



# DTS HEAT EXCHANGERS



Sanitary  
flow  
equipment

# DTS heat exchangers

Since 1990 Aerre Inox has been designing and making, in line with USP 23 and FDA norms, a full range of stainless steel tube shaft sterile heat exchangers with double tube sheet (DTS) for use in the chemical and pharmaceutical industries.

## DESCRIPTION

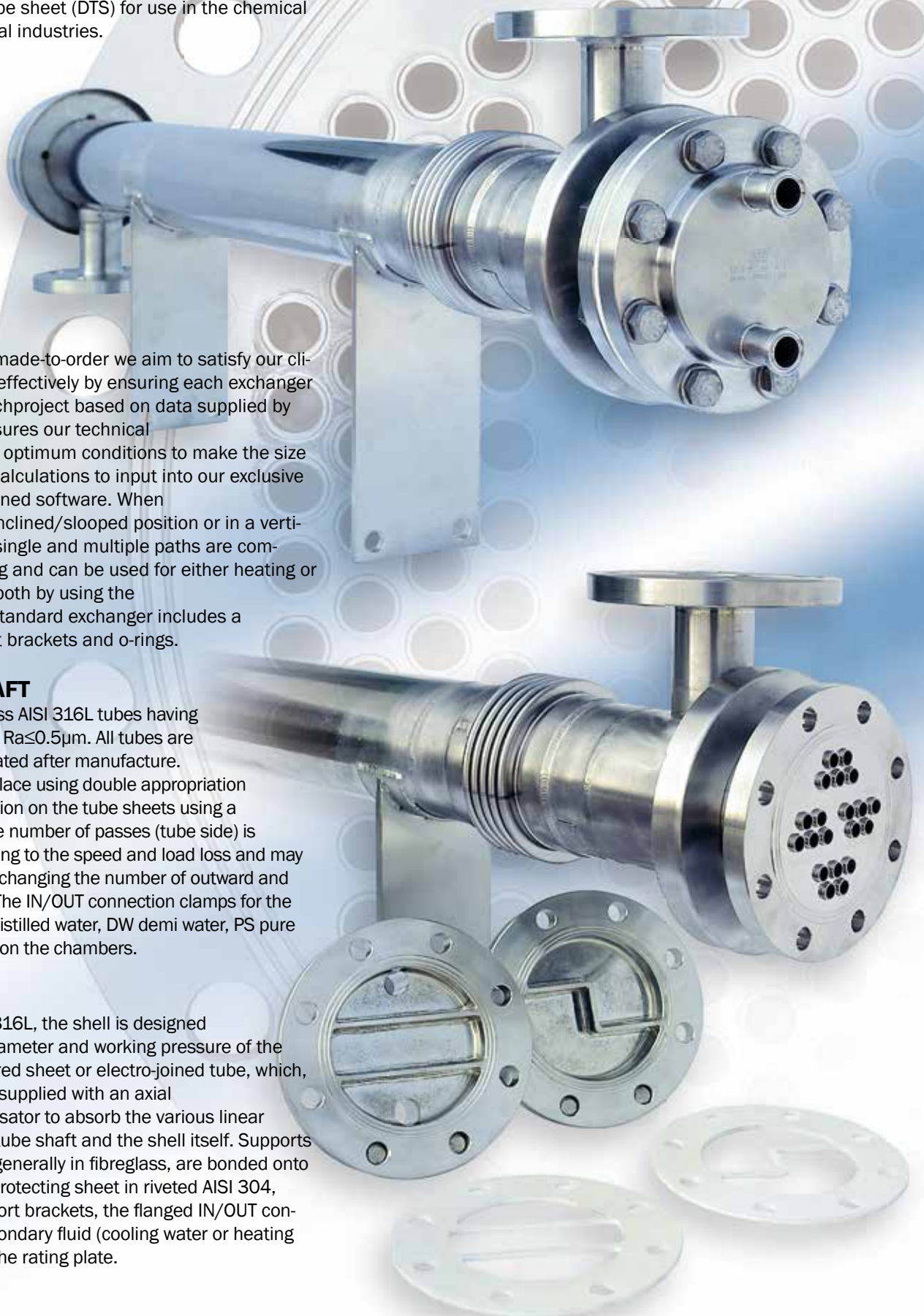
As this product is made-to-order we aim to satisfy our clients' needs more effectively by ensuring each exchanger is designed for each project based on data supplied by the client. This ensures our technical office works under optimum conditions to make the size and temperature calculations to input into our exclusive and purpose-designed software. When functioning in an inclined/sloped position or in a vertical position, both single and multiple paths are completely self-draining and can be used for either heating or cooling or indeed both by using the dual-control. The standard exchanger includes a insulation, support brackets and o-rings.

