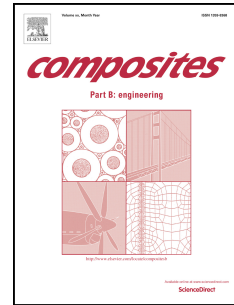


# Accepted Manuscript

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PII: S1359-8368(18)32529-0

DOI: [10.1016/j.compositesb.2018.08.113](https://doi.org/10.1016/j.compositesb.2018.08.113)

Reference: JCOMB 5943

To appear in: *Composites Part B*

Received Date: 9 August 2018

Accepted Date: 23 August 2018

Please cite this article as: Wang Z, Jia Z, Feng X, Zou Y, Graphene nanoplatelets/epoxy composites with excellent shear properties for construction adhesives, *Composites Part B* (2018), doi: 10.1016/j.compositesb.2018.08.113.

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# Graphene nanoplatelets/epoxy composites with excellent shear properties for construction adhesives

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## Abstract

The properties and bonding capabilities of construction adhesives have attracted tremendous interests in the past decades. This paper conducts an experimental study on the shear properties of epoxy construction adhesive reinforced with graphene nanoplatelets (GNPs) through thick adherend shear test (TAST). The experimental results show that the shear strength of nanocomposites increases with the increased graphene content. It is worth noting that the shear strength of nanocomposites at a graphene content of only 0.75 wt% exhibit a 102% enhancement compared with neat epoxy adhesive. Other shear properties, including shear modulus, shear strain at failure and toughness also deliver much better performances compared with neat epoxy, indicating the effectiveness of graphene on shear properties improvement. The mechanical behavior of the TAST specimens with different nanocomposites adhesive are predicted using 3D finite elements analysis (FEA). The shear properties of nanocomposites obtained from the experimental results are used as cohesive zone model parameters in FEA. The prediction agree very well with the experimental

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