

The effect of pMDI addition to PF resin on some OSB mechanical properties

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HYBRID RESINS



- Meet requirements for panels load-bearing and resistance to humidity like the OSB/3.
- Take advantage of both resin features.
- Reducing the cost.
- The need of further reaserch.

RESULTS/CONCLUSIONS

- The study shows that the small addition of pMDI (10%) to the PF resin improved the mechanical properties of OSB (OSB/3 => OSB/4).
- The replacement pMDI resin by PF (75% pMDI/ 25% PF) did not significantly decrease the tested mechanical properties of boards.

THE EFFECT OF PMDI ADDITION TO PF RESIN ON SOME OSB MECHANICAL PROPERTIES

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METHODOLOGY

The aim of this work was to study the mechanical properties of OSB (from pine strands) bonded with PF resin with addition of pMDI in the ratio 0, 10, 25, 50, 75 and 90%. The manufactured materials were 3-layers OSB boards (thickness of 15 mm and density of 590 kg/m³ and pMDI range from 0, 10, 25, 50, 75, 90, 100%). The tested properties were: elastic modulus (E_m II), bending strength (f_m II). [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] [49] [50] [51] [52] [53] [54] [55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66] [67] [68] [69] [70] [71] [72] [73] [74] [75] [76] [77] [78] [79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89] [90] [91] [92] [93] [94] [95] [96] [97] [98] [99] [100].



Fig. 1. OSB properties from 0% to 100% pMDI

Tab. 1. OSB properties depending on the percent amount of pMDI in the adhesive mixture PF/pMDI

Property	Unit	Numerical value						
		0	10	25	50	75	90	100
ρ	kg/m ³	618(0.9)**	603(0.9)**	603(0.9)**	604(0.9)**	604(0.9)**	608(4.5)	588(4.6)
f _m II	N/mm ²	27.3(0.9)**	30.0(0.9)**	31.3(0.9)**	31.0(0.9)**	31.4(0.9)**	35.6(11.8)	35.7(9.7)
f _m ⊥	N/mm ²	17.6(0.9)**	20.1(0.9)**	20.7(0.9)**	21.6(0.9)**	21.6(0.9)**	22.1(8.3)	22.3(5.7)
E _m II	N/mm ²	4670(0.9)**	5180(0.9)**	510(10.0)	5320(0.9)**	510(0.9)**	6150(9.2)	6190(4.9)
E _m ⊥	N/mm ²	2120(0.9)**	2400(0.9)**	2400(10.0)	2400(0.9)**	2400(0.9)**	2560(8.0)	2670(5.3)

* - content of pMDI (%), ** - the variation coefficient

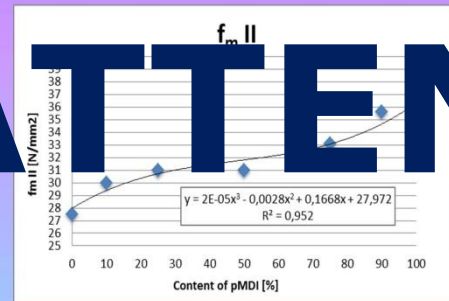


Fig. 2. OSB properties (bending strength - the axis larger) depending on the percent amount of pMDI in the adhesive mixture PF/pMDI

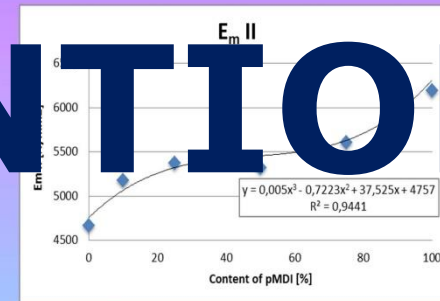


Fig. 3. OSB properties (elastic modulus - the axis larger) depending on the percent amount of pMDI in the adhesive mixture PF/pMDI

CONCLUSIONS

- The study shows that the small addition of pMDI (10%) to the PF resin improved the mechanical properties of OSB (OSB/3 => OSB/4).
- The replacement pMDI resin by PF (75% pMDI/ 25% PF) did not significantly decrease the tested mechanical properties of boards.

THANK YOU FOR ATTENTION