

## Cold wash – Tests on the washing performance

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## Cold wash = washing at 15°/20°C

- Washing of clothes / textiles is part of our lives
- Main share of electricity consumption: heating up cold tap water to up to 90°C
- Cold wash saves 60% electricity as compared to 40°C



## Agenda

- **Introduction (B. Josephy)**
- Testing methodology (Ch. Türk)
- Test results (Ch. Türk)
- Summary and recommendations (B. Josephy)



## Cold wash saves (lots of) electricity

- Saving potential of cold wash in EU-27
  - up to 11 TWh/a
  - 2,200 Mio. €/a
  - annual production of the nuclear power plant Emsland (DE)

→ We should re-think our everyday routine

### Assumptions

- EU-27-stock washing machines: around 180 million units (2013, «Omnibus» Review Study 2014)
- Total electricity consumption: 19 TWh/a («Omnibus» Review Study 2014)
- Electricity tariff: 0.20 €/kWh
- Nuclear power plant Emsland (DE): 11.5 TWh (2013, Wikipedia)



## Barriers are psychological rather than technical

- EEDAL'13: Cold Wash – Do Prejudices Impede High Energy Savings? (Josephy et al.)
  - 20°C-cycle is required by Ecodesign Regulation 1015/2010
  - Detergent designed for cold wash are also available
  - Prejudice, tradition and custom stop consumers from cold-washing



## Topten



## Facts could help overcome psychological barriers

- Discussions on cold wash – especially on washing performance – run controversial and emotional
- Tests in Dec'14 to contribute scientific facts to the debate
- Collaboration between
  - Topten.eu
  - VDE Testing and Certification Institute, DE
  - Stiftung Warentest, DE
  - On behalf of EKZ, electrical utility in CH

## Stiftung Warentest

- Founded in 1964, to support consumers objectively and neutrally with comparative tests of products and services
- Buys products, tests and evaluates them (very good – poor)
- Publishes the results
  - Magazines: test, Finanztest
  - [test.de](http://test.de)

## Stiftung Warentest



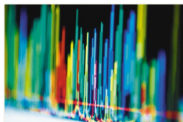
## VDE Testing and Certification Institute



- Test experience since 1996
- Governmental market control in different countries
- Membership in international committees
- Energy tests for USA, Canada, Hong Kong and Singapore, Australia, China and SASO....



## VDE Testing and Certification Institute



- **Knowledge transfers in a network of experts/ Technology and education policies/ Support for young talent**
  - Conferences and symposia
  - Studies, analyses and position papers
- **International norms and standards**
  - Standardization work for more safety and innovation
  - Representation of interests of Germany in international (IEC) and European standardization committees (CENELEC)
- **Product testing and certification**
  - Safety, quality and environmental protection for electrical and electronic devices, systems and components
  - Energy efficiency
  - VDE Marks and conformity attestations



## Agenda

- Introduction
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- Summary and recommendations

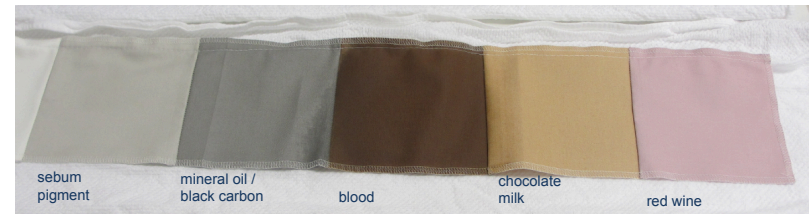


## We compared washing at 40°C vs. 20°C

- We measured
  - Washing performance
  - Energy consumption
  - Programme duration
- Factors influencing the washing performance
  - Detergent: good, medium, sufficient
  - Pre-treatment of stains: yes, no
  - Washing machine: good, medium, sufficient
  - Loading: half, full

## Test conditions followed the EN 60456

- Test laundry
- Number of laundry pieces
- Test cycles
- Standardised soiling
- Water hardness



## Test arrangement to investigate the influence-factors

Influence	Fix parameters	Varying Parameters	Temp.
Detergent	No soil remover Good machine Half-load	Good detergent	20°C
		40°C	
		Medium detergent	20°C
		40°C	
		Sufficient detergent	20°C
		40°C	
Pre-treatment of stains	Good detergent Good machine Half-load	Stain remover	20°C
		40°C	
		No stain remover	20°C
		40°C	
		Sufficient detergent	20°C
		Sufficient machine	40°C
Washing machine	Medium detergent Half-load	Good machine	20°C
		40°C	
		Medium machine	20°C
		40°C	
		Sufficient machine	20°C
		40°C	
Loading	Good machine Medium detergent No soil remover	Half-load	20°C
		40°C	
		Full-load	20°C
		40°C	

