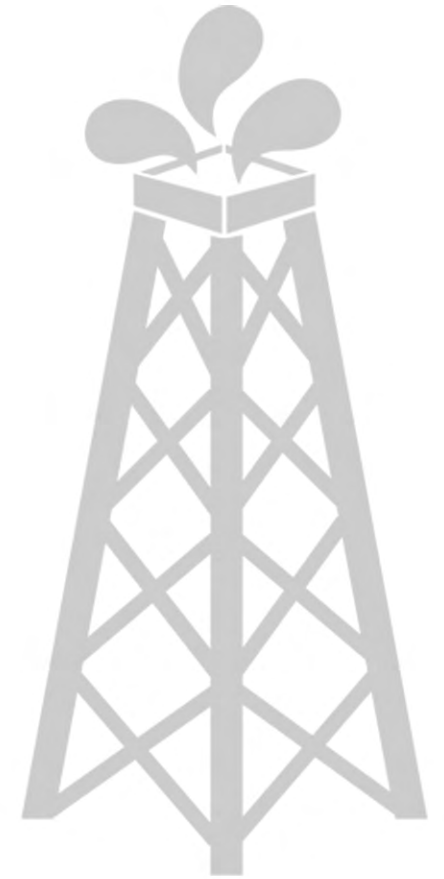


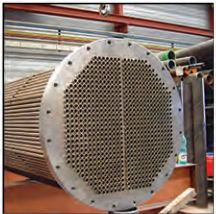
# Heat Exchangers for Oil, Gas, Refinery & Petrochemicals



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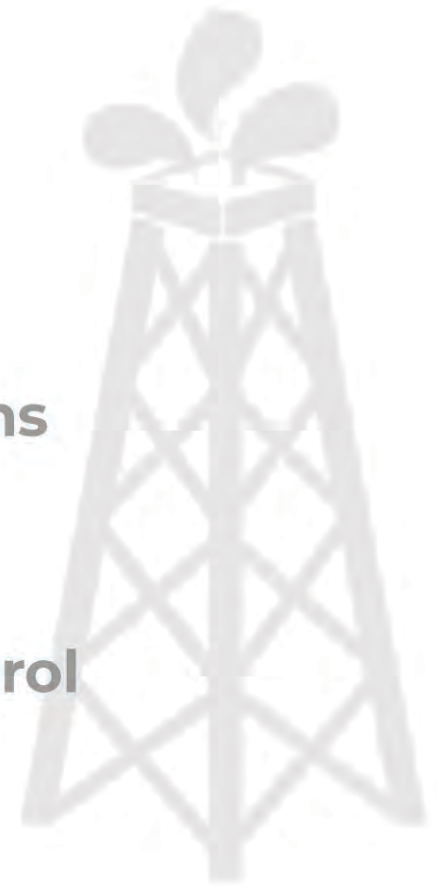
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# ABOUT CRYSTAL INDUSTRIAL

[CONTACT](#)



Crystal Industrial Syndicate Pvt. Limited, incorporated in the year 1991, is an ISO 9001 : 2000, ISO 14001 : 2004, OHSAS 18001 : 2007

The company was started by two graduate engineers with the objective to serve the Indian industry with products like Steam Jet Ejectors & Wet Scrubbing Systems.

They later diversified into design, fabrication, and commissioning of equipment such as pressure vessels, heat exchangers, columns, plant pressure piping for various chemical, petrochemical, fertilizer and other process industries.

Crystal has also specialized into design and fabrication of various intricate and complex equipment, components, assemblies, and sub-assemblies, of cast, forged, welded and machined construction for Indian Defense and Nuclear Sector.



Crystal has now mastered the technology of carrying out Corrosion Resistance Weld Overlay of Monel, Inconel 625, Incoloy 825, Hastell oy B3, Hastelloy C-276, Hastelloy C-2000.

Hard facing overlay on the inside surfaces of pipes, elbows, tees, flanges, including fabrication and welding of Cladded Vessels involving these materials.

Crystal's list of clients spans the most reputed industrial houses in India to top global firms. Engineering companies like Aker Kvaerner, Bechtel, Bindal Agro, Dr. Reddy's, GEA, Hindustan Petroleum, Indian Navy, Indian Oil, Jacobs, Larsen & Toubro, Mangalore Refineries, Mitsubishi Heavy Industries, Pfizer, Oswal Chemicals, Reliance Industries and Saint Gobain are some of Crystal's most distinguished clients.



