

LOINTEK PRESENTATION



2016

- **General Information**
- **Design & Engineering**
- **Manufacturing.**
 - **Heat Exchanger & Feed Water Heaters**
 - **Reactors & Pressure Vessels**
 - **Boilers**
 - **Surface Condensers**
 - **Piping**
 - **Process Systems – Modular Plants**
 - **Offshore**
 - **Solar Thermal Plants**

GENERAL INFORMATION

WWW.TISYS.RU

ООО «ТИ-СИСТЕМС»



ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

Интернет: www.tisys.ru www.tisys.kz www.tisys.by www.tesec.ru www.ти-системс.рф

Телефоны: +7 (495) 7774788, 7489626, 5007155, 54 Эл. почта: info@tisys.ru info@tisys.kz info@tisys.by

General Information

- Engineering and comprehensive solutions for Industry.
- Turnkey projects with heat transfer equipment. Design and manufacturing.
- Specialist in heat exchangers, boilers, condensers, FWH and pressure vessels.
- 2 Workshops: one located in Urduliz, (Vizcaya) and the other one at the Port of Bilbao
- Lointek USA Inc. and Lointek Mex.



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General Information

**LOINTEK HEAVY
INDUSTRIES**

Port of Bilbao - Spain

Workshop

**International Port
of Bilbao**

**LOINTEK
HEADQUARTERS**

Urduliz - Spain

*Workshops
Main Offices*



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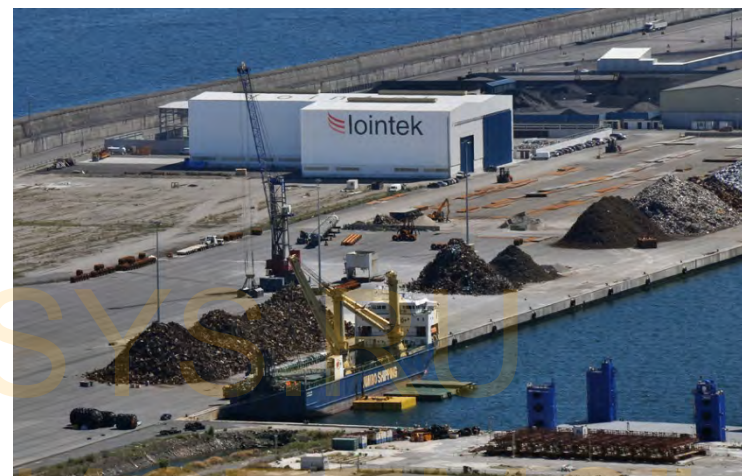
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General Information

LOINTEK HEAVY INDUSTRIES

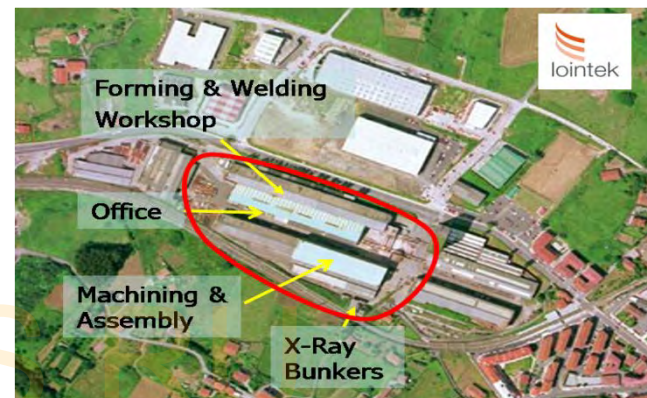
- Total area of 55.000 sq.m
- Direct load to ships
- Focused on oversize equipment and skids.



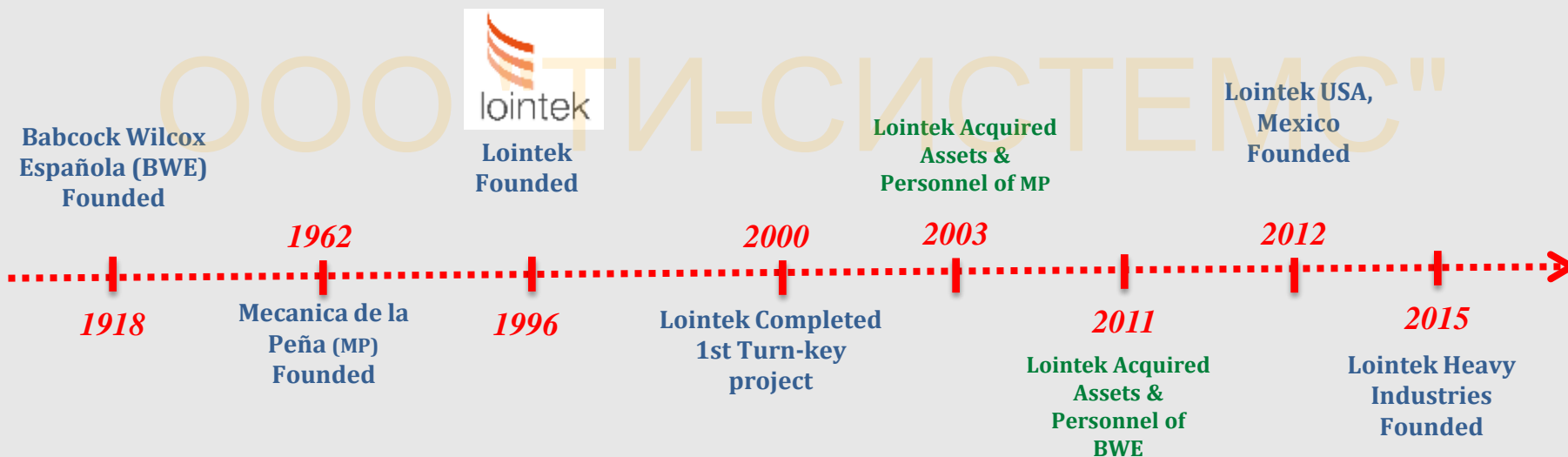
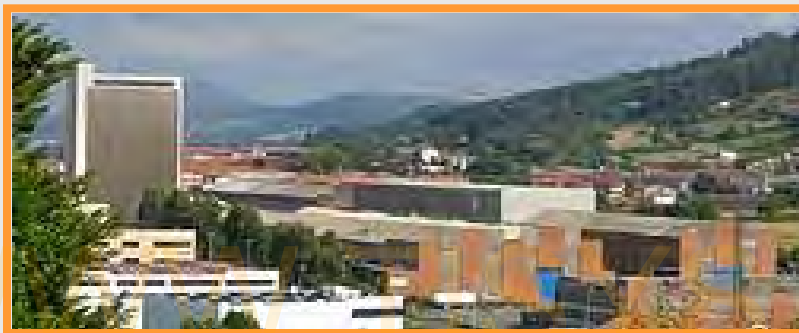
General Information

LOINTEK HEADQUARTERS

- Total area of 40.000 sq.m
- Offices
- Workshops, sandblasting and painting area...



Advancement History



Lointek Solutions

TURNKEY PROJECTS

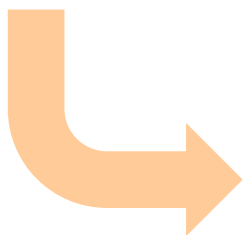
- ✓ STEAM GENERATION SYSTEMS
- ✓ PROCESS SYSTEMS
- ✓ BOILERS
- ✓ PIPING



EQUIPMENT DESIGN & SUPPLY

- ✓ REACTORS
- ✓ CONDENSERS
- ✓ FEED WATER HEATERS
 - ✓ CONVENTIONAL
 - ✓ SUPERCRITICAL
 - ✓ ULTRA SUPERCRITICAL
- ✓ HEAT EXCHANGERS
- ✓ BOILERS
- ✓ PIPING

- ❖ REFINERIES & HYDROCARBONS
- ❖ GENERATION POWER PLANTS
- ❖ COMBINED CYCLE
- ❖ NUCLEAR POWER PLANT
- ❖ UPSTREAM PROCESS
- ❖ CHEMICAL PLANTS
- ❖ AMMONIA & UREA
- ❖ OFFSHORE
- ❖ SOLAR POWER PLANTS



TURNKEY PROJECTS

Engineering

Procurement

Construction

Erection

Commissioning

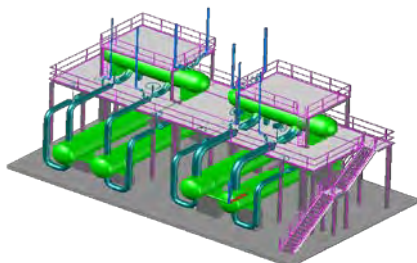
STEAM GENERATION SYSTEMS



BOILERS



PROCESS SYSTEMS



PIPING SYSTEMS



EQUIPMENT DESIGN & SUPPLY



REACTORS



CONDENSERS



FEED WATER HEATERS

CONVENTIONAL & SUPERCRITICAL



HEAT EXCHANGERS



BOILERS



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ACTIVITY SECTORS



Refineries & Hydrocarbons



**Combined Cycle
& Nuclear
Power Plants**



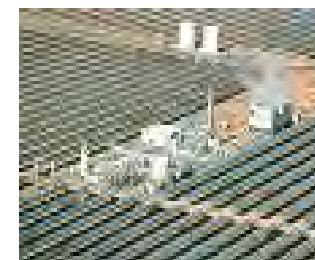
OFFSHORE



Chemical Plants



Ammonia & Urea



Solar Power Plants

Products & Applications

- **High Pressure/High Temperature Applications:**

- Reactors (Urea, Ammonia, etc.)
- Reformers,
- Desulfurization, Hydrotreater, Hydrocracker



- **Gassification & GTL:**

- Gassifier
- Syngas Cooler



- **Boilers:**

- WHB & HTF
- Packaged Boiler (up to 200 t/h)
- Fire-Tube Boilers (up to 40 t/h)
- Biomass Boilers & Steam Superheaters



Products & Applications

Solar Power Plants:

- SGS HX and Turn-key system
- Feed Water Heater
- Molten Salt HX
- Oil-Salt Thermal storage HX



Combined Cycle, Nuclear, Coal, and Biofuel Plants:

- HRSGs
- CCPP piping design, engineering, fabrication, assembly
- Feed Water Heater: Critical, Supercritical, Ultra-Super Critical
- Condensers and Deaerators
- Heat Exchangers and Steam Drums



Materials

- Duplex & Super Duplex S. Steel
- High Nickel Alloys
- Austenitic S. Steel
- Titanium
- High Strength Carbon Steel
- Chrome Moly Alloy Steel
- Chrome Moly Alloy Steel + Vanadium



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Quality Certifications



DESIGN & ENGINEERING

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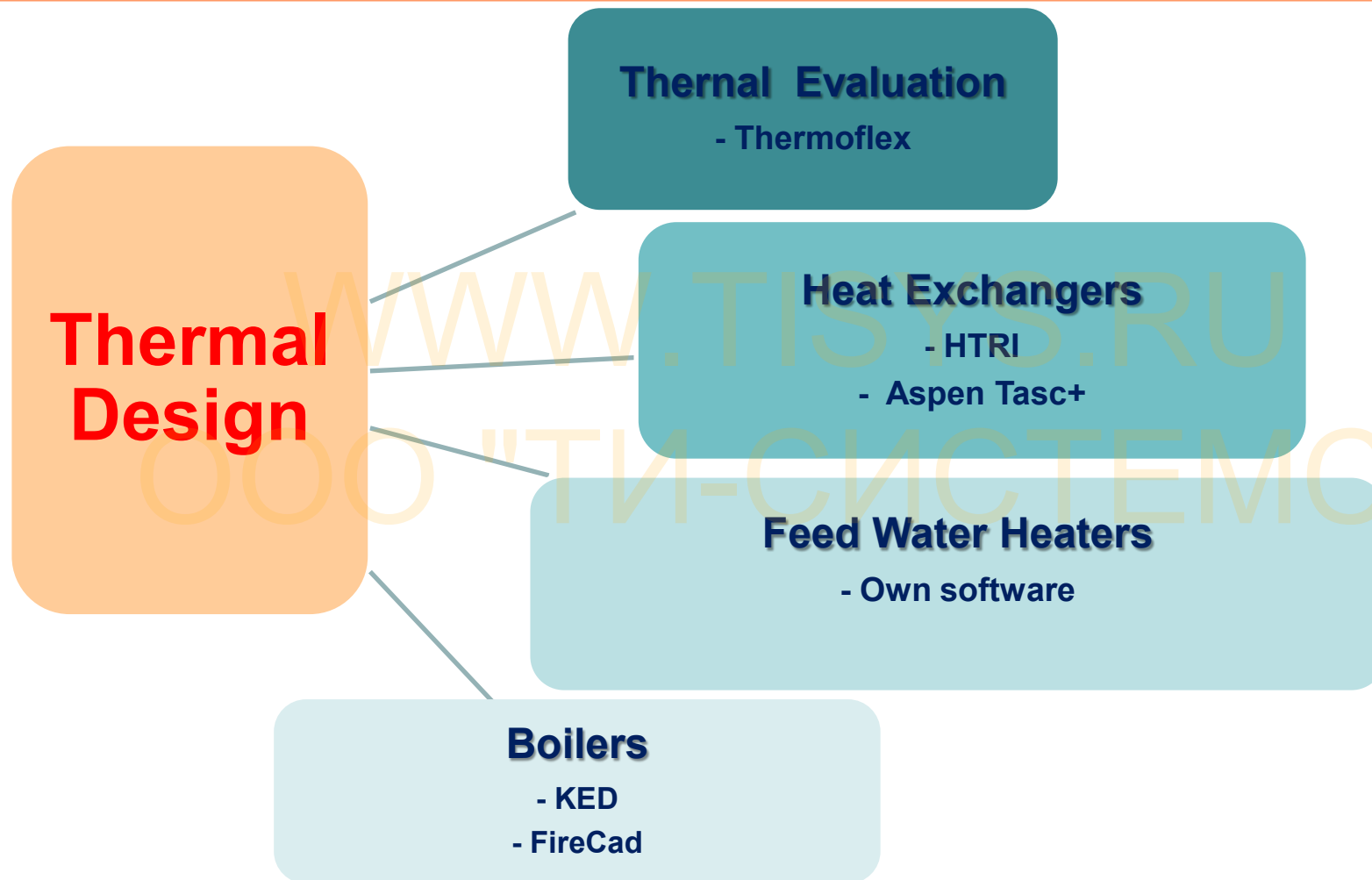
**Thermal
Design**

**Mechanical
Design**

**Detail
Engineering**

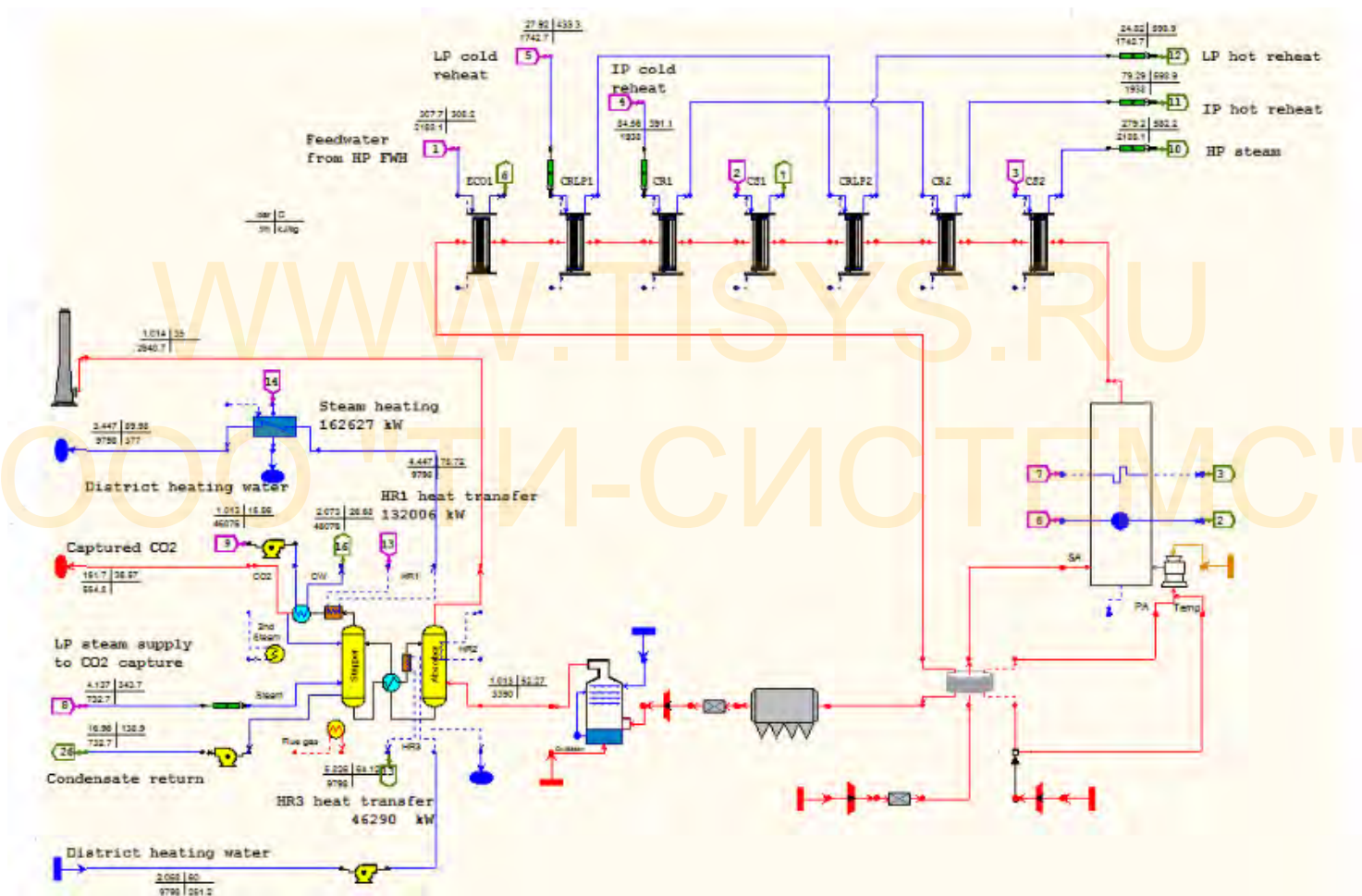
**Manufacturing
and inspection**

Engineering



Thermal Evaluation Systems

- Thermoflex



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Heat Exchangers

- HTRI
- TASC

HEAT EXCHANGER SPECIFICATION SHEET

Job No: CAIS-100%

Customer: [Redacted]

Address: [Redacted]

Plant Location: [Redacted] Date: 10/10/2011 Rev: 1

Size: 880.002 x 9753.40 mm Type: CHX No. of Passes: 1 Parallel 1 Series

SurfArea (Gross/EM): 530.27 / 617.91 m² ShellUnit: 1 SurfArea (Gross/EM): 530.27 / 617.91 m²

PERFORMANCE OF ONE UNIT			
Fluid Allocation:	Shell Side	Tube Side	
Fluid Name:	TERMINAL VPI	Steam	21.1704
Fluid Quantity Total (kg/s):	261.663	29.1704	29.1704
Velocity (m/s):	0.1522	0.1500	0.0237
Temperature (in/Out) C:	383.00 / 367.00	310.00	302.00
Specific Gravity:	0.7040	0.7200	
Viscosity (mPa·s):	0.1522	0.1500	0.0237
Heat Exchanger Weight (kg):	2.5498	2.5491	0.0747
Specific Heat (kJ/kg·C):	0.3775	0.3790	0.8695
Thermal Conductivity (W/m·C):			
Design Test Pressure (bar):	13.397	111.401	
Velocity (m/s):	1.00	7.39	
Pressure Drop (Actual/CALC) (bar):	1.600	1.848	1.300
Fouling Resistance (m ² ·h/kcal):	0.00076	0.00176	0.00176
Heat Exchanger Weight (kg):	4.42	4.42	771.94
Transfer Rate (Service):	4.42	4.42	4.42

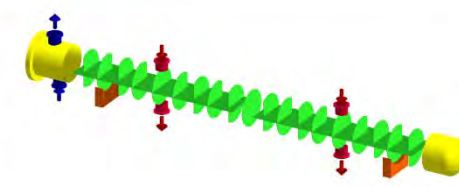
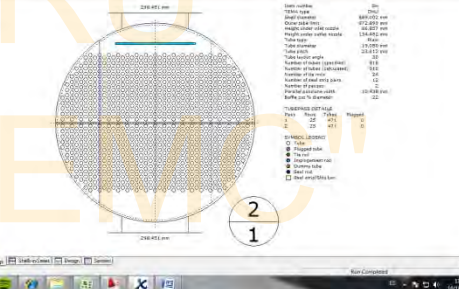
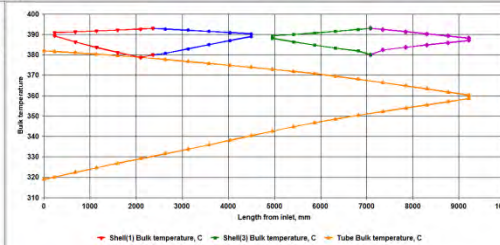
CONSTRUCTIONS OF ONE SHELL: 4-shell (switch (nondefective (synchronous)))

