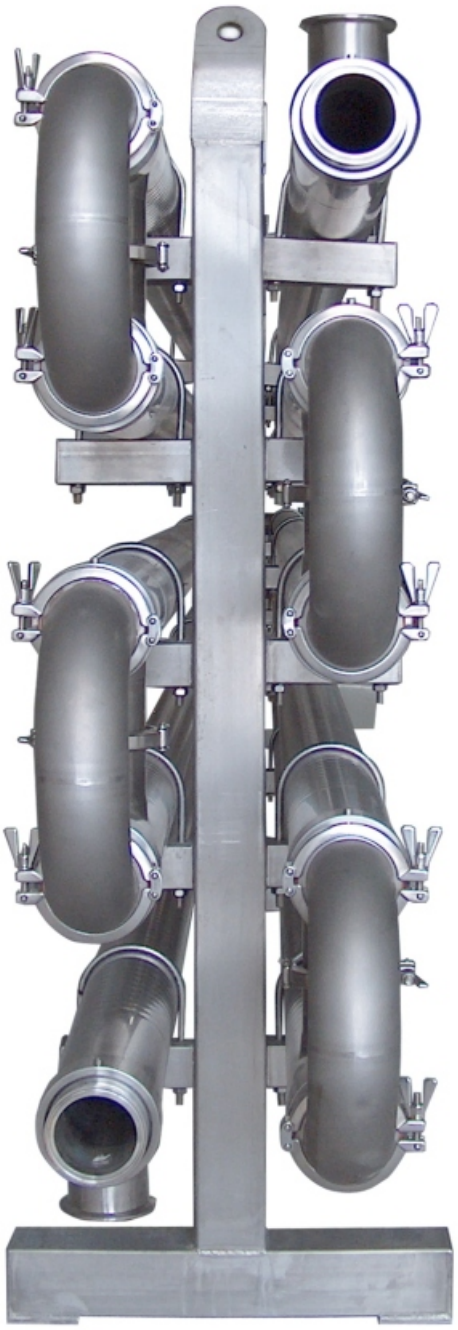
XTUBE® Monotube



Description

XTube® Monotube heat exchangers are constructed from stainless steel and are formed by having two concentric tubes, the inner tube being demountable from the outer tube. The fluid to be treated is normally passed through the corrugated inner tube and the service fluid, providing the source of cooling or heating, passes through the annulus formed by the two tubes.

This range is formed from units of different tube diameters chosen according to the flow rates of the working fluids. Corrugated tubes are used in order to significantly enhance the rate of heat transfer and thus minimise the size of heat exchanger required.

The fluid circulating through the inner tube (the product) and the fluid circulating through the annulus formed by the two tubes (the service fluid) are completely isolated from one another and cannot interleak, the heat being transferred via the tube wall of the inner tube. Leakage of the service fluid to atmosphere is prevented by a pair of elastomeric O ring seals at each end of the tube. One end of the inner tube is fixed to the outer tube assembly while the other end is free to expand and contract with the change of temperatures occurring in service, thus avoiding the potentially damaging stresses that occur in other types of fully welded heat exchangers.

When a specific application requires multiple units interconnected in either series or parallel flow regimes the necessary interconnecting manifolds, bends and support frame can be supplied for floor, wall or ceiling mounting.

All of our units are designed and manufactured according to the CE marking regulations contained in the European Pressure Directive (97/23/EC) and are CE marked when we are permitted to do so.

If the application or the clients own preference demands it, an equivalent range of all welded units is also available.

Applications

The XTube® Monotube heat exchangers can be used in the following and many other applications:

- Heating and cooling fluids containing particles and fibres etc.
- Heating and cooling sewage treatment plant sludge.
- Heating and cooling sauces and fruit or vegetable purées and pulps.
- Heat recovery from industrial effluents and dirty waste water.
- High temperature and pressure applications.

