

Testing technology for Consumer tests



Christoph Türk Dipl.- Ing.
December 2014

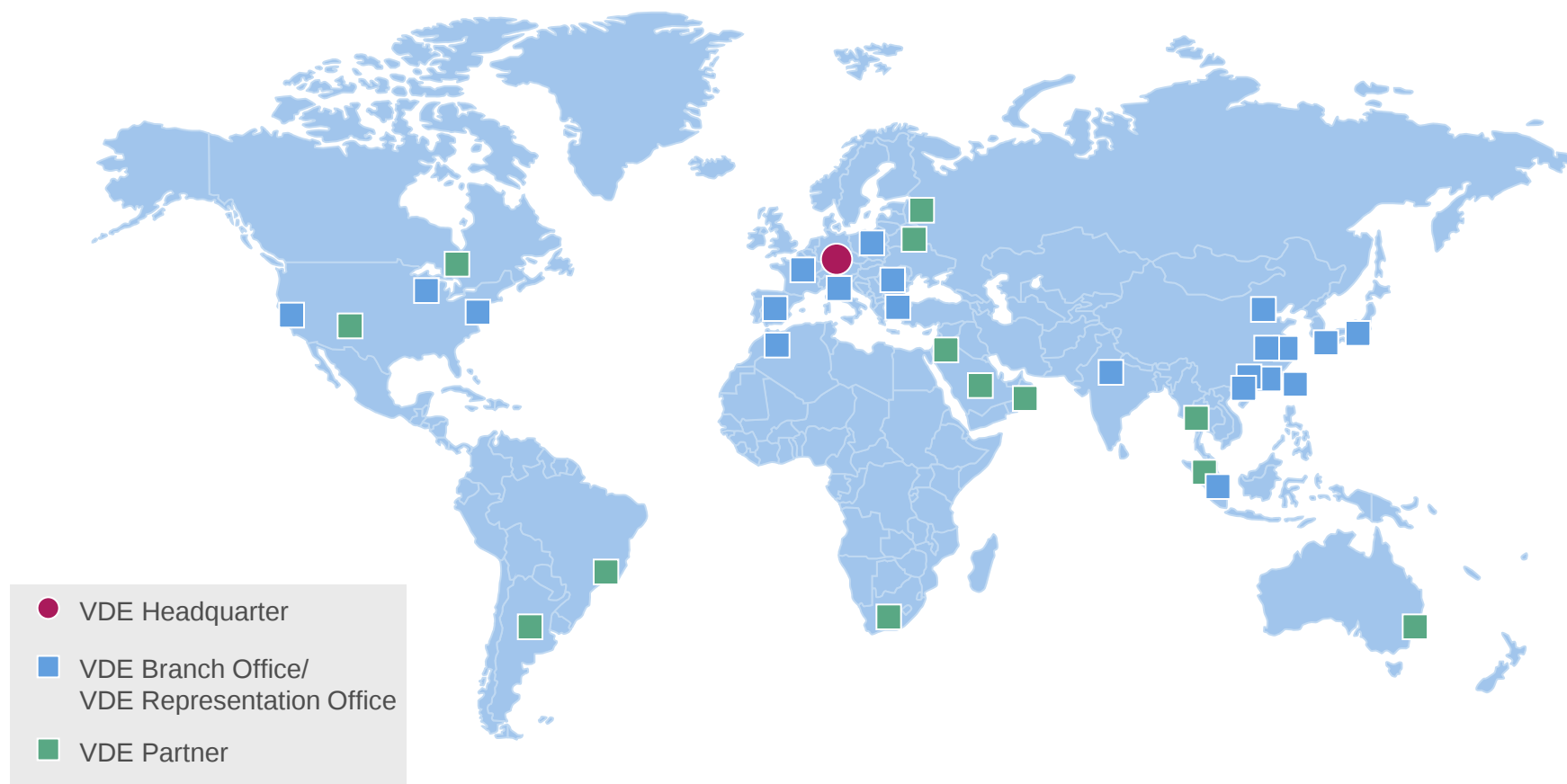
I. Short presentation of structure and task of VDE Institute

