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## SAMPLE SPECIFICATIONS

The following sample specifications are provided by Superior Boiler 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: CHEYENNE 4,000 MBH – 12,000 MBH

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

Cheyenne 3-Pass Condensing Boiler, 4,000-12,000 MBH Section IV. Standard design pressure is 125 psig. 160 psig is also available.

The size and location of all connections, area, water volume, furnace volume can be found on the boiler ratings and dimension drawing

Contact your local insurance carrier and State Boiler Inspector for information on special insurance requirements and special code requirements if needed.

Please contact Superior factory if you need any assistance in completing the specification.

### 1.0 Specification Overview

- 1.1 The boiler shall be a 3-pass Cheyenne dryback boiler manufactured by Superior Boiler, 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 (125) PSI water in accordance with the latest edition and addenda of Section IV.
- 1.4 The water boiler shall be completely pre-assembled and firetested at the factory to check construction, controls, and combustion characteristics of the unit.



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- 1.5 Boilers are to be constructed to meet the requirement of CSD-1. The complete packaged boiler shall be listed as a unit by Underwriters Laboratories and shall bear the Underwriters label.

## 2.0 Structural Specification

- 2.1 The first boiler pass is a large mild steel furnace located in the center of the upper vessel.
- 2.2 All boilers shall have a furnace volume of not less than (see R&D) cubic feet.
- 2.3 The second boiler pass is made of mild steel rifled (X-ID) tubes in the upper vessel. All tubes are to be a 3" OD with a nominal wall thickness of .109". These tubes are to be attached to the tubesheets by full penetration welds.
- 2.4 The tubesheets in the upper vessel are to be SA516-70 steel with a minimum thickness of 3/8"
- 2.5 The third pass is made of grade 316L stainless steel tubes in the lower vessel. All tubes are to be 2" OD with a nominal wall thickness of .109". These tubes are to be attached to the tubesheets by full penetration welds. Tubes will include stainless steel turbulators for increased heat transfer.
- 2.6 The tubesheets in the lower vessel are to be grade 316L stainless steel with a minimum thickness of 1/4".
- 2.7 The boiler shall be mounted on a structural steel saddle.
- 2.8 The bolt holes in the rear saddle are to be slotted to allow for expansion.
- 2.9 All heating surfaces must be fully accessible for inspection and cleaning without disturbing the burner equipment or removing jacketing.
- 2.10 The upper rear door is hinged for support. All rear door hinges are to be extra heavy duty and capable of supporting the door when it is being opened or shut. The hinge is to be positioned so that the rear door will open to the (right) (left) when viewed from the burner end.
- 2.11 The upper front 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 covered with a stainless steel liner to prevent erosion from the flue gases. These doors are to be the davited design.



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- 2.12 The lower front 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 covered with a stainless steel liner to prevent erosion from the flue gases.
- 2.13 The lower rear smokebox and doors are to be constructed of stainless steel to resist erosion from the acidic condensate.
- 2.14 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.
- 2.15 All necessary inspection and access openings shall be provided in accordance with the A.S.M.E. Code.
- 2.16 The front and rear tubesheets must be fully accessible for inspections or cleaning when the doors are open. Opening of the doors is not to be impeded by electrical connections.
- 2.17 The boiler is capable of safely operating with a zero-flow condition.
- 2.18 The boiler is to be equipped with two lifting eyes on each vessel.
- 2.19 The boiler shell is to be insulated with 5.7# density rock wool insulation. This insulation is to have a water repellant fiber backing.
- 2.20 The boiler casing is made of powder coated steel panels. These panels can be easily removed to allow for waterside inspection.

### **3.0 Connections**

- 3.1 The supply (size) connection is to be located along the top centerline of the boiler near the front of the boiler.
- 3.2 The water return (size) connection is located at the rear of the boiler. Standard location is near the vertical centerline on the right side. Alternatively, this connection can be on the left side. The return inlet includes a baffle to prevent water impinging on the tubes.
- 3.3 A (size) flue gas connection shall be located at the rear of the boiler. The stack shall be designed for easy attachment of the exhaust flue by allowing for a slip connection.
- 3.4 The boiler is to have an air vent connection on the boiler top centerline.



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- 3.5 The condensate drain is to be 1 ½” and located in the lower rear smokebox.
- 3.6 The boiler drain connection is to be 2” and is located at the rear of the boiler.

#### **4.0 Boiler Trim**

- 4.1 A probe type primary low water cut-off shall be provided.
- 4.2 The boiler is to be supplied with an operating and high limit control.
- 4.3 A firing rate controller or temperature transmitter communicating with the burner’s modulation control shall be supplied
- 4.4 Relief valves set at a minimum of 10% higher than the operating pressure of the boiler, but no higher than the boiler design pressure shall be provided.
- 4.5 A pressure gauge with an inspector's test cock and temperature gauge that screws into a brass thermowell. The pressure gauge and temperature gauges are remote mounted at the front of the boiler.

#### **5.0 Factory Electrical Test**

- 5.1 The electrical test shall be a test for the boiler safety controls. All components wired into the boiler safety control circuit are to be tested by simulating a failure condition. A copy of this report is to be included in the manual.