



Heavy Engineering With **Heat Transfer DNA**





Four Decades of Engineering Excellence | 18000+ Process Equipment Supplied



## Specialized Heat Transfer Equipment

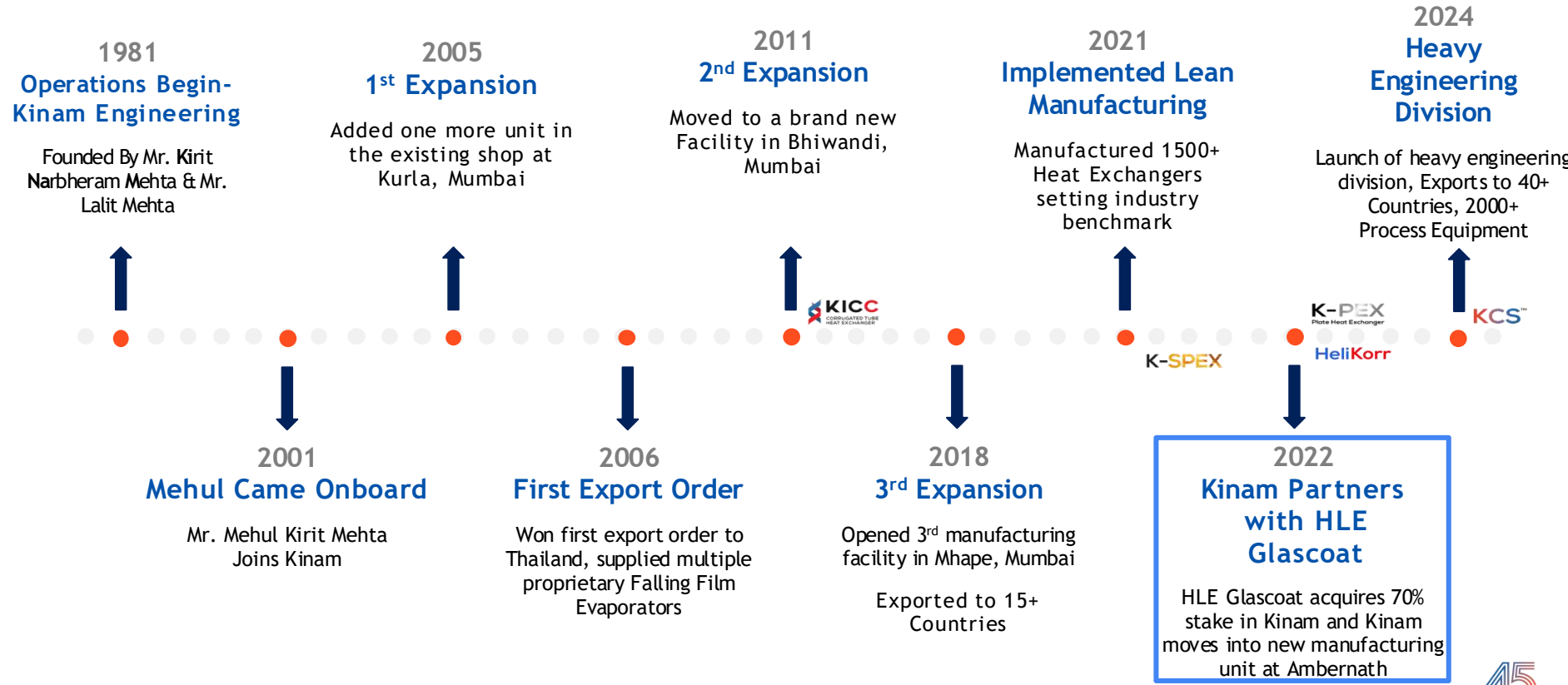
- Shell & Tube Heat Exchangers
- Corrugated Tubes (KICCT<sup>TM</sup>)
- Helical Baffle (HeliKorr<sup>TM</sup>)
- Spiral (K-SPEX<sup>TM</sup>)
- Plate Type (K-PEX<sup>TM</sup>)
- Condensing System (KCS<sup>TM</sup>)

## Heavy Process Equipment

- Large Heat Exchangers
- Pressure Vessels
- Columns & Towers
- Conventional & Tubular Reactors
- Fabricated Pipe Spools
- Proprietary Licensed Equipment



# OUR JOURNEY: KEY MILESTONES





Mr. Aalap Patel, Mr. Mehul Mehta, Mr. Kirit Mehta, Mr. Himanshu Patel, Mr. Nilesh Patel, Mr. Harsh Patel

**In 2022 Kinam joined hands with HLE Glascoat Limited**, the leading manufacturer of process equipment. HLE Glascoat Limited is now the largest stakeholder in Kinam, this partnership has enabled us to embark on a new chapter of expansion & innovation, helping us in transitioning to the next phase of our growth journey.



GLOBAL GROUP COMPANIES



ENGINEERING EXCELLENCE. DELIVERING PERFORMANCE.

**\$150+ Mn**  
Group Turnover

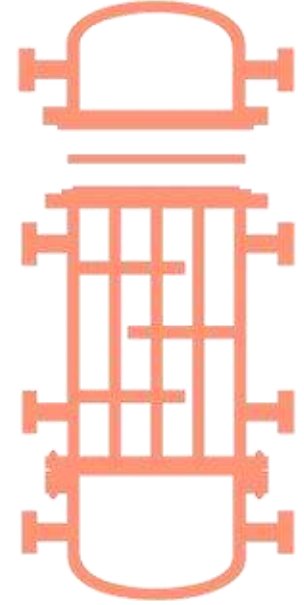
**\$16.5 Mn**  
EBITDA

**\$6.50 Mn**  
Profit After Tax

**\$69 Mn**  
Net Worth



# INTEGRATED MANUFACTURING ECOSYSTEM



# HLE MANUFACTURING ECOSYSTEM



**42 years** of Experience | **Largest ANFD Manufacturer**  
Head Office: Anand  
Plant Locations: Anand, Silvassa and Maroli  
Turnover: ~\$77Mn



**19 years** of Experience

Glass-Lined Reactor and  
Process Equipment  
Manufacturer

Head Office & Plant Location:  
Germany

~\$22Mn



**45 years** of Experience

Process Equipment  
Manufacturer for Heavy  
Engineering

Head Office: Mumbai  
Plant Location: Ambernath &  
Dahej

~\$24Mn



GROUP

**200 years** of Experience

Glass Lined Tanks & Silos  
Manufacturer for Chemical &  
Petrochemical Applications

Head Office & Plant Location:  
Germany

~\$29Mn



7 Manufacturing Units  
4 Head Offices



## MAROLI WORKS

- 161,000 ft<sup>2</sup> built-up area with nearly 13,000 m<sup>2</sup> covered under 40 EOT cranes.
- Machine shop including VMCs, CNC Turn-mill, CNC drilling, VTLs, Amada Punching Press, and Rolling.
- Welding capabilities with pulsed arc welding systems and over 100 qualified welders.
- Jigs, fixtures, welding manipulators and specialized tooling
- Productivity, throughput and budgetary controls through customized ERP solutions.



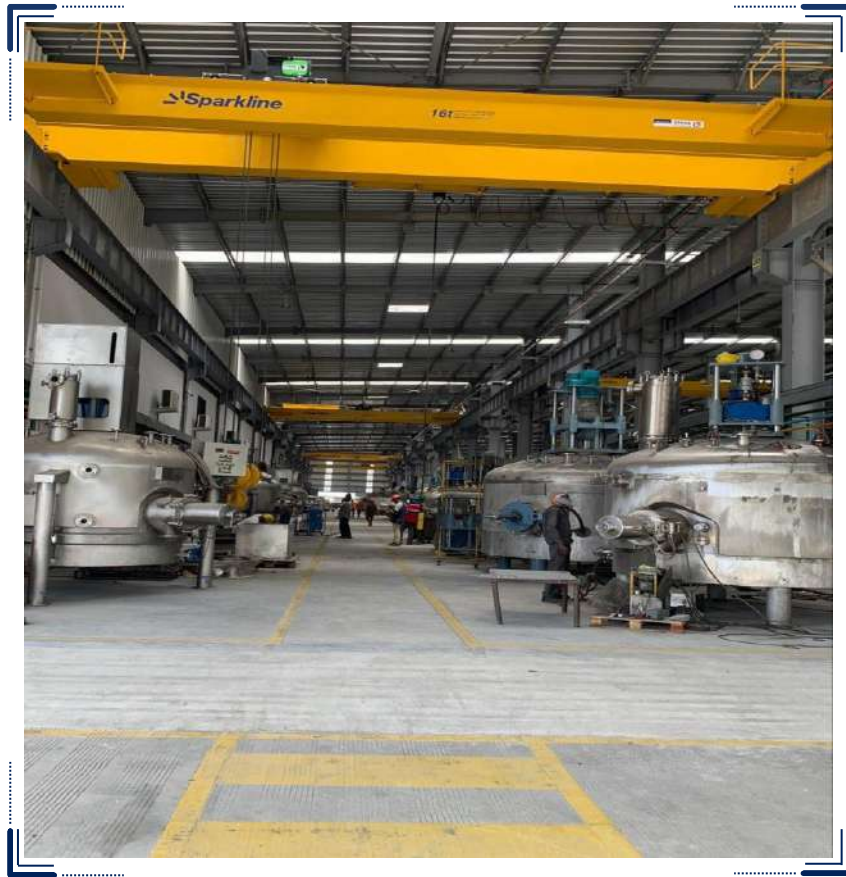
## ANAND WORKS

- 215,000 ft<sup>2</sup> floor area covered by 33 EOT cranes.
- Five SCADA controlled electric and gas fired furnaces for glass lining.
- Four dedicated furnaces for glass lining of components.
- Robotic welding set-up for critical pressure part weld joints.
- Highly automated manufacturing process with CNC SPMs for accuracy & repeatability.
- Productivity, throughout and quality control through customized ERP solutions.



