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RADIANT HEAT EXCHANGER PVT. LTD.



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Power Plant Expectations from Heat Exchangers (Shell & Tube)

- ❖ **Zero Stoppage** due to Heat Exchanger failure
- ❖ **Higher Mechanical Efficiency** with Improved Temperatures
- ❖ **Power Saving** in pumping due to **Low Pressure Drop**
- ❖ **Low Maintenance Time**
- ❖ **Low Maintenance Cost**



RADIANT HEAT EXCHANGER PVT. LTD.

Most Common Heat Exchanger Problems & Possible Reasons (Shell & Tube)

- Vibration issues –
Flow Induced Vibrations
- Exchanger leakage-
Tube- Tube-sheet Joint Failure
Gasket/O-Ring Failure
Inadequate Tightening Torque
Baffle & Partition bypass
- Increasing exchanger energy consumption-
Poor Design, High Fouling, Incorrect Input Parameters

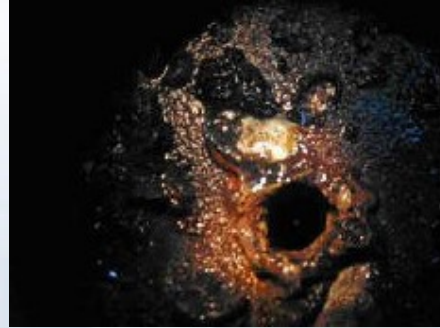


Most Common Heat Exchanger Problems (Shell & Tube)

❑ Fouling = High PD, High Thermal Resistance



Scaling



Sedimentation



Corrosion



Freezing



Chemical Fouling



Biological

Need a Solution ?



*** SPECIAL VIDEO ON LAST SLIDE :
ASSEMBLY AND DISASSEMBLY OF HEAT EXCHANGERS

SOLUTION PROVIDER



**Reliable Solution Provider
For
Shell & Tube
Heat Exchangers,
Pressure Vessels & Skids**

RII
RADIANT HEAT EXCHANGER PVT. LTD.

PRODUCT OFFERED

✦ Heat Exchangers(Shell & Tube and Extended Surface)

✦ Pressure Vessels

✦ Skids

Invest in Quality Products

Front View Of Machine



RADIANT HEAT EXCHANGER PVT. LTD.

SKID Vaporizer Drum 215000L x 2000MM Length, FCC Refining Chemicals

Finn type square tube bundle

Quench column
Condenser 1092(OD) X
7200 Recycle Column
Product Cooler
727(OD) X 5310L

SERVICES OFFERED

✦ Health Check up for Heat Exchangers AT SITE

✦ On-Site Maintenance

✦ Spares Support

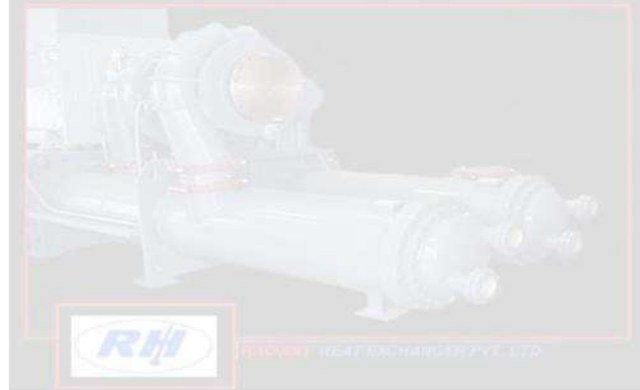
✦ Troubleshooting

✦ Design Optimization Services – By Licensed Software's AspenTech, HTRI

✦ Design Validation Services – 70,000 + equipments validated

✦ Construction Optimization for Efficiency & Servicing

Front View Of Machine



Custom Column
Condenser 1092(OD) X
7200 Recycle Column
Product Cooler
727(OD) X 5310L



RICH HISTORY BUILT ON VALUES AND SYSTEMS

- ✦ **Serving Client Needs Since 1977**
- ✦ **Repeat, Satisfied Customer Base**
- ✦ **Equipment's supplied - 72000,..... and counting**
- ✦ **Fabrication Capacity over 80 tons weighing equipment**
- ✦ **Vast Global Experience**
- ✦ **Strong Design team - Handles Complex Engineering**
- ✦ **Fabrication facilities of 40,000 SQFT**



RADIANT HEAT EXCHANGER PVT. LTD.

