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Responsible processing – dyeing and finishing

How to reduce textile dyeing‘s environmental footprint?

John Murphy, Technical Resource Director Europe

Water – a vital and valuable resource

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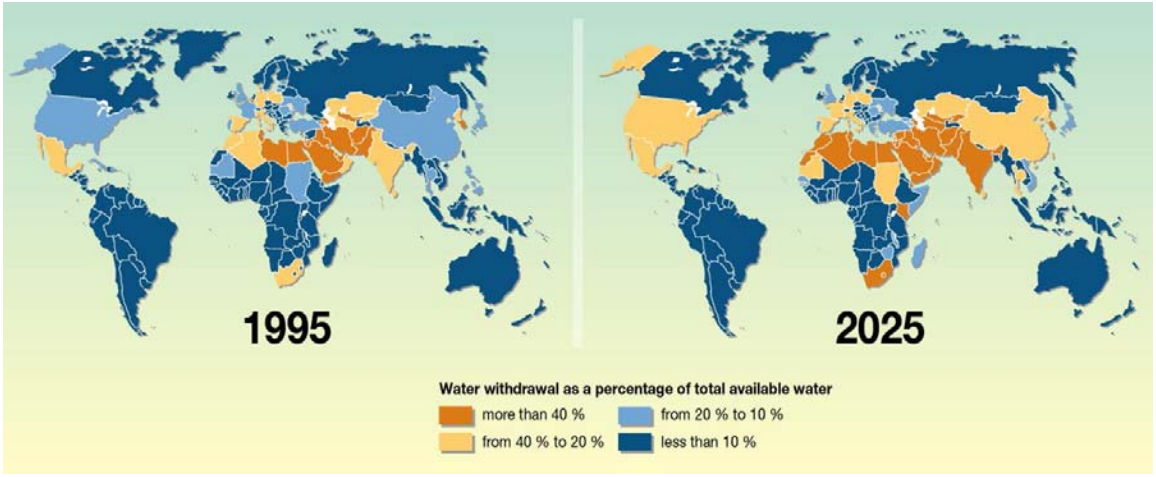
- Only 3% of the earth's water is fresh – the rest is salt.
  Water usage worldwide (estimate):
  Irrigation: ca. 69%
  Industry: ca. 22%
  Domestic: ca. 9%

- Regions with the highest urbanization rates and expanding industry are often critically short of water.



- The need of clean safe water for a rapidly growing population, industry and agriculture have to be balanced.

A major challenge for textile mills

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Industrial-scale processing of all textiles is extremely water intensive.

Water is used at all stages of processing – bleaching, dyeing and printing, finishing.

Water is growing scarcer and more expensive – precisely in regions where most textiles are processed.

Waste water pollutes if not properly treated

How Huntsman helps

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- By reducing the environmental impact of our own manufacturing processes.

- By providing textile mills with products and processes that

- reduce water and energy consumption

- reduce effluent

- improve yield

- By enabling consumers to reduce water and energy consumption during washing, tumble drying and ironing.

