Design of a System for Collection of Condensate Using Capillary Forces

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Capillarity is a phenomenon that involves spontaneous displacement of small columns of liquid through very small spaces such as holes and corners [1-3]. The forces that govern this phenomenon are those of cohesion and adhesion between molecules of the fluid with itself and those with the contact material. The characteristics of these forces depend on the nature of the materials. They involve important concepts: the contact angle and surface tension [2, 3]. The spontaneous displacement of liquid is of great interest in dynamics of fluids, since it occurs naturally without the application of additional forces; this is the reason why it is broadly attractive for industrial applications [3-5].

The objective was to create a design procedure for managing and collecting condensed fluids using capillary forces near corners. This represents an industrial application that allows the elimination of the problems of drip of condensed fluids on the final product and/or equipment, and that generates counteractive consequences in the quantity and quality of the final product and in the useful life of the equipment. The development of the design required the geometric angle, depth of the grooves, and the angle of inclination from the properties and quantity of the fluid and material of construction.

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