

The Effect of Chlorine on FILTERSORB SP3

Technical Bulletin
Issue: MAX 2014

Introduction

Chlorine and chloramines are the primary disinfectants used in municipal water supplies throughout the World. In most potable waters, a 0.5 - 1.0 mg/L (ppm) free-chlorine residual is maintained throughout the water distribution network. In older municipalities, much higher chlorine residuals are often found closer to the point of discharge from the water treatment plant. At sufficiently high levels, chlorine compounds will attack the SP3 bead surface used in scale prevention and dramatically reduce the service life. The primary route of degradation of FILTERSORB SP3 as they age is by oxidation, which destabilizes the SP3 surface structure. This leads to increasing bead breakage, fines, and ultimately, higher pressure loss and channelling. This in turn reduces operating capacity and throughput.

Predicting SP3 Lifespan

It is difficult to predict the service life of FILTERSORB SP3. The presence of oxidants, such as chlorine or chloramines, the presence of iron, manganese, copper, lead etc. and exposure to foulants all influence the service life of FILTERSORB SP3. Copper reduces the service life by directly fouling the SP3 media surface, as well as by speeding the degradation (oxidation) reactions within the FILTERSORB SP3 bed.

Effect of Chlorine on FILTERSORB SP3

FILTERSORB SP3 is considered moderately resistant to oxidation by chlorine and can last up to 5 - 7 years when treating water with a free chlorine level up to 1.0 mg/L (ppm). However, a chlorine level above 1.0 mg/L (ppm) will cut the SP3 life in half. The effects of chloramines are not as drastic as chlorine. It is estimated the oxidative effect is only above half that of free chlorine.



Chlorine Removal

Depending on the circumstances, it may be cost effective to dechlorinate the water prior to entering a Scale Prevention unit. This can be accomplished by passing the water going into the FILTERSORB SP3 through a bed of activated carbon or by the introduction of chemicals, such as sodium sulfite or sodium bisulfite. Chemical addition has not been very effective in the removal of chloramines. One may want to consider chlorine removal ahead of a Scale Prevention system whenever the free chlorine residual routinely exceeds 1.0 mg/L (ppm).

SP3 Replacement

If one can mush the FILTERSORB SP3 between your fingers, the SP3 has been oxidized and the moisture content has increased.

SP3 that has been degraded by high chlorine levels will reduce both the Scale Prevention capacity and the flow rate. Degraded SP3 can also contribute contaminants to the effluent water, including volatile organics and a range of low- to high-molecular weight organics.

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