YOUR GLOBAL PARTNER FOR HEAT EXCHANGERS

Contact:
STIL-M d.o.o.
Novi Sad, Serbia
Marko Damjanac, sales manager
Email. damjanacmarko@gmail.com
Mob. +381 63 524 885
Web. www.stilm.rs
BARRIQUAND HEAT EXCHANGERS
PORTFOLIO OF PRODUCTS
www.barriquand.com

- WELDED PLATE PLATULAR®
- PLATES & GASKETS
- SHELL & TUBES
• AGRO INDUSTRY, SUGAR AND BIOETHANOL
• PULP & PAPER
• ALUMINIUM, STEEL AND MINERALS
• FINE CHEMICAL AND PHARMACY
• PETROCHEMICAL
• ENERGY & ENVIRONMENTAL TECHNOLOGIES
• HVAC AND DISTRICT HEATING
• 1936  Creation in Roanne
• 1950  Development of welded plate exchangers for the chemicals industry
• 1975  First sterilization autoclave
• 1982  ASET Acquisition
• 1991  Organization into product lines and creation of Steriflow and Barriquand Echangeurs companies
• 2005  Creation of Barriquand Technologies Thermiques
• 2010  Creation of Barriquand do Brasil
• Thermal design and sales

• Plate exchangers fabrication

• Tubes & Shell exchangers fabrication

• Sterilization autoclave world leader
• 250 Employees
• 15,000 m² workshop
• Turnover 45 M€
• Over 70% export
• Clients in more than 60 countries
OUR SOLUTION:
PLATULAR® HEAT EXCHANGER
www.barriquand.com

DESIGN OF PLATULAR®

• Made for fluids with particles in suspension and viscous
• High thermal performances
• Low cost of operation
THE BEST OF BOTH WORLDS:

• The heat transfer performance of the plate
• The robust design of the tube
• The 100% full free flow design
Our solution: PLATULAR® Heat Exchanger

- Channel A: Dimpled design on energy side (steam, condensates, water...)

- Channel B: CLEAR FREE FLOW CHANNELS design for JUICE stream
OUR SOLUTION:
PLATULAR® HEAT EXCHANGER

www.barriquand.com
Traditionnal thermal design in shell and tubes

- Expl: 400 t/h of juice and 206 t/h condensates
  - Duty: 3 720 kW
  - ΔT Ln: 13.46 (f=0.86)
  - Area: 395 m²

Traditionnal thermal design in PLATULAR®

- Expl: 400 t/h of juice and 206 t/h condensates
  - Duty: 5 166 kW
  - ΔT Ln: 9.49
  - Area: 500 m²
CONDENSATES / JUICE HEATER

PLATULAR® 738 m²

Juice : 490 m³/h
from 25°C to 46.8°C

Condensates: 485 m³/h
from 54.8°C to 37.4°C

2013 Manufacture for SAINT-LOUIS SUCRE
-SÜDZUCKER group-
CONDENSATES / JUICE HEATER

PLATULAR®  2*1100 m²

Juice : 850 m³/h
from 33°C to 58.2°C

Condensates : 988 m³/h
from 63°C to 42.9°C

Delivered 2012 for CRISTAL UNION-FRANCE-
TEREOS Bucy: Diffusion juice with condensates
HEATER OF DIFFUSION/LIMED or CLEAR JUICE WITH VACUUM STEAM

Typical application in sugar/starch industry

Juice

Non condensables

Vacuum steam

Condensates
HEATER OF DIFFUSION/LIMED or CLEAR JUICE WITH VACUUM STEAM

PLATULAR® 395 m²

Juice : 280 m³/h from 25°C to 52°C

Vacuum Steam : 13 T/H at 0.795 bar g-60°C

Delivered 2012 for SÜDZUCKER-ALLEMAGNE-
KEMIRA (DK)

\( \text{NH}_4\text{NO}_3 \) (95%) Heater - TYPE IXASP
Material : AISI 304L
Heat Transfer Area : 1 x 33.6m\(^2\)

STREAM A : Steam 224m\(^3\)/h 175.4°C
STREAM B : \( \text{NH}_4\text{NO}_3 \) 31.4m\(^3\)/h 135 \( \Rightarrow \) 160°C

Inspection doors on Ammonium Nitrate side
KEMIRA (DK)

DUTY 755 000 kcal/h
1500 kg/h STEAM 184°C
110 m³/h Nitrate Solution 160°C <-> 150.2°C
PLATULAR type DIXASP 33.6m² (AISI 304L)
Arrangement: 1 x 19 / 1 x 18 x 2750 x 340
KEMIRA (DK)
GRANDE PAROISSE

