# An approach for simulation of polymers in fire situations.

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## ABSTRACT

The versatility of polymeric materials, as demostrated in such features as high strength, low weight, ease of processing, and capability to form into complex shapes, have led to their widespread industrial application in aircraft structures, transportation vehicles, building construction, maintenance and finishing products, electronic boards, bioengineering, structural materials, and many other different applications. The behaviour of polymers in fire situations is of considerable interest because of their important role in the ignition and growth stages of fire[1]. In this paper, a new computational procedure for analysis of the combustion, melting and flame spread of polymer under fire conditions is presented. The method models the polymer in a Lagrangian framework adopting the Particle Finite Element Method philosophy[2]. The surrounding air adopts an Eulerian Framework. This approach allows to treat naturally the polymer shape deformations and changing properties due to heating, while mechanical interaction between the polymer and the ambience is solved on a fixed Eulerian mesh. The thermal problem is treated by solving a heat equation on the Eulerian mesh using enrichment technique [3]. The model is enriched with a simplified model for combustion [4]. Finally some numerical results are presented and compared with experimental data.

## REFERENCES

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