



User Requirement Specification

For – New Cooling Water Chiller

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Document Control

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1 Executive Summary

1.1 Scope & background

This document specifies the requirement for new Chiller Water system for Polymermedics Ltd.

2 Description of Requirements

Polymermedics Ltd require a replacement chilled water system for use at its St Austell facility. The chiller should comprise of a Free Air-Cooling unit system and refrigerant chiller that can fully accommodate the requirements set out below. The system should have new process pumps that are inverter/VSD controlled to reduce energy costs and a new 4000lt nominal capacity weir tank. An offline filtration system should be offered for review at time of quote. The new system should replace the existing free air/chiller units feeding mould shop 1 and also a smaller 125Kw chiller feeding mould shop 2. It should also have the required capacity and design to have the addition of a 3rd mould shop that is in planning phase now.

The entire system should fit onto a footprint no larger than 5m x 11m.

The refrigerant should have a very low GWP such as R1234ze for ultra-low environmental impact and high energy efficiency.

All Electrics of the equipment shall operate on 230/240 volt 50 Hz single phase or 415-volt 3 phase electrical supply and air pressure requirements of less than 8.5 bar.

The supplier will provide full details of required service connections for power and water connections. The supplier will install and commission the equipment as specified by Polymermedics Ltd.

2.1 Functional Requirements

To provide a chilled water which is capable of running the equipment and tooling that are present within the Polymermedics facility at present and the planned future growth of the business. This equipment must enable consistent control of the process water temp of +/- 1 degree. The set temperature of the chiller will be 17.5 degrees. This has been found to be the optimal temperature for our manufacturing environment.

The following calculations have been provided to enable correct specification of the chiller requirements.

2.1.1 Material Throughput.

The allowance for material throughput has been defined as 7 Kg/Hr per machine, or 294 Kg/Hr, which equates to a cooling requirement of 52kW.

2.1.2 Tooling Hot Runner Cooling Requirements.

The allowance for hot runners has been defined as an average of 24 zones (12kW installed power) for all 42 machines, this gives a cooling requirement of 302kW.

2.1.3 Hydraulic Cooling.

The allowance for hydraulic cooling has been defined as, the estimated total installed power of the hydraulic motors is 1,268kW. Taking 50% of installed power (in accordance with PMMDA guidelines), this requires 634kW.

By using these figures we have a requirement of 988Kw of cooling capacity.

2.1.4 Pipework.

As part of this installation the pipework should be optimised to allow chilled water from this system to be fed to mould shop 2 and the as yet built mould shop 3. (See appendix A)

3 Specification.

3.1 Machine Requirements.

The following items must be included as part of the standard machine specification.

- The chiller must not exceed 5m x 3m in size due to space restriction of installation site. (see Appendix B)
- New inverter/VSD process pumps for energy reduction.
- The refrigerant used must be ultra-low GWP, to reduce environmental impact and energy costs.
- New baffled weir tank.
- Freeze protection with onboard independent glycol system for the chiller.
- Where possible the equipment must have energy efficiency at its core to reduce running costs.
- The cooling fins must be copper, or coated with a resin in order to protect them from the aggressive environment they will be installed in. (facility within 2 miles of sea)
- The chiller must interface to a central computer system for production monitoring and control, so an OPC or Euromap 15 or 63 connection is needed.
- The language on the Chiller labels must be in English.
- All external pipework must be lagged where appropriate.
- The Chiller must be commissioned with calibration certificates
- The delivered Chiller must be fully documented, including all components.
- Documentation must be written in English and the following documentation is required.
 - - Operation manual
 - - Safety instructions
 - - Operator instructions
 - - Instructions for settings and adjustments
 - - Description of fault situations and alarms as well as correcting of malfunctions
 - - Instruction for service and maintenance
 - - General mechanical drawings
 - - Pneumatic schematics
 - - Electrical schematics
 - - List of errors/alarms and a description with reference to involved components and I/O.
 - - Configuration diagram of the complete control system
 - - Software identification (version)
 - - Back-up of software SRAM (electronic)
 - - List of recommended spare parts and expectations to consumption of wearing parts and service inspections for the first three years.
 - - All system components, wires, etc. must be tagged with a "TAG no."
 - - The tag no. on the system must be in compliance with the tag no. in the documentation.
 - - The system must be equipped with a CE-UK mark.

3.2 Additional Requirements.

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The following items must be included as additional requirements.

- The supplier must quote for full installation with fully detailed project plan agreed with Polymermedics prior to commencing
- Existing chiller to be decommissioned and moved to a site agreed by Polymermedics. Polymermedics to arrange disposal.
- Supply and installation of suitable temporary chiller to enable continuous site operations during install of the new chilled water equipment if required.
- Transparent additional ongoing service costs to support any extended warranty, e.g. 3 – 5 years.

4 Mode of Use.

The Chilled water system will be used in the St Austell facility. However, the equipment must be able to be relocated should the need occur.

5 Acceptance Criteria.

The following points must be adhered to as acceptance criteria.

- Initial acceptance will be made once a design has been agreed upon.
- A visit to the supplying company may be required to ensure all requirements of the specification and requirements have been met. This will be in the form of an F.A.T.
- Final acceptance will be following successful installation and commissioning on Polymermedics premises in St Austell. This final sign off will be based on the ability to replicate the test criteria during the S.A.T and the ability of the machine to pass all validation requirements.

Within 3 weeks of placement of an order a meeting will be held with the supplier to agree the following:

- Overall timeframe for the project
- Confirmation of outstanding issues
- Final programme and logistics issues

6 Compliance / Safety.

The chiller system must have all appropriate guarding fixed and moving to comply with all legislations. All equipment must be CE-UK marked.

7 Support.

We would like full support from the supplier in the implementation of this equipment to ensure that they are installed, commissioned, validated and running production in the shortest time possible. It would be expected that any issues arising would be dealt with in an efficient and professional manner.

8 Timescales.

Once the official purchase order is placed an official project plan must be drawn up with agreement from both the supplier and Polymermedics Ltd. This plan must be adhered to and any variation in timescales must be agreed by both parties.

9 Approvals

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