

**Dry All**<sup>®</sup>

Full Range of HVAC&R Line Products



**Shell and Tube Heat Exchanger**

## Introduction

Dry All offered a wide range of Heat Exchangers (HE) like Co-Axial HE, Brazed Plate HE, etc which were in the capacity range of 0.5-12 TR. However, there was a requirement for Heat Exchangers in higher tonnage from our customers and the same was missing in our product portfolio.

To meet this additional demand for higher capacity heat exchangers, Dry All has partnered with ONDA from Italy to introduce 'Shell & Tube Type Heat Exchangers under the brand name Dry All-ONDA.

Shell & Tube Type heat exchangers are the oldest, most basic, and conventional type of heat exchangers. These heat exchangers have few unique advantages over other heat exchangers as listed below.

- Large surface area to volume ratio
- Easily replaceable parts
- Range of materials can be used depending on the application
- Assembly headers and tube sheets enable easy cleaning
- Proven and well-established design

### **About Dry All-ONDA Shell and Tube Heat Exchangers**

ONDA is one of the most renowned Italian company for Shell & Tube type heat exchangers, known for its high-quality product and wide range offered.

#### **Range Available:**

- Evaporators Range LPE, MPE, HPE, LSE, HSE, etc
- Condenser Range - M&SM, C, L, etc.

For the India market, Dry All currently offer 'C' Type Condensers and 'MPE' Type Evaporators in ready stock.

## 'C' Series Condensers

- The main applications of 'C' series Shell & tubes condensers are the condensation of refrigerant gas in the air conditioning and refrigeration plants, and heat recovery
- Suitable for all refrigerants, provided they are compatible with the materials used for construction.
- In standard conditions "C" series Shell & Tube condensers have a heat capacity between 10 kW and 2 MW.
- Customized versions are available as per specific customer needs, even at higher capacity.

### MATERIALS

The materials adopted for ONDA "C" series condensers are compliant with the requirements of the European pressure vessels directive. The standard construction of these condensers consists of the following materials:

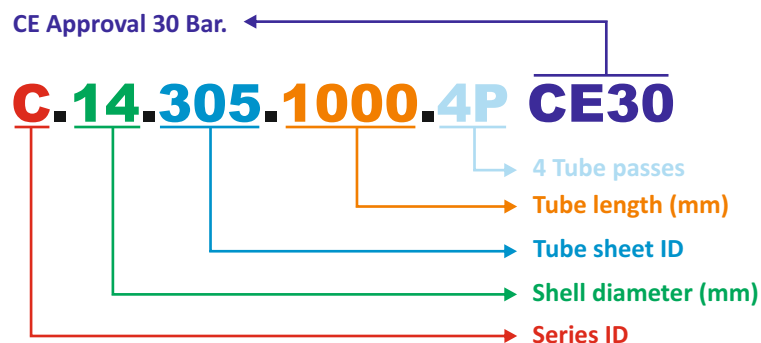
- Cast iron or carbon steel for headers
- Copper for exchanger tubes
- Carbon steel for tube-sheets, shell, support baffles and refrigerant c connections
- Rubber or asbestos free gaskets
- Alloys steel bolts and nuts

**Different versions with special materials are also available, as for example:**

- Stainless steel AISI 316L and CuNi 90/10 exchanger tubes
- Stainless steel AISI 316L shell
- Stainless steel AISI 316L, CuNi cladded or titanium cladded tube-sheets

### DESIGNATION

The "C" Series condensers are designated by an alphanumeric string, which allows the customer to easily recognize the diameter, the tubes length and number of passes, and so on. In the following table the meaning of the different alphanumeric characters is reported.