Materials of construction

All product wetted components (interior tube and bends etc.) are manufactured from AISI 316L stainless steel but for more aggressive fluids a range of Duplex stainless steels are also available.
The service side components are normally made from AISI 304 stainless steel but AISI 316L and Duplex steels may be used when required.
Areas not in contact with the working fluids are normally constructed from AISI 304 stainless steel.
Silicone rubber is normally used for the O ring seals and connection gaskets or seals but a wide range of alternative elastomers are available when specific applications require them.
Alternative materials can be offered for all wetted components on application.

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XTUBE® Monotube

Connections

To allow a rapid and flexible installation and easy inspection of the units the XTUBE® Monotube heat exchangers use ISO standard ferrule/clamp connections. If the matching ferrules, clamps gaskets are required by the client for installation purposes these can be supplied on request to allow connection to the clients' pipework system.

For special applications, or at the request of the client, flanges conforming to one of the international flange standards can be provided, rated for the operating pressures and temperatures of the unit.

Design Conditions

These will depend on the specific process and system requirements of the application but when not specified the standard design conditions for the XTube® Monotube heat exchangers are the following:

- Minimum and maximum allowable working temperatures: -40°C / +180°C
- Minimum and maximum allowable working pressures: 10 Bar(g)/Full vacuum

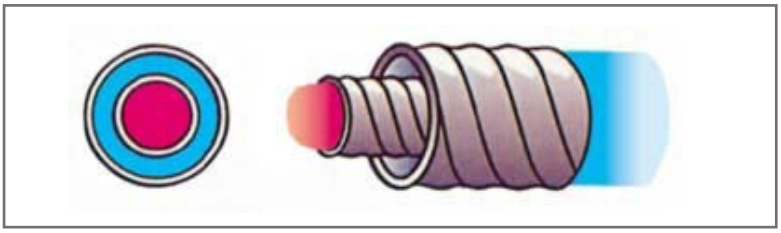
Higher pressures and temperatures are possible on request.

Standard dimensions

XTube® Monotube heat exchangers can be delivered in various lengths, the standard dimensions being approximately 1500 mm, 2000 mm, 3000 mm and 6000 mm.

The exterior tube diameters used are as follows: Ø 88.9 mm, 104.0 mm, 114.3 mm, 129.0 mm, 141.3 mm, 168.3 mm, 219.1 mm, 273.1 mm, 323.0 mm and 406.4 mm. The tube thickness used will depend on the design conditions for each application.

The diameters of the interior tube and its wall thickness will be chosen to meet the requirements of each application.



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XTUBE® MULTITUBE

Corrugated Tube Multitube Heat Exchanger

Description

The XTUBE® Multitube corrugated tube heat exchangers are all stainless steel units consisting of a number of corrugated tubes within a shell. This exchanger is very suitable for hygienic processes.

The process fluid flows through the inner corrugated tubes with the service fluid in the shell.

All the product channel including the seam welds have a surface roughness Ra ≤ 0.8 µm, which make this range of heat exchanger highly appropriate for all kinds of hygienic processing of foods such as pasteurisation, high temperature sterilization, aseptic processing, etc.

The tube side fluid is completely isolated from the shell side and leakage of the shell side fluid to the atmosphere is prevented by a pair of O-ring seals fitted at each end. Steam barriers are available on request.

One of the tubeplates is secured to the shell assembly in order to ensure positional stability while the other tubeplate is free to expand and contract as the metal temperatures vary, thus eliminating the damaging expansion stresses found in many fully welded designs.

Product side connections can be clamps (ISO) and threaded connections (DIN).

The units are all designed and manufactured in accordance with the requirements of the European Pressure Directive (97/23/EC) and are CE marked when appropriate.

When specific applications or customer preference dictates, all welded equivalent units are available.

Applications

The XTUBE® Multitube heat exchangers can be used in most applications involving:

- Hygienic applications to heat and cool liquids. Also liquids that contain fibres, pulp and small particulates.
- High temperature sterilisation of milk, juices, beverages, etc.
- Direct heat regeneration (product to product) in case of juices, beverages, etc.
- Heating and cooling cream, custard, etc.
- High temperature and pressure applications.

