



Fulton Steam Boiler Products



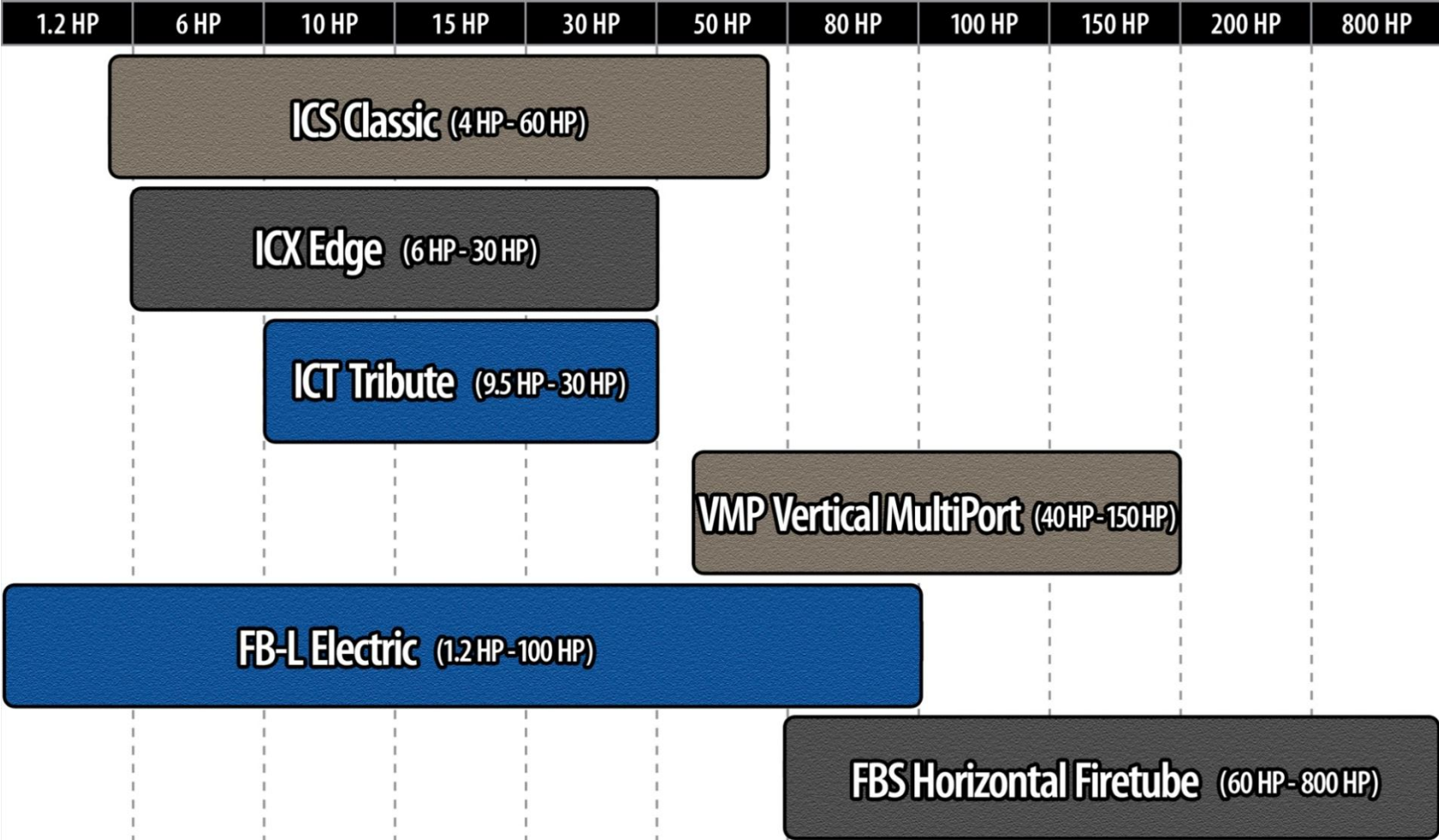
Fulton Boiler Works

Est. 1949

Fulton Steam Overview



Fulton Steam Boilers

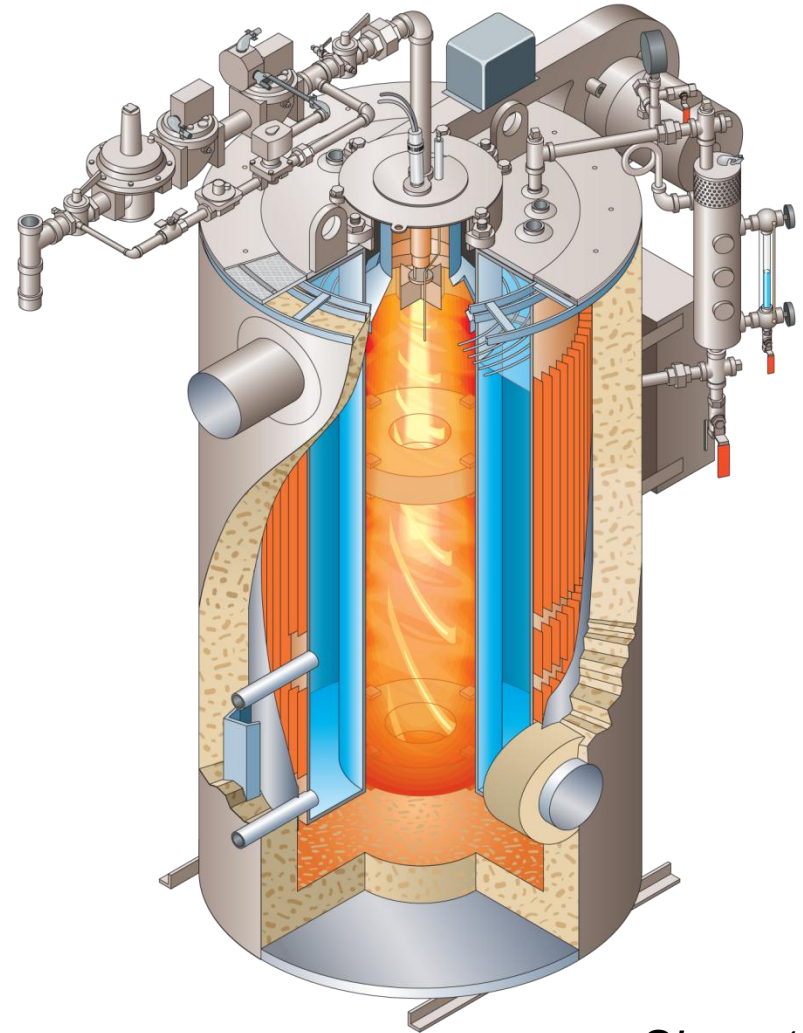


The heat transfer innovators.

