



akvia
group[®]

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About Us

Akvia Group Company Ltd. based in Turkey and has widened the spectrum of its services and products over the past years with the support of our local and global partners to better cater to the emerging needs of Industrial, Gas & Oil field world-wide.

Akvia Industrial Technologies

Akvia Industrial Tech. provides exact solutions through our products for all kind of requirements of Mining Industry, Power Plants, Chemistry Plant Project, Steel Plant Project, Oil & Gas Plants and Fertilizer Industry by our professional engineering team with right products, immediate response, technical support and competitive prices.

You can find all type of technical, mechanical and industrial products beside automation systems. Akvia Industrial Tech. supplies origin of USA, Europe, Turkey and South Korea products in international standards which are required in your facilities.

We offer right products according to your demand are referred by our esteemed clients.

Each product has technical data sheet in all our offers and all are ready to submit in technical proposal stage upon your request.

Quality Policy

Primarily occupational safety

Reliability

High sense of responsibility

Awareness of responsibility towards customers

Punctual delivery

Teamwork and communication

Compatibility with current and evolving technology



www.akviagroup.com

At Akvia, quality is all-encompassing and applies to everything we do. Quality is a common interest and an important factor in our success one that guarantees satisfied customers. Akvia's quality policy is a commitment to our customers and other interest groups. Making the Quality Policy an integral aspect of our practical, everyday work is the continual challenge of quality management. We all both management and employees alike must be committed in order to succeed.

Vision

To grow by making a difference based on clearly set values inspired by dreams; to multiply our power and preserve our good name.

Mission

To come up with solutions specific to present and future needs & requirements of the companies we move together; to carry our company into future by sticking loyal to our core values.

Core Values of Akvia:

- To pay particular attention to offer high quality services to companies
- To fully preserve and protect company benefits
- To encourage our people to adopt principles of quality, justice and loyalty
- To respect traditions and be open-minded

Mr. Serhat YILMAZ

Managing Director

Usage of Heat Exchangers



Heat exchangers are one of the most important devices of mechanical systems in modern society. The shell and tube heat exchangers are a very common and logical process solution for heating and cooling liquids and gasses to required temperatures in specific time periods. The shell and tube heat exchangers are most common type of heat exchangers which are widely used in oil refineries and large chemical process plants and are optimal for high pressure and temperature applications. The shell and tube heat exchangers are used to transfer heat between two or more fluids, between a solid surface and a fluid at different temperatures and in thermal contact. It basically consists of a shell with a bundle of tubes inside. One of the fluids flows through a bundle of tubes enclosed by a shell. The other fluid is forced through the shell and it flows over the outside surface of the tubes.

HOW WE WORK!

We design and manufacture the shell and tube heat exchangers to ASME (American Society of Mechanical Engineers) code, TEMA (Tubular Equipment Manufacturers Association) standards and to our client's individual specifications.

»» ADVANTAGES SHELL AND TUBE H.E.X.

- Can be used in systems with very high operating temperatures and pressures.
- Pressure drop across the tube side is less
- Since pressure test is easy, tube leaks are easily located and plugged.
- Using sacrificial anodes protects the whole cooling system against corrosion
- Large ratio of heat transfer to volume and weight.
- Easy to construct and mechanically robust.
- Maintenance and repairs are easy.
- There is no size limitation.



