ONDA

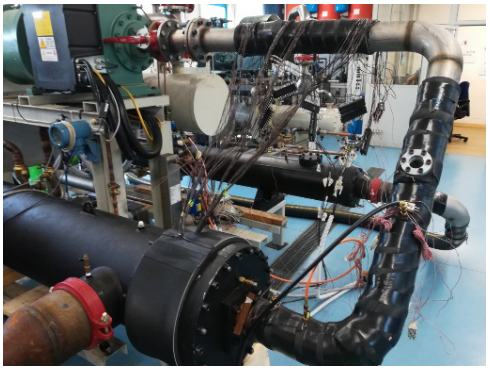
FSE

dry-expansion evaporator

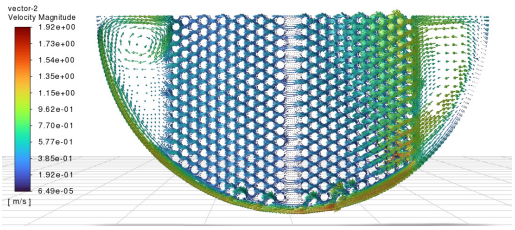
ADVANCED HEAT EXCHANGERS

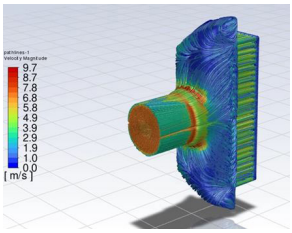
The new dry-expansion evaporator FSE has been developed to respond to Air Conditioning, Data Center and Process Cooling application demands. FSE employs a refrigerant distribution system which has been optimized to manage multiple refrigerants in order to respond to the new EU F-Gas regulation proposal with R290, R600a or with the traditional HFC, HFO low pressure refrigerants.

The FSE design has been optimized by R&D by using a fluid dynamic simulation analysis (CFD) and internal thermal design simulation tools. The efficiency of water side has been improved by reducing the pressure drop. CFD has also contributed to improve the refrigerant distribution and allowed to optimize distributors specific for Data Center applications.



We have confirmed the calculations with extensive test campaign in Onda's laboratory.



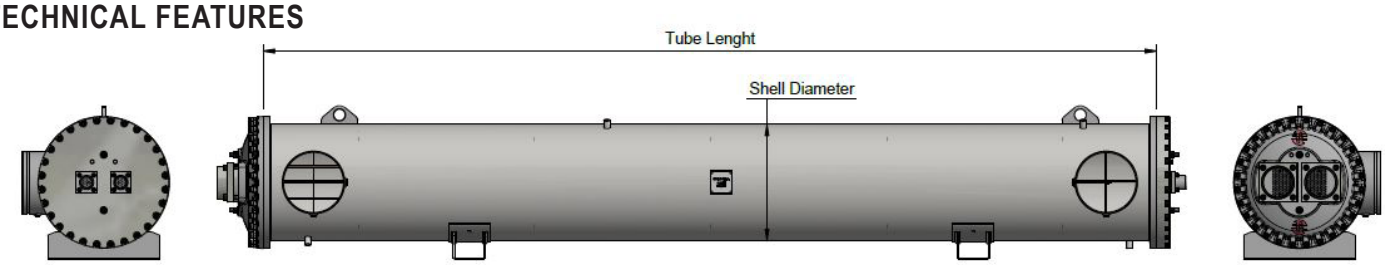


FSE dry-expansion evaporator

BENEFITS

- ***Reliability***: FSE thermal performance has been validated in Onda's laboratory with an extensive test campaign covering different operating conditions for Air Conditioning and Data Center applications. Capacity range from 300 – 1200 kW with R513A and R1234ze refrigerants.
- ***Thermal efficiency:*** +20% average vs previous SSE model
- ***Less refrigerant charge:*** -18% average vs previous SSE model
- ***Multiple distribution systems*** optimized for low and mid pressure refrigerants.

TECHNICAL FEATURES



			Tubes Length [mm]						
Dshell	**Circuits numb**	**Water nozzle***	**1800**	**2115**	**2750**	**3000**	**3300**	**3600**	**3900**
273	1,2	DN-125	X	X	X	X	X		
324	1,2,3	DN-150	X	X	X	X	X	X	
406	1,2,3,4	DN-150	X	X	X	X	X	X	X
508	2,3,4	DN-200	X	X	X		X	X	X
610	2,3,4	DN-250	X	X	X		X	X	X

(*) Dimension could change according to the operating conditions.

Water nozzle connections orientation from: Right, Left

Pressure vessel codes: PED/CE , ASME VIII Div 1, other codes are available on demand.

	Tube side	Shell side
PS [barg]	20	10
TS [°C]	-10/+90	-10/+90

MATERIALS – STANDARD CONFIGURATION

Major components	Material
Tubes	2 wall thickness available
Baffles	Plastic
Tube sheet	Carbon steel
Shell	Carbon steel
Headers	Carbon steel, cast iron

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