



GEO DICT
The Digital Material Laboratory

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Designation: E3278 - 21

Standard Test Method for Bubble Point Pressure of Woven Wire Filter Cloth

GeoDict® in the ASTM E3278-21 international standard as standard test method for bubble point pressure of woven wire filter cloth

The simulation software GeoDict is presented in the ASTM international standard to digitally perform bubble point pressure testing of woven wire filter cloth.

As taken from the ASTM E3278-21: "An established physical phenomenon, the pressure is inversely proportional to the pore size." The ASTM E3278-21 describes GeoDict "as a means for determining a pore size calculation factor (CF) to allow the calculation of a pore size from the resultant pressure." In the terminology and definitions specific to this standard, it is established that *hydraulic diameter bubble point pressure*, *percolation path fitting particle diameter*, and *pore size calculation factor (CF)* are generated using the [PoroDict](#) module of GeoDict. The results from *percolation path fitting particle diameter* from [PoroDict](#) have been previously established in the ASTM 2814-18 standard (Table 1) to correspond to the results of glass bead testing. In this ASTM E3278-21 standard, the *pore size calculation factor (CF)* is used to determine the pore size of filter cloth from the bubble point pressure.

Traditionally, the pore diameter is calculated using the measured pressure based on the Young-Laplace equation for the equilibrium of the gas pressure and surface tension forces. However, this equation is only for the perfect model (cylindrical pore, thin film with contact angle of 0°, isopropanol wetting liquid) and must be corrected by either the actual contact angle or a tortuosity factor for the filter cloth. Alternatively, according to ASTM E3278-21, the software-based calculations of the [PoroDict](#) module of GeoDict are obtained through the non-circular cross-section of the bottle neck through-path of the filter cloth. This improves correlation and is able to generate a specific correction factor for each different filter cloth specification.

The ASTM E3278-21 includes tables and figures from the PoroDict 2021 handbook of the GeoDict User Guide.

The ASTM E3278-21 standardizes software-based calculations of pore size through bubble point computations performed with the PoroDict module. PoroDict quantitatively characterizes pore size, percolation path, tortuosity, bubble point pressure, and other parameters of the pore space, such as Pore Size Distribution (Granulometry and Porosimetry), Chord Length Distribution, open and closed porosity, and geodesic tortuosity.

Math2Market software products are a worthwhile new technological strategy, used by internationally renowned manufacturers in the filtration industry to optimize processes, to cut prototyping and R&D costs, to accelerate the design of filters and filter media greatly, and to boost their competitive edge.

[Access the ASTM E3278 on the ASTM website](#)

[Learn more about GeoDict in the ASTM E2814 of 2018](#)

