Industrial boilers

Vaduz, March 2013
Hoval System Solution (P&ID)
steam boiler plant
Main equipment for steam boiler plant

- Steam boiler
- Economiser
- Feedwater tank
- Water treatment plant
- Condensate station
Equipment of steam boiler plants for high plant efficiency

- steam boiler
- high pressure condensate tank
- low pressure condensate tank
- feedwater tank with deaerator
- ionic exchanger
- reverse osmosis with permeat tank
### Equipment of steam boiler plants

**Water treatment station (softener)**

#### B) Desaltination rate refering to water treatment plant

<table>
<thead>
<tr>
<th>Method</th>
<th>Investment</th>
<th>Required space</th>
<th>Operating facilities</th>
<th>Boiler desalination</th>
<th>Treatment plant drain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ionic exchanger</strong></td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>medium</td>
</tr>
<tr>
<td><strong>Partial / Complete demineralisation</strong></td>
<td>medium</td>
<td>high</td>
<td>high</td>
<td>medium/low</td>
<td>low</td>
</tr>
<tr>
<td><strong>Reverse osmosis</strong></td>
<td>high</td>
<td>medium</td>
<td>low</td>
<td>low</td>
<td>low</td>
</tr>
</tbody>
</table>

Parameter: raw-water hardness, condensate quantity, quality of steam
Energy circle of boilers

- Steam for feedwater heating: 2% - 14%
- Steam for production: 62% - 94%

**O₂ + CO controlling**
higher efficiency
0.5 - 2%

**Energy loss**
at 10 bar
0.3% - 12%

**Energy recovery**
from stem
til 9%

**ECO 1**
saving
4 - 6%

**ECO 2**
condensation
recovery from exhaust - 6%

Stack

Drain
Industrial steam systems

Hoval equipment installed:

Picture above:
• Boiler type: 1 x Hoval THSD-I 170/160 E (17 to/h steam)
• Burner: Saacke
• Fuel: natural gas (H)

Picture below:
• Boiler type: Hoval 6 x THW-I 210/200 HTE (20 MW)
• Burner: Dreizler
• Fuel: natural gas (H) and light fuel oil (diesel)

Hoval Steam boilers advantages at a glance:
• High efficiency rate – up to 90% even without economizer.
• Complete systems including boilers, feedwater tanks, deaerator, condensate tanks, blow down tanks, etc. from one hand.
• Easy to install, easy to operate, easy to maintain.
Economical Cost effectiveness

- Cost-efficient solution due to low investment costs
- Best effectiveness due to built in
  - water cooled fin tube wall at flame tube rear wall
  - dimpled tubes at THD-U boiler series
- Power saving and high efficiency
  - due to smooth heating surfaces
  - boiler design calculated according to actual rules
Ecological
Lowest emissions

Conservation of energy – protection of the environment

- Environment friendly due to lowest noxious emission
- Low CO2 emissions due to minimal consumption
- Outstanding low emissions values due to power adjustment (modulation) of LowNOx burners
- Low fuel consumption due to special calculated heat transfer areas resulting in high boiler efficiency
Clever
Perfect solution

- Large range of applications due to flexible combination options
- Space-saving due to compact design
- Simple installation due to high flexibility in positioning
Easy to use due to intelligent design details

Convenient and accessible remote maintenance by using TopTronic® online (THW-I…NTE)

Large boiler front door which guarantees easy access for cleaning of boiler and burner service

Boiler door hinged – no special lifting or support tools necessary

No fire proof concrete at back wall of boiler
Hoval Industrial boiler product portfolio

All hot water and Steam boilers are also available with Economizer!

