

AEROGEL APPLICATION ON FIRE CERTIFICATION TECHNIQUES AND HEAT TRANSFER

The study investigates the experimental fire certification and numerical simulation of heat transfer of silica aerogel application. The aim of the study is to evaluate the performance of different types of silica aerogel used for fire certification and heat transfer application. The fire certification of aerogel was performed experimentally by coating the aluminium alloy 2024-T3 with polymer-aerogel and burn-through according to ISO2685 standard. While the heat transfers application of the aerogel was conducted by numerical simulation on different types of channels. From the result obtained based on fire certification test GEATM 0.125 silica aerogel composite produces less thermal conductivity than the other two composites with 10.9% and 25.2% greater than Enova® IC3100 and Hamzel® respectively. Also, the result of heat transfer shows that 4% concentration of Hamzel® Produce higher heat exchange than 1%, likewise, trapezoidal step facing channel produces a better result than the other three channels. Conclusively, the study indicates that the nanofluid silica aerogel can be used in fire certification application and heat transfer applications with better performance since it is lightweight in nature and environmentally friendly.