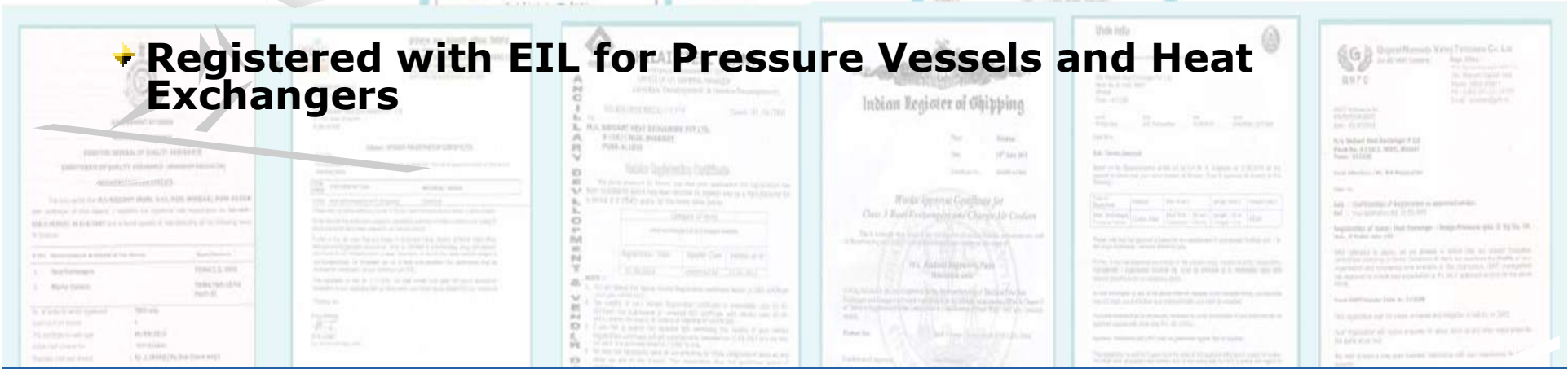
GLOBAL PRESENCE

- **Already Established Customer Base in 48 Countries**
- **Supplies to all continents**
- **More than 1800 equipment exported**
- **Equipment conforming to ASME, PED, EN, AD 2000, TRCU and Australian standards**
- **GOST, DOSH (Malaysia), MOM (Singapore), CRN (Canada) approved equipment's supplied**



CERTIFICATIONS

- ✦ ISO 9001:2015 (QMS) & 45001:2018 (Safety)
- ✦ ASME U, U2, NB, R, AD 2000 HP0, ISO 3834
- ✦ IBR & CE certification for Europe jobs
- ✦ Executed MOM(Singapore) & DOSH(Malaysia) certified jobs
- ✦ Registered with EIL for Pressure Vessels and Heat Exchangers



RADIANT HEAT EXCHANGER PVT. LTD.

