

Technology Brief

EVALUATION OF RECYCLED CRUSHED GLASS SAND MEDIA FOR HIGH-RATE SAND FILTRATION

This field test compared the performance of a recycled glass filtration medium with conventional sand in high-rate recirculating sand filters. Previous studies sponsored by the CWC have tested glass as a filtration medium in slow sand filtration for municipal water treatment, septic treatment sand filtration, and monitoring well filtration. Those studies demonstrated that, when properly processed, recycled glass is an effective filtration medium as a substitute for natural sand in many applications. This study extends the knowledge base of effective filtration uses of recycled glass.

Background

Previous lab studies at Pennsylvania State and San Jose State Universities have demonstrated that recycled glass appears to be an effective filtration medium as a substitute for natural sand in recirculating water filters.

The test at an athletic club swimming pool was designed to full-scale data on whether glass sand was able to attain or exceed the clarity achieved with conventional sand and to establish how the cleaning characteristics of glass sand media compared with sand in terms of frequency and water use. This project was also intended to provide the filtration industry with information for economic evaluations to be made regarding the market potential for recycled glass sand as a filtration medium.

Testing

The test was run from July 1997 to March 1998 at the Bally Total Fitness Center in Federal Way, Washington. Control data on turbidity, operating

Key Words

Materials: Recycled Glass.

Technologies: Performance testing of processed glass filtration medium.

Applications: Recirculating water filtration.

Market Goals: Increased use for post-industrial and post-consumer glass.

Abstract: Evaluation of post-industrial waste glass as a filtration medium.

pressures and backwash efficiency were developed by observing and testing the filters' operation through four complete filter runs with conventional silica sand media.

The conventional media was removed and replaced with *VitroClean*TM crushed glass sand media manufactured by TriVitro Corporation in Seattle, WA. Again, data was collected during repeated filter runs with the recycled glass media. This data was then compared to the control data for silica sand.

The glass used in this project was post-industrial plate glass scrap from window and door manufacturers. The glass is processed through a series of crushers, dryers, and screens to remove contaminants and to produce a range of uniformly sized filtration media.

Post-industrial glass was chosen for this test because it is completely free of the potential organic (sugars, labels, etc.) and inorganic (aluminum rings, steel



caps, etc.) contamination that can be present in post-consumer container glass. The potential for these types of contamination would introduce another variable in the analysis, and it was beyond the scope of this project to test methods for cleaning post-consumer glass.

An anomaly in filter pressure differentials was found during the data analysis phase. While it is unfortunate that the data on influent pressure and flow was inconsistent, other critical and positive information regarding improved water clarity and increased backwash efficiency remains unaffected.

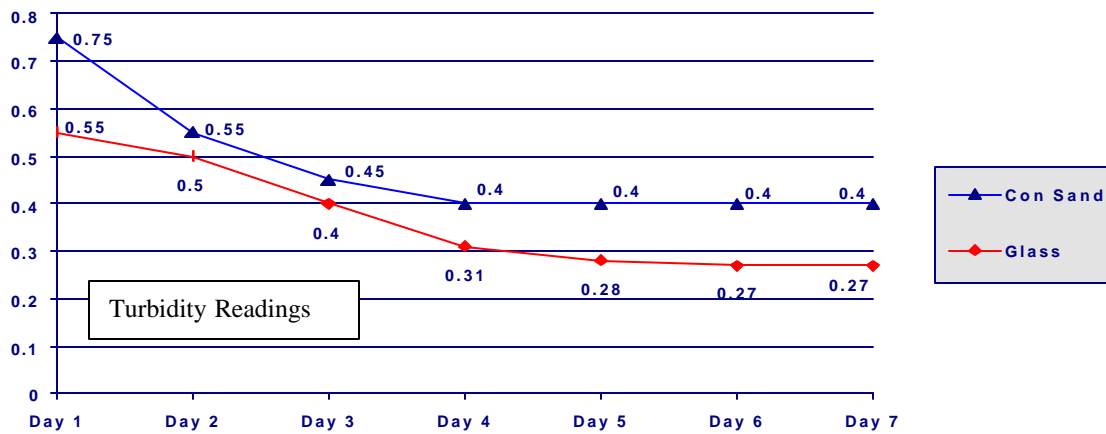
Results and Conclusions

The field evaluation revealed the following trends that illustrate the performance of recycled glass sand media compared to conventional sand media:

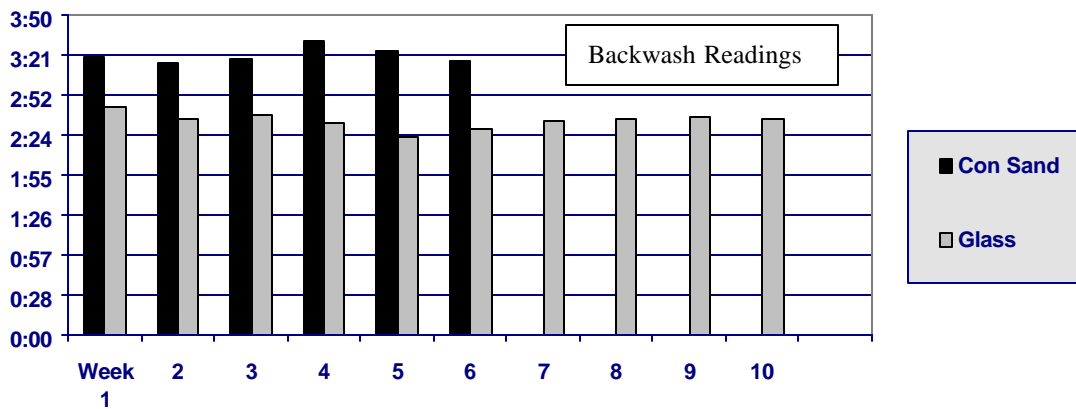
1. Improved water clarity shown by a 25% reduction in National Turbidity Unit readings
2. Increased backwash efficiency shown by a 23% reduction in backwashing time
3. Approximately 20% less glass sand (by weight) required for filtration

The charts below illustrate improvements in turbidity and backwash readings.

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Note: Conventional sand recorded for 6 weeks, Glass sand for 10



For More Information

For a copy of the report, *Evaluation of Recycled Crushed Glass Sand Media for High-Rate Sand Filtration (No. GL-98-1)*, call the CWC at (206) 443-7746, email info@cw.org, or visit the CWC Internet Website at www.cw.org.

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