Hot water boilers:
- Hot water boiler: THW-I NT E
- High temperature hot water boiler: THW-I HT E

Steam boilers:
- 3-pass reversed flow principle: THD-U
- 3-pass: THSD-I E

Accessories:
- SPW-D (Feedwater tank pressure less)
- SPW-E (Feedwater tank with deaerator)
- KDS (Condensate tank)
- ABS (blow down tank)
Hot water boiler

- **THW-I NT E**
  Hot water boiler max. 10 bar(g), 120°

- **THW-I HT E**
  High temperature hot water boiler max. 16 bar(g), 204,3°

Steam boiler, for saturated steam

- **THD-U, THSD-I E**
  Design press. max. 16 bar(g) and 204,3°C
Hot water boiler THW-I NTE

THW-I NTE
1500-20000 kW
6 and 10 bar
STB 120°C
(Safety temperature limiter)
High temperature - hot water boiler THW-I HTE

THW-I HTE
1000-21000 kW
10, 13 and 16 bar
STB 204,3°C
(Safety temperature limiter)
High temperature - hot water boiler THW-I HTE

Flame tube – flue gas tube - hotwater boiler
Steam boiler THD-U / THSD-I … E

THD-U
500 - 5000 kg/h
10, 13 and 16 bar (MAWP)

THSD-I…E
2000 - 22000 kg/h
10, 13 and 16 bar (MAWP)
Flame tube – flue gas tube - steam boiler
Examples:

1.) THD - U with SPW - D
   (Luxor Jolie-Ville - Egypt)

2.) THSD-I ... E with SPW-E
   (Contitech Changshu – China)
Jolie Ville Hotel / Luxor Egypt  
(former Mövenpick Jolie Ville)

Founded 1991 in Egypt

Owner buys the brand Jolie Ville from Mövenpick and starts expansion

Today cooperation with the German Hotel chain Maritim
Solution - Jolie Ville

Technical area (steam and heating boilers – split system)
Efficient steam system for expansion of Jolie Ville Hotel in Luxor – Kings Island by replacement and extension of existing old boiler plant

- Very tight time schedule: Finishing of the complete project in short time (Guests have already booked!)
- Proofed system
- Quality - Safety
Steam system for most modern laundry

→ 3000 kg/h steam with operating pressure 8.5 bar
→ 100% stand-by steam boiler
→ Feed water tank for boiler water supply and pre-heating
→ Water softener and chemical dosing station for boiler feed water preparation
→ Several steam pressure reducing stations for supply of different pressure needs of laundry area
Solution - Jolie Ville: Steam boiler

2 x THD-U 3000 11bar
Solution - Jolie Ville: Steam boiler

Steam header and steam reducing stations
Contitech Changshu / China

Company founded 1871 in Germany – in year 2010 the plant in Changshu was built.

Actually Contitech has more the 27000 employes worldwide
Solution - Continental

Technical area (steam boilers)
Solution – Continental: Requirements

- High efficient steam system for new production facility in Changshu / China

  ➔ 2 boilers with possibility for extension with 3´rd boiler
  ➔ Prooﬁed and “China” certiﬁed boilers
  ➔ Local support by supplier technicians
  ➔ Quality - Safety
Steam system description

- 2 x 8000 kg/h steam with operating pressure 20.5 bar
- 2nd boiler operated by “cascade control” due to steam system needs
- Feed water tank with deaerator for boiler water supply and pre-heating
- Steam accumulator for covering extremely high steam demand during short time
- Water softener (osmosis) and chemical dosing station for boiler feed water preparation
- Several steam pressure reducing stations for supply of different pressure needs of production area
- PLC- system for operation and remote maintenance
Solution – Continental: Steam boiler

2 x THSD-I 90/80 E - C (8000 kg/h) – 24.5 bar
Solution – Continental: Economiser unit
Solution – Continental: Switchboard
Solution – Continental: Switch board - touch panels

Electrical control panel mit Siemens PLC Simatic S7

Touch panel („HMI“) for general plant indication and operation

Touch panel („HMI“) for simple boiler indication and operation
Feedwater tank + Purge tank
Steam distributors

Observe good condensate collection and drain!
Plant pictures
Plant pictures
Plant pictures

Hoval
Plant pictures
Plant pictures
Steam boiler explosion force

(blasting agent)

Sprengstoff
Semitex (kg)

500
400
300
200
100

30 bar  20 bar  10 bar  5 bar

(blower pressure)

boiler water content (t)

10  20  30
Technically advanced heating and indoor climate solutions

Thank you for your attention.