Design Test Pressure: 24.9614 bar

Design Temperature: 400.00 C

No. Passes per Shell: 4

Corrosion Allowance: mm

Temperature Profile Data (Approximate):

Length from Inlet (mm)	Shell 1 Bulk Temp (C)	Shell 2 Bulk Temp (C)	Tube Bulk Temp (C)
0	390	380	320
1000	390	380	330
2000	390	380	340
3000	390	380	350
4000	390	380	360
5000	390	380	370
6000	390	380	380
7000	390	380	390
8000	390	380	390
9000	390	380	390
10000	390	380	390

Item number: SH

TEMA type: TEMA

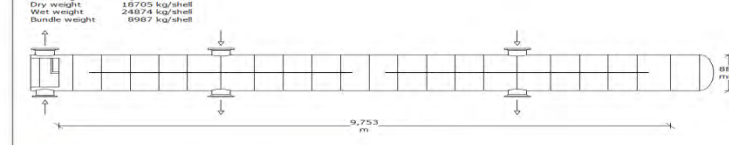
Shell diameter: 880.002 mm

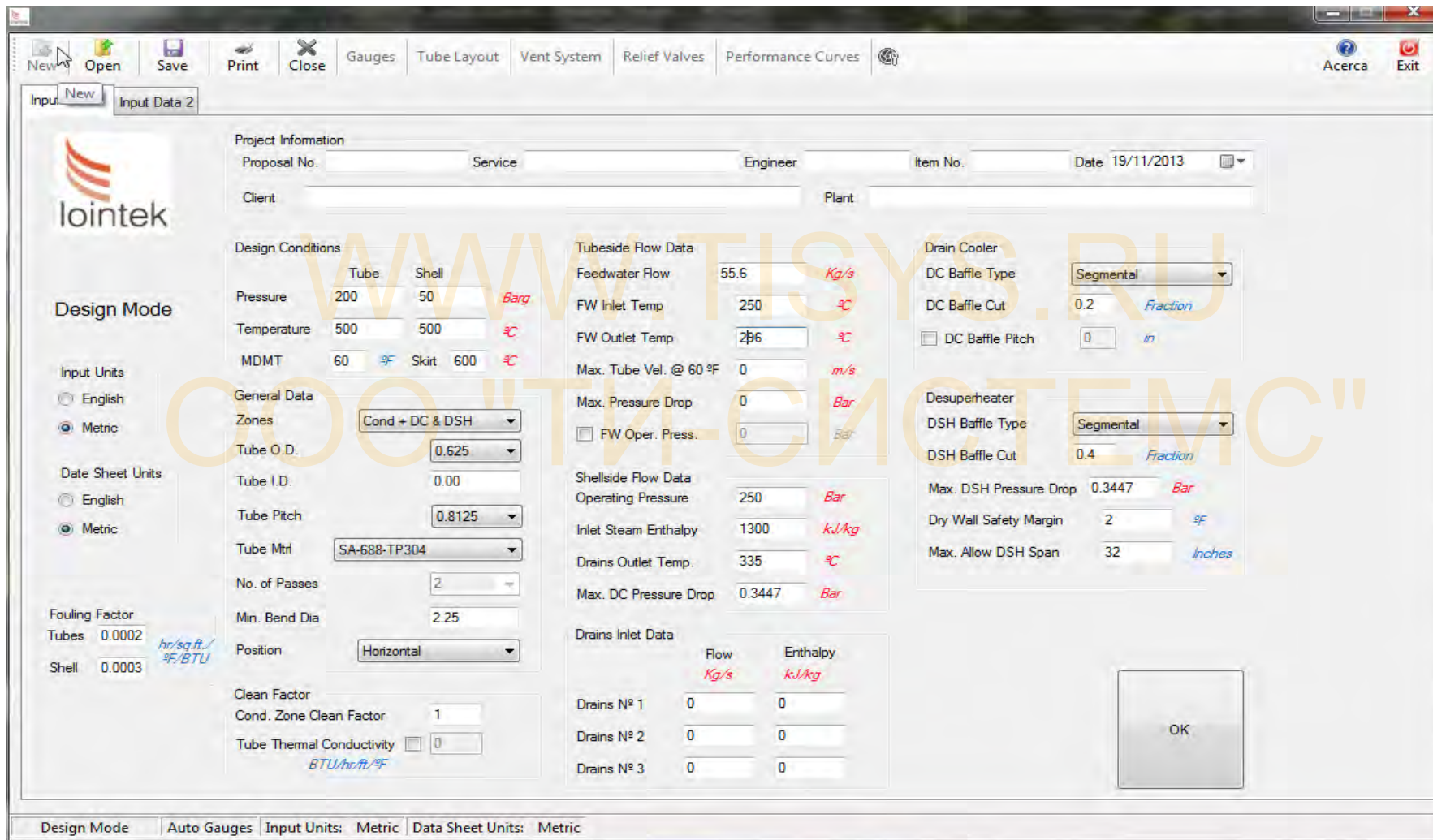
Tube length: 9753.40 mm

Dry weight: 16705 kg/shell

Wet weight: 24874 kg/shell

Bundle weight: 6967 kg/shell





The screenshot displays the 'Input Data 2' window of the FWH software. The interface includes a menu bar with options like 'New', 'Open', 'Save', 'Print', 'Close', 'Gauges', 'Tube Layout', 'Vent System', 'Relief Valves', and 'Performance Curves'. The main area is divided into several sections:

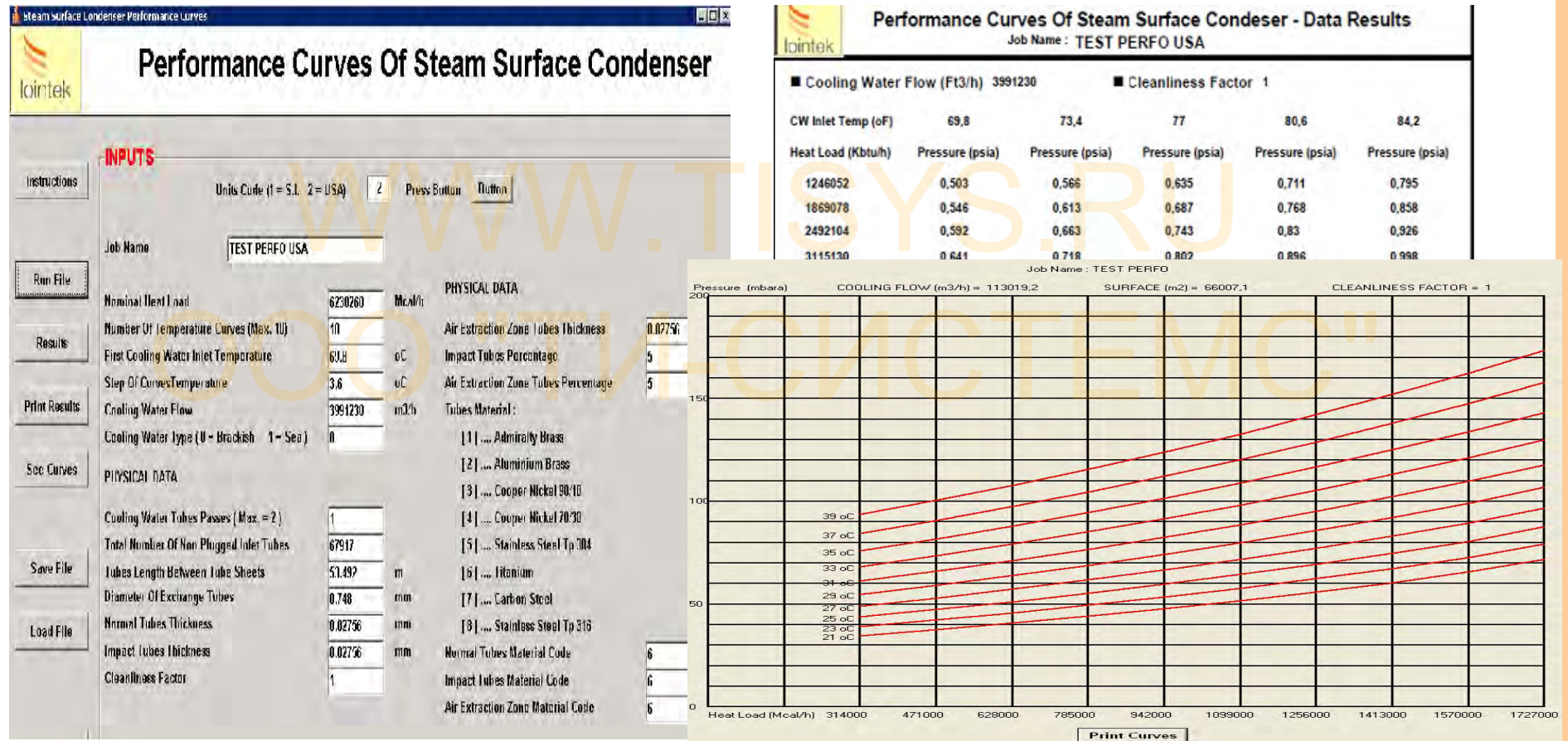
- Project Information:** Fields for Proposal No., Service, Engineer, Item No., and Date (19/11/2013).
- Design Conditions:** A table for Tube and Shell properties.

	Tube	Shell
Pressure	200	50 <i>Bar</i>
Temperature	500	500 <i>°C</i>
MDMT	60 <i>°F</i>	Skirt 600 <i>°C</i>
- General Data:** Zones (Cond + DC & DSH), Tube O.D. (0.625), Tube I.D. (0.00), Tube Pitch (0.8125), Tube Mtrl (SA-688-TP304), No. of Passes (2), Min. Bend Dia (2.25), Position (Horizontal).
- Tubeside Flow Data:** Feedwater Flow (55.6 *Kg/s*), FW Inlet Temp (250 *°C*), FW Outlet Temp (296 *°C*), Max. Tube Vel. @ 60 °F (0 *m/s*), Max. Pressure Drop (0 *Bar*), FW Oper. Press. (0 *Bar*).
- Shellside Flow Data:** Operating Pressure (250 *Bar*), Inlet Steam Enthalpy (1300 *kJ/kg*), Drains Outlet Temp. (335 *°C*), Max. DC Pressure Drop (0.3447 *Bar*).
- Drain Cooler:** DC Baffle Type (Segmental), DC Baffle Cut (0.2 *Fraction*), DC Baffle Pitch (0 *in*).
- Desuperheater:** DSH Baffle Type (Segmental), DSH Baffle Cut (0.4 *Fraction*), Max. DSH Pressure Drop (0.3447 *Bar*), Dry Wall Safety Margin (2 *%*), Max. Allow DSH Span (32 *Inches*).
- Fouling Factor:** Tubes (0.0002 *hr/sq.ft./°F/BTU*), Shell (0.0003).
- Clean Factor:** Cond. Zone Clean Factor (1), Tube Thermal Conductivity (0 *BTU/hr.ft.°F*).
- Drains Inlet Data:** A table with columns for Flow (*Kg/s*) and Enthalpy (*kJ/kg*).

	Flow <i>Kg/s</i>	Enthalpy <i>kJ/kg</i>
Drains N° 1	0	0
Drains N° 2	0	0
Drains N° 3	0	0

The bottom status bar shows 'Design Mode', 'Auto Gauges', 'Input Units: Metric', and 'Data Sheet Units: Metric'. An 'OK' button is located in the bottom right corner.

Condensers design (Own Software)



Steam Surface Condenser Performance Curves

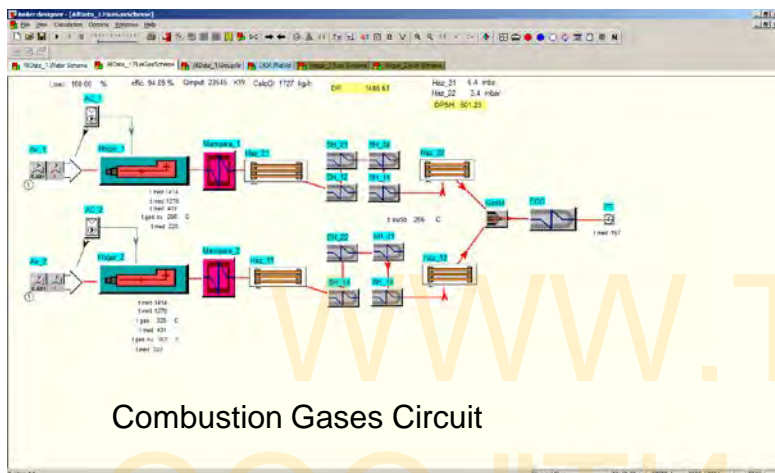
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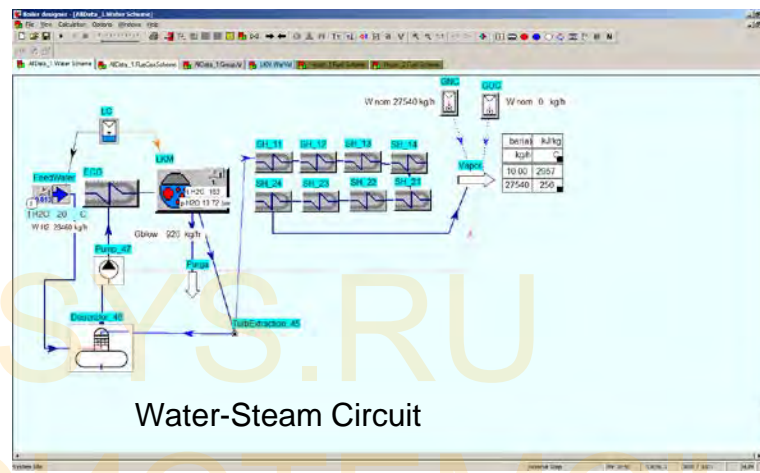
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Boilers

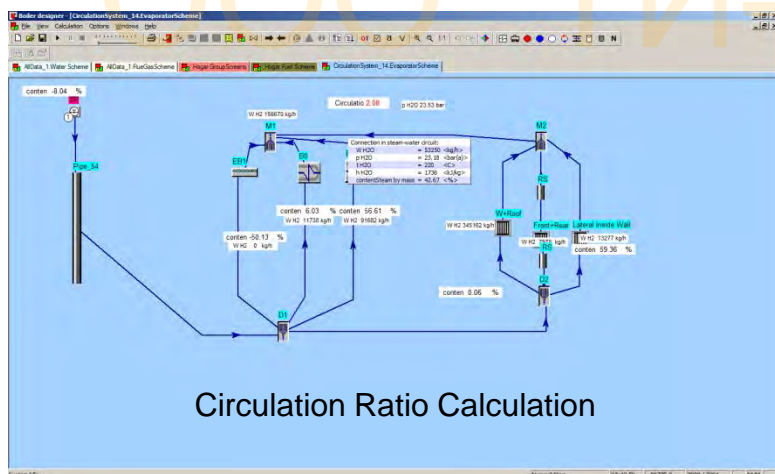
- KED Power Plant Simulator & Designer V11,3



Combustion Gases Circuit



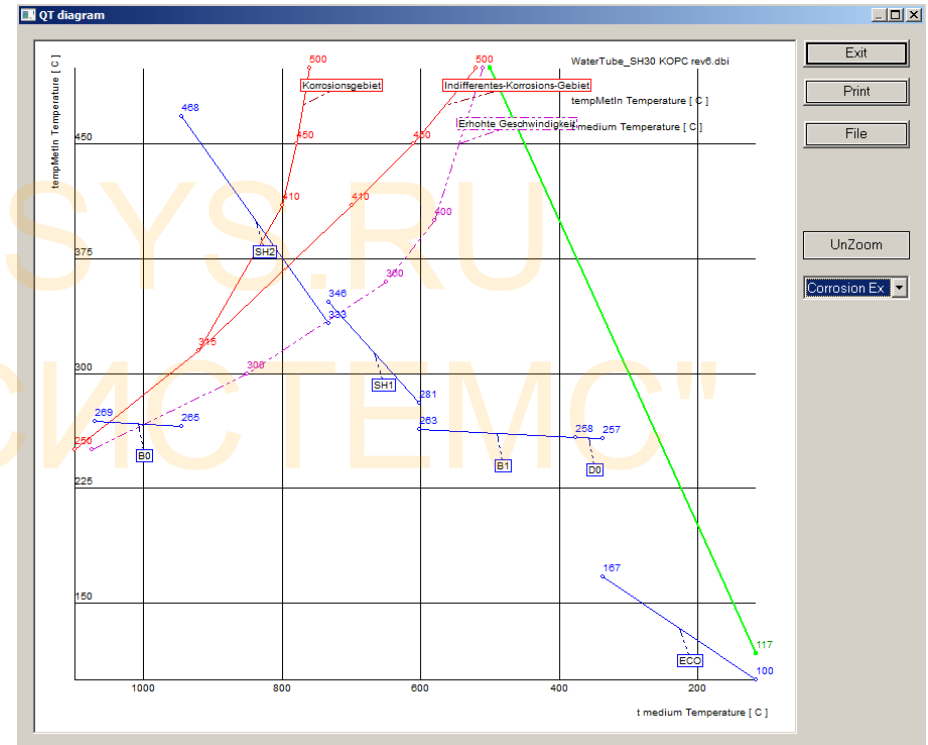
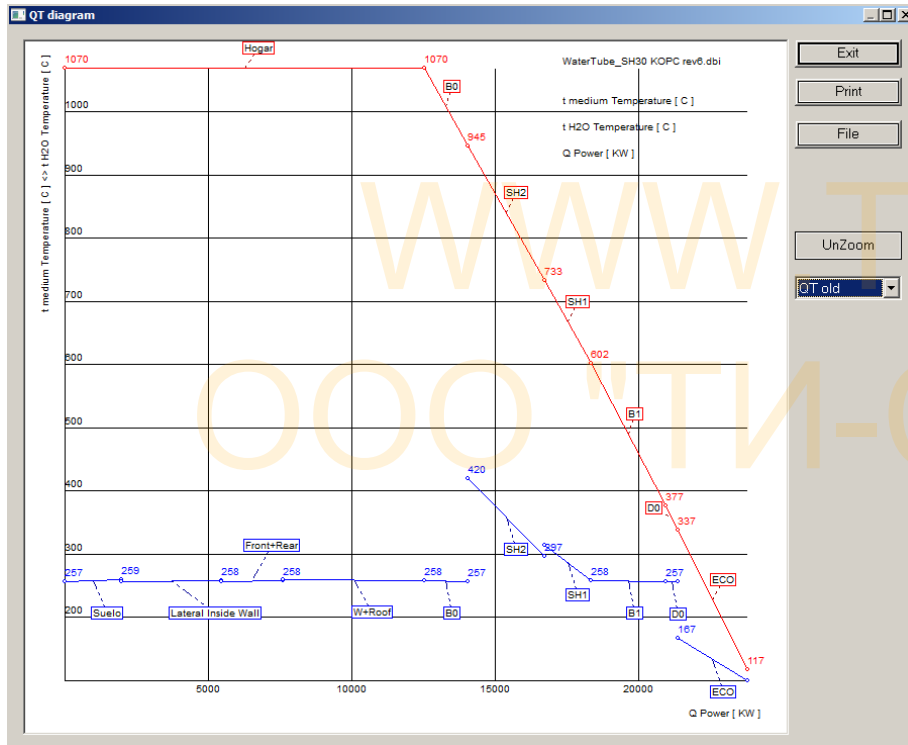
Water-Steam Circuit