# OVERVIEW & APPLICATION



## APPLICATIONS

Shell and tube heat exchangers are widely used in various applications Oil & Gas, Refineries, and other large chemical processes and is suited for higher pressure industrial process applications.

They are available in various Diameters and lengths. The heat exchangers are designed for a wide range of liquid to liquid and steam to liquid application. The shell and tube heat exchangers are constructed using tube sheet tube baffles and shell. it is manufactured using the most advance technology available and is specifically engineered for a wide range of applications.

Every unit is designed, manufactured and tested to meet the quality requirements of ASME codes .

## OVERVIEW

For crystal, Shell and Tube Heat Exchanger manufacturing is a natural extension of its exotic materials fabrication expertise . Today's process industry demands more and more equipment in exotic material like Duplex Stainless Steel, Monel, inconnel, Titanium, Clad Materials etc.

Crystal Harnesses its expertise in manufacture of these materials and welding of dissimilar materials to deliver high quality "shell and Tube Heat Exchanger". All Products From Crystal come with same quality of highest Standard, Which has earned them the authorization to use certification stamp.



## PRODUCT RANGE



The heat exchangers are designed and manufactured to meet the requirement of TEMA, ASME code and stamping requirement.

The heat exchangers are supplied in fixed tube sheet type and other various types with removable tube bundle i.e floating type, "U" tube bundle type, kettle reboiler type etc.. The removable tube bundle like floating type has the advantage of removable tube bundle and access for cleaning both inner and outer side of tube and shell.

Crystal undertakes manufacturing of heat exchangers based on customers datasheet/design and also develop the equipment based on process data given by customer. Crystal also supplies "Steam Surface Condensers" and "Condensing System" for steam turbines upto 20MW Incorporating thermo-hydraulic & Mechanical Design.

Steam surface Condensers are critical components. Crystal design an economically sized condenser suitable for small turbine ratings under 25 MW. The circular configuration is compact in design and easy for shipping . All heat exchangers manufactured by Crystal meet the requirements of ASME codes. We also custom fabricate to meet all the requirements of our customers.

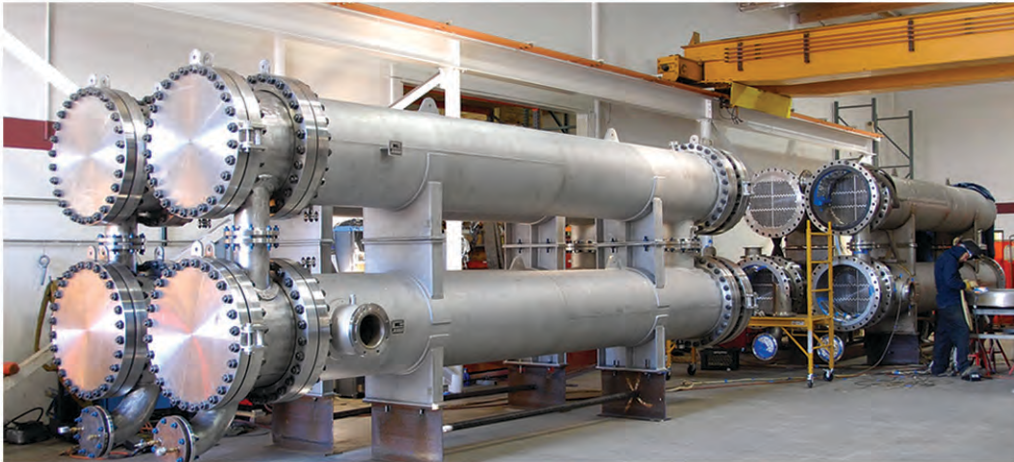
Crystal manufactures surface condensers features high overall heat transfer coefficients which results in smaller heat transfer areas and thus optimal use of available space and extremely low oxygen concentrations in the condensate. Condensers are designed to stand up to turbine and steam generator overloads and to variations in cooling water temperature at different times of the year.

Crystal's customers can source a wide range of their specialized shell & tube heat exchanger needs under one roof at crystal . Surface condensers with special designed Baffles are manufactured by drilling facility available in house. Our drilling machine has a capacity to drill up to 150 MM thick Tube sheet.