SIDE A: COOLING WATER 22.3 kg/h 35 °C ⇔ 51°C
SIDE B: AQUEOUS UREA SOLUTION (45 %) 22.3 kg/h 60 °C ⇔ 40°C

IXASP – 3 x 7 / 10 x 2 x 2500 x 400

Area: 36.0 m²
M.O.C.: 1.4307 DUTY: 356.925 Kcal/h
Service Pressure: 0.58 bar(a) on Side A – 0.51 bar(a) on Side B

DIMPLED CHANNEL ON STREAM A: 4 mm SPACING
CLEAR FREE FLOW CHANNEL ON STREAM B: 8 mm SPACING
GRANDE PAROISSE : Urea solution cooling
**MULTISTREAM PLATULAR®:**

- Several streams integrated in the same exchanger
- Economical and compact solution
JUICE/VAPOUR MULTI-STREAM FLOW ARRANGEMENT

Delivered for TEREOS
PLATULAR® Heater / Cooler with 2 utility streams
KEMIRA (B)

HNO₃ (60%) Cooler - TYPE DIXASP
MULTISTREAM UNIT  2 x 117m²
Material : AISI 304L

STREAM A :  HNO₃  100 000kg/h  40 °C  30°C
STREAM B : Cooling Water  87 500kg/h  27 °C  34.4°C

Water in the clear free flow channels with a 10 mm spacing to ease cleaning and inspection
HNO₃ (60%) Cooler

KEMIRA (B)

2 x 117.0 m²

NH₃ / HNO₃ Industry

www.barriquand.com
ASEAN BINTULU FERTILIZERS (Malaysia)

2 steps condenser combined in one single unit with 2 condensates outlets

74 748 kg/h wet CO2 gas 50 \(\Rightarrow\) 38 °C
140 000 kg/h cooling water 32 \(\Rightarrow\) 37.4 °C

Step 2

73 440 kg/h wet CO2 gas 38 \(\Rightarrow\) 8 °C
183 590 kg/h chilled water 4.5 \(\Rightarrow\) 11.4 °C
ASEAN BINTULU FERTILIZERS (Malaysia)

Service and design pressures:

- Wet CO2 gas: 1.3 / -1/ 2.5 bar a
- Cooling water: 4.5 / -1 9 bar a
- Chilled water: 3 / -1/ 5 bar a

Material of construction: 316 L

- Wet CO2 gas: 6 mm free flow channels
- Water: 4 mm dimpled channels with inspection door

Total weight: 16 500 kg
Total heat duty: 1 137 kW
ASEAN BINTULU FERTILIZERS (Malaysia)
## Typical Application in Bioethanol Industry

<table>
<thead>
<tr>
<th>PROCESS FLUID</th>
<th>HEATING FLUID</th>
<th>PLATULAR®</th>
<th>WIDE GAP GASKET PHE</th>
<th>STD GASKET PHE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MASH</td>
<td>Cond. /V4/V5</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ALCOHOL</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>FERM. MASH</td>
<td>Vinasses</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>VINASSES</td>
<td>Water</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
WINE HEATER WITH VINASSE

PLATULAR®  40 m²

Wine : 50 m³/h
from 50°C to 85°C

Vinasse 42 m³/h
From 115°C to 75.2°C
ETHANOL CONDENSER

PLATULAR®  1 416 m²
Duty : 19,3 MW
Alcohol 94% : 78.9 T/H at 50°C
Water 1 500 T/H
From 28.7°C to 39.7°C