Fulton Boilers

The Classic – ICS

- 2-pass, Vertical Tubeless
- Small Footprint
- Up to 81% Efficient
- High Temperature Castable Insulation
- Fulton Down-fired Burner
- UL listed as a Packaged Boiler
- Simple, reliable and very forgiving - over 100,000 installed
- Natural Gas/Propane/#2 Oil fuels
- 4HP – 60HP, Section I design boilers only
- Standard firing rate on/off
- Upgrade firing rate to linkage modulation with 2:1 turndown on natural gas
- 5 year standard PV Warranty
 - **10 years** with Engineered System

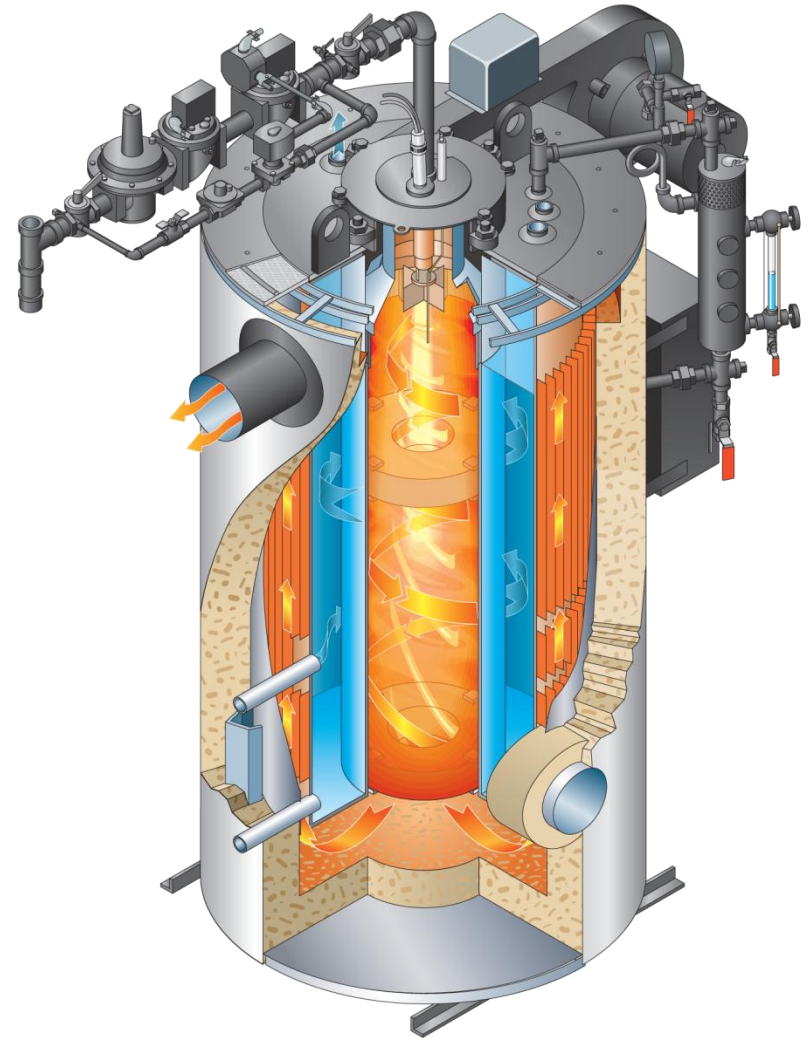


Since 1949

Fulton Boilers

The Edge – ICX

- 2-pass, Vertical Tubeless
- Upgraded Fin Arrangement – More fins!
- Up to 83% Efficient
- Stainless Steel Jacket
- High Temperature Castable Insulation
- Fulton Down-fired Burner
- UL listed as a Packaged Boiler
- Natural Gas/Propane fuels
- 6HP – 30HP
- Section I or Section IV Design
- Standard firing rate on/off
- Upgrade firing rate to linkage modulation with 2:1 turndown on natural gas
- 5 year standard PV Warranty
 - **10 years** with Engineered System

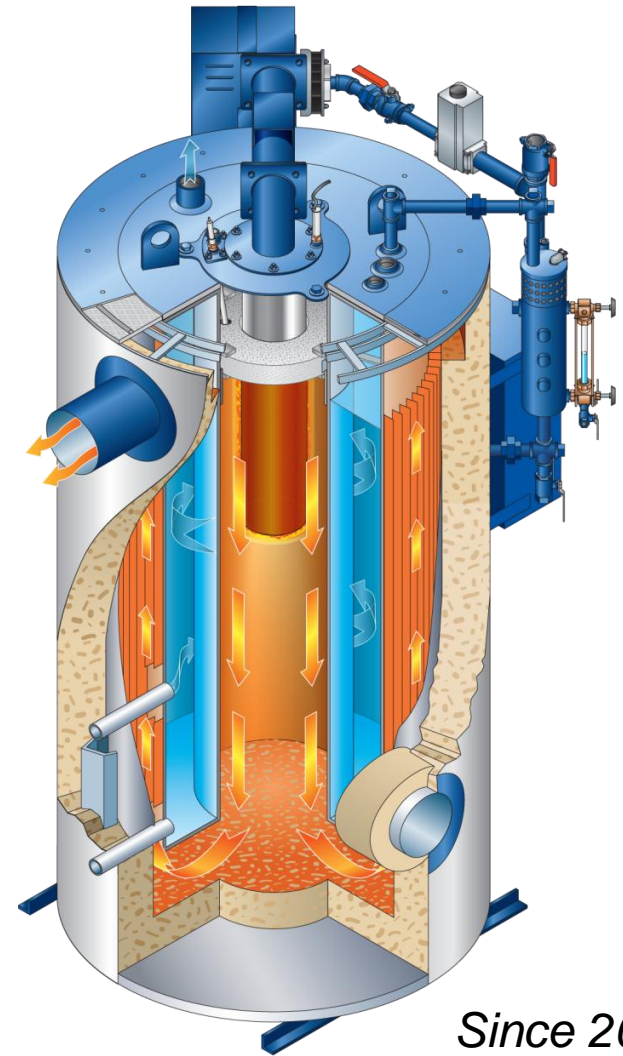


Since 1995

Fulton Boilers

The Tribute – ICT

- 2-pass, Vertical Tubeless
- The “Edge” Pressure Vessel
- with Upgraded Fin Arrangement
- Mesh Burner
- Natural Gas/Propane fuels
- 9.5HP – 30HP
- High Temperature Castable Insulation
- Fulton Down-fired Burner
- ETL listed as a Packaged Boiler
- 4:1 Turndown with VFD for modulation
- 20ppm NOx standard
- 9ppm NOx configurable
- Section I design boilers only

