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Sensors and Controls

Sustainable SuccessStory at Spunlace Process:

Reducing Gas Consumption at Drying of Nonwovens

The Situation

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SÄCHSISCHES TEXTIL FORSCHUNGS INSTITUT e.V.

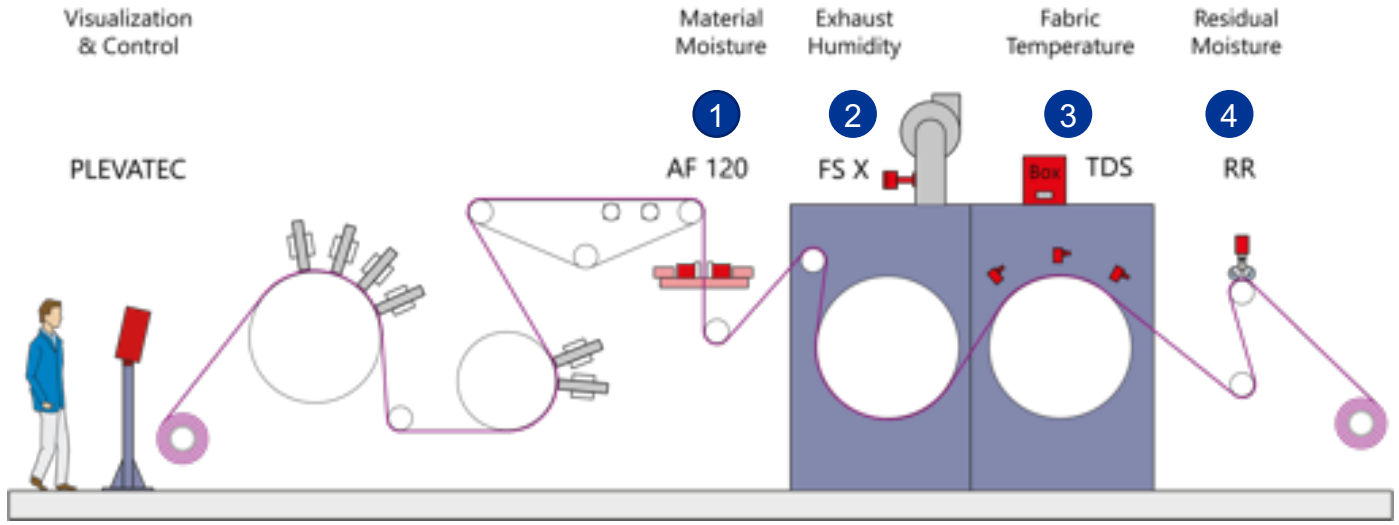
Spunlace laboratory facility at
Center of Excellence in Nonwovens
at STFI (Sächsisches Textilforschungsinstitut e.V.), Chemnitz

https://www.stfi.de/en/research/nonwovens

- Production of nonwovens with area weights of 20, 50, 80 g/m² for **hygiene articles**, **wet wipes**, **partly hollow fibers with high water absorption capacity**
- Materials: viscose, PES
- Residual moisture values after AquaJet in range of 20...80 g H_20/m^2

For an **energy efficient** spunlace production,
a measurement and control concept consisting of **sensors** for **residual moisture, fabric temperature** and **exhaust humidity** as well as a **process control system** was required.

The Solution



1 Moisture measurement (AF 120)

- Contactless microwave measurement of incoming moisture after spunlace process with AquaJet
- Determining water content for dryer optimization

2 Air humidity measurement (FS X)

- Continuous humidity measurement at exhaust duct of drum dryer
- Controlling of optimum humidity via exhaust fan speed

3 Fabric temperature measurement (TDS)

- Continuous, contactless measurement of nonwoven fabric temperature inside double drum dryer
- Ensuring that quality is not affected by overheating

4 Residual moisture measurement (RR)

- Contact measurement of low residual moisture after drum dryer
- Optimizing of drying temperatures for natural moisture content according to fiber/material

The Success

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At customer trials the goal of saving energy was achieved.

AF 120 after AquaJet before drum dryer

Relevant process optimization steps:

- Lowering drying temperature by running on target moisture
- For viscose, setting to 5-7% residual moisture
- **Reducing drying temperature by 40°C** (from 100°C to 60°C)

→ Equals gas volume reduction of ~ 20%

Transferability to industrial dryers is given.

The Sustainable Success

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"The profile of the residual moisture after the AquaJet and the drying temperature (fabric temperature) allow **new optimization possibilities in the drying process**. Gentle heating curves become possible, which **prevent nonwoven surface damage**. Also, the process and tolerance monitoring enables the improvement of the nonwoven quality, as it is not exposed to unnecessarily high drying temperatures."

Andreas Nestler, Research Associate at STFI

Our impact as your
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- **Increased energy efficiency and lower CO_2-emissions** due to lowered drying temperatures
- **First-Time-Right Principle**: prevention of surface damages and improvement of quality
  → Less second choice goods or rejects which equals waste of resources