

Glass fibre length and Toughness of GMT versus LFT

In a recently published study by Czigany et al. (ref. 1), the fracture toughness of GMT produced in two different ways was compared. One process was the fiber mat needling and lamination process (GMT-C) and the other was a wet route process (LFT). The LFT materials are characterized by dispersed, random fibers with a length of approximately 12 mm.

It was shown that the fracture toughness of GMT-C materials, based on laminated non-woven glass fiber mats, have an excellent fracture toughness. This behavior was related to the large deformation zone at the crack tip and it was shown that this toughness increased with a decreasing temperature.

In the same study it was further shown that the toughness of GMT based on non-woven fiber mats (GMT-C) was approximately twice that of dispersed fiber GMT (LFT). These results are shown in the figure as a function of the temperature. The values in figure 4 are measured on materials having the same material content (polymer type, additives etc.), only the laminate production and thus the mat structure is different. This is a typical example of the positive influence the long fibers in Symalit GMT have on the mechanical properties of the molded parts.

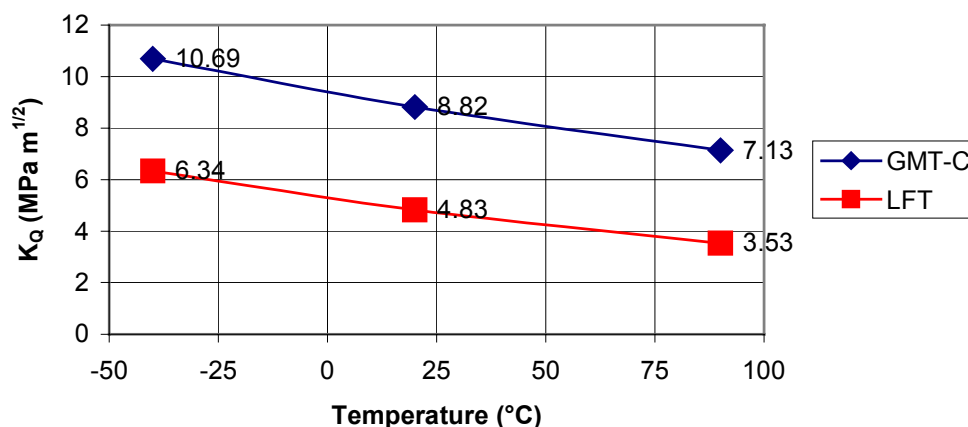


Figure. Critical stress intensity factor standard GMT (GMT-C) and LFT having 12mm long dispersed fibers, both with 30% GF (values from ref. 1).

1. T. Czigany, J. Marosfalvi, J. Karger-Kocsis, "An acoustic emission study of the temperature-dependent fracture behavior of polypropylene composites reinforced by continuous and discontinuous fiber mats", Composites science and technology 69, p. 1203-1212, (2000)

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