I **I**ndustrial

M **M**anufacturing processes

P **P**roduct

A **A**pplication

C **C**are of the

T **T**extile

Water Footprint in Textile Processing

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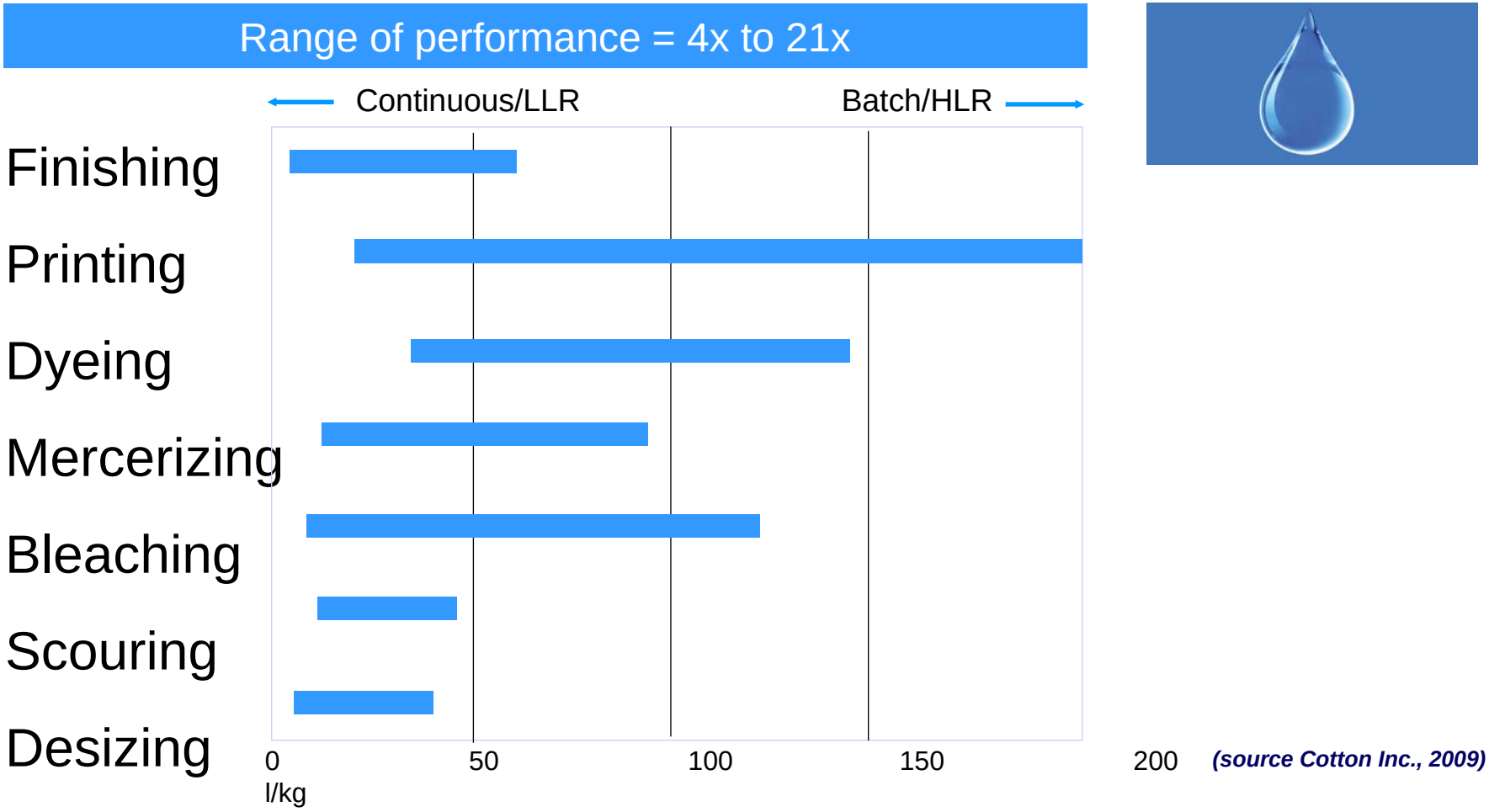
Water consumption by Wet Processing Step



(source Cotton Inc., 2009)

Cotton processing consumes masses of water

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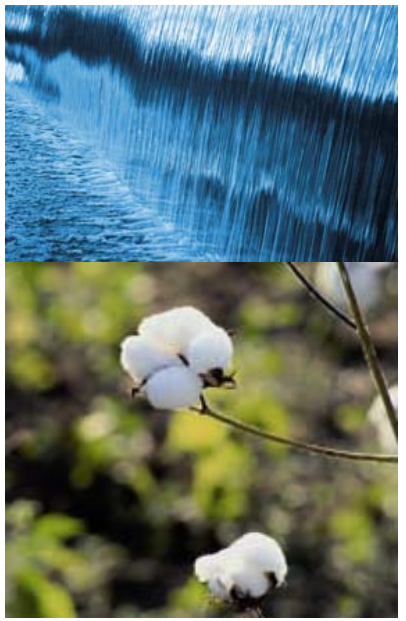

The highest volume textile fiber, cotton, is most frequently dyed with reactive dyes.

