

Useful applications of byproducts of petroleum industry: Polyurea as a protective coating

Damith Mohotti
University of Sydney, Australia

Polyurea uses by products of petroleum industry and has been identified as a good candidate material to use as a protective coating or an energy absorber. Over the last few decades, many researchers have investigated the use of polyurea as a protective coating material due to its ability to absorb a considerably high amount of energy compared to most other similar coating materials. In recent years, researchers have drawn their attention towards the application of polyurea to enhance the resistance of structures and systems against extreme impulsive loadings. With adequate surface preparation, polyurea bonds well with most structural materials (such as concrete, steel and aluminium), thereby forming composite behavior. It can be used either as the outer face of a structure, or as an inter layer material, by utilizing its compressive or tensile properties depending upon the nature of the load transmitted. Due to the complex nature of its microstructure, polyurea shows a high level of stress-strain non-linearity, rate sensitivity, and a high degree of pressure dependency compared to other elastomeric materials. In addition, polyurea has a higher energy density than most other elastomeric materials. In recent years, a spray-in-place methodology has been introduced for polyurea coating, which has increased its usage in many industrial applications such as tank liners, manhole and tunnel coatings, and secondary coatings on bridges, roofs and parking decks. Recent studies show that it also possesses the desired characteristics for effective protective coating application against blast and ballistic loadings in both vehicles and ground structures.

Biography:

Dr. Mohotti has developed expertise in many interrelated areas in structural and materials engineering including extreme loadings on structures (blast and impact), wind loadings on buildings and development of smart materials. He is considered as an expert in advanced numerical simulations with his immense contribution to the development of this sector. In addition to his expertise as a researcher he has gained worthy of experience working as a structural engineer and a consultant. Dr. Damith is currently working as a lecturer in the School of Civil Engineering at the Faculty of Engineering and IT at University of Sydney. He currently works as a member of the industrial engagement committee of the school and holds the responsibility of delivering three key units of studies on design of concrete and pre-stressed concrete structures.