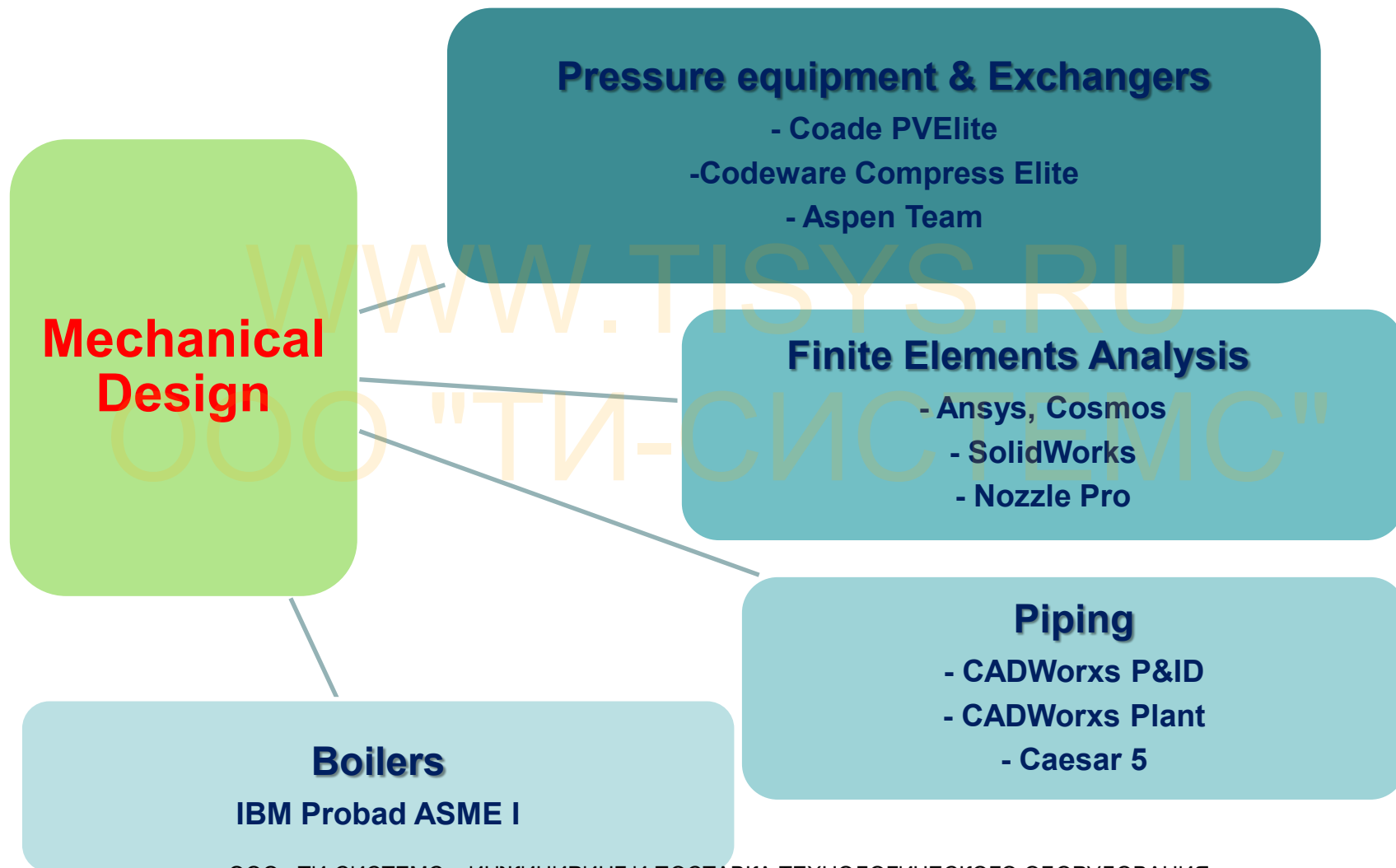
Circulation Ratio Calculation

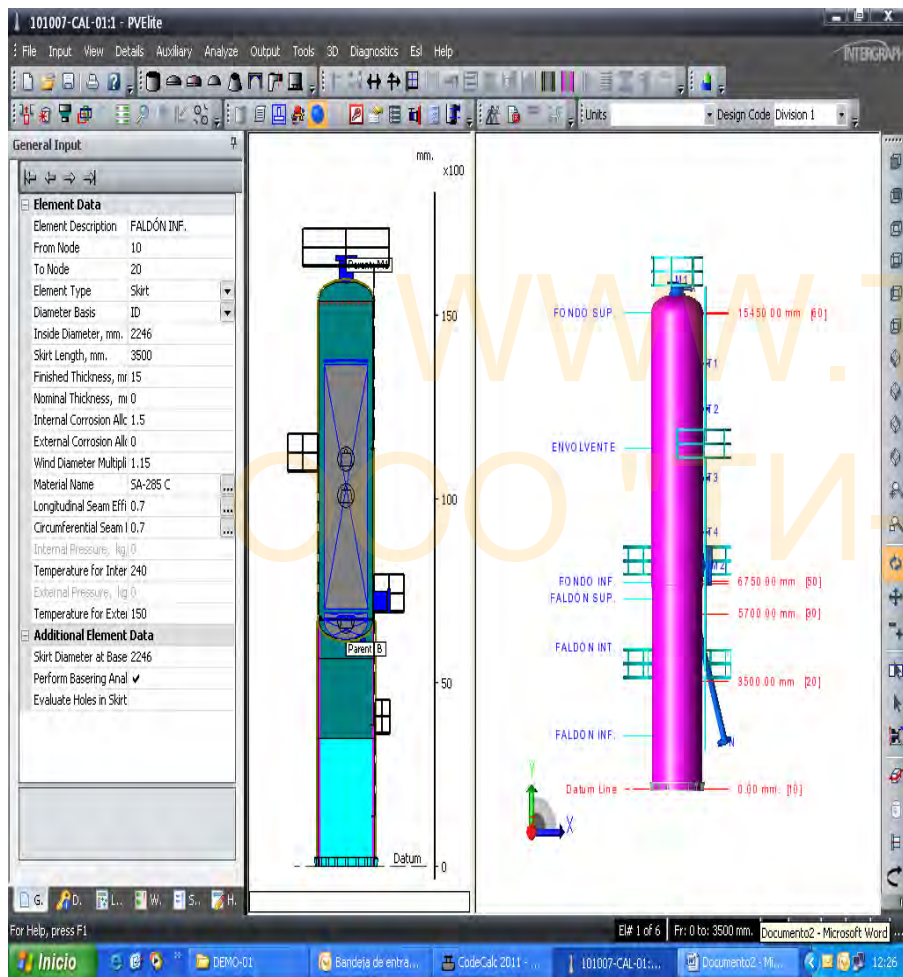
Property	Value	Description
Heat power	2105 kW	Heat power
Heat surface	47.07 m ²	Heat surface
Mean temperature difference	381.34 K	Mean temperature difference
Overall heat transfer coefficient	86.95 1/m ² ·K	Overall heat transfer coefficient
Gas side convection heat transfer coefficient	62.56 1/m ² ·K	Gas side convection heat transfer coefficient
Heat transfer coefficient (inside tubes)	1078.25 1/m ² ·K	Heat transfer coefficient (inside tubes)
Gas side radiation heat transfer coefficient	11.77 1/m ² ·K	Gas side radiation heat transfer coefficient
Pressure drop in gas circuit	2.3 kPa	Pressure drop in gas circuit
Pressure drop of medium	0.84 Pa	Pressure drop of medium
velocity outside tubes	11.28 m/s	velocity outside tubes
Flow mass speed	4.28 kg/m ² ·s	Flow mass speed
Flow flux	434.15 kg/m ² ·s	Flow flux
Reynolds number	8738.94	Reynolds number
Reynolds number	22271.98	Reynolds number
Number of parallel tubes	24.000	Number of parallel tubes
Inside diameter of tube	31.6 mm	Inside diameter of tube
mean beam length (Thickness of emission layer)	185.29 mm	mean beam length (Thickness of emission layer)
Cross section area for gas flow	1.29 m ²	Cross section area for gas flow
Cross section area (for medium flow)	0.02 m ²	Cross section area (for medium flow)
Normal pressure of medium	44.56 bar(a)	Normal pressure of medium
Normal rate of heat flux of medium	29415 kg/s	Normal rate of heat flux of medium
Temperature of tube wall	112 C	Temperature of tube wall
velocity inlet outside	11.17 m/s	velocity at the inlet outside pipes
velocity outlet outside	16.76 m/s	velocity at the outlet outside pipes
inlet velocity m/s	38.38 m/s	inlet velocity m/s
outlet velocity m/s	22.20 m/s	outlet velocity m/s
Heat loss to ambient	6.40W	Heat loss to ambient
Evolution heat flux (including primary and secondary heating surfaces)	0.432 MW/m ²	Evolution heat flux (including primary and secondary heating surfaces)
Overall usage factor (Surface area factor)	0.98	Overall usage factor (Surface area factor)
Tube Length	18.91788 mm	Tube Length
Welding factor of all tubing layers	0.9999	Welding factor of all tubing layers
Specific heat capacity of gas (at constant pressure)	1.02 kJ/kg·K	Specific heat capacity of gas (at constant pressure)
Radiation heat flux from gases to bank of tubes	8 kW	Radiation heat flux from gases to bank of tubes
Thermal conductivity of metal	46.5 10/W·K	Thermal conductivity of metal
Outside heat transfer coefficient	19.21 1/m ² ·K	Outside heat transfer coefficient
density (primary steam density)	0.5757 kg/m ³	density (primary steam density)
Dynamic Friction/Fluid velocity	36.5 1/m·s	Dynamic Friction/Fluid velocity
0 - bank of in-line tubes, 1 - bank of staggered tubes	0	0 - bank of in-line tubes, 1 - bank of staggered tubes
Welding factor of gas carrying flow on evaporator side	0.99	Welding factor of gas carrying flow on evaporator side

Calculation Results



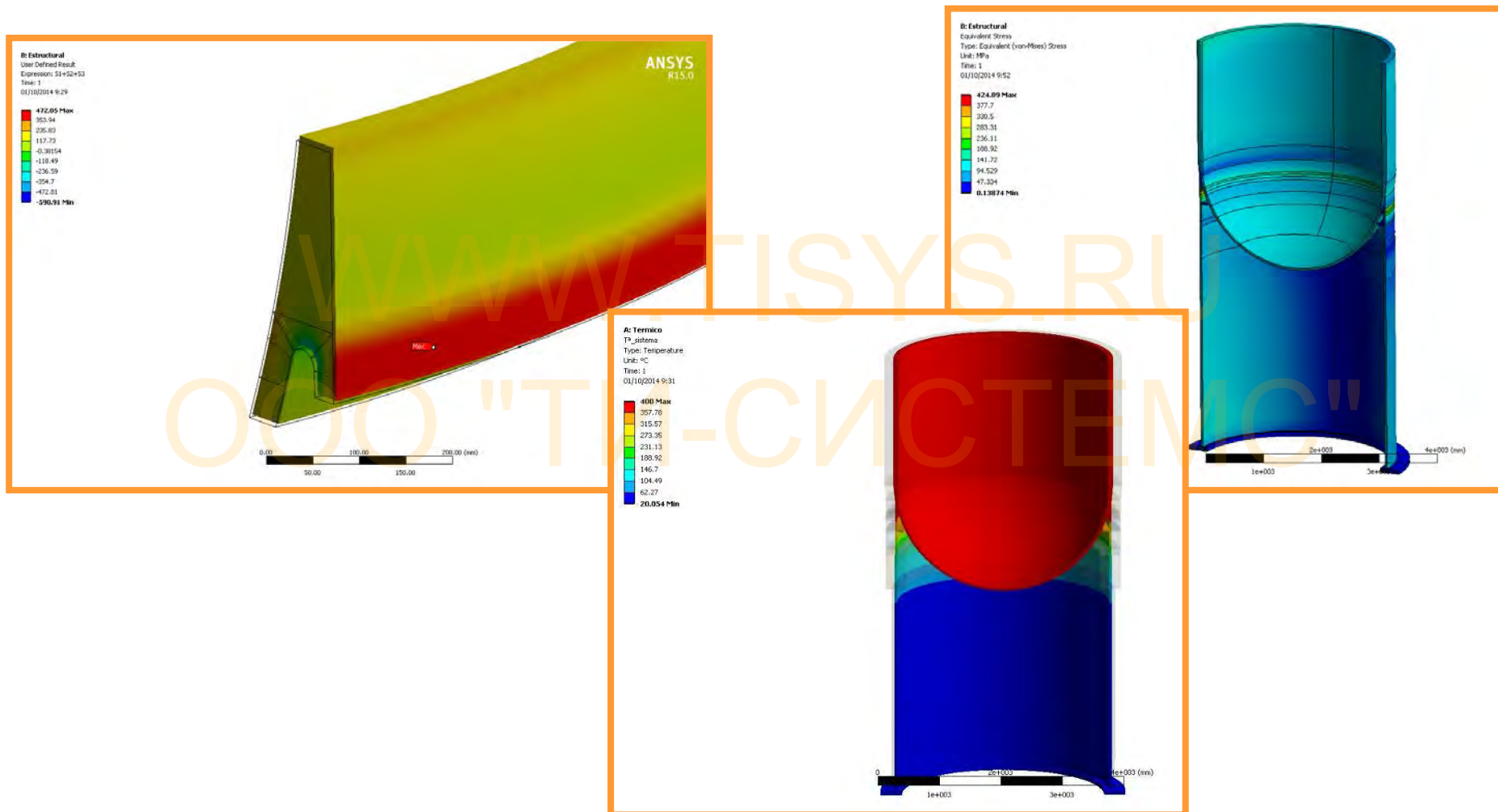
Engineering

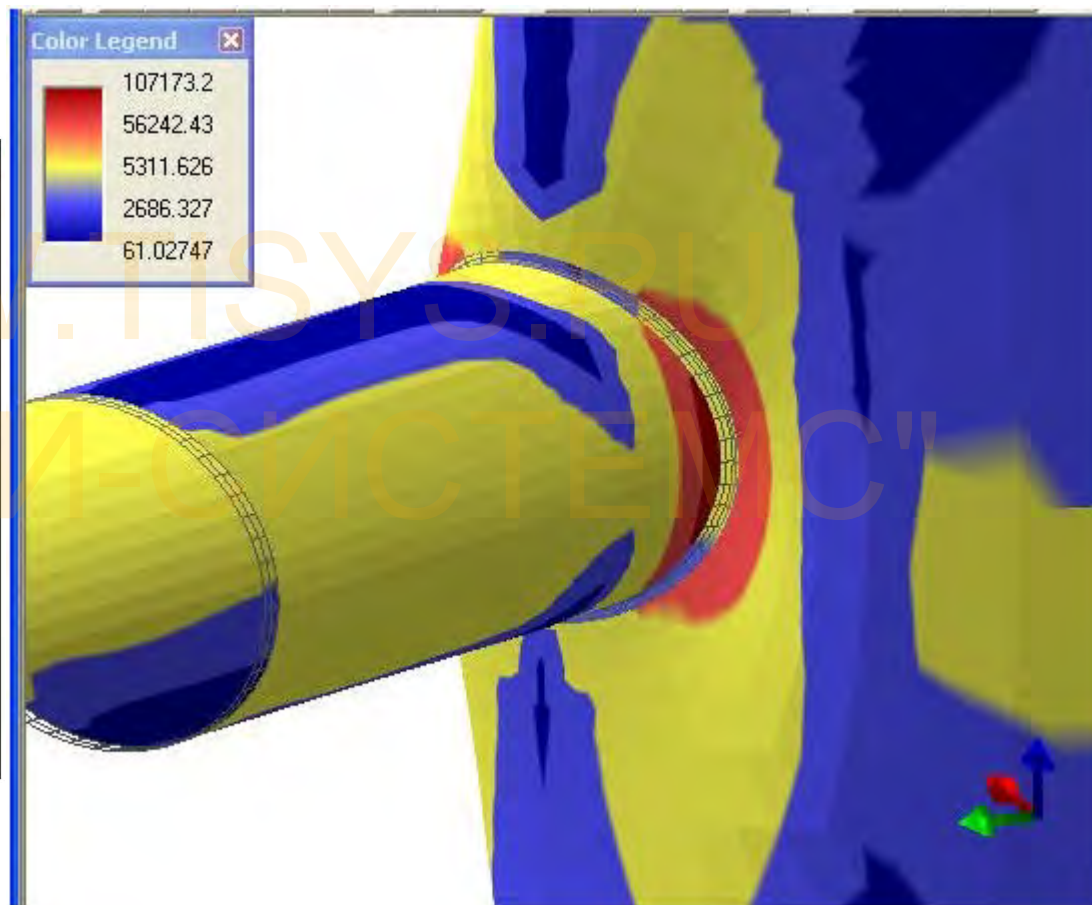
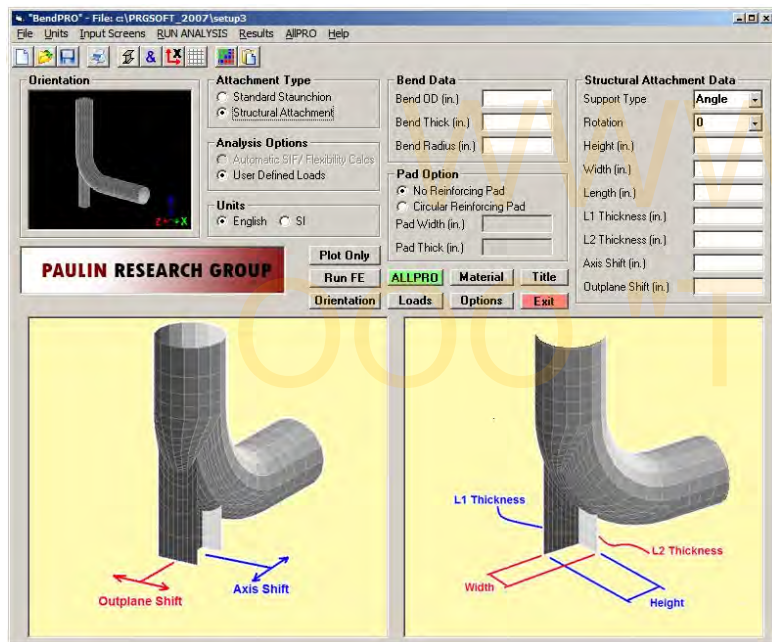


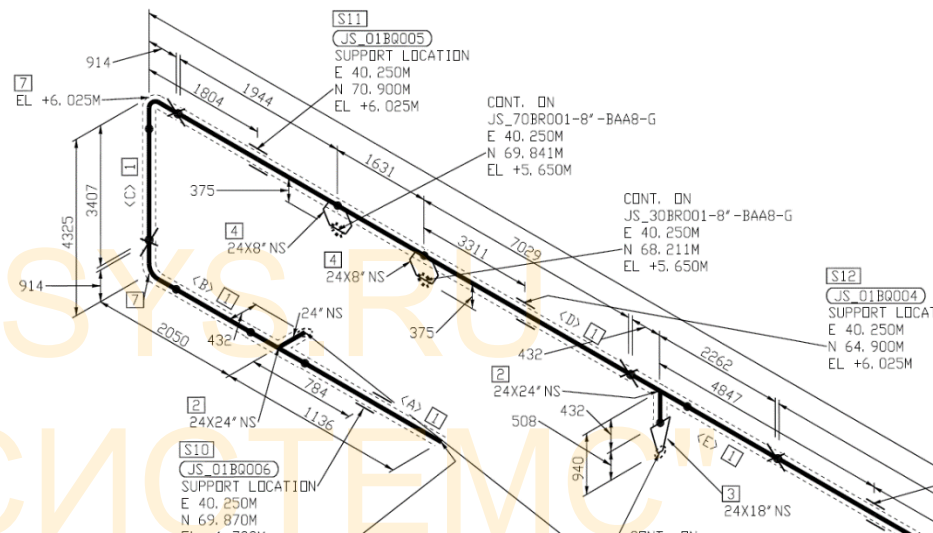
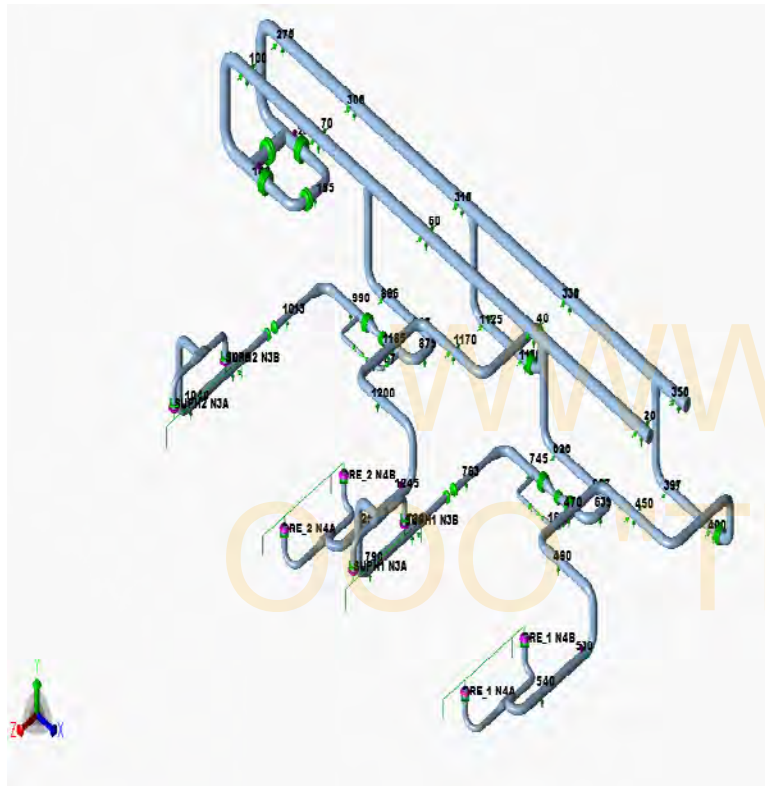


