

**SALES PROMOTION**

# NEWS

# ENERGY SAVING

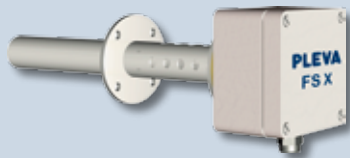
**CINTEX**  
TEXTILE AUTOMATION

NEWS 2021\_1

## Control of air humidity on drying process

**FS**

**FSC**

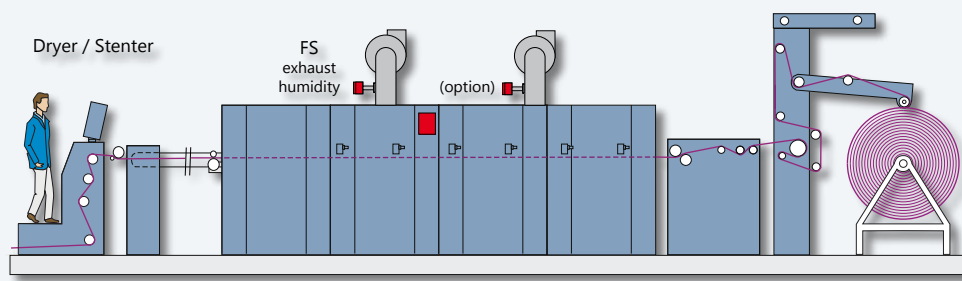


Air humidity sensor FSX



PLEVA FS Box

- Great effect in energy saving up to 35%
- Short payback time within 2..3 months
- High fabric quality by constant humidity



### Optimized drying process

#### Optimal humidity at drying process

Circulation air loaded with humidity is a perfect energy transfer medium. The most efficient humidity range in the dryer is between 80..130 g/kg water per kg air, corresponding to 11..18 Vol % for drying temperatures between 120 °C and 160 °C.

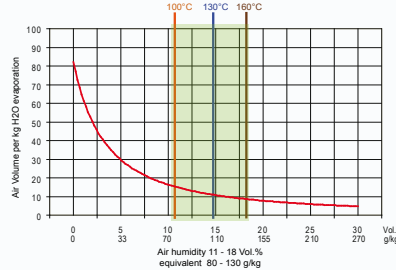
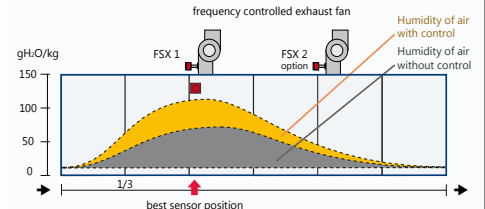


Table of optimal humidity at different drying temperature

#### Optimal loading of air with humidity

The measurement and control of the humidity in the dryer allows to load the air to an optimum degree with water vapour (humidity). The higher the humidity, the smaller the quantity of exhaust air and with that the smaller energy consumption.



Humidity distribution in a stenter with / without control

### Air humidity



#### Air humidity measurement and control



The air humidity measurement FS is used to minimise the energy consumption of drying processes in dryers and stenter.

The maintenance free exhaust humidity sensors type FSX measures the humidity of the process air to control the exhaust air rate for an economic efficiency on drying process.

Device variants:

- A) Set Exhaust air humidity measurement FS
  - 1x FSX ST sensor, incl. cable 10m length to FS-Box
  - 1x PLEVA FS-Box as measuring unit
- B) Set Exhaust air humidity measurement+control FSC
  - 1x FSX ST sensor, incl. cable 10m length to FS-Box
  - 1x PLEVA FSC-Box as measuring and control unit

Frequency inverters for exhaust fan is required to control automatically exhaust air volume of the dryer.

### Great savings



#### Great effect in energy saving • Short payback time • Sample calculation with customer data

Big savings in energy are guaranteed through the automatic regulation of the exhaust air volumes in existing and new drying systems.

The example shows the cost savings on the dryer with automatic control of the exhaust air volume compared to a dryer without control.

The payback is within 2..3 months or less depending on the production capacity.

#### Economic Efficiency Calculation - OIL Heating based on heavy oil

Customer:	Sample with 90g/kg	
	Value	Dimension
<b>1. Customer data</b> (red triangle: fill!)		
Reachable exhaust air values (FSX sensor)	90	g/kg
Fabric weight	0.25	kg/m <sup>2</sup>
Fabric width	1.6	m
Incoming fabric pick-up in %	60.0	%
Residual moisture in the outlet in %	8.00	%
Fabric speed	30.0	m/min
Installed exhaust air volume (m <sup>3</sup> /h)	18000	m <sup>3</sup> /h
Price 1 kg of OIL	0.31	€/kg
Efficiency of combustion at direct heating	0.8	
Air temperature inside the dryer (°C)	150	°C
Air temperature of the inlet air (°C)	40	°C
Working hours per year	4900	h
Investment costs for control device	10000	€
<b>2. Fixed values</b>		
Density of air inside the stenter	0.80	kg/m <sup>3</sup>
Energy burning of 1 kg of OIL (calorific/heat value)	40	MJ/kg
Specific heat capacity of the air (kJ/h)	1.00	kJ/(kg·°C)
<b>3. Intermediate result: Energy demand for unnecessary heated exhaust air (MJ/h):</b>		
	1126.4	MJ/h
<b>4. Intermediate result: costs per MJ</b>		
	0.0097	€/MJ
<b>5. Savings</b>		
<b>5a. Savings per year (C/year):</b>	<b>53'469 €</b>	<b>/year</b>
<b>5b. Savings per month (C/month)</b>	<b>4'456 €</b>	<b>/month</b>
<b>6. Return on Investment RoI</b>		
<b>6a. RoI in years</b>	<b>0.19</b>	<b>years</b>
<b>6b. RoI in months</b>	<b>2.24</b>	<b>months</b>



Ask for your best price at

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