## SILVASSA WORKS

- 92,500 ft<sup>2</sup> floor area covered by 18 EOT cranes
- Well developed welding capabilities with pulsed arc welding systems and over 30 qualified welders
- Jigs, fixtures, welding manipulators and specialized tooling for fast and repeatable performance
- Machine shop including VMCs, CNC Turn-mill, CNC drilling and VTLs
- Fixtures and tooling geared towards low-cost, high-volume manufacturing of Monoblock ANFDs.





## THALE WORKS - THALETEC, GERMANY

- 430,000 ft<sup>2</sup> manufacturing facility with more than 160 employees
- 17 Patents, Design and Trademarks
- Capabilities to manufacture equipment with dimensions of up to 100,000 liters volume
- Unmatched product offering; offers multiple one-of-a-kind products & solutions
- Facility is equipped to work with carbon steel, stainless steel, and nickel-based alloys (Hastelloy, Inconel) and other materials



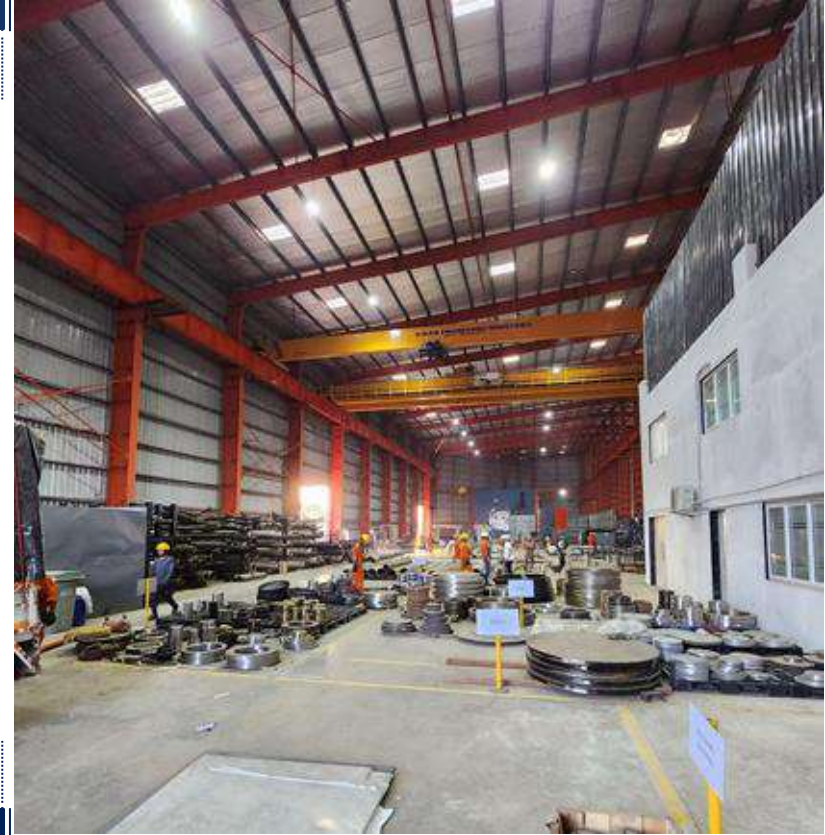
## LAUTER-BERNSBACH WORKS - OMERAS, GERMANY

- 200 years of legacy with multiple design patents
- Storage capacities ranging from 8 m<sup>3</sup> to 23,000 m<sup>3</sup> per tank
- End-to-end in-house process covering design, cutting, blasting, rolling, treatment, enamelling, firing, testing, and packing
- Equipment produced in compliance with EN 1090, EEA (European Enamel Authority No 202) and ANSI 61



## AMBERNATH WORKS

- 110,000 ft<sup>2</sup> total area with 10 EOT cranes (1.5-50MT) and 12 m hook height supporting equipment up to 150 MT
- Machine shop including VMCs, CNC Laser & Plasma Cutting, Weld-Overlay, and Rolling Machines
- 12 meter hook height enabling fabrication of large equipment
- Dedicated Class 100,000 Clean Room for Titanium and exotic alloys
- Productivity, throughput and budgetary controls through customized ERP solutions





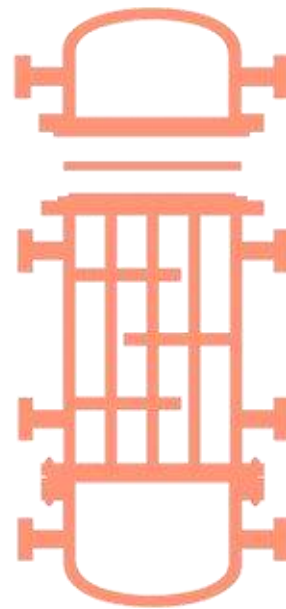
## GUJARAT WORKS

- 213,000 ft<sup>2</sup> plot area and under the hook height of 18 meters and 125MT EOT Cranes
- CNC profile cutting systems, and 1200MT forming machine capability for complex geometries
- Hydrostatic and pneumatic testing facilities up to 200 bar for rigorous performance validation
- Uninterrupted access to multiple seaports enabling dispatches of ODC equipment and modules





## RESEARCH & DEVELOPMENT





- State of the Art dedicated R&D Centre has been set up at Anand, Gujarat with the strategic objective of undertaking advanced research in glass lining technologies.
- The Centre also showcases the functioning of certain key products at a lab scale
- The center has been accredited by DSIR, Government of India

# PILOT PLANT & TEST RIG



- Fully equipped pilot plant in Maroli, Gujarat where accurate & extensive product performance simulation is carried out.
- State of the art test rig created with the strategic objective of undertaking advanced research in heat transfer and glass lining technologies.
- India's first and only heat transfer research centre in association with HTRI USA
- KICC, Helikorr, KCS are few of the products developed from this research centre





**Our Research Philosophy-** Rigorous research to redefine Heat Transfer efficiency and performance.

- **Focused Expertise & Dedicated Team:** Leveraging cutting-edge technology with a team of experts in engineering, materials science, and process innovation.
- **Lead By: Dr. Rambir** - PHD IIT Mumbai (Thermal Engineering) | Mtech IIT Delhi | 22 Years Exp. at ISRO, L&T, Kelvion, Sondex and many more.
- **Dedicated Budget:** 1% of revenue invested in R&D.
- **Location:** Dedicated R&D setup of 10000 Sq. Ft. at Maroli, Gujarat
- **Patents:** 3 Design Patents Filed



# WORLD-CLASS TOOLS & SOFTWARES



## PRECISION MEETS INNOVATION

Process Design:



Mechanical Design:



Drawing:



AutoCAD

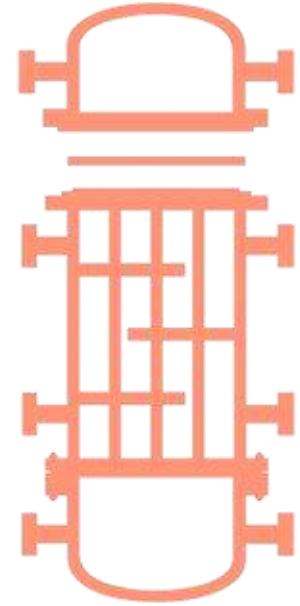


FEA & 3D Modelling:





# MANUFACTURING CAPABILITIES & FACILITIES





**Max Length: 40000MM**

**Max Diameter: 8000MM**

**Max Tubesheet Thickness:  
2000MM**

**Max Weight: 300MT**

**Max Heat Transfer Area:  
10000 Sq. Mtrs.**

# MANUFACTURING CAPABILITIES

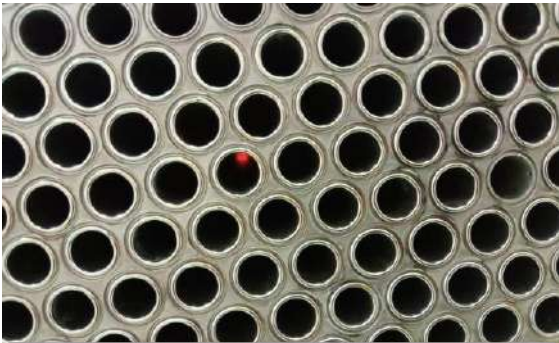


|                            |                                    |                             |                             |                           |                                                |                                    |
|----------------------------|------------------------------------|-----------------------------|-----------------------------|---------------------------|------------------------------------------------|------------------------------------|
| Shell Diameter:<br>8000 mm | Tubesheet<br>Thickness:<br>2000 mm | Overall Length:<br>40000 mm | Design Pressure:<br>200 bar | Maximum Weight:<br>300 MT | Heat Transfer<br>Area:<br>10000 m <sup>2</sup> | Production<br>Capacity:<br>3000 HE |
|----------------------------|------------------------------------|-----------------------------|-----------------------------|---------------------------|------------------------------------------------|------------------------------------|

# WELDING STRENGTH



|                     |                                                                           |
|---------------------|---------------------------------------------------------------------------|
| Qualified Welders   | Kinam: 48 Nos; Group: 200+ Nos.                                           |
| Welding Machine     | 48 Nos. (GTAW), 16 Column & Boom (SAW), 1 (GMAW) (5 in Spare).            |
| WPS/PQR And Mock-up | 60+ certificates for different range of materials.                        |
| Materials Handled   | Titanium, Hastelloy, Inconel, Monel, DSS, SDSS, Cu-Ni alloys & SS Series. |
| Welding Types       | SAW, TIG (GTAW), Orbital Welding.                                         |



Titanium T/S With Cassilation Groove



SAW Welding



## Precision Welding For Unmatched Strength & Quality

| Material                                                                                                                                                                                                                                                                                              | Welding Procedure                                                                                                                                                                                                                                                                  | NDT Examination                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Expertise in welding materials like:</p> <ul style="list-style-type: none"><li>➤ Titanium, Hastelloy C276, C22, C2000</li><li>➤ Nickel 200/201</li><li>➤ Monel, Inconel, Incoloy</li><li>➤ SS 321 / 316 / 316L / 316Ti / 310 / 304 / 304L / CS</li><li>➤ Duplex &amp; Super duplex steel</li></ul> | <ul style="list-style-type: none"><li>➤ GTAW, SMAW, GMAW, SAW &amp; FCAW</li><li>➤ Thickness ranging from 1.5 mm to 200mm</li><li>➤ Qualified as per ASME &amp; EN Std.</li><li>➤ Minimum pipe diameter 3/8" (DN10)(17.1mm dia.)</li><li>➤ Qualified for overlay welding</li></ul> | <ul style="list-style-type: none"><li>➤ Visual Inspection (VT)</li><li>➤ Liquid Penetrant Testing (PT)</li><li>➤ Magnetic Particle Testing (MT)</li><li>➤ Radiographic Testing (RT)</li><li>➤ Ultrasonic Testing (UT)</li><li>➤ Phased Array Ultrasonic Testing (PAUT)</li></ul> |

# INSTALLED MANUFACTURING FACILITIES



**Rolling Machines: 3 Roll, CNC Controlled, 100 mm x 3000 mm**



**CNC Plate Cutting Machines**



**Deephole Drilling Machines: 7000 mm x 3500 mm x 2000 mm**



**Laser Baffle Cutting & Drilling Machine**

# INSTALLED MANUFACTURING FACILITIES



**Horizontal Boring Machine**



**Laser Pipe Cutting Machine: Up to 14" OD**



**Multiple Shotblasting and Painting Booths**



**Heat Treatment Furnaces**

# SPECIAL PURPOSE MACHINES



**Robotic Welding Machine**



**Turret Punch Press**



**Vertical Turret Lathes**



**Vertical Milling Centre**

# CLEAN ROOMS: AMBERNATH & MAROLI



**Class 100,000** Clean Rooms (8m OD to 15m L) with HEPA Filtration

**14 Welders** Specialising in Exotic Welding



**Expert Fitters** Trained in Titanium, Hastelloy, Monel and Inconel

**Dedicated QA/QC Team** with **15+ Years** of Expertise in Exotic Materials

# QUALITY ACCREDITATIONS





The American Society of Mechanical Engineers

CERTIFICATE OF AUTHORIZATION

The named company is authorized by The American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the ASME Single Certification Mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with the ASME Single Certification Mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

**Kinam Engineering Industries Private Limited**  
Plot No. M-4, MIDC, Ashwamedh Ashwamedh, Village Pale,  
Ashwamedh, District Thane,  
Maharashtra 421304  
India

SCOPE:

Manufacture of pressure vessels at the above location and field sites controlled by the above location (This authorization does not cover integrated graphics)

AUTHORIZED: November 14, 2025

EXPIRES: November 14, 2030

CERTIFICATE NUMBER: 65186

*Richard B. C. Hill*  
Board Chair,  
Certification Assessment

*Matthew Vargay*  
Senior Director,  
Engineering Operations



THE NATIONAL BOARD  
OF  
BOILER & PRESSURE VESSEL INSPECTORS

Certificate of Authorization  
to Register



This is to certify that:

**Kinam Engineering Industries Private Limited**  
Plot No. M-4, MIDC, Ashwamedh Ashwamedh,  
Village Pale,  
Ashwamedh, District Thane,  
Maharashtra 421304  
India

is authorized to apply the "NB" mark and register boilers, pressure vessels and other pressure containing items with the National Board.

The scope of authorization is limited to items manufactured/inspected with:

ASME (Impressions): U

Issue Date: November 14, 2025

Renewal Date: August 9, 2030

This Certificate of Authorization to Register will remain in effect as long as the manufacturing organization holds valid Certificate of Authorization issued by the American Society of Mechanical Engineers.

Based on: *[Signature]*



GOVERNMENT OF MAHARASHTRA  
LABOUR DEPARTMENT  
DIRECTORATE OF STEAM BOILERS  
MangalChaur 7 P. Box 174 No. C-25  
Block - E, Chhatrapati Shivaji Maharaj Complex, Baramba (2)  
Mumbai - 400 051

E-mail: [labour.boiler@maharashtra.gov.in](mailto:labour.boiler@maharashtra.gov.in) | [www.boilerboard.org.in](http://www.boilerboard.org.in) | <http://www.labour.gov.in>

Phone No. 022-26072251/241262  
Fax: 022-26071283



To:  
**Kinam Engineering Industries Private Limited**  
Kinam Engineering Industries, Plot No. M-4,  
Ashwamedh MIDC, Near Mangal Hotel,  
Ashwamedh, AMBASTRA THANE, 421304

D.O. - Renewal of approval as a "Heat Exchanger Manufacturer, Class 1" as per Indian Boiler Regulations, 1923 and to issue authorization.

Ref. - Your online application with ID: 180000023019 dt. 10-12-2024

Comments:

With reference to your online application with 180000023019, dated 10-12-2024, on above subject, I have to inform you that your approval as "Heat Exchanger Manufacturer, Class 1" as per Indian Boiler Regulation 1923 and to issue authorization is renewed upto 31<sup>st</sup> December 2026, subject to conditions laid down in letter of approval.

You are to submit your next application for renewal at least One (01) month before the expiry date.

  
Digitally signed by *[Name]*, DN: cn=*[Name]*, o=*[Organization]*, email=*[Email]*, c=*[Country]*, date=2025.11.14 10:07

Yours faithfully,  
(Chaitan Prakash Antipokkar)  
Director of Steam Boilers,  
Maharashtra State, Mumbai



