

# Filter media sampling and analysis procedure

The following provides a procedure for filter media sample collection, preparation and analysis for surface bacteria enumeration. When any filter is inspected there must be a quantifiable measure of the condition of the filter media. Bacterial analysis is simple and gives a good measure of filter condition and is recommended as a standard procedure.

Bacterial per 1 gram of media	Filter condition guide	Action
<100	Excellent	None
100 to 500	Good	None
500 to 2000	Suspect	Check for problems, and fix
2000 to 10,000	Dangerous	Serious condition, public health issues, stop filter and fix
>10,000	Filter failure	Close the pool, and fix

## Equipment required.

1. Filter media sample collection spear to permit collection of samples at a depth of approximately 250mm below the top of the filter bed
2. Clean sample tubes or measuring spoon to allow a 5 g sample of media to be taken.

## Filter condition and sample collection

1. Back-flush the filter immediately prior to collection of the media sample.
2. Open the top of the filter
3. Collect a sample of filter media from the centre of the filter at a depth of 250mm and remove approximately 5g and place on a clean tray or plate. Drain as much of the chlorinated swimming pool water from the media as far as possible. Repeat the procedure for a sample at the edge of the filter and at the mid point between the edge and centre of the filter.
4. Take 3 x 100ml of sterile water bottles, add the 5g of filter media to each bottle and shake aggressively for 5 minutes to dislodge the bacteria.
5. Send the bottle to the laboratory for Total aerobic bacteria count at 22 deg C, or use a TTC dip slid.
6. Calculation = No. of bacteria per ml x 100/5 = bacteria per gram of filter media.

## Biomass analysis.

1. Take a sample of filter media from the filter before or after a back-wash, at the side, mid-point and centre of the filter.
2. Take a GF (Glass fibre filter paper), accurately weight the paper.
3. Place the filter media sample on the paper and leave to drain and dry at room temp ( 20 deg c) for 1 hour and weight the paper with media.
4. Place the filter paper with media in an oven at 110 deg C for 1 hour and then measure the weight
5. Increase the temperature of the oven to 500 deg C for 1 hour, allow the paper and media to cool down in a desicator for 1 hour and weight again.
6. Results will be as follows;
  - a. Room temp; Wet weight for media, which may include some excess water
  - b. 110 deg C; Dryden weight of media, organic matter will remain, but water from the bacteria and alginate will be lost
  - c. 500 degC, all water and organic matter will be burned off the media, all that will remain will be any dry inorganic residue and the filter media.



Fig 1. Large sample spear, smaller ones can be made for small filters