Delivered for CRISTANOL
<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>PLATULAR</th>
<th>SURFACE</th>
<th>STREAM 1</th>
<th>STREAM 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cristal Union</td>
<td>IXASP</td>
<td>1416.6</td>
<td>Vap. Alcool 94%</td>
<td>Cooling water</td>
</tr>
<tr>
<td>CIMV</td>
<td>IXASP</td>
<td>8.94</td>
<td>Vapour</td>
<td>Cooling water</td>
</tr>
<tr>
<td>CIMV</td>
<td>IXASP</td>
<td>0.98</td>
<td>Cooling water</td>
<td>Hydrolisat acide</td>
</tr>
<tr>
<td>Tereos</td>
<td>IXASP</td>
<td>703.5</td>
<td>Water</td>
<td>Liq. Worts</td>
</tr>
<tr>
<td>Tereos</td>
<td>IXASP</td>
<td>923.4</td>
<td>Water</td>
<td>Worts</td>
</tr>
<tr>
<td>Tereos</td>
<td>IXASP</td>
<td>703.5</td>
<td>Water</td>
<td>Liq. Worts</td>
</tr>
<tr>
<td>Tereos</td>
<td>DIXASP</td>
<td>37.3</td>
<td>Water</td>
<td>Cooling water</td>
</tr>
<tr>
<td>Tereos</td>
<td>IJS</td>
<td>4.5</td>
<td>Water</td>
<td>Vapour</td>
</tr>
<tr>
<td>Tereos</td>
<td>DXP</td>
<td>40.13</td>
<td>Wine</td>
<td>Vinasse</td>
</tr>
<tr>
<td>Tereos</td>
<td>IIXS</td>
<td>61.7</td>
<td>Flegmasse</td>
<td>Water + Alcool</td>
</tr>
<tr>
<td>Tereos</td>
<td>IJASP</td>
<td></td>
<td>Flegmasse</td>
<td></td>
</tr>
<tr>
<td>SüdZucker</td>
<td>DIXASP</td>
<td>3x727.3</td>
<td>Cooling water</td>
<td>Sach. Worts</td>
</tr>
<tr>
<td>SüdZucker</td>
<td>IIXS</td>
<td>27.4</td>
<td>Alcool/water</td>
<td>Alcool/water</td>
</tr>
<tr>
<td>SüdZucker</td>
<td>UXP</td>
<td>2x341.3</td>
<td>Stillage</td>
<td>Beer</td>
</tr>
<tr>
<td>SüdZucker</td>
<td>DIXASP</td>
<td>2x969.8</td>
<td>Cooling water</td>
<td>Worts</td>
</tr>
<tr>
<td>SüdZucker</td>
<td>UXP</td>
<td>2x175.8</td>
<td>Vinasse</td>
<td>Beer</td>
</tr>
<tr>
<td>SüdZucker</td>
<td>IIXS</td>
<td>194.7</td>
<td>Alcool/water</td>
<td>Alcool/water</td>
</tr>
<tr>
<td>SüdZucker</td>
<td>UXP</td>
<td>3x509.3</td>
<td>Vinasse</td>
<td>Alc. Worts</td>
</tr>
<tr>
<td>Tereos</td>
<td>DIXP</td>
<td>40.1</td>
<td>Wine</td>
<td>Vinasse</td>
</tr>
</tbody>
</table>
Series of alcohol condensers with plate and gaskets heat exchangers
EXAMPLE OF STEAM / JUICE HEAT EXCHANGER
EXAMPLE OF CONDENSATES / JUICE HEAT EXCHANGER
EXAMPLE OF PLATULAR® WITH JUICE/STEAM
PLATULAR® HEAT EXCHANGERS
EASY MAINTENANCE
• HIGH HEAT TRANSFER COEFFICIENT
• INDIVIDUAL OPTIMIZATION OF FLUID SPEEDS
• LOW $\Delta T$ BETWEEN HEATING FLUID AND JUICE
• LOW PRESSURE VAPOURS (PAN VAPOUR, V5, V4, …)
• HORIZONTAL POSITION: HOMOGENE FLUID CIRCULATION
• SELF VENTING AND PURGING
• COMPACT TAYLOR MADE DESIGN
• LARGE DISTRIBUTION AREAS (NO NEED FOR BACKFLUSHING)
• MULTI-STREAMS (VAPOURS AND/OR CONDENSATES) DESIGN
• WIDE GAP 100% FREE FLOW CHANNELS ON JUICE STREAM
• VERY LOW INSTALLATION COST
• NO MAINTENANCE COSTS (NO GASKETS)
• EASY CLEANABILITY ON THE JUICE STREAM
+ 200 PLATULAR® units in beet sugar factories

Countries: Belgium, France, Germany, Italy, Morocco, Portugal, Russia, Serbia, Spain, Turkey, etc.

Customers: Acor, Cosumar, Cristal union, Südzucker, Sucden, Tereos, etc.

+ 60 PLATULAR® units in cane sugar factories
  (Africa, Brazil, India, Mauritius, Reunion, USA, etc.)

+ 30 PLATULAR® units in raw sugar refineries
  (Algeria, Austria, France, Italy, Morocco, Bahrain, etc.)

+ 20 PLATULAR® units in Ethanol plants
  (France, Germany)
ZABALJ: 2 PLATULAR® (86 + 175 m²)
Limed juice heating with VP5 & VP4
CRENVKA: 2 PLATULAR® (196 + 352 m²)
Limed juice heating with condensates
SENTE: 3 PLATULAR® (122, 195 & 441 m²)
Raw juice heating with condensates
THANK YOU FOR YOUR ATTENTION

Contact:
STIL-M d.o.o.
Novi Sad, Serbia
Marko Damjanac, sales manager
Email. damjanacmarko@gmail.com
Mob. +381 63 524 885
Web. www.stilm.rs