

ARMSTRONG HEAT EXCHANGERS
Shell and Tubes for Steam

Please read the following write-up as it details the Standard construction, and the drawing nomenclature. This will help you access the correct drawing you need for your project.

Kindly familiarize yourself with the following section, as it will reduce the search time needed to download the required drawing.

Standard construction material for Armstrong Heat Exchangers is as listed below.

Carbon Steel shell, Carbon Steel tubesheet, Carbon Steel spacers, Carbon Steel rods, Carbon Steel hardware, Type #1 cast iron head, non-asbestos gaskets and 3/4 inch OD - 20 gauge - copper tubing.

This applies to the following models:

WS , WS – E , WSX , WSX – E , WR and WRX

Nomenclature

Model Designation:

- W** Water, and by-extension, Clear Liquid
- S** Steam on shell side
- E** Extended shell configuration
- X** Double-Wall Tubes
- R** Steam inside the tubes (reverse typical location)

Let's now define the composite lettering that designate the model:

WS Water (liquid) in the tubes,
Steam on the shell

**Steam inlet pressure not to exceed 30
psig**

For higher steam pressure use Extended shell

WS-E Water (liquid) in the tubes,
Steam on the Extended shell

**This design configuration allows
steam inlet pressure to 150 psig.**

Optional materials available:

- Shell** - 316 St. St.
- Tubesheet** - Brass and 316 St. St.
- Baffles & Tie Rods** - Brass and 316 St. St.

Heads ([please refer to drawing depicting all types](#))

Several head types are available. Listed below are the most common designs.

- **Type #1** cast bronze with NPT connections
- **Type #2** cast iron and cast bronze (Elbowed connections with FF flanges)
- **Type #3** in 316 St. St. (Milled flat head with NPT connections)

- **Type #4** in carbon steel and 316 St. St. (Fabricated head with RF flanges)

Tubing

(all tubes are 3/4 inch OD)

- 18 gauge copper
- 18 gauge Admiralty brass
- 18 gauge 316 St. St.
- 18 gauge 90/10 Cu-Ni
- 14 gauge carbon steel
- 12 gauge Double-Wall copper
- 12 gauge Double-Wall 90/10 Cu – Ni

The complete description under the heading Optional Materials available including the new head description and complete with tubing.

Drawings:

The following drawing designation was used throughout. Please read the description below.

We have used the following drawing generic designation:

Model	Size	No. of passes	type of head	E	shell side (larger connection)
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For example:

Model	Size	No. of passes	type of head	E	shell side (larger connection)
WS	08	4P	1	-	(4)
WSX	04	2P	1	-	(not available)

Each drawing number shows the heat exchanger drawing complete with a table covering all available tube lengths.

The following are examples of drawings with explanation:

WS HEATERS

WS - 14 - 2P - 1

- WS** - Water to steam heat exchanger
- 14** - 14" diameter of the shell
- 2P** - 2 pass
- 1** - Head type #1

WS – 12 - 4P - E - 4

- WS** - Water to steam heat exchanger
- 12** - 12" diameter of the shell
- 4P** - 4 pass
- E** - Extended shell design
- 4** - Head type #4

WS – 14 - 2P - E2 - (6)

- WS** - Water to steam heat exchanger
- 14** - 14" diameter of the shell
- 2P** - 2 pass
- E** - Extended shell design
- 2** - Head type #2
- (6)** - 6" Shell connection

WSX – 10 - 4P - 4 - (8)

- WS** - Water to steam heat exchanger
- X** - Double wall tubes (two tubesheets required)
- 10** - 10" diameter of the shell
- 4P** - 4 pass

WS – 8 - 2P - 2 - (6)

- 4 - Head type #4
- (8) - 8" Shell connection
- WS - Water to steam heat exchanger
- 8 - 8" diameter of the shell
- 2P - 2 pass
- 2 - Head type #2
- (6) - 6" Shell connection