XTUBE® MULTITUBE

Corrugated Tube Multitube Heat Exchanger

Materials of construction

All tube side fluid wetted surfaces are AISI 316L stainless steel. Duplex steels are also available on request for handling corrosive media.

All shell side wetted surfaces are AISI 304 stainless steel.

Non-wetted surfaces are AISI 304 stainless steel.

O-ring seals and clamp seals are manufactured from elastomeric Silicone but alternative materials can be supplied when required for specific applications.

Alternative materials for both shell side and tube side wetted surfaces are available on request for specific applications.

Inner tube side surfaces normally have roughness values of Ra ≤ 0.8 µm, external surfaces have a matt or polished finish as demanded by the Customer.

Interface

To ensure complete ease and flexibility of installation and facilitate rapid cleaning they are fitted with ISO standard ferrules on all fluid connections with pipe diameters chosen to meet the application requirements.

Mating ferrules, seals and Vee clamps in various styles to suit working conditions can be supplied on request.

Design conditions

Subject to specific site conditions or code requirements the standard design conditions are as follows:

- Minimum/Maximum allowable working temperature: -40°C / +180°C (*)
- Minimum/Maximum allowable working pressure: Full vacuum / 10 Bar(g) (*)

(*) Attention: higher temperatures and pressures are also available on demand. Please contact us.

Standard dimensions

The XTUBE® Multitube heat exchangers can be supplied in lengths adjusted to suit the installation but the standard unit overall lengths are as follows: 1515, 2015, 3032 and 6032 mm.

The following shell diameters are standard, the thickness being chosen to suit the application and satisfy the design standard requirements: Ø 88.9, 104.0, 114.3, 129.0, 141.3, 168.3, 219.1, 273.1, 323.0 and 406.4 mm.

The shell side connection positions can be varied to suit the installation.

TAS POWER TRANSMISSION & PROCESS EQUIPMENT

XTUBE® Tripletube

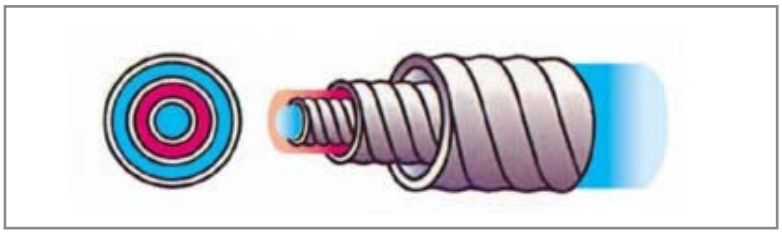
Description

XTube® Tripletube heat exchangers are manufactured entirely from stainless steel and consist of three or four concentric corrugated tubes.

The fluid to be treated (the product) flows through a kind of sandwich as it is heated (or cooled) from the outside and the inside annulus made by concentric tubes, while the product flows in the middle annulus formed by the 2nd and 3rd tubes. The range is formed by units with different diameters to meet from low to high process flow rates. Tubes are corrugated to boost heat transfer and to minimize fouling.

All of our units are designed and manufactured according to the CE marking regulations contained in the European Pressure Directive (97/23/EC) and are CE marked when we are permitted to do so.

If the application or the clients own preference demands it, an equivalent range of all welded units is also available.



Applications

XTube® Tripletube heat exchangers are very suitable for the following applications:

- Heating and cooling fluids of average and high viscosity, even including for small fibres and particles.
- Heating and cooling of tomato concentrate.
- Heating and cooling banana paste.
- High temperature and pressure applications.

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XTUBE® Tripletube

Connections

To allow a rapid and flexible installation and easy inspection of the units the XTUBE® Tripletube heat exchangers use ISO standard ferrule/clamp connections. If the matching ferrules, clamps gaskets are required by the client for installation purposes these can be supplied on request to allow connection to the clients' pipe work system.

Materials of construction

All product wetted components (interior tube and bends etc.) are manufactured from AISI 316L stainless steel but for more aggressive fluids a range of Duplex stainless steels are also available.