POWER PLANT SHELL & TUBE HEAT EXCHANGERS

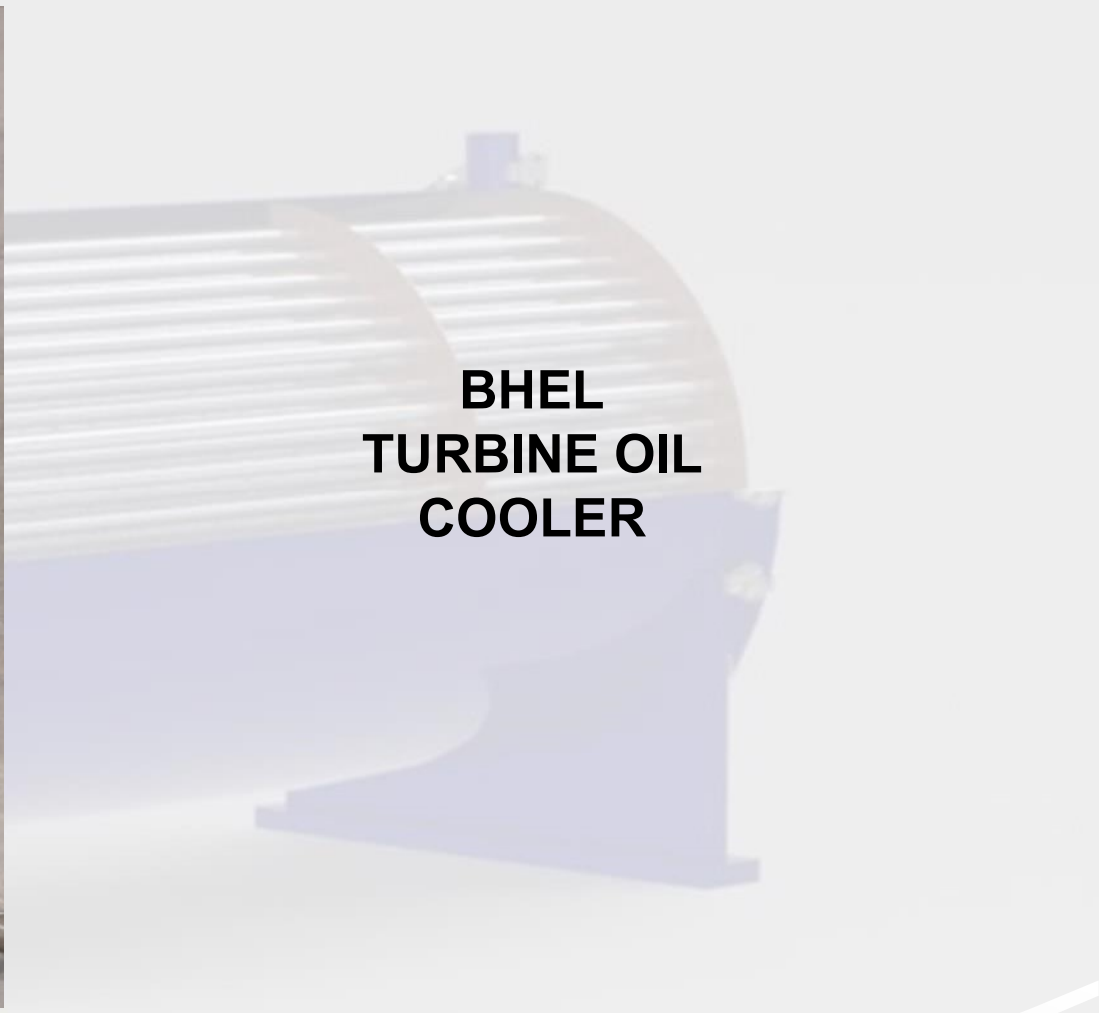


**VOITH TURBO
LUBE OIL COOLER**

POWER PLANT SHELL & TUBE HEAT EXCHANGERS



**BHEL
TURBINE OIL
COOLER**



POWER PLANT SHELL & TUBE HEAT EXCHANGERS

WORKING & LUBE OIL COOLER FOR BFP



COMPLETE ASSEMBLY



TUBE BUNDLES

FEW ESTEEMED SUPPLIES

Supply of Duplex Stainless Steel Gas Cooler to Siemens(Germany)