## TYPES & COMPONENTS



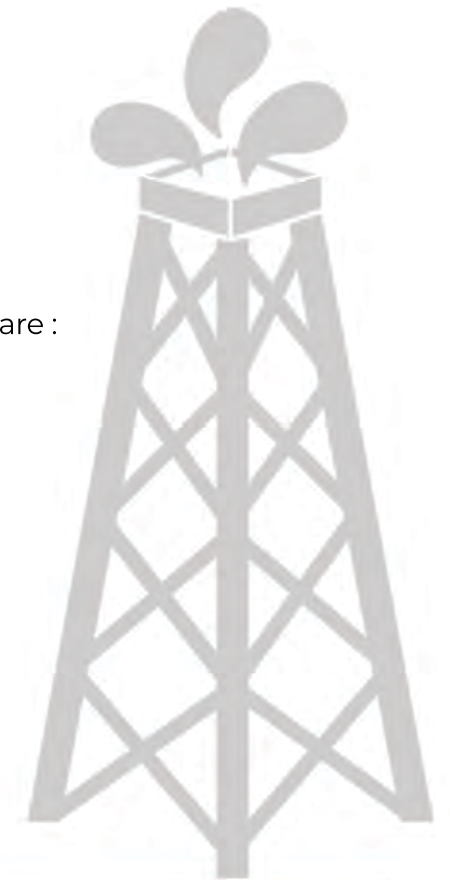
Crystal supplies high reliability, high integrity Pressure Vessels, Towers & Columns in practically all engineering metals used by process industry. Crystal supplies pressure vessels that are designed to operate safely at a specific pressure & temperature .

Crystal is approved by ASME for the manufacture of pressure vessels as per code stamp. Crystal has manufactured pressure vessel under reputed international inspection agencies like LLOYDS, TUV, BUREAU VERITAS, AKER KVAERNER, UHDE, TOYO.

Crystal also supplies all the above products in cladded construction . Crystal manufactures internals for towers and columns. The towers and columns can be offered with complete set of internals pre-installed.

The type of vessels offered by crystal are :

- Pressure vessels
- Accumulator shells
- Filters
- Tanks
- Towers
- Columns
- Cladded drums



# PRODUCT SPECIFICATIONS & RANGE

What makes Crystal a unique manufacturer is the complete insight of the metallurgical processes in manufacture and welding of the different engineering materials. Crystal handles welding of dissimilar materials, whether for joining or for corrosion resistant overlays, equally competently. Crystal fabricates pressure vessels in:

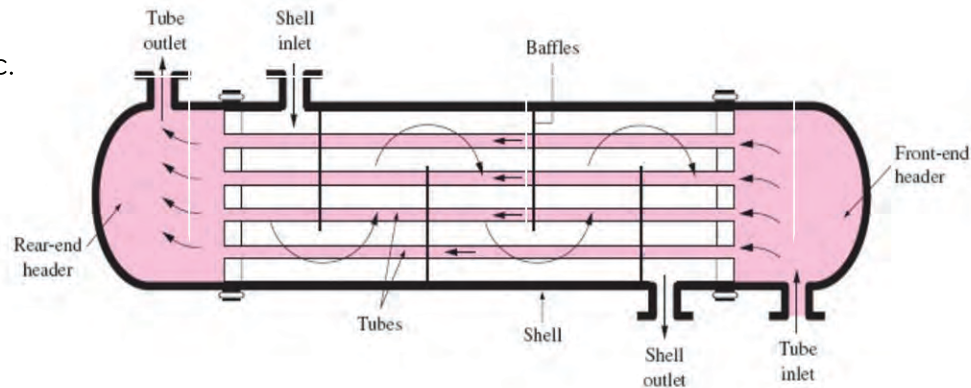
- All grades of Stainless steels,
- Duplex/ Super Duplex
- Super Austenitic Stainless steels,
- Monel,
- Inconel,
- Hastelloy,
- Clad steels etc.

The equipment from Crystal are offered with complete engineering package incorporating :

- Code Design
- Stress Analysis
- Vibration Analysis
- Seismic Analysis
- Wind Load Analysis

## Specification :

DESIGN CODE ASME:	Section VIII Div-1, Div-2
DIAMETER:	Upto 4 Meter
LENGTH:	Upto 12 Meter
THICKNESS:	Upto 50 mm





# QUALITY CONTROL SYSTEM

Crystal follows a stringent quality control system so that all parameters are complied with, and the customer gets a high quality product.