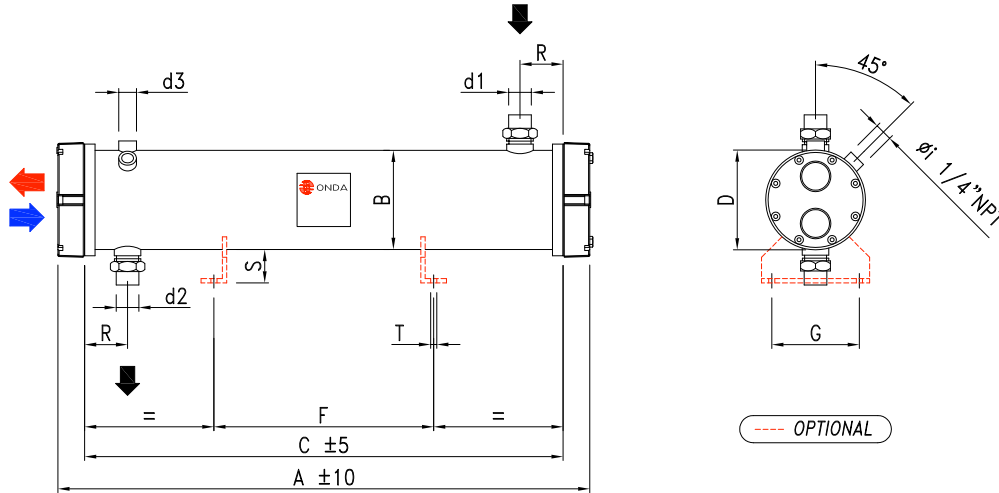


# Shell and Tube Heat Exchanger

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## Drawing



## Dimensional Data

Sr. No.	Model No.	Shell Side Volume (L)	Tube Side Volume (L)	Weight (kg)	Dimension in mm											
					A	B	C	D	F	G	R	S	T	d1	d2	d3
1	C.14.305.1000	9.5	4	35.3	1090	140	1000	180	650	160	100	56	12	ODS 22 $\phi_e$ 1-1/4"RTLK	ODS 18 $\phi_e$ 1-1/4"RTLK	$\phi_i$ 1/2 NPT
2	C 17.304.1200	17.9	6	46.6	1290	168	1200	180	850	160	100	58	12	ODS 28 $\phi_e$ 1-3/4"RTLK	ODS 28 $\phi_e$ 1-3/4"RTLK	$\phi_i$ 1/2 NPT
3	C.17.307.1200	15.1	8.4	49.7	1290	168	1200	180	850	160	100	58	12	ODS 28 $\phi_e$ 1-3/4"RTLK	ODS 22 $\phi_e$ 1-1/4"RTLK	$\phi_i$ 1/2"NPT
4	C 19.303.1200	20.8	10.8	68.8	1318	194	1200	230	700	220	100	66	12	ODS 42 $\phi_e$ 48.3	ODS 35 $\phi_e$ 1-3/4"RTLK	$\phi_i$ 1"NPT
5	C 19.304.1200	19.4	11.9	70	1318	194	1200	230	700	220	100	66	12	ODS 42 $\phi_e$ 48.3	ODS 35 $\phi_e$ 1-3/4"RTLK	$\phi_i$ 1"NPT

## Models Available & Details

Sr. No.	Model No.	Condenser Capacity		Flow rate	Pressure Drop	Passes
		kW	TR	m <sup>3</sup> /hr	kPa	Np
1	C.14.305.1000	34.4	9.78	5.96	31	4
2	C 17.304.1200	54.57	15.52	9.45	56	4
3	C.17.307.1200	75.69	21.52	13.11	55	4
4	C 19.303.1200	97.46	27.71	16.88	55	4
5	C 19.304.1200	107.54	30.58	18.62	54	4

### Nominal Working Condition

Refrigerant	R134a
Secondary Fluid	Water
Water inlet Temperature	30°C
Water outlet Temperature	35°C
Condensing Temperature	40°C
Subcooling	3 K
Fouling Factor	0.000043 m <sup>2</sup> K/W

### MPE Series Evaporators

- These are the medium pressure, dry expansion type evaporators used for water, liquid or brine cooling solutions in refrigeration plants and also for hot water production in heat pumps.
- Suitable with all HCFCs & HFCs, refrigerants
- Cooling capacity range, at specified standard condition starts at about 15kW and can go up to 1400 kW with 1 to 4 refrigerant circuits.
- The water connections standard position is vertical, but on request can be placed horizontally, at right (DX) or left(SX) side when facing the refrigerant header.
- Exchangers can also be ordered with removable tube bundle (FTE) when not supplied as standard feature.

