

## THE IMPORTANCE OF COLD TACK OF UREA FORMALDEHYDE IN PLYWOOD PRODUCTION

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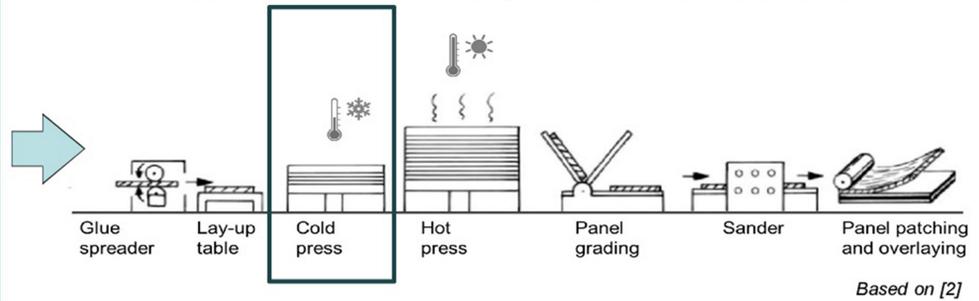
### BACKGROUND [1]:

In plywood production it is common practice for veneers to be pre-pressed. It activates the cold tack of the urea formaldehyde (UF) resin, ensuring that the veneer layers fit into the narrow openings of a multi-daylight hot press. This study investigated the influence of various factors that can affect cold tack during plywood production, using tensile shear strength (TSS) as a parameter to assess the quality of cold tack.

### OBJECTIVES:

- Define influencing factors
- Develop an experimental setup
- Determine the effect of each factor on cold tack
- Identify interactions between the factors

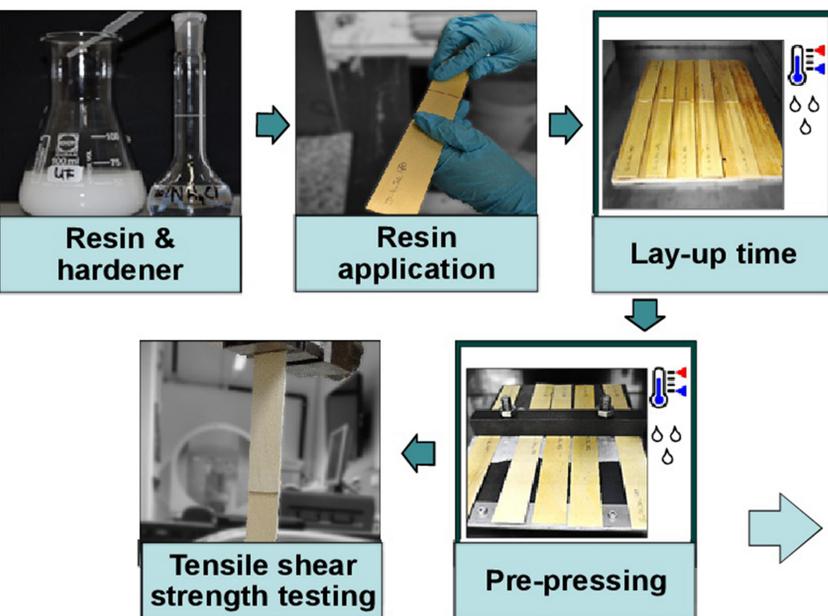
### OUTLINE OF PANEL LAY-UP, PRESSING AND FINISHING



### FACTORS

FACTOR	MIN	MEAN	MAX
Lay-up time [min]	10 – 15	20 – 25	30 – 35
Resin amount [g/m <sup>2</sup> ]	90	120	150
Resin age [week]	1	2	3
Veneer moisture content (MC) [%]	4	8	12
Veneer temperature [°C]	10	20	30
Pre-press time [min]	15	30	45

