
Approximate method of calculating a slush-like cryogenic product melting in a torus container

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The research proposes an approximate analytical method for calculating the melting time of a slush-like cryogenic product in a torus container when drain storing. We examine the problem of finding the position of the interface between the pure liquid region and the slush with an allowance for the heat flow from the walls and the area of pure liquid. We accept the following parameters: the area of slush is isothermal and has a melting point of the solid phase, the interface slush is pure liquid, a flat free surface of the liquid is stationary and has a saturation temperature at a given pressure. The temperature in the area of pure liquid is linearly distributed. The approximate relations obtained allow us to evaluate the melting time of a slush-like cryogenic product in the container without a detailed calculation of the temperature fields in the pure liquid.

Keywords: cryogenic liquid, cryogenic product, drain storage, liquid, slush, melting, container.

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