Finite Elements Analysis

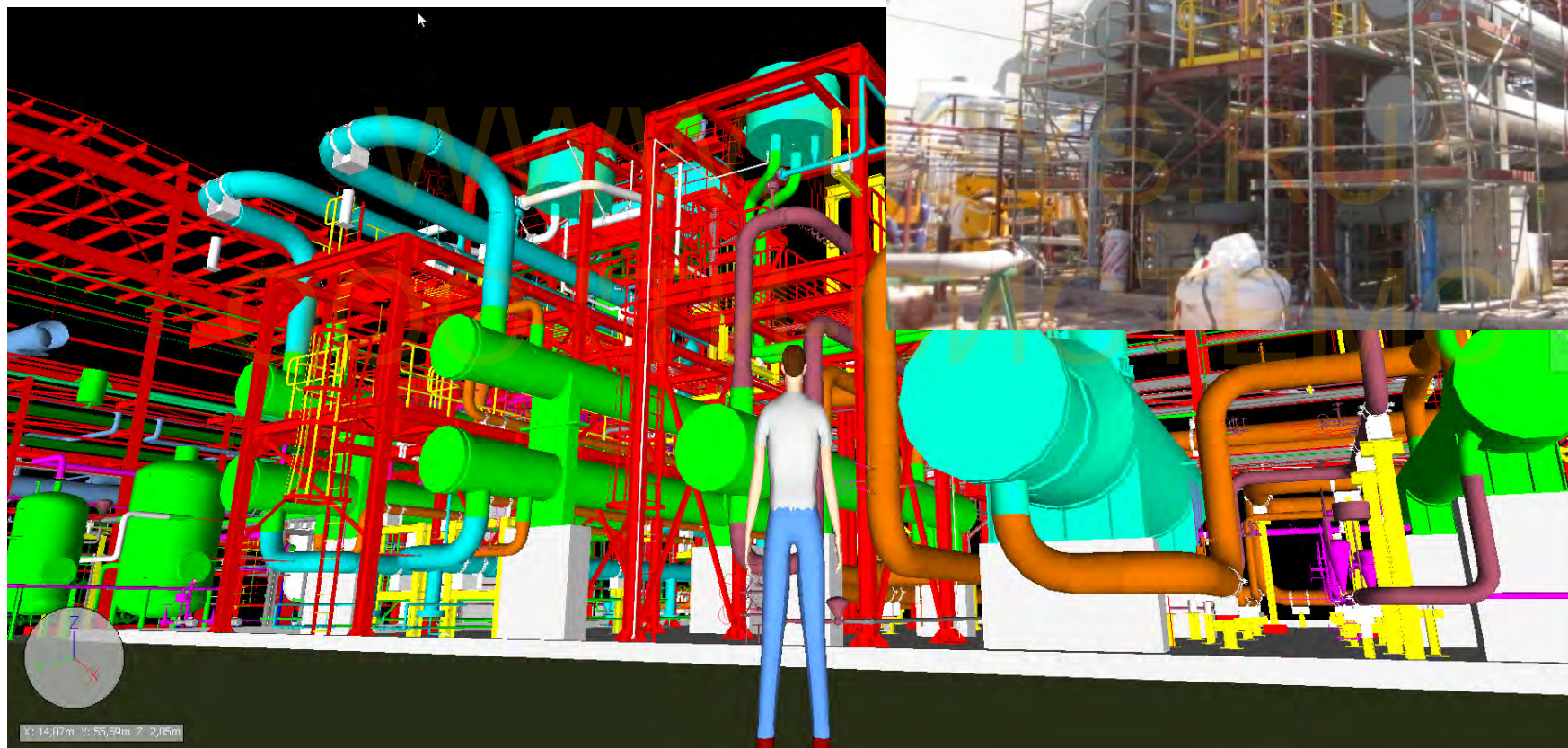
- Ansys & Cosmos

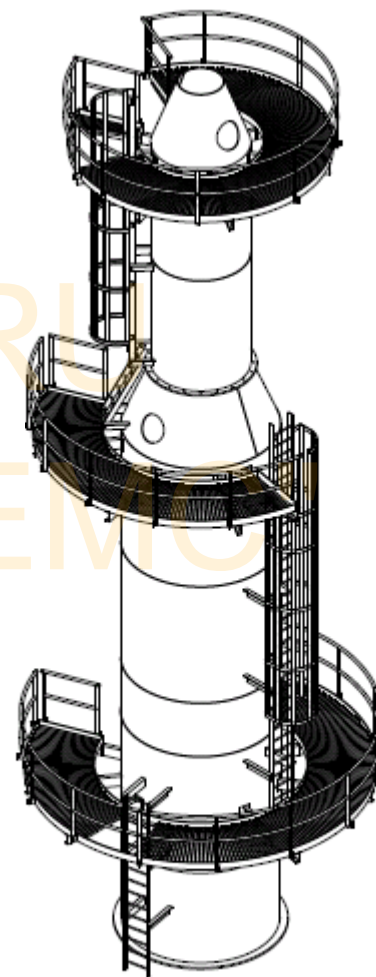
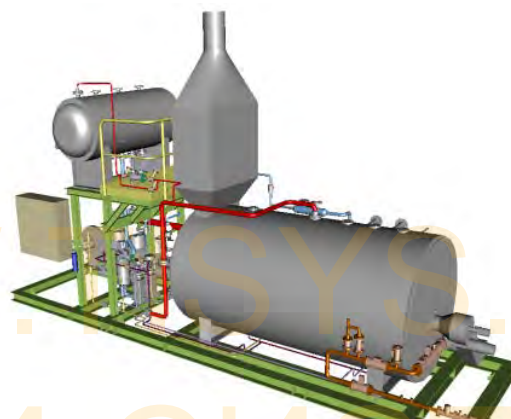
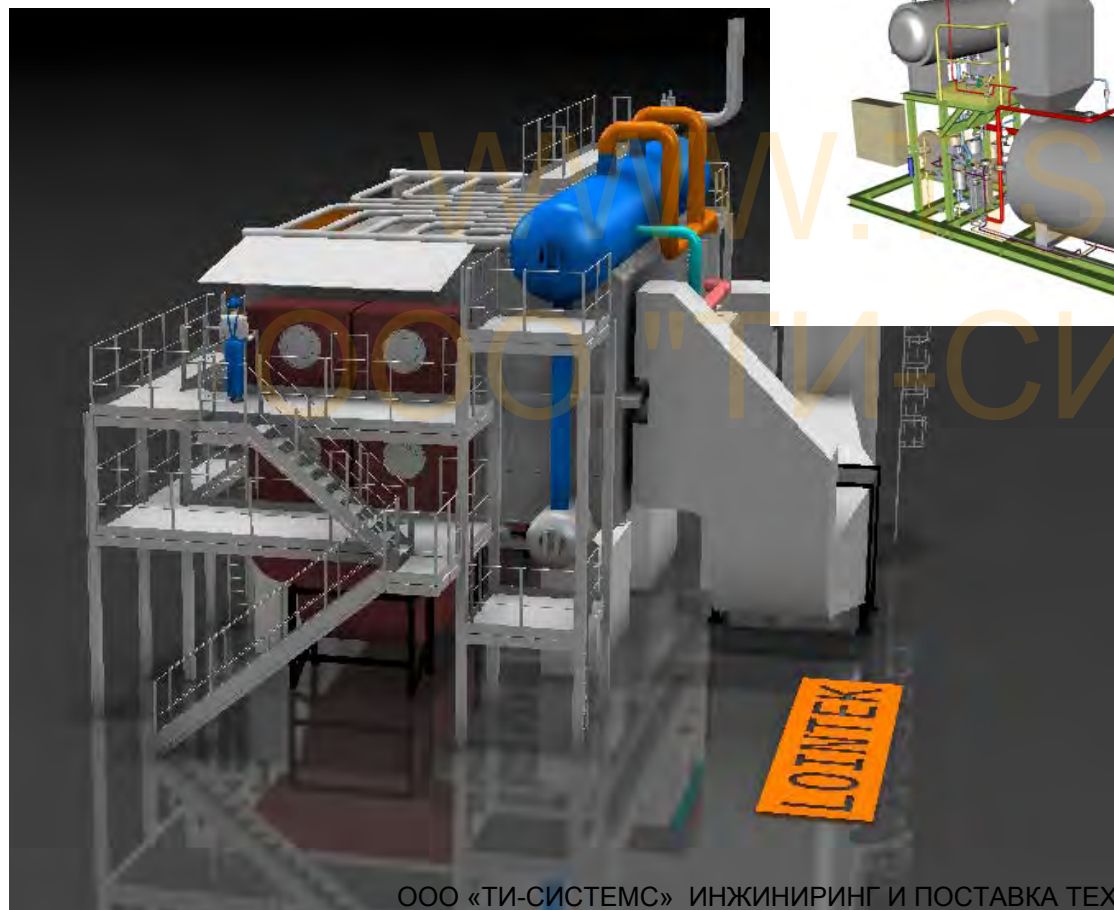


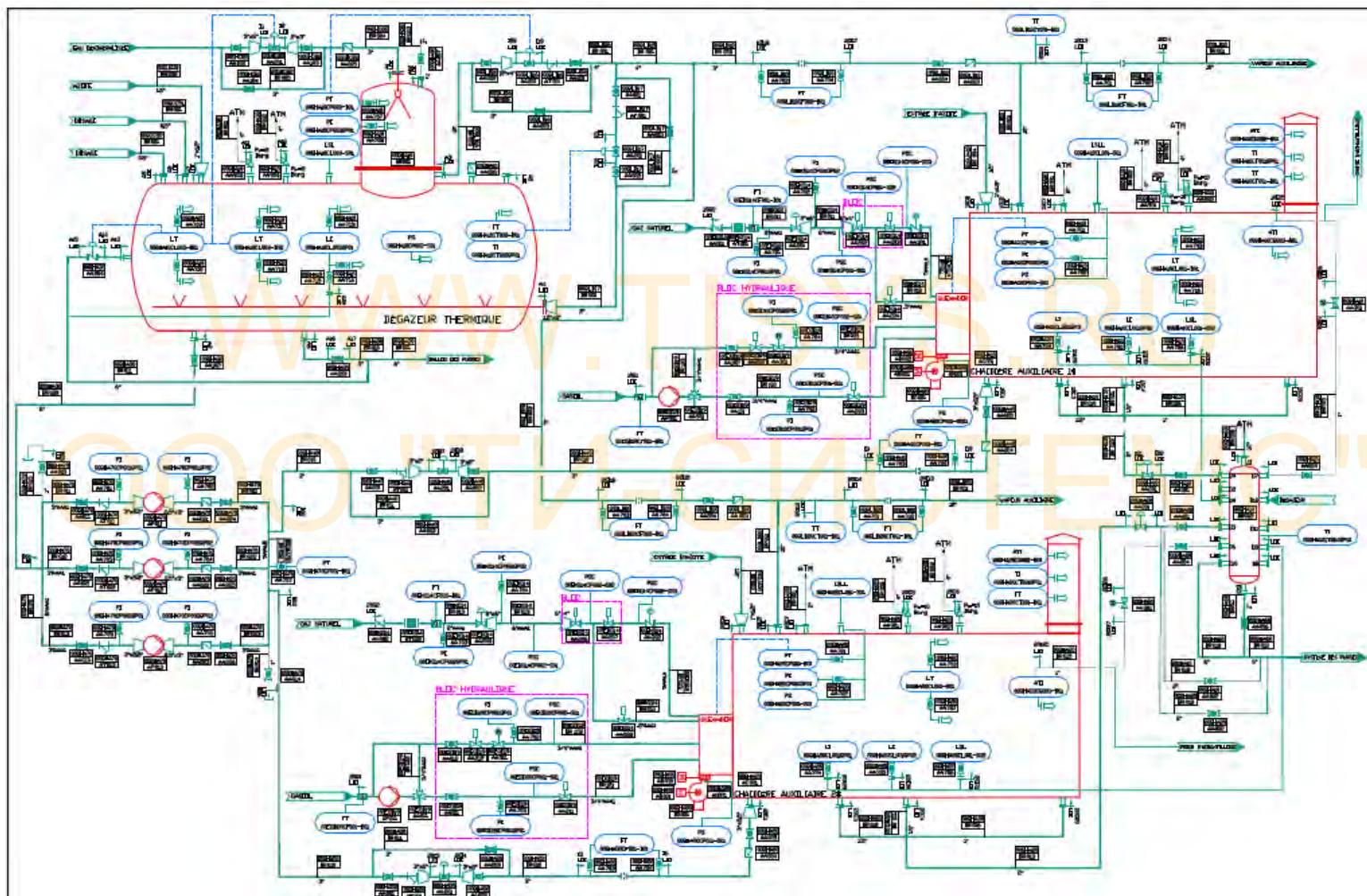




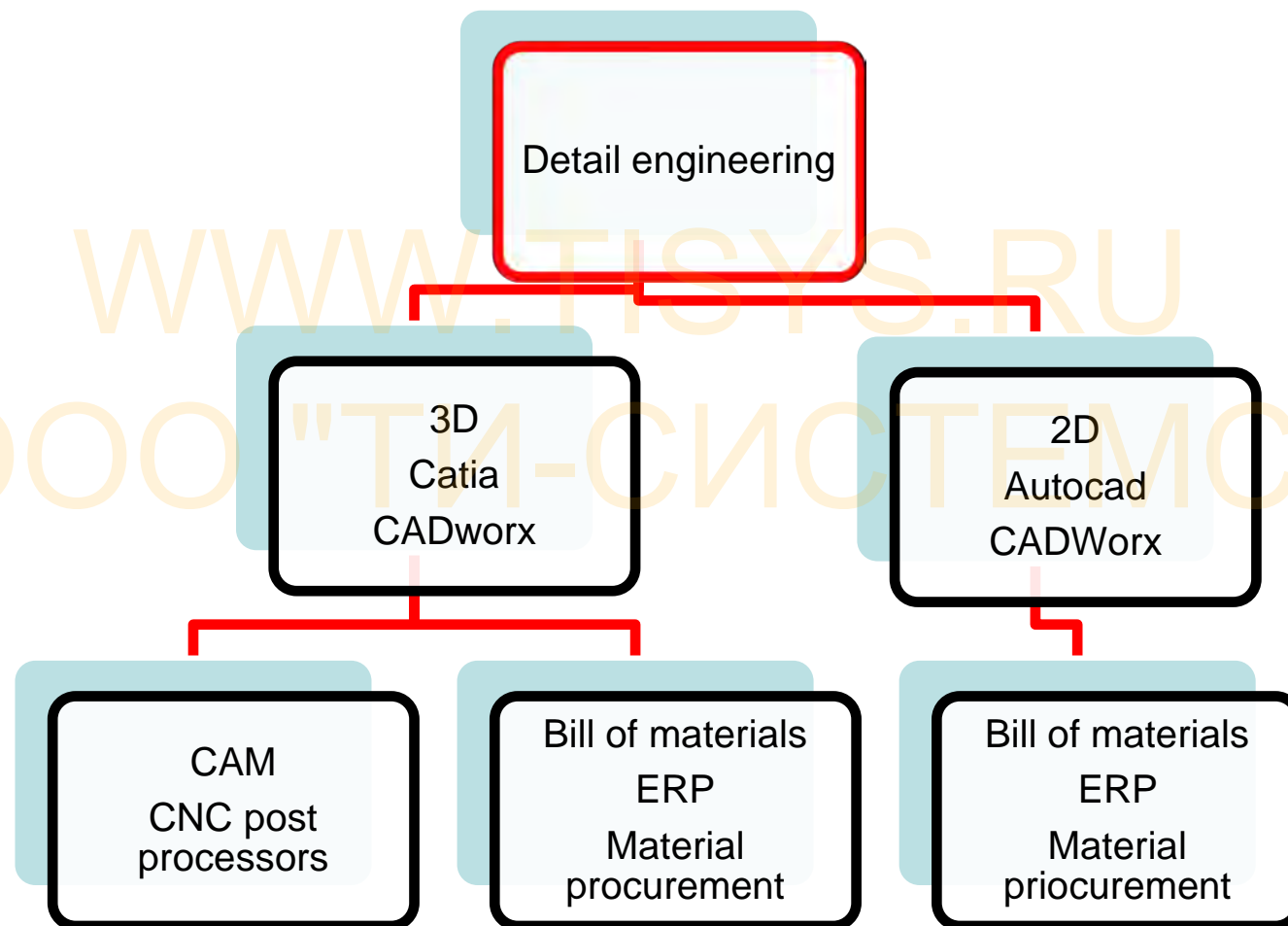
IDENTIF.:	137002	FECHA:	HOJA 35 de 429 08-04-11
TÍTULO:	INFORME DE TENSIONES DE TUBERÍAS - CIRCUITO 1	REV.:	0
Code Stress:	147431.9	Allowable:	217955.2
Axial Stress:	2641.1	ENode	930
Bending Stress:	147371.8	ENode	415
Torsion Stress:	24595.3	ENode	417
Hoop Stress:	0.0	ENode	20
3D Max Intensity:	177124.3	ENode	415
CODE STRESS CHECK PASSED : LOADCASE 31 EXPANSION CASE MINIMUM TEMPERATURE			
Highest Stresses: (KPa)	LOADCASE 31 EXPANSION CASE MINIMUM TEMPERATURE		
Code Stress Ratio (%):	11.3	ENode	385
Code Stress:	28533.6	Allowable:	251563.4
Axial Stress:	848.6	ENode	1015
Bending Stress:	28532.3	ENode	385
Torsion Stress:	1099.7	ENode	1220
Hoop Stress:	0.0	ENode	20
3D Max Intensity:	34072.3	ENode	385
CODE STRESS CHECK PASSED : LOADCASE 32 EXP NSION CASE DESIGN TO MINIMUM TEMPERATURE			







Engineering



MANUFACTURING

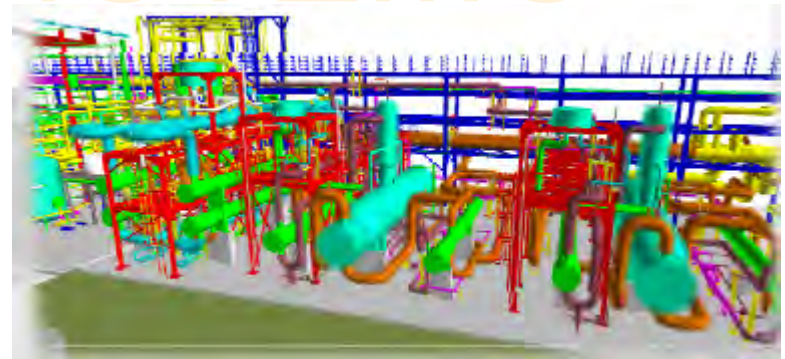


HEAT EXCHANGERS



Heat Exchangers

- Focused on design of **Tailor made equipment** to meet clients' need for a wide range of industries.
- Taking into account operating conditions, fluids and client requirements, Lointek design the best suited equipment and the **most efficient** solution.
- Most **advanced manufacture** technologies.