99%+

Project Design Success

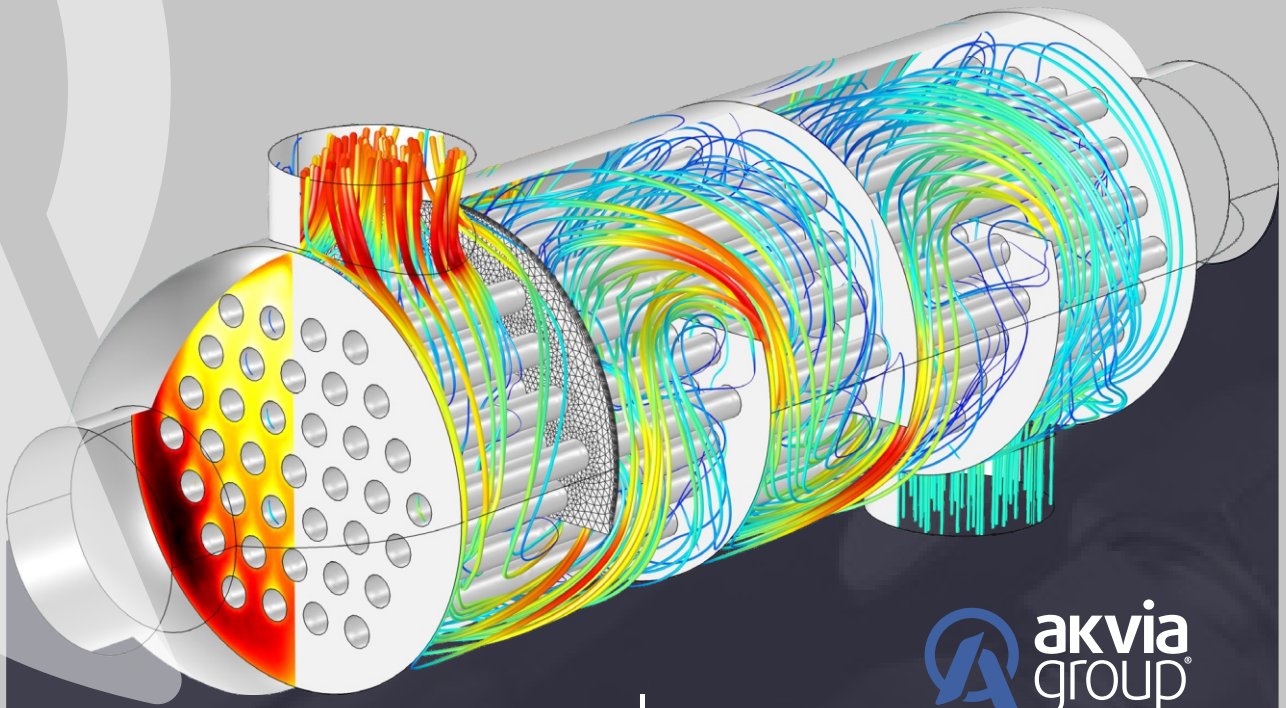
Quality has always been the hallmark of our products.

We manufacture shell and tube heat exchangers for a wide range of applications. The shell and tube heat exchangers are designed to satisfy the rigid requirements of the toughest industries, including:

USAGE AREAS

Renewable energies
Power plants
Oil and petroleum
Petrochemical
Utility
Chemical
Steel/metals
Food & beverage



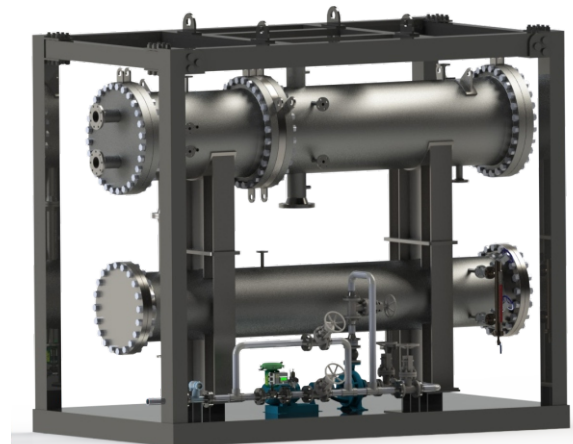
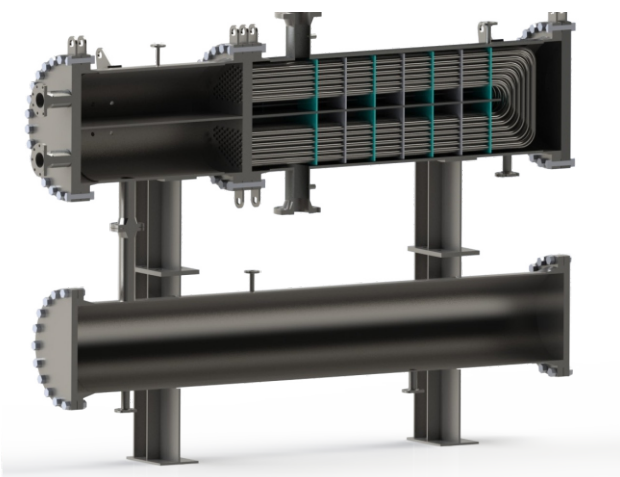


DESIGN

Energy conservation is crucial for the development of world economy. Using energy more efficiently is the most effective precaution for saving energy. To this respect, our team work continuously to be efficiency-driven heat exchanger manufacturer. Creating innovative solutions for complex applications and problems has always been one of our greatest strengths. We are ready to take on all technical challenges with you to deliver the world's most efficient and reliable heat exchanger.