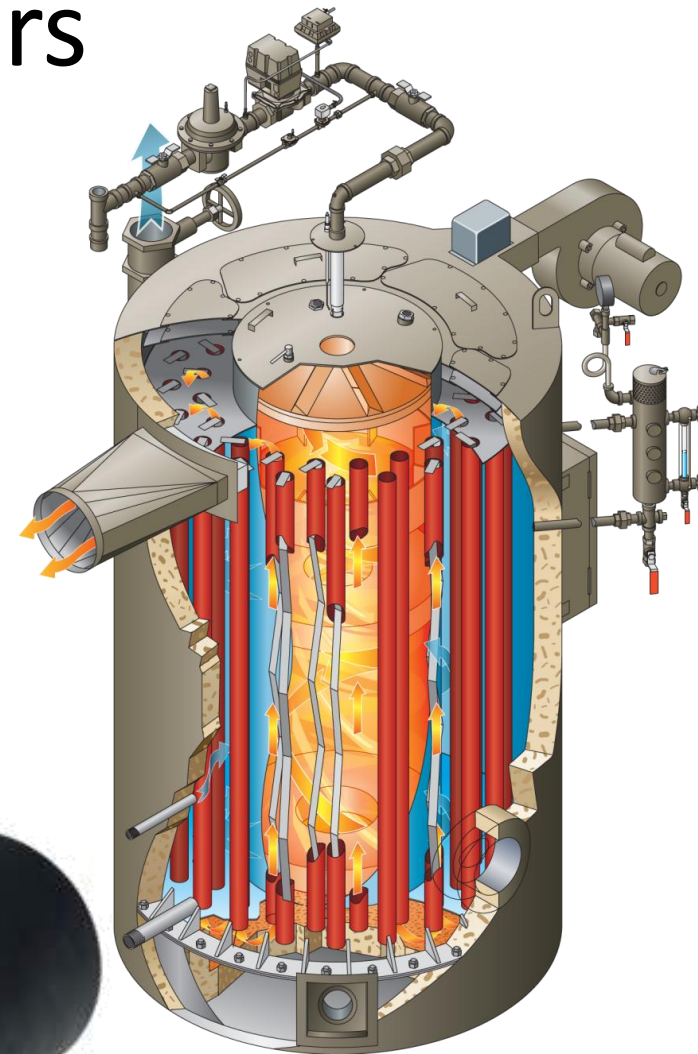


Since 2010

Fulton Boilers

Vertical Multi-Port – VMP

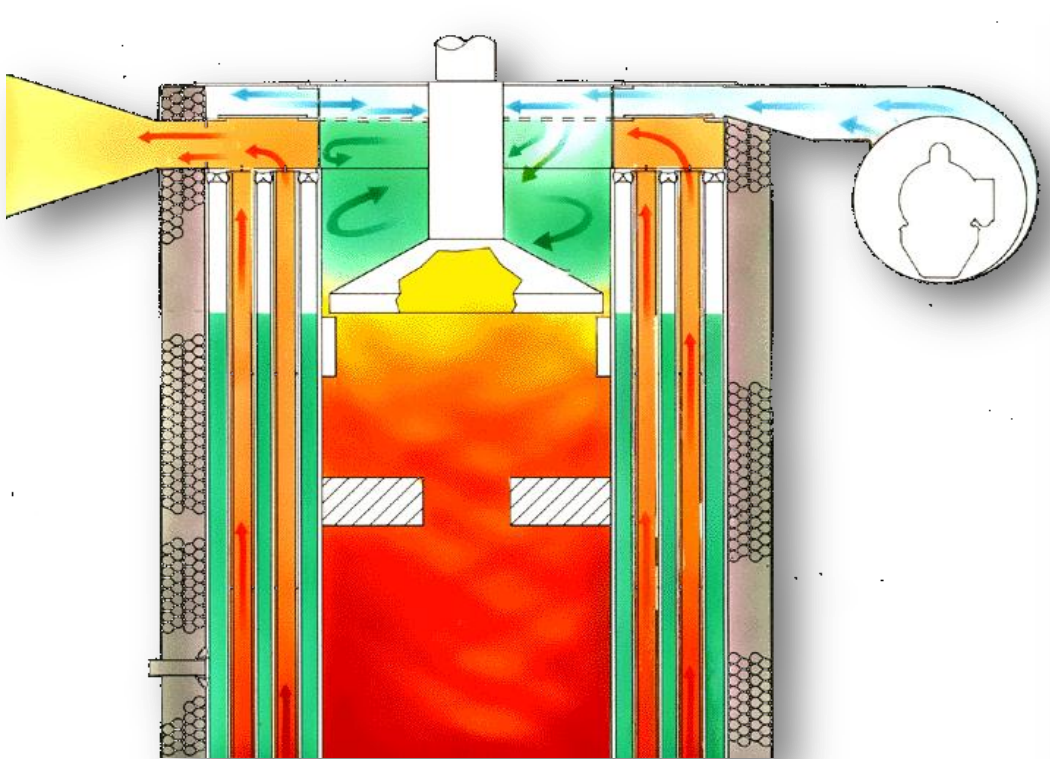
- 2-pass, Pipe-Type
- Sch. 80 pipes, not tubes
- Up to 84% efficient
- Preheated combustion air
- Turbulators for higher efficiency
- Small Footprint
- 40HP-150HP, 15 psig-150 psig
- Section I or Section IV design boilers
- Standard modulation is linkageless with 3:1 turndown on natural gas



Since 1992

Fulton Boilers

- VMP Preheated Combustion Air



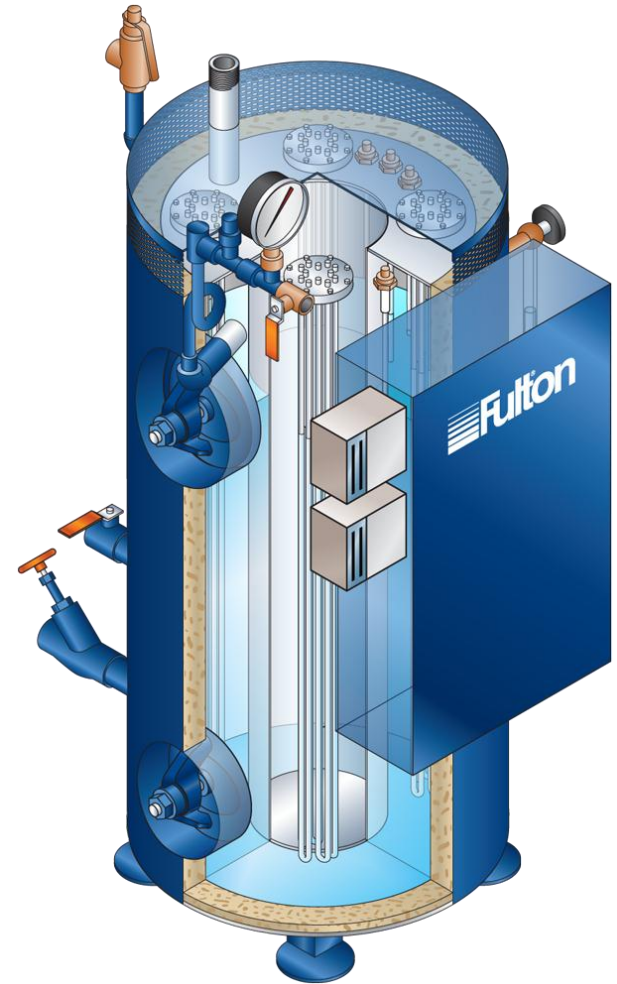
- VMP Pressure Vessel



Fulton Boilers

Electric Resistance – FB-L

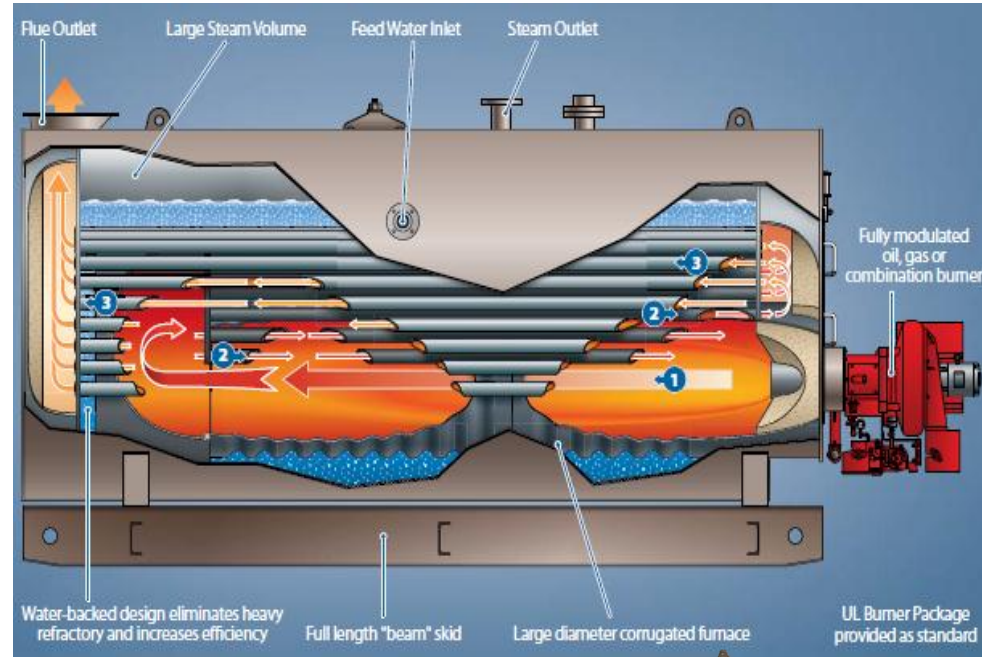
- No stack
- Stainless Steel Elements
- 1.2 HP – 100 HP
- Nearly 100% Efficient
- Fully Insulated
- Low Watt density
 - Approx. 50-70 W/in²
- Section I and Section IV design boilers
- 7.5 HP and smaller standard on/off modulation
- 10 HP and larger standard step modulation



