

# **APOS CureKT - NIR measurement of curing degree after short cycle (,KT') press**

Wedel, 06/23

# **APOS – the Company**

- Founded in 2010
- Initial focus on biomass CHP's, since 2012 products for the panel board industry, flooring...
- System integrator for robust industry spectroscopy solutions
- APOS is part of **Nynomic AG Group**, 10 companies, 500+ team
- All optical hardware components are manufactured within the group in Europe
- Software and system integration developed by APOS

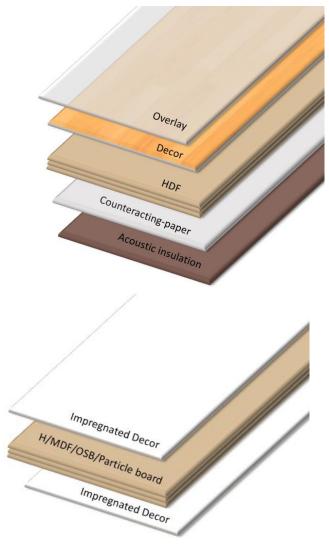




#### **PAST: Acid Test to determine curing degree**

Background:

- In production of floor, furniture or wall panels, the pressing (short cycle press) of (several) resinimpregnated papers is carried out on (woodbased) panels
- Curing degree is routinely determined on a production line using a so-called acid test
- The curing degree of the hardened resin determines the surface quality
- The laboratory analysis is time and material consuming
- The laboratory analysis can be replaced by an online spectroscopic measurement





#### **NOW: CureKT online measurement of curing degree**

Online measurement has many advantages:

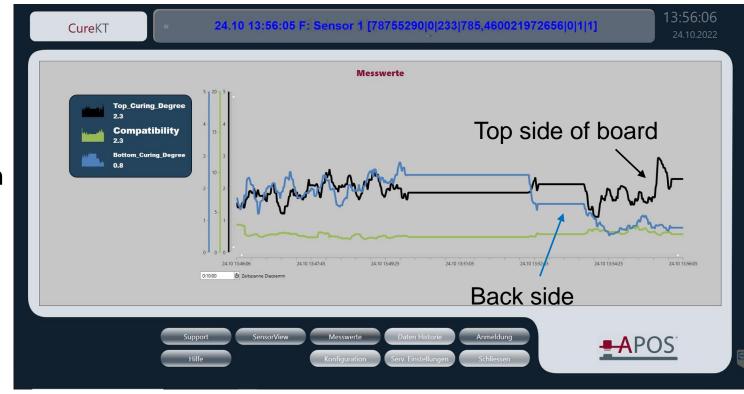
- Permanent online control of production process and ad-hoc reaction to changes – reduce misproduction
- Production speed can be increased get closer to the max by online monitoring of quality
- Time-consuming laboratory procedures are replaced by online measurements
  - No chemicals
  - Continuous monitoring
  - Reduction of material loss
- Product quality is improved
- Material waste can be reduced
- Based on the reference method of acid test and visual assessment
- Reference methods that show similar results, e.g. photometer assessment, are also covered





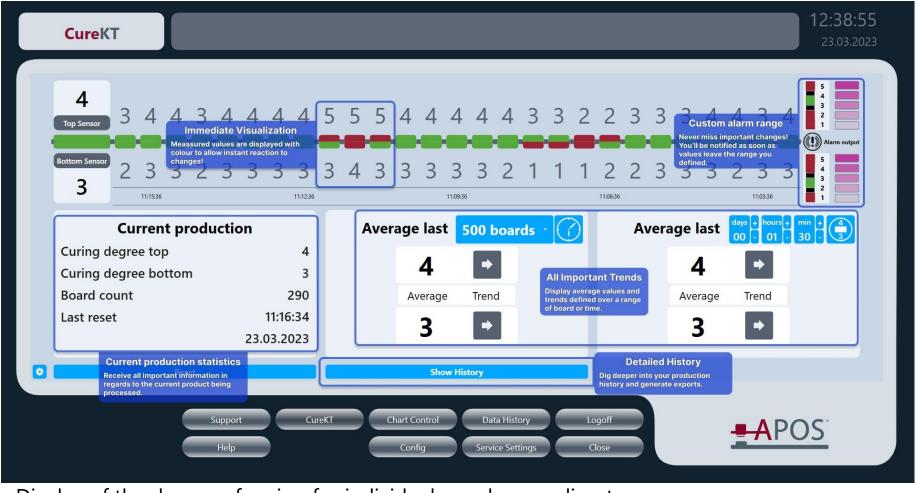
# **Process Visualisation**

- Visualisation can be for one or multiple sensors per line
- Physical systems of e.g. two lines can be shown in one visualisation
- Can be classical line chart or other displays
- Target curing corridors can be defined per sensor
- System shows whether production is in corridor
- Alarms can be set
- Integration to SCADAs easily possible