EUROPE

CANADA



Department of Occupational  
Safety & Health  
MALAYSIA



TR CU  
EAEU

BRAZIL

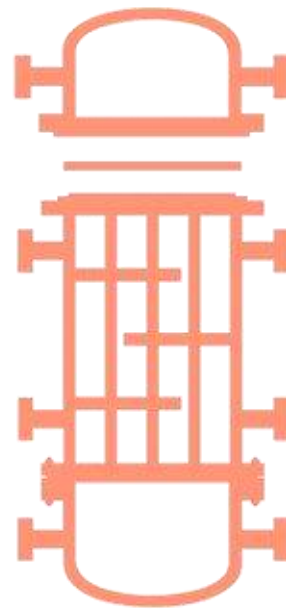
ISO 9001-2015

ISO 14001-2015

ISO 45001-2018



# TRACK RECORD





## CHP EVAPORATOR



**End User:** Haldia Petrochemicals Limited, India

**Consultant:** ThyssenKrupp Industrial Solutions

**Weight:** 167 MT, 7268 No. of Tubes

**Major Dimensions:** 3100 mm ID x 40 mm T x 11682 mm L

**Shell:** SA 516 Gr 70; **Channel:** SA 240 Gr. 316L; **T/S:** SA 965 F 316L; **Tube:** SA 213 TP 316L

## CONCENTRATOR NO. 2 PREHEATER



**End User:** Haldia Petrochemicals Limited, India

**Consultant:** ThyssenKrupp Industrial Solutions

**Weight:** 127 MT, 10652 No. of Tubes

**Major Dimensions:** 3530 mm ID x 30 mm T x 8512 mm L

**Shell:** SA 240 Gr. 316L ; **Channel:** SA 240 Gr. 316L; **T/S:** SA 965 F 316L; **Tube:** SA 213 TP 316L



## CHP PREHEATER



**End User:** Haldia Petrochemicals Limited, India

**Consultant:** ThyssenKrupp Industrial Solutions

**Weight:** 124 MT, 3878 No. of Tubes

**Major Dimensions:** 2280 mm ID x 50 mm T x 14187 mm L

**Shell:** SA 516 Gr 70; **Channel:** SA 240 Gr. 316L; **T/S:** SA 965 F316L; **Tube:** SA 213 TP 316L

## PURE PHENOL COLUMN CONDENSER



**End User:** Haldia Petrochemicals Limited, India

**Consultant:** ThyssenKrupp Industrial Solutions

**Weight:** 110 MT, 5601 No. of Tubes

**Major Dimensions:** 2540 mm ID x 18 mm T x 10700 mm L

**Shell:** SA 516 Gr 70; **Cover Flange:** SA 965 F 316L; **T/S:** SA 965 F 316L; **Tube:** SA 213 TP 316L



## TAIL GAS HEATER



**End User:** Deepak Fertilizer & Petrochemicals Corp. Ltd, India

**Consultant:** ThyssenKrupp Industrial Solutions

**Weight:** 19.10 MT

**Major Dimensions:** 1087 mm ID x 12 mm T x 8230 mm L

**Shell:** SA 240 GR 304L; **T/S:** SS316L; **Tube:** SA-182 F309

## RAW ACETONE FEED EVAPORATOR



**End User:** Haldia Petrochemicals Limited, India

**Consultant:** ThyssenKrupp Industrial Solutions

**Weight:** 72 MT, 4696 No. of Tubes

**Major Dimensions:** 2350 mm ID x 28 mm T x 7045 mm L

**Shell:** SA 516 Gr 70; **Channel:** SA 240 Gr. 316L; **T/S:** SA 965 F 316L; **Tube:** SA 213 TP 316L



## BLAST FURNACE GAS HEATER – LETHAL SERVICE



**End User:** ArcelorMittal Nippon Steel, India (AM/NS India)

**Consultant:** Danieli Corus India Private Limited

**Weight:** 32 MT

**Major Dimensions:** 1700 mm ID x 20 mm T x 5000 mm L

**Shell:** SA 516 Gr 70; **Channel:** SA 516 Gr 70; **T/S:** SA 105; **Tube:** SA 179

## PRE HEATER



**End User:** Mopani Copper Mine, Zambia

**Consultant:** Jasubhai Engineering Pvt Ltd

**Weight:** 86 MT, **Operating Temperature:** 900 Deg C

**Major Dimensions:** 3000 mm ID x 12 mm T x 4500 mm L

**Shell:** SA 516 Gr 70 (with 6 sheets of insulation inside); **T/S:** SA 516 Gr 70 ; **Tube:** SA 249 TP 310S



## CHLORINE LIQUIFIERS



**End User:** Kutch Chemical Industries Limited, India

**Consultant:** Not Applicable

**Weight:** 33 MT, Special Construction

**Major Dimensions:** 1700 mm ID x 18 mm T x 7800 mm L

**Shell:** SA 516 Gr 70; **Channel:** SA 516 Gr 70; **T/S:** SA 516 Gr 70; **Tube:** SA 334 Gr. 6

## FALLING FILM EVAPORATOR (DOSH COMPLIANCE)



**End User:** Shell Eastern Petroleum Pte. Ltd., Malaysia

**Consultant:** Not Applicable

**Weight:** 19 MT, Proprietary Licensor Design

**Major Dimensions:** 1400 mm ID x 14 mm T x 7000 mm L

**Shell:** SA 240 Gr 304; **Channel:** SA 240 Gr 304; **T/S:** SA 965 F 304 ; **Tube:** SA 213 TP 304



## PP COLUMN BOTTOM COOLER



**End User:** Navin Fluorine International Limited

**Consultant:**

**Weight:** 22 MT, 215 mm T/S Thickness

**Major Dimensions:** 1650 ID X 8000 L X 10 Shell T

**Material of Construction:** Shell: SB424 N08825, T/S: SB 564 N08825, Tubes: Inconel 825

## KETTLE TYPE REBOILER



**End User:** Epsilon Carbon Ashoka Pvt. Ltd.

**Consultant:**

**Weight:** 3MT, Limpet Coils

**Major Dimensions:** 1200 ID X 10 2200 L X 10 Shell Thk

**Material of Construction:** Shell: SA 516 Gr 70; Channel: SA 516 Gr 70; T/S: SA 182 F 316L Tube: SA 213 TP 316L



## TUBULAR REACTORS



- End User: Navin Fluorine International Limited, India
- Consultant: Not Applicable
- Weight: 40 MT
- Major Dimensions: 2345 mm ID x 18+6 mm T x 11497 mm L
- Shell: SA 240 Gr 304; Channel: SB 168; T/S: SA 240 Gr 304 + SB 168 Cladding; Tube: SB 163

## PRESSURE VESSELS



- End User: Mundra Petrochem Limited, India
- Consultant: Not Applicable
- Weight: 11 MT
- Major Dimensions: 5000 mm ID x 5 mm T x 8175 mm L
- Shell: SB 265 Gr. 2; Dish end: SB 265 Gr. 2