Fulton Boilers

Horizontal Firetube - FBS

- 3-pass Wetback design
- 60HP – 800HP
- Boiler Tubes are 28% thicker than any U.S. competitor
- Large Corrugated Morrison Tube w/ Low Primary heat release
- Large Steam Chest & Steam Disengagement Area
- 5 ft²/BHP fire side surface area if required
- Open Protocol Burner
- Section I design boilers only



Fulton SRT-30



- **First new steam boiler design in DECADES!!**
- Very high efficiency
- Low Emissions standard
- Multiple Patents Pending
- Rugged - Robust - Reliable



PURE TECHNOLOGY



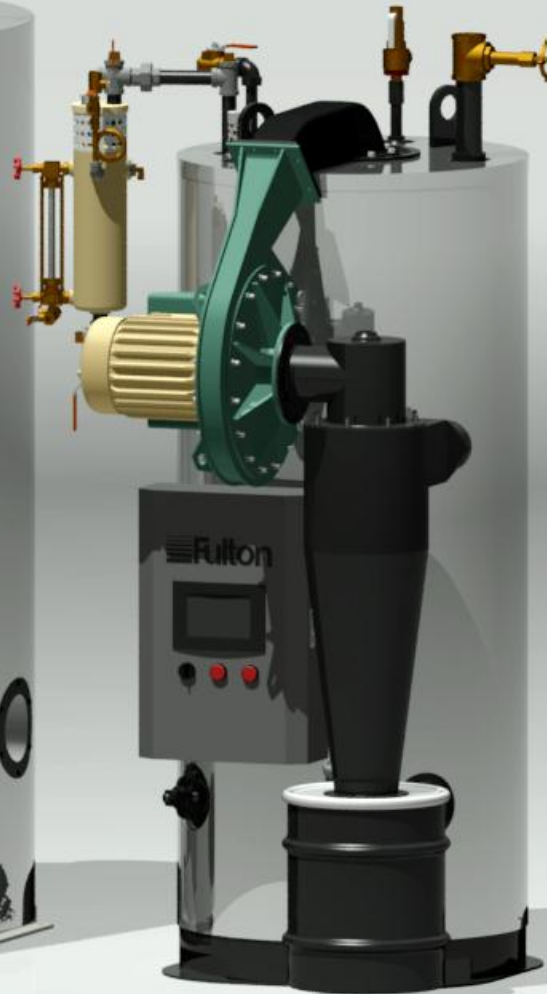
The design philosophy used by Fulton for the development of our new Steam and Condensing Boiler product lines. PURE Technology represents a “clean state” design approach.

Comprehensive system optimization by radically challenging heat transfer and mechanical design principles.

ICS-30



SRT-30



Spiral Rib Tubeless

Efficiency:	+ 4.5%	84.5%
Footprint:	- 38 %	12 ft ²
Diameter:	- 34 %	31 "
Height:	- 4 %	79 "
Turndown:	+ 600 %	6:1

20 ppm NOx: Standard

No refractory, fully wetted

Fits through standard door

Specifications

SRT-30

Boiler Horsepower

30

Efficiency (% AHRI)

84.5%

Maximum Skin Temperature (F)

<140

Steam Quality

99% @ 80 psi

NOx (ppm) - Baseline

<20

NOx (ppm) - Option

NA

Turndown (x:1) Baseline

1

Turndown (x:1) Option

6

Height (in)

79

Service Height (in)

97

Boiler Diameter (in)

31

Depth (in)

58

Footprint (Rectangular) (ft2)

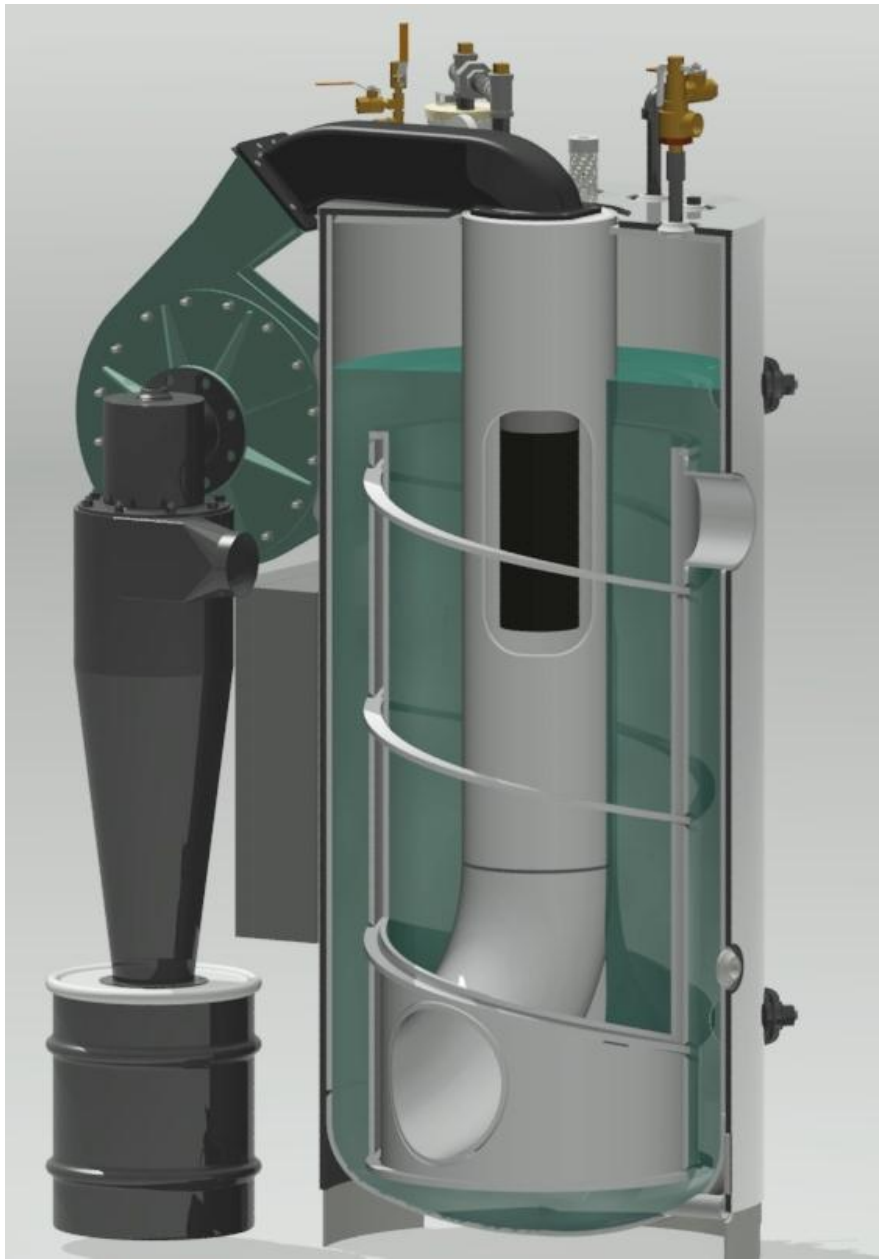
12

Installed Footprint (ft2)

