Supporting Information

As shown in Tab. 1, when considering the same thickness and moisture content, the mass loss rate of wood under unsealed conditions was approximately twice that observed under unsealed conditions. The microstructure analysis of poplar wood revealed that water vapor can escape to the external environment through longitudinal interconnected conduits and radial pitting. Consequently, a significant amount of water vapor leakage from the radial section and cross section of unsealed wood resulted in reduced peak pressure of the internal gas. However, the difference in gas pressure and mass loss rate for samples with the same moisture content is not substantial. From Tab. 1, overall, it was apparent that the mass loss rate of the samples used for layered moisture content detection before and after splitting was minimal, thereby ensuring the accuracy of subsequent test data.

Tab. 1 The mass loss rate of samples (%)

Thickness \ Moisture content		15%	25%	35%
30 mm	S	0.542±0.413[a] 0.211±0.175	1.033±0.356 0.232±0.036	2.973±0.154 0.300±0.053
	U	1.212±0.336 0.307±0.310	2.873±0.285 0.300±0.103	3.753±0.429 0.237±0.138
40 mm	S	0.670±0.671 0.500±0.671	2.076±0.026 0.360±0.170	2.740±0.870 0.293±0.099
	U	1.830±0.260 0.158±0.057	4.405±0.115 0.348±0.114	4.455±0.345 0.398±0.149
50 mm	S	0.400±0.120 0.375±0.150	2.040±0.268 0.478±0.078	3.020±0.382 0.428±0.130
	U	1.510±0.200 0.160±0.073	4.010±0.136 0.708±0.336	4.475±0.021 0.475±0.247

S means sealed condition, U means unsealed condition; a means value ± standard deviation; The black font means the mass loss rate of the samples subsequent to hot pressing, and the blue font means the mass loss rate after splitting the layer moisture content test specimens.