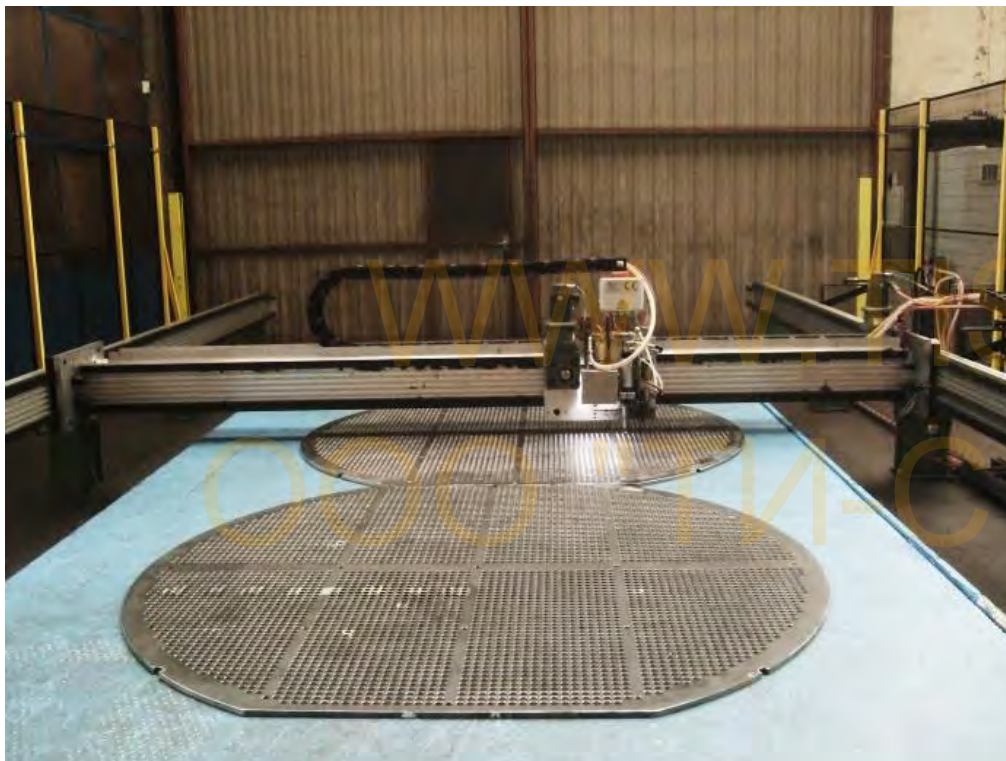
Heat Exchangers

MATERIALS

Table example of some of the materials used in heat exchangers:

	<i>Sheet</i>	<i>Tube</i>	<i>Forge</i>
CARBON STEEL AND ALLOY			
Low T ^a	SA516Gr70	SA-179	SA266Gr2
	SA516Gr70	SA-210-A1	SA350LF2
Media T ^a	SA387Gr11Cl.2	SA-213T11	SA387F11Cl.2
High T ^a	SA387Gr22Cl.2	SA-213T22	SA387F22Cl.3
STAINLESS STEEL			
	SA240tp304	SA213tp304	SA336tp304
	SA240tp316	SA213tp316	SA336tp316
	SA240tp321	SA213tp321	SA336tp321
	SA240tp347	SA213tp347	SA336tp347
TITANIUM			
	SA516Gr70+CladTi	B338Gr2	SA266Gr2+CladTi
SEA CURE®			
	SA387Gr22c.12+Clad Inconel	Inconel 825-B163/423	SA336F22+Clad Inconel

Heat Exchangers Drilling and chamfering



Heat Exchangers Support Plates (Baffles) Machining

MACHINING OF SUPPORT PLATES (Baffles):

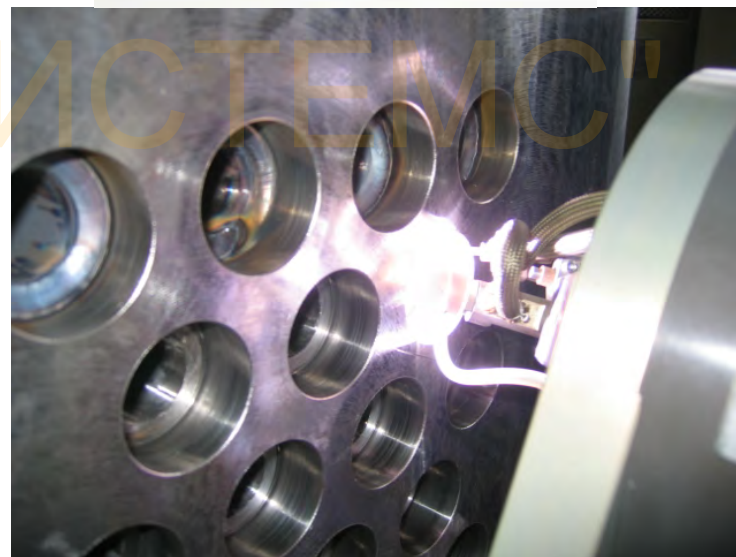
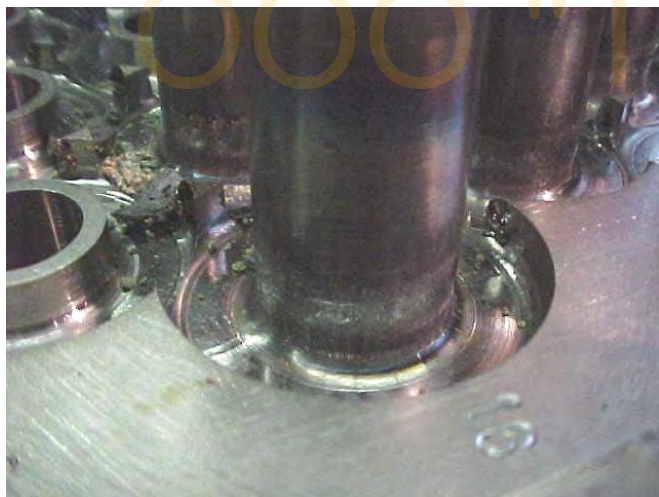
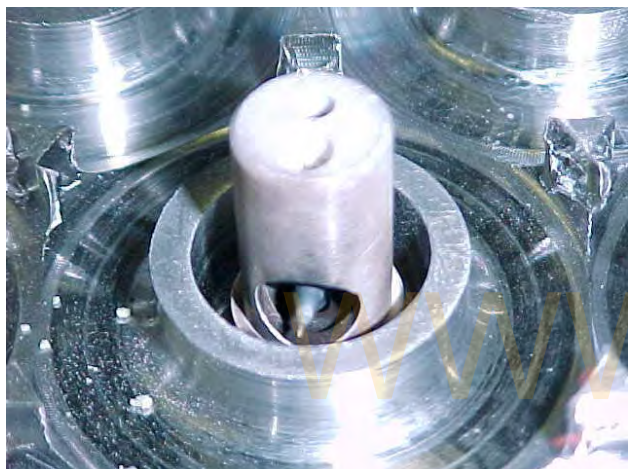
- Plate Size: 4000x3000 mm
- Multi drill machine



Heat Exchangers Tube-Tubesheet Automatic Welding



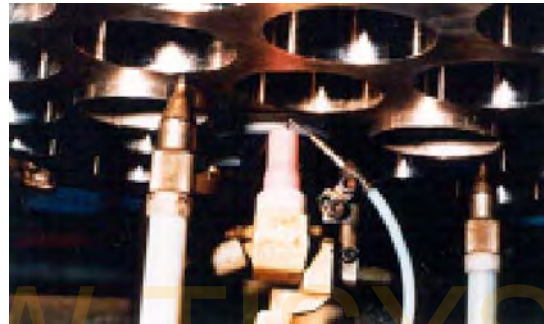
Heat Exchangers Tube-Tubesheet Welding



Heat Exchangers Tube-Tubesheet Welding



WELDING 5F
TUBESHEET.: PLAQUEADO TITANIO
TUBES: TITANIO Gr2



WELDING 4F
TUBESHEET : SA 240 Tp304L
TUBES : SA 213 Tp304L



MOCK UP WELDING
TUBESHEET: SB 443
TUBES: SB 444

INTERNAL BORE WELDING

WELDING 2G

TUBESHEET : SA 387 F22
TUBES : SA 213 T22

WELDING 2G

HEADER: TU 15CD 2.05
TUBES : TU 15CD 2.05

WELDING 2G

TUBESHEET : 1-2 S.S. Tp316L 3-4-5 TiGr2
TUBES : 1-2 S.S Tp316L 3-4-5 TiGr2



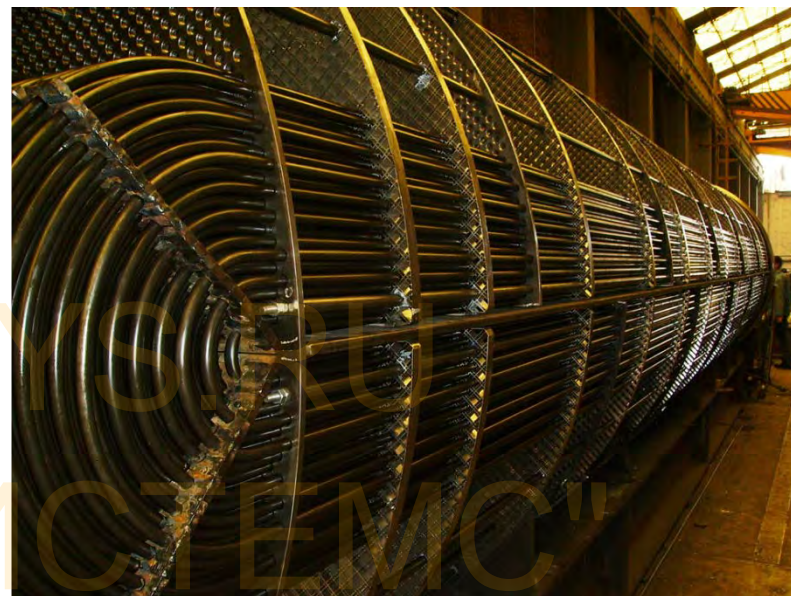
ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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Heat Exchangers

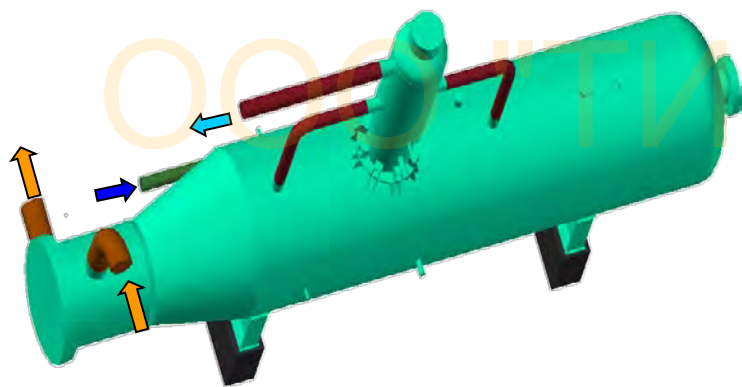
Lointek has a wide number of references on shell & tube heat exchangers



Heat Exchangers

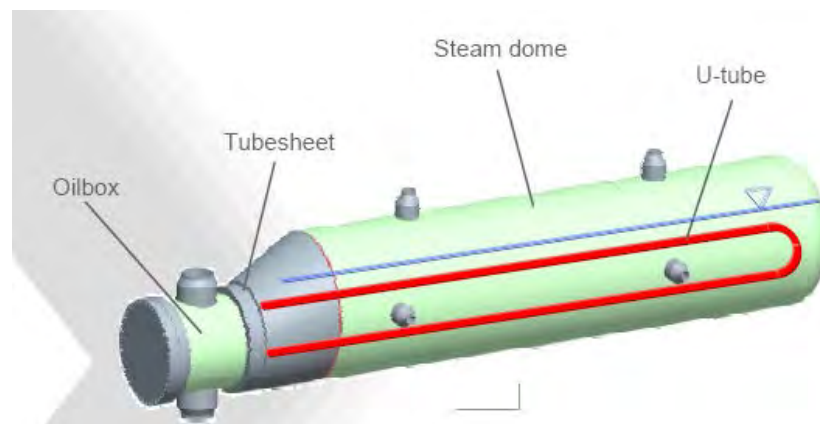
SPECIALIZED EQUIPMENT

Lointek has managed to optimize the exchangers basing on the experience of previous models, using as the most characteristic Kettle and Hairpin Type

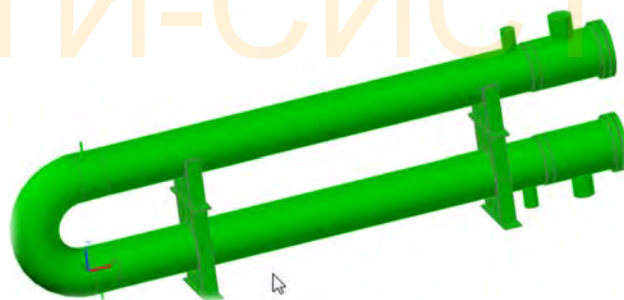


KETTLE BOILER

Design optimized for steam generation using only one equipment; lower costs



Heat Exchangers

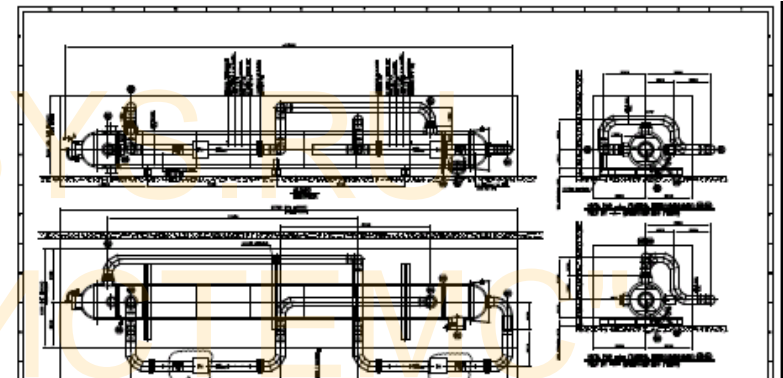


HAIRPIN

This model developed by Lointek for SGS allows greater flexibility and increased performance

Heat Exchangers

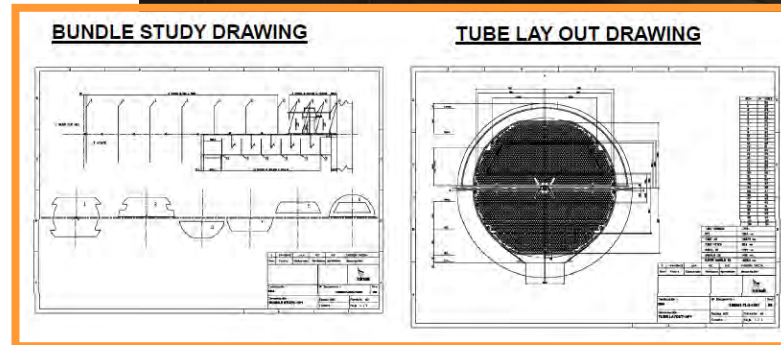
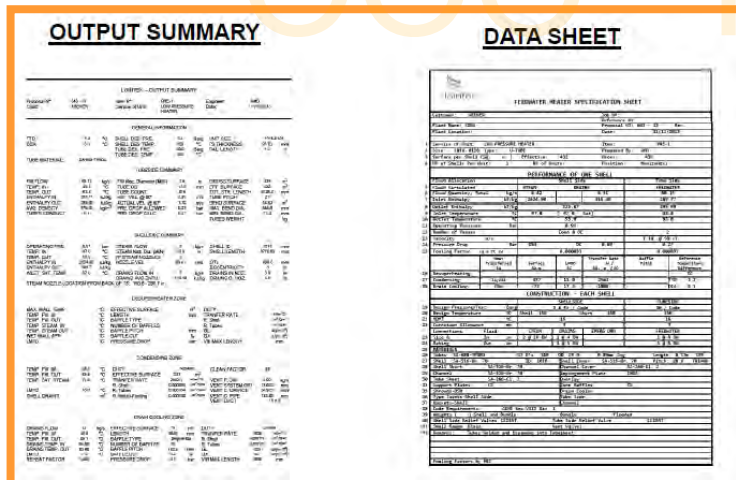
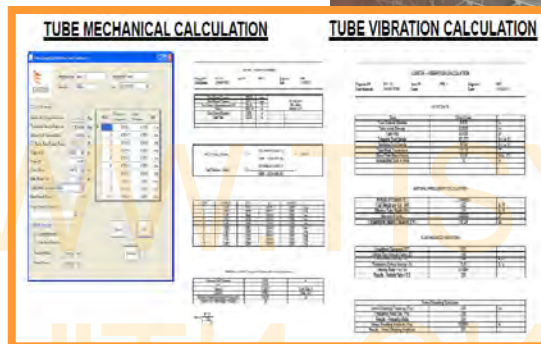
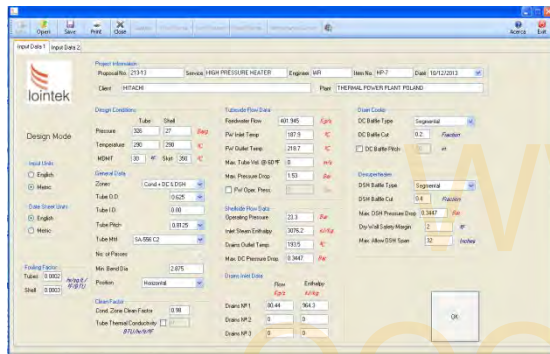
POSTWELD HEAT TREATMENT UNDER INERT ATMOSPHERE



Feedwater Heater

Own design software

“LOINTEK FWH DESIGN PROGRAM”

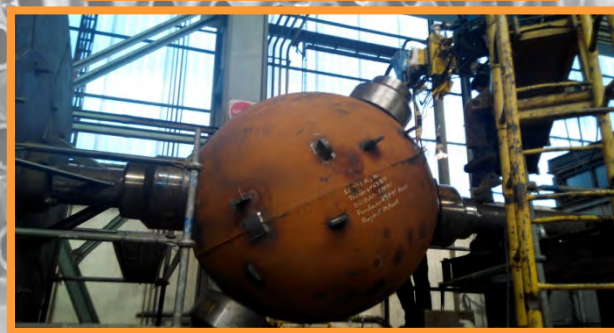


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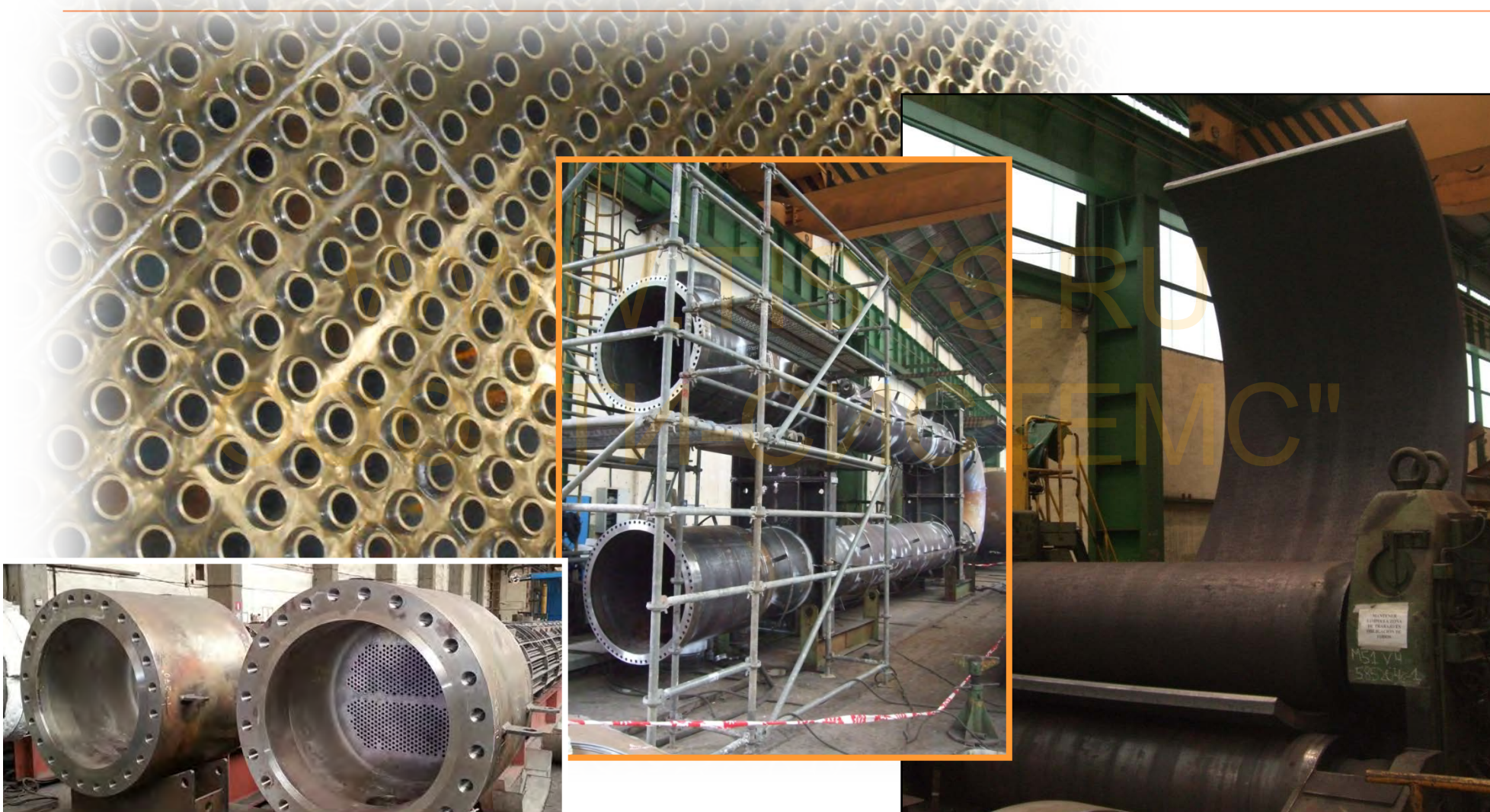
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Feedwater Heater



