Table 1. Average Maximum Water Main Temperatures[a]

State	City	Temp. F
Ala.	Birmingham	84
	Mobile	73
Ariz.	Phoenix	81
	Tucson	80
Calif.	Anaheim	60
	Berkeley	69
	Fresno	72
	Fullerton	75
	Glendale	68
	Los Angeles	75
	Oakland	69
	Ontario	70
	Pasadena	82
	Pomona	75
	Riverside	78
	Sacramento	72
	San Bernardino	65
	San Diego	82
	San Francisco	62
	Whittier	75
Colo.	Denver	75
Conn.	Bridgeport	66
	Hartford	73
	New Haven	76
	Waterbury	72
D. C.	Washington	84
Del.	Wilmington	83
Fla.	Jacksonville	80
	Miami	80
	Tampa	77
Ga.	Atlanta	87
	Macon	80
Ill.	Chicago	76
	Cicero	76
	Evanston	73
	Peoria	67
	Rockford	59
	Springfield	82
Ind.	Evansville	86
	Gary	75
	Indianapolis	80
	South Bend	61
	Terre Haute	82
Iowa	Cedar Rapids	78
	Des Moines	77
	Sioux City	62
Kans.	Concordia	57
	Kansas City	86
	Topeka	88
	Wichita	72
Ky.	Louisville	85
La.	Baton Rouge	85
	New Orleans	85
Me.	Augusta	60
Md.	Baltimore	75
Mass.	Boston	80
	Cambridge	70
	Fall River	76

State	City	Temp. F
Mass.	Lowell	50
	Lynn	68
	New Bedford	70
	Salem	68
	Worcester	76
Mich.	Detroit	77
	Flint	70
	Grand Rapids	84
	Highland Park	77
	Jackson	56
	Kalamazoo	53
	Lansing	64
	Saginaw	82
Minn.	Duluth	55
	Minneapolis	80
	St. Paul	77
Mo.	Jefferson City	82
	Kansas City	84
	St. Joseph	84
	St. Louis	85
	Springfield	70
Nebr.	Lincoln	63
	Omaha	87
Nev.	Reno	61
N. H.	Manchester	76
N. J.	Jersey City	63
	Newark	74
	Paterson	78
	Trenton	79
N. Y.	Albany	68
	Buffalo	75
	Jamaica	56
	Mt. Vernon	74
	New Rochelle	75
	New York	72
	Rochester	70
	Schenectady	60
	Syracuse	74
	Utica	69
	Yonkers	70
N. C.	Asheville	74
	Charlotte	85
	Winston-Salem	82
N. M.	Albuquerque	65
Ohio	Akron	76
	Canton	50
	Cincinnati	84
	Cleveland	74
	Columbus	82
	Dayton	60
	Lakewood	82
	Springfield	72
	Toledo	83
Okla.	Oklahoma City	82
	Tulsa	85
Ore.	Eugene	60
	Portland	64

[a]These averages taken from various city water main locations, with some actual values slightly higher and some lower than values shown.

Table 1. Average Maximum Water Main Temperatures[a] (Concluded)

State	City	Temp. F
Pa.	Altoona	74
	Erie	75
	Johnstown	74
	McKeesport	82
	Philadelphia	83
	Pittsburgh	81
R. I.	Providence	68
S. C.	Charleston	80
	Greenville	81
	Spartanburg	78
S. Dak.	Rapid City	55
Tenn.	Chattanooga	84
	Knoxville	89
	Memphis	70
	Nashville	90
Texas	Amarillo	65
	Austin	90
	Beaumont	86
	Dallas	86
	Fort Worth	84
	Galveston	90
	Houston	84
	Port Arthur	83
	San Antonio	76
	Wichita Falls	85
Utah	Logan	44
	Salt Lake City	60

State	City	Temp. F
Va.	Fredericksburg	75
	Lynchburg	73
	Norfolk	80
Wash.	Olympia	58
	Seattle	62
	Spokane	51
	Tacoma	57
W. Va.	Charleston	85
	Huntington	78
	Wheeling	78
Wis.	LaCrosse	54
	Madison	58
	Milwaukee	70
	Racine	68
Province		
Alta.	Calgary	64
B. C.	Vancouver	60
Ont.	London	50
	Toronto	63
P. E. I.	Charlottetown	48
Que.	Montreal	78
	Quebec	68

[a]These averages taken from various city water main locations, with some actual values slightly higher and some lower than values shown.

ordinarily by first transferring the heat of the gas to water in a heat exchanger, from which water it may then be dissipated in a number of ways. If the plant is situated on the banks of a river or lake, an intake may be taken up-stream or at a considerable distance from the discharge, to prevent mixing of the heated discharged water with the inlet water. If the source of cooling water is a city supply or a well, the discharge water may be run into the nearest sewer or open waterway. Lacking an unlimited water supply, or in cases where purchased water is too expensive or where the water available contains dissolved salts which would form scale on the heat-exchanging apparatus, it is necessary to recirculate the water, and to cool it after each passage through the heat-exchanger by exposure to air in an atmospheric water cooling apparatus.

Air has a capacity for absorbing heat from water when the wet-bulb temperature of the air is lower than the temperature of the water with which it is in contact. The rapidity with which this transfer of heat occurs depends upon (1) the area of water in contact with the air, (2) the relative velocity of the air and water, and (3) the difference between the wet-bulb temperature of the air and the temperature of the water. The rate of heat dissipation is influenced further by many small factors[2] prevailing upon these primary ones, and complicating the design. Selection of equipment for any specified service must ultimately rest in over-all economic considerations established from reliable performance data.

[2]Cooling Tower Performance Studies, by L. M. K. Boelter (A.S.H.V.E. Transactions, Vol. 45, 1939, p. 615).