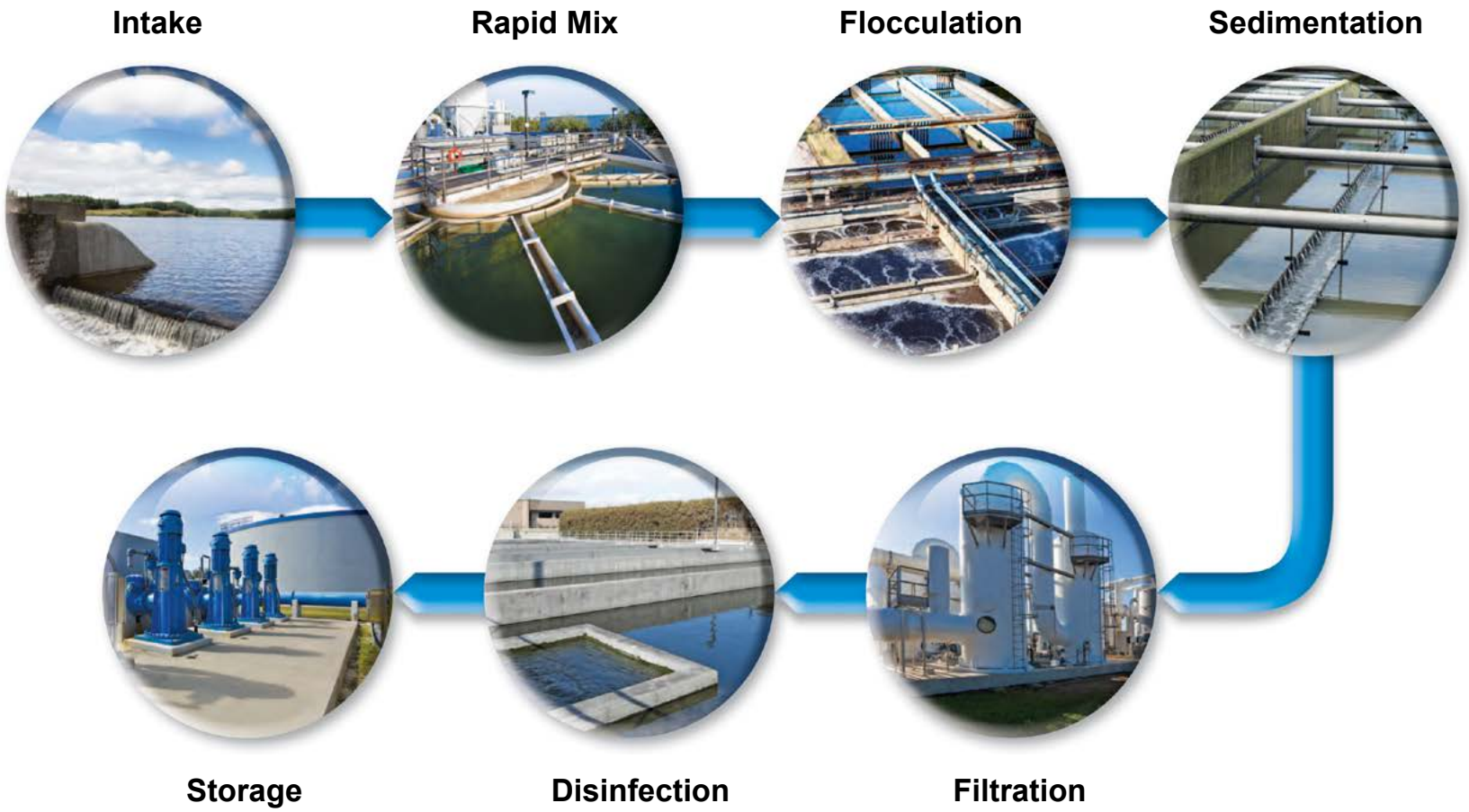
Water Treatment



Intake

Description

Water is essential to the survival of most living things, and assuring clean water is a top priority for more than 50,000 community water systems in the United States alone. This process begins with flowlines that take water from lakes, rivers and reservoirs and pump it to a treatment plant.

Bearing Applications

Housed bearing units are used in sluice gates and ball bearings in the pumps at pumping stations

Rapid Mix

Description

Water coming into the treatment plant goes through a coarse screen to keep out debris. Then coagulant (e.g. aluminum sulfate, iron chloride) is added to help solids agglomerate, or clump together. Air is pumped in to mix the coagulants at high speed.

Bearing Applications

Mixers typically use sleeve bearings, while fans and blowers feature housed bearing units (e.g. split-to-the-shaft). The pumps have ball bearings.

Items to Consider

Most submerged applications use sleeve bearings.

Flocculation

Description

The water is gently stirred in flocculators to help coagulated particles cling together to form larger particles, known as “floc.” This is done with paddles (20 on a shaft is not uncommon) in one of five arrangements: horizontal paddle wheel, vertical paddle wheel, walking beam, oscillating, or impeller.

Bearing Applications

Housed bearing units (e.g. split-to-the-shaft) connect paddle shafts in a series and provide vital support. These applications can require as many as 100 bearings. On vertical paddle wheels, where the bearings may be submerged, sleeve bearings are common.

Items to Consider

In some flocculators, such as the horizontal design, the bearings are submerged in the water and should use a lubricant that is moisture-repellant. Corrosion resistance is also important, especially as the use of ferric chloride as a flocculant becomes more common.

Sedimentation

Description

Water and floc are pumped to a sedimentation tank, where the floc settles on the bottom so it can be discharged and thickened and dried for disposal. Drag screens help separate the floc from the water, which exits through a sluiceway near the top of the tank.

Bearing Applications

The pumps use ball bearings, while the drag screens typically have chain-and- sprocket drives with sleeve bearings. The jack shaft, or support shaft, of a sludge collector has ball bearings or roller bearings.

Items to Consider

The drag screen drives are underwater, so their sleeve bearings are generally made of nylon or polyethylene.

Filtration

Description

Any particles remaining in the water are filtered out thorough filter beds of sand, gravel and/or activated charcoal.

Bearing Applications

The pumps that move the water into and out of the filtration stage use ball bearings.

Disinfection

Description

Small amounts of chlorine are added to kill any bacteria or microorganisms. If the water will be used for drinking, fluoride is added to fight tooth decay.

Bearing Applications

Ball bearings are used in the pumps at pumping stations.

Storage

Description

Purified water is pumped from the treatment plant to water towers or reservoirs, sometimes called clearwells, to be stored until needed. From there it enters the distribution system that takes it to local residences and business.

Bearing Applications

Ball bearings are used in the pumps at pumping stations.

Water Treatment Applications

	Ball Bearings	Roller Bearings	Sleeve Bearings	Housed Units
Intake	X			
Rapid Mix	X		X	X
Flocculation			X	X
Sedimentation	X	X	X	X
Filtration	X			
Disinfection	X			
Storage	X			