the doors.
- 2.15 The turnaround area at the bottom of the boiler shall have water backed side walls.
- 2.16 The boiler shell is to be insulated with 2" thick, 8 lbs. per cubic foot density mineral wool with a K-factor of .27. The insulation is to be held in place by bands and then covered with a 22 gauge phosphate coated galvanized steel jacket. All openings in the jacket are to have trim rings.
- 2.17 The entire boiler is to be painted with a high temperature, 400° F minimum, silicone based enamel. The top and bottom door are to be sand blasted before painting and the jacket is to be primed with a vinyl wash primer before painting.

3.0 Connections

- 3.1 The boiler is to have (qty.) (size) bottom blowdown connections.
- 3.2 Section IV boilers are to be supplied with one factory piped and installed slow opening blowdown valve. Section I boilers have an additional quick opening valve. The piping is to be documented on the Manufacturer's Data Report.
- 3.3 The boiler is to be equipped with four lifting eyes.
- 3.4 A (size) feedwater connection shall be provided with an internal baffle.
- 3.5 One set of feedwater valves (one gate valve and one check valve) the same size as the boiler feedwater connection is to be factory piped and installed on one of the feedwater connections. The piping is to be documented on the Manufacturer's Data Report.
- 3.6 A (size) flue gas connection shall be located at the rear of the boiler on the top centerline. The stack shall be designed for easy attachment of the exhaust flue by allowing for a slip connection. The flue gas connection will be designed to support a minimum of 2,000 lbs. dead weight. The stack shall have a 1/2" connection for a stack thermometer.



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- 3.7 A 1" surface blowdown connection shall be provided.
- 3.8 One set of surface blowdown valves (a gate type shutoff valve and a calibrated flow control valve) are to be factory piped and installed on the boiler. The piping is to be documented on the Manufacturer's Data Report.
- 3.9 The steam connection will be a ____ (size) ____ class (300# Section I) (150# Section IV).

4.0 Boiler Trim

- 4.1 A float type primary low water cut-off and pump control shall be provided with gage glass, ball check gage glass valves, try-cocks and a ball type water column blowdown valve.
- 4.2 A probe type secondary low water cut-off shall be provided in an external cage.
- 4.3 A high limit control with manual reset shall be provided in addition to the operating control.
- 4.4 A pressure sensor providing a modulating signal to the linkageless control
- 4.5 Relief valves set at a minimum of 17% higher than the operating pressure of the boiler, but no higher than the boiler design pressure shall be provided.
- 4.6 A pressure gauge with an inspector's test cock shall be provided.

5.0 Factory Firetest

- 5.1 The factory firetest shall be a complete functional test conducted at 10 PSIG (Section IV) or 100 PSIG (Section I) and at a minimum, is to consist of filling the boiler with water and operating the burner throughout its complete range of operation. Additionally, all of the components wired into the boiler safety control circuit are to be tested by simulating a failure condition. A copy of the firetest report is to be included in the manual.
- 5.2 Upon completion of the factory firetest, the boiler shall be cooled and hydrostatically tested and the boiler external piping documented. The unit shall be ready for installation and final connection of water, steam, fuel, blowdown, electrical and flue.