

## **ARTICLE 62-04 WATER CONDITIONING CODE**

Chapter	
62-04-01	Definitions
62-04-02	General Provisions
62-04-03	Materials
62-04-04	Joints and Connections
62-04-05	Hangers and Supports
62-04-06	Indirect Waste Piping and Special Waste
62-04-07	Water Supply and Distribution
62-04-08	Water Softener Units
62-04-09	Inspections

### **CHAPTER 62-04-01 DEFINITIONS**

Section	
62-04-01-01	Definitions

#### **62-04-01-01. Definitions.**

For the purpose of this article, the following terms shall have the meaning indicated in this section. No attempt is made to define ordinary words which are used in accordance with their established dictionary meaning except where it is necessary to define their meaning as used in this article to avoid misunderstanding.

1. "Absorption" means the physical, electrostatic, surface attraction of an absorbent for molecules of a gas, liquid, dissolved or suspended substance.
2. "Accessible" means having access thereto but which first may require the removal of an access panel, door, or similar obstruction. "Readily accessible" means direct access without the necessity of removing or moving any panel, door, or similar obstruction.
3. "Acid neutralizer" means neutralizer.
4. "Acidity" means the presence of compounds that release hydrogen in solution.
5. "Administrative authority" means the individual official, board, department, or agency established and authorized by a state, county, city or other political subdivision created by law to administer and enforce the provisions of the water conditioning code as adopted or amended.
6. "Air break (drainage system)" means a piping arrangement in which a drain from a fixture, appliance, or device discharges indirectly into a fixture, receptacle, or interceptor at a point below the flood level rim of the receptacle so installed as to prevent backflow or siphonage.
7. "Airgap (drainage system)" means the unobstructed vertical distance through the free atmosphere between the outlet of waste pipe and the flood level rim of the receptacle into which it is discharging.
8. "Airgap (water distribution system)" means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flood level rim of the receptacle.
9. "Alkalinity" means the presence of bicarbonates, carbonates, or hydroxides in water.

10. "Anchors" means supports.
11. "Approved" means accepted or acceptable under an applicable standard stated or cited in this article, or accepted as suitable for the proposed use under procedures and powers of the administrative authority.
12. "Backflow" means the flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than its intended source. Backsiphonage is one type of backflow.
13. "Backflow connection" means any arrangement whereby backflow can occur.
14. "Backflow preventer" means a device or means to prevent backflow.
15. "Backsiphonage" means the flowing back of used, contaminated, or polluted water from a plumbing fixture or vessel or other sources into a potable water supply pipe due to a negative pressure in such pipe.
16. "Backwash filter" means any filter requiring reverse flow for maintenance.
17. "Backwashing" means reversing the flow of water through a bed of ion exchanger or filter material.
18. "Brine" means a solution of sodium chloride (salt) used for regenerating water softeners.
19. "Bypass" means a connection or a valve system that allows raw water to be supplied while the water conditioner is being cleaned or media changed or serviced in any manner.
20. "Building" means a structure having walls and a roof designed and used for the housing, shelter, enclosure, or support of persons, animals, or property.
21. "Building classification" means the arrangements adopted by the administrative authority for the designation of buildings in classes according to occupancy.
22. "Calcium" is one of the principal elements making up the earth's crust, the compounds of which when dissolved in water make the water hard. The presence of calcium in water is a factor contributing to the formation of scale and insoluble soap curds which are means of clearly identifying hard water.
23. "Calcium carbonate equivalent" is commonly used for expressing all forms of hardness and other salts in the same terms.
24. "Capacity" is expressed in total gallons (liters) of water treated meeting the specifications and produced in a defined period of time.
25. "Cartridge" means any removable preformed or prepackaged component, containing the filter media.
26. "Cartridge filter" means a filter using a cartridge or cartridges.
27. "Cation exchange", in water softening, is principally the exchange of calcium and magnesium ions in water for sodium ions on an insoluble ion exchange material. Ferrous iron and other metals such as manganese and aluminum are sometimes present in small quantities. These metals are also exchanged, but they may precipitate and foul the exchanger bed.
28. "Clear water waste" means cooling water and condensate drainage from refrigeration, and air-conditioning equipment; cooled condensate from steam heating systems; cooled boiler blowdown water; water softeners; wastewater drainage from equipment rooms and other

areas where water is used without an appreciable addition of oil, gasoline, solvent, acid, etc., and treated effluent in which impurities have been reduced below a minimum concentration considered harmful.

