

Reactor heating, Germany

3 reactors on steam recirculation since 2000

A large chemical company in Germany heats three double-jacketed polymer reactors through U-tube heat exchangers on 66 bar steam. Jetomat® steam ejectors recirculate the steam left at the exchanger outlet, so the reactors run at full capacity with an even temperature.

3

double-jacketed reactors
one Jetomat per exchanger

66 bar a

saturated motive steam
heating the U-tube exchangers

100 %

reactor capacity
for faster production

2000

in service since
running without problems

01 The plant and the duty

PLANT	A large chemical company, Germany: high-pressure plastics production
REACTORS	Three double-jacketed polymer reactors, each heated through a U-tube heat exchanger
MOTIVE	Saturated steam at 66 bar a
EQUIPMENT	Controllable steam ejector Jetomat® (Baelz 590, DN 50, PN 160) with a pneumatic actuator, one per reactor exchanger

02 Before

High-pressure plastics production needs reactors that heat evenly and fast. Low-pressure steam is left at each exchanger's outlet; vented or throttled, it is wasted, and a low steam velocity in the tubes gives an uneven temperature.

03 What changed

- The 66 bar steam is the motive steam of the Jetomat.
- The Jetomat sucks the remaining low-pressure steam from the exchanger outlet and returns it to the exchanger, mixed with the motive steam: a recirculation loop.
- The actuator moves the nozzle spindle, so the steam flow follows the reactor's heating demand.

04 Results

- Much higher steam mass flow through the tubes, for a more uniform temperature and stable heat transfer.
- The reactors run at 100 % capacity, for faster production.
- No heat lost from the remaining low-pressure steam.
- In service since 2000 and running without problems.

05 Why it works

A steam ejector turns the pressure of the motive steam into suction: it draws in the low-pressure steam and recompresses the mixture in the diffuser. In a recirculation loop this raises the flow through the heat exchanger without a circulation pump.

Where a reactor or an exchanger needs an even temperature at high load, a Jetomat recirculation loop raises the steam flow through the heating surface and uses the steam left at the outlet, on one variable nozzle.