Average amount of water consumed in dyeing **1 kg** of cotton (excluding pretreatment and finishing):

- Using conventional dyes:

60 to 80 liters

- Using today's best available technology (BAT):

30 to 40 liters

Reactive dyeing technologies

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In the conventional reactive dyeing process, 20-40% of the dye molecules are damaged and incapable of fixation.

Removing unfixed dye is a long, hot, expensive, water- and energy-intensive process.

- ***Hot dyeing systems*** = 80° C + boiling water for rinsing
- ***Conventional warm dyeing systems*** = 60° C, but high water consumption and washing-off temperatures
- ***Best Available Technology*** requires less water for washing off

New reactive dyeing technology

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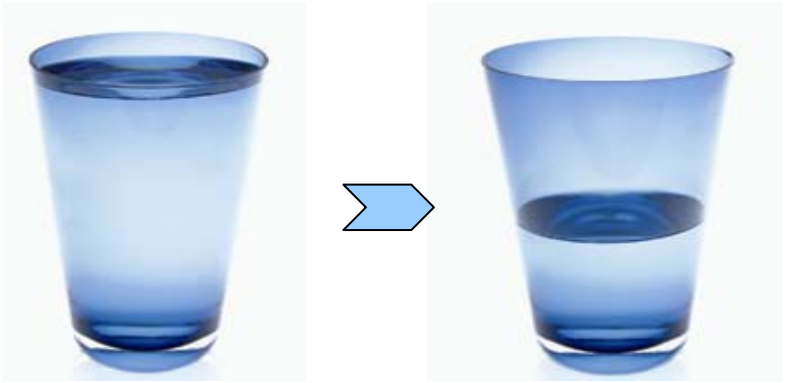
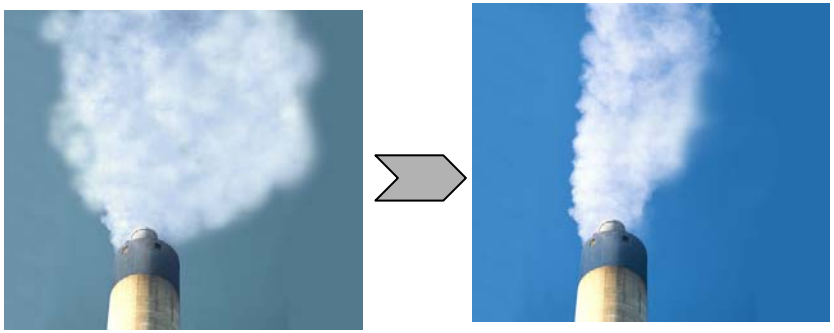
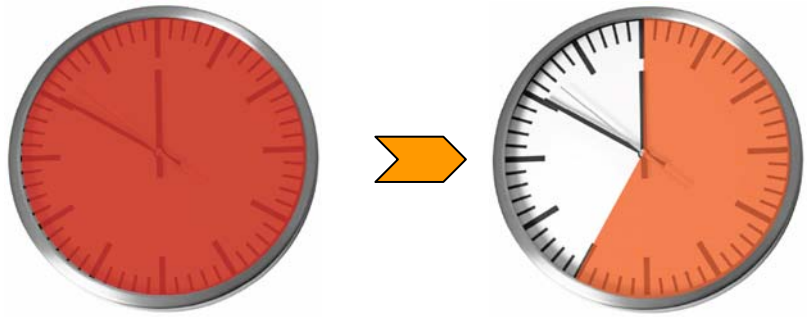
50% less water



50% less CO_2



30% less time



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Actions speak louder than words