The service side components are normally made from AISI 304 stainless steel but AISI 316L and Duplex steels may be used when required.

Areas not in contact with the working fluids are normally constructed from AISI 304 stainless steel.

Silicone rubber is used for the O ring seals and connection gaskets or seals but a wide range of alternative elastomers are available when specific applications require them.

Alternative materials can be offered for all wetted components on application.

Design Conditions

The standard design conditions for the XTube® Tripletube heat exchangers are the following:

- Minimum and maximum allowable working temperatures: -40°C / +180°C
- Minimum and maximum allowable working pressures: 25 Bar(g)/Full vacuum

Higher pressures and temperatures are possible on request.

Standard dimensions

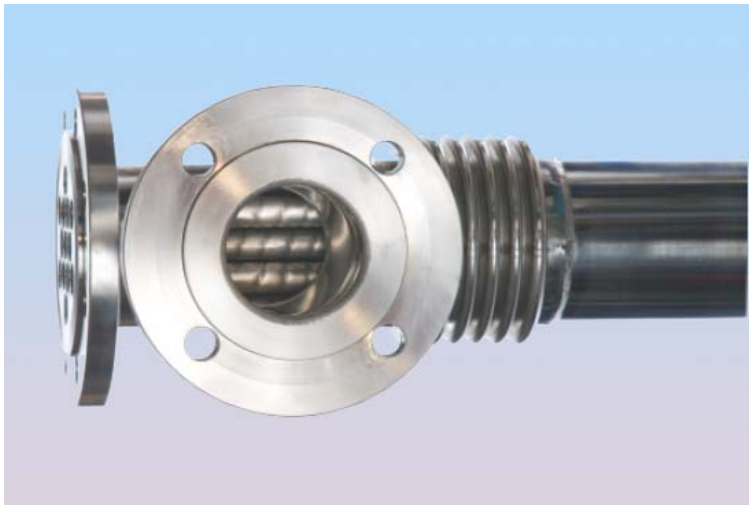
XTube® Tripletube heat exchangers can be delivered in various lengths, the standard dimensions being approximately 1500 mm, 2000 mm, 3000 mm and 6000 mm.

The exterior tube diameters used are as follows: Ø 88.9 mm, 104.0 mm, 114.3 mm, 129.0 mm, 141.3 mm and 168.3 mm. The tube thickness used will depend on the design conditions for each application.

The diameters of the interior tubes and their wall thickness will be chosen to meet the requirements of each application.

XTUBE® B-Type

Corrugated Tube Multitube Heat Exchanger



Description

The XTUBE® B-Type corrugated tube multitube heat exchangers are all stainless steel units consisting of a number of corrugated tubes within a shell. The process fluid flows through the inner corrugated tubes with the service fluid in the shell.

Units can be supplied either of all welded construction with expansion bellows in the shell, or with a removable inner tube bundle.

The units can be fitted with a range of tube diameters all of which are given a shallow spiral corrugation designed to significantly enhance the rate of heat transfer.

For specific applications or when customer preference dictates, all welded heat exchanger units are available incorporating flanged connections on both shell side and tube side.

When the unit is subject to frequent daily start-ups and shut-downs, B-Types with dismountable tube bundle are preferred. In this case the tube side fluid is completely isolated from the shell side and leakage of the shell side fluid to the atmosphere is prevented by a pair of O-ring seals fitted at each end. One of the tubeplates is secured to the shell assembly in order to ensure positional stability while the other tubeplate is free to expand and contract as the metal temperatures vary, thus eliminating the damaging expansion stresses found in many fully welded designs.

The units are all designed and manufactured in accordance with the requirements of the European Pressure Directive (97/23/EC) and are CE marked when appropriate.

Applications

The XTUBE® B-Type units can be used in most applications involving:

- Steam heating of water.
- Heating or cooling process liquids and gases. Liquids can contain fibres, small particulates and slurries.
- Water to water heat recovery.
- Vapour condensers
- CIP solution heaters
- Exhaust gas cooling.
- High temperature and pressure applications.