TECHNOLOGY

Some specific softwares are generally used by technical people while designing the shell and tube heat exchangers. However, a good understanding of the underlying principles of exchanger design is needed to use this software effectively. Our thermodynamic and mechanic team are highly skilled engineers who are experienced, know working principles behind the related design software. We develop the most cost effective shell and tube heat exchanger possible for our client's specific requirements.



DESIGN

We design and manufacture the shell and tube heat exchangers to ASME (American Society of Mechanical Engineers) code, TEMA (Tubular Equipment Manufacturers Association) standards and to our client's individual specifications.

Thermal design is carried out to meet customer service requirements taking care of the following Constrains; space limitations, fouling from operating fluids, pressure drop limitations, fluid induced vibrations, cost effective optimum design, etc.

DIRECTOR STATEMENT

MATERIAL OF CONSTRUCTION

Stainless steel	Aluminum
Carbon steel	Aluminum Bronze
Copper	Inconel



WE ARE DIFFERENT FROM OTHERS

QUALITY ASSURANCE

Quality assurance: Products are backed up by comprehensive technical documentation for quality and safety, including:

Material Certification

Certified Welding Inspection

Non-Destructive Testing Reports

Third Party Inspection Reports

Leak Testing

Pressure Testing

Operating and Maintenance Instructions



TEMA DESIGNATION OF SHELL AND TUBE HEAT EXCHANGER

The shell-and-tube heat exchangers are widely used type of heat exchanger in all kind of industrial applications especially refineries, power plants and oil & gas industry. They are called "workhorse" of industrial heat transfer. TEMA "Tubular Exchanger Manufacturers Association" is an association of manufacturers of shell and tube heat exchangers. Who have been pioneers in the research and is responsible to developments of tubular heat exchanger. The association has published standards that contain design and manufacturing criteria for shell-and-tube heat exchanger. These standards are performed a whole range of industries throughout the world.

TEMA standards are divided into three major classes as an industrial service below;

1. TEMA C - General Service
2. TEMA B - Chemical Service
3. TEMA R - Refinery Service

TEMA standards classify shell-and-tube heat exchanger design as three significant components as following;

1. The Front End
2. Shell
3. The Rear End



Each of these components are identified by alphabetic character. A heat exchanger is defined with three letters which represent each type of components respectively the front end, shell and the rear end like CFU, AES, BEM etc. TEMA contains five major types front ends, seven types of shells and eight types of rear heads. The heat exchanger nomenclature as per TEMA is demonstrated in Figure 1.

