Four Steps to Successful Filtration

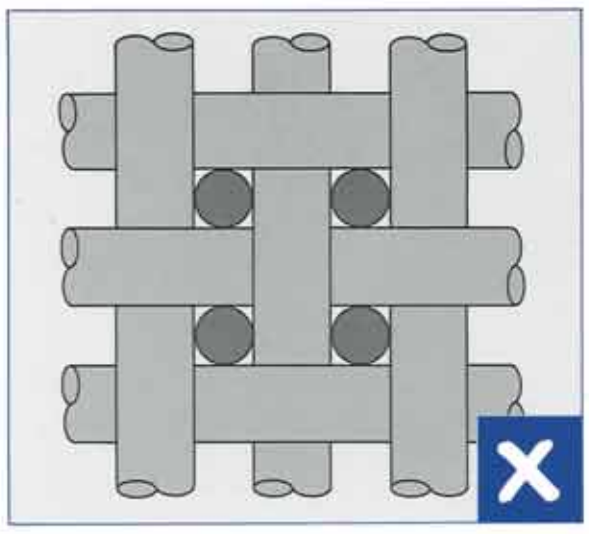
1 HIGH OPEN AREA (POROSITY)

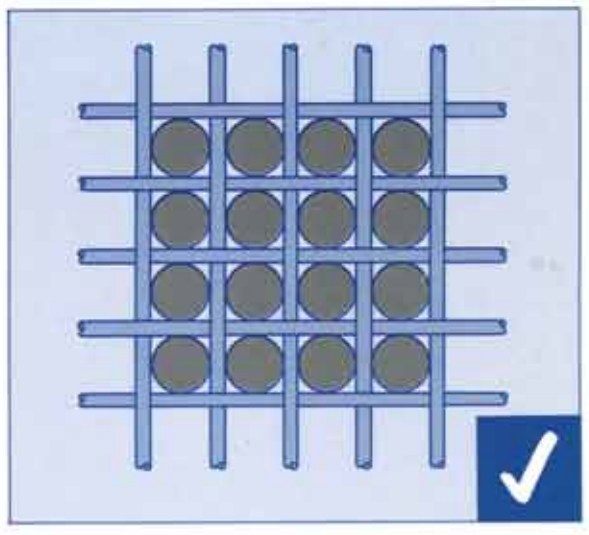
Filters with high open area give high flow-rate, low resistance to flow and good capacity for contaminants.

These factors mean longer life and lower filtration costs and an opportunity to use smaller-sized filters.

Open area is often expressed as 'Voidage' and is typically 70–80% for modern filter media.

$$\text{Voidage} = \frac{\text{Open volume} \times 100\%}{\text{Total media volume}}$$



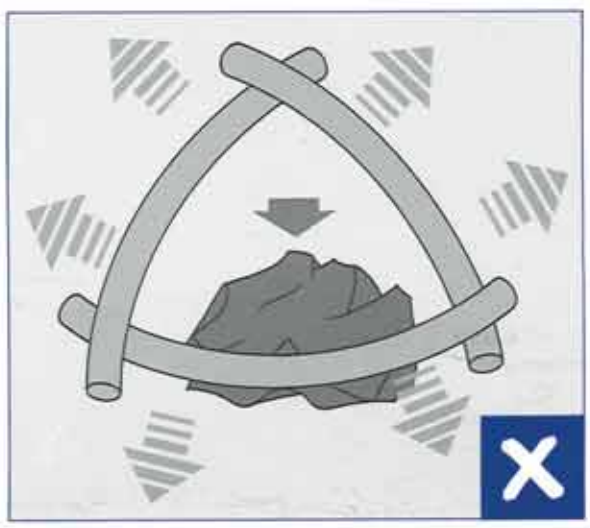


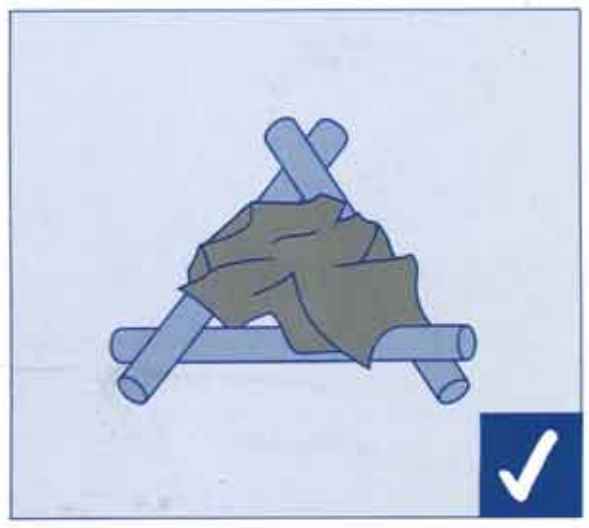
2 PORE STABILITY

During filtration, filters are subjected to increasing differential pressure and sometimes, pressure pulsing.

A stable pore structure is essential to ensure that enlargement or distortion of pores does not occur and that previously trapped contaminants are not 'unloaded'.