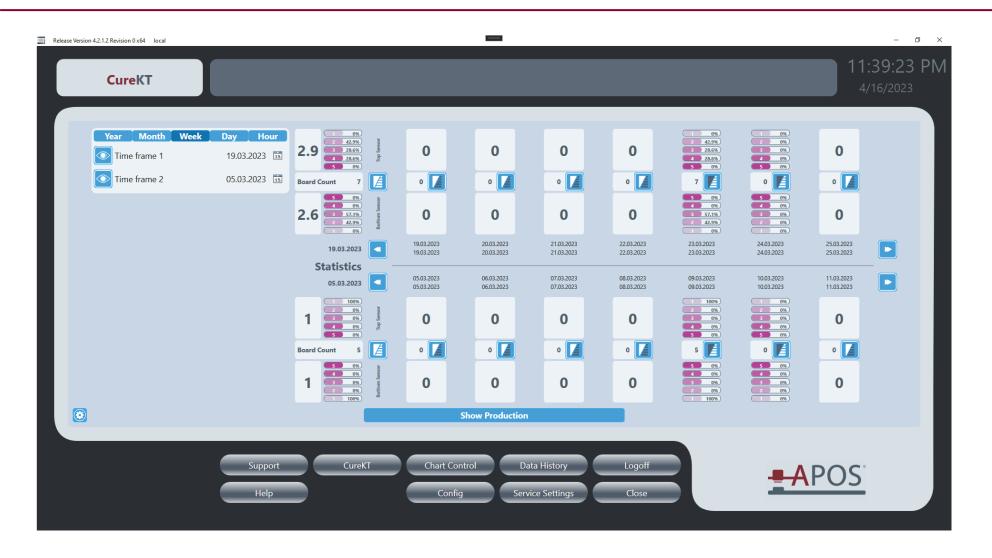
#### **Visualisation CureKT as Batch prozess**



 Display of the degree of curing for individual panels according to production sequence



### **History of the CureKT**





### **Savings with APOS CureKT**

Sample calculation for savings potential:

- Savings potential of >EUR 100,000 per year possible
- Online measurement replace Lab
  - No destroyed boards/no boards with test marks
  - Reduced Lab costs
- Reduced customer complains
  - Typical complains ratio in the industry between 0,3-0,5%
  - Reduction of complains ratio possible as defects are recognized by the system IMMEDIATELY

Product APOS CureKT for coated surfaces, furniture			
Application	Curing degree after short cycle ('KT') press, as a r	replacement for	acid test
Assumptions	SC Press speed	180	Pressungen/h
	Working width	2,07	m
	Working length	5,2	m
	Production per h	1.938	m²/h
	Production days	290	/a
	equals operating hours	6.960	h/a
	Price coated board	3	EUR/m²
	Production volume m <sup>2</sup> / year	13.485.139	m²/a
	Acid testing curing degree every	8	h
	Curing test (example: 180 boards every hour. When testing every 1.5 hours, one of 270 boards (180 * 1.5) is tested, corresponding to $100 / (180 * 1.5) = 0.37\%$ )	0,07	%
	Square meters of board with test/inspection marks	9.365	m²/a
	Price of boards with inspection marks	1	EUR/m²
	Revenue lost with boards with inspection marks	18.729	EUR/a
Effort quality control	Time used per board/test (sawing, transport of sample, acid treatment, cleaning, comparison, storing/documenting)	20	Min
	Total costs employee per h	50	EUR/h
	Costs per day	50	EUR
	Costs per annum	14.500	EUR
Savings (revenue not lost due to boards not damaged, saved QC effort)		42.594	EUR/a
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Further Savings potentia			
Material, complains reductoin	Percentage quality claims without CureKT	0,3	%
	Percentage quality claims with CureKT	0,15	%
	Avoided claims	20.228	m²/a
	equals number of truck loads	4,5	trucks
	avoided damage by improved quality	60.683	EUR/a
Savings	per annum	60.683	EUR/a
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	Total improvement	103.277	EUR/a



# **APOS GmbH**

