

GREY- TEC

Connecting industries —



OUR TEAM



Arjan Greidanus

Managing Director GreyTec B.V.

20 years of International Engineering, Operational and Managerial experience within (petro)chemical companies like Unilever, Sabic, AkzoNobel and Nouryon.



Huzaifa Das

Business Development GreyTec B.V.

12 years experience in RD&I , process technology and manufacturing within AkzoNobel and Nouryon.



Amol Palve

Business Manager GreyTec B.V.

13 years of experience in Oil & Gas (downstream), Wastewater, and Chemicals across Asia and Europe. His background includes significant roles at global firms such as Dorf Ketal BV and Taprogge GmbH.



Equipment made from FRP, GRE or steel lined with thermoplastic / fluoropolymer such as PP, PVC, PE, PTFE, PVDF, PFA



Thermoplastic valves and lined valves made from PP/PFA/PTFE/FEP



Heat Exchangers manufactured from all different metals incl SS, Inconel, titanium, monel, etc.



Offers state-of-art engineering services (conceptual design-basic engineering-detailed engineering) with an experienced team of professionals



GRP / Composite flanges, fittings , pipes, spools, backing rings, tubulures, elbows made with an innovative RTM, vacuum infusion and SMC process



Graphite and silicon carbide Heat exchangers
Graphite columns and quenchers
Process systems for HCL acid synthesis and recovery, FeCl₃, Sulphuric acid dilution
Glass lined equipment for corrosive applications

POLYPLAST CHEMI-PLANTS

- Polyplast designs & manufactures GRP/FRP chemical equipment & dual laminate thermoplastic liners like PP, HDPE, PVC, CPVC, PVDF, PTFE, TFM, ETFE, ECTFE, FEP, PFA.
- 10000 m² modern manufacturing facility with filament winding machines
- Total number of people working : 350
- Production location : India
- Representative Offices: India, Abu Dhabi, Dubai, Israel, Oman, Qatar, USA, The Netherlands



**Modern 10000 m²
workshop**

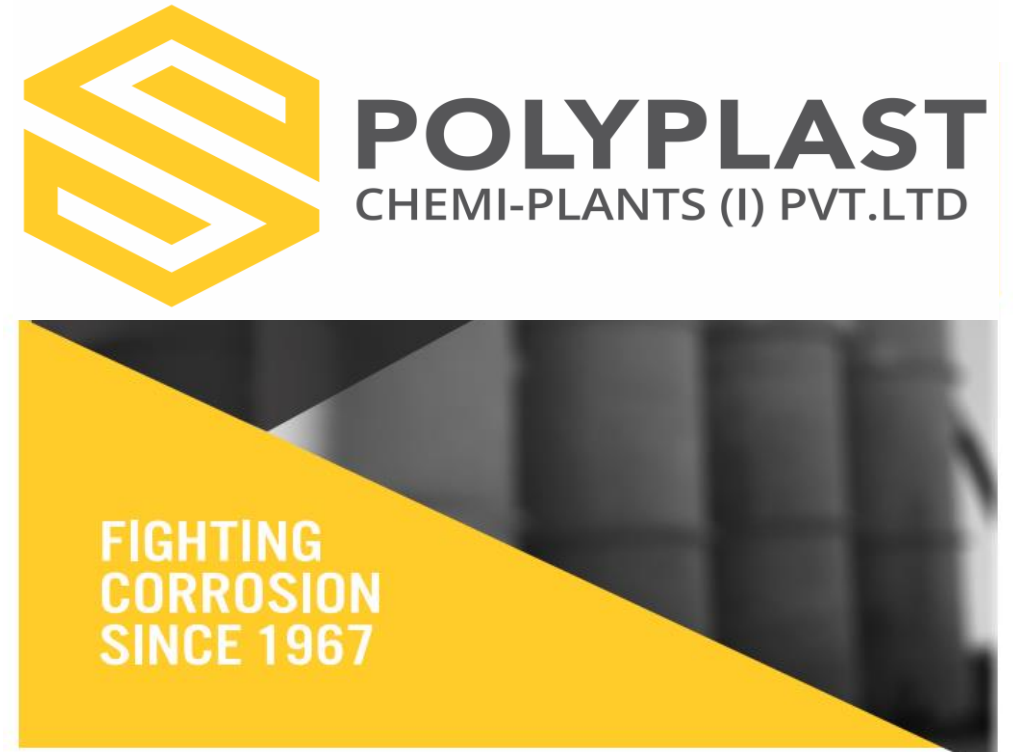
**Hand lay-up
Filament winding**

Filament winding
For vessels and piping up to 6.5m dia

Certified
ISO 9001-2015, DVS,
PED, CE

FRP – CHARACTERISTICS & ADVANTAGES

- Little to no maintenance is required
- A long product life span, up to 50 years
- High-performance insulation
- Abrasion and corrosion resistant
- Lightweight (7x lighter than steel)
- High Chemical Resistance
- FRP replaces expensive alloys like Hastelloy, Super Duplex, Nickel, Monel, etc.
- Able to work with temperature limits of approximately – 50°C to 180°C (gas) / 125 °C (liquid)



FRP/GRP CAN BE USED FOR

- Hydrochloric Acid
- Sulphur Acid
- Phosphoric Acid
- Acid solutions
- Caustic Solutions
- Brines and salt solutions
- Chlorides
- Flue gases
- Lime slurry
- Fuels
- Fertilizers
- Starch solutions
- Vegetable oils
- (Sea) Water