XTUBE® B-Type

Corrugated Tube Multitube Heat Exchanger

Materials of construction

All tube side fluid wetted surfaces are AISI 316L stainless steel. Duplex steels are also available on request for handling corrosive media.

All shell side wetted surfaces are AISI 304 stainless steel.

Expansion bellows are made out of AISI 316. Non-wetted surfaces are AISI 304 stainless steel.

In case of dismountable B-Type units, the O-ring seals and clamp seals are normally manufactured from elastomeric Silicone but alternative materials can be supplied when required for specific applications.

Alternative materials for both shell side and tube side wetted surfaces are available on request for specific applications.
Inner tube side surfaces normally have roughness values Ra ≤ 0.8 µm, external surfaces have a matt finish.

Interface

All welded B-Type multitube heat exchangers are fitted with DIN flanges both on tubes and shell sides. When appropriate for specific customer's demands other flanges as per International Standards can be supplied.

In case of dismountable B-Type heat exchangers and to ensure complete ease and flexibility of installation and facilitate rapid cleaning they are fitted with ISO standard ferrules on all fluid connections with pipe diameters chosen to meet the application requirements.

Mating ferrules, seals and Vee clamps in various styles to suit working conditions can be supplied on request.

Design conditions

Subject to specific site conditions or code requirements the standard design conditions for the XTUBE® B-Type units are as follows:

- Minimum/Maximum allowable working temperature: -40°C / +180°C (*)
- Minimum/Maximum allowable working pressure: Full vacuum / 10 Bar(g) (*)

(*) Attention: higher temperatures and pressures are also available on demand. Please contact us.

Standard dimensions

The XTUBE® B-Type heat exchangers can be supplied in lengths adjusted to suit the installation but the standard unit overall lengths are as follows: 1515, 2015, 3032 and 6032 mm.
The following shell diameters are standard, the thickness being chosen to suit the application and satisfy the design standard requirements: Ø 88.9, 104.0, 114.3, 129.0, 141.3, 168.3, 219.1, 273.1, 323.0 and 406.4 mm.
The shell side connection positions can be varied to suit the installation.

XTUBE® Boxer

Description

The Xtube Boxer® heat exchangers are a new design of Scraped Surface heat exchanger which is being patented by XLG.

The heat exchanger incorporates a tube bundle with heating or cooling fluid passing through the interior of the tubes (the Service fluid) with the fluid to be processed (the Product) passing over the external surfaces of the tube bundle.

The heat exchangers are fitted with an electric motor and gearbox which drive a rotor attached to a series of scraping elements. Movement of the rotor displaces the scraping elements along the length of the tube bundle, which results in the outer surfaces of the tubes being cleaned of any fouling deposit while the Product fluid is agitated and mixed. The movement maintains the outer tube surfaces clean and improves the rate of heat transfer into or out of the Product

Various types of scraping elements are available, chosen to enhance the rate of heat transfer with highly viscous fluids or to provide efficient cleaning of the outer tube surfaces for highly fouling fluids.

