

## OPTICAL RESPONSES AND PHOTODEGRADATION RESISTANCE OF FOREST-BASED FILLERS INCORPORATED INTO POLYURETHANE BIOFOAMS

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The effect of different fillers in polyurethane (PU) foam color has not yet been elucidated. This factor is somewhat neglected, although the foam color is revealed when glass laminates or other translucent materials are used as their face sheets. Moreover, these foams are also used as perimeter insulations or exposed parts of indoor furniture. In this work, six kinds of forest-based particles were incorporated into rigid bio-based PU foams and characterized for optical properties and photodegradation resistance. The rigid PUs were prepared by the free-rising method. Then, the final rigid foams were analyzed by color (CIELAB method) and specular gloss measurements performed before and after aging tests conducted under ultraviolet radiation into a black wooden box. The filled foams resembled their respective filler, representing different colorimetric patterns. They also presented higher specular glosses compared to the neat PU, especially for filler contents up to 5%. All the foams presented similar photodegradation marked by a yellow color inclined to orange shades, represented by increases in both  $a^*$  and  $b^*$  levels accompanied by losses in  $L^*$  and specular gloss levels. Therefore, those naturally darker filled foams underwent a lower photodegradation effect than the others, probably due to the higher extractives content in their fillers, which may be capable of induce a contrary effect against the natural discoloration of the PU under UV rays.

**Keywords:** forestry wastes, rigid polyurethane foams, wood flour, kraft lignin, paper sludge.