65

Volume (ft3)

82



Pressure Vessel

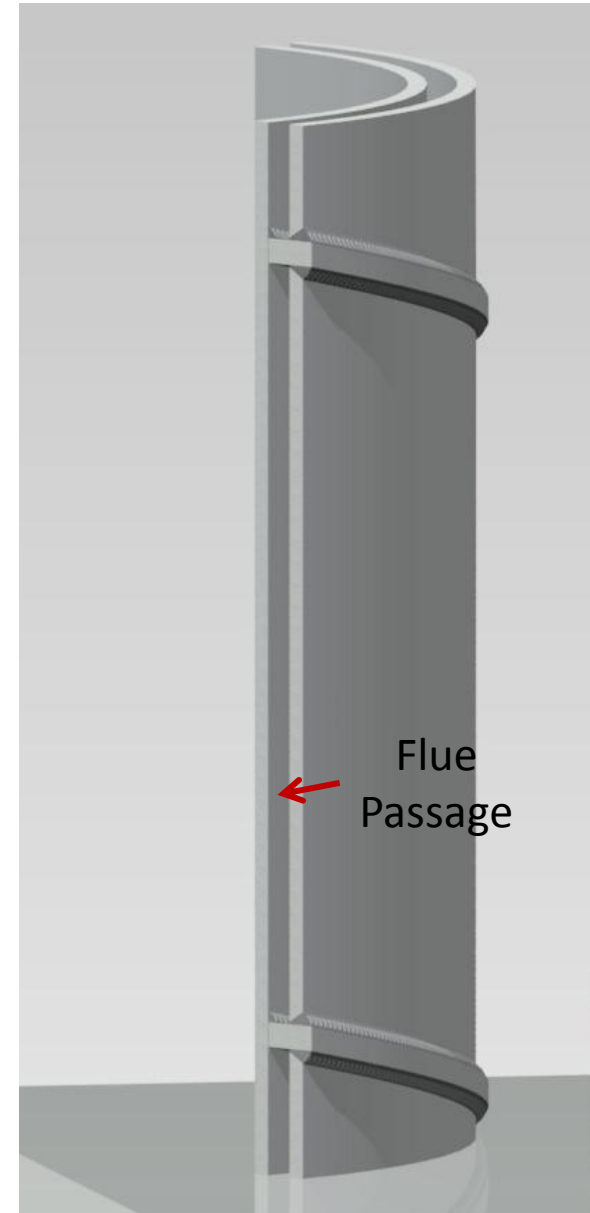
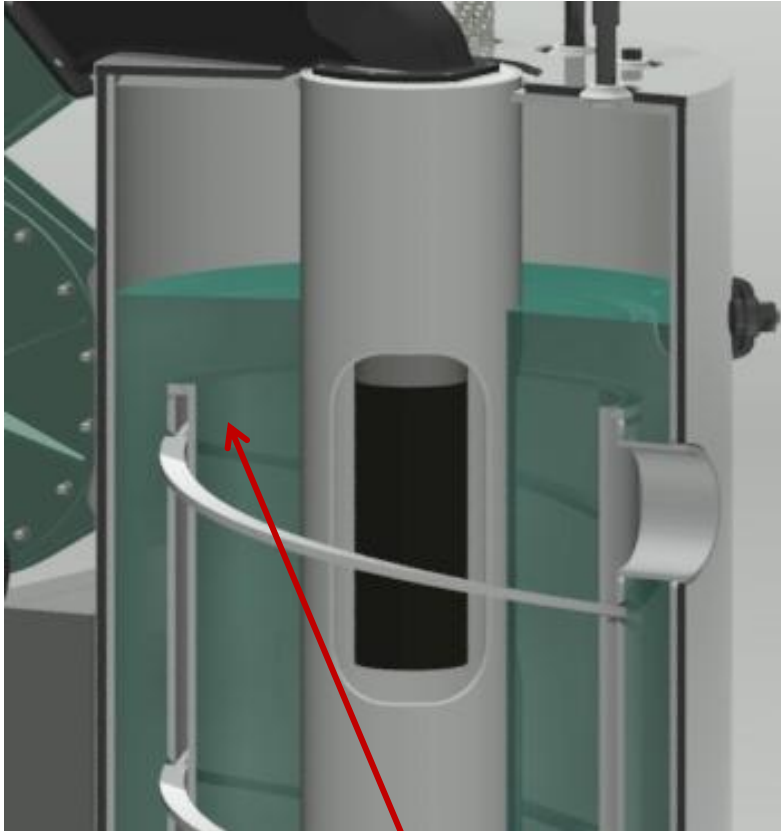
- Fully wetted – refractory free
- Spiral rib tubeless design



Fully Modulating Control Package

- No proprietary parts
- VFD and servos for 6:1 turndown
- Siemens LMV37 servo based combustion control
- UL Approval

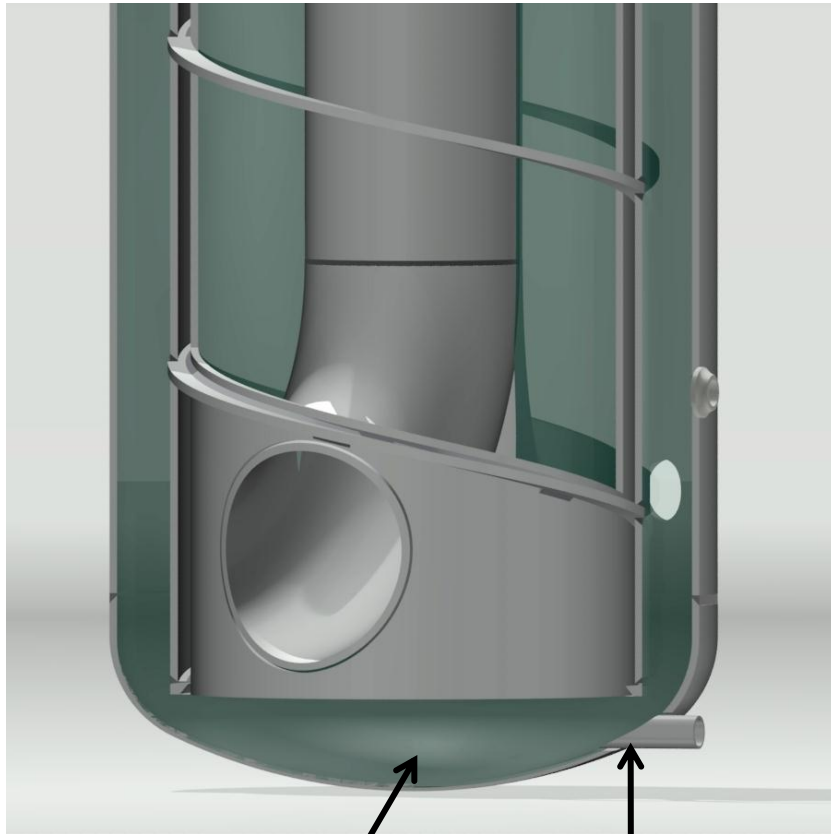
Heat Exchanger, Fireside



Key Points

- Flue Gas will be inside passage
- Water will surround entire HX

Heat Exchanger, Waterside



Blowdown Point

Open Volume to Collect Sludge/Debris – Unheated!

