



## **ADI INTERNATIONAL INC. MEDIA G2® Technology Description**

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MEDIA G2® is an iron-based adsorption treatment technology for removing arsenic from water, specifically groundwater, for potable use. The technology involves adsorption of arsenic onto a filter media (MEDIA G2®) as water passes through it. MEDIA G2® adsorption media consists of granular, calcined diatomite upon which ferric hydroxide is chemically bonded. Iron attracts the arsenic in water and binds it to the substrate by chemisorption. Although it was developed specifically for adsorbing arsenic, MEDIA G2® will also adsorb iron, manganese, uranium and chromium. The adsorption capacity for arsenic is in the range of about 800 to 2400  $\mu\text{g/g}$ , depending on operating pH and other contaminants in the water.

Research, pilot tests, and full-scale operating history, have shown that MEDIA G2® systems work well in the pH range of 5.5 to 7.5 - the lower the pH the better for extending the life of the media; i.e., its adsorption capacity increases with decreasing pH. However, for most applications, it is desired to operate the system in the 6.5 to 7.0 pH range.

An arsenic removal system consists of one or more pressure vessels containing MEDIA G2® adsorption media, operated in a down-flow mode. Most systems are sized for 10 minutes EBCT (Empty Bed Contact Time). The media depth is about three feet (one metre), which results in a filtration rate of about 2.5 to 3.0  $\text{gpm/ft}^2$  (5 to 7  $\text{m/s}$ ) when the EBCT is 10 minutes. The vessels can be operated in series or in parallel. The hydraulic capacity of a system is determined by the size and number of vessels.

As the media becomes saturated with arsenic, the concentration in the treated water begins to increase. Before this concentration reaches the maximum allowable contaminant level (break through), the media is either replaced or regenerated in-situ. MEDIA G2® adsorption media can be regenerated 4 to 5 times, in-situ, in a process which takes only a few hours. The volume of waste produced in regeneration is typically less than 0.1% of the volume of treated water. The adsorption capacity of the media is reduced by 10% with each regeneration; therefore, after 4 - 5 regenerations, it is more economical and practical to replace the media. Of significance is the fact that the residuals generated from regeneration, as well as the spent media itself, are non-hazardous according to US EPA's TCLP and Canadian Reg 347.

## Physical Properties

Density: 47 lb/ft<sup>3</sup> (753 kg/m<sup>3</sup>)  
Hardness: 210 lb/in<sup>2</sup> (14.8 kg/cm<sup>2</sup>)  
Effective size: 0.32 mm  
Uniformity Coefficient: 1.8 - 2.0  
Fe percent by weight 5% to 30%

Bulk Relative Density: 1.073  
Bulk Relative Density (SSD): 1.618  
Apparent Relative Density: 2.359  
Adsorption, %: 51.1

## Other Properties & Features

Adsorbs both As III and As V  
Little interference from chlorides and sulfates up to 500 mg/L  
Maximum iron concentration in raw water - 2.0 mg/L  
Maximum manganese concentration in raw water - 0.8 mg/L

Certified to ANSI/NSF Standard 61

Performance verified by ETV Canada Inc.



MEDIA G2<sup>®</sup> is a registered Trade Mark of ADI International Inc. 1133 Regent Street, Suite 300, Fredericton, NB E3B 3Z2 Canada. Contact: Eric Winchester  
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US Patent No. 6,200,482, other related patents pending.