29. "Code" means this article, subsequent amendments thereto, or any emergency rule or regulation which the administrative authority having jurisdiction may lawfully adopt.
30. "Color throw" means the imparting of color by any part of a water softener to the effluent during any state of the operating cycle.
31. "Compensated hardness" means water with a total hardness of over four hundred milligrams per liter as calcium carbonate and over one hundred milligrams per liter of sodium as calcium carbonates.
32. "Corrosion" means the attack by water on any part of a water system, causing the wasting away of metal parts. This would include the most noticeable effects of corrosion, which are: leakage, flow stoppage, valve failure, etc.
33. "Cross connection" means any connection or arrangement between two otherwise separate piping systems, one of which contains potable water and the other either water of unknown or questionable safety or steam, gas, or chemical whereby there may be a flow from one system to the other, the direction of flow depending on the pressure differential between the two systems. (See backflow and backsiphonage.)
34. "Cubic feet" means the volumetric unit used for measuring ion exchange materials. Volume is measured on an in-place, backwashed, drained, and settled condition.
35. "Deionization" means the removal of all ionized minerals from the water in a two step ion exchange process.
36. "Demineralization" means essentially the same as deionization.
37. "Developed length" means the length of a pipe line measured along the center line of the pipe and fittings.
38. "Disinfection" means the process of destroying harmful micro-organisms, done in accordance with section 62-03-10-09.
39. "Distillation" means a process of removing solids from water by converting the water to vapor (by heating), and condensing the water (by cooling), and collecting the condensate.
40. "Distributors" means devices to distribute or collect the water.
41. "Drain" means any pipe which carries wastewater or water-borne wastes in a building drainage system.
42. "Drain line" means a line used to carry backwash water, spent regenerant, and rinse water to the waste system.
43. "Drainage system" includes all the piping, within public or private premises, which conveys sewage, rainwater, or other liquid wastes to a point of disposal. It does not include the mains of a public sewer system or private or public sewage-treatment or disposal plant.
44. "Dwelling unit" means one or more rooms with provision for living, sanitary, sleeping, cooking, and eating facilities arranged for the use of one family or individual.

45. "Effective opening" means the minimum cross-sectional area at the point of water supply discharge, measured or expressed in terms of (a) diameter of a circle, or (b) if the opening is not circular, the diameter of a circle of equivalent cross-sectional area.
46. "Effluent" means the water or solution which emerges from a water conditioner during any phase of the operating cycle.
47. "Existing work" means a plumbing system or any part thereof installed prior to the effective date of this article.
48. "Filter" means a device installed as part of the water system through which water flows for the removal of turbidity, taste, color, or odor.
49. "Filter area" means the effective cross-sectional area applicable to the surface type filter media only, usually expressed in square feet.
50. "Filter medium (filter media)" means medium.
51. "Fixture supply" means the water supply pipe connecting a fixture to a branch water supply pipe or directly to a main water supply pipe.
52. "Fixture unit (drainage - d.f.u.)" means a measure of the probable discharge into the drainage system by various types of plumbing fixtures. The drainage fixture-unit value for a particular fixture depends on its volume rate of drainage discharge, on the time duration of a single drainage operation, and on the average time between successive operations.
53. "Fixture unit (supply - s.f.u.)" means a measure of the probable hydraulic demand on the water supply by various types of plumbing fixtures. The supply fixture-unit value for a particular fixture depends on its volume rate of supply, on the time duration of a single supply operation, and on the average time between successive operations.
54. "Floc" means a flocculent mass formed by the aggregation of a number of fine suspended particles.
55. "Flood level rim" means the edge of the receptacle from which water overflows.
56. "Flooded" means the condition which results when the liquid in a container or receptacle rises to the flood-level rim.
57. "Flow pressure" means the pressure in the water supply pipe near the faucet or water outlet while the faucet or water outlet is wide-open and flowing.
58. "Flow rate" means the quantity of water or regenerant flowing, measured in gallons per minute.
59. "Galvanic corrosion" means when dissimilar metals are in contact with each other and with a solution which can carry electricity, a galvanic cell is established, which generates a flow of electricity, and as a result, one of the metals is gradually consumed.
60. "Grade" means the fall (slope) of a line of pipe in reference to a horizontal plane. In drainage it is usually expressed as the fall in a fraction of an inch per foot length of pipe.
61. "Grains per gallon" means a common basis of reporting water analysis in the United States and Canada. One grain per United States gallon equals seventeen and one-tenth milligrams per liter or seventeen and one-tenth parts per million. One grain per Imperial gallon equals fourteen and three-tenths milligrams per liter or fourteen and three-tenths parts per million. One grain is one seven-thousandths pounds or six hundred forty-seven ten-thousandths.