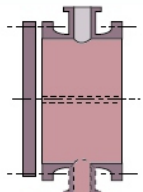
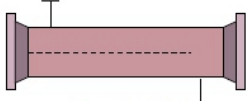
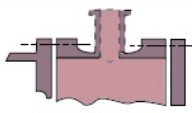
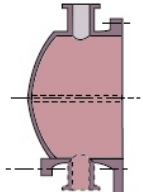
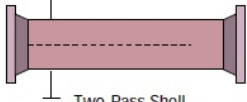
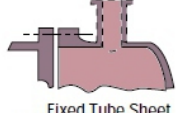
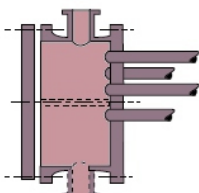
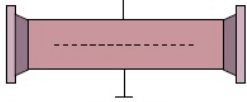
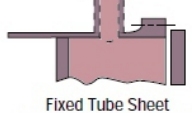
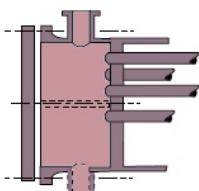
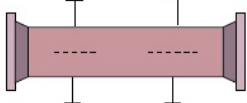
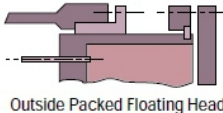
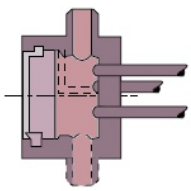
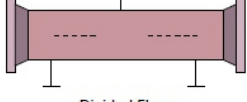
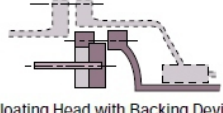
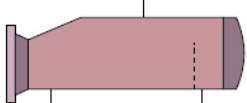
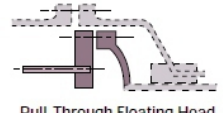
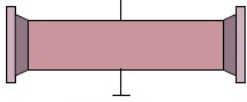
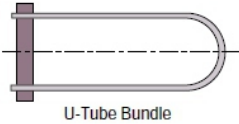
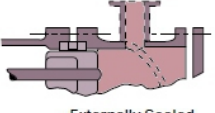
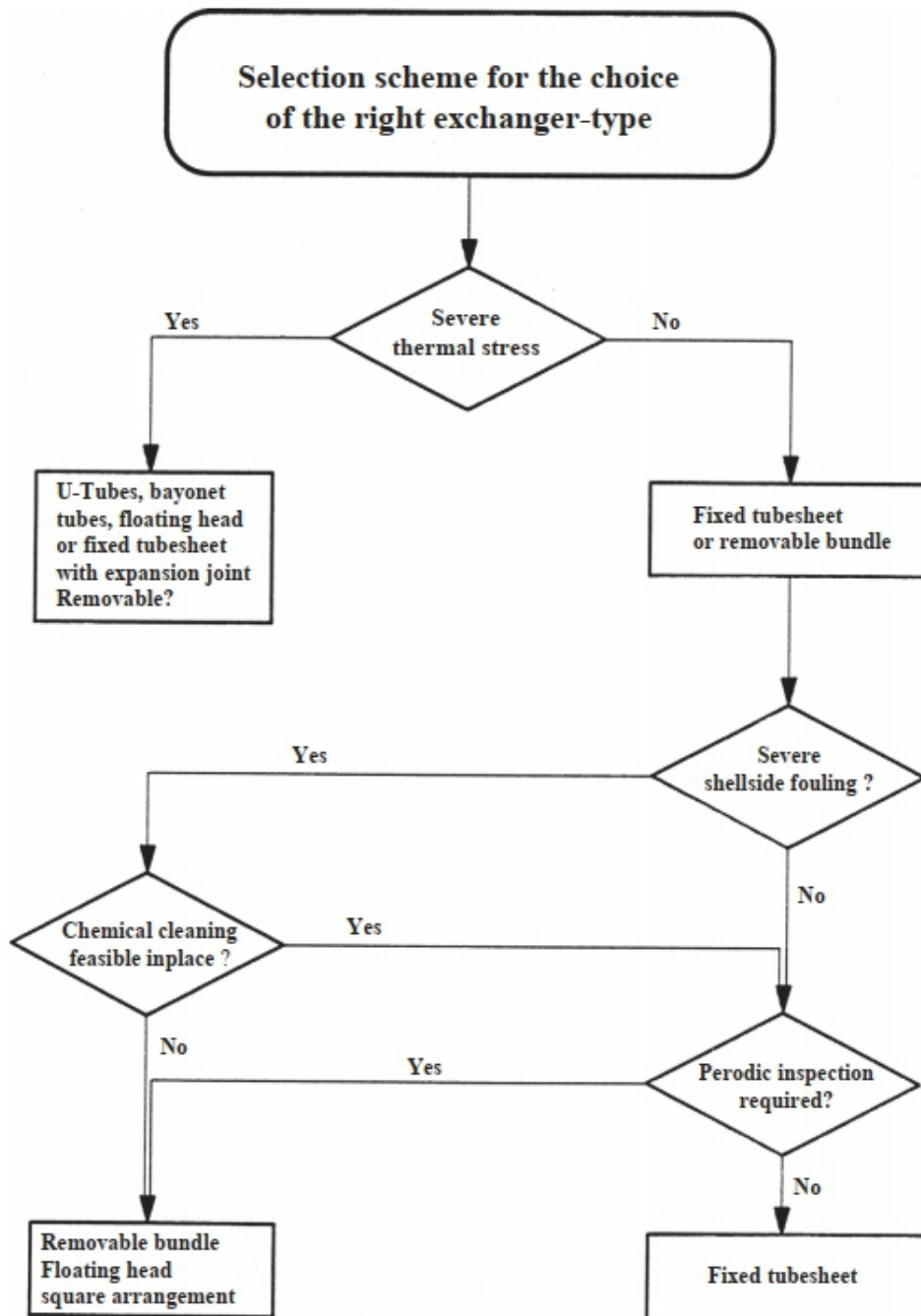
Stationary Head Types	Shell Types	Rear Head Types
<p>A</p>  <p>Removable Channel and Cover</p>	<p>E</p>  <p>One-Pass Shell</p>	<p>L</p>  <p>Fixed Tube Sheet Like "A" Stationary Head</p>
<p>B</p>  <p>Bonnet (Integral Cover)</p>	<p>F</p>  <p>Two-Pass Shell with Longitudinal Baffle</p>	<p>M</p>  <p>Fixed Tube Sheet Like "B" Stationary Head</p>
<p>C</p>  <p>Integral With Tubesheet Removable Cover</p>	<p>G</p>  <p>Split Flow</p>	<p>N</p>  <p>Fixed Tube Sheet Like "C" Stationary Head</p>
<p>N</p>  <p>Channel Integral With Tubesheet and Removable Cover</p>	<p>H</p>  <p>Double Split Flow</p>	<p>P</p>  <p>Outside Packed Floating Head</p>
<p>D</p>  <p>Special High-Pressure Closures</p>	<p>J</p>  <p>Divided Flow</p>	<p>S</p>  <p>Floating Head with Backing Device</p>
	<p>K</p>  <p>Kettle-Type Reboiler</p>	<p>T</p>  <p>Pull-Through Floating Head</p>
	<p>X</p>  <p>Cross Flow</p>	<p>U</p>  <p>U-Tube Bundle</p>
		<p>W</p>  <p>Externally Sealed Floating Tubesheet</p>

