

КОЕФИЦИЕНТ НА ИНТЕНЗИВНОСТ НА НАПРЕЖЕНИЯТА И СКОРОСТ НА ОСВОБОДЕНАТА ЕНЕРГИЯ ПРИ КОМПОЗИТИ ОТ РЕЦИКЛИРАНИ МАТЕРИАЛИ

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STRESS INTENSITY FACTORS AND ENERGY RELEASE RATE IN COMPOSITES FROM RECYCLED MATERIALS

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Abstract:

Recycled composites such as polyester and polymer concretes, prepared from recycled concrete wastes as well as non-saturated polymer or polyester resins prepared from recycled plastics are new energy saving and high strength structural materials. Besides their use as conventional structural materials, they also meet ecology and environmental requirements.

The present study focuses on cracked structural elements fabricated from recycled polyester/polymer and concrete and in particular- on the determination of the stress intensity factors (SIF) and the energy release rate (ERR). Stress and strain distribution is found in specific structural elements using two methods- analytical and numerical ones. The technique is based on the energy approach of fracture mechanics and on the assumptions of the linear mechanics of elasto-brittle fracture, involving also FEM. The values of SIF and ERR are calculated for different initial crack lengths and external loads applied. Crack critical length is found and crack growth is followed applying critical loads.

Comparison of the FEM results to the analytical ones and to those found adopting the energy approach is made showing good agreement.

Keywords:

SIF, ERR, J-integral, FEM, Cracked Structural Elements.

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