### EXPERIMENTAL SETUP

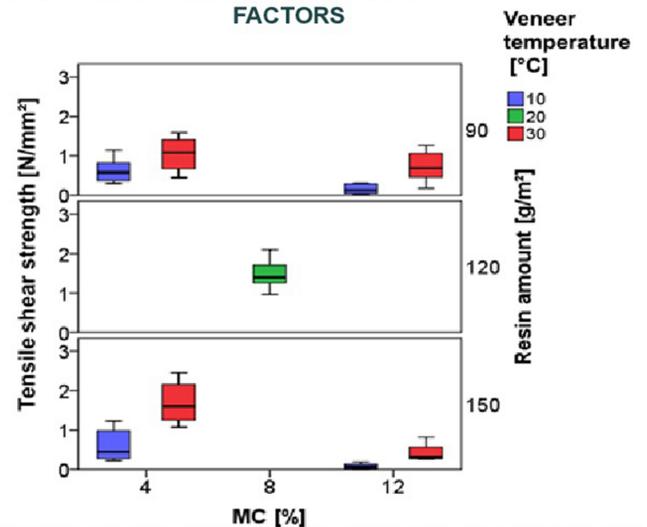


### CONCLUSION [1]:

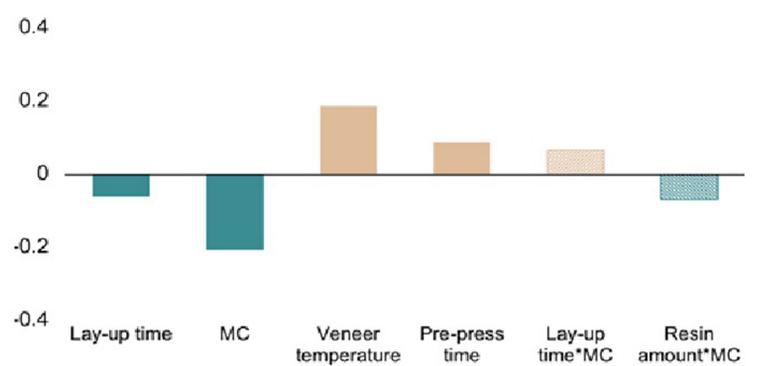
- Factors lay-up time, veneer MC, veneer temperature, pre-press time have a significant influence on cold tack
- MC and veneer temperature have the **strongest effect** on cold tack
- **Interactions** between lay-up time and MC, resin amount and MC have a significant effect on cold tack
- 3D models can be used for **adaption and optimization** of the different factors and therefore the cold tack during plywood production
- The **experimental setup** can be used for further tests (e.g. other factors, different adhesive formulations)
- Cold tack is very important during production, but has no influence on the performance of a **cured glue joint**<sup>[3]</sup>

### RESULTS

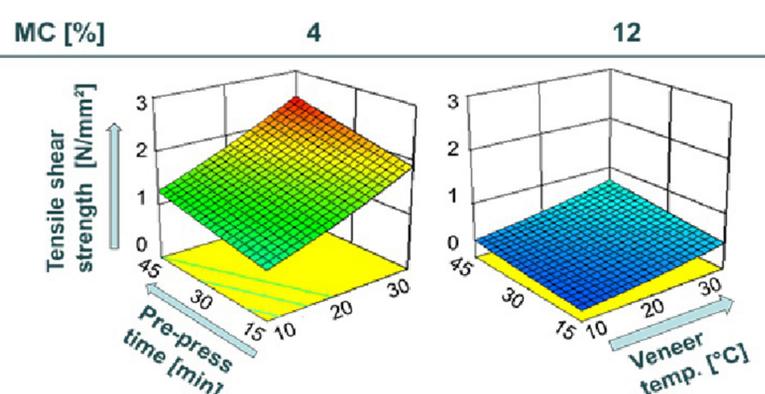
#### TENSILE SHEAR STRENGTH DEPENDING ON VARIOUS FACTORS



#### EFFECT OF SIGNIFICANT CODED FACTORS



#### 3D MODELS FOR ADAPTION AND OPTIMIZATION



[1] E.M. Hogger, H.W.G. van Herwijnen, J. Moser, W. Kantner, J. Konnerth, *European Journal of Wood and Wood Products* 2018, 76, 1391-1398

[2] S. Shi and J. Walker, *Primary wood processing: Principle and practice*, 2006, 391-426

[3] E.M. Hogger, H.W.G. van Herwijnen, J. Moser, W. Kantner, J. Konnerth, *European Journal of Wood and Wood Products* 2019, 77, 487-490