ABB were asked to examine a low temperature refrigeration system on this client’s site, which is essential in the production of some key products. Just when extra production was required the refrigeration system performance suddenly deteriorated. The cooling capacity of the refrigeration system was severely restricted but the cause was elusive.

The resulting limit on production was costing the company several tens of thousands of pounds each week and consideration was being given to purchasing an additional refrigeration unit.

“The refrigeration systems are now working very well indeed”

Keith Austin, Plant Engineer, Rhodia

Solution

The refrigeration system was complex, involving two independent refrigeration packages and a large secondary refrigerant distribution system supplying several users.

ABB initially focussed on the process and mechanical issues and, following some plant trials, managed to pinpoint several problems in the refrigeration system, these included both mechanical faults and heat exchanger fouling. ABB were able to provide specialist technical assistance in chemical cleaning of some heat exchangers which had immediate benefits in terms of plant capacity.

ABB also provided the detailed engineering specification of mechanical modifications that would prevent heat exchanger fouling in the future. These changes were implemented successfully a few weeks after the initial study.

In a final phase of improvement ABB specified an up-rated heat exchanger that dramatically increased the capacity of the refrigeration system. This was installed during a planned window in production.
ABB have considerable expertise in design and operation of bespoke industrial refrigeration systems and broad specialist expertise necessary for diagnosing and correcting mechanical and process faults.

**Benefits**
- Improving the operation of the refrigeration systems gave power savings of around £48,000 per year
- The improvements made have removed a significant production bottleneck allowing increased production rate and plant flexibility
- The enhancements to the refrigeration system have resulted in dramatically reduced maintenance shutdowns, less frequent and smaller compressor oil additions and have effectively eliminated heat exchanger fouling
- The enhanced cooling achieved with the revamped systems has allowed shorter reactant addition time in a key batch reaction. The faster addition has increased reaction yield and that directly improves site profit
- Using ABB expertise enabled the client to continue to focus on core production activities. ABB’s experts were able to quickly identify the root cause of the performance problems and implement improvements to bring about an initial increase in performance