

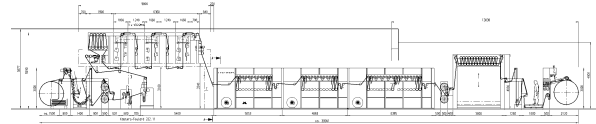
## Demands on Modern Continuous Dyeing Ranges

21st IFATCC International Congress, Barcelona 6-9 May 2008

Leader in Innovation

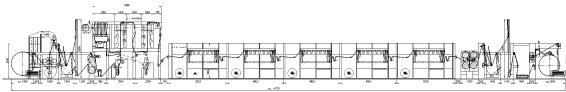
Dipl.-Ing. Kurt van Wersch

### Continuous dyeing range



2  
4 Demands on Modern Continuous Dyeing Ranges

### Continuous dyeing range



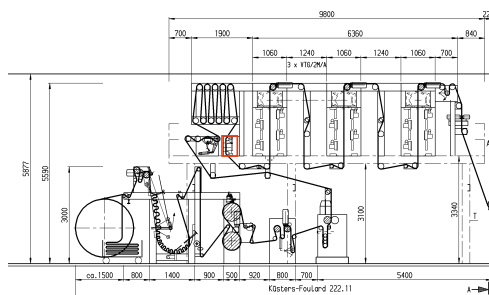
3  
4 Demands on Modern Continuous Dyeing Ranges

### A 'Must' for every continuous dyeing range

- ▶ Constant temperature across the whole width of the range
- ▶ Constant nozzle pressure across the whole width of the range
- ▶ Variable nozzle pressure
- ▶ Variable exhaust air volume
- ▶ Drying with lowest migration
- ▶ Optimum roller diameter
- ▶ Optimum roller distance
- ▶ Lowest possible energy consumption
- ▶ Environment-friendly working method (right in first time)

4  
4 Demands on Modern Continuous Dyeing Ranges

### Continuous dyeing range



5  
4 Demands on Modern Continuous Dyeing Ranges

### What do we have?

- ▶ Wet cloth run
- ▶ Dyestuff is not fixed yet
- ▶ No forecast possible how the colour will look like

6  
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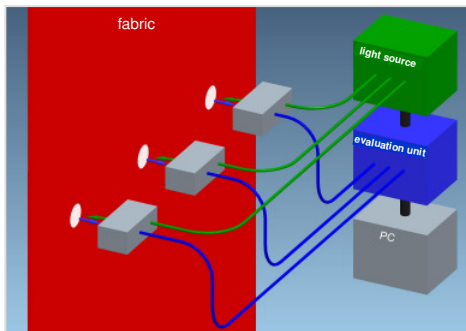
## What do we want?

- ▶ We would like to examine a dyed cloth run in terms of colorimetry to be able to say if the centre of the cloth run looks exactly like the edges, i.e. if the cloth run has been dyed in a uniform way.

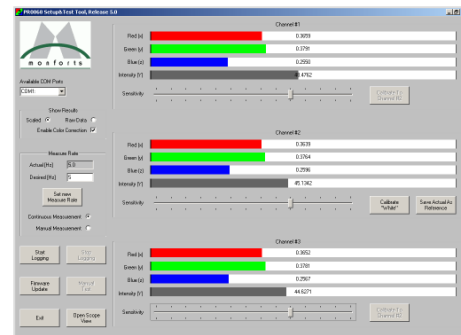
## Measuring methods

- ▶ 1 source of light (white light diopter) LED
- ▶ 3 sensing heads
- ▶ 3 colour sensors
- ▶ 6 fiber-optical light guides
- ▶ Measuring frequency 5 Hz (5 measurements/second i.e. 300 measurements/minute)
- ▶ 1 visible measuring flash = 300 single flashes (suppression of ambient light)

