



Oregon Energy Efficiency Specialty Code

Mechanical Compliance Certificate

Plant Cooling: Water Chiller



Developed with
COMcheck Software
Version 3.8.0

Department of Consumer and Business Services Building Codes Division

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SECTION 1: PROJECT INFORMATION

Project type: New construction Addition Alteration *(check only one)*

Project title:

Construction site

Address:		City:		State:	OR	ZIP:	
Permit number:				Permit date:			

Owner/agent

First and last name:							
Company:							
Address:		City:		State:		ZIP:	
Phone number:				E-mail:			

Designer/contractor

First and last name:							
Company:							
Address:		City:		State:		ZIP:	
Phone number:				E-mail:			



SECTION 2: GENERAL INFORMATION

Building type:

Floor area square foot.:

Plant type

Water chiller	Quantity	Capacity tons	Proposed efficiency	Minimum efficiency	Units	Chiller type
Air-cooled					EER	Centrifugal (standard)
					EER	Centrifugal (non-standard)
					EER	Rotary screw or scroll
					EER	Reciprocating
					COP	Single effect absorption
					COP	Double effect absorption indirect-fired
					COP	Double effect absorption direct-fired

Water-cooled					kW/ton	Centrifugal (standard)
					kW/ton	Centrifugal (non-standard)
					kW/ton	Rotary screw or scroll
					kW/ton	Reciprocating
					COP	Single effect absorption
					COP	Double effect absorption indirect-fired
					COP	Double effect absorption direct-fired

Heat rejection equipment type (water cooled only)	Proposed	Performance required
Air-cooled condenser		>176 kBtu/h*hp
Centrifugal fan open-circuit cooling tower		>20.0 gpm/hp
Centrifugal fan closed-circuit cooling tower		>7.0 gpm/hp
Low profile centrifugal fan open-circuit cooling tower		>30.0 gpm/hp
Propeller or axial fan open-circuit cooling tower		>38.2 gpm/hp
Propeller or axial fan closed-circuit cooling tower		>14.0 gpm/hp

See Table 503.2.3(6) and 503.2.3(8)

SECTION 3: REQUIREMENTS CHECKLIST

Requirements specific to: Plant 4

- [503.2.3]** Equipment meets minimum efficiency.
- [503.4.1]** Supply air economizers are provided on each cooling system and are capable of providing 100 percent outdoor air, even if additional mechanical cooling is required to meet the cooling load of the building.

Exceptions:

- Systems utilizing water economizers that are capable of cooling supply air by direct or indirect evaporation or both and providing 100 percent of the expected system cooling load at outside air temperatures of 50 degrees F dry bulb/45 degrees F wet bulb and below*
- Cooling equipment less than 54,000 Btu/hour total cooling capacity. The total capacity of all such units without economizers shall not exceed 240,000 Btu/hour per building area serviced by one utility meter or service, or 10 percent of its total installed cooling capacity, whichever is greater.*
- Ground-coupled heat pumps with cooling capacity of 54,000 Btu/hour or less*
- Systems where internal/external zone heat recovery is used*
- Systems used to cool any dedicated computer server room, electronic equipment room, or telecom switch room having a water economizer system capable of cooling air by direct and/or indirect evaporation and providing 100 percent of the expected systems cooling load at outside air temperatures of 45 degrees F dry bulb and 40 degrees F web bulb and below*
- Systems using condenser heat recovery, up to the cooling capacity used to provide condenser heat recovery*

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.4.3] Hydronic systems controls.** The heating of fluids that have been previously mechanically cooled and the cooling of fluids that have been previously mechanically heated are limited in accordance with Sections 503.4.3.1 through 503.4.3.3.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.4.3.1] Three-pipe system.** Hydronic systems that use a common return system for both hot water and chilled water are not installed.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.4.3.2] Two-pipe changeover system.** Systems that use a common distribution system to supply both heated and chilled water are designed to allow a dead band between changeover from one mode to the other; are provided with controls that will allow operation in one mode for at least four hours before changing over to the other mode; and are provided with controls that allow heating and cooling supply temperatures at the changeover point.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- ❑ **[503.4.3.5] Pump isolation.** Chilled water plants including more than one chiller have the capability to reduce flow automatically through the chiller plant when a chiller is shut down. Boiler plants including more than one boiler have the capability to reduce flow automatically through the boiler plant when a boiler is shut down.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- ❑ **[503.4.3.6] Heating and cooling water pump control.** Water circulation systems serving heating coil(s) or cooling coil(s) have controls that lock out pump operation when there is no demand. The pumps will shut off based on the outside air lock out temperatures.

Exceptions:

- *Industrial process and humidity control process*
- *Pumps serving water side economizer functions, systems*

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- ❑ **[503.4.3.7] Tower flow turndown.** Open cooling towers configured with multiple condenser water pumps are designed so that all cells can be run in parallel with a turndown flow as described in section requirement.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- ❑ **[503.4.5.4] Heat recovery for reheat and service water heating.** Where the total installed heat rejection capacity of water-cooled chillers exceeds 6,000 kBtu/hour and the combined design reheat, dual duct heating, and service water heating load exceeds 1,000 kBtu/hour, condenser heat recovery is installed, reheat and dual duct coils are hydronic, and required heat recovery is properly sized. Additional details apply.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

Generic requirements:

Must be met by all systems to which the requirement is applicable:

- ❑ **[503.2.3] HVAC equipment performance requirements.** Reported efficiencies have been tested and rated in accordance with the applicable test procedure. The efficiency has been verified through certification under an approved certification program or, if no certification program exists, the equipment efficiency ratings are supported by data furnished by the manufacturer.

- ❑ **[503.2.4.2] Set point overlap restriction.** Where used to control both heating and cooling, zone thermostatic controls provide a temperature range or deadband of at least 5 degrees F (2.8 degrees C) within which the supply of heating and cooling energy to the zone is capable of being shut off or reduced to a minimum.

Exception:

- *Thermostats requiring manual change over between heating and cooling modes*

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.2.4.3] Optimum start controls.** Each HVAC system has controls that vary the start-up time of the system to just meet the temperature set point at time of occupancy.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.2.4.4] Off-hour controls.** Each zone is provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.

Exceptions:

- Zones that will be operated continuously*
- Zones with a full HVAC load demand not exceeding 6,800 Btu/hour (2 kW) and having a readily accessible manual shutoff switch*

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.2.8] Piping insulation.** All pipes serving space-conditioning systems (hot water piping for heat systems, chilled water, refrigerant, and brine piping systems, and steam piping) are insulated as specified by this section.

Exception:

- Pipe insulation is not required for runout piping no exceeding four feet in length and one inch in diameter between the control valve and HVAC coil*

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.2.9.3] Manuals.** The construction documents require that the mechanical contractor give an operating and maintenance manual to the building owner. See long description for specifications.

Location in plans/specs where compliance can be identified (enter NA if not applicable): _____

- [503.2.12] Hot gas bypass limitation.** For cooling systems ≤ 240 kBtu/hour, maximum hot gas bypass capacity is no more than 50 percent total cooling capacity.

SECTION 4: COMPLIANCE STATEMENT

Compliance statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the Oregon Energy Efficiency Specialty Code requirements in COMcheck Version 3.8.0 and to comply with the mandatory requirements in the requirements checklist.

Name – Title

Signature

Date

Project notes:

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