62. "Ground water" means subsurface water occupying the zone of saturation. Confined ground water is a body of ground water overlain by material sufficiently impervious to sever free hydraulic connection with overlying ground water. Free ground water is ground water in the zone of saturation extending down to the first impervious barrier.
63. "Hangers" means supports.
64. "Hardness" means dissolved calcium and magnesium salts in water. Compounds of these two elements are responsible for most scaling in pipes and water heaters, and cause numerous problems in laundry, kitchen, and bath. Hardness is usually expressed in grains per gallon as calcium carbonate equivalent.
65. "Hardness leakage" means calcium and magnesium present in water after passing through a water softener.
66. "Hard water" means treated water containing calcium and magnesium salts in concentration of one grain per gallon [17.1 milligrams per liter] or more (as calcium carbonate equivalent).
67. "Horizontal pipe" means any pipe or fitting which makes an angle of less than forty-five degrees with the horizontal.
68. "Hydrogen sulfide" means an inflammable, poisonous gas that is found in some water supplies and which makes water smell like rotten eggs.
69. "Indirect waste pipe" means a waste pipe which does not connect directly with the drainage system, but which discharges into the drainage system through an air break or airgap into a trap, fixture, receptor, or interceptor.
70. "Individual water supply" means a supply other than an approved public water supply which serves one or more families.
71. "Insanitary" means contrary to sanitary principles - injurious to health.
72. "Installation" means the piping or valving by which water conditioners are connected into the water supply system, including a drain line.
73. "Installed" means altered, changed, or a new installation.
74. "Ion exchange" means a process whereby ions in solution are interchanged by a reactive material (see ion exchanger).
75. "Ion exchanger" means an insoluble reactive material capable of interchanging ions combined with the material for ions in the solution.
76. "Iron" is an element often present in ground waters in a soluble form (such as ferrous bicarbonate) in quantities usually ranging from zero to ten parts per million. It is sometimes present in larger amounts. Iron may exist in surface waters due to natural causes or pollution. Iron in solution is susceptible to oxidation, precipitating as reddish-brown floc when contacted by air (causing staining and discoloration). Iron can be removed by aeration or chlorination followed by filtration. Iron in solution can be removed by ion exchange. Oxidizing filters such as manganese treated zeolite are used for removing large amounts of iron from water supplies.
77. "Liquid waste" means the discharge from any fixture, appliance, area, or appurtenance, which does not contain human or animal waste matter.
78. "Magnesium" is one of the elements making up the earth's crust, the compounds of which when dissolved in water make the water hard. The presence of magnesium in water is a factor

contributing to the formation of scale, and insoluble soap curds which are means of clearly identifying hard water.

