

Textile Dyeing in the Age of Aquarius

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The Earth



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Earth – Its Continents and Ocean

	Area (km ² x 10 ⁶)	%
Europe	10.5	2.1
Asia	43.5	8.5
Africa	30.1	5.9
North America	24.2	4.7
South America	17.8	3.5
Australia and Oceania	8.9	1.7
Antarctica	14.0	2.7
The World Ocean	361.3	70.8
Total	510.3	100.0

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	Volume (km³x10³)	Percentage of Hydrosphere	% Fresh Water
World Ocean	1338000.0	96.5	
Ground Water *	23400.0	1.7	
Fresh Ground Water	10530.0	0.76	30.1
Soil Moisture	16.5	0.001	0.05
Glaciers and Permanent Snow	24064.0	1.74	68.7
Antarctica	21600.0	1.56	61.7
Permafrost	300.0	0.022	0.86
Lakes (Fresh)	91.0	0.007	0.26
Lakes (Salt)	85.4	0.006	
Swamp Water	11.5	0.0008	0.03
Rivers	2.1	0.0002	0.006
Biological Water	1.1	0.0001	0.003
Water in Air	12.9	0.001	0.04
TOTAL	1386000.0	100	
FRESH WATER	35029.2	2.53	100

* - excl. 2 million km³ underground in the Antarctic (50% of it fresh water)

Examples of Water Crises

- Central America
- The Aral Sea
- The Yellow River - China's Northern Plain
- Major cities of Europe
- The Ogallala Aquifer
- Mexico City
- AFRICA

Annual Consumption of Cellulosic Fibres 2007

- Cotton Production – 26.9 million tonnes
- Viscose + other – 2.7 million tonnes

- Total Cellulosic - 29.6 million tonnes

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Total Water used in Wet Processing of Cellulosic Fibres

- At 100 l/kg – 2.96 trillion litres
- At 25lts/kg – 0.74 trillion litres

- In the UK we use on average 145 litres per kg per capita per day (USA is 250 lts)

- A saving of 2,220,000,000,000 litres per year is domestic water (at developed world standards) for 41.95 million people
- or Drinking water (at 2.6 litres per capita per day) for 2.34 billion people

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Domestic Water we can save

for 41.95 million people compared to national populations:

UK – 61.6 million

Spain 45.9 million

Sudan 42.3 million

Poland 38.1 million

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Drinking Water we can save

2,340 million people (34% of global population) compared to national populations :

China – 1,333 million

India – 1,170 million

USA – 308 million

The former British India – 1,500 million

The World – 6,790 million

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Domestic Water Usage - USA

American Water Works Association (Drinktap.org)

Daily indoor per capita water use in the typical single family home is 69.3 gallons (252 lts)

Use	Gallons per Capita	Percentage
Showers	11.6	16.8
Clothes Washers	15.0	21.7
Dishwashers	1.0	1.4
Toilets	18.5	26.7
Baths	1.2	1.7
Leaks	9.5	13.7
Faucets	10.9	15.7
Other Domestic Uses	1.6	2.2

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Types of Problem for the Modern Fabric Dyer

- Environment and Ecology
- Cost of Reprocessing
- Seconds and Customer Rejections
- Fabric Quality and Performance
- Production Costs

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Result of Failure to Address the Issues

- Environment and Ecology – **Closed down by Authorities**
- Cost of Reprocessing - **Bankruptcy**
- Seconds and Customer Rejections - **Bankruptcy**
- Fabric Quality and Performance – **loss of business, expensive claims**
- Production Costs – **loss of profit**

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Environmental Issues to be Addressed

- Water consumption
- Electrical Power Consumption
- Fuel consumption for Steam Generation
- Discharged Effluent
- Atmospheric pollution
- Health and Safety of Operators

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How do we save water in Jet Dyeing?

- Reuse dyehouse water
- Reduce reprocessing
- Optimise rinsing and soaping processes
- Reduce Liquor ratio

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How do we save costs in Jet Dyeing?

- **Eliminate reprocessing and shade correction (lab work, liquor ratio control, pH control, automation, etc.)**
- Optimise processes (to reduce time and energy consumption)
- Reduce consumption of water
- Reduce consumption of electrical power (lowest power motors consistent with effective operation of machine)
- Reduce steam consumption (including use of heat exchangers/heat recovery)
- Optimise dye/chemical costs (mostly by reducing reprocessing)

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Automation

- People make mistakes – computers don't
- Everything that can be automated should be to ensure consistency batch to batch
- Automation ensures reliable optimum processing times independent of the whim of an operator

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SDC Consultancy

Independent Expert Help from the
World's Most Experienced
Professional Colour Organisation

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Consultancy

Longest established textile colour organisation in the world and has set the standards for best practice for the supply chain. We offer tailor made consultancy:

- Dyeing of all textile fibres and blends
- Colour measurement and communication
- Laboratory management and testing
- Dyehouse management
- Dyehouse control and supervision systems

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Benefits of SDC Consultancy

- Value for money – achieve efficiency savings and reduce processing time
- Excellence – objective, independent advice and international reputation for excellence
- Expertise – acknowledged industry experts based worldwide/specialist advice
- Industry standards – commission and publish industry standards.

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Dyehouse Audits

- As well as consultancy projects the SDC will also provide audits of existing manufacturing or laboratory facilities with recommendations for remedial actions
- A thorough investigation of all aspects of a dyehouse operation including analysis of customer requirements and local environmental issues is invaluable in its own right – especially when carried out by a true expert with no bias.
- Such an audit is also an essential prerequisite for planning a full Consultancy Project such as Adastra.

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www.dyehousedoctor.com

- A network of independent specialist consultants with decades of experience in optimisation of utility consumption of production processes within the dyehouse
- Services range from simple production audits through short term projects with specific targets to major projects based on 12 month or longer interventions with payment related to target achievement.
- For more information email arthurwelham@gmail.com

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The 21st Century Philosophy for Textile Dyeing

- Minimum human/operator intervention
- Process steps optimised for utility consumption
- Decisions made strategically not on a daily routine basis
- Processes devised and selected to produce the correct shade and quality as an expectation not just an intention
- Digital Shade passing and colour communication
- Profits are made by doing it right - not just by doing it cheaply

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