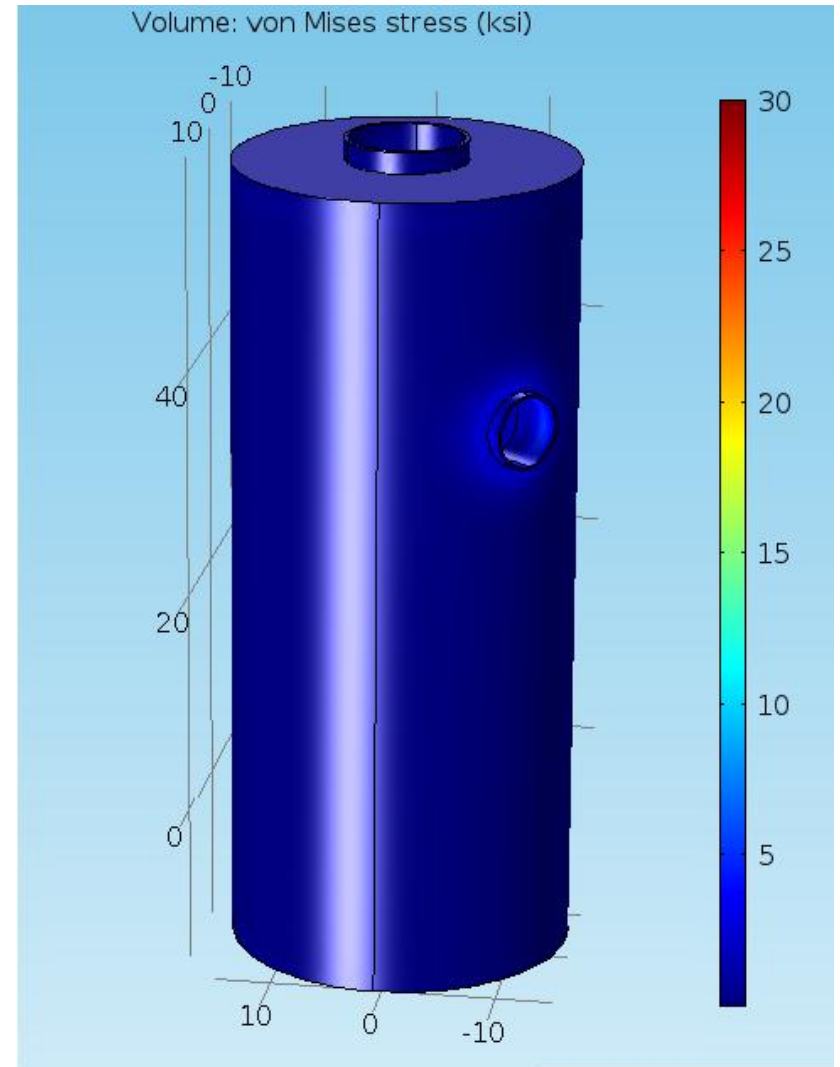
1. *Heat exchanger totally waterbacked*
2. - *Less skin loss*
3. - *Lower skin temperatures*
4. - *No refractory*
5. *Volume in bottom for collection of debris*
6. - *No sludge on heated surfaces*
7. *Blow down designed to effectively remove debris*

Thermal Stress

Self Compensating Design

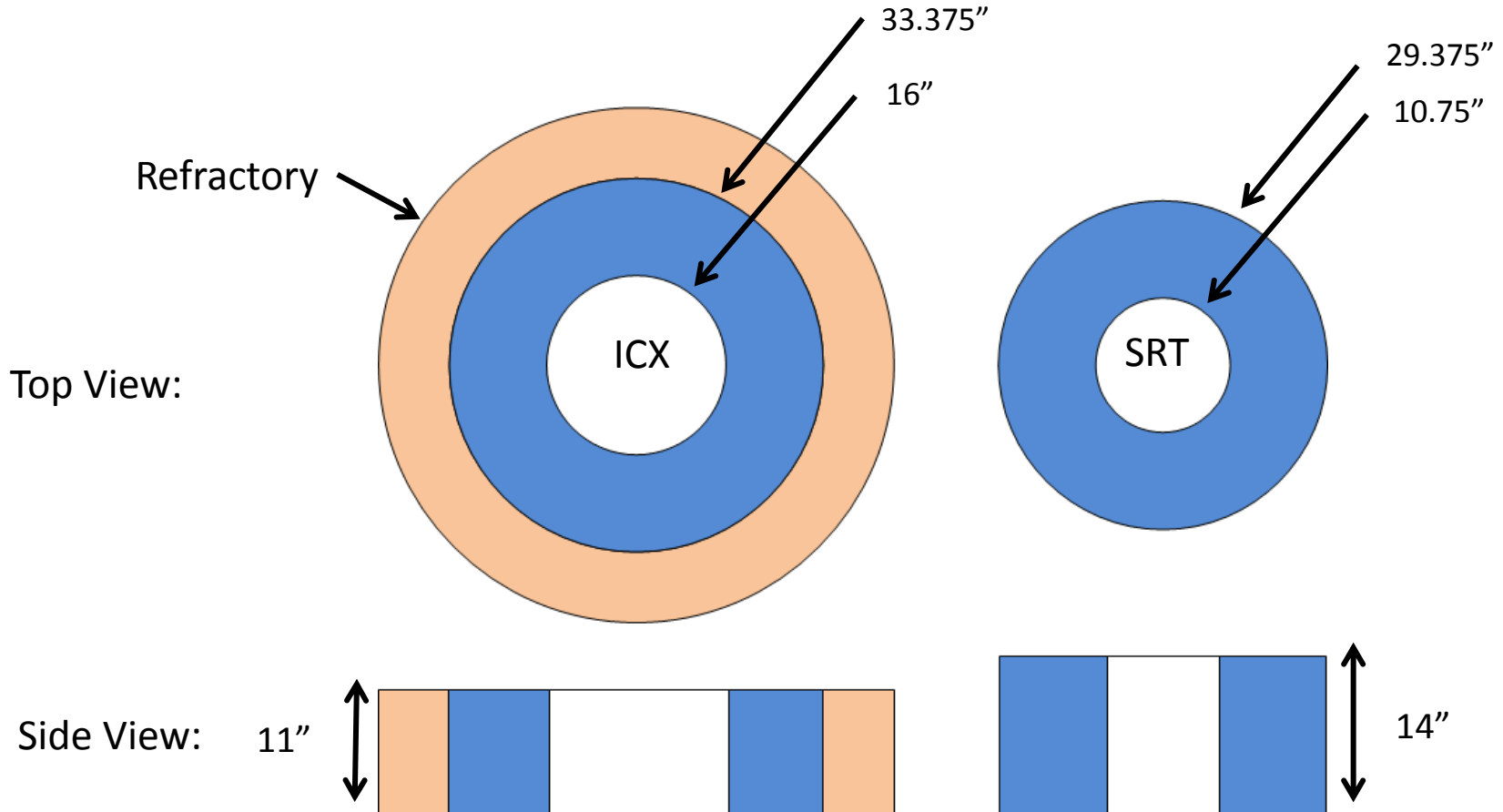
Confirmed with Combined
FEA/CFD Analysis

