

# ON THE USE OF A POLYUREA BASED ELASTOMER FOR PREVENTING SPALL AND BREACHING IN REINFORCED CONCRETE

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## ABSTRACT

Spall in concrete is usually of concern for structures where personnel or valuable equipment require protection. This phenomenon is the result of a tension failure in the concrete normal to its free surface and is caused by the shock pressures of an impinging blast wave being transmitted through the element. This failure results in the formation of potentially dangerous, small concrete fragments, which are accelerated into the structure. In a series of experiments, a method for the prevention of spall and breaching in normal strength reinforced concrete (RC) elements was examined. The retrofit of the concrete elements was executed by spraying a Polyurea Based Elastomer (PBE), on the back face of structures and singular constructive elements. The liner then may reduce the formation of spall through composite behavior or act as a confining mechanism for the fragments. This paper presents the results of tests designed to investigate the damage behavior of PBE retrofitted concrete and especially the ability to prevent spall and breaching from contact charges. Different coating thicknesses were tested and compared to an untreated reinforced concrete wall. High speed cameras were used to provide further diagnostics. The different stages of damage caused to the elements are described both qualitatively and quantitatively and recommendations are made for further research.