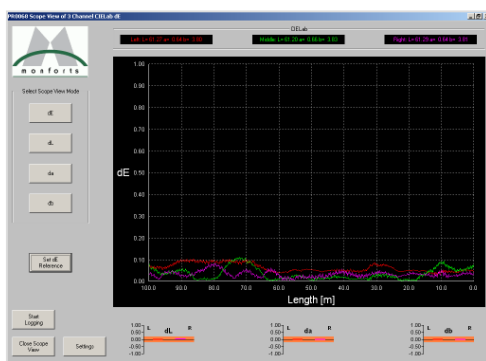
## Principle of the Colour Nip Control



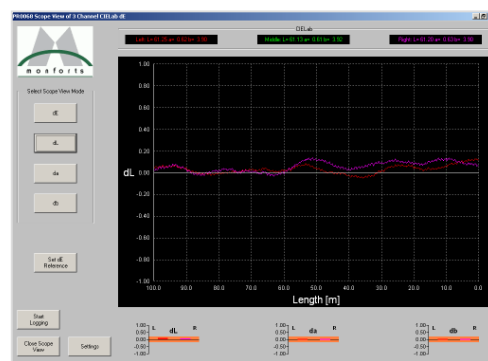
## Colorimetry



## dE



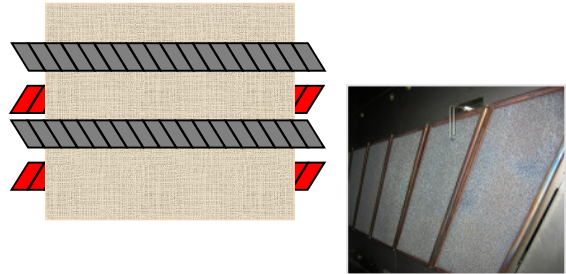
## dL



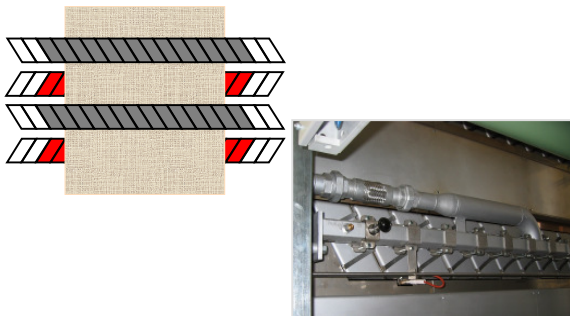
### Infrared predryer VTG 2x2



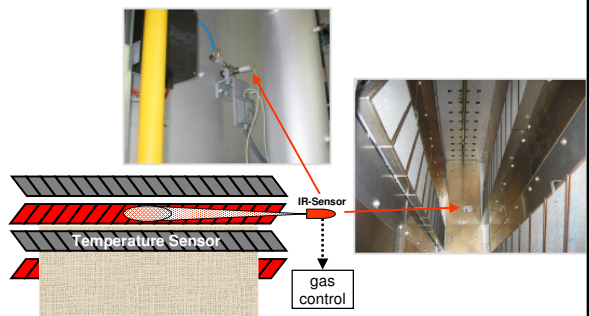
### Metal foam radiator elements rhombic arrangement



### Edge zone shut down



### Infrared temperature control



### What do we want?

- ▶ **More benefits for the customer through adaptation possibilities for**
  - Fabric running behaviour
  - Fabric capacity
  - Drying and dwell performance
  - Wider range of processes
  - Even higher level of quality
  - Lower energy consumption

- Solution** → **New design of the Thermex 7000 for**
- Dye drying
  - Thermosoling
  - Curing

### Thermex 7000 – Loop distance

- ▶ 3 different **loop distance possibilities** in 1 hotflue
- ▶ Loop distances with 180 mm roll diameter
  - 620 mm
  - 1020 mm
  - 1420 mm

### Thermex 7000 – Fabric capacities

- ▶ 3 different **fabric capacities** in 1 hotflue
- ▶ Fabric capacities of Thermex-B with 180 mm roll diameter
 

Roll distance	Fabric capacity (approx.)
▪ 620 mm	23 m
▪ 1020 mm	33 m
▪ 1420 mm	43 m
- ▶ Thermex-C in preparation

### Thermex 7000 – Drying performances

- ▶ 3 different **drying performances** in 1 hotflue
- ▶ Drying performance of Thermex-B with 180 mm roll diameter
 

Roll distance	Drying performance
▪ 620 mm	} dependent on machine width
▪ 1020 mm	
▪ 1420 mm	

### Thermex 7000 – Production speeds

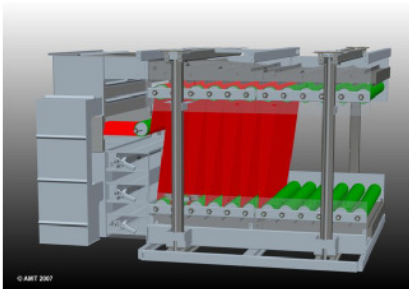
- ▶ 3 different **production speeds for dwell processes such as thermosoling or curing** in 1 hotflue
- ▶ Production speeds with 60 seconds total time, Thermex-B with 180 mm roll diameter
 

Roll distance	Production speed (approx.) Thermex-B
▪ 620 mm	23 m/min
▪ 1020 mm	33 m/min
▪ 1420 mm	43 m/min