CERTIFIED FOR THE HIGHEST QUALITY AND THE LATEST STANDARDS

Design Standards

EU / British Standard

BS 4994-1987 | BS 6464-1984 | BS 7159-1989 | BS 5480-1982 | BS 5500/53 | BS EN 13121

American Standard

ASTM D 3982-03 | ASME RTP 1 2013 | AWWA M-45 & C-950 | ASME SEC X

German Standard

DIN 16965 : Part 4 & 5 | DIN 16966 : Part 1,2,4,5,6 | AD 2000 - MERKBLATT N1

Testing Laboratory



Certifications



VERTICAL STORAGE TANK

- Industry : Pulp & Paper
- SCG
- Thailand
- 200 m³
- PVC + FRP



REACTION VESSEL

- Industry : Steel
- Andritz AG
- India
- 100 m³
- FRP
- Fluid : HCl



MIXER SETTLERS

- Industry : Phosphoric acid
- India
- PVC+FRP
- 167 nos



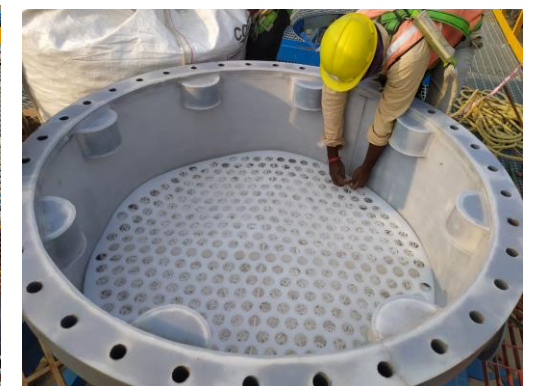
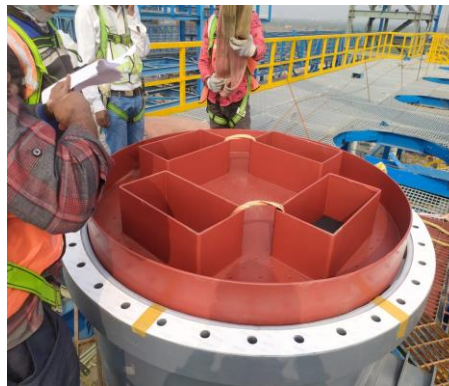
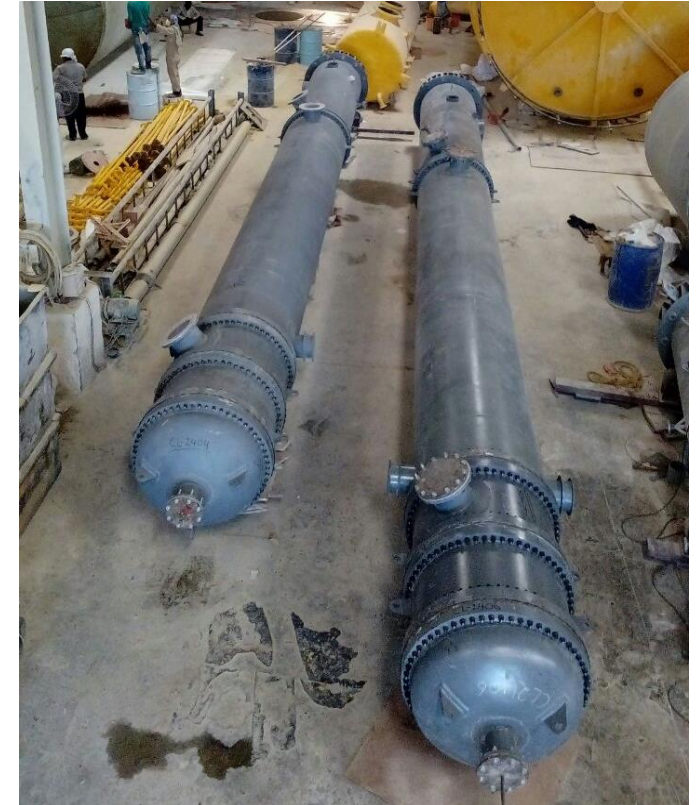
ION EXCHANGE APPLICATIONS

- Industry : Beverage
- ResinTech Inc
- USA
- Fluid : 80% Sulphuric Acid
- Volume - 10 m³ -20 m³
- Quantity : 18 nos
- MOC - FRP



FLUROPOLYMER LINED EQUIPMENT

- Industry : ChlorAlkali
- GACL
- Dahej, India
- PFA / PVDF + MS
- Fluid : Chloromethane



ANOLYTE & CATHOLYTE HEADERS

- Industry : ChlorAlkali
- Various sizes
- Fluid : Catholyte & Anolyte (chlorine, caustic , brine)



PIPING

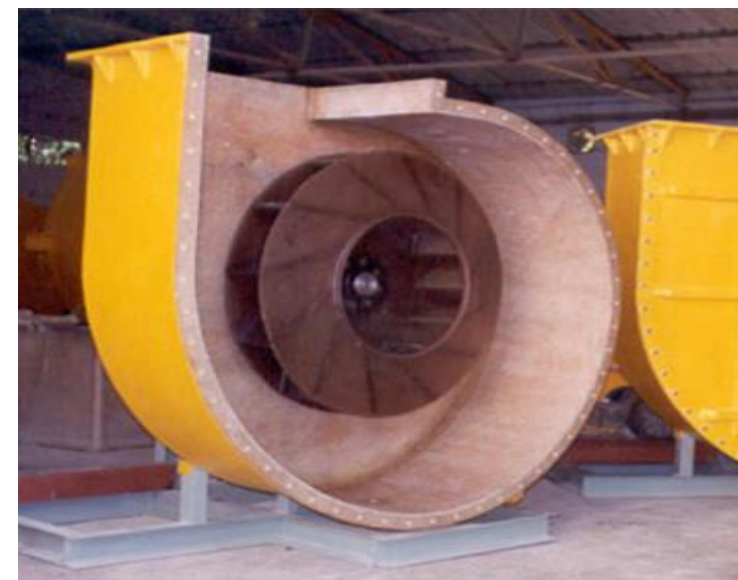
- Industry : Chemicals
- Various liners + FRP/GRE
- Top Photo :

FRP fire retardant pipes operating at 22 bar pressure rating for IOCL



SCRUBBER SYSTEMS

- Tenova S.p.A.
- Industry – Steel
- HCl Packed Bed Scrubber installed in Vietnam (Left)
- Industry – Fertilizer
- Ammonia Scrubbing System (Right)
- Biogas Treatment – H_2S
- Venturi scrubbers



SCRUBBER SYSTEMS

- Industry : Pulp & Paper
- Lean Gas Scrubber
- 1.7m D x 15 m H
- MOC - FRP
- Sulphuric Acid



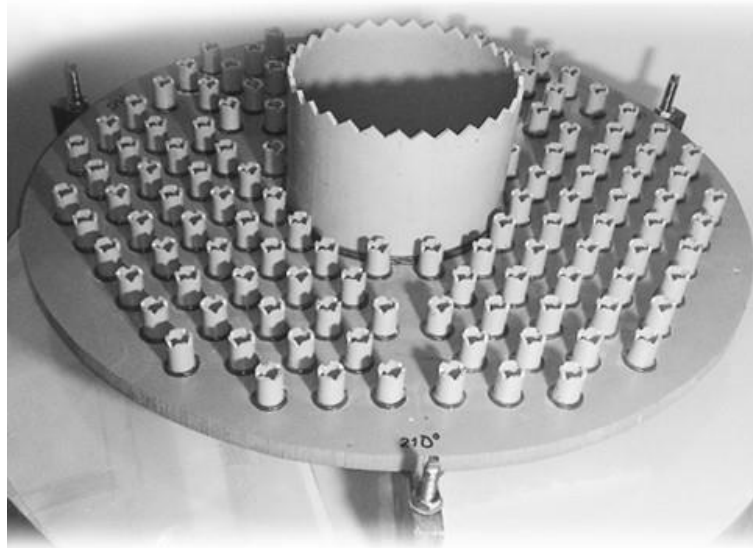
SCRUBBER SYSTEMS

- Industry : Textiles
- Haldor Topsoe
- Indonesia
- MOC – ECTFE + FRP
- Fluid Handled - Sulphuric Acid + SO₂ gas
- Size - 1400 mm Diameter



MIXERS INTERNALS AGITATORS

- MOC – CPVC , PVDF , PTFE
- Static mixer for Sulzer
- Liquid Distributor
- Column trays
- Agitators



ROTEC Fittings, Special Products and Solutions



Fixed Flanges (RTM)