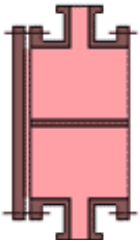
Figure 1: Designation for heat exchanger components (Standards of Tubular Exchanger Manufacturers Association, Inc., 9th ed., 2007.)

For instance, for TEMA type CFU, the first letter "C" refers to front end type which corresponds to "integral with tube sheet removable cover, the second letter "F" refers to shell type which corresponds to "two-pass shell with longitudinal baffle", the last letter "U" refers to rear end which corresponds to "U-tube Bundle".

SELECTION CRITERIA OF TEMA TYPE

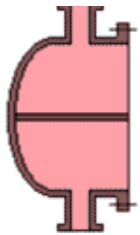


FRONT HEAD TYPE



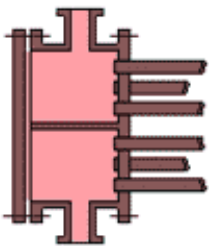
A TYPE

- The most common type of header
- Two flange joints
- Easy to maintenance and replace
- Suitable for cleaning inside of tubing
- High risk of leakage due to two seals



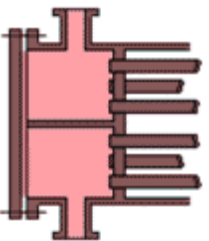
B TYPE

- One end is flanged, other one is welded in semi-elliptical head
- High pressure duties compare to A-Type
- Clean tubeside fluid is recommended



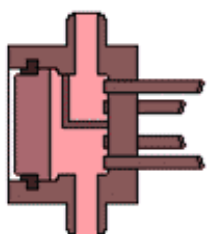
C TYPE

- One end is flanged, other one is welded in semi-elliptical head
- High pressure duties compare to A-Type
- Clean tubeside fluid is recommended
- One end is flanged while other end is welded to tubesheet and extended to form a flange
- Hard to replace and repair
- Convenient to high pressure service over 100 bar
- Removable bundles



N TYPE

- Similar to C-type but integral tubesheet is not welded form flange instead welded to the shell
- Difficult to replace and repair
- Suitable for high pressure application > 150 bar
- Hazardous tubeside fluid



D TYPE

- Non bolted closure
- Difficult to repair and replace
- Most expensive type of C

SHELL TYPE

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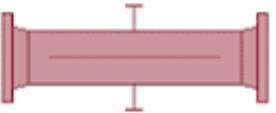
E TYPE