Very low stress vessel



Steam Quality

Changes from today's product

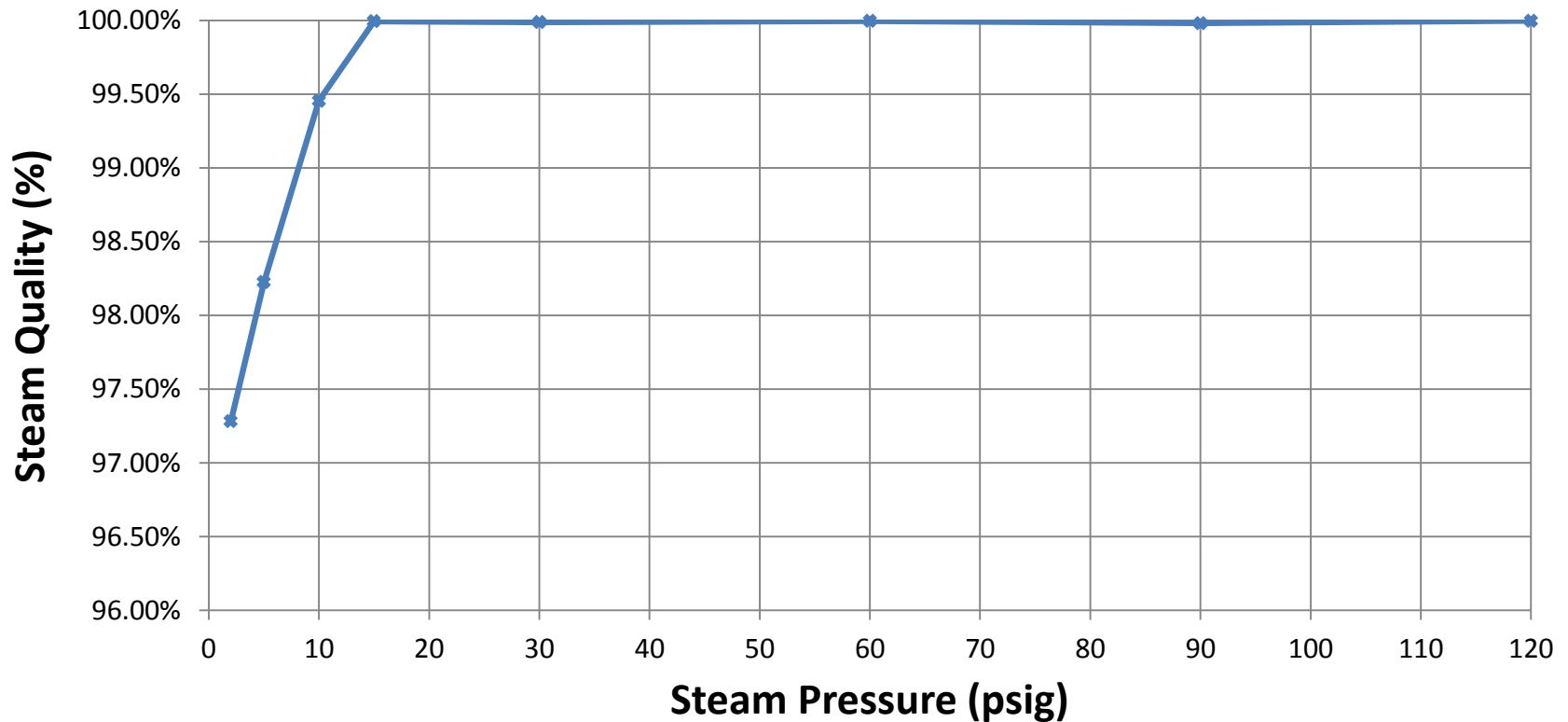


		<i>ICX</i>	<i>SRT-30</i>	<i>Change</i>
Steam Volume	<i>ft³</i>	4.247508	4.708753	10.9%
Steam Height	<i>in</i>	11	14	27.3%
Steam Release Area	<i>in²</i>	667.2448	581.1946	-12.9%

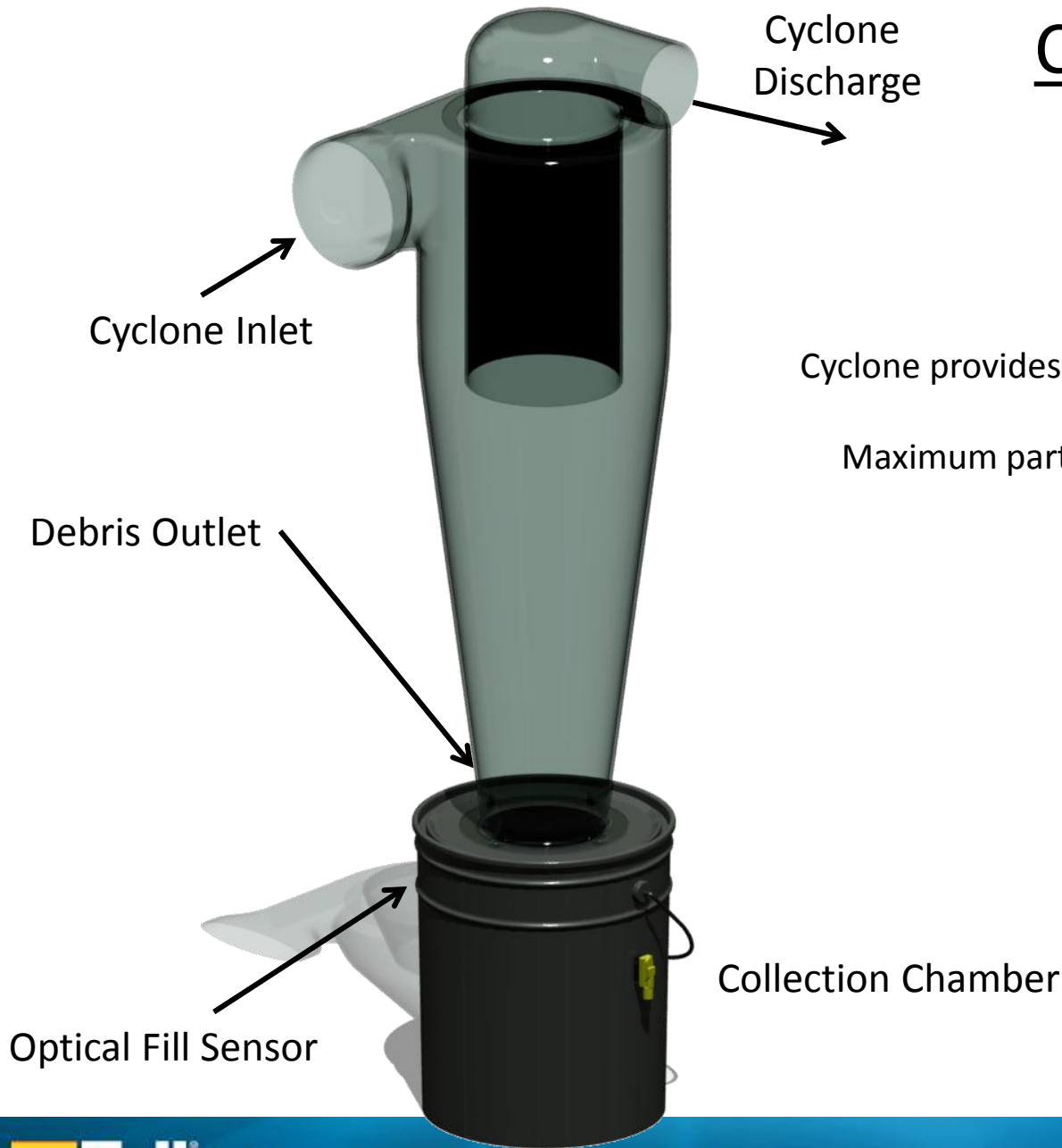
Steam Quality

Steam quality measured with a 2" high pressure opening

Steam Quality vs Pressure



Cyclone Inlet Filter



Cyclone provides filtration with stable pressure drop

Maximum particle passing through = 8 microns

Media Free Filter



The FUTURE



Fulton Ancillary Equipment

- Feedwater/Condensate Return Tanks
- Deaerator Tanks
- Surge Tanks
- Blowoff Separators/Tanks
- Chemical Feed Systems
- Water Softeners
- Carbon Filters
- RO/DI Systems