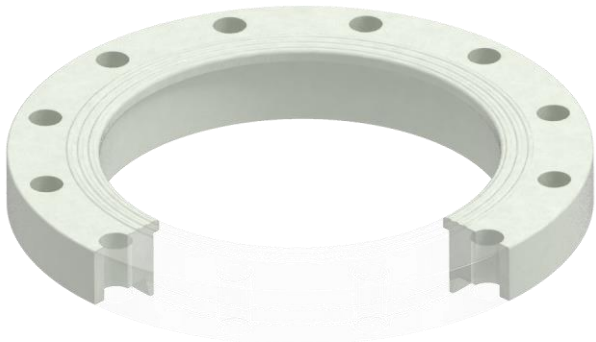
Stub Flanges (RTM)



Backing Rings (RTM and vacuum infusion)



Blind Flanges (RTM and vacuum infusion)



SMC Flanges and Backing Rings (SMC)



Manholes and Covers



Tubulated Stub Flanges (Nozzles)



Tubulated Fixed Flanges (Nozzles)

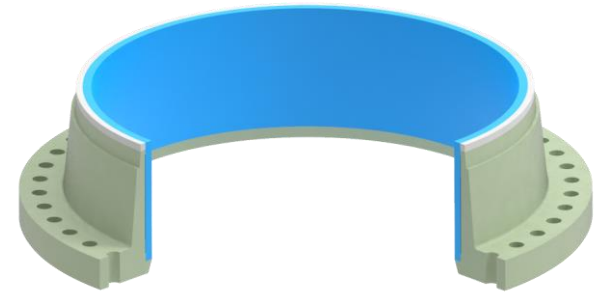
ROTEC Fittings, Special Products and Solutions



Molded Bends and TEE's



Quick Couplings



Linercon® flanges and fittings for relining (CCIP)



ISO tank spout



Chemical drainage cover



Sandwich floor panels and Plates

Manufacturing Process Matters! (RTM, Vacuum infusion and SMC)

Manufacturing process governs major aspects of the overall product quality and it's long-term performance.

- 01 Product material properties** such as fiber to resin ratio & stiffness are important to use the full potential of composite material.
- 02 Traditional manufacturing methods** are not highly sustainable. High material usage, high manpower, cost, production time and machining after production are main issues.
- 03** In addition, **Traditional manufacturing methods** with manual work might lead to overdesigned products with poor quality and production volume limit.



DN 600 GRE flange PN40

UNP POLYVALVES

One of India's largest manufacturer of thermoplastic valves and lined valves made from PP/PFA/PTFE/FEP



30+
Years of Experience



45+
Countries Presence



100%
Quality Tested Products



1,200+
Satisfied Customers



CE
Certified



250+
Employees



210,000 +
Sq. Ft.
Factory Spread



SIL-3
Certified Products



Lined Ball Valve



Lined Plug Valve



Lined Butterfly Valve



Lined Diaphragm Valve



Lined Sampling Valve



Thermoplastic Ball Check Valve



Lined Ball Check Valve



Lined Globe Valve



Lined Swing Check Valve



Lined Sight Glass



Thermoplastic Ball Valves



Thermoplastic Butterfly Valve



Control Lined
Ball Valve



Control Lined
Butterfly Valve



Control Lined
Plug Valve



Control Lined
Diaphragm Valve



Lined Globe
Control Valve



Actuated Thermoplastic
Diaphragm Valve

PTFE / PVDF / PFA LINED PIPES AND FITTINGS



FLUOROPOLYMER LINED EQUIPMENT

- Purolite
- Romania
- Fluid : Sulphuric Acid
- MOC : PTFE lined carbon steel





**Modern 12000 m²
workshop**

Since 1988

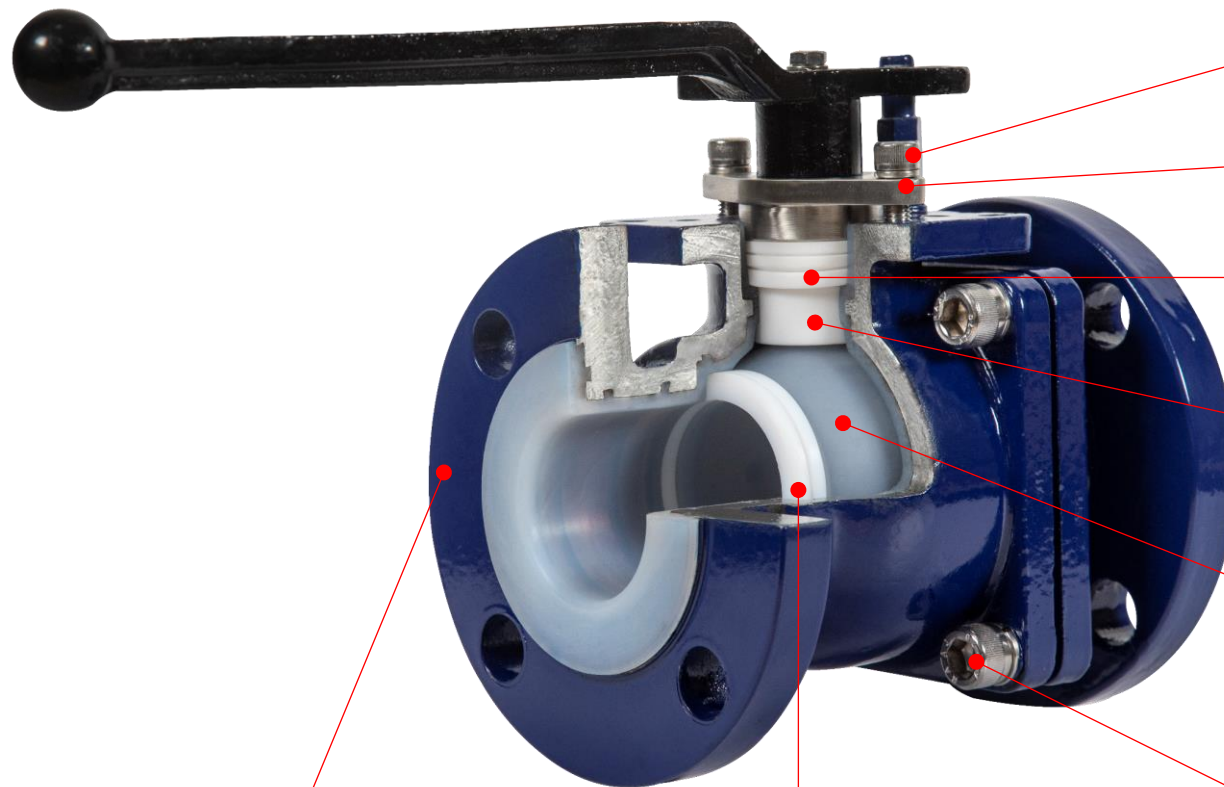
Plastic valves
Lined valves
PTFE Lined Pipes

Certified
ISO 9001-2015
CE ATEX SIL3



RANGE OF MATERIALS

Materials	Materials	Chemical resistance	Temperature resistance
Thermoplastics	POLYPROPYLENE	Selective	+18 to 85 deg.C
	ISOTACTIC POLYPROPYLENE	Selective	+18 to 110 deg.C
	PPH	Selective	+18 to 110 deg.C
Fluoropolymers	PVDF	Moderate	-18 to +135 deg.C
	ETFE	Moderate	-18 to 155 deg.C
	ECTFE	Moderate	-18 to 155 deg.C
Fluorocarbons	PTFE	Universal	-28 to 180 deg.C
	FEP	Moderate	-28 to 120 deg.C
	PFA	Universal	-28 to 160 deg.C



Gland Cover Bolts in B7 / SS 316 /Alloy 20 / Hest alloy C 276 for Gland cover load adjustment.

