THE EFFECTS of POWDER FILLER TYPES on THERMAL INSULATION PERFORMANCE in VACUUM INSULATION PANELS

Abstract:
Howadays the most effective thermal insulation materials are VIPs in the production of A+++ refrigerators. In addition, research and application studies are being carried out for use in building thermal insulation applications. However, the most important barrier to the use of VIP in both the refrigerator and construction sectors is the cost of VIP core. In this study, three different specific surface area (SSA) of fumed silica, precipitated silica and cryogenic perlite were used in the production of cores. SiC is used to reduce the heat transfer to the radiation in the samples. 3 layer metallized film is preferred as a barrier. The thermal conductivities of cores and VIPs were measured at the atmospheric pressure and at 0.1 Pa. When the findings are evaluated, the lowest thermal conductivity values ensure the VIPs produced from the powders with the largest SSA. However, it is the most economical sample in which the cryogenic perlite is equally mixed with the fumed silica.

**Keywords:** Vacuum insulation panels, thermal insulation performance, filler type, core, economics.