79. "Main" means the principal pipe artery to which branches may be connected.
80. "Manganese greensand" means a processed, natural alumino silicate, converted to the oxidized manganese form. This is a granular material, generally used for the removal of iron or sulfides, in oxidizing filters.
81. "Manganese zeolite" means a processed natural, or synthetic alumino silicate, converted to the oxidized manganese form (see manganese greensand).
82. "May" is a permissive term.
83. "Media" is the plural of medium.
84. "Medium" means the active material in a filter.
85. "Micron" means a linear measure of size; one-thousandth of a millimeter; denoted by the Greek letter symbol  $\mu$ . The micron is used in filtration work to define particle size, in which case it refers to the diameter, or the largest dimension of the particle. It is also used to measure the size of pores, openings, or wire mesh.
86. "Milligrams per liter" is a common basis of reporting water analysis in the United States and Canada. One milligram per liter equals one pound per million pounds of water; seventeen and one-tenth milligrams per liter equals one grain per United States gallon.
87. "Neutralizer - (neutralizing filter)" means a filter type, mainly used to neutralize acidity or reduce free carbon dioxide in water.
88. "Nonpotable water" means water not safe for drinking or for personal or culinary use.
89. "Nuisance" means public nuisance at common law or in equity jurisprudence; whatever is dangerous to human life or detrimental to health; whatever building, structure, or premise is not sufficiently ventilated, sewered, drained, cleaned, or lighted, in reference to its intended or actual use; and whatever renders the air or human food or drink or water supply unwholesome.
90. "Operating pressure" means the pressure range within which the equipment properly functions.
91. "Pathogenic organisms" means organisms that are capable of producing disease.
92. "Person" means a natural person, the natural person's heirs, executors, administrators or assigns, and includes a firm, partnership or corporation, its or their successors or assigns. Singular includes plural and male includes female.
93. "Ph value" means a number denoting alkalinity or acidity. Numbers below seven indicate acidity, which increases as the number becomes smaller. Numbers above seven indicate alkalinity, which increases as the number becomes larger. The Ph scale runs from zero to fourteen, seven being the neutral point.
94. "Pitch" means grade.
95. "Plumbing appliance" Any one of a special class of plumbing fixtures which is intended to perform a special plumbing function. Its operation or control may be dependent upon one or more energized components, such as motors, controls, heating elements, or pressure or temperature-sensing elements. Such fixtures may operate automatically through one or more

of the following actions: a time cycle, a temperature range, a pressure range, a measured volume or weight; or the fixture may be manually adjusted or controlled by the user or operator.

96. "Plumbing appurtenance" means a manufactured device, or a prefabricated assembly, or an on-the-job assembly of component parts, and which is an adjunct to the basic piping system and plumbing fixtures. An appurtenance demands no additional water supply, nor does it add any discharge load to a fixture or the drainage system. It is presumed that it performs some useful function in the operations, maintenance, servicing, economy, or safety of the plumbing system.
97. "Plumbing inspector" means administrative authority.
98. "Plumbing system" includes the water supply, water-treating or water-using equipment, and distribution pipes, plumbing fixtures and traps; soil, waste, and vent pipes, sanitary and storm drains and building sewers, including their respective connections, devices, and appurtenances to an approved point of disposal.
99. "Pollution" means the addition of sewage, industrial wastes, or other harmful or objectionable material to water. Sources of sewage pollution may be privies, septic tanks, subsurface irrigation fields, seepage pits, sink drains, barnyard wastes, etc.
100. "Portable exchange tank" means a softener or filter unit which is owned by a dealer and supplied on an exchange basis to a customer.
101. "Potable water" means water free from impurities present in amounts sufficient to cause disease or harmful physiological effects and conforming in its bacteriological and chemical quality to the requirements of the public health service drinking water standards or the regulations of the public health authority having jurisdiction.
102. "Precoat" means the application of a loose filter medium to a supporting membrane.
103. "Pressure drop or pressure loss" means a differential in pressure during flow due to frictional resistance in the system. It may be expressed in pounds per square inch or feet of head (of water).
104. "Private or private use" applies, in the classification of plumbing fixtures, to fixtures in residences and apartments and similar installations.
105. "Public or public use" applies in the classification of plumbing fixtures, to every fixture not defined under private use and public includes all installations where a number of fixtures are installed and their use may be restricted or unrestricted.
106. "Public water main" means a water supply pipe for public use controlled by public authority.
107. "Rated service flow" means the manufacturer's specified maximum flow at which the conditioner will deliver water for a minimum period of ten minutes at a pressure drop not to exceed fifteen pounds per square inch [6.80 kilograms per 6.45 square centimeters].
108. "Rated softening capacity" is based on grains of hardness removed (as calcium carbonate) while producing soft water between successive regenerations and must be related to pounds of salt required for each regeneration.
109. "Raw water" means water at the inlet of the water treating unit.
110. "Receptor" means a fixture or device which receives the discharge from indirect waste pipes.