Gland Cover in CF8 or CF8M

Special Sintered Chevron Packing. No cup seals which may result in cracking in PTFE/TFM

PTFE/TFM Bush to ensure 100% Alignment of Integral stem to the Ball.

PFA/Conductive PFA encapsulate Ball available in option of vented Ball for Chlorine service, V port Balls for control applications.

Allen Bolts in option of B7 / SS 316 / Alloy 20 / Hest alloy C 276 available

Investment castings for Intact lining quality in options of WCB/CF8M/Inconel/Hest alloy C / Alloy 20 available.

TFM (M-PTFE) Seats with special energizing groove for low torque and better endurance for enhanced life.












Since
1981

14000+
installations

10000 m² workshop
with cleanroom for welding
titanium and tantalum

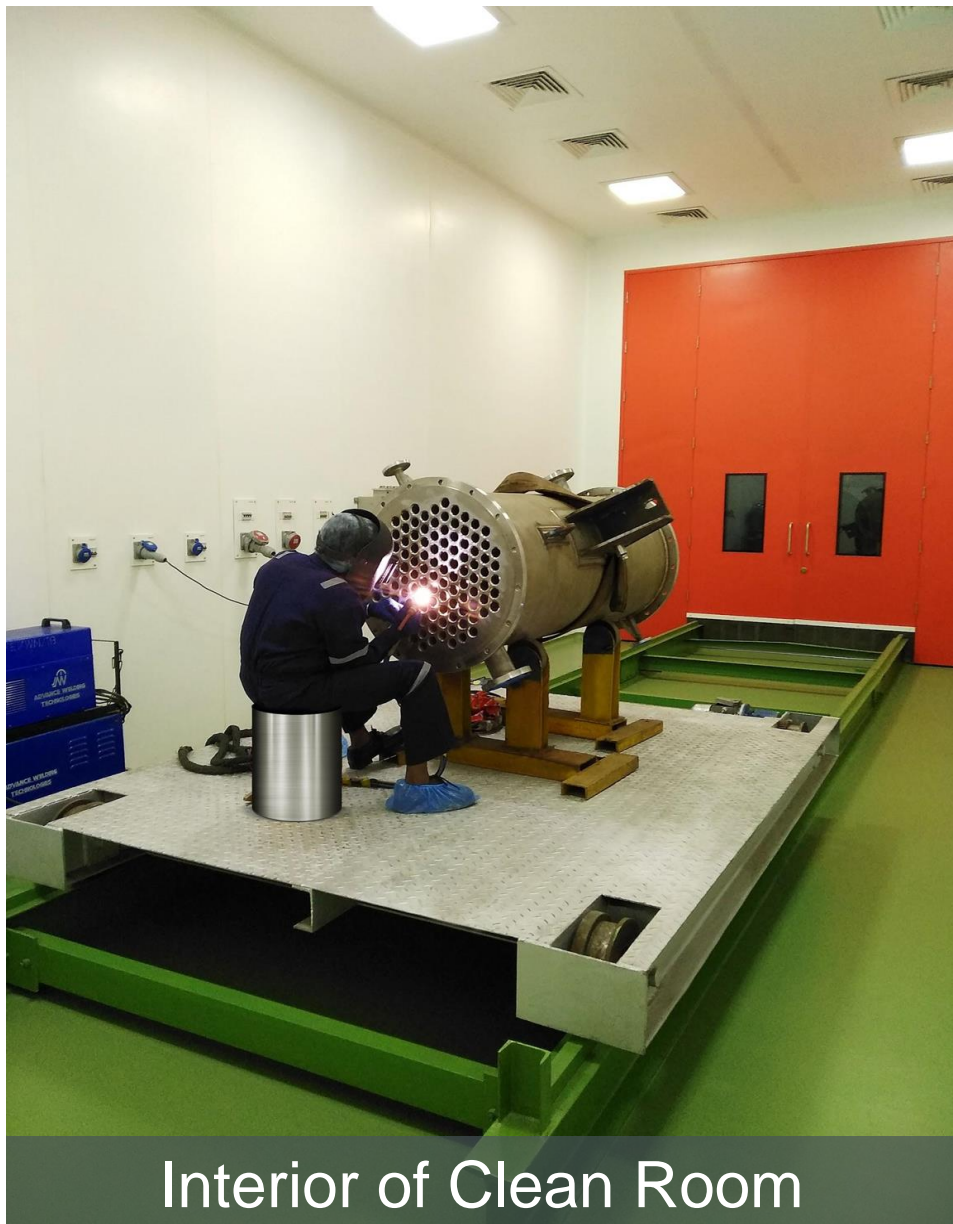
Certified
ISO 3834-2, 9001-2015, 45001, PED, CE,
ASME U Stamp

Supplied
Globally

Infrastructure	Design	Cutting	Rolling	Drilling	Dished End	Welding	Clean Room	Testing
 <p>3 fabrication units Total area under crane - 56000 sq. ft Team strength - 150+ personnel Heat Transfer area range -1m² to 4000m² Maximum weight handled per equipment- 100 tons</p>	 <p>Thermal design HTRI CHEMCAD 7 Mechanical design CademPVD PV Elite Construction drawing AutoCAD GstarCAD Proprietary Software ProHE</p>	 <p>CNC cutting upto 30 mm thick Plasma cutting upto 100 mm thick</p>	 <p>Maximum width 2.5 meter Maximum thickness 30 mm thick</p>	 <p>Tube-sheet drilling upto 400 mm thick & 4 meter diameter</p>	 <p>Dished End forming upto 3 meter diameter and 25 mm thick</p>	 <p>GTAW SAW Orbital Welding</p>	 <p>1000 sq. ft Clean room for welding of Titanium</p>	 <p>Hydraulic and Pneumatic testing Vaccum testing Helium leak Testing Penetrant flow testing Radiographic testing Ultrasonic testing PMI testing</p>

Materials handled - Austenitic Stainless Steel (All 300 series) / Carbon Steel / Alloy Steel / Hastelloy* / Inconel* / Monel* / Nickel 200 / Cu-Ni Alloys / Titanium / Tantalum / Duplex / Super Duplex

Construction Codes - ASME Boiler & Pressure Vessel Code / TEMA / EN 13445 & AD 2000 with PED & CE marking
Certification - ISO 9001:2015, ISO 3834-2, ISO 14001, ISO 45001, U Stamp*

