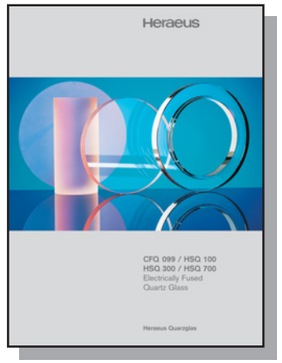
High Purity
Porous Filter Discs

Heraeus



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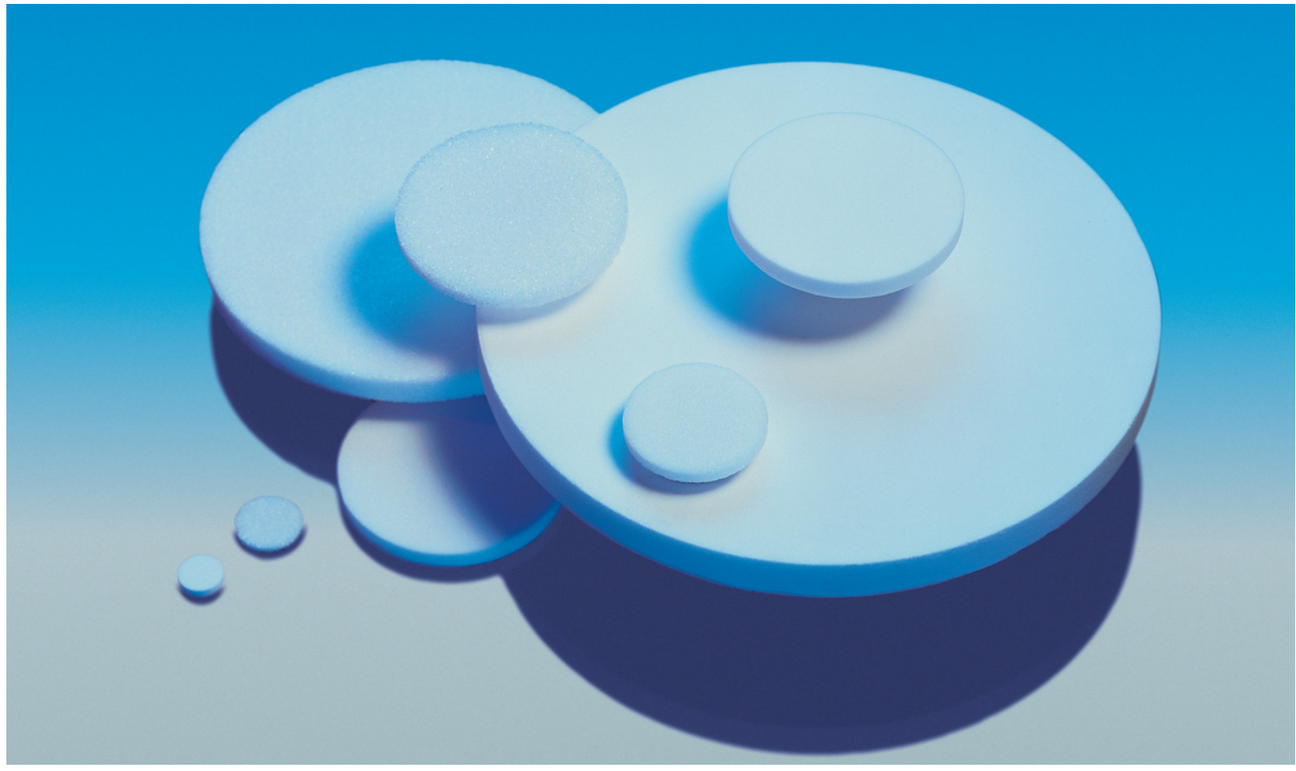

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General Product Description

The key to success when working with glass filters is selection of the correct porosity.

Glass filters vary in porosity according to grades that are labeled 0 to 5. The table on the right shows the porosity ranges and the main fields of application for each grade. The pore size indicated always refers to the largest pore in the disc. This also indicates the diameter of the smallest particle retained during filtration.
Porosities are determined using the Bechold bubble-pressure method which has often been described in literature. To achieve rapid filtration it is necessary to produce as many "passage" pores as possible without dead-ends or enclosed hollow spaces.

This also permits the highest possible flow rates without making cleaning unnecessarily difficult. This is especially important in the separation of fine-grained insoluble solid particles such as silicates and graphite.

