

Natural fiber and wood plastic composites technical tip

Eastman G™ polymer—coupling agents

Introduction

Polar natural fibers and nonpolar polyolefins have negligible attraction. The result is encapsulation of wood fibers in the polyolefin with little or no interaction. Coupling agents help overcome the polarity disparity to increase composite strength and moisture resistance.

Figure 1 Polar—cellulose

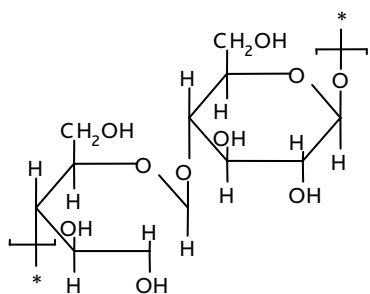


Figure 2 Nonpolar polyolefin

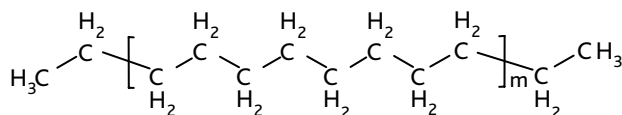
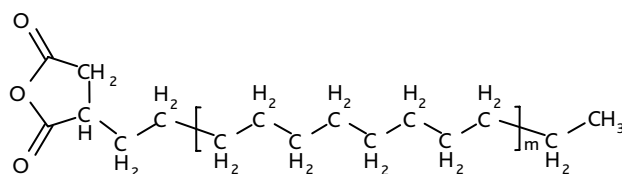


Figure 3 Maleated polyolefin



Polypropylene (PP)—flax and jute

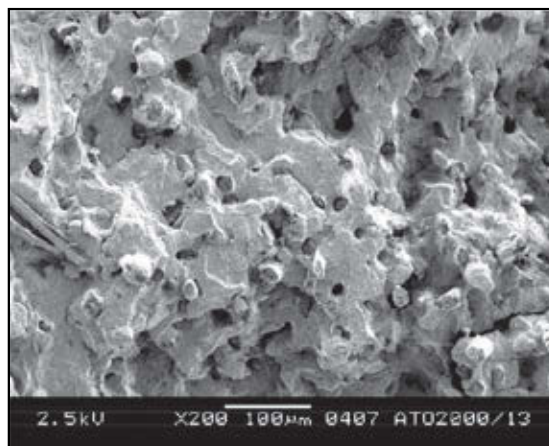
Incorporating 3% of Eastman G™ 3015 polymer into a 30% agrifiber/PP composite resulted in more than a 60% increase in the flexural and tensile strengths. For more comprehensive information, see Eastman publication WA-114, Maleated Coupling Agents for Natural Fibre Composites* in its entirety.

*With permission from Elsevier, Composites Part A: Applied Science and Manufacturing, Volume 35, T. J. Keener, R. K. Stuart, and T. K. Brown, Coupling agents for natural fiber composites, pages 357–362, 2004.

Figure 4 Agrifiber/PP—no coupling agent polymer



Figure 5 With 3% Eastman G™ 3015 polymer



Polyethylene (PE)—wood

The Eastman G series product line includes a variety of coupling agents that are useful in natural fiber and wood plastic composites. View product technical data sheets at www.eastman.com/EASTMAN-G.



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