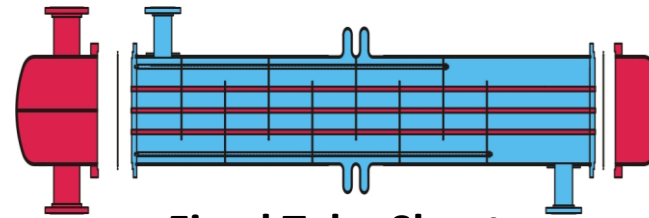


Interior of Clean Room

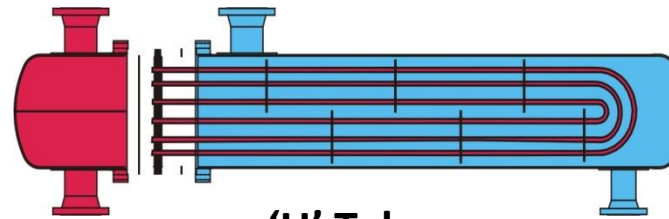


Orbital Welding of Titanium

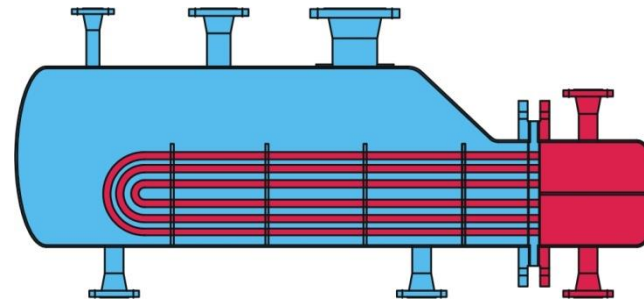
Shell Diameter	4000 mm
Tube-sheet Thickness	400 mm
Overall Length	Up to 25m
Design Pressure	200 Kg/cm ²
Weight per equipment	100 Ton
Heat Transfer Area	1m ² to 4000m ²



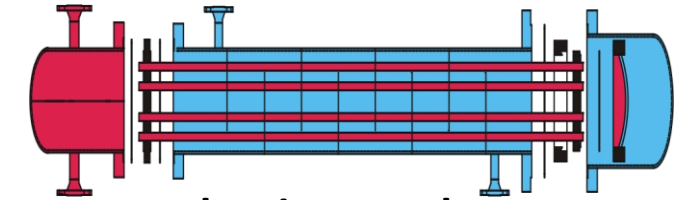
Fixed Tube Sheet



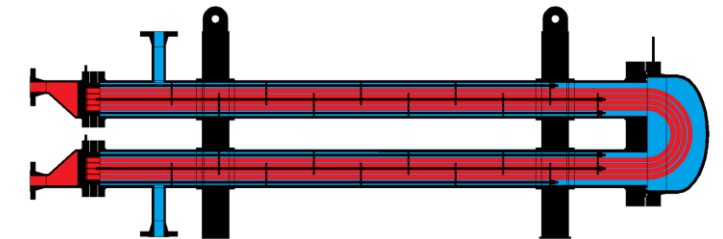
'U' Tube



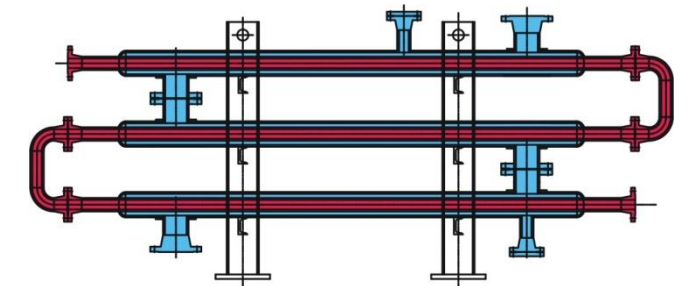
Kettle Reboilers



Floating Head



Hairpin



More than > 3000 heat exchangers sold every year !

KICC
The most efficient condenser

K-PEX
Plate Heat Exchanger

K-SPEX
The Spiral Heat Exchanger

New Order

- India's latest Phenol plant project (\$ 365 million) 300 ktpa capacity
- Kinam will deliver 31 x heat exchangers for this project next year
- Kinam will incorporate its advanced technology to ensure maximum efficiency in operations



- Acetone Recovery Column Reboiler
- Cumene AMS Topping Column Start-Up Reboiler
- Pure Phenol Column Condenser
- Acetone Stripper Reboiler
- Feed Cumene Heater
- CHP Evaporator
- Raw Acetone Column Reboiler
- Raw Acetone Feed Evaporator
- Pure Acetone Column Reboiler
- Phenol Recovery Column Reboiler
- Acetone Reactor Preheater
- Raw Phenol Column Condenser

- Phenol Extraction Column Reboiler
- Glycol Recovery Column Reboiler
- Glycol Recovery Column Condenser
- Phenol Extraction Column Feed Preheater
- Pure Phenol Column Vent Condenser
- Water/ Acetone Vent Cooler
- Phenol Slop Cooler
- Cumene AMS Topping Column Condenser
- Acetone Vent Condenser
- Cumene AMS Topping Column Interchanger
- Raw Acetone Column Vent Condenser

Floating head
bundle

Depropaniser
condensor

4032 tubes
55 tons

Phenol plant

India



Fixed tube sheet

Tail gas heater

710 m²

Fertilizer plant

India



U-tube type
919 m²

Feed column
condenser

1280 tubes
46 tons

Cumene plant

India



Kettle type reboiler

Column reboiler

NOCIL

Rubber
chemicals

India



Condensor

Steam
condensor

16 m²
1 ton

Chemicals

Poland



Sludge heater

Sewage
treatment

India



Stack Heat
exchangers

Slurry heater

12 nos

Gold mine/plant

Kazakhstan



Custom made heat
exchanger

Flue gas pre-
heater

2200 m²
900 °C

SS-310/304
56 tons

Copper mine
Zambia



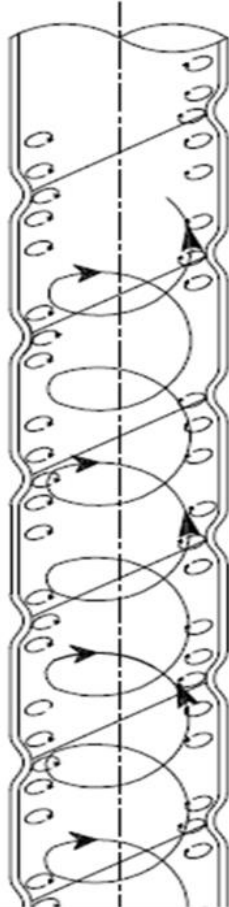
Falling film type

Evaporator

DOSH
compliant

Malaysia

KICC TECHNOLOGY – CORRUGATED TUBE HEAT EXCHANGERS



Higher Heat Transfer Coefficient

Longer Running Cycles

Lower Heat transfer Area

Low Maintenance

Economical

Uniform Temperature Profile

Reduced Fouling

Smaller Footprint

Compact

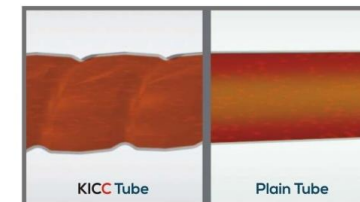
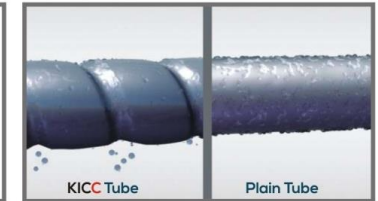
Versatile

Variety of Material of Construction



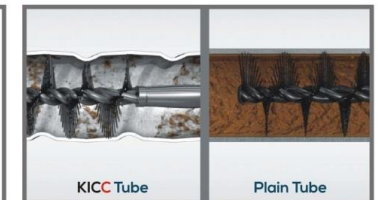
Turbulent Flow resulting in higher heat transfer coefficient.

