3D Numerical Defrost Modeling on an Ambient Air Vaporizer Using Computational Fluid Dynamics

박종민, 정익환, 이용규, 한종훈†
서울대학교
(chhan@snu.ac.kr†)

Ambient air vaporizer (AAV) is one of technology which is applied to regasify LNG at LNG terminals. LNG regasification technology using ambient air is both eco-friendly and cost-effective, and it shows high operating efficiency as well. However, when heat is transferred from air to LNG, the water-vapor contained in the air is solidified on the surfaces of AAV. This frost formed works as thermal resistance which hinders the heat transfer between the air and LNG, thus lowering the efficiency of LNG regasification. Therefore, after the operation time, the frost once formed must be defrosted. In this study, hot gas defrosting method is selected.
Although much research on the frost growth on AAV has been conducted previously, the number of research on defrosting is scanty. But studies on defrosting are as important as those on frosting since operating conditions in the defrosting process such as the quantity of heat needed and the time allocated should be informed. Therefore, this study suggests the 3D numerical defrosting model on AAV through CFD (Computational Fluid Dynamics) and analyzes the defrosting time and the temperature distribution of the AAV.