

Improved Shrinkage on Relax Dryers (Open width knit goods and terry towelling)

The excellent dimension stability on cellulose knitted fabrics is getting the most important criteria for the consumer nowadays because of easier washing and more tumbler drying in the households as well. This target should be reached without any chemical products. The well proven PLEVA fabric surface temperature sensor TDS 95 and the exhaust humidity sensor FS 91 linked with the advanced CINTEX control system allows the perfect adjustment of relaxation conditions to improve shrinkage, increase productivity and to save energy significantly as well.

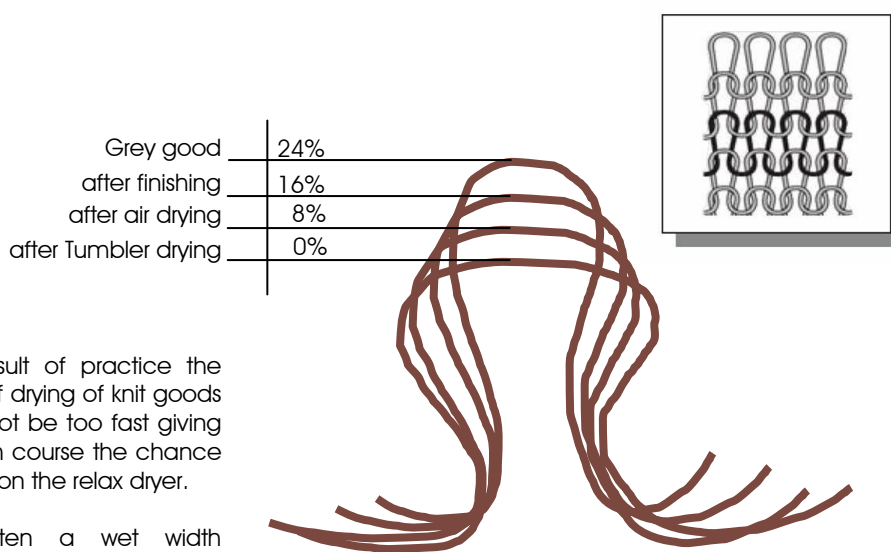


Fig. 1: Shrinkage potential of knit goods in different process stages (source: Rouette/Peter)

As a result of practice the speed of drying of knit goods should not be too fast giving the stitch course the chance to shrink on the relax dryer.

Very often a wet width expansion is installed just before the inlet of the relax dryer to unblock the stitcher of the knit goods for easier longitudinal shrinkage.

Drying temperatures between 120 - 145 °C are established.

Unfortunately on relax dryers the target to dry to the hygroscopic equilibrium of the fibre (CO = 8,5% moisture) cannot be realised.

Why?

If the residual moisture during relaxation is higher than approximately 5% the shrinking mechanism is disturbed and the optimum shrinkage results cannot be achieved. This is generally confirmed and well known in the market.

The solution

The new PLEVA/CINTEX software is controlling the optimised chamber humidity as well as the ideal surface temperature of the fabric using a defined short dwell time in seconds (2-4 s) getting the best possible shrinking conditions on relax

Advantages and benefits of the sensor package and control software

- ◆ Low intervention by operator required
- ◆ Increase of productivity of up to 33 % in same high quality standard
- ◆ Significant energy saving (gas and electricity) of up to 25 %
- ◆ Uniform good shrinkage level from beginning to the end

