



## Standard Terminology Used for Crossflow Microfiltration, Ultrafiltration, Nanofiltration and Reverse Osmosis Membrane Processes<sup>1</sup>

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### 1. Scope

1.1 This terminology covers the use of crossflow microfiltration, ultrafiltration, nanofiltration and reverse osmosis for membrane separation processes.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 1129 Terminology Relating to Water<sup>2</sup>

D 2035 Practice for Coagulation-Flocculation Jar Test of Water<sup>3</sup>

### 3. Significance and Use

3.1 The need to understand the relationships found in membrane unit processes for water treatment increases with the continuing demand for these separation systems. Defining the terms common to crossflow microfiltration, ultrafiltration, nanofiltration and reverse osmosis processes assist the manufacturer, consultant and end-user in eliminating inter-process terminology confusion.

### 4. Terminology

#### 4.1 Definitions:

**absorption**—the holding of a substance within a solid by cohesive or capillary forces.

**accumulator**—a pulsation dampener installed on the suction and/or discharge lines of pumps, generally plunger type, to minimize pressure surges and provide uniformity of flow.

**accuracy**—the closeness of agreement between an observed value and an accepted reference value. Where an accepted reference value is not available, a measure of the degree of conformity of a value generated by a specific procedure to

the assumed or accepted true value, and includes both precision and bias.

**acetylation**—substitution of an acetyl radical for an active hydrogen. Specifically, formation of cellulose acetate from cellulose.

**acidity**—the quantitative capacity of aqueous media to react with hydroxyl ions.

**activated carbon**—granulated or powdered activated carbon used to remove tastes, odor, chlorine, chloramines, and some organics from water. A family of carbonaceous substances manufactured by processes that develop adsorptive properties.

**adsorption**—the holding of a substance onto the surface of a solid by chemical surface forces, without forming new chemical bonds.

**aerobic bacteria**—bacteria that require oxygen for growth. See **bacteria**, **aerobes**.

**aggregate**—granular material such as sand, gravel, crushed stone.

**air scour**—distributing air over the entire filter area at the bottom of a filter media flowing upward to improve the effectiveness of backwashing or to permit the use of lower backwash water flow rate, or both.

**algae**—any of a group of chiefly aquatic mono cellular plants with chlorophyll often masked by a brown or red pigment.

**alkalinity**—the quantitative capacity of aqueous media to react with hydrogen ions. “M” alkalinity is that which will react with acid as the pH of the sample is reduced to the methylorange endpoint of about 4.5. “P” alkalinity is that which reacts with acid as the pH of the sample is reduced to the phenolphthalein end point of 8.3. “M” is the total alkalinity which is the sum of hydroxide plus carbonate plus bicarbonate contents, “P” includes all the hydroxyl and half the carbonate content.

**alum**—aluminum sulfate,  $Al_2(SO_4)_3 \cdot XH_2O$  ( $X = 14-18$ ), a coagulant.

**ambient temperature**—the temperature of the surroundings, typically 20°–25°C.

**amorphous**—non crystalline, devoid of regular cohesive structure.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 11.02.