Drop wise 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.



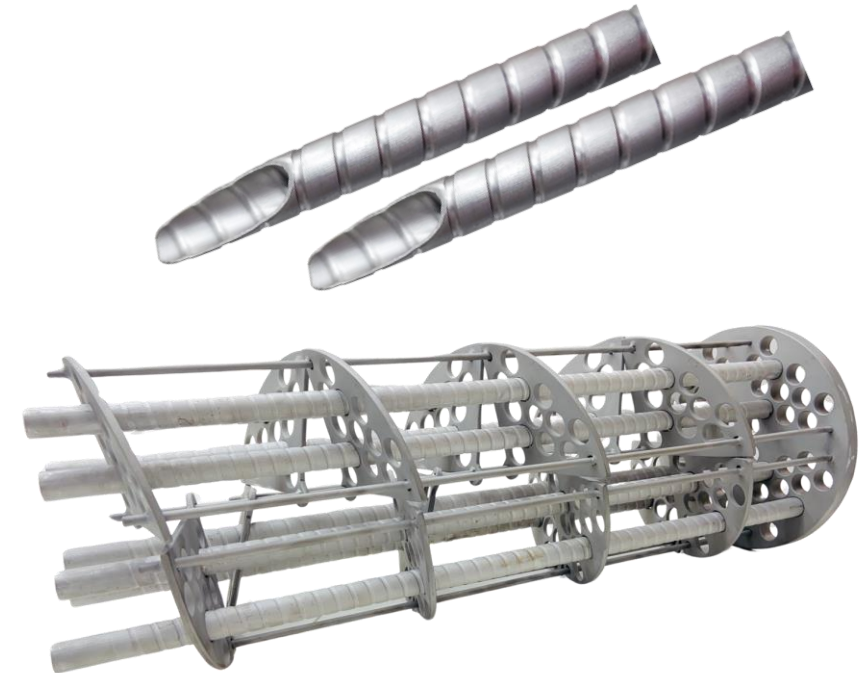
HELICAL BAFFLE CORRUGATED TUBE HEAT EXCHANGER

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 %)



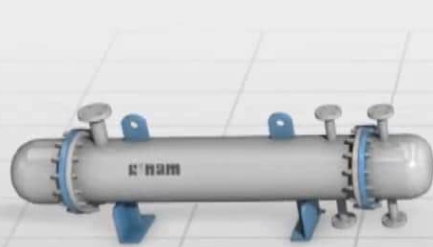
[Click here to watch the video](#)



COMPACT • LOW MAINTENANCE & OPERATING COST • HOMOGENOUS THERMAL TREATMENT

REDUCED FOULING • SMALL PRODUCT AND SERVICE HOLD UP VOLUMES • VERSATILE

LONGER RUNNING TIME • EFFICIENT • ECONOMICAL • HIGHER HEAT TRANSFER CO-EFFICIENT






Corrugated Tube Heat Exchanger



Plain Tube Heat Exchanger

KICC combines best advantages of PHE and STHE

	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 +



Titanium Corrugated Tube Heat Exchanger for
Desalination Plant



Titanium tube bundle



C-22 Condensor



Inconel 850



90:10 Cupro Nickel

Specialist in exotic metals

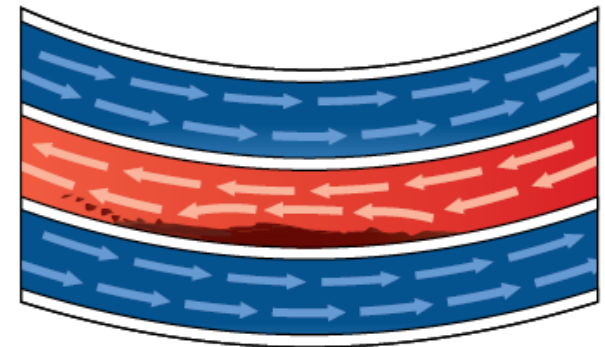
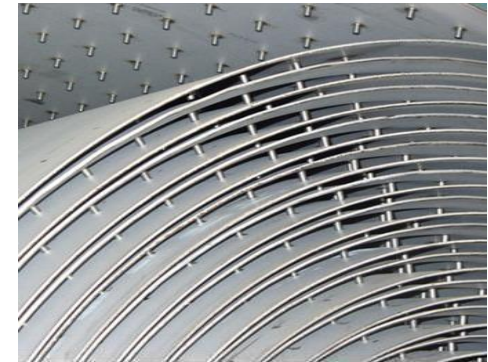
GREYTEC B.V. Titanium | Hastelloy | Inconel | Monel | Nickel 200 | Duplex | Super Duplex

K-SPEX– THE SPIRAL HEAT EXCHANGERS

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.

- Self cleaning
- High heat transfer rates
- High percentage heat recovery
- Suitability for vacuum and highly viscous fluids





