

Greenhouse and Nursery Water Treatment Information System

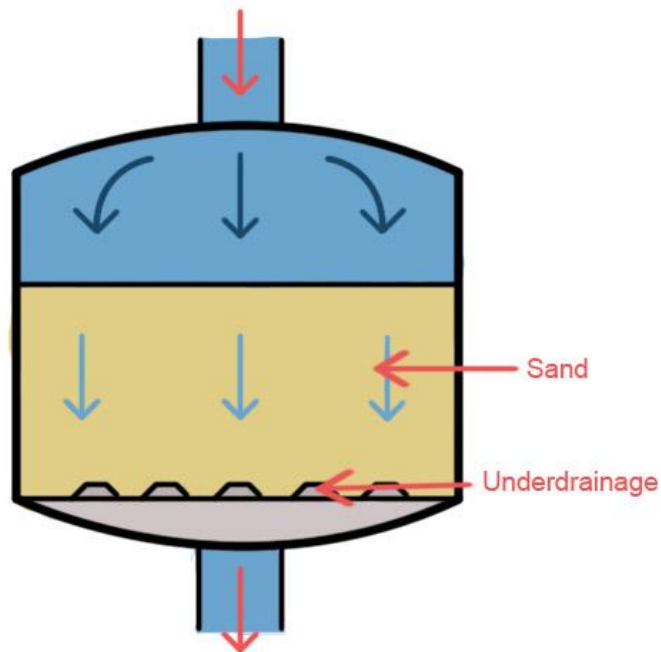
School of Environmental Sciences, University of Guelph



Rapid sand filtration

Approximate particle size filtered: >10 microns (1250 mesh)

Removes (in small amounts): Organic and inorganic debris, sand, silt, general soil particles, algae/biofilm



After a screen filter has removed larger debris, media filters such as rapid sand filtration are particularly effective for filtering out organic material such as algae and bacterial slimes, as well as fine sediments such as silt and clay (Bartok, 2009). In rapid sand filtration, water flows through a tank containing coarse sand and deposits material as it goes. Rapid sand filtration may be differentiated from [slow sand filtration](#) in that the sand used is larger than 1mm in diameter, compared to the much finer sand used in slow sand filtration. The smallest particle that can be filtered out by a particular rapid sand filter is determined by the particle size of the filter medium (Benham and Ross, 2009), as shown in the following table:

Material	Mean media diameter (mm)	Effective filter mesh size
Crushed granite	1.50-0.78	100-200
Crushed silica	0.66-0.34	140-400

Cleaning of the filter must occur when pressure drop across the filter reaches a pre-determined magnitude. Cleaning occurs via backflushing, in which the media is expanded by water shot through the bottom of the filter (Bartok, 2009). This loosens trapped particulate matter which subsequently flows out a drain.

These filters cannot handle a high flow rate. The media filter should not be subjected to a flow rate greater than 95 gpm per square foot of filter (Benham and Ross, 2009). Up to a point, filter surface area can be increased to allow for the filtration of greater water volumes. Generally, multiple (around 3) media filters are used to allow for cleaning of one at a time (Benham and Ross, 2009). It is often good practice to install a screen filter downstream of the media filter to prevent potential plugging of emitters by loose media.

REFERENCES

Bartok, J.W. 2009. Protecting your water system with a good filter. *University of Massachusetts Amherst*: Amherst, MA. <http://extension.umass.edu/floriculture/fact-sheets/protecting-your-water-system-good-filter>

Benham, B. and Ross, B. 2009. Filtration, Treatment, and Maintenance Considerations for Micro-Irrigation Systems. *Virginia State University*: Petersburg, VA.