### MATERIALS

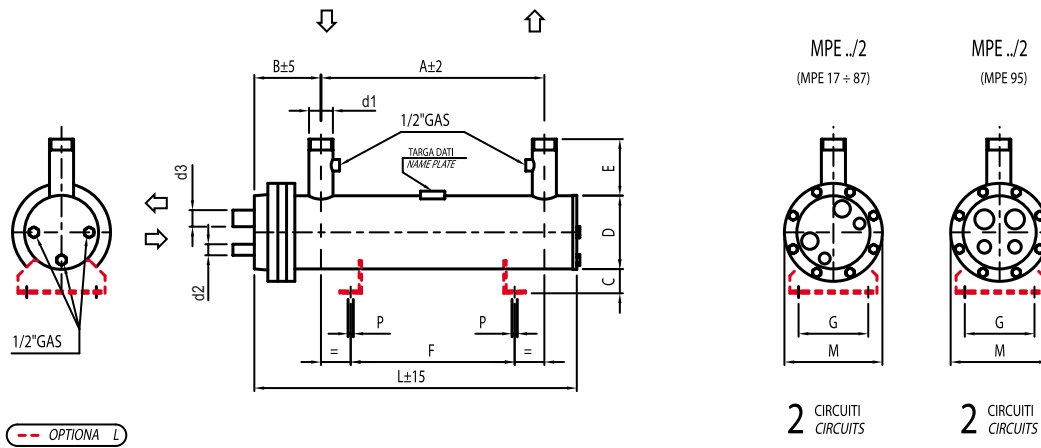
The quality of the materials used to manufacture Dry All -ONDA HE satisfies the requirements of the European Pressure Vessels Codes. The standard type construction of the Shell & Tube type heat exchangers consists of following materials.

- Header, tube sheet, shell, refrigerant and water connections- Carbon Steel
- Exchanger tubes - Copper
- Baffles - Brass or carbon steel for the baffles
- Bolts- Alloy Steel
- Asbestos free gaskets;

On request, above raw material can be changed with other materials compatible with our production facilities. Please contact our Technical Staff for nonstandard materials and cooling capacity.

# Shell and Tube Heat Exchanger

## Drawing



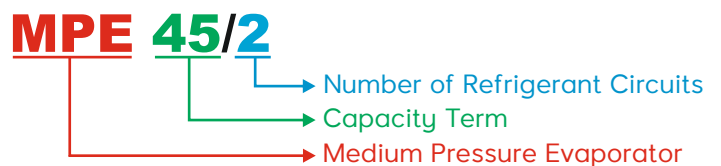
## Dimensional Data

Sr. No.	Model No.	A	B	C	D	E	F	G	I	M	P	d1	d2	d3
1	MPE 45/2	1190	153	56	141	130	950	160	1415	225	12	Ø 1-1/2"	ODS (RT) 22	ODS (RT) 35
2	MPE 55/2	1030	165	56	168	130	800	160	1280	225	12	Ø 2-1/2"	ODS (RT) 22	ODS (RT) 35
3	MPE 87/2	1380	165	56	168	130	1100	160	1630	225	12	Ø 2-1/2"	ODS (RT) 22	ODS (RT) 35
4	MPE 121/2	1530	177	66	194	130	1200	220	1805	270	12	Ø 3"	ODS (FL) 28	ODS (FL) 42
5	MPE 160/2	2030	177	66	194	130	1700	220	2305	270	12	Ø 3"	ODS (FL) 28	ODS (FL) 42
6	MPE 180/2	2000	192	66	219	150	1600	220	2305	270	12	DN 100	ODS (FL) 35	ODS (FL) 54

## Model Available & Details

Sr. No.	Model No.	Evaporator Capacity		Flow rate	Pressure Drop	Circuits
		kW	TR	m3/hr	kPa	
1	MPE 45/2	49.08	14.0	8.42	30	2
2	MPE 55/2	59.69	17.0	10.25	23	2
3	MPE 87/2	94.73	26.9	16.26	26	2
4	MPE 121/2	131.61	37.4	22.59	27	2
5	MPE 160/2	172.13	48.9	29.65	48	2
6	MPE 180/2	196.01	55.7	33.65	24	2

Nominal Working Condition	
Refrigerant	R407C
Secondary Fluid	Water
Water inlet Temperature	12°C
Water outlet Temperature	7°C
Evaporating emperature	2°C
Super Heat	5°C
Fouling Factor	0.000043 m²K/W



For more details please contact us on Email - [info@dryall.net](mailto:info@dryall.net)

Marketed by:



Full Range of HVAC&R Line Products

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