BioDesign Inc. of New York

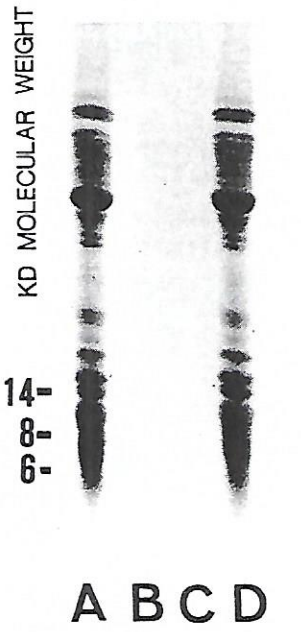
BioDesignDialysis Tubing™

Product Description and Use: **BioDesignDialysis Tubing™** is prepared from the finest available regenerated cellulose and is an extremely thin, transparent, and tear resistant tubing that provides for very rapid dialysis. The product contains cellulose, water, glycerol, and trace amounts of sulfur compounds (approximately 0.1%). Extensive efforts are made to provide uniformity of wall thickness, porosity, membrane integrity and product purity. BioDesignDialysis Tubing is supplied as a dried tubular membrane in either 100 foot (30.5 m) rolls or convenient pre-cut 12 inch (30.5 cm) strips.

For normal laboratory use, simply wet BioDesignDialysis Tubing in distilled water. Tie a knot at the bottom of the tube and fill the sack with distilled water. To verify the integrity of the membrane, use two fingers to close the tube top and increase the pressure. Remove the water, place the sample to be dialyzed in the tube, and tie a knot at the top of the tube.

Storage: BioDesignDialysis Tubing is supplied in an air tight moisture proof container for correct storage. To conserve moisture content and flexibility, unused tubing should always be stored using this container in a cool location such as a refrigerator. Under these conditions, the product will remain flexible. If allowed to lose moisture and become brittle, membrane integrity may be reduced. Once the tubing has been wet, it should never be allowed to re-dry. Wet tubing may be stored refrigerated, but great care should be taken to prevent microbial attack by cellulose degrading microorganisms. Storage solutions must contain 1% benzoic acid or 1% formaldehyde which inhibit microbial growth. BioDesignDialysis Tubing can be steamed sterilized, but should be used immediately or properly stored wet. Steam sterilization will alter the porosity characteristics of the tubing.

Molecular Weight Cut-Off:



A cellulose membrane represents a fluid three-dimensional matrix where the passage of compounds through the tubing is dependent on a wide variety of interdependent factors including the shape, size, and charge of the compound, as well as the pH, temperature, ionic strength, polarity, and composition of the solution being used. Pressure and tension on the membrane significantly alter the average porosity. Therefore, it is essential that the membrane be characterized by the purchaser under the specific conditions being used to determine if the product suitably retains or passes the desired compounds.

BioDesign Inc. of New York has extensively studied the ability of this product to act as a pore matrix for proteins. We will glady provide technical assistance to determine if the product is suitable for its intended application. An example of our testing is shown in the Figure, where fibrinogen was digested with the proteolytic enzyme S. Aureus V8 and the passage of the peptides through D100 BioDesignDialysis Tubing was examined. After dialysis for six hours, none of the fibrinogen peptides were found to pass through the membrane. With another protein, passage of a very low percentage of a 12,000 molecular weight species, after extensive dialysis, has been observed. Such results are typical of cellulose dialysis membrane.

SDS polyacrylamide gel, stained with brilliant blue, examining the dialysis of S. Aureus V8 digested fibrinogen using D100 BioDesignDialysis Tubing. In a 200mM NaCl, 2mM $MgCl_2$, 2mM Tris, pH 7.4 solution, the proteins inside the dialysis tubing and in the outside solution (at 14 times higher concentration) were examined. Using BioDesignDialysis Tubing, the peptide mixture (Lane A) was found to be retained, as no peptides are observed in the outside solution after dialysis (Lane B). Another manufacturer's cellulose dialysis tubing with a described 6-8,000 molecular weight cut-off is similarly examined with the outside solution (Lane C) compared to the retained peptide sample (Lane D).

Removing Glycerol, Sulfides, and Reducing Heavy Metals: BioDesignDialysis Tubing has been treated with glycerol which aids in the production and flexibility of this product. Although glycerol is rarely a problem in the research laboratory, it can be removed by washing the tubing with distilled water for three hours. The heavy metal content of this cellulose tubing is very low, but cellulose has a natural affinity for some heavy metal ions. To reduce the concentration of heavy metals bound to the tubing, a chelating wash containing 1% EDTA should be used. To remove sulfur compounds, heat (80° C) the tubing in 0.3% sodium sulfide for one minute and then wash with 60° C distilled water for two minutes. Acidify with 0.2% sulfuric acid and wash with distilled water. This procedure will alter the porosity of the tubing.

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