ARSENIC REMOVAL ENERGIZED BY LANXESS

Energizing Chemistry

Lewatit®

LEWATIT® FO 36 – POTABLE WATER SAFE TO DRINK

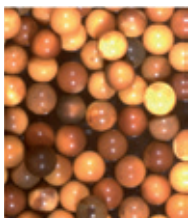
Adsorber for the removal of arsenic from potable water

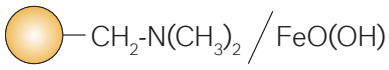
Lewatit® FO 36 is designed to reduce the arsenic contamination in potable water supplies, and to meet stringent requirements of regional legislation at the same time. More than 20 industrial filters are successfully operated worldwide with our even further improved Lewatit® FO 36.

Selectivity

In comparison to strongly basic anion exchange resins, Lewatit® FO 36 **(Figure 1)** selectively adsorbs arsenic as both, arsenate (AsV) as well as arsenite (AsIII). Other anions, such as chloride, sulfate, or nitrate, are not adsorbed and do not influence the uptake of arsenic. The capacity of Lewatit® FO 36 for arsenic is significantly higher than that of conventional anion exchange resins. Minor constituents, such as silicate, phosphate, vanadate, and antimonate, are co-adsorbed by Lewatit® FO 36. LANXESS recently developed the SESARIX technology for arsenic removal from highly silicate contaminated waters.

Figure 1: Chemical structure and appearance





Regeneration

Adsorbed arsenic can be removed from the exhausted adsorber by applying a specially developed regeneration method based on extraction with alkaline solutions in combination with sodium chloride. After conditioning with diluted acid, Lewatit® FO 36 is regenerated and ready for another loading cycle. More than 10 cycles are reliably implementable without any capacity loss.
Storage ability of arsenic loaded resin is proofed according to elution tests by EPA method 1311 TCLP.

Operating capacity

The arsenic uptake of Lewatit® FO 36 depends on the concentration of arsenic present in the solution. Under field conditions arsenic feed concentrations of 0.01mg/l up to 0.1mg/l are expected. The operating capacity under these conditions usually is in a range of 3 to 4 g/l of resin.

Figure 2 shows an example of breakthrough curves of improved Lewatit® FO 36 compared to ferric oxide market leader material under field conditions. After passage of about 38,000 bed volumes of feed, outlet concentrations approach 10 ppb and a gradual breakthrough of arsenic begins. The operating capacity at the breakthrough point is 3.8 g of adsorbed arsenic per liter of resin. Competitor material shows exhaustion after 22,000 bed volumes of feed and therefore 2.2 g/l arsenic capacity. These results

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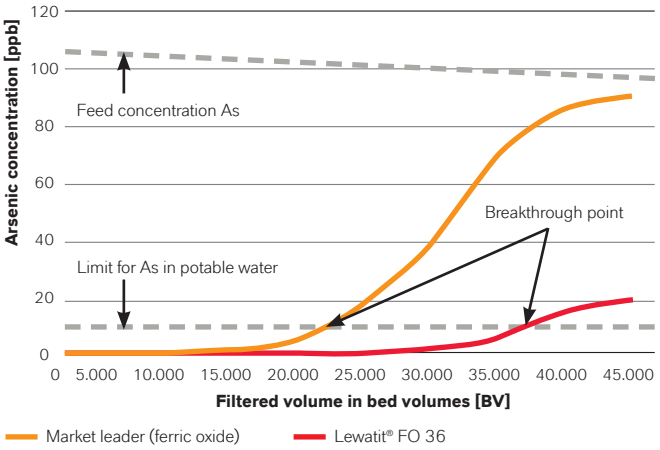
were obtained at LHSV 20 (bed vol/h). At lower LHSV and two filters in series in lead-lag operation, arsenic capacites of Lewatit® FO 36 can further increase up to 50 %.

Figure 2: Benchmark presenting breakthrough curve of improved Lewatit® FO 36 and granulated ferric oxide market leader



Specific velocity: 20 BV/h, feed concentration 100 µg/l arsenate V (AsV) in neutral tap water, 8 mg/l silica as SiO_2, 100 µg/l phosphorus, 150 mg/l bicarbonate, 70 mg/l chloride, 100 mg/l sulfate

Certifications

Lewatit® FO 36 is certified under NSF/ANSI Std 61 "Drinking Water System Components – Health Effects ".

It is tested and certified under BS 6920 by the british WRAS, "Water Regulations Advisory Scheme", and is in compliance with the European Resolution ResAP(2004)3. Total Organic Carbon (TOC) release is according to the AFNOR test T 90-601.

LANXESS staff collaborates with the EU committees in order to create norms for the application of ion exchange resins and to assure a registered and licensed application in potable water treatment.

Contact

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We are happy to support your business. Please contact us for additional information: visit www.lewatit.com

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0011P-EN | 06/2014