

Unistat® 510w

Cooling a 25-litre DDPS reactor to T_{min}

Requirement

This case study examines the minimum temperature that a Unistat 510w can take the process temperature contained in a 25-litre vacuum-insulated glass reactor.

Method

The DDPS reactor was connected to the Unistat 510w using two 1.5 m insulated metal hoses. The reactor was filled with 18.75 litre of "M90.055.03", a silicon based Huber supplied HTF.

Results

The initial ramp rate is very rapid but as the cooling begins to asymptote at around $-25\text{ }^{\circ}\text{C}$ (jacket temperature) the ramp rate begins to slow.

The final temperature is $-49\text{ }^{\circ}\text{C}$ in the jacket and approximately $-47\text{ }^{\circ}\text{C}$ in the process.

Setup details

Unistat® 510w & DDPS reactor

Temperature range: $-50\text{...}250\text{ }^{\circ}\text{C}$
 Cooling power: $5.3\text{ kW @ }250\text{...}0\text{ }^{\circ}\text{C}$
 $2.8\text{ kW @ }-20\text{ }^{\circ}\text{C}$
 $0.9\text{ kW @ }-40\text{ }^{\circ}\text{C}$
 Heating power: 6.0 kW
 Hoses: $2 \times 1.5\text{ m; M38} \times 1.5$
 (#6656)
 HTF: DW-Therm (#6479)
 Reactor: DDPS 25-litre vacuum insulated glass reactor
 Reactor content: $18.75\text{ litre M90.055.03}$
 (#6259)
 Stirrer speed: 80 rpm
 Control: process