## FUEL GAS HEATER



**End User:** Ari Refinery, Nigeria

**Consultant:** Petroexcel Technology

**Design Pressure:** 165 Bar

**Major Dimensions:** 300 ID X 8mm T x 3000 mm L

**Material of Construction:** SA312 TP316;T/S: SA 182 F 316L;Tube: SA213 TP 316L

## PROPYLENE FEED COLUMN CONDENSER



**End User:** Deepak Fertilizer & Petrochemicals Corp. Ltd, India

**Consultant:** Not Applicable

**Weight:** 46 MT

**Major Dimensions:** 900 ID X 14 mm T x 8900 L

**Material of Construction:** Shell: SA 516 Gr 70; Channel: SA 516 Gr 70;  
T/S: SA 266 Gr.2 Tube: SA179 U Tubes



## REMOVABLE HAIRPIN HEAT EXCHANGERS



**End User:** Deepak Phenolics Ltd

**Construction:** Hairpin Heat Exchanger with removable Tube Bundle

**Weight:** 2.8 MT

**Major Dimensions:** NPS 6 X 4516 mm L

**Material of Construction:** Shell: SA106Gr. B, T/S: SA266 Gr.2

## DOUBLE PIPE HEAT EXCHANGERS



**End User:** Shapoorji Pallonji And Company Pvt. Ltd

**Consultant:** Not Applicable

**Weight:** 3.8 MT

**Major Dimensions:** NPS 10 X 6000 mm L

**Material of Construction:** SA312 TP316; T/S: SA182 F316L; Tube: SA213 TP 316L



## SPIRAL HEAT EXCHANGERS



**End User:** Jindal Steel & Power, India

**Consultant:** Not Applicable

**Weight:** 9.3 MT

**Major Dimensions:** 1753 mm Width x 3000 mm Height

**Material of Construction:** SA 240 304

## CORRUGATED TUBE HEAT EXCHANGERS



**End User:** Jindal Steel & Power, India

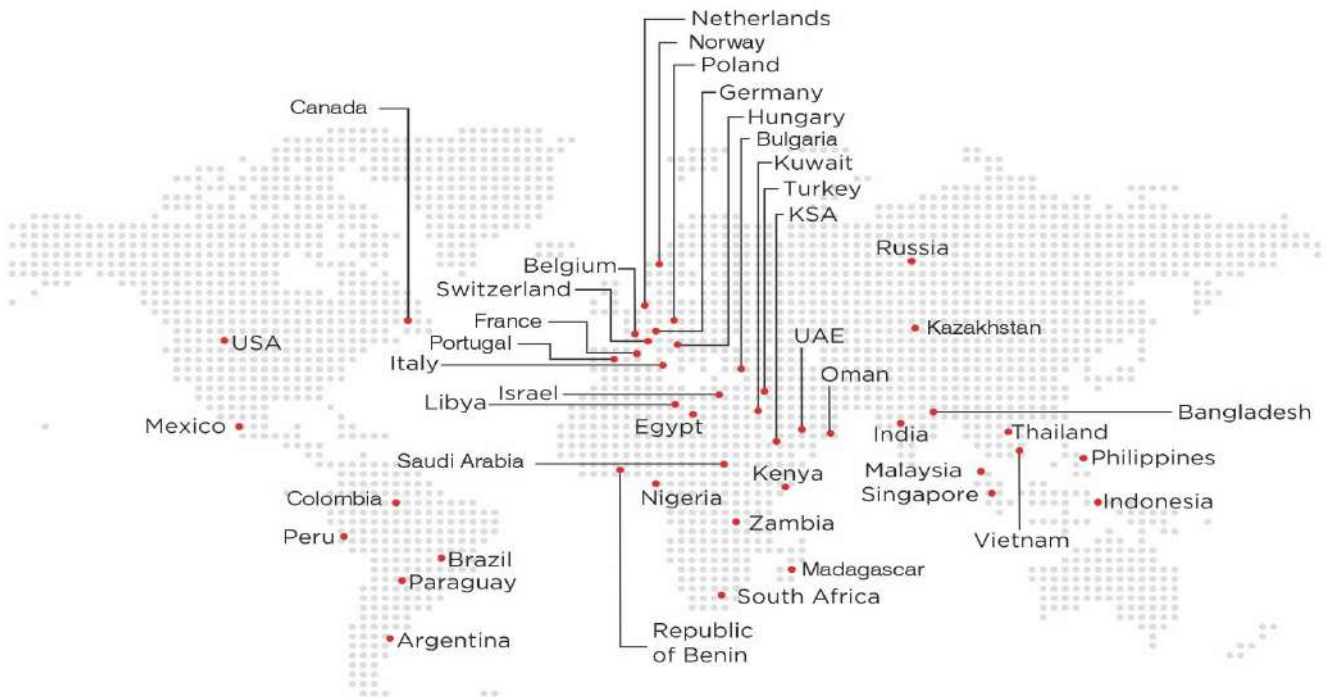
**Consultant:** Not Applicable

**Weight:** 18 MT

**Major Dimensions:** 1392 mm ID x 12 mm T x 6900 mm L

**Shell:** SA 516 Gr 70; **Channel:** SA 516 Gr 70; **T/S:** SA 182 F 316L **Tube:** SA 213 TP 316L

# OUR GLOBAL FOOTPRINT



**45+**

Years of Experience

**18000+**

Process Equipment Supplied

**650+**

Satisfied Customers

**40+**

Countries Exported To



EPC COMPANIES





ENGINEERS  
INDIA LIMITED  
A Navratna Company



























OEM CUSTOMERS













































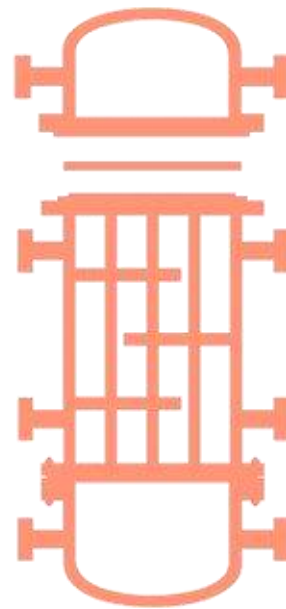


# TRUSTED BY GLOBAL LEADERS - END USER





# OUR PROPRIETARY TECHNOLOGIES





## MASTERING HEAT EXCHANGERS

#EfficiencyMatters

Matching the Right Product with  
the right Application.





## KICC Technology

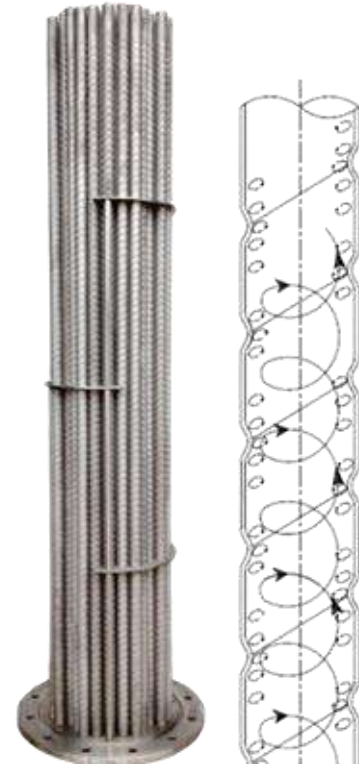
- KICC heat exchangers are similar in construction as conventional tabular heat exchangers.
- Corrugated tubes are manufactured by indenting tubes in spiral pattern.
- No material is removed. No additional stresses. No compromise on the strength of the tubes.

## KICC Is The End Result Of?

- Kinam's ongoing research and development.
- In-depth analysis of corrugation profiles and flow dynamics.
- Constant testing for various condensing application.

## What Is New?

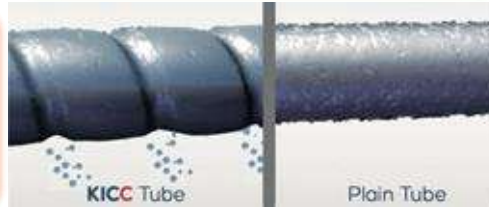
- New & improved corrugation profile for condensers resulting in even higher heat transfer coefficient.
- Compact & economical design, hence higher savings.
- Manufacturability in all exotic materials like hastelloy, titanium, tantalum & super duplex steels, etc.



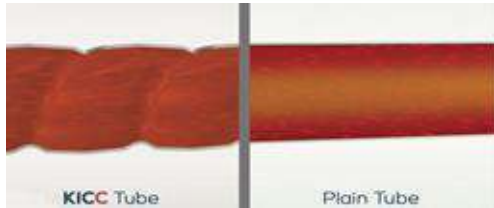


Turbulent Flow Resulting In Higher Heat Transfer Coefficient.

Dropwise Condensation Resulting In A Fresh New Surface For The Vapours To Condense.



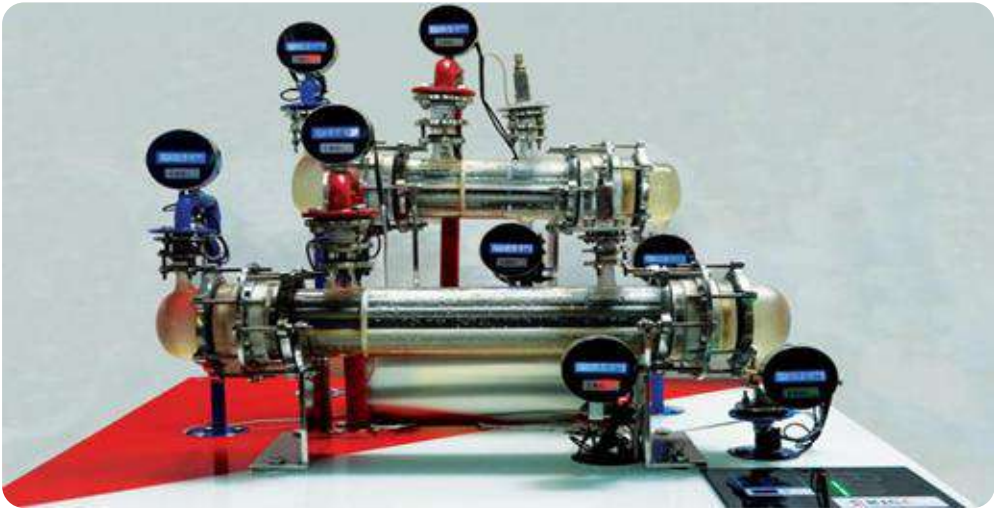
Uniform Temperature Distribution.



Easy To Clean Due To Intermittent Scaling. Longer Running Time. Low Maintenance.