Heat Exchangers & Feedwater Heater



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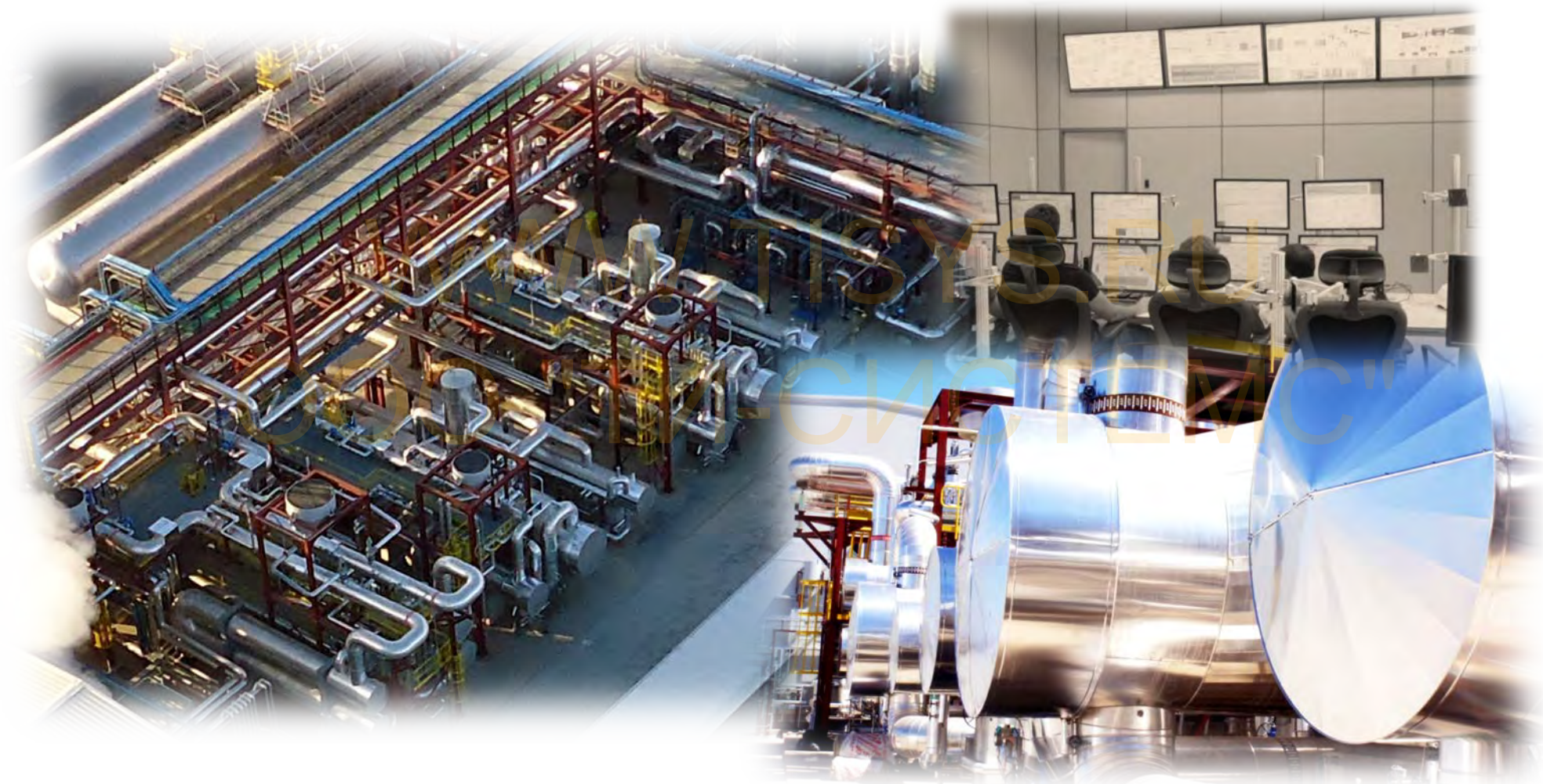
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Heat Exchangers & Feedwater Heater



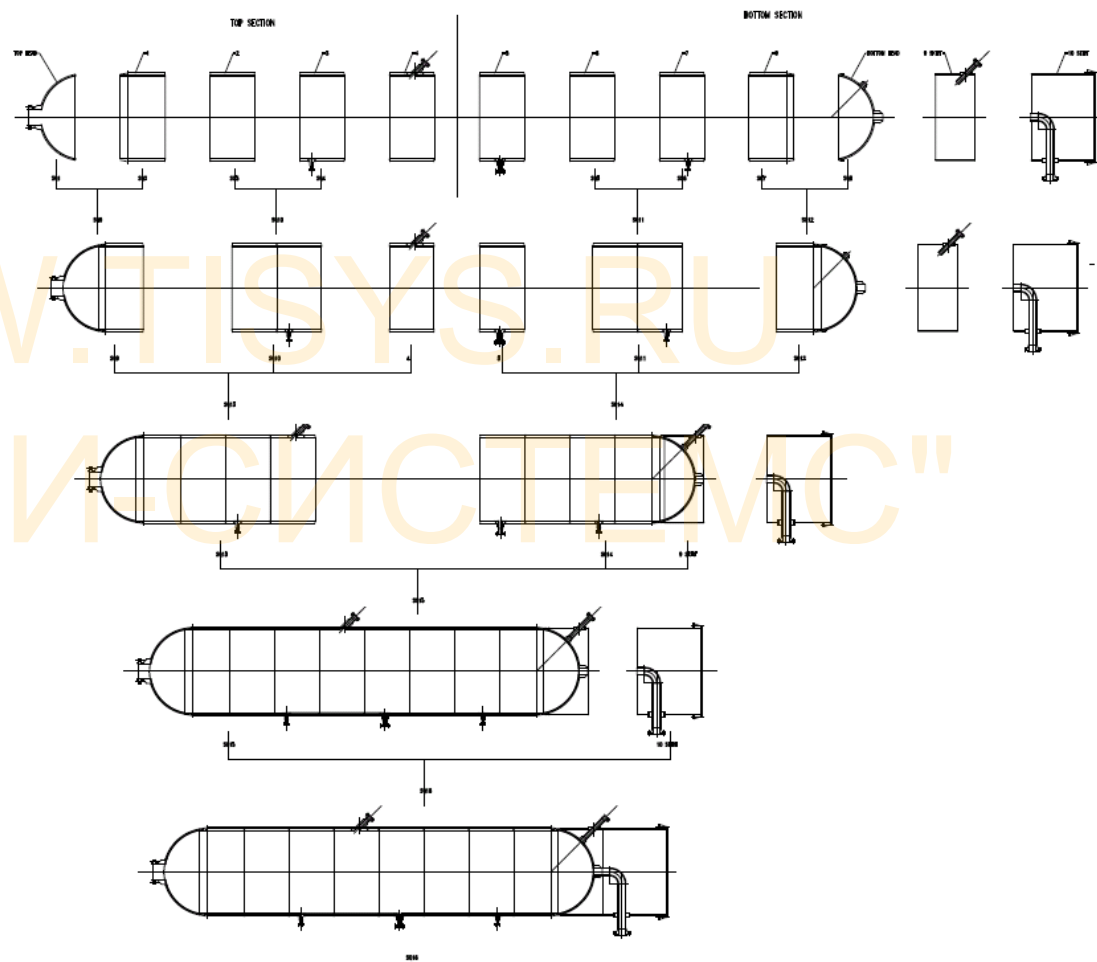
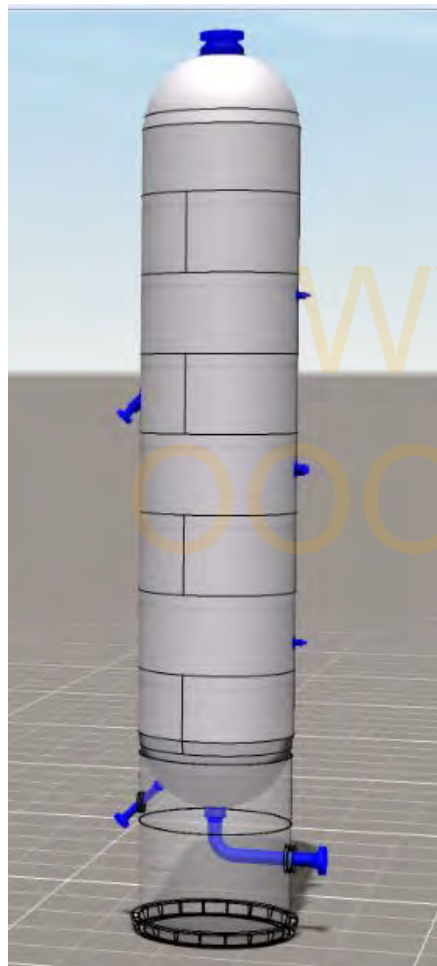
Heat Exchangers & Feedwater Heater



REACTORS & PRESSURE VESSELS



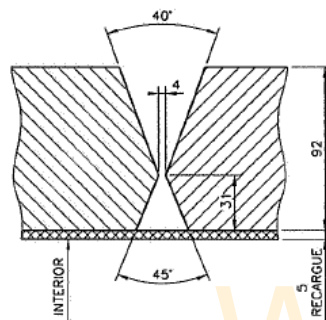
Typical Manufacturing sequence for reactors



Body Shells Manufacturing Bending



Body Sheets Manufacturing Longitudinal Welding



DET. TIPICO SOLDADURA
LONGITUDINALES

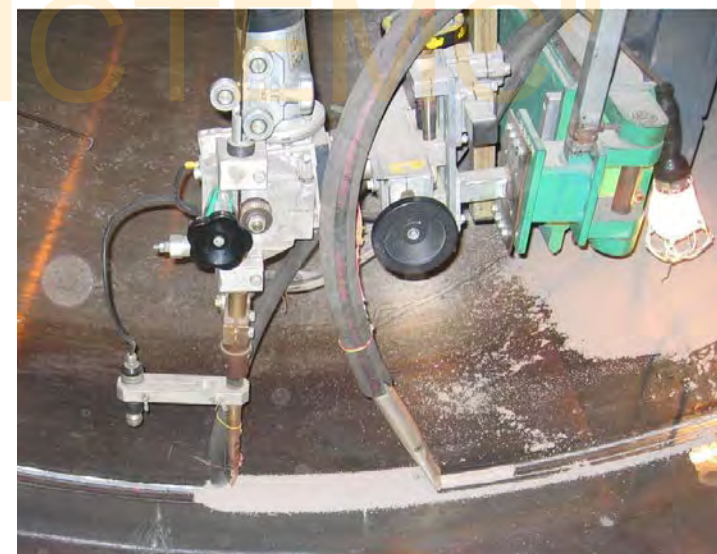
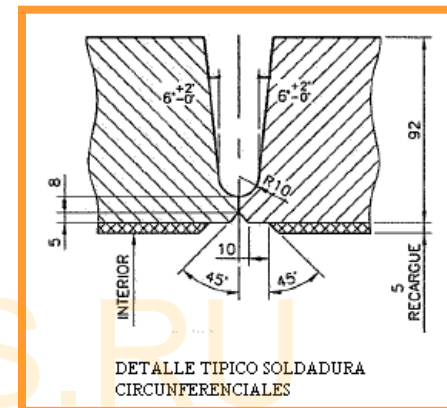


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Equipment Assembling Welding



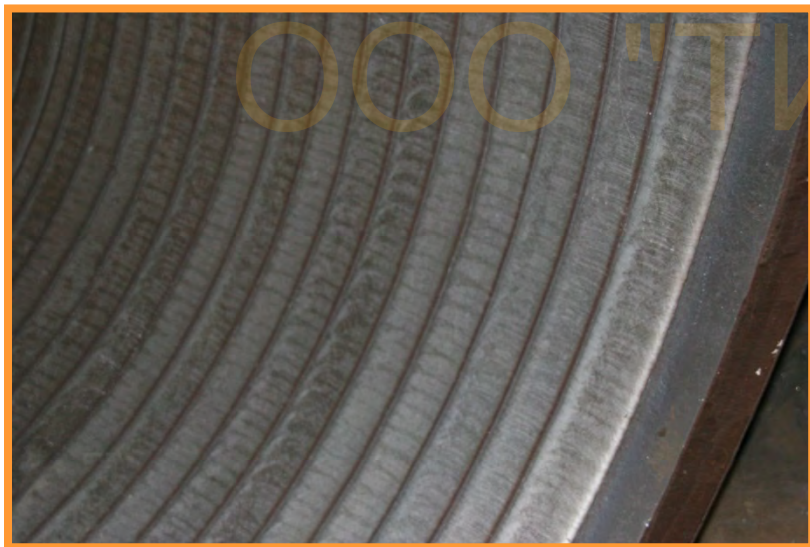
Body Shells Manufacturing Weld Overlay



STRIP ELECTROSLAG
OVERLAY



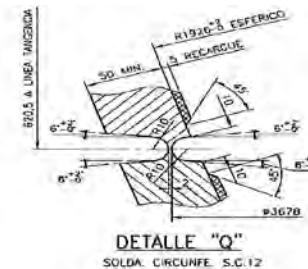
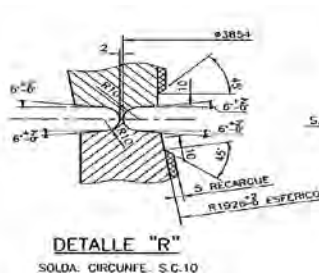
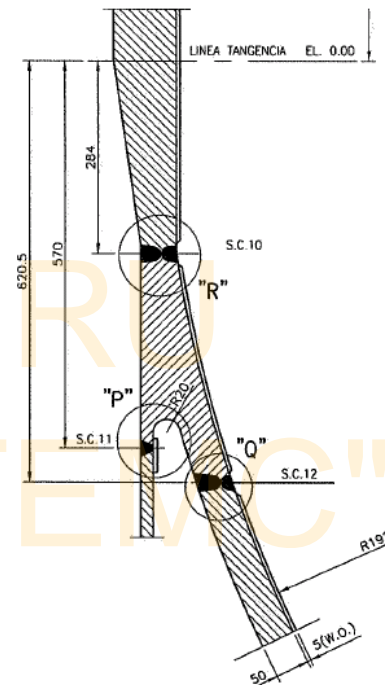
SAW AND SMAW
OVERLAYS STRIP FOR
REACTORS



Heads Manufacturing Assembly and Overlay



Heads Manufacturing Skirt-head joint



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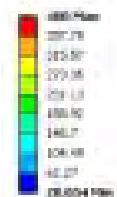
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Heads Manufacturing

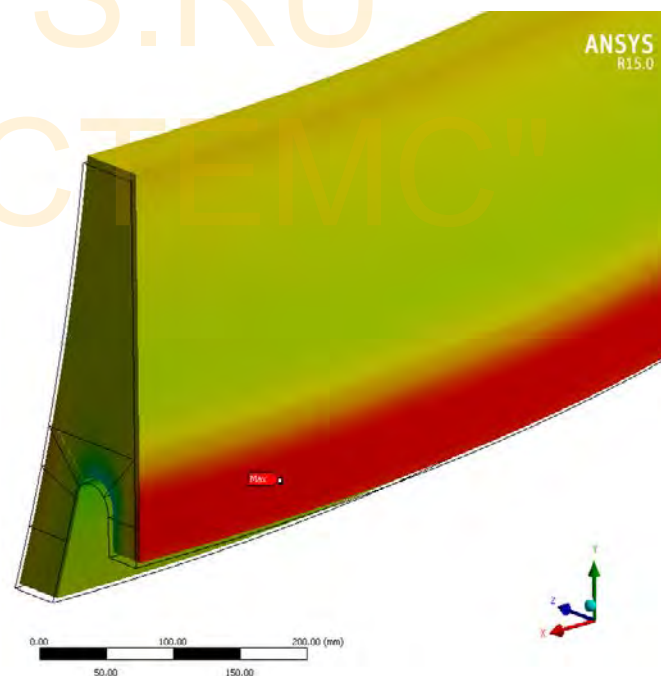
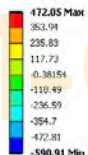
Skirt-head joint

Thermal gradient and mechanical stresses analysis at skirt to vessel joint

ANSYS Workbench
 Results
 Temperature
 Units: °C
 Scale: 1
 01/10/2014 9:29



B: Structural
 User Defined Result
 Expression: S1+S2+S3
 Time: 1
 01/10/2014 9:29



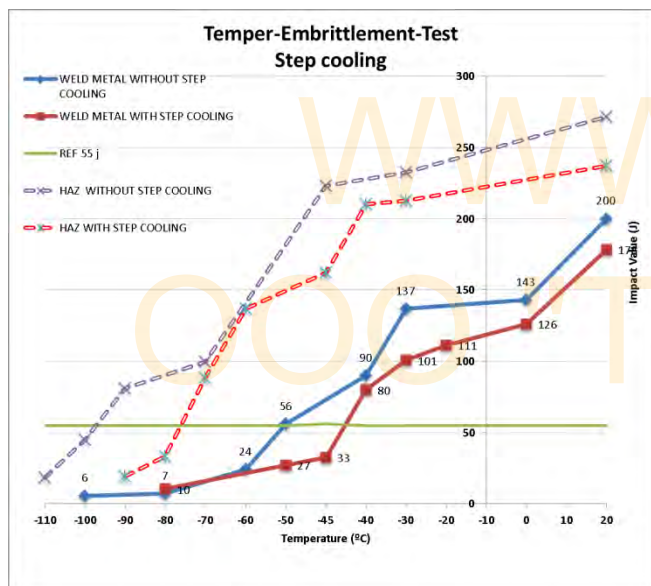
Vessel Assembly Preparation



Equipment Assembling Closure welding



Heat Treatment (ISR + PWHT)



DHT (Dehydrogenation Heat Treatment)

Temperatura : 350°C
Duración: 6 Horas

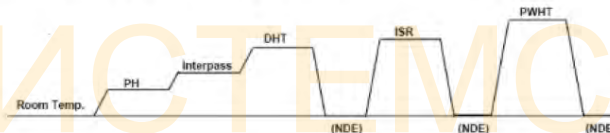
ISR (Intermediate Stress Relief)

Temperatura : 650°C
Duración: 6 Horas

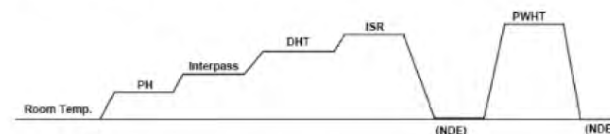
PWHT (Post Weld Heat Treatment)

Temperatura : 710°C
Duración: 6

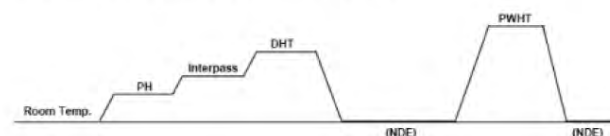
Tratamientos Térmicos en Soldaduras Longitudinales



Tratamientos Térmicos en Conexiones y Fondos



Tratamientos Térmicos en Costuras Circunferenciales



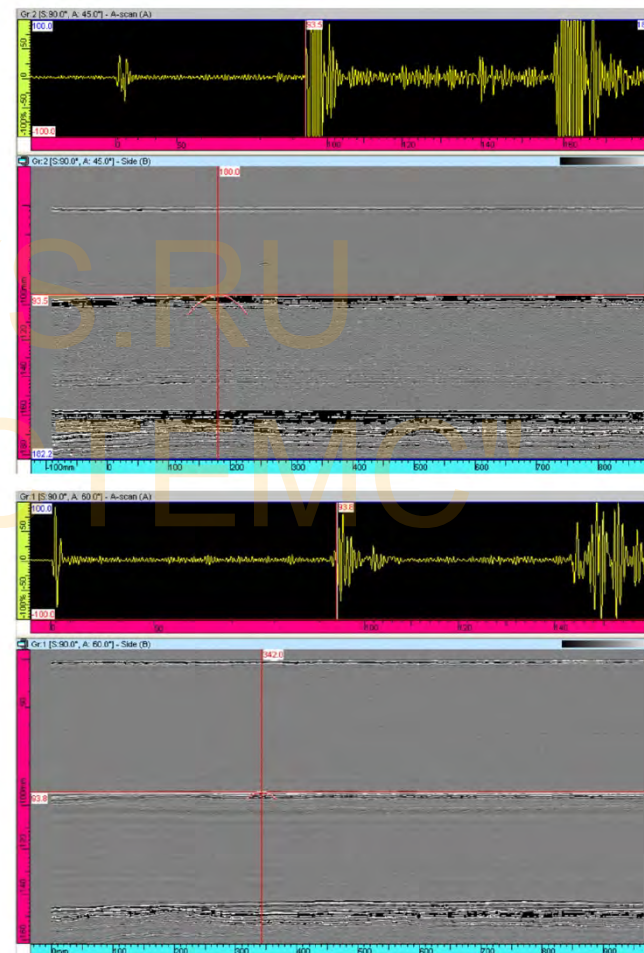


Quality NDT

Welding types	Before PWHT	After PHWT	After Hydraulic Test
Longitudinal	MT-TOFD-MANUAL UT	MT-TOFD-MANUAL UT	MT-TOFD-MANUAL UT
Circumferential	MT-TOFD-MANUAL UT	MT-TOFD-MANUAL UT	MT-TOFD-MANUAL UT
Nozzle	MT-TOFD-PHASED ARRAY	MT-TOFD-PHASED ARRAY	MT-TOFD-PHASED ARRAY
Overlay	PT-UT-FERRITE	PT-UT	

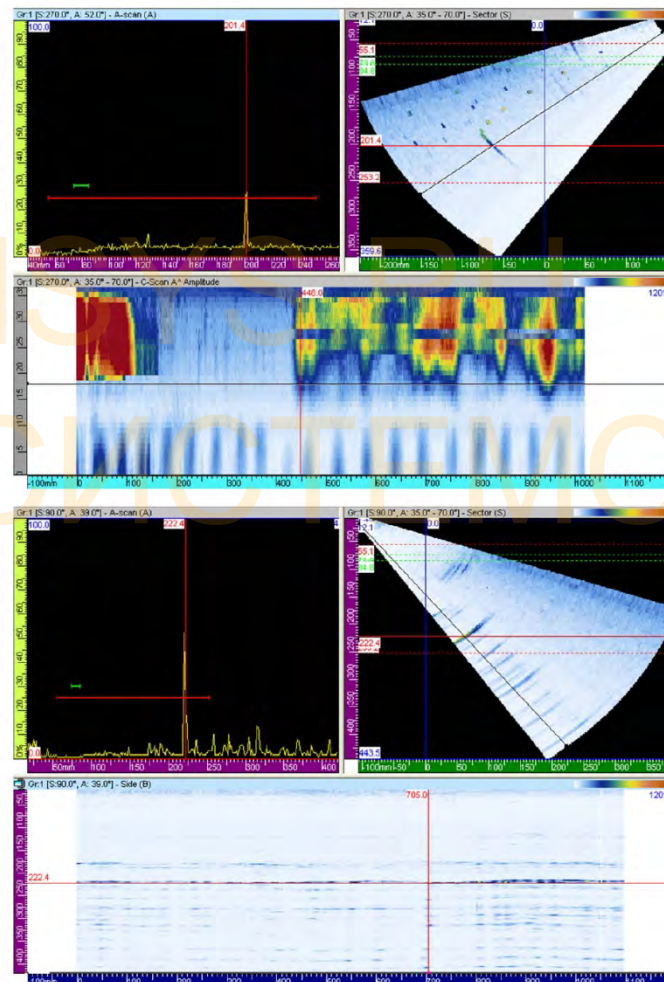


Registro de TOFD.