Stability of pores means that consistent filtrate quality will be maintained throughout the life of the filter.



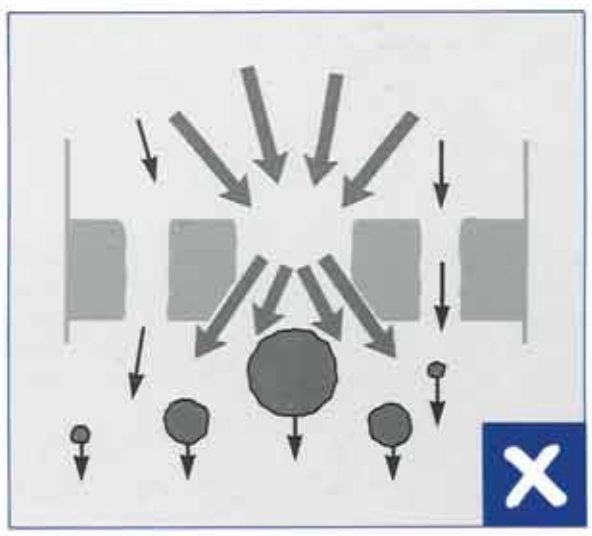


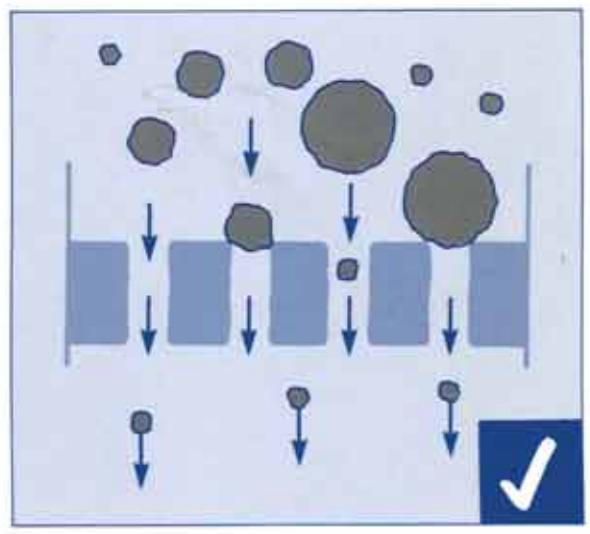
3 PORE SIZE

Efficient filter media must have narrow pore-size distribution because the presence of larger pores would allow 'channelling' of flow and the passage of larger particles.

The flow through a pore $\propto d^4$ where d is the diameter of the pore.

This means that oversized pores will carry a disproportionate part of the flow.



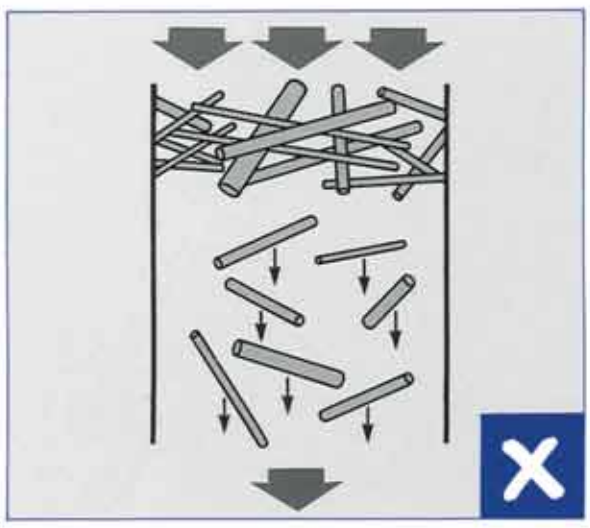


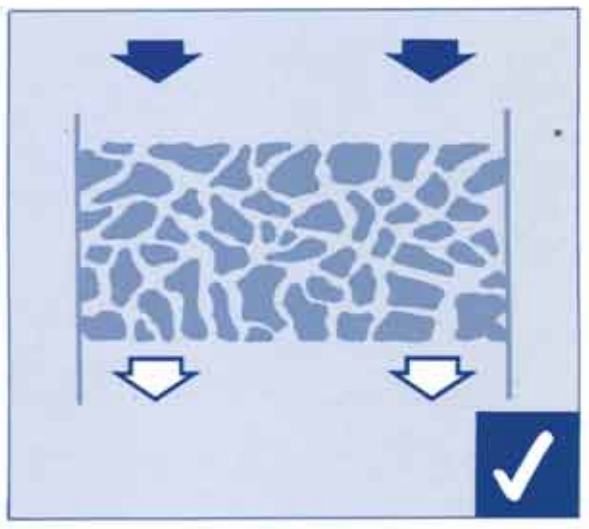
4 STRUCTURAL INTEGRITY

A filter medium must not shed particles or filaments which will contaminate the filtrate.

This 'media migration' is prevented by:

- the use of media which have good mechanical and chemical resistance;
- fully-bonded filter media which guarantee structural integrity in service.





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