KINAM ENGINEERING
MFG. INDUSTRY
Tel. No. 921.003

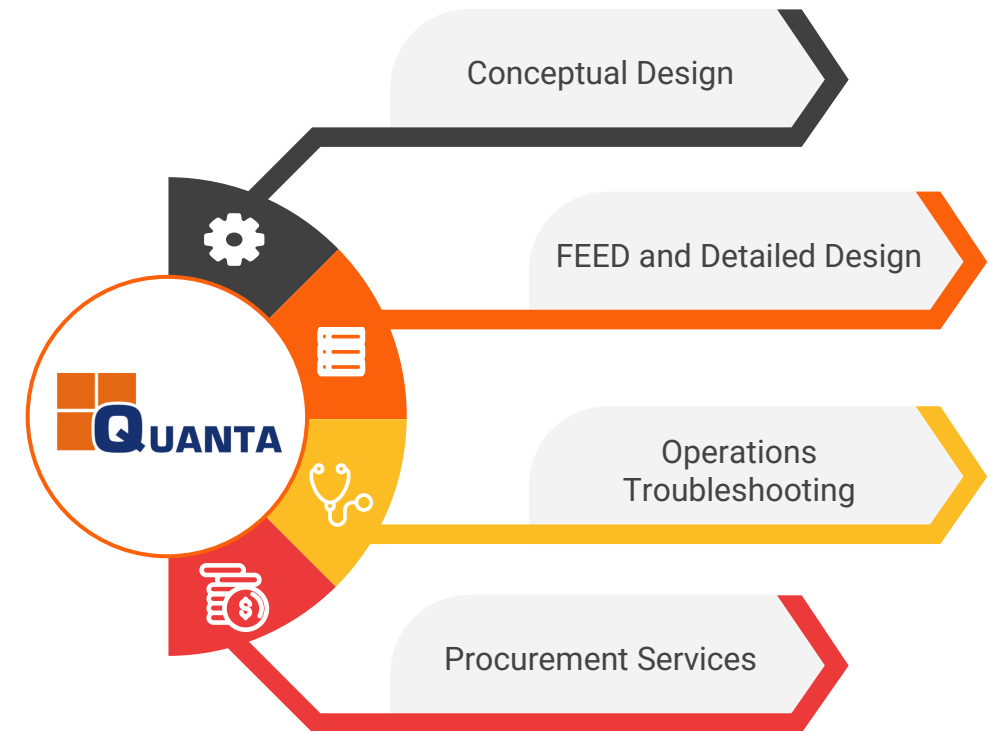
ECARB EQUIPMENT AND SYSTEMS

- Established in 2009 as spinoff from SGL Italy, based in Milan and Narni (Italy) and Pune (India).
- Graphite equipment custom made
 - Shell and tube Heat exchangers (Graphite bundle + metallic shell)
 - Block heat exchangers
 - Modular Heat Exchangers
 - Columns and quenchers
- Turnkey Systems
 - HCl Synthesis units and recovery (quenching and absorption, distillation)
 - FeCl_3 Ferric Chloride from synthesis or exhaust pickling solution
 - H_2SO_4 Sulphuric Acid Dilutions systems
 - Pickling solution heating/circulation
 - PAC (Poly Aluminum chloride) skids
- Graphite spare parts and services



QUANTA PROCESS SOLUTION

- Established in 2004, 90+clients and 500+ projects over the last 15 years
- Concept-to- completion design, engineering services and modular plant supplies to the oil & gas, hydrocarbons and chemicals process industries
- Core competency is in Process Design
- 150+ In-house engineers
- ISO 9001:2015 Certified Company
- Projects for Shell India, Bayer India Limited, Gujarat State Fertilizer Limited, Gujarat Fluorochemicals Limited, United Phosphorous Limited, Coromandel etc.
- Extensive experience in Basic and Detail Engineering, Front-End Engineering Design (FEED), SIL Study & HAZOP Study, Procurement Engineering



QUANTA PROCESS SOLUTION

- Conceptual Design
- Front-End Engineering Design
- Detailed Engineering
- Safety Services
- Procurement Services
- Construction Management
- Commissioning Assistance
- Operations Troubleshooting