- One pass shell
- Most common shell type
- Suitable for all applications and duties



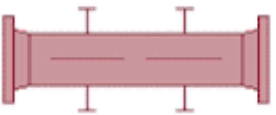
F TYPE

- Two-pass shell with longitudinal baffle
- Suitable up to 175°C due to thermal and hydraulic leakages through longitudinal baffle
- Pure counter current flow
- U tube type with removable bundles



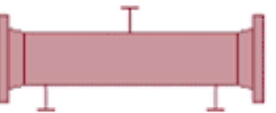
G TYPE

- Split flow
- Central support plate
- Recommended for Horizontal thermosyphon reboilers



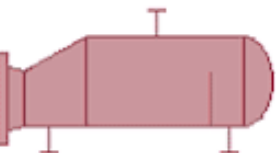
H TYPE

- Double split flow
- Central support plate
- Pressure drop is much lower as flow is divided
- Greater in length than G-type
- Recommended for Horizontal thermosyphon reboilers



J TYPE

- Divided flow on the shell side reduce the flow velocities over the tubes
- Reduce pressure drop and tube vibration
- Recommended for when shell side pressure drop exceeds
- Recommended for condensing and boiling services

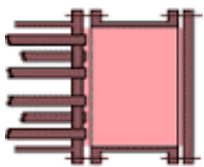


K TYPE

- Kettle type reboiler
- Shell diameter is larger than tube bundle
- Large diameter provides more space in order to disassembly and minimize shell side liquid carry over.
- Recommended for condensing or boiling services

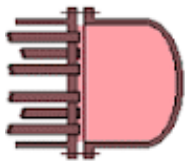
REAR HEAD TYPE

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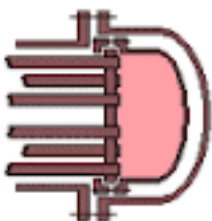
FIXED TUBE SHEET L,M,N TYPE

- L,M,N rear heads are involved corresponding to A,B,N type front head channels
- Shell side is not accessible due to tubesheet is welded to shell
- Tubeside is available for cleaning without any pipework (L Type - Mechanically , M and N type Chemically)
- Expansion joints or bellows are needed in order to compensate thermal expansions
- Clean fluid for shell side is recommended.



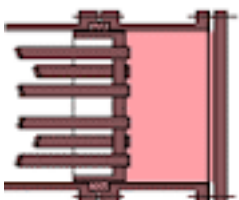
U TYPE

- Cheapest one.
- Removable bundle design.
- Allow thermal expansion for tubeside.
- Counter flow is not satisfied except F-Type.
- Recommended for clean fluid in tubeside and high pressure applications



FLOATING HEAD TYPE P,S,T,U and W TYPE

- All the floating heads permit thermal expansion of tube bundle, tubesheet and shell
- P type allows access to the tubes and the bundle for cleaning. It is limited to low pressure and non-hazardous fluids.
- S type is most expensive of among all floating types. It has smaller bundle to shell clearance than others.
- T types has largest bundle to shell clearance. It is more expensive than fixed head and U -tube types
- W type is limited to low pressure and non-hazardous fluids.



INOVATERM OFFERS

A wide range of shell-and-tube heat exchanger and customisable solutions for all your heat transfer applications without any restriction regular size and components.



Shell-and-tube heat exchangers may be designed and manufactured in any size or shape according to your request as well as necessity. Each design provides your working conditions with ensuring safe operation. High effectiveness and Low operation costs always have been our success criteria. Our qualified design team investigates and analyses your process based on engineering codes in order to provide best solution for your heat transfer application. The conceptual design would be created based on your data accordance with ASME VIII Division-1 , TEMA, PED and "U" &"C" stamps. This conceptual design may also examined with your specified personals and might be revised as per your request.

Inovaterm can supply all kind of components comprising condensate system, piping, instrumentation etc.

PROJECT PROCESS INFO



All services may be included in one contract such as commissioning, installation, training and maintenance as per your request.

Send Us Details of Your Project !



Concept

We can analyze and determine your initial conceptual projects.



Planning

Our team can handle with the unexpected results of concept.

Inovaterm has always taken care of working cooperatively with customer throughout project.

Akvia Group Brands



**WHERE ARE
WE NOW?**





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