FEW ESTEEMED SUPPLIES



Tube Bundles for Jindal Steel&Power Ltd(India)
for Atlas Copco Compressor

FEW ESTEEMED SUPPLIES



Intercoolers 1,2,3&4 for JSW(India) supplied through MAN DIESEL&TURBO

FEW ESTEEMED SUPPLIES



Supply of SS Heat Exchangers to GNFC(Bharuch)



Supply of Tube Bundle to RCF(Mumbai)

FEW ESTEEMED SUPPLIES

Effluent Heat Exchanger supply to KRIBHCO(SURAT)



FEW ESTEEMED SUPPLIES



Condenser supply to TCI Sanmar Chemicals(Egypt) Aftercooler supply to SASOL Chemicals(South Africa)

FEW ESTEEMED SUPPLIES



Supply of Intercoolers & Aftercoolers for Reliance Tail Gas Project for Large Compressor Application

STRENGTHS

Material capabilities:

Carbon Steel

Stainless Steel

Duplex stainless steel

Copper and Copper alloys

Cupro Nickel Cladded

Nickel

Stainless steel Cladded

Low Temperature Carbon steel

Size & Temperature capabilities:

Length: Up to 12 meters

Diameter: Up to 3 meters

Shell Thickness: Up to 32 mm

Tube Sheet Thickness: Up to 200 mm

Design Temp:- upto 650 Deg C



RADIANT HEAT EXCHANGER PVT. LTD.

STRENGTHS

Design & Size Capabilities

Flow Rate : 2,00,000 kg/hr

Pressure : 650 bar

Diameter : 3000 mm

Length : 12 meters



Pressure Vessels

Types of Vessels supplied:

**Air receivers, Absorbers
Volume Bottles, Vaporizers
Tanks, Dampers, Scrubbers**

Size capabilities:

**Length: Up to 12 meters
Diameter: Up to 4 meters
Shell Thickness: Up to 32 mm**



Fluid Services

◆ Process Fluids Handled

- ◆ Hydrocarbon
- ◆ Ethylene Dichloride
- ◆ Vinyl Chloride
- ◆ Hydrochloric acid
- ◆ Hydrogen
- ◆ Sulphuric Acid
- ◆ Cooling & Lubrication Oil
- ◆ Nitrogen
- ◆ Oxygen
- ◆ Chlorine
- ◆ Carbon Dioxide
- ◆ Ammonia
- ◆ EO & PO



Design SPECIFICATIONS

Design Specifications as per Standards:-

- ❖ ASME Sect VIII, Div.1
- ❖ AD Merkblatter AD-2000
- ❖ Australian Code
- ❖ EN 13445
- ❖ TEMA
- ❖ TRCU
- ❖ PED/CE
- ❖ Indian Naval Standard
- ❖ NACE
- ❖ HIC
- ❖ IBR

Design Specifications as per Client/Third Party requirement :-

**EIL, AXEN, Reliance, Praxair, Air Product, Petrofac,
Petronas, Jacobs, PDIL, KOC, Saipem, Technip, Worley**

DESIGN & ENGINEERING Softwares

✦ In House Licensed Softwares

- ❖ AspenTech (HTFS) – Version 8.8(4 Licenses)
- ❖ HTRI- Version 7.2.1
- ❖ PV-Elite
- ❖ Code Calc
- ❖ Nozzle Pro
- ❖ Autodesk package for drafting and 3D modeling
- ❖ Inventor
- ✦ NC Programming software

RHEPL FACTORY PHOTOS



MANUFACTURING FACILITY at RHEPL

- a) CNC Drill M/c
- b) Shell Rolling M/c
- c) RHEM(M/c for Tube to Tubesheet Welding)
- d) Helium Leak Testing M/c
- e) Bullet Expansion M/c
- f) Grit Blasting Unit
- g) SPM for Fin Punching
- h) Modular Fabrication Fixture(Demmler, Germany)
- i) Welding M/c