REGISTRO DE PHASE ARRAY



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BOILERS



Lointek Boilers

WATER TUBE	FIRE TUBE BOILER
HRSG – Recovery < 60 Mw	Fire Tubes < 40 tn/h steam
Industrial Package < 200 tn/h steam	Recovery Boilers
	HTF Boilers
	Waste Heat Boilers
Biomass Boilers < 40 tn/h steam	Superheated Steam

HRSG Boilers

ZABALGARBI (CNIM – SENER)



Industrial Boilers

60 T/H A 45 BAR ABENGOA PS-20



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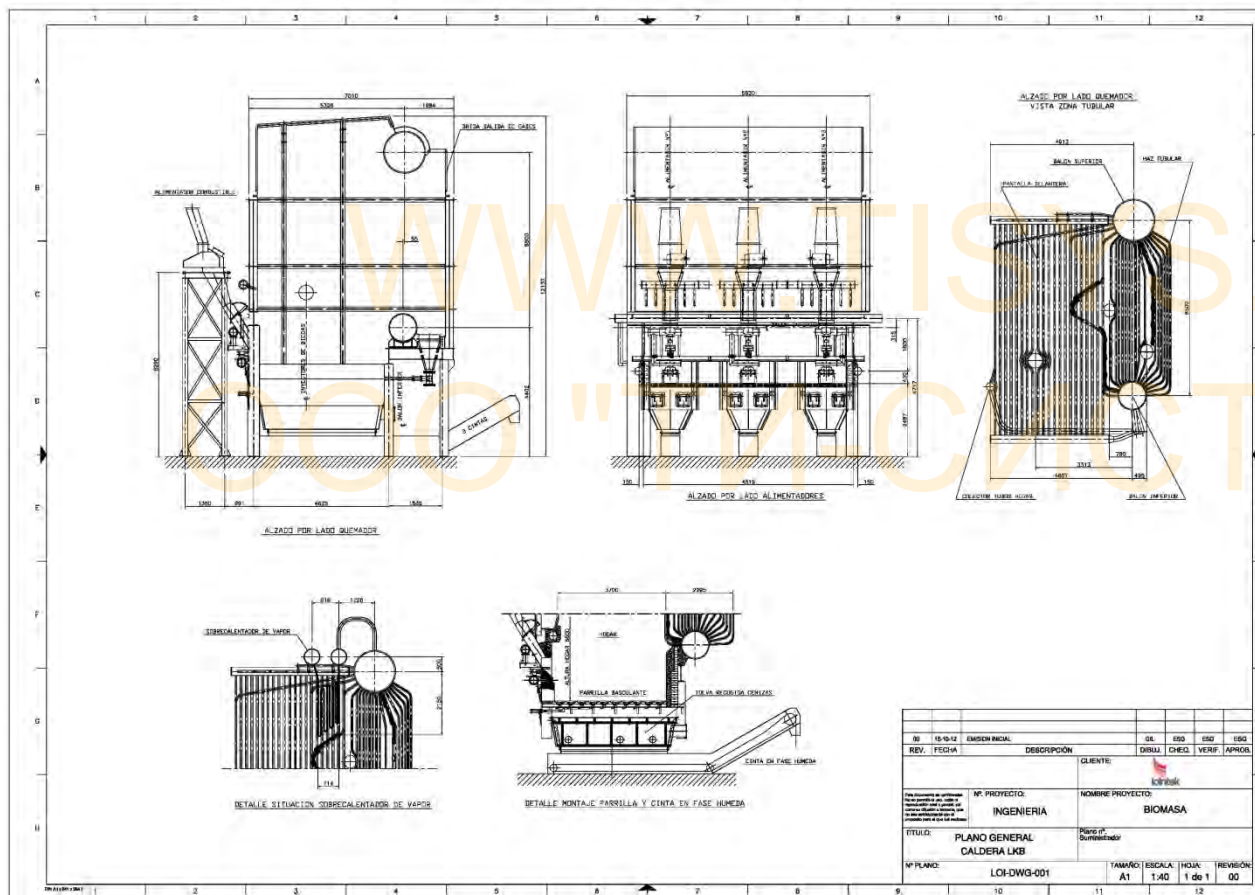
Industrial Boilers

150 T/H WITH FUEL OIL PETROGAL



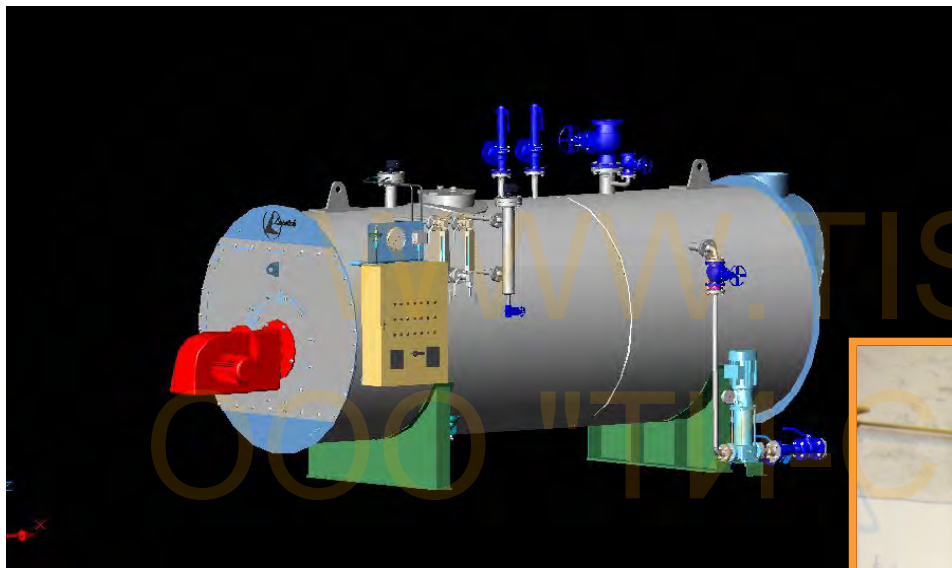
Biomass Boilers

BAGASSE



Fire Tube Boilers

4 T/H OLEANOSTRA

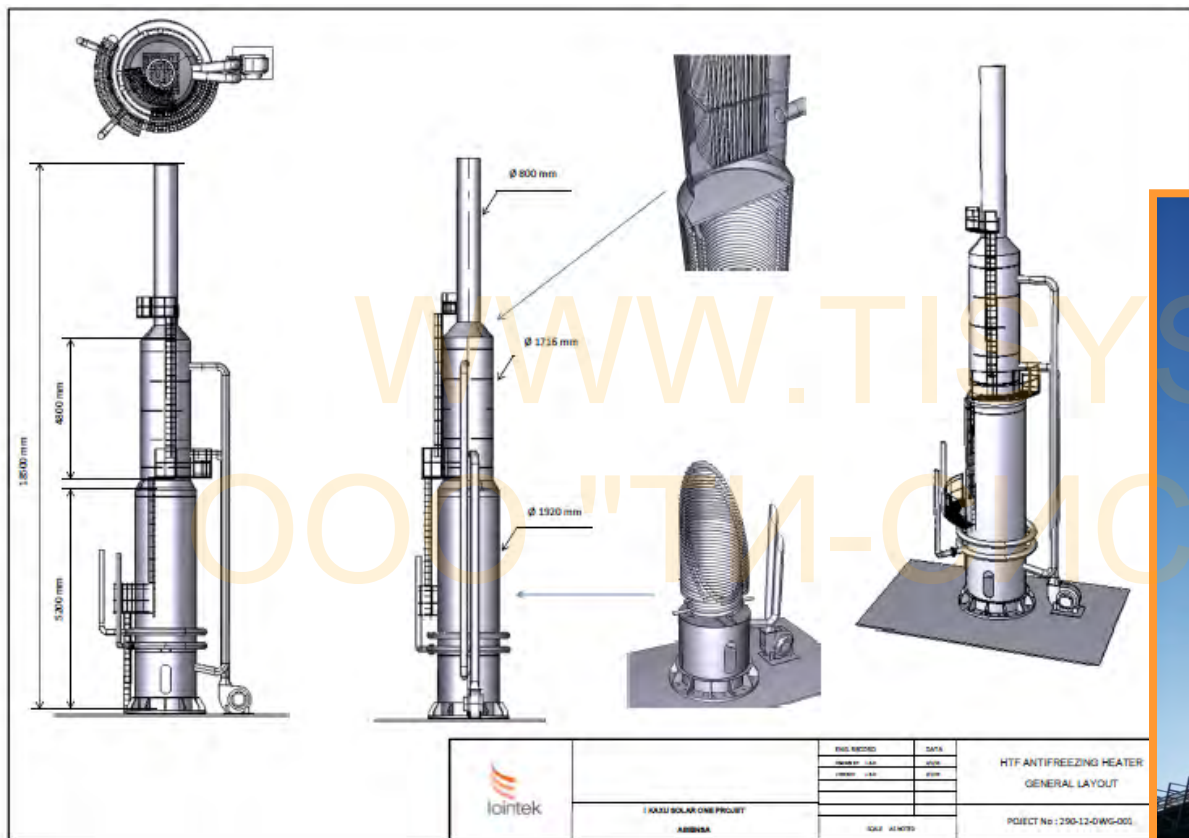


Fire Tube Boilers

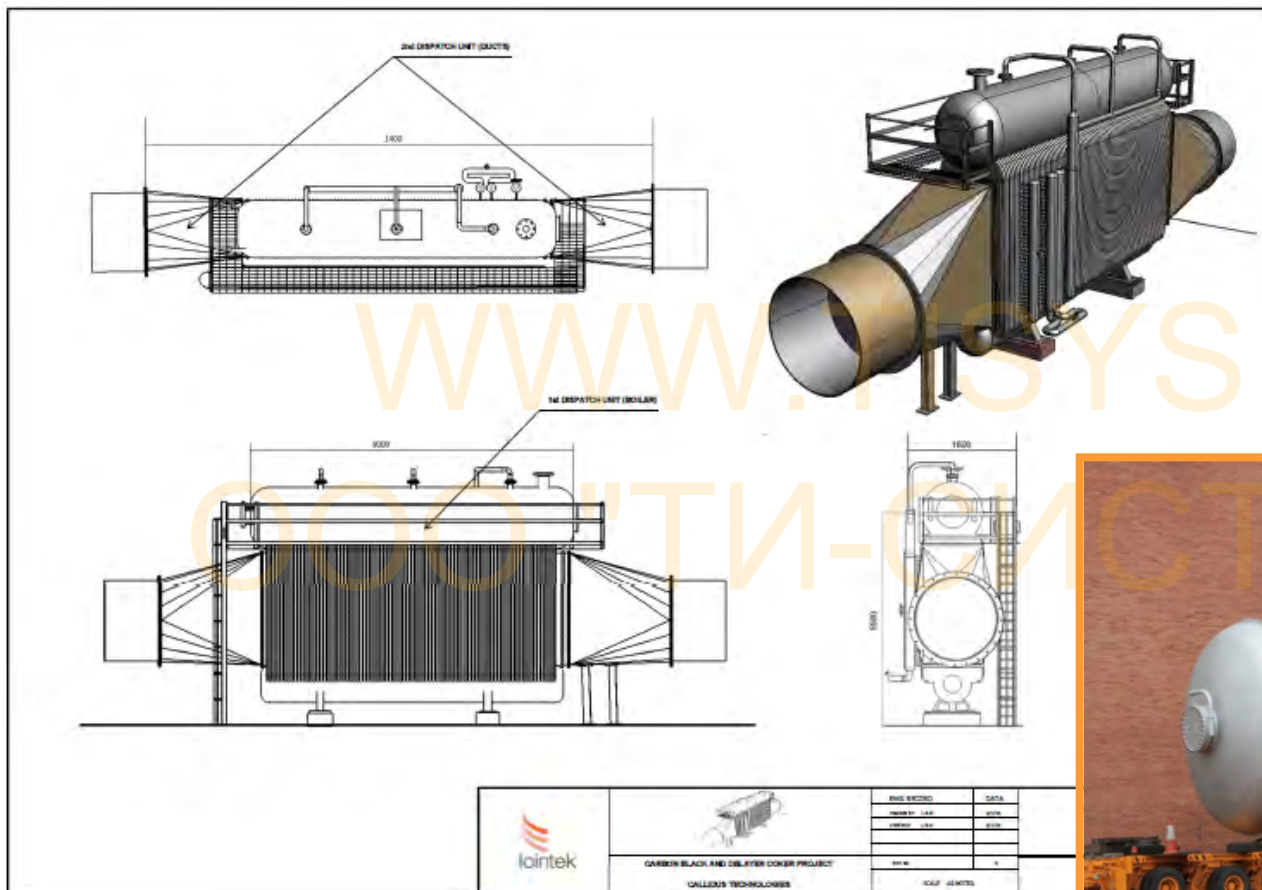
LKM-30 (30 T/H 12 BAR SH 225°C - LITUANIA)



HTF Fired Heaters

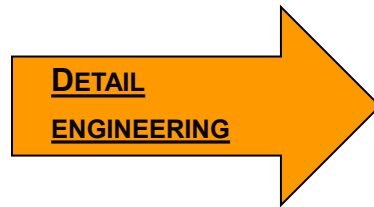


Waste Heat Boilers



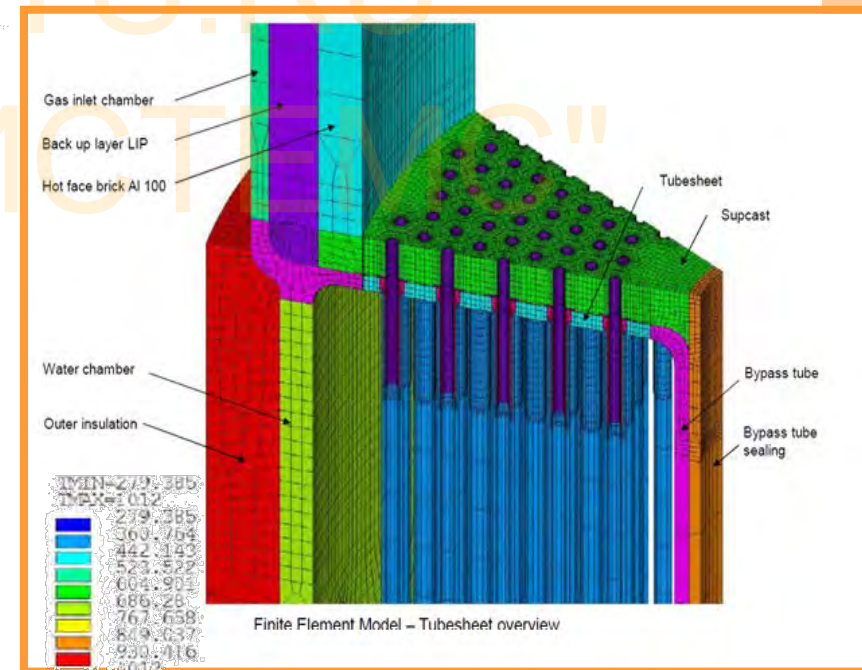
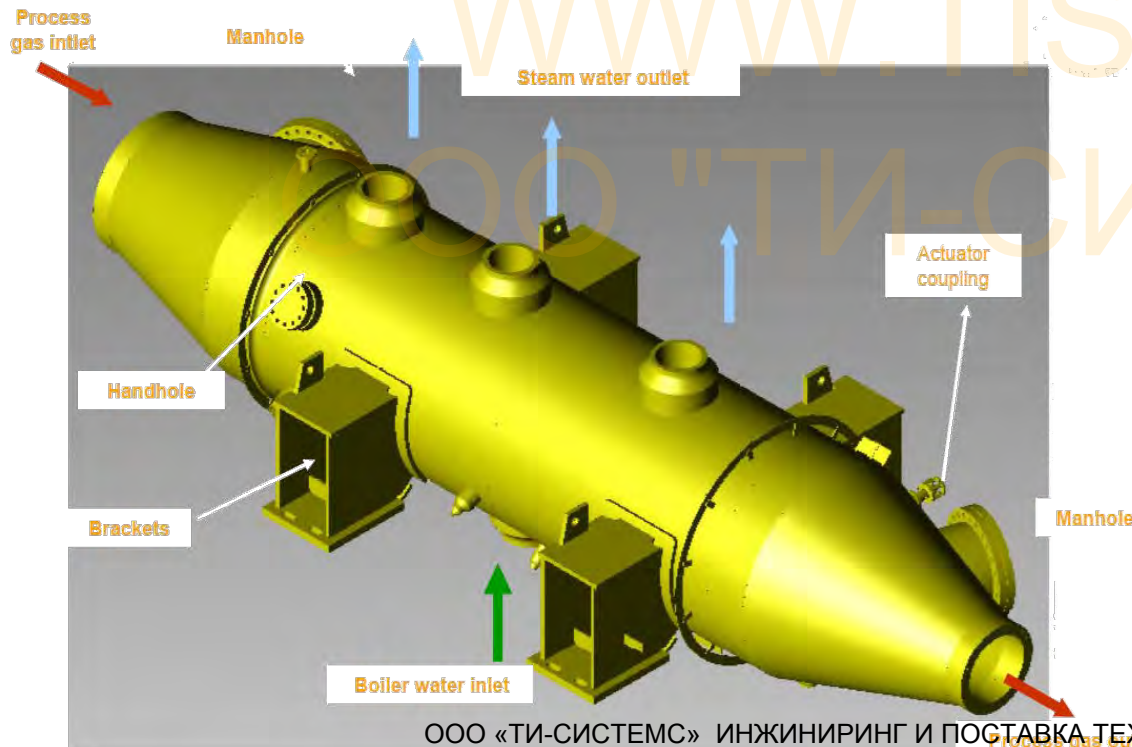
Waste Heat Boilers

Critical Temperatures
(up to 1200°C)
&
Corrosive gases



Alloyed Materials
Specialized Design
Manufacture with advanced
procedures:

- Inner bore welding
- Recessed welding



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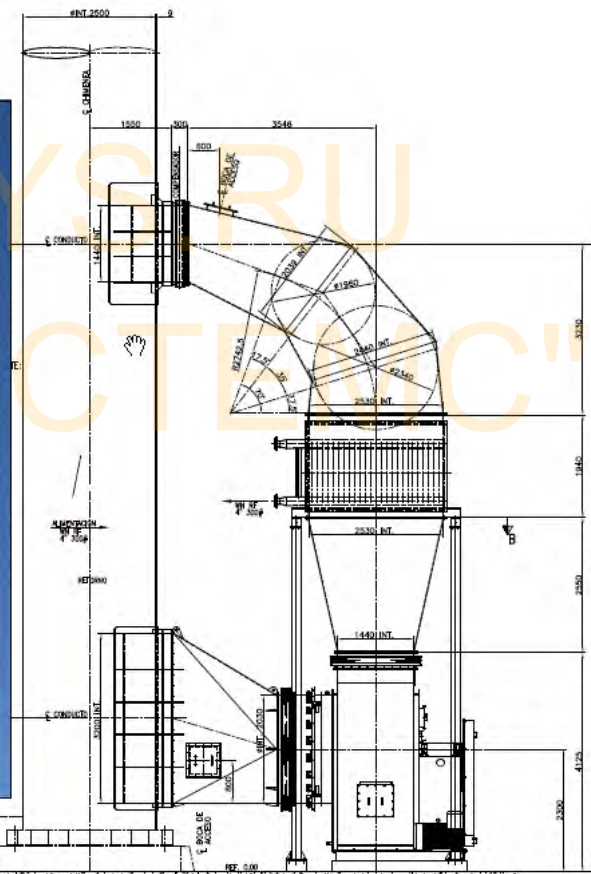
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Energy Optimization Studies

BOILER GAS HEAT RECOVERY SYSTEM

OPEL FACTORY (ZARAGOZA)



ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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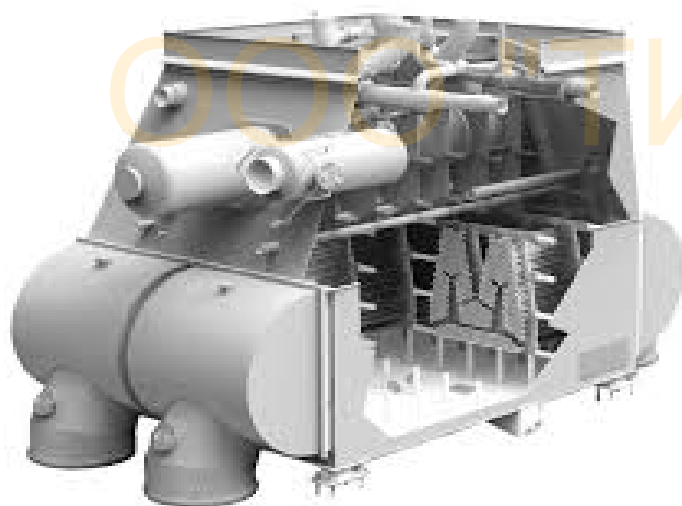
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SURFACE CONDENSERS



Cylindrical Surface Condensers

- Tubesheet diameter < 4500 mm
- Duty: Up to 150 ~ 200 MWth



Rectangular Surface Condensers

- N° of tubes > 8500 ~ 9000 ud
- Duty range: 150 ~ 1000 MWth

Auxiliary components (Optional)

- Air removal system (Steam jet ejector or liquid ring pumps)
- Tube ball cleaning system (Package unit)
- Cathodic protection system (induced currents or sacrificial anodes)

Configurations

- Axial or radial steam inlet
- Simple or double pass

Main design codes

- HEI
- ASME VIII Div.1
- AWWA

Applications

- Steam/Condensate recovery systems for industrial processes (energy production plants, petrochemical industry, food industry...)

