



Setup details

Unistat® 830 & Buchi Glas Uster reactor

- Temperature range: -85...200 °C
- Cooling power: 3.5 kW @ -20...-40 °C
2.2 kW @ -60 °C
0.7 kW @ -80 °C
- Heating power: 3 kW
- Hoses: 2x1.5 m; M30x1.5 (#6386)
- HTF: DW-Therm (#6479)
- Reactor: 20-litre un-insulated jacketed metal pressure reactor
- Reactor contents: 15 litre M90.055.03 (#6259)
- Reactor stirrer speed: 400 rpm
- Control: internal

Unistat® 830

Cooling a Buchi Glas Uster 20-litre metal reactor to T_{min}

Requirement

This case study looks at the performance of a Unistat 830 cooling a 20-litre metal reactor to T_{min} under "internal" (jacket) control.

Method

The Unistat and reactor are connected using two 1.5-metre insulated metal hoses. The reactor is filled with 15 litre of "M90.055.03", a Huber supplied silicon based HTF.

Results

The initial ramp rate from 20 °C to -40 °C (60 K) over approximately 12 minutes (a ramp rate of 5 K/min.) is almost linear before the cooling power begins to asymptote and the ramp rate slows. After 2 hours the "internal" (jacket) temperature reaches -80 °C with a corresponding process temperature of -67 °C. Both temperatures continue to trend lower but with a slowing ramp rate.