### Thermex 7000 – Design features

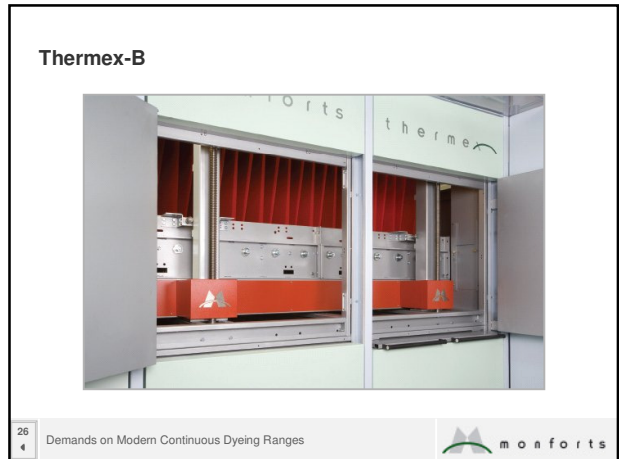
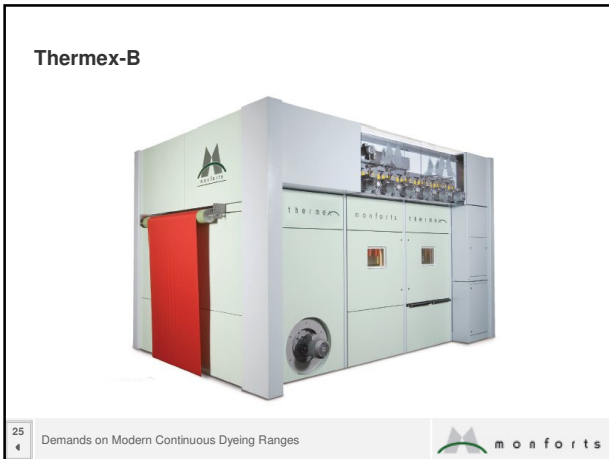
- ▶ Upper nozzle block and roll drive **fixed**
- ▶ Lower nozzle block with idle rolls **variable** to 3 distances
- ▶ Free choice of heating methods
- ▶ Precision temperature control in all 3 stages
- ▶ Precision air guidance for all 3 stages
- ▶ Can be integrated into the heat recovery concept

### Thermex 7000 – Functional principle



### Thermex-B





**Customer benefits for drying, thermosoling and curing** Part 1

- ▶ **Use of various processes**  
Pad-dry, Pad-dry-thermosol, Pad-dry-thermofix, Econtrol®, Moist cross-linking (MXL®), curing
- ▶ **Possibility of selective different heating methods**  
Steam, circulating oil, direct gas, indirect gas
- ▶ **Possibility of operating with a wide variety of fabric types**  
100% Co, 100% Co mercerised, Pes/Co in a wide variety of blends, Pes/viscose, Co + elastane fibres in the weft, Co + elastane fibres in warp and weft
- ▶ **Possibility of operating with a wide variety of weight classes**  
80 – 1,000 g/m<sup>2</sup> through to fleeces with 20 - 25 g/m<sup>2</sup>
- ▶ **Roll diameter 180 mm**

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**Customer benefits for drying, thermosoling and curing** Part 2

- ▶ **Adaptability to the fabric running behaviour with delicate articles**  
thanks to variable fabric capacities and roll distances

Roll distance with 180 mm dia.	Fabric capacity Thermex-B with 180 mm dia.
620 mm	23 m
1020 mm	33 m
1420 mm	43 m

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**Customer benefits for drying, thermosoling and curing** Part 3

- ▶ **Influencing of the drying performance**  
through variable fabric capacities
- ▶ **Influencing of the dwell time**  
through variable fabric capacities
- ▶ **Influencing of the drying performance**  
through infinitely variable circulating air fan speeds
- ▶ **Precise treatment temperature**  
in all 3 stages
- ▶ **Precise nozzle pressure**  
in all 3 stages
- ▶ **Extremely low energy consumption**  
(possibility of heat recovery)
- ▶ **High level of quality**  
of the treated fabrics

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**Application examples: Material PES/Co 65/35**  
Roll diameter 180 mm

VTG 2 x 2    VTG 2 x 2    Thermex B-B Drying 120 °C, initial moisture 55%    Thermex B-B Thermosoling 220 °C, 40 sec.

Case A: Weight 375 g/m<sup>2</sup>    v = 34 m/min.    ➔ Full use of whole range

VTG 2 x 2    VTG 2 x 2    Thermex B-B Drying 120 °C, initial moisture 55%    Thermex B-B Thermosoling 220 °C, 40 sec.

Case B: Weight 125 g/m<sup>2</sup>    v = 63 m/min.    ➔ Drying section too large

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### Changes in application B, Material PES/Co 65/35

Roll diameter 180 mm

VTG 2 x 2    VTG 2 x 2

Thermex B-B    Thermex B-B

Drying 120 °C, initial moisture 55%    Thermosoling 220 °C, 40 sec.

Case B1: Weight 125 g/m<sup>2</sup> v = 63 m/min.    Saving in electrical energy: 24 %  
 Saving in heat energy: 16%

VTG 2 x 2    VTG 2 x 2

Thermex B-B    Thermex B-B

Drying 120 °C, initial moisture 55%    Thermosoling 220 °C, 40 sec.

Case B2: Weight 125 g/m<sup>2</sup> v = 82 m/min.    Increase in production: 30%

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### Our goal

- ▶ Remain world market leader in continuous dyeing range construction
- ▶ Further strengthen our market position

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# Thank you!

Demands on Modern Continuous Dyeing Ranges

Leader in Innovation

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