Porosity por.	Nominal max. pore size µm	Fields of applications, examples
00	250 - 550	Liquid and gas distribution
0	160 - 250	Gas distribution Gas distribution in liquids at low pressure Filtration of very coarse precipitates
1	100 - 160	Coarse filtration, Filtration of coarse precipitates, gas distribution in liquids Liquid distribution, coarse gas filtration. Extraction apparatus for coarse grain materials. Loose filter layer substrates for gelatinous precipitates
2	40 - 100	Preparatory fine filtration Preparatory work with crystalline precipitates Mercury filtration
3	16 - 40	Analytical filtration. Analytical work with medium-fine precipitates. Preparatory work with fine precipitates. Filtration in cellulose chemistry, fine gas filtration. Extraction apparatus for fine-grained materials
4	10 - 16	Analytical fine filtration Analytical work with very fine precipitates (e. g. $BaSO_4$, Cu_2O) Preparative work with precipitates of appropriate fineness. Non-return and stop valves for mercury

Glass filters with porosities 3 or 4 are used almost exclusively in quantitative analysis. Different porosities are sometimes recommended for the same substances. This is explained by the fact that differing precipitation techniques for gravimetric analysis often produce different particle sizes. When in doubt, porosity 4 is preferred as it will always allow quantitative separation of the precipitate. Porosity 3 however, has proved itself completely satisfactory in all cases for substances such as silver chloride and nickel dimethylglyoxime.

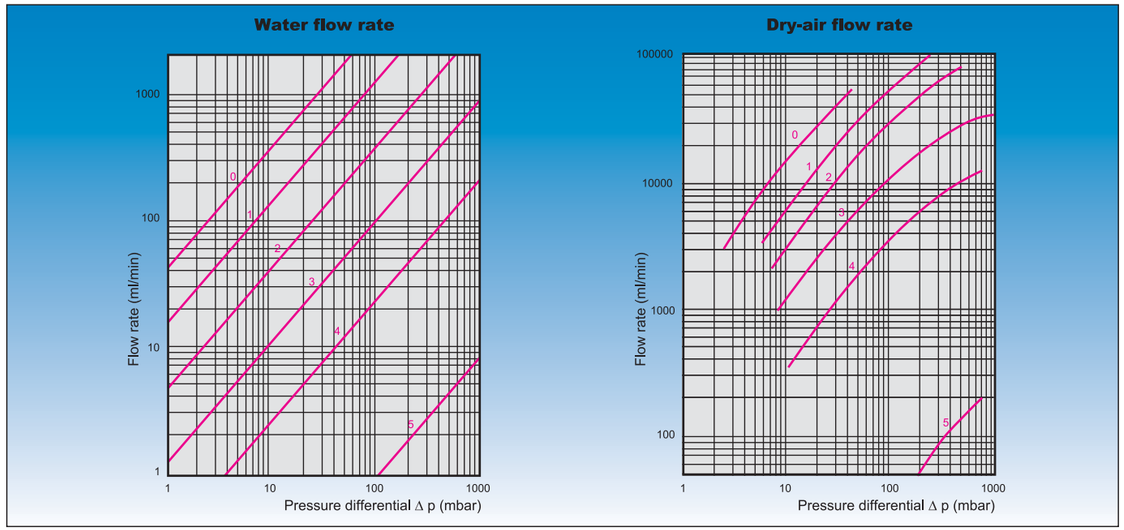

Fig. 1: Water and air flow rate through filter discs of various porosities as a function of pressure differential. For disc diameter 30 mm.

Ultrafine Filtration

It is interesting to note that dilute suspensions of these bacteria (15 000 to 90 000 per millilitre) could still be sterilely filtered through porosity 3 filters. However, a bacterium-free filtrate could not be obtained when filtering dense suspensions through them.

The pores are already so narrow that all bacteria in dilute suspensions adhere to the pore walls.
In the case of dense suspensions, bacteria can still pass through once the pore walls become saturated. Real straining is only achieved with a maximum pore size of 2 µm and below; i.e. it is only here that the pores are smaller than the bacteria to be separated.
Ultrafine filtration is one of the most important methods for treatment of biological solutions without using high temperatures which often lead to changes in or decomposition of the active ingredients in the solution. For liquid filtration, sintered glass filter funnels of standard design are used. For bacterium-free filtration of gases, e.g. in ventilation of fungal and bacterial cultures, pipeline filters are used. In this case, porosity 3 is adequate provided that the space in front of the dry filter disc on the air inlet side is stuffed evenly and loosely with cotton wool.

Outer diameter mm	Thickness mm	Tolerance mm	Porosity
10	2.5	+-0.5-1.0	0-4
15	2.5	+-1	0-4
20	4.0	+-1	0/00-4
25	4.0	+-1	0/00-4
30	4.0	+-1	0/00-4
35	4.0	+-1	0/00-4
40	4.0	+-1	0/00-4
45	4.0	+-1	0/00-4
50	5.0	+-1	0/00-4
55	5.0	+-1	0/00-4
60	5.0	+-1	0/00-4
70	5.0	+-1	0/00-4
80	5.0	+-1	0/00-4
90	5.0	+-1	0/00-4
100	8.0	+-2	0/00-4
110	8.0	+-2	0/00-3
120	8.0	+-2	0/00-3

Standard dimensions of filter discs are shown on the left. Other shapes and dimensions are available on request (e.g. rectangular plates 400 x 200 x 20 mm).