

INTUMESCENCE: A VERSATILE CONCEPT FOR DIVERSE APPLICATIONS

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Abstract

Intumescence is a versatile method for providing reaction and resistance to fire to materials. When heated beyond a critical temperature, the intumescent material begins to swell and then to expand forming an insulative coating limiting heat and mass transfer. We should distinguish the reaction to fire which is the contribution of the material to fire growth and the resistance to fire which is defined as the ability of materials to resist the passage of fire and/or gaseous products of combustion. It means that different scenarios are considered to evaluate the materials using different tests. It will be considered in the talk.

The talk will focus on how to use intumescence (coating and flame retardants) to make flame retarded polymeric materials (reaction to fire) and fire barrier on substrates (resistance to fire). Diverse applications of intumescence and fire scenarios will be examined: (i) the resistance to fire of composite (aircraft post-crash fire and flame spread) and steel (hydrocarbon fire) covered by an intumescent paint and (ii) the use of intumescent flame retardants in thermoplastics (E&E applications) for improving their fire properties.