- **Higher Heat Transfer Coefficient**
- **Longer Running Cycles**
- **Lower Heat Transfer Area**
- **Low Maintenance**
- **Economical**
- **Uniform Temperature Profile**
- **Reduced Fouling**
- **Smaller Footprint**
- **Compact**
- **Versatile**
- **Variety Of Material Of Construction**



| Condenser Type | Shell Side Flow Rate |                | Shell Side Temperature |                | Cooling Water Temperature |       | Tube Length | No. Of Tubes | Heat Transfer Coefficient<br>kcl/h-m2-c |
|----------------|----------------------|----------------|------------------------|----------------|---------------------------|-------|-------------|--------------|-----------------------------------------|
|                | Steam In             | Condensate Out | Steam In               | Condensate Out | In                        | Out   |             |              |                                         |
| STHE           | 30.2                 | 30.2           | 100.05                 | 99.5           | 30                        | 34.09 | 570mm       | 7            | 1264                                    |
| KICC           | 30.2                 | 30.2           | 100.05                 | 99.5           | 30                        | 34.09 | 300mm       | 7            | 1.7 times x 1264                        |

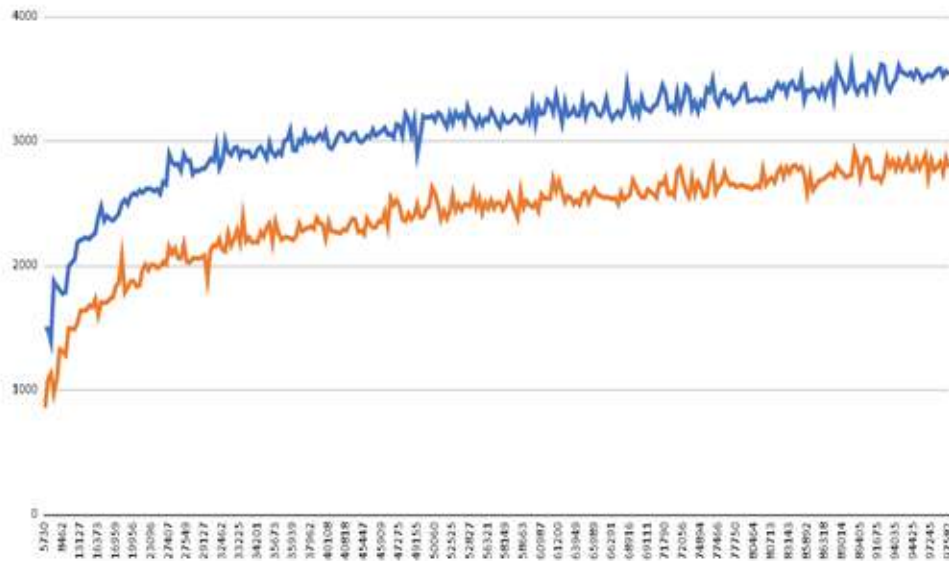


# TEST RIG



Overall Heat Transfer Coefficient  
(kcal/hrm<sup>2</sup>C)

CTHE/STHE - OHTC VS Reynolds Number



Reynolds Number (Re)

Heavy Engineering with Heat Transfer DNA | Kinam Engineering Industries | Confidential & Proprietary



[Introducing Kinam's KICC](#)



[Test Rig](#)



Shell & Tube Heat Exchanger

Plate Heat Exchanger

KICC Tube Heat Exchanger



Heat Transfer Coefficient

Low

-

High

+

High

+

Size

Huge

-

Compact

+

Compact

+

Temperature Distribution

Non-Uniform

-

Uniform

+

Uniform

+

Fouling

High

-

Low

-

Low

+

High Pressure Application

Yes

+

No

-

Yes

+

High Temperature Application

Yes

+

No

-

Yes

+

Maintenance Cost

Low

+

High

-

Low

+

# CASE STUDY : CORRUGATED TUBE HEAT EXCHANGERS



## ADVANCED COAL GASIFICATION TECHNOLOGY

- Existing equipment facing performance issues
- Conventional STHE Converted to CTHE
- Heat transfer area reduced from 1100 m<sup>2</sup> to 682 m<sup>2</sup>
- Operating successfully since 2021

## PROCESS INPUTS

- Application: Gas Liquor Cooler
- Duty: 21 MW
- Shell Side Fluid: Cooling Water at 1725 m<sup>3</sup>/hr.
- Tube Side Fluid: Gas Liquor at 365 m<sup>3</sup>/hr.
- Design Pressure: 2.2 Mpa (Tube side), 1 Mpa (Shell Side)
- Design Temperature: 180 Deg C (Tube side), 100 Deg C (Shell side)

# CASE STUDY : CORRUGATED TUBE HEAT EXCHANGERS

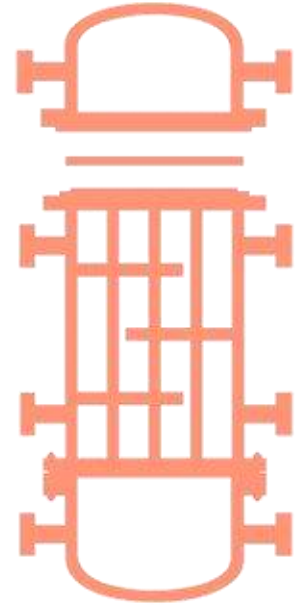


| CUSTOMER CHALLENGE                                                                                                            | KINAM ENGINEERING SOLUTION                                                                       | PERFORMANCE ACHIEVED                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Existing big sized straight tube heat exchanger experienced significant fouling, resulting in frequent maintenance shutdowns. | Converted conventional Shell & Tube Heat Exchanger into a Corrugated Tube Heat Exchanger (CTHE). | Successfully operating since <b>5+ years</b> of service.                                          |
| Customer required higher thermal efficiency without increasing equipment size.                                                | Optimized thermal design using HTRI to enhance turbulence and heat transfer.                     | Heat transfer area reduced from <b>1,100 m<sup>2</sup> to 682 m<sup>2</sup></b> (≈38% reduction). |
| Large heat transfer surface increased fabrication cost and footprint.                                                         | Higher overall heat transfer coefficient enabled a much more compact design.                     | Reduced equipment size, weight and plot space requirement.                                        |
| Fouling led to increased operating costs.                                                                                     | Corrugated tube geometry minimized fouling and improved self-cleaning characteristics.           | Longer operating cycles with reduced maintenance frequency.                                       |
| Required reliable long-term operation under demanding coal gasification service.                                              | Robust mechanical design complying with ASME standards and process requirements.                 | Improved plant reliability, availability and lifecycle economics.                                 |



# HeliKorr

Helical Baffle Corrugated Tube Heat Exchanger





## Enhancing both shell side and tube side coefficients in the same Heat Exchanger

By introducing its Corrugated Tube technology to Helical Baffle Shell and Tube heat exchangers, Kinam offers highly efficient and compact heat exchanger. In Helikorr, Heat transfer enhancement occurs both for shell side fluid and tube side fluid due to presence of helical baffle and corrugated tube respectively.

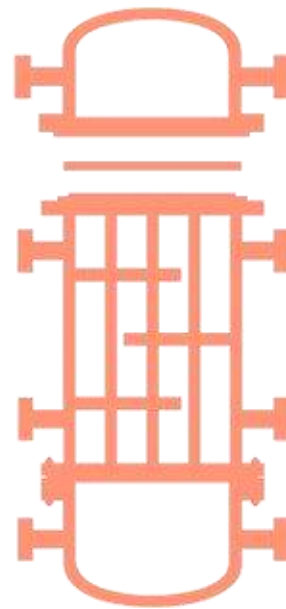
## Why Helikorr?

- Compact (Reduces Heat transfer area upto 35 - 50 %)
- Economical (reduced cost upto 30%)
- Enhanced Heat transfer on shell and tube side (upto 35 - 50 %)
- Elimination of dead zones on shell side (Reduced fouling upto 40 %)
- Prevent flow induced vibrations.
- Reduce Pumping cost
- Reduced maintenance frequency & overall life cycle cost.





**K-SPEX**





## K-SPEX Type 1

### What are K-SPEX Spiral Heat Exchangers?

Spiral Heat Exchangers are circular units containing two concentric spiral flow channels, one for each fluid. One Fluid enters the center of the unit and flows to the periphery, whereas the other fluid enters the unit from the periphery and flows to the center. This results in a pure counter-current flow, thus providing higher heat transfer rates.

#### Available Configurations:

1. Openable
2. Fully Welded

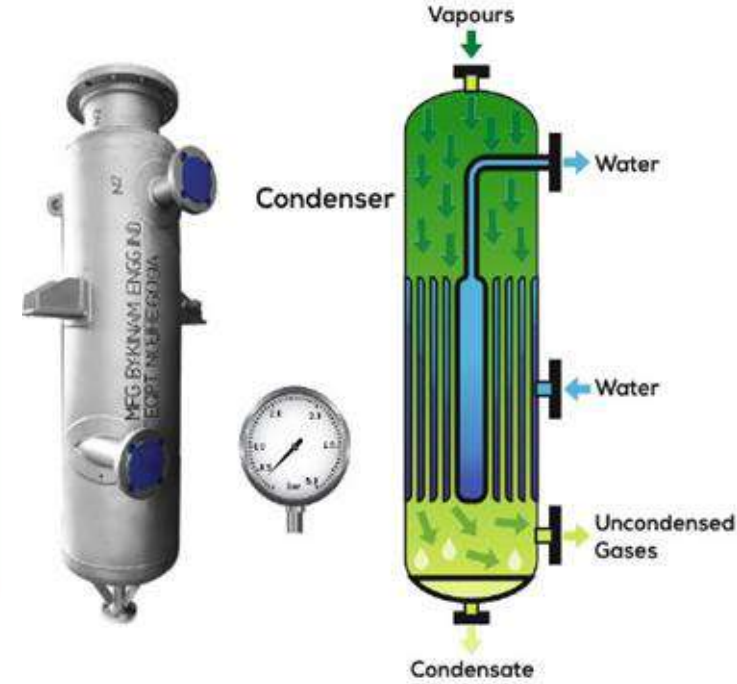




## K-SPEX Type 2

### Why and When?

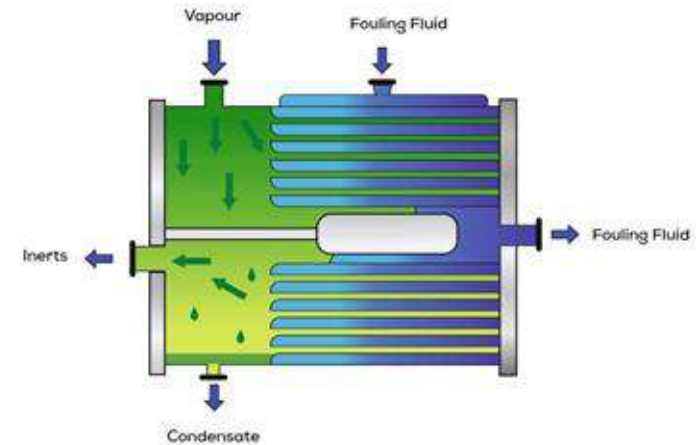
- Highly Compact
- Higher percentage of Heat Recovery
- Clean Utility is preferred
- 100% Cross flow
- Exchanger can be designed with negligible pressure drop
- Gasket free design, no leakage chances
- Generally used for Vapor Liquid Applications





