



## Petite Fleur

**Petite Fleur cycling a 10 liters glass vacuum insulated reactor**

### Requirement

This Case Study demonstrates the control capabilities over the process temperature when a Petite Fleur is connected with an Asahi 10 liters vacuum insulated reactor over the temperature range of +20°C to -20°C to +100°C and back to +20°C.

### Method

The 10 liters 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 150 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 10 liters glass vacuum insulated  
 Reactor content: DW-Therm  
 Stirrer speed: 150 rpm  
 Control: process  
 Amb. temperature: +23°C

## Results

### 1. Performance:

The graphic shows the speed, accuracy and stability as the Petite Fleur reaches and maintains each new set-point.

Start T	End T	Approximate Time	Av. Ramp Rate	Fastest Ramp Rate
+20°C	-20°C	131 minutes	0.3 K/min	(+10°C to 0°C) 0.5 K/min
-20°C	+100°C	76 minutes	1.6 K/min	(+30°C to +60°C) 2.1 K/min
+100°C	+20°C	79 minutes	1 K/min	(+60°C to +30°C) 1 K/min