111. "Recharging cycle" means when a water softener becomes exhausted and is incapable of removing hardness, the bed must be "recharged" by passing a strong solution of salt through it.
112. "Regeneration" includes, in general, the backwash, brine, and fresh water rinse steps, necessary to prepare the exchanger bed for service after exhaustion. Specifically, the term may be applied to the "brine" step in which a sodium chloride solution is passed thru the exchanger bed. The sodium ions displace the hardness ions from the exchanger to permit the hardness to be rinsed to drain; also, includes the maintenance steps (not necessarily in this order) to backwash, precoating, or fresh water rinse or other treatment necessary to prepare or restore a conditioner for service.
113. "Resin" means a synthetic organic ion exchange material such as high capacity cation exchange resin widely used in water softeners.
114. "Rim" means an unobstructed open edge of a fixture.
115. "Rinse" means that part of the cycle of a water conditioner operation where water is introduced to remove spent backwash water or regenerant prior to placing the conditioner into service.
116. "Riser" means a water supply pipe which extends vertically one full story or more to convey water to branches or to a group of fixtures.
117. "Roughing-in" means the installation of all parts of the plumbing system which can be completed prior to the installation of fixtures. This includes drainage, water supply, and vent piping, and the necessary fixture supports, or any fixtures that are built into the structure.
118. "Rust" - see iron.
119. "Salt" means high purity sodium chloride of a granular, rock, or briquetted type used for regenerating a water softener.
120. "Scale" means a hard insoluble mineral deposit (usually of calcium and magnesium compounds).
121. "Service run" means that part of the operating cycle of a water conditioner in which the raw water supply is passed through a conditioner, thereby producing quality water.
122. "Shall" is a mandatory term.
123. "Shielded (insulated)" means the separation of metallic parts by a nonconductor.
124. "Slope" means grade.
125. "Soft water" means treated water containing less than one grain per gallon (17.1 milligrams per liter) dissolved calcium and magnesium salts (as calcium carbonate equivalent).
126. "Soil pipe" means a pipe which conveys sewage containing human or animal waste to the building drain or building sewer.
127. "Solution feeder" means a small pump or eductor unit used to feed a measured amount of chemical solution into a water supply to solve a water problem.
128. "Supports" means devices for supporting and securing pipe, fixtures, and equipment.
129. "Suspended matter" means all undissolved material in water.



- 130. "Turbidity" means any undissolved materials in water, such as finely divided particles of sand, clay, etc.
- 131. "Upflow" means the direction (up) in which water flows through the ion exchange bed during any phase of the operating cycle.
- 132. "Vacuum" means any pressure less than that exerted by the atmosphere.
- 133. "Vacuum breaker" means backflow preventer.
- 134. "Vacuum breaker, nonpressure type (atmospheric)" means a vacuum breaker which is not designed to be subject to static line pressure.
- 135. "Vacuum breaker, pressure type" means a vacuum breaker designed to operate under conditions of static line pressure.
- 136. "Vacuum relief valve" means a device to prevent excessive vacuum in a pressure vessel.
- 137. "Vertical pipe" means any pipe or fitting which makes an angle of forty-five degrees or less with the vertical.
- 138. "Waste" means liquid waste and industrial waste.
- 139. "Waste pipe" means a pipe which conveys only waste.
- 140. "Water conditioning" is any processing of water which renders it more satisfactory for use.
- 141. "Water distributing pipe" means a pipe within the building or on the premises which conveys water from the water service pipe to the point of usage.
- 142. "Water outlet" means a discharge opening through which water is supplied to a fixture, into the atmosphere (except into an open tank which is part of the water supply system), to a boiler or heating system, to any devices or equipment requiring water to operate but which are not part of the plumbing system.
- 143. "Water riser pipe" means riser.
- 144. "Water service pipe" means the pipe from the water main or other source of potable water supply to the water distributing system of the building served.
- 145. "Water softener" means a device installed as part of a water system which produces soft water by cation exchange removing calcium and magnesium (hardness from flowing water, replacing it with sodium, thereby requiring periodic regeneration with sodium chloride (salt).
- 146. "Water supply system" means the water service pipe, the water-distributing pipes, and the necessary connecting pipes, fittings, control valves, and all appurtenances in or adjacent to the building or premises.
- 147. "Zeolite" means a processed natural, or synthetic, alumino silicate. See also manganese greensand and manganese zeolite.

**General Authority:** NDCC 43-18.1-03

**Law Implemented:** NDCC 43-18.1-04