

StormFilter® 330

First Flush Capability

It is widely accepted that over 90% of all pollutants present in stormwater are flushed from the surface of paved sites within the first 1/2 inch (13 mm) of rainfall.



In order to demonstrate how effective CULTEC's StormFilter 330 is and how to position the units on a site plan effectively, some operational and material facts need to be reviewed.

The design of StormFilter 330 is a basic baffle pass-thru system. Run-off water flows into the unit from a pipe downward into the chamber and has to pass through or over filters before it is discharged. A pass-thru filter is the most simple and most effective way to remove pollutants. The StormFilter 330 is designed primarily as a particulate filter. The standard separation is for particles over US 30 Std. Sieve (0.60 mm).

The filter area per baffle is 6.44 ft² (0.6 m²). The geotextile composed of polypropylene yarns, which are woven into a stable network is capable of accepting 115 gpm/ft² (4685 lpm/m²). Two filter baffles of this type are in each StormFilter 330 chamber.

Looking at the 1/2 inch (13 mm) of rainfall characterized as being the first flush, while incidences of the 1/2 inch (13 mm) falling at a start of a storm event in less than 30 minutes can occur is not common. One inch (25 mm) of rain in an hour is significant.

We use the 1/2 inch (13 mm) over 30 minutes to demonstrate the StormFilter 330's capacity under what would be accepted as above normal demand.

Data	1/2 inch = 0.042 ft. Flow Rate Value of Filter = 115 gpm/ft ² Filter area per filter = 6.44 ft ² One acre = 43560 ft ²	13 mm rainfall Flow Rate Value of Filter = 4685 lpm/m ² Filter area per filter = 0.6 m ² One acre = 4.05 decare
Calculations	At 6.44 ft ² per filter, the capacity per filter is: 6.44 ft ² x 115 gpm per ft ² = 740.6 gpm 740.6 gpm / 7.481 gal / ft ³ = 99 ft ³ / min. 99 ft ³ /min. / 60 sec/min = 1.65 cfs 1.65 cfs of rain / 0.042 ft ³ = 39.60 ft ² of area drained in a 1/2 inch rainfall if rain falls in one second total time. <u>For 30 minute duration:</u> 30 min. x 60 sec./min = 1800 seconds. Therefore, as rainfall over time decreases, total area serviced increases. 39.60 ft ² x 1800 sec. = 71278.17 ft ² serviced	The capacity per filter: 2800 lpm The area drained in 13 mm rainfall if rain falls in one second total time = 3.68 m ² 6622 m ² of serviced area
Conclusion	Since 71278.17 ft ² is greater than 43560 ft ² (by almost 64%) the CULTEC StormFilter 330 has the operational capability to service over one acre of impervious surface during a 1 inch per hour storm.	6.62 decare > 4.05 decare

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