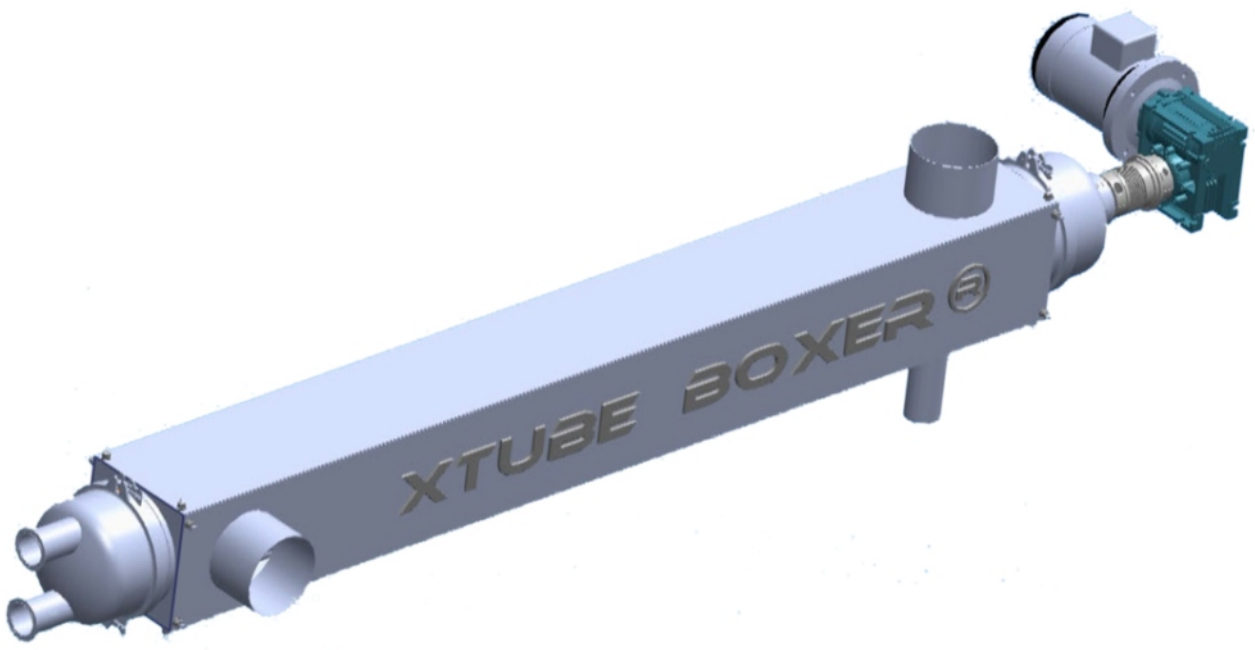
The range includes units with various tube sizes and tube counts which can be adapted to match the different flow rates and fluids encountered in service.

All of the heat exchangers comply with the requirements of the European Pressure Equipment Directive 97/23/EC, the Electromagnetic Compatibility Directive 2004/108/EC, the Low Voltage Regulations 2006/95/EC and the Machinery Directive 98/37/EC.

The units are CE marked as required by the various Directives.

Applications

- Condensation of vapours contaminated with fouling deposits
- Heat recovery from mixtures of gases and vapours contaminated with fouling deposits
- Heating and cooling high viscosity products in industrial, non-hygienic, applications
- Evaporation/concentration of liquids and liquid mixtures containing fouling deposits



XTUBE® Boxer

Connections

To facilitate ease and flexibility of installation the Xtube Boxer® heat exchangers use ISO standard clamps on all connections.

If required we can include the ferrules, seals and pressure rated clamps in our supply to allow the installer to match to his fluid pipework to and from the heat exchanger.

Materials of construction

The tubes and all other product wetted surfaces, with the exception of the scraping elements, are manufactured from AISI 316L Austenitic Stainless Steel. The scraping elements are manufactured from different combinations of stainless steel, copper nickel and plastic materials (PEEK amongst others) according to the application. When highly corrosive fluids are being processed various grades of Super Austenitic (Duplex) stainless steel tubes can be used

Non-wetted parts of the heat exchanger are manufactured from AISI 304 stainless steel, proprietary motor drives and gearboxes are purchased from leading specialists in their field.

Design Conditions

Subject to the specific requirements of any particular application or requirement to use a specific Design Code, our standard conditions of design for the Xtube Boxer® heat exchangers are as follows:

- Minimum/maximum temperature permitted -40°C/+400°C
- Minimum/maximum allowed pressures: Full vacuum/10 Bar(g)

Higher temperatures and pressures are also possible subject to specific design checks

Standard dimensions

The Xtube Boxer® heat exchangers can be delivered in various lengths, the standard units using tubes of either 3000 mm or 6000 mm.

The various models in the standard range have heat transfer surfaces varying from 10 up to 60 m².

The heat exchangers can work mounted either horizontally or vertically depending on the requirements of the process and the installation.