Ultrasonic Testing



Hydrostatic testing



Dye Penetrant Testing



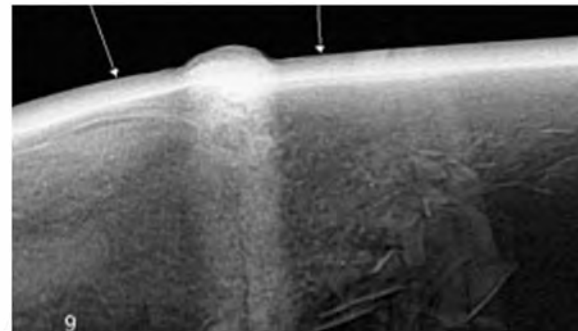
Hardness Testing



Positive Material Identification



Magnetic Particle Inspection



Radiography



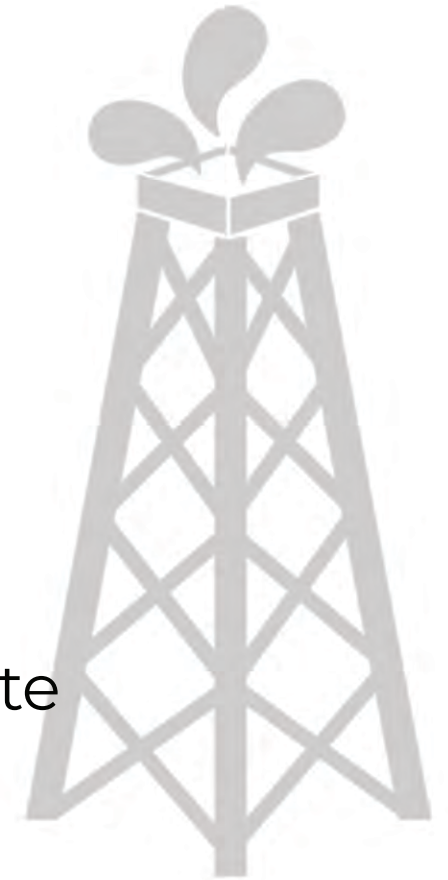
Dimensional Inspection



## CERTIFICATIONS



- ISO 9001 : 2015 Certificate
- ISO 14001 : 2015 Certificate
- OHSAS 18001 : 2007 Certificate
- Stamp Certificate
- National Board Registration
- IBR Approved



# CLIENTS





## CONTACT



### ABOUT US

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**Crystal**  
**industrial**



Model	High Pressure Access Fitting Assembly									
CISPL-10	Flare weld									
Model	Flare weld with Tee									
CISPL-10	Flanged									
CISPL-10	Flanged with Tee									
	Code 1 XX	Type (1st digit)	Alloy Material (2nd digit)							
		N - Not Required	0 - Not Required							
		R - Solid	1 - 316/316L Stainless Steel							
			2 - 304 Stainless Steel							
			3 - Hastelloy							
			4 - Nitronic 60							
			5 - Carbon steel							
			6 - Inconel 625							
		7 - 2205 Duplex Stainless Steel								
	Code 2	Side Tee Size								
	0	Non- Tee								
	1	¾" Tee								
	2	½" Tee								
	3	¾" Tee								
	4	1" Tee								
	Code 3	Optional Side Tee Configuration (omit for standard NPT)								
	xx	For Flare Weld								
	A1	150#RF								
	A2	300#RF								
	A3	400/600#RF								
	A4	900/1500#RF								
A5	2500#RF									
B1	2500#RF									
B2	300#RJ									
B3	400/600#RJ									
B4	900/1500#RJ									
	Code 4	Optional Side Tee Configuration (for standard NPT)								
	A1	150#RF								
	A2	300#RF								
	A3	400/600#RF								
	A4	900/1500#RF								
	A5	2500#RF								
	B1	150#RJ								
	B2	300#RJ								
B3	400/600#RJ									
B4	900/1500#RJ									
	Code 5	Pipeline Size								
	XX	For Flanged								
	02	2"								
	03	3"								
	04	4"								
	06	6"								
	10	8-10"								
	18	12-18"								
36	20-36"									
	Code 6	Alloy Material								
	0	Not Required								
	1	316/316L Stainless Steel								
	2	304 Stainless Steel								
	3	Hastelloy								
	4	Nitronic 60								
	5	Carbon steel								
	6	Inconel 625								
7	2205 Duplex Stainless Steel									
	Code 7	Secondary Pressure								
	PR	Pressure Retaining Cover								
	NP	Non-Pressure Retaining Cover								
CISPL-20	R1	2	XX	A1	10	1	PR			

MODEL  
SELECTION  
MATRIX

# MODEL SELECTION MATRIX