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M&S plan A

Sun Hing Factory in China, chosen as ‘eco dyehouse’ prototype

Huntsman selected as exclusive technology partner

Audited 7 criteria

1. Energy Consumption & associated emissions
2. Water Consumption, Recycling and Discharge (quantity/quality)
3. Chemicals Usage and Toxicological Impact
4. Waste Reduction for solids, water and air emissions
5. Health and Safety Management & Compliance with M&S C99 standards
6. Capacity Utilization including Right First Time (RFT) and reproducibility
7. Commercial Performance for costs and improved productivity

Results

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The Huntsman Team established a process technology plan:

Dyeing System for Sensitive Colors on Cotton

A Short Dyeing System for T/C Blends

Pretreatment System

- ✓ 34% of total energy savings and 30% of total water savings
- ✓ 30% of dyestuff (in volume) could be reduced for dyeing cotton in dark shades
- ✓ 50-80g of chemicals per kg fabric reduction is possible

productivity can be improved by more than 35% for all recommended dyeing process, for pretreatment a 10% improvement is possible

Win-win situation for people, environment and profit !

We are all responsible

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The technology we need is available today.

It is up to each and every link in the textile chain to take responsibility, make the change and communicate this to all stakeholders.

The WHO recommends 1.3 liters of fresh water per person per day

Tapping in to all the potential savings could acheive this for the population of Bangladesh, India and China!

It will take courage, commitment and partnership

Long term sustainable partnership

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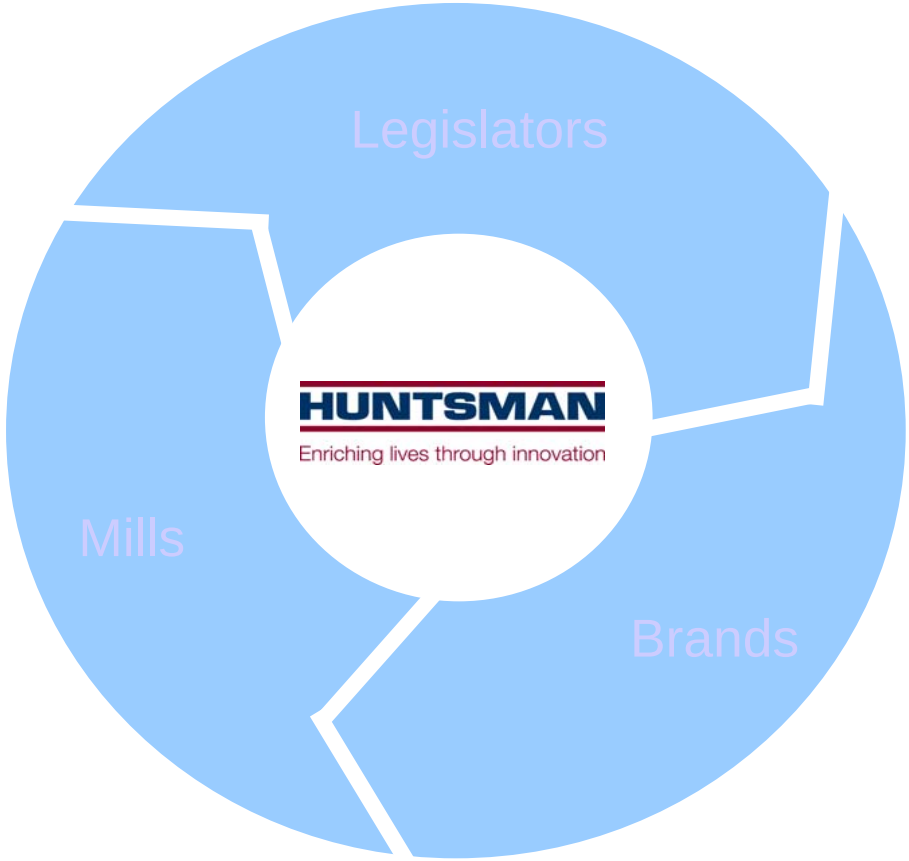
Opportunity today,
imperative tomorrow



THANKS FOR YOUR ATTENTION!