## K-SPEX Type 3

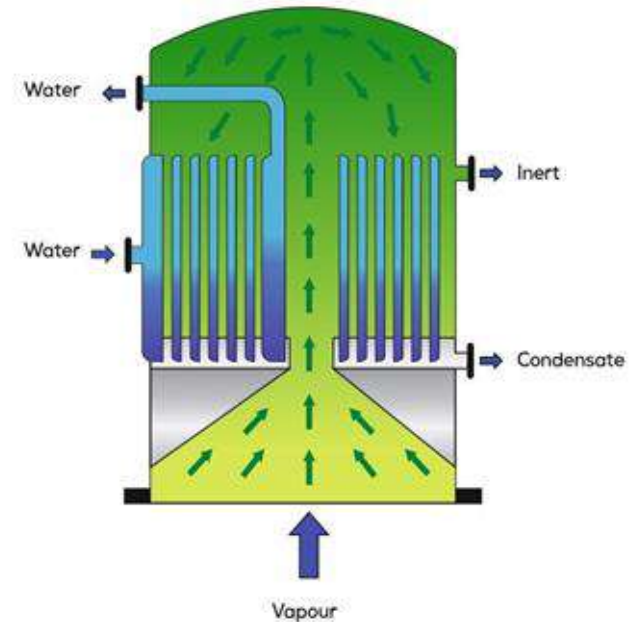
- The Type 3 spiral is often called a “steam heater” and has a mixture of Type 1 and Type 2 features.
- It can be horizontal or vertical. The main feature is that the liquid being heated by the steam is generally fouling which means that the circuit must be accessible for cleaning.
- Therefore the liquid circuit is sealed at one side by welding and at the other end by the gasket face of the end cover (same as for Type 1).
- The vapour circuit however is more similar to the Type 2, operating in cross-flow rather than spiral flow, and the circuit is sealed by welding along one side.
- This construction is not so common, most 2-phase applications use the regular type 2





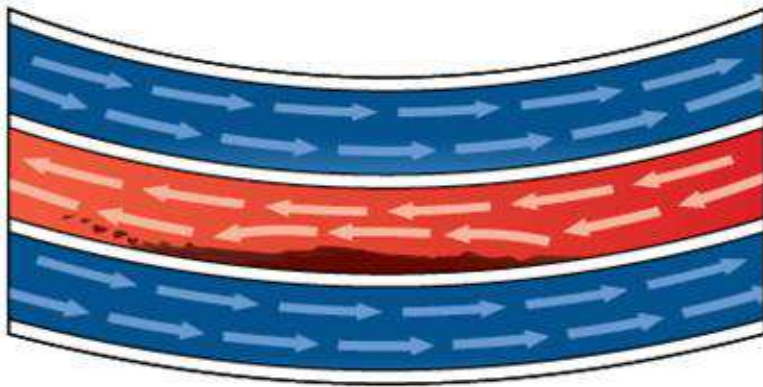
## K-SPEX Type 4

- The Type 4 spiral refers to a spiral that is integrated into a column, often as part of a distillation process. In most cases the spiral operates similarly to the Type 2
- Vertically Mounted and diameter is same as column diameter
- In terms of operation the spiral can be a simple reflux type condenser or have condensate collection



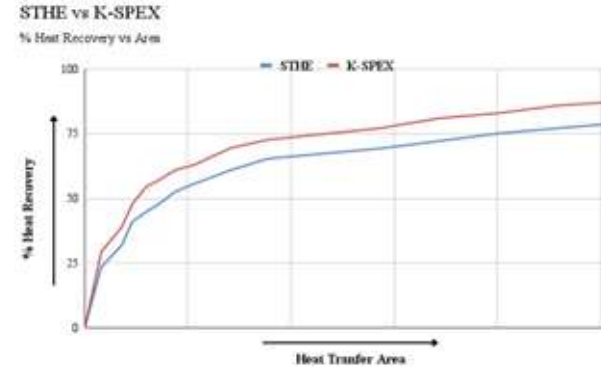


**Self Cleaning:** As the flow in K-SPEX is a fully developed turbulent flow, the continuous curving flow channel causes a self-cleaning effect



**High Heat Transfer Rates:** With studs and curvature of the single-channel promoting turbulent flow, K-SPEX can give twice the heat transfer coefficient when compared to Shell & Tube. A high heat transfer rate allows K-SPEX to be more compact in terms of area and volume.

**High Percentage of Heat Recovery:** The Continuously curved flow channels and studs produce high turbulence, thereby enhancing the Heat Transfer Coefficient. With practically 100% counter-current flow, K-SPEX has a high degree of heat recovery than conventional STHE(Comparison chart)



**Suitability for High Vacuum Applications and Highly Viscous Fluids:** The single flow channel and reduced fouling results in achieving a low-pressure drop in vacuum operations. K-SPEX unique design and reduced deposition fouling facilitates efficient handling of highly viscous fluids with lower maintenance requirements in a compact size



|                               | Shell & Tube Heat Exchanger                                                       | Gasketed Plate Heat Exchanger                                                      | Welded Plate Heat Exchanger                                                         | K-SPEX Heat Exchanger                                                               |
|-------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |
| Two Phase Applications        | +                                                                                 | -                                                                                  | -                                                                                   | +                                                                                   |
| Close Temperature Approach    | -                                                                                 | +                                                                                  | +                                                                                   | +                                                                                   |
| Operating Pressure            | ++                                                                                | -                                                                                  | +                                                                                   | +                                                                                   |
| Products With Solid Particles | +                                                                                 | -                                                                                  | -                                                                                   | ++                                                                                  |
| Products With High Viscosity  | +                                                                                 | -                                                                                  | -                                                                                   | ++                                                                                  |
| Uniform Temp Distribution     | -                                                                                 | +                                                                                  | +                                                                                   | ++                                                                                  |
| Smaller Footprint             | -                                                                                 | +                                                                                  | +                                                                                   | +                                                                                   |
| Less Deposition Fouling       | -                                                                                 | +                                                                                  | +                                                                                   | ++                                                                                  |
| High Heat Transfer            | -                                                                                 | +                                                                                  | +                                                                                   | +                                                                                   |



## WASTE TREATMENT SLUDGE HEATING

- Customer looking for maintenance friendly solution to handle sludge containing solids
- Existing set - up was with 32 double pipe heat exchangers
- Converted it into 1 Spiral Heat Exchanger
- Footprint reduced to 1/6<sup>th</sup> of double pipe units.
- First “U” Stamp Spiral Heat Exchanger by an Indian Manufacturer supplied to Latin Americas largest Oil and Gas Company

## PROCESS INPUTS

- Application: Sludge Heater
- Hot side Fluid: Water
- Cold side Fluid: Sludge
- Design Pressure: 1 Mpa (Hot side), 1 Mpa (Cold Side)
- Design Temperature: 140 Deg C (Hot side), 140 Deg C (Cold side)



| CUSTOMER CHALLENGE                                                                                                                   | KINAM ENGINEERING SOLUTION                                                                                                                           | PERFORMANCE ACHIEVED                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Existing system consisted of <b>32 Double Pipe Heat Exchangers</b> , resulting in a large installation footprint and complex piping. | Re-engineered the process by replacing the entire system with <b>1 Spiral Heat Exchanger</b> .                                                       | Reduced equipment count from <b>32 units to just 1 single unit</b> .                  |
| Required a fouling friendly unit due to slurry service, to avoid plant downtime.                                                     | Selected Spiral Heat Exchanger technology with a single-channel flow path to minimize fouling and promote self-cleaning.                             | Significantly reduced maintenance frequency and plant downtime.                       |
| Customer required a more maintenance-friendly and reliable solution for continuous operation.                                        | Designed a compact, easy-to-access exchanger for simplified inspection and cleaning.                                                                 | Improved equipment availability and reduced maintenance costs.                        |
| Customer required a certified, long-life solution for slurry service, as per Global industry standards.                              | Manufactured <b>India's first ASME U-Stamp Spiral Heat Exchanger</b> , designed specifically for demanding slurry applications, recognized globally. | Improved process reliability, certified globally and extended equipment service life. |