## THE TUBE SHAFT

Made from seamless AISI 316L tubes having an internal finish of  $Ra \leq 0.5 \mu\text{m}$ . All tubes are pickled and passivated after manufacture. Tubes are fixed in place using double appropriation mechanical expansion on the tube sheets using a triangular pitch. The number of passes (tube side) is established according to the speed and load loss and may vary from 1 to 8 by changing the number of outward and inward chambers. The IN/OUT connection clamps for the primary fluid (WFI distilled water, DW demi water, PS pure steam) are located on the chambers.

## THE SHELL,

also made in AISI 316L, the shell is designed according to the diameter and working pressure of the welded or calendered sheet or electro-joined tube, which, if required, can be supplied with an axial expansion compensator to absorb the various linear expansions of the tube shaft and the shell itself. Supports for the insulation, generally in fibreglass, are bonded onto the shell with the protecting sheet in riveted AISI 304, together with support brackets, the flanged IN/OUT connectors for the secondary fluid (cooling water or heating steam) as well as the rating plate.



# Laboratory Sample Condenser



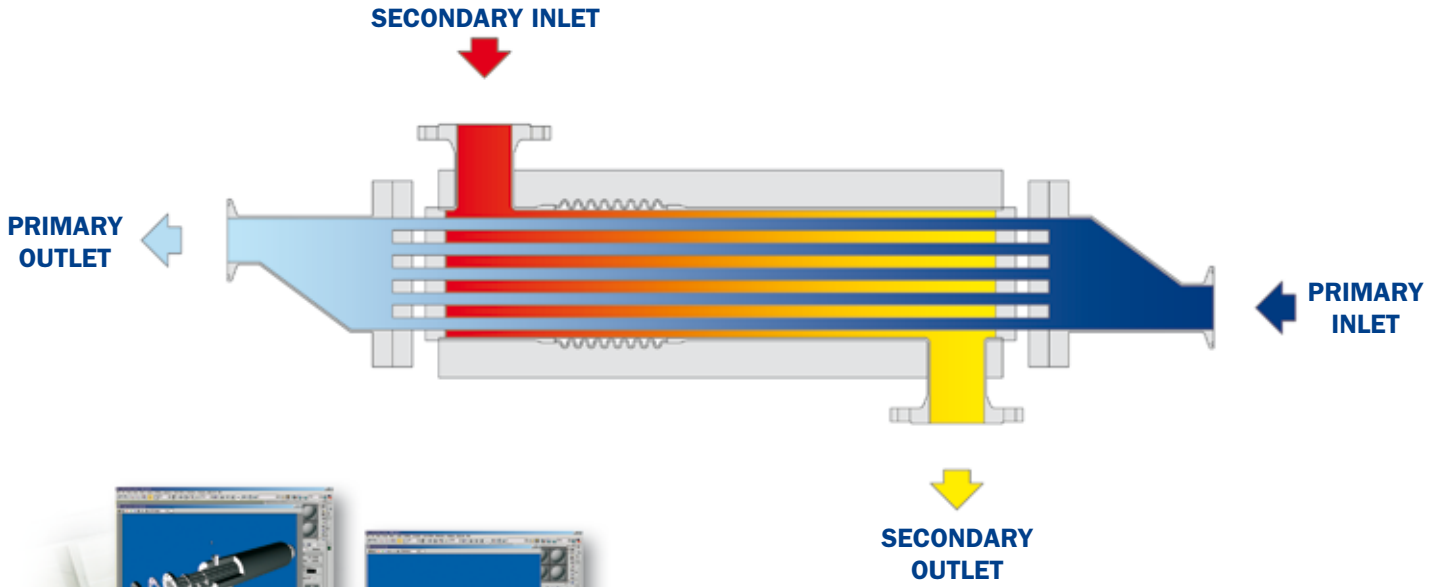
## Headers details

*This LSC unit ranges have been designed to allow clean steam and Water For Injection (WFI) samples to be taken quickly and easily whilst providing a sterile environment for testing and can be operated with mains water as the cooling medium. Availability of aseptic sample valve allow fine control of sample flow during testing. The capacity of the LSC range is dependent on the system pressure and temperature, together with the temperature and flow rate of the cooling water supply.*

