Chemical wood pretreatment for OHT process - analysis of the selected application properties

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The aim

The aim of research was to improve the biological durability of low-quality wood species against wood destroying fungi and reduce its water absorption and hygroscopicity.

Methodology

Spices of wood: pine, poplar, black alder
Chemicals for pretreated process:
A - 10% sodium silicate
B – 10% emulsion based on 2-9034 (Dow Corning),
C - 10% emulsion based on 2-9034 (Dow Corning) + 5% Aerodisp W 1714 (Evonik).

Chemical pretreated
Vacuum 0.85 bar/30 minute
Pressure 10 bar/150 minutes

OHT process
Preheated T = 100^{o}C; Heated T = 200^{o}C, t= 18 h
Heating medium – **palm oil**

Analysis:
Mycological examination; *Poria placenta* acc. to EN 113
Aging test acc. to EN 84
Hygroscopicity
Water absorption

Results

The **benefit** of the pretreatment was mostly discovered in case of wood treated with **sodium silicate**

The mass loss of wood treated with sodium silcate [EN 113]

Species of wood	Pretreated with sodium silcate [%]	After leaching [%]	Preatreated with sodium silcate and OHT [%]	After leaching [%]
Scots pine	0	29,9	2,1	2,3
Poplar	2,5	32,0	1,9	0,8
Black alder	1,1	26,2	1,1	2,7

Conclusion

- OHT wood pretreated with sodium silicate reveal resistance to *Poria placenta,* regardless to the species of wood
- OHT process limited leaching effect of used chemicals
- The sodium silicate increased the hygroscopicity of scots pine and black alder by about 30% and of poplar by about 70%.
- Organosilicon compounds did not show any significant improvement of the tested wood properties.

Thank you for your attention