ANALYSIS OF SMOKE GENERATION OF SELECTED GLASS/POLYESTER LAMINATES

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Abstract

Glass/polyester laminates are used in rail, construction, and shipbuilding industries, due to their several advantages including corrosion resistance, lightweight, resistance to mechanical damage, weatherability and water resistance. However, their high flammability and generation of a dense smoke during combustion significantly narrow the possibilities for their potential use. The aim of the study was to perform a comparative analysis of smoke generation tests of selected glass/polyester laminates. Tests were conducted according to ISO 5659-2:2017, at a heat flux of 25 kW/m^2 and 50 kW/m^2 with and without an application of a pilot flame. The characteristics of the optical density as a function of time, as well as the burning time, the maximum specific optical density $D_{s\,max}$, the specific optical density of smoke after 4 minutes $D_{s(4)}$ and an indicator $VOF_{(4)}$, were determined for all studied laminates. A comparative analysis of results allowed to select the most favorable and least suitable laminates in terms of smoke generation properties.

Keywords: Smoke generation, Optical density, Single-chamber test, Glass/polyester laminates, ISO 5659-2