Vented Return Tank

- Sizes range from 10 HP to 500 HP
- Vertical tanks 10 – 100 HP
- Horizontal tanks 10 – 500 HP
- Standard tank is complete with tank, pump, and stand
- Standard turbine pump rated for 180 F
- Pumps upgradable to 250 F rating
 - (vented tanks 212 F maximum)

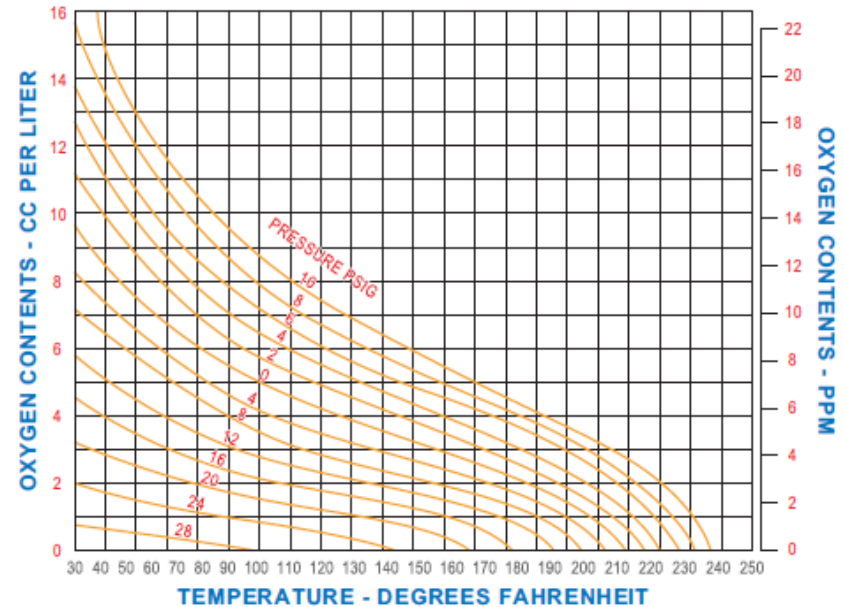


Fulton Ancillary Equipment

- Deaerator Tanks
 - Tray style: 316L stainless steel internal trays
 - Carbon steel or stainless steel tanks available
- Up to 600,000 lbs/hr (17,391 BHP) capacity available



Oxygen Solubility in Water at Various Pressures

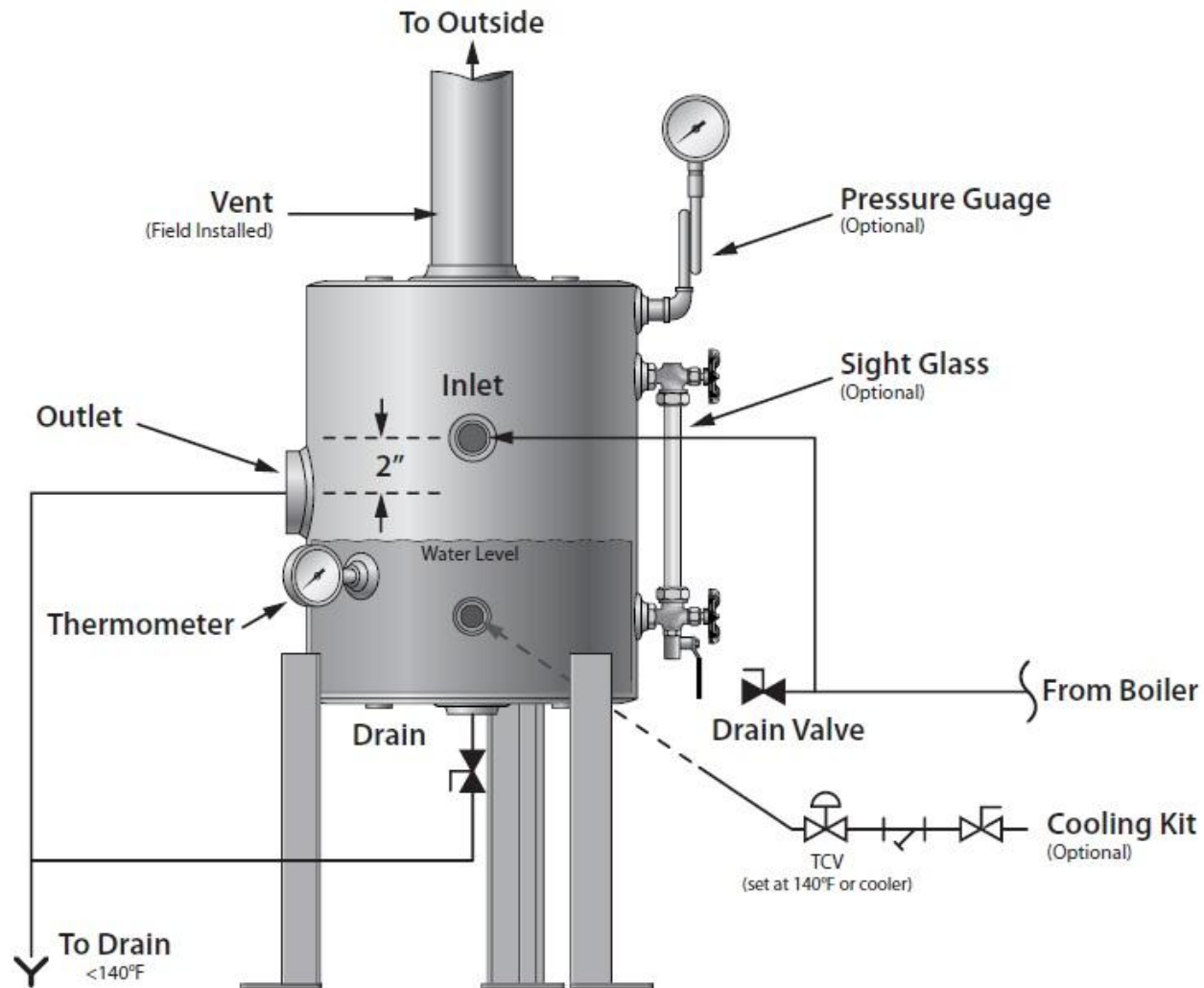


Blowdown Separators/Tanks

- ASME designed – Vented tank
 - 3”x 4” inspection handholes
 - Cooling kit is optional (140 deg. F)
 - Blowdown tank has larger tank volume for local codes
 - Blowdown separators are ASME designed to 75 PSIG
 - Blowdown tanks are ASME designed to 100 PSIG



Blowoff Separator Connections



Water Treatment Accessories

- Water Softener

- Standard sizes available up to 400 HP at 100% makeup
- Lowers hardness of makeup water to help prevent scaling in the boiler
- Fulton water softener is designed to provide continuous softened water utilizing a twin tank design
- Custom sizes available upon request



Water Treatment Accessories

- Carbon filters
 - Removes chlorine and sediment from makeup water
 - Installed upstream of water softeners



Water Treatment Accessories

- Chemical feed tanks
 - Inject chemicals into boiler system
 - Injection points include feedwater tank, boiler feed line, and steam header
 - Help to stabilize boiler water chemistry
 - Control can be manual, feedwater pump relay, or water meter



Fulton Engineered Systems

- Standard Skids
OR
- Completely Customizable Skids
 - Engineered per job

- Why Pre-pipe?
 - Single Source
 - **10 year PV warranty** with Fulton engineered systems





Fulton[®]

**RUGGED
ROBUST
RELIABLE**