

Petite Fleur

Petite Fleur cycling a 5-litres glass vacuum insulated reactor

Requirement

This Case Study demonstrates the minimum achievable process temperature and the control capabilities over the process temperature when a Petite Fleur is connected with an Asahi 5-liter vacuum insulated reactor.

Method

The 5-litres Asahi glass vacuum insulated reactor was connected to Petite Fleur using 1-meter metal insulated hoses. The thermofluid used in the system was "DW-Therm". Process control was carried out via a Pt100 sensor located in the process mass. Stirrer speed was set to 130 rpm.

Setup details

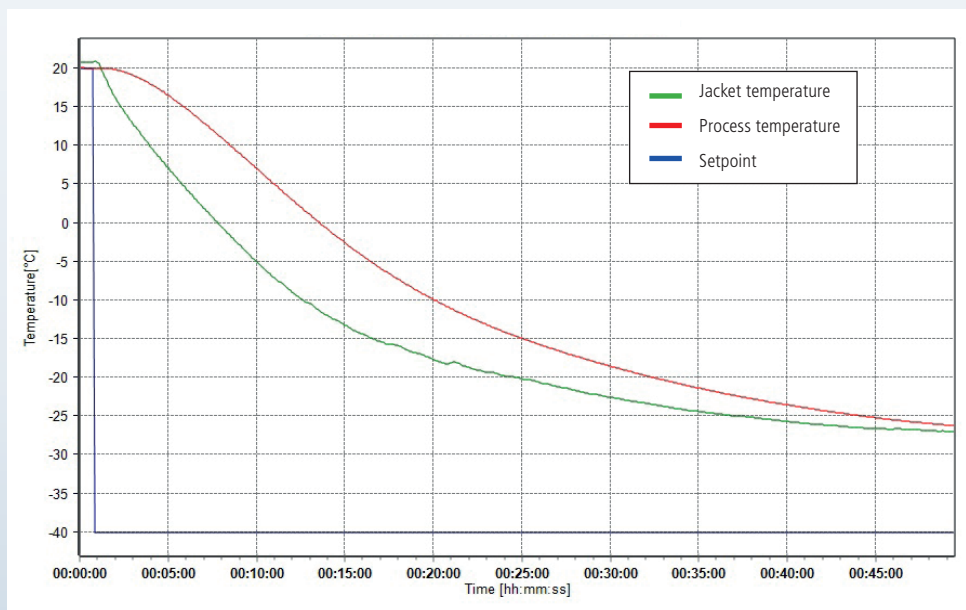
- Temperature range: -40°C...+200°C
- Cooling power: 0.48 kW @ +20°C
0.45 kW @ 0°C
0.27 kW @ -20°C
- Heating power: 1.5 kW
- Hoses: 2*1 m metal insulated
- HTF: DW-Therm
- Reactor: Asahi 5-litres glass vacuum insulated
- Reactor content: M60.115/200.05
- Stirrer speed: 130 rpm
- Control: process
- Amb. temperature: +25°C



Results

1. Lowest achievable temperature (Tmin):

As the graphic shows, a process temperature of -26.3°C was reached.



2. Performance:

The table and graphic data show the speed, accuracy and stability of the Petite Fleur as each new set point is reached and maintained.

Start T	End T	Approximate time	Av. Ramp Rate	Fastest Ramp Rate
+20°C	-20°C	60 minutes	0.7 K/min	(+10°C to 0°C) 0.7 K/min
-20°C	+100°C	41 minutes	2.9 K/min	(+30°C to +60°C) 4.3 K/min
+100°C	+20°C	57 minutes	1.4 K/min	(+60°C to +30°C) 1.4 K/min

