Damith Mohotti, Int J Petrochem Res. 2017
http://dx.doi.org/10.18689/2638-1974.a1.001

Use of Polyurea as a protective coating: New applications of polymers in damage mitigation

Damith Mohotti
School of Civil Engineering, University of Sydney, Australia

The economical and technical values of elastomers in many different industrial applications are still under estimated. Over the last few decades, many researchers have investigated the use of elastomers such as 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. 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. In recent years, researchers have drawn their attention towards the application of polyuria to enhance the resistance of structures and systems against extreme impulsive loadings such as blasts. With adequate surface preparation, polyurea bonds well with most structural materials (such as concrete, steel and aluminium), thereby forming composite behaviour. It can be used either as the outer face of a structure, or as an interlayer material, by utilising its compressive or tensile properties depending upon the nature of the load transmitted. Due to the complex nature of its microstructure, polyuria 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 polyuria 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. In this presentation, some previous research projects done on polyuria applications on damage mitigation will be reviewed. Also new technological developments possible in polymer industry with their economical benefits will be discussed.

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 hold the responsibility of delivering three key units of studies on design of concrete and pre-stressed concrete structures.