QUALITY ASSURANCE

✦ Quality and Inspection

- ❖ **Standard Procedures approved for ISO**
- ❖ **Non Destructive examinations**
- ❖ **Final Inspection**
- ❖ **Hydro test**
- ❖ **Pneumatic test**
- ❖ **Materials Control**
- ❖ **Layout Inspection**
- ❖ **Stage Inspection**
- ❖ **Cleaning & Painting**
- ❖ **Documentation**



In-House Inspection & Testing

- ❖ **PMI Testing**
- ❖ **Surface Roughness Test**
- ❖ **Dew Point Meter**
- ❖ **RAL Chart**
- ❖ **Helium Leak Test**
- ❖ **Dry Film Paint Thickness**
- ❖ **Surface thickness Comparator**
- ❖ **Chlorine content tester Kit**
- ❖ **Portable Hardness Tester**

Client Approvals

Power Plant , Petrochemical, Fertilizer, Chemical

- JSW(Dolvi & Salem)
- JSPL(Raigarh & Angul)
- JSL(Hisar & Jajpur)
- TATA STEEL(Jamshedpur),
- RINL(Vizag)
- SAIL(BHILAI), SAIL(Durgapur),
- BHEL
- DAMODAR VALLEY
- MAHAGENCO
- NLC INDIA
- TATA POWER
- RELIANCE
- CHABRA POWER
- NTPC
- HPCL
- IOCL
- BPCL
- GSFC
- GNFC
- KRIBHCO
- RCF
- NFL
- EMERSON (INDIA,ITALY, HUNGARY, UK)
- VEDANTA
- TCI SANMAR & many more
- SANMAR CHEMICAL
- SEQUOIA ENERGY



Client Approvals

Compressor OEM's:-

- MAN DIESEL & TURBO(India & Germany),
- Siemens-Dresser Rand(India & Germany),
- Atlas Copco(India & Germany)
- Cameron
- Ingersoll Rand
- Burckhardt Compression,
- Hoerbiger,
- KPCL
- FS Compressors.



Air Separation Industries

- Linde Gases(India & Germany),
- Air Liquide India,
- Air Liquide Global
- Inox Air Product
- Air Product
- Ellenbarrie Gases
- Air Water India
- Messer Gases

Engineering Consultants

Saipem

Technip

UHDE

Mecon

MN Dastur

Tata Projects

TCE

EIL

L&T

Fluor

Jacobs

IBIC

CHENGDA

Aker Solution

PDIL

Technimont

TOYO



RADIANT HEAT EXCHANGER PVT. LTD.

After Market Services

Radiant has its new 3R(Repair, Re-design & Replace)service at your door step. Our Engineers would visit your plant & help you in solving the problems related to Heat Exchangers.

Services offered at site include- Problem diagnosis, Dimensions of Tube Bundles during shutdown, Re-design for site conditions & field assistance during replacement to ensure Interchangeability & Performance



Deep Analysis Through Detailed Reports

INTERCOOLER-1 A



Deep Analysis Through Detailed Reports



Recommendations After Thorough Assessment

REMARKS

- The Tube Bundles have application of Cross Flow type. There are two circuits (Hot & Cold). The Longitudinal Seal is used for separating the Hot & Cold Circuits. This gives advantage of better heat transfer rate & compactness.
- This type of Tube Bundle has reached Corrosion of around 20%. It should be operated on Critical situations only.
- If Corrosion limit is beyond 20%, then there is change in Fin Integrity. If the Fin particles could hit the Impeller & chances for Compressor are damaged.
- The estimated Life of this Heat Exchanger is 6 to 8 years subject to regular maintenance of Heat Exchanger (as per provided Operation & Maintenance Safety Manual along with the Heat Exchanger) & maintaining the pH of Water.
- **RADIANT** recommends procurement of new Tube Bundle if the Corrosion Limit crosses beyond 20% & Fin Integrity beyond 20%.

What you will get Owning a Radiant Equipment ?

