



‘Turn waste heat into profit’



Paul van Dillen
Director Global sales & Marketing
Heatmatrix

www.heatmatrixgroup.com

Payback
1,3 years

- Annual savings**
- 300.000 m3 gas
 - 600 ton CO2
 - 9 TJ

- Other benefits**
- **Reliable operation in acidic and/or fouling environments**
 - **Applicable with biogas and other corrosive gas streams**

HeatMatrix polymer LUVO heat-exchanger

Carlsberg’s brewery in Kiev, is front runner in the Carlsberg group with respect to energy savings and reducing carbon dioxide emissions. In Q2 2015 a polymer heat exchanger of HeatMatrix has been installed by an Ukrainian installation company at the brewery. Since then it has been operated 24/7.

The polymer heat-exchanger preheats cold combustion air using the waste heat from the corrosive flue gas after the economizer. The energy saving is approx. 325 kW at full load and has increased the boiler efficiency with 3,5% resulting in a CO₂ emission reduction of 600,000 kg/year.

The HeatMatrix polymer LUVO heat-exchanger is, because of its material, very well capable to deal with corrosive flue gas which is formed when burning biogas. The installation in Kiev, is the first within the Carlsberg Group and has already drawn the attention from many other companies in the region.

Project in 2015
Carlsberg – Kiev, Ukraine
Boiler co-fired with 10-15% biogas
Duty ~325 kW; flow ~16,000 kg/hr;
LUVO with 19 bundles;
boiler efficiency increase of ~ 3,5%





BEST PRACTICES FACTSHEET

STEAM UP

Acid Dew Point Corrosion

Sulphur containing fuel is converted during combustion into acidic flue gas, because of the formation of sulphur dioxide and trioxide. The sulphur trioxide condenses in the presence of water vapour as sulphuric acid at a certain dew point temperature ('acid dew point'). At this dew point a first small amount of highly concentrated sulphuric acid precipitates on the heat exchanger surface followed by rapid corrosion, fouling and break down of metal heat exchangers.

When flue gas temperature is further reduced beyond the acid dew point the concentration of sulphuric acid is reduced as well as its corrosiveness. It is important to note that the local flue gas temperature at the wall of the heat exchanger is lower compared to the bulk temperature. This local temperature at the flue gas side is leading for cold spot corrosion problems.

Technology

The core of any HeatMatrix exchanger is a rigid matrix of connected polymer tubes. The thin walled tubes are supported over the full length by supporting ribs in order to provide strength and rigidity to the tube bundle. The connected tubes also provide a counter current flow pattern, which has the highest efficiency for heat transfer. The HeatMatrix exchanger can be scaled to any desired size due to the modular structure of the matrix.

The unique advantages of the HeatMatrix exchanger are:

- Corrosion resistant
- Easy to clean and maintain
- Robust
- Lightweight
- Compact
- Counter current