## Clamped Headers



# Operating principles



## OPERATING PRINCIPLES

The main flow (WFI distilled water, DW demineralised water, PS pure steam) is sent along one or more of the tube shafts, while the secondary fluid (CW cooling water, or heating medium) is channelled countercurrent inside the shell. The double tube sheet operation prevents any mixing of the two processing fluids, since should the tube contract, the fluid inside of the shell will leak to atmosphere.




HEAT EXCHANGER DATA SHEET						
Client			Spec. No.:			
Location:			Project No.:			
ITEM No.:		No. REQD:				
EXCHANGER SIZE/TYPE		<b>SANITARY SHELL&amp;TUBE, DOUBLE TUBE SHEET</b>				
<input type="checkbox"/> Single pass		<input type="checkbox"/> Multiple passes		TOTAL SURFACE REQD m <sup>2</sup>		
MOUNTING: <input type="checkbox"/> Horizontal		<input type="checkbox"/> Vertical		<input type="checkbox"/> No Preference <input type="checkbox"/> Sloped		
OPERATING DATA						
		IN	TUBE SIDE (primary)	OUT	IN SHELL SIDE (secondary)	OUT
Fluid Name						
TOTAL Fluid Flowrate	kg/h					
Temperature	°C					
Inlet Pressure	barg/Allow Delta bar					
Heat Exchanged	kcal/h				Margin required on Flow / Surface	%
DESIGN DATA						
Design Pressure/Temperature		barg	@	°C	barg	@ °C
Cyclic Service						
Nozzles Size In / Out	DN					
Insulation Required	Rockwool or equivalent. Covering: AISI 304 rivetted sheet					
NECESSARY DATA EXAMPLE :						
<b>(A) IF INSTANTANEOUS:</b> THE EXCHANGER SHALL BE SIZED TO <input checked="" type="checkbox"/> HEAT UP / <input type="checkbox"/> COOL DOWN FROM [ 15°C ] TO [ 85°C ] A FLOW OF [ 15.000 kg/h ]						
<b>(B) IN RECYCLING:</b> THE EXCHANGER SHALL BE SIZED TO <input checked="" type="checkbox"/> HEAT UP / <input type="checkbox"/> COOL DOWN A MASS OF [ 1.000 kg ], FROM [ 15°C ] TO [ 85°C ] IN A TIME OF [ 1,50 h ] RECIRCULATED AT A FLOW OF [ 15.000 kg/h ]						



# *DTS heat exchangers*



*Thermal insulation cover completely welded*



*External tube sheet with tube bundle expanded and seal weld according to Asme-BPE Directive*



## **DOCUMENTATION AND CERTIFICATION**

Made in conformity with PED Directives. FDA and cGMP approved. Validation is included in the form of heat calculations, certificates for the ASTM 3.1B materials used, construction plans and surface finish readings, etc.



ASEPTIC SAMPLING VALVES



SANITARY SAMPLING VALVES



SANITARY SAMPLING BOTTLE



TANK BOTTOM ASEPTIC VALVE



SPRING CHECK VALVES



HIGH PURITY BALL VALVES



BUTTERFLY VALVES



DTS HEAT EXCHANGERS



SIGHT GLASS-FLOW INDICATOR



CLAMP FITTINGS



TANK CONNECTIONS



SILICONE HOSE & FITTINGS



MAGNETIC MIXER



ITT DIAPHRAGM VALVES



WASHING DEVICES



Sanitary flow equipment

AERRE INOX s.r.l.  
Via Gerola, 4  
I-26010 Fiesco (Cremona)  
Tel. +39 0374 370 828 Fax +39 0374 370 833  
www.aerreinox.it

Get the information you need and more at info@erreinox.it