

# Accepted Manuscript

Complex effect of graphite nanoplatelets on performance of HDPE/PA66 microfibrillar composites

Ivan Kelnar, Ümitcan Bal, Alexander Zhigunov, Ludmila Kaprálková, Ivan Fortelný, Sabina Krejčíková, Jana Kredatusová



PII: S1359-8368(18)30275-0

DOI: [10.1016/j.compositesb.2018.03.006](https://doi.org/10.1016/j.compositesb.2018.03.006)

Reference: JCOMB 5565

To appear in: *Composites Part B*

Received Date: 23 January 2018

Revised Date: 23 February 2018

Accepted Date: 3 March 2018

Please cite this article as: Kelnar I, Bal Ü, Zhigunov A, Kaprálková L, Fortelný I, Krejčíková S, Kredatusová J, Complex effect of graphite nanoplatelets on performance of HDPE/PA66 microfibrillar composites, *Composites Part B* (2018), doi: 10.1016/j.compositesb.2018.03.006.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Complex effect of graphite nanoplatelets on performance of HDPE/PA66 microfibrillar composites

Ivan Kelnar<sup>\*</sup>, Ľmitcan Bal, Alexander Zhigunov, Ludmila Kaprálková, Ivan Fortelný, Sabina Krejčíková, Jana Kredatusová

*Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovského nám. 2, 162 06 Praha, Czech Republic*

<sup>\*</sup>Corresponding author: kelnar@imc.cas.cz

## ABSTRACT

The effect of nanofillers (NF) on parameters of polymer blends in microfibrillar composites (MFC) is complex due the effect of NF on melt drawing. This work concerns HDPE/PA66 modified with graphite nanoplatelets (GNP) prepared by different mixing protocols. GNP influence the dispersed phase size in the original blend negligibly and mostly lead to finer high-aspect ratio fibrils, i.e. GNP rather support elongation of inclusions than coalescence in the course of drawing. Favourable mechanical behaviour, exceeding predicted one, was found with low GNP content using the PA66 masterbatch. MFC with similar structure and GNP localization in PA66 show marked differences in properties depending on mixing protocol. Antagonistic effects found for the HDPE masterbatch indicate high effect of GNP migration between the components which affects the interphase by variation of crystallinity. The results confirm complex effect of GNP and dominance of other GNP-induced effects over dual reinforcement with GNP and PA66 microfibrils.

*Keywords:* Polymer-matrix composites; Interface/Interphase; Mechanical testing; Extrusion

Download English Version:

<https://daneshyari.com/en/article/7212072>

Download Persian Version:

<https://daneshyari.com/article/7212072>

[Daneshyari.com](https://daneshyari.com)