- ❖ **100% Reliability**
- ❖ **No joint failure - Not a single joint failure through 2.5 to 3 million joints**
- ❖ **Better Heat Exchanger Performance**
- ❖ **Low energy costs.**
- ❖ **Full Conformance to Specifications**
- ❖ **Ease of installation and Excellent Aesthetics**
- ❖ **Service: Special department & Dedicated team for After market support, on site support**
- ❖ **Flexibility : Flexible to give solution for other Heat Exchangers**

What you will get Owning a Radiant Equipment ?

OPERATION, MAINTENANCE & SAFETY MANUAL



RADIANT HEAT EXCHANGER PVT. LTD.

S-116/2, MIDC, BHOSARI, PUNE-411 026

MAHARASHTRA INDIA.

Phone : 91-20-4071 8000/8004/8026

E-mail : CustomerSupport@radiantexch.com

brajesh.chaubey@radiantexch.com

OPERATION, MAINTENANCE & SAFETY MANUAL

**FINNED INTERCOOLER BUNDLE FOR 1ST STAGE
(143#413A/B)
DOCUMENT NO:-OMSM-RH-13151**

OPERATION, MAINTENANCE & S.

Company Data:- Radiant Heat Exchanger Pvt. L.
S-116/2, MIDC, Bhosari, Pune

Device:- FINNED INTERCOOLER
(143#:
Manufacturer Ser:
Drawing No:- H)

1 SCOPE OF RHEPL:-

- General Arrangement drawing approved by BPCL dr
- The adequacy of standards mentioned on fabrication

Note:-

User of this Heat Exchanger shall follow & main
Maintenance & Safety Manual. Warranty of eqt
disassembled without informing Radiant Heat E

2. PREFACE:-

The operation and maintenance manual is an instrum
assigned to the installation and maintenance in order
and/or maintenance as well as any use of the equipm
stage. Main factor for a longer product life and good,
careful maintenance.

The exceeding of the limits fixed by the design, even
starting and stopping procedure is to be avoided also
equipment. Regarding such occurrence, Radiant Heat
assume any responsibility in case the client does not
according to manual and design specifications.

Any modification in the equipment desired by the use
& their approval must be obtained.

RHEPL do not consider themselves responsible for a
may happen due to non compliance with operating

3. Packing & Unpacking at site:-

RHEPL equipment packing is done by stret
packed in Wooden Box. Check of the delivery note sh
the conformity of every single component of the equi
is mandatory to make a written notification within 14



RADIANT HEAT EXCHANGER PVT. LTD.

TESTIMONIALS

- 1) Vast experience in Big heat exchangers for turbo compressors.
- R.R Tandiya (DGM-Mechanical-Oxygen Plant), SAIL Bhilai Steel Plant**
- 2) Professional and Great Team - J. Rieger (Production Manager), Voith Germany**
- 3) Very impressed by the company. Looking forward to further develop the business internationally - Harold Mueller (Global Procurement - Head), Siemens Germany**
- 4) Safety culture practiced is outstanding, cleanliness & attention to environment is very good. Every thing is well organized.
-C. Shanmugam (Director-Technology) AirLiquide**
- 5) Only supplier of AlfaLaval to have track record of No Field Failures for over 22 Years. - Mr. Prasanna Joglekar (Sr. Manager - Purchase) Alfa Laval Pune**
- 6) Thank Radiant for support & supervision of installation of Tube Bundle. We are satisfied with the Performance of the Cooler
- Rene Hrncarek(Managing Director)- MG Odra Gas(Czech Republic)**
- 7) We take the privilege to appreciate the Good Work . Keep it up.
-S. Arul Anandan(DGM- ASP & Utilities- JSW Steel(Salem))**

THANK YOU



VIDEO : ASSEMBLY AND DISASSEMBLY OF HEAT EXCHANGERS



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QUESTIONS ?

Satisfy