Fluoro-chlor chemical plants



LPG extraction plant



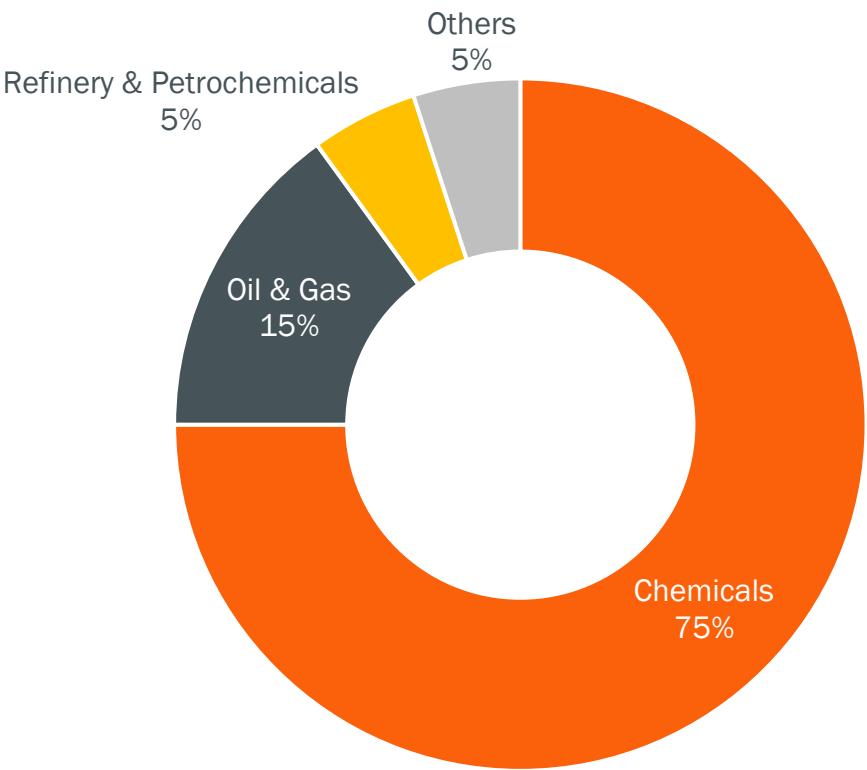
Specialty amines plant



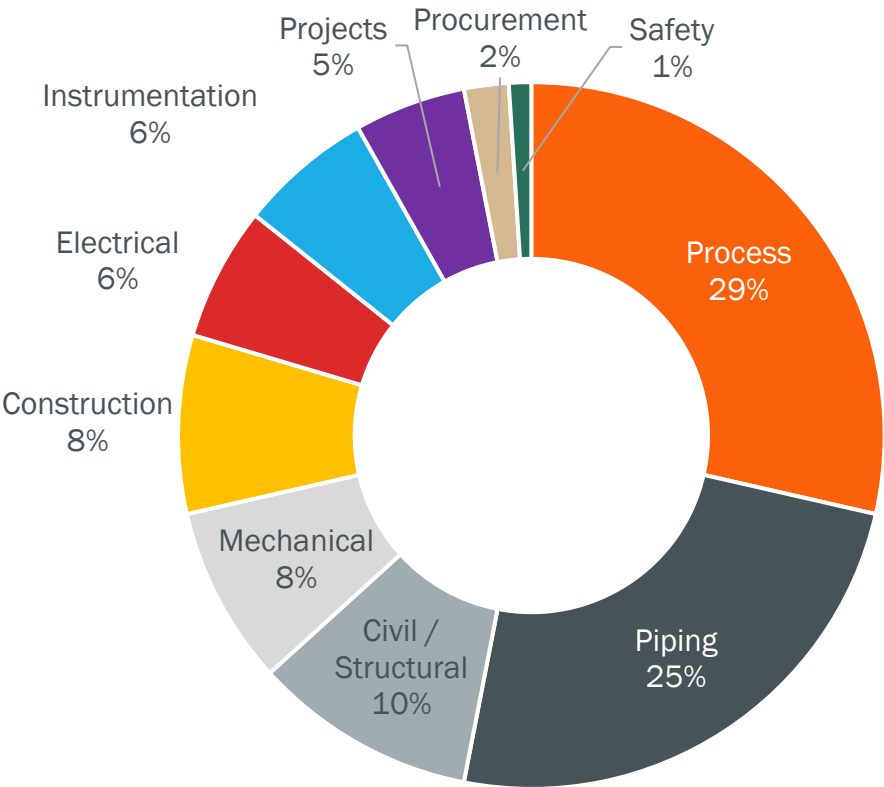
Agro chemicals plant

QUANTA PROCESS SOLUTIONS

Industry segments served



Team Composition



QUANTA PROCESS SOLUTIONS : SELECTED CLIENTS



SOFTWARE PACKAGES

Discipline	Application	Software
Process	Simulation	PRO/II , ASPEN+
	Column Internals	SULCOL / KG Tower
	Heat Exchanger	HTRI
	PFDs & P&IDs	AutoCAD
Civil / Structure	Foundation Design	RCDC / STAAD Foundation
	Structural Design	STAAD Pro
Piping	3D Modelling	CADWorx / PDMS / e3D
	Stress Analysis	CAESAR II
	GA Drawings / Plot plan	AutoCAD/BricksCAD
Electrical	Relay Coordination / Loss Optimization	ETAP (Outsourced)
Instrumentation	Sizing	Instru Calc
Mechanical	Equipment Design	PV Elite
Project Mgmt	Planning / Scheduling	MS Projects

SELECTED LIST OF PROJECTS

- **Conceptual Design**
 - Anhydrous Alcohol Technology: Bayer, Vapi
 - Ammonia Recovery Technology: UPL, Ankleshwar
- **FEED & Detailed Engineering**
 - Specialty Amines Plant (10 Nos.): AACL, Pune & Dahej
 - Specialty Pigment Plant (10 Nos.): Heubach Colour, Ankleshwar
 - Chloro-Fluoromethanes Facilities (15 Nos.): GFL, Dahej
 - Hexamine & Other Facilities (3 Nos.): KCIL, Vizag
- **PMC**
 - Specialty Gum Plant: India Malt, Savli
 - Specialty Chemicals Plant: GFL, Dahej
 - Specialty Chemical Plant: AACL, Dahej

500+ Projects Successfully Carried Out!

90+ clients in Asia , Africa and Middle East

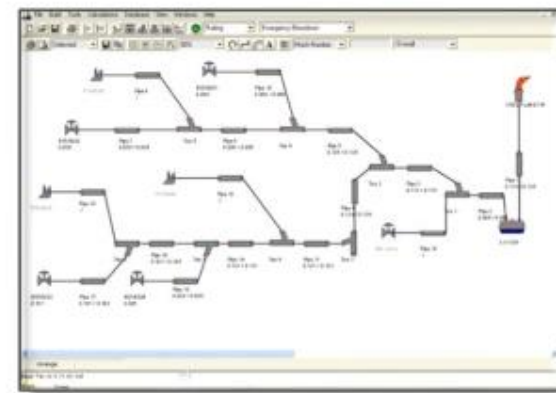
SELECTED LIST OF PROJECTS

- **Client & Location:** Clean Planet Energy
- **Location:** Teesside, UK & Gibbstown, NJ, USA
- **Year of completion:** 2025
- **Capital Outlay:** TBD
- **Scope:**
 - 60,000 TPA Waste Plastics to Premium Grade Fuels Plant
 - Pyrolysis Oil Hydroprocessing Unit, Distillation Unit, Storage & Utilities
 - High pressure hydrogen systems – Reactors, Storage & Handling Facilities
 - Skid-mounted unit - 65 Equipment, 300 lines
- **Services Provided:**
 - FEED & Detail Engineering



SELECTED LIST OF PROJECTS

- Client & Location : Shell India, Hazira, India
- Year of completion: 2014 Onwards
- Capital Outlay: 8-10 Million Euros per year
- Scope:
 - Annual maintenance contract at LNG Terminal
 - Continual Sustenance Engineering activities for facility safety & upkeep
- Services Provided:
 - FEED, Detail Engineering, Procurement Services
- 2009 Project : Flare relief system – Study of all PSVs, flare network, flare stack and blowdown. – 1 MUSD



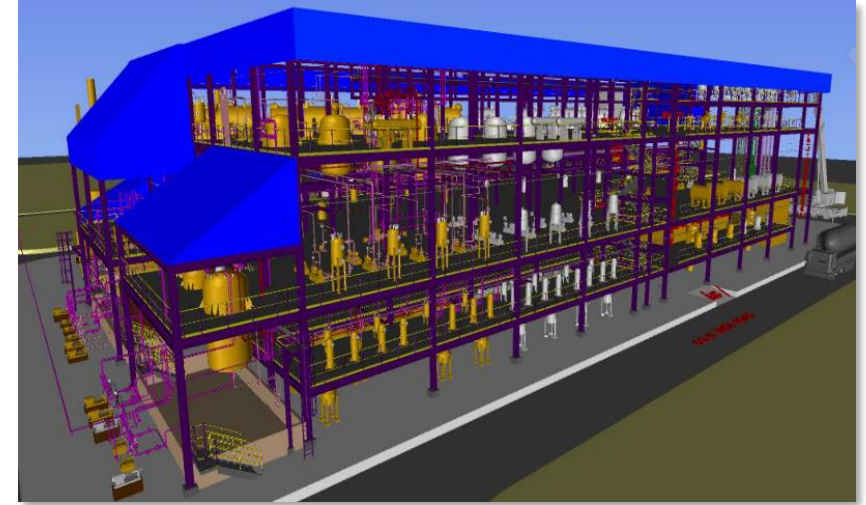
SELECTED LIST OF PROJECTS

- Client & Location: GFL- Dahej, Gujarat
- Year of completion: 2014-2015
- Capital Outlay: 35 Million Euros
- Scope:
 - Anhydrous HF, HCFC Plants with all utilities and storages
 - 350 Equipment, 1800 lines, 6 plant / utility buildings
- Services Provided:
 - Extended basic engineering & Detail Engineering
 - Procurement Engineering
 - Construction Support



SELECTED LIST OF PROJECTS

- Client & Location: GFL- Jalva, Gujarat
- Year of completion: Ongoing
- Capital Outlay: 57 million USD
- Scope:
 - Greenfield plant for lithium derivative
 - 324 Equipment, 1000+ lines, 2 plant / 1 utility buildings
- Services Provided:
 - Extended basic engineering & Detail Engineering
 - Procurement Engineering
 - Construction Support



SELECTED LIST OF PROJECTS

- Client & Location : Kisanfu Mining Kimin - Kolwezi, Congo
- Year of completion : 2022
- Capital Outlay : Confidential
- Scope :
 - SO₂ Transfer & Scrubbing Facility
 - SO₂ - rich feed gas is tapped off and fed to cobalt reactors
 - Reactor off-gases scrubbed with caustic solution
- Services Provided:
 - Basic & Detail Engineering
 - Procurement Services





THANK YOU

Arjan Greidanus

+31 611 799 108

a.greidanus@greytec.nl

GreyTec B.V.

Huzaifa Das

+31 621 587 683

h.das@greytec.nl

GreyTec B.V.

Amol Palve

+31 631 185 610

a.palve@greytec.nl

GreyTec B.V.

www.greytec.nl