TECHNICAL SERVICE DEPARTMENT
Technical Service Bulletin
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Dissolved Gasses and Milky Water

Gasses such as oxygen, chlorine, carbon dioxide, hydrogen sulfide and others are soluble in water. In fact, water is made up of two gasses, Hydrogen and Oxygen (H_2O). The amount of gas that water can hold is decreased as the temperature of the water increases. For example, a pot of cold water is placed on a stove to boil. When the pot is first put on the stove, there are no bubbles. As the water is heated, bubbles form on the bottom and sides of the pot. This is the perfect example of gasses, naturally present in the water, being released as the temperature of the water increases.

Another point that is noteworthy is that hot water from a faucet may also expel these naturally occurring gasses. One of the more common occurrences is the phenomenon called ***milky water***. The hot water, when drawn into a clear glass, may appear discolored or chalky. Allow the glass to stand for a few minutes and the water becomes clear. By allowing the water to stand for several minutes, the small gas bubbles, that give the appearance of milky water, will dissipate and the condition will clear. Aerated faucets may help in reducing the likelihood of this happening.

In the plumbing field, we should also be aware of a couple of other effects of this gas release. As pressure inside a plumbing system increases, the waters ability to retain dissolved gasses increases. The higher the pressure, the more dissolved gasses in the water. Significant pressure drops may occur at the inner radius of elbows and fittings under high pressure. This rapid pressure drop may release gas bubbles. These gas bubbles have an abrasive effect on piping and are an important factor in corrosion-erosion.

The release of dissolved gas also creates air pockets and air locks in plumbing systems. The spurts of air or gas when opening a hot water faucet can be attributed to the release of dissolved gasses in the water. Other gases, such as hydrogen, can be a by-product of severe corrosion activity in a plumbing system.

Another phenomenon is the incident of smelly water. Smelling like rotten eggs, the gas is really hydrogen sulfide. It is at the point of pressure release, due to the increased water temperature, that noxious gases like hydrogen sulfide become noticeable. The sulfate reducing bacteria that form the hydrogen sulfide gas may have been absorbed by the ground water and are present in both the hot and cold water. However, due to the hotter water, such as in a water heater, the gasses are released and more noticeable when one is taking a shower.

The chart below shows the percentage of gasses that can be held in water as the temperature increases. Notice at freezing, 100% of the existing gasses in the water can be retained. You will see that as the temperature of the water increases, the ability of the water to retain the gasses will decrease.