Retrofit Package

for existing and new equipment

Excellent Shrinkage%

Soft Handle

Energy Saving gas/steam/electricity

Higher Productivity

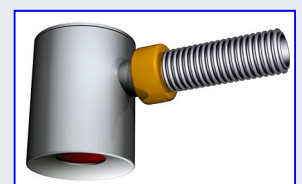


Fig. 2: TDS 95 Sensor

Control of Relaxation on Relax Dryers for Knit Goods



Fig. 3: FS 91 Exhaust Humidity Sensor

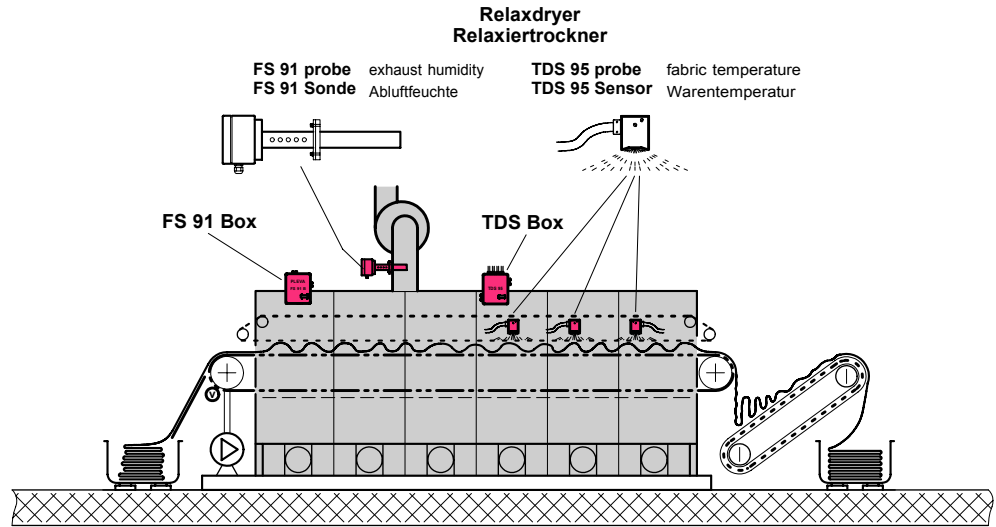


Fig. 3: Relax dryer for knit goods

Problems in relaxation

Frequently arising problems which affect the product quality and the costs:

- ◆ Poor shrinkage results
- ◆ Harsh handle due to overdriving
- ◆ Poor productivity
- ◆ High energy consumption due to high wet pick-up of knit goods

Components

The following parts are required to control the drying process on a relax dryer with the new control concept:

HeatSetCOMPACT (CP35)

3 x TDS 95 S Sensors
+ TDS 95 B (Electronic Box)

1x FS 91 S Sensor
+ FS 91 B (Electronic Box)

Concept of control

The basic information of the actual situation in the dryer is measured by three sets of PLEVA fabric temperature sensors TDS 95. They are installed inside the dryer above the conveyor belt.

The TDS 95 sensors are measuring the air temperature inside the dryer as well as the surface temperature of the fabric and detect the temperature profile during production.

The setting is defined in a

- ◆ Defined surface temperature
- ◆ Short dwell time in seconds (4 - 6 sec)

The short dwell time is used to level out unevenness in drying over the width (slightly curling single jersey fabric)

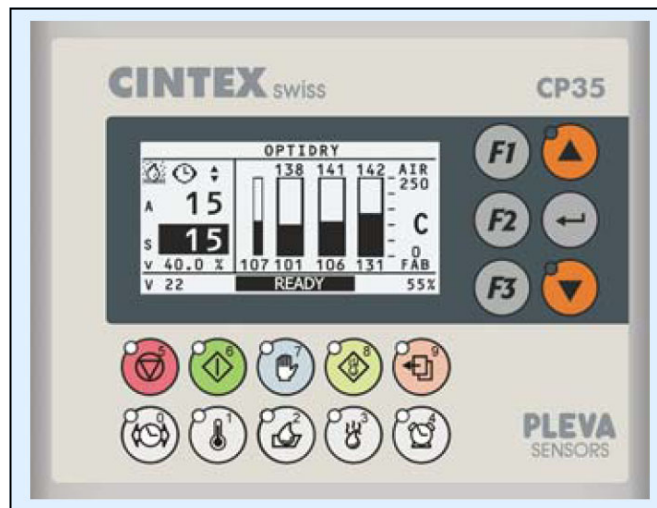


Fig. 4: **COMPACT Controller CP35**

The controller CP35 is equipped with a special software to control the drying process on a relax dryer for perfect results. The controller is able to detect the actual

air humidity (g H₂O/kg) and fabric temperature (°C) in connection with the PLEVA sensors. The drying process is then controlled by varying the speed of the dryer.



Fig. 5: TDS 95 S mounting

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