# K-PEX

Plate Heat Exchanger





## Reduce Your Capex By Using K-PEX!!

### Advantages:

- Low Investment
- Compact
- Spare part readily available
- High Heat Transfer Coefficient
- Near Perfect Temperature Approach
- High Turbulent Flow

### PHE Manufacturing Capabilities:

|                 |                                                  |
|-----------------|--------------------------------------------------|
| Port Sizes      | 25NB to 500NB                                    |
| Type            | Gasketed                                         |
| Gasket Material | Various grades of NBR, EPDM and Viton            |
| Material        | Titanium Gr 1 and 11, SMO, Duplex, Hastelloy, SS |





**KCS<sup>TM</sup>**  
Condensing System



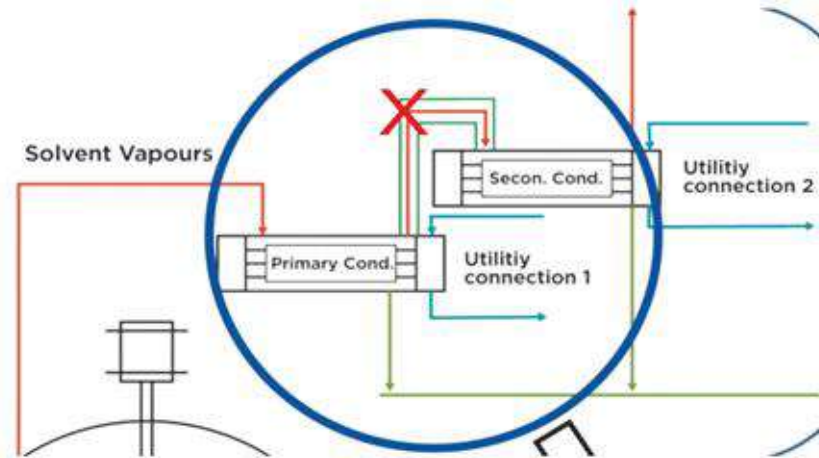
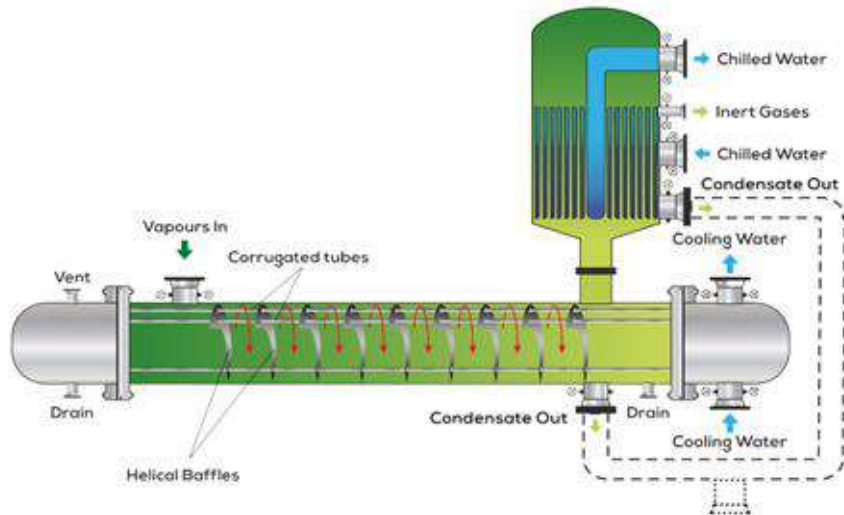
# KCS CONDENSING SYSTEMS



Design Patented by Kinam

Powered with **Helikorr** and **Spiraleco**

Next-Generation Condensing System Driving Efficiency in Chemical & Pharma Plant





- **High Recovery:** Low solvent losses
- **Efficiency:** Up to 30% higher heat transfer rates compared to conventional systems
- **Compact Design:** Space-saving configuration
- **Sustainability:** Reduced energy consumption and environmental impact. Low utility consumption (Less OPEX)

## ADVANTAGES

- Higher HTC on shell (helical baffles) and tube (corrugations)
- Eliminates dead zones
- Low-pressure drop on vapour side.
- Accelerates condensation with helical vapour flow
- Enhanced Dropwise Condensation due to Corrugated Tubes
- Fully drainable
- Reduces fouling & Self-cleaning effect
- Higher subcooling for improved performance
- Removes piping between primary and secondary condensers
- Lower Operating Cost





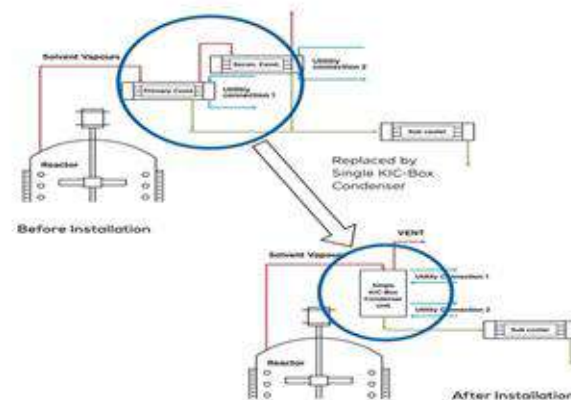
## Integrated with the new Corrugated Tube Technology

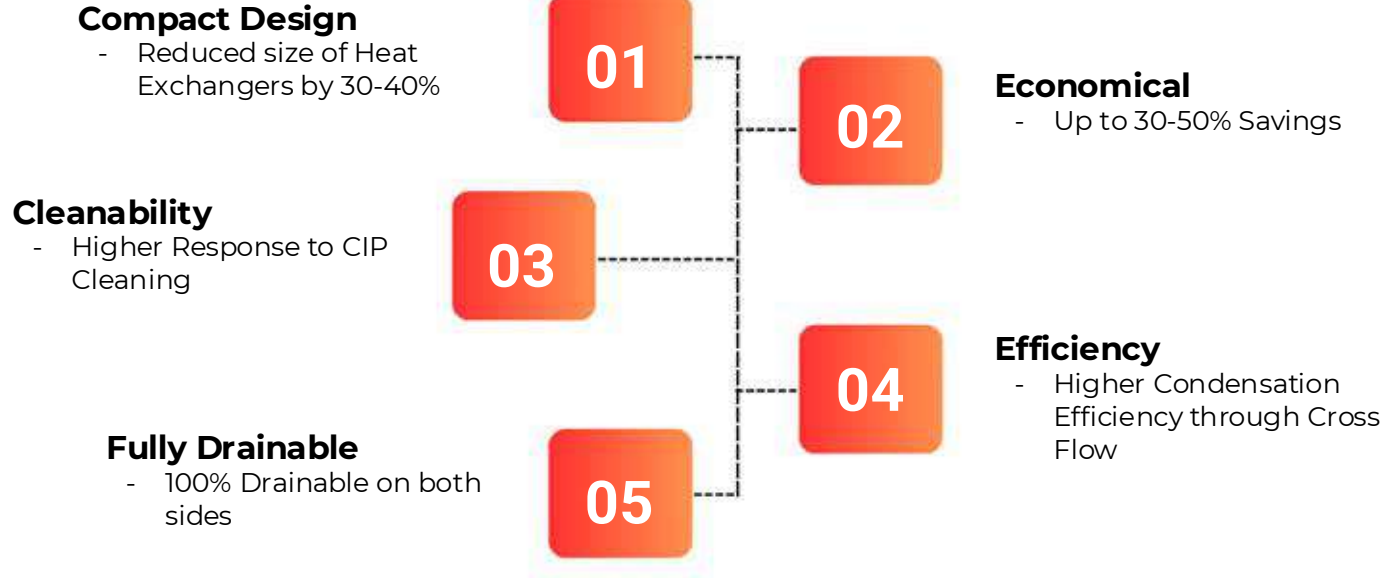
Kinam Introduces India's First KIC-Box Condenser, specifically designed for the Pharmaceutical Industry.

Box Type Condensers integrated with Kinam's KICC Corrugated Tube Technology are designed to be a one-stop solution for all Pharmaceutical Condensing needs.

**KIC-Box Heat Exchangers** replace the Primary and Secondary Condensers in a Solvent Recovery System.

Here as you can see in the image on the right the primary and secondary condensers are replaced by a single Box-Type HE Unit. This saves **cost** and **space**.







**THANK YOU**