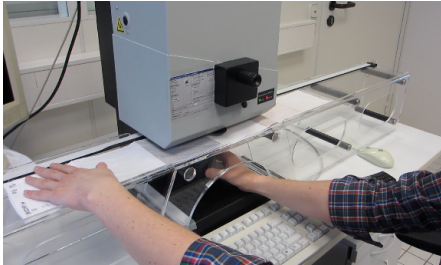
## Test conditions followed the EN 60456





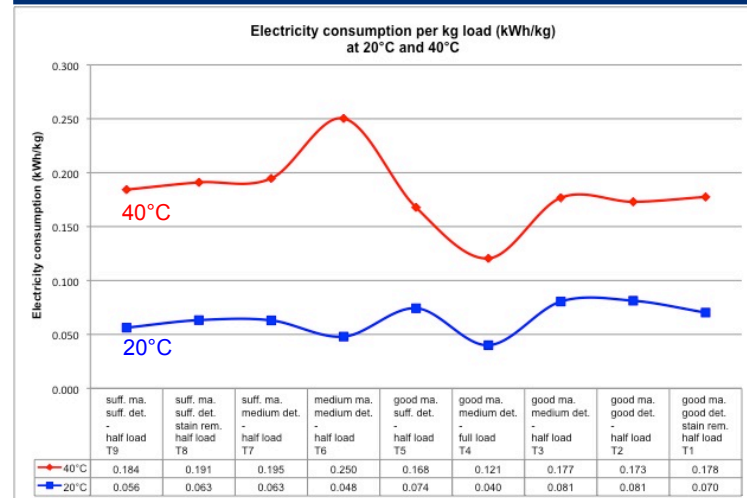
## Washing Efficiency Index

- After washing / drying



Example (20°C, T3)	
C <sub>test</sub>	320.40
C <sub>ref, 60°C</sub>	330.37
Washing Efficiency Index (C <sub>test</sub> / C <sub>ref, 60°C</sub> )	0.970

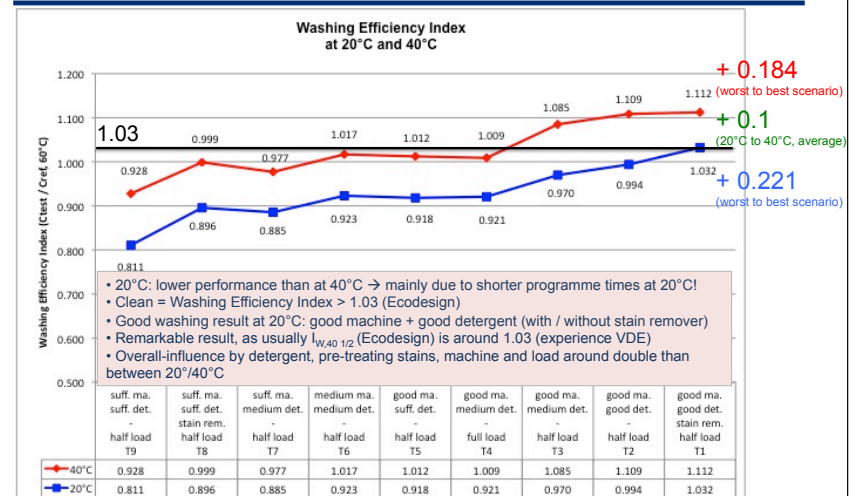
## 60% less electricity use at 20°C than at 40°C



## Agenda

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- Test results**
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## Good washing performance at 20°C is possible



## Agenda

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## Summary

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- To be kept in mind: tests were carried out with standard test laundry, which is medium to heavily soiled.
- However, our everyday clothing only worn for a few hours or one day usually are only lightly and normally soiled.
- Cold wash might be appropriate for most everyday situations.
- Cold wash is a cool and modern way to launder.
- We encourage you to try!

## Summary

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- Cold wash (15°/20°C) saves 60% electricity compared to 40°C.
- Temperature just one factor affecting washing performance.
- More impacting is the combination of detergent, pre-treating of stains, washing machine and load.
- Good washing performance is reached at 20°C with good machines and good detergents.

## Recommendations

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- EU policy-makers
  - Include requirements on the washing efficiency at 20°C in the revision of EU Ecodesign Regulation 1015/2010
- Washing machine & detergent manufacturers
  - Optimization of machines and detergents for 15°/20°C
  - Use «cold wash compatibility» as a selling argument
  - Encouragement of consumers to try it out

## Recommendations

- Environmental & consumer organisations, energy agencies
  - Continue consumer information/education campaigns on cold wash
  - Encouragement of consumers to try it out
- Academia, research institutes, testing laboratories
  - Tests and publication of studies



## Thank you for your attention

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## Topten-Flyer: «Washing at 20°C is Cool»

- Illustrates how to best wash at 20°C
- Download  
[www.topten.eu/uploads/File/Professional/Other%20Pro%20Guidelines/Flyer\\_Coldwash\\_2014.pdf](http://www.topten.eu/uploads/File/Professional/Other%20Pro%20Guidelines/Flyer_Coldwash_2014.pdf)

