Grande Fleur

Grande Fleur cycling a 10-litres glass jacketed reactor

Requirement
This Case Study demonstrates the minimum achievable process temperature and the process temperature control capabilities of the Unistat Grande Fleur when it is connected to an Asahi 10-litre vacuum insulated reactor.

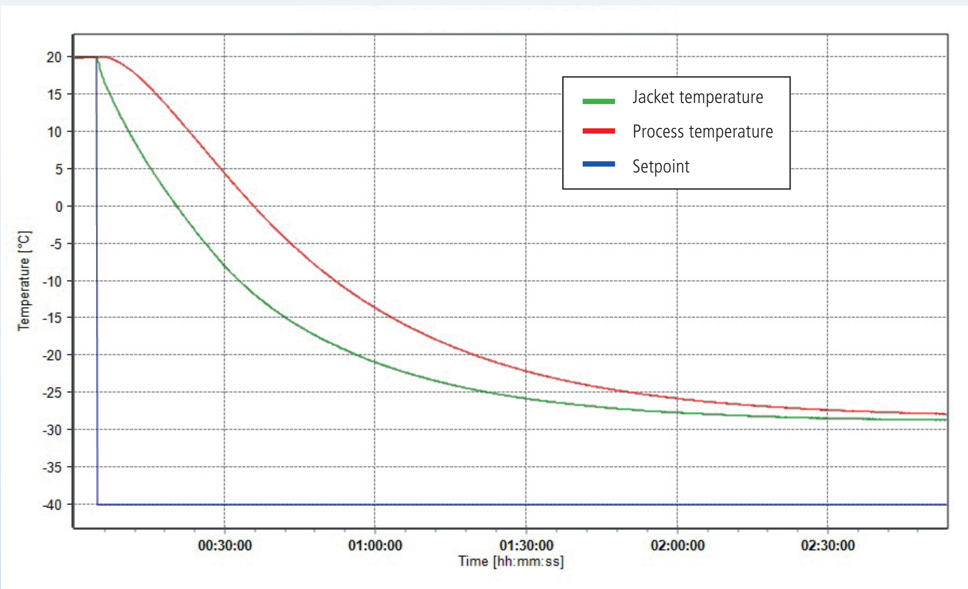
Method
The 10-litres vacuum insulated reactor was connected to Grande Fleur using 1.5-meter M24 metal insulated hoses. The thermofluid used in the system was "DW-Therm". Process control was carried out via a Pt100 sensor located in the process mass. Stirrer speed was set to 100 rpm.

Setup details

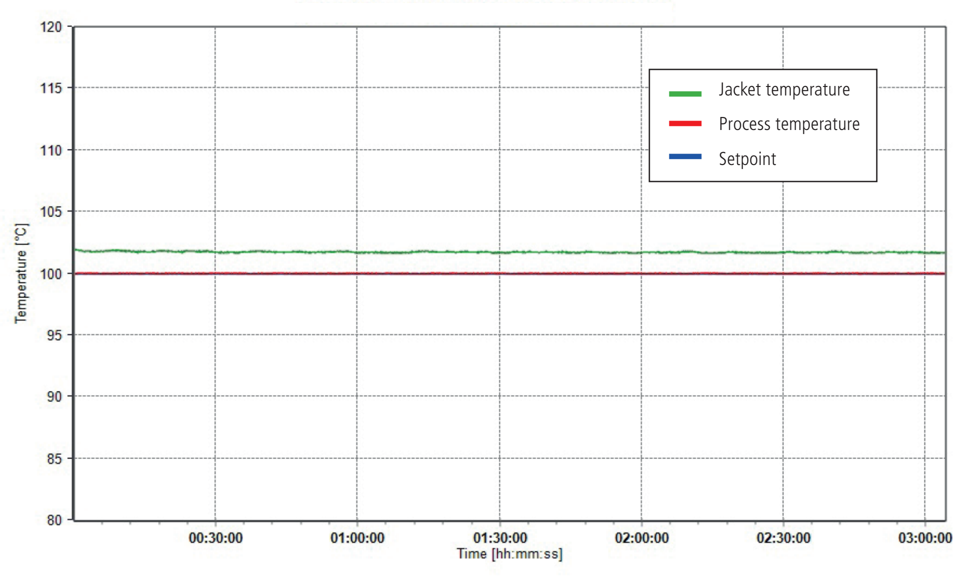
Temperature range:	-40°C...+200°C
Cooling power:	0.6 kW @ +20°C 0.6 kW @ 0°C 0.35 kW @ -20°C
Heating power:	1.5 kW
Hoses:	2*1.5 m metal insulated
HTF:	DW-Therm
Reactor:	Asahi 10-litres glass jacketed
Reactor content:	7 l DW-Therm
Stirrer speed:	100 rpm
Control:	process
Amb. temperature:	+25°C

Results

1. Lowest achievable temperature (Tmin):
The graphic shows that a minimum achievable process temperature was -27.8°C.

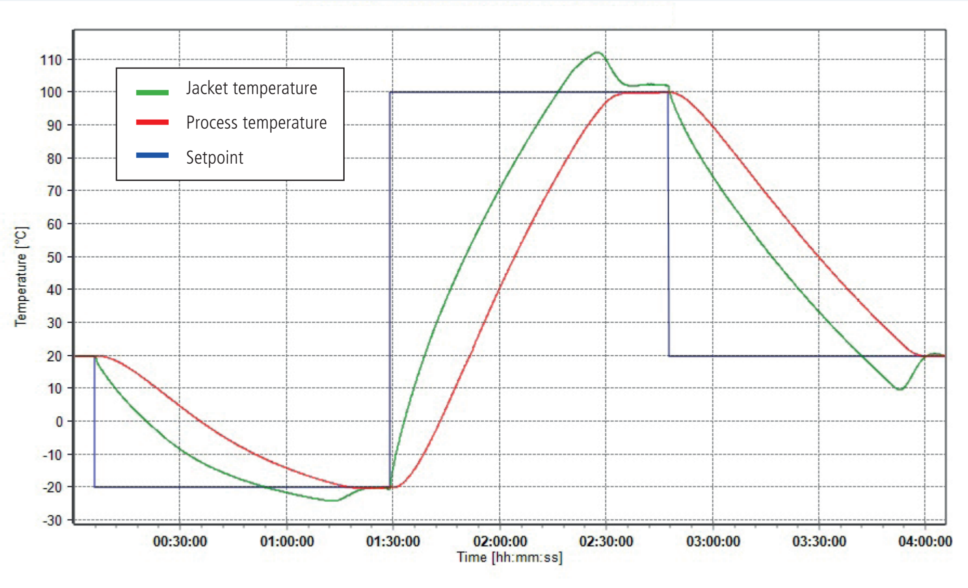


2. Stability:
The graphic shows the jacket temperature continually adjusting to keep the process temperature constantly at +100°C.



3. Performance:
The table and graphic data show the speed, accuracy and stability of the Grande Fleur as each new set point is reached.

Start T	End T	Approximate time	Av. Ramp Rate	Fastest Ramp Rate
+20°C	-20°C	73 minutes	0.55 K/min	(+10°C to 0°C) 0.7 K/min
-20°C	+100°C	67 minutes	1.8 K/min	(+30°C to +60°C) 2.3 K/min
+100°C	+20°C	71 minutes	1.1 K/min	(+60°C to +30°C) 1.1 K/min



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