Surface Condensers



Condenser components



ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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PIPING

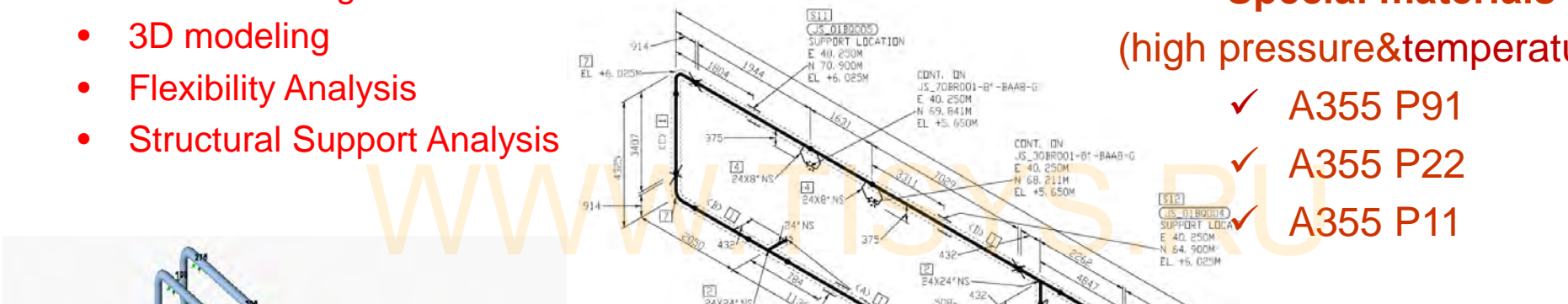


Piping

- Thermal design & Mechanical calculation
- 3D modeling
- Flexibility Analysis
- Structural Support Analysis

Special materials
(high pressure&temperature):

- ✓ A355 P91
- ✓ A355 P22
- ✓ A355 P11



Technical drawing showing piping layout with dimensions and annotations. Key annotations include:

- S11 JS_0180005 SUPPORT LOCATION E 40.250M N 70.900M EL +6.025M
- CDNT. DN JS_70BR001-B1-BAAB-G E 40.250M N 69.841M EL +5.650M
- CDNT. DN JS_30BR001-B1-BAAB-G E 40.250M N 68.211M EL +5.650M
- S12 JS_0180014 SUPPORT LOCATION E 40.250M N 64.900M EL +5.025M

3D model showing piping layout with nodes and stress analysis results.


Code Stress:	147431.9	Allowable:	217955.2
Axial Stress:	2641.1	@Node	530
Bending Stress:	147371.0	@Node	415
Torsion Stress:	24595.3	@Node	417
Hoop Stress:	0.0	@Node	20
3D Max Intensity:	177124.3	@Node	415

IDENTIF.: 137002 FECHA: HOJA: 1
 TÍTULO: INFORME DE TENSIONES DE TUBERÍAS - CIRCUITO 1 REV.: 1

CODE STRESS CHECK PASSED : LOADCASE 31 EXPANSION CASE MINIMUM TEMPERATURE

Highest Stresses (KPa)	LOADCASE 31 EXPANSION CASE MINIMUM TEMPERATURE
Code Stress:	11.3 @Node 395
Axial Stress:	848.6 @Node 1015
Bending Stress:	28532.5 @Node 395
Torsion Stress:	1094.7 @Node 1220
Hoop Stress:	0.0 @Node 20
3D Max Intensity:	34072.3 @Node 395

CODE STRESS CHECK PASSED : LOADCASE 32 EXPANSION CASE DESIGN TO MINIMUM TEMPERATURE



PROCESS SYSTEMS MODULAR PLANTS



Activity Sectors



Upstream



Refineries



Petrochemicals



LNG

- Project Management
- Basic engineering
- Detail engineering
- Equipment design: thermal, mechanical, fatigue,...
- Fabrication, Procurement, Erection
- Commissioning, Start up & Training
- Technical Assistance

- Customized Systems

Typical Process Systems

- **Acid Gas Cleaning Units**

Contaminants (H₂S, CO₂, HCN, COS, CS₂, mercaptans,...) removal by absorption.

Selection of most adequate solvent /amine (MEA, DGA, DEA, DIPA, MDEA) for each project conditions.

- **Gas Dehydration Units**

Water removal by absorption with glycol (DEG, TEG, TREG).

- **Crude Oil pre-treatment units**

Bring oil to meet certain export specifications (BS&W, TVP/RVP,...)

Units based on Multistage separation or Reboiled Stabilizer column processes

- **Process Packages**

Customized fully functional systems designed to client needs including:

heat exchangers / columns / separators / pressure vessels / piping

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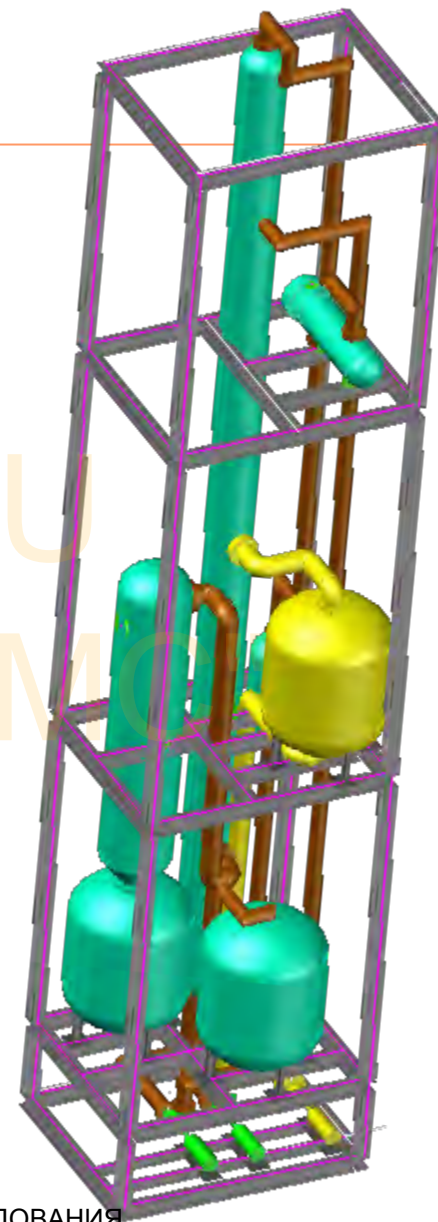
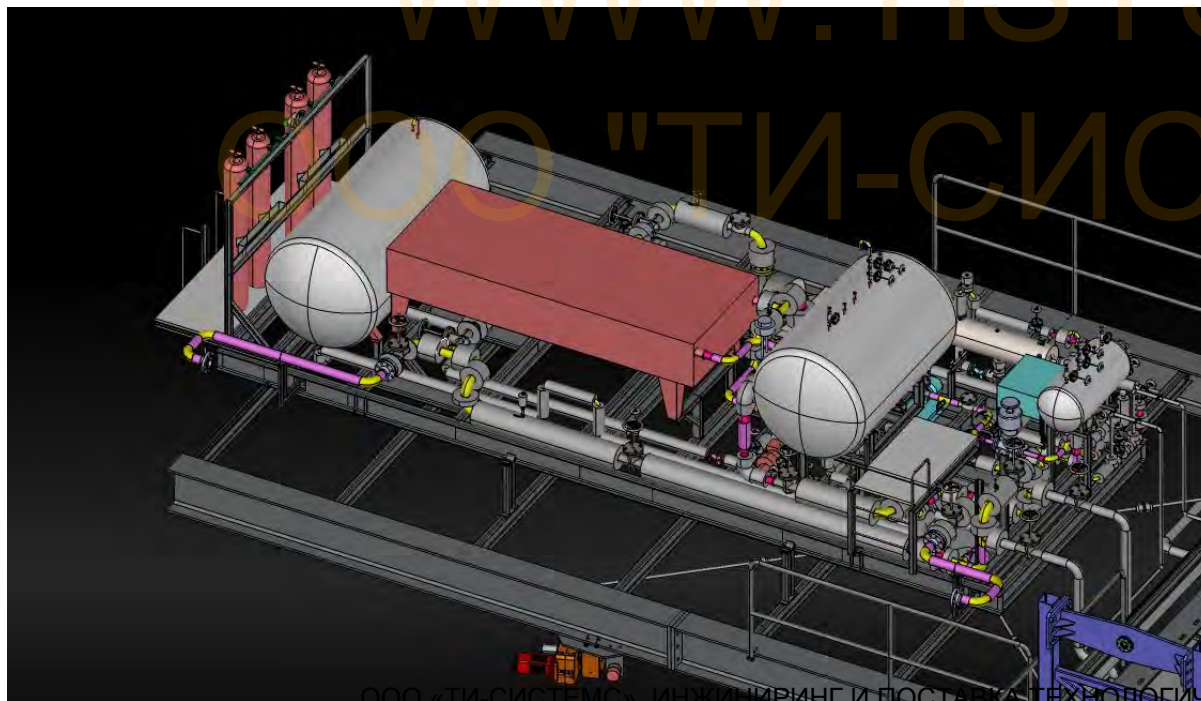
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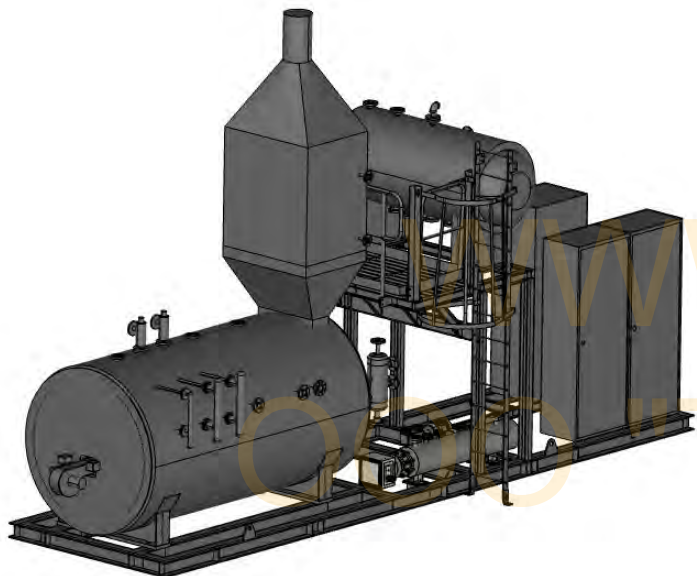
Modular Plants & Skids

When?

- Hard environments
- Scarcity or high cost of local skilled labor
- Transportable complete functional systems



Modular Plants & Skids



OFFSHORE



OFFSHORE

- Piles and transition pieces for Offshore
Wind Energy sector
- Able to manufacture any product of
Steel in our facilities at the Port of Bilbao
- Our extensive experience in
manufacturing steel products, allows us
to compete in this sector with total
guarantee.



SOLAR THERMAL ENERGY



Lointek's Scope in Solar Thermal Parabolic Trough & Tower Plants

STEAM GENERATION SYSTEM



HTF HEATERS



HP & LP FEED WATER HEATERS



BOILERS



OIL TO SALT HEAT EXCHANGERS

Lointek's Scope in Solar Thermal Parabolic Trough & Tower Plants



Lointek Markets

OWNER	PROJECT	LOCATION	SUPPLIER
COBRA	Andasol-1	Granada	LOINTEK
COBRA	Andasol-2	Granada	LOINTEK
Iberdrola Energía Solar de Puertollano		Ciudad Real	LOINTEK
Acciona/ Mitsubishi Corp	La Risca	Badajoz	LOINTEK
COBRA	Extresol-1	Badajoz	LOINTEK
COBRA	Extresol-2	Badajoz	LOINTEK
Abengoa Solar	Solnova 1	Sevilla	OTROS
Abengoa Solar	Solnova 3	Sevilla	OTROS
Renovables SAMCA, S.A.	La Florida	Badajoz	LOINTEK
Abengoa Solar	Solnova 2	Sevilla	OTROS
Acciona/ Mitsubishi Corp		Cáceres	OTROS
Renovables SAMCA, S.A.		Badajoz	LOINTEK
Acciona/ Mitsubishi Corp		Ciudad Real	LOINTEK
COBRA		Ciudad Real	LOINTEK
COBRA		Ciudad Real	LOINTEK
Acciona/ Mitsubishi Corp		Ciudad Real	LOINTEK
Abengoa Solar		Ciudad Real	OTROS
Valoriza/SAMCA		Ciudad Real	LOINTEK
Solar Millennium Energy/SWM			OTROS
Electron/Eise			LOINTEK
Torresol			OTROS
Torresol			OTROS
Electron/Eise			LOINTEK
Electron/Eise			LOINTEK
Abengoa Solar			OTROS
Abengoa Solar			LOINTEK
Abengoa Solar			LOINTEK
Abengoa Solar			LOINTEK
Abengoa Solar			LOINTEK
Iberdrola			LOINTEK
Abengoa Solar/IT			LOINTEK
Grupo Ortiz-Gruber/Magnum			OTROS
FCC/Mitsui		Córdoba	LOINTEK
Iberdrola		Badajoz	OTROS
Acciona		Badajoz	LOINTEK
COBRA	Extresol-3	Badajoz	LOINTEK
Abengoa Solar	Helios 2	Ciudad Real	LOINTEK
Abengoa Solar/TOCHU	Solaben 2	Cáceres	LOINTEK
Abantia /Comsa EMTE	Termosolar Borja	Lleida	LOINTEK
COBRA	Casablanca	Cáceres	LOINTEK
FCC/OTROS	Enerstar	Alicante	OTROS
Solar Millennium/Ferrostaal	Extremasol 1	Badajoz	PENDIENTE
Solar Millennium/OHL	Arenales	Sevilla	LOINTEK
Nextera-FPL	Termosol 1	Badajoz	OTROS
Abengoa Solar/TOCHU	Solaben 1	Cáceres	LOINTEK
Renovables SAMCA, S.A.	Cáceres	Cáceres	LOINTEK
Abengoa Solar/TOCHU	Solaben 6	Cáceres	LOINTEK
Nextera-FPL	Termosol 2	Badajoz	OTROS

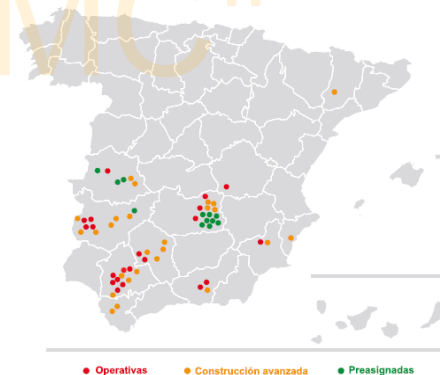
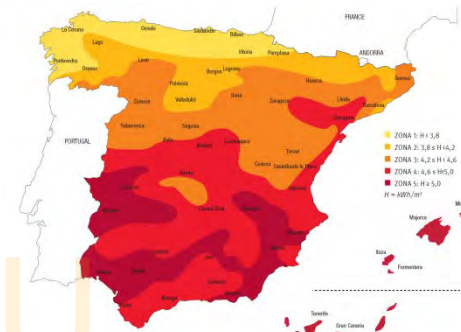
**70%
Spanish
Market
Share**

Presence in more than 40 Thermosolar Power Plants

More than 500 Heat Exchangers Supplied

More than 350,000 Engineering Hours

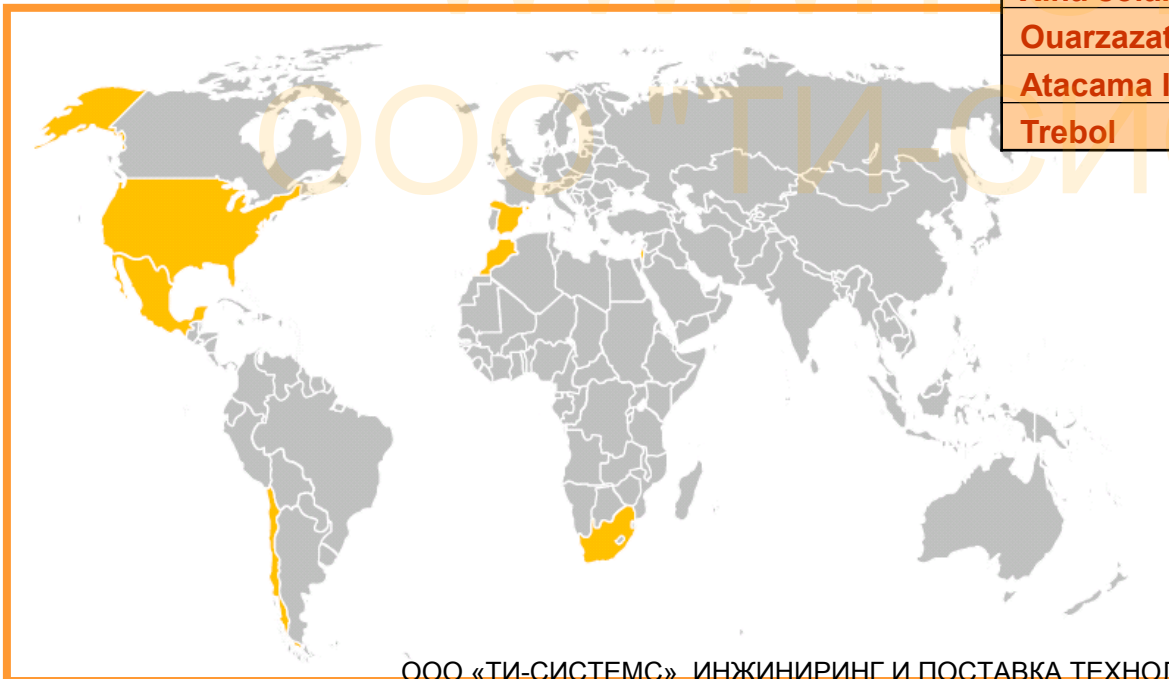
More than 1,500,000 Manufacturing Hours



Lointek Markets



PROJECT	COUNTRY	TYPE
Crescent Dunes	U.S.A.	Tower
Solana	U.S.A.	Parabolic Trough
SEGS Harper 8	U.S.A.	Parabolic Trough
Agua Prieta	Mexico	Parabolic Trough
Ashalim	Israel	Parabolic Trough
Kaxu solar one	South Africa	Parabolic Trough
Xina solar one	South Africa	Parabolic Trough
Ouarzazate	Morocco	Parabolic Trough
Atacama I	Chile	Tower
Trebol	Chile	Tower



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Clients



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Stamicarbon
pure knowledge



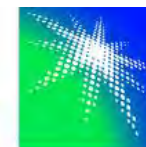
Tecnimont



PEMEX



IBERDROLA



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**Thank you
for your attention**

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