- VDE- neutral and independent testing and certification institute
- Integrated in the VDE Association for Electrical, Electronic & Information Technologies
- Founded 1893 by Werner von Siemens
- 1906 one of the few founders of IEC Standardization Organization
- 1.100 employees

Targets:

- Improve safety and consumer protection
- Maintaining and supporting technical sciences and their application – in the context of environmental protection

VDE Worldwide



Ecodesign and Energy efficiency

Tests for the Energy Star in the USA
and Canada



Energie		Waschmaschine
Hersteller		Siemens
Modell		WIQ1632
Niedriger Energieverbrauch	A B C D E F G	A
Hoher Energieverbrauch		
Energieverbrauch kWh/Waschprogramm (ausgehend von den Ergebnissen der Normprüfung für das Programm „Baumwolle 60°C“)		1.02
Der tatsächliche Energieverbrauch hängt von der Art der Nutzung des Gerätes ab		
Waschwirkung A: besser G: schlechter	A B C D E F G	
Schleudernwirkung A: besser G: schlechter	A B C D E F G	
Schleuderdrehzahl (U/min)		1600
Füllmenge (Baumwolle) kg		6kg
Wasserverbrauch		43l
Geräusch (dB(A) re 1 pW)	Waschen Schleudern	
Ein Datenblatt mit weiteren Gerätesangaben ist in den Prospekten enthalten		

- Our knowledge - your benefit:
- Test experience since 1996
- Recognized by CECED as verification laboratory
- Governmental market control related to the energy declarations for washing machines, dryers, dishwashers and ovens in different countries
- Publications and international presentations
- Membership in international committees

- **New: Measurement of Stand-By-Power according to Regulation EC 1275/2008**
- Energy tests for USA, Canada, Hong Kong and Singapore, Australia, China and SASO

Household appliance



AS Service Portfolio - Usability

- Handling and ergonomics
- Functionality
- Performance
- User manuals
- Sensory tests
- Energy efficiency
- Noise emission
- Reliability and endurance
- **Consumer Test**



Consumer Tests

- **Comprehensive approach** covering all product characteristics relevant to consumers
- **Typical** for appliances:
 - Functionality / performance
 - Ease of use/ handling
 - Durability
 - Environmental aspects (energy, water, noise)
 - Safety (e.g. electrical, mechanical and chemical safety)

Vacuum Cleaner

Important test issues can be

- **Suction test**

- Carpet (with different loads in the bag)
- Hard-floor
- Cracks, edges and corners
- Removal of fibres

- **Easy of use**

- Manual, assembly, dismantling
- Cleaning on different floors
- Changing/emptying of bag or box



Vacuum Cleaner

Other aspects

■ Health and environment

- Release of dust
- Noise
- Energy consumption
- Hazardous substances
- And other partials like
microbes or allergic materials!



Cleaning performance classes

CP-class	Dust pick-up on carpet (dpu_c)	Dust pick-up on hard floor (dpu_{hf})
A	$dpu_c \geq 0,91$	$dpu_{hf} \geq 1,11$
B	$0,87 \leq dpu_c < 0,91$	$1,08 \leq dpu_{hf} < 1,11$
C	$0,83 \leq dpu_c < 0,87$	$1,05 \leq dpu_{hf} < 1,08$
D	$0,79 \leq dpu_c < 0,83$	$1,02 \leq dpu_{hf} < 1,05$
E	$0,75 \leq dpu_c < 0,79$	$0,99 \leq dpu_{hf} < 1,02$
F	$0,71 < dpu_c < 0,75$	$0,96 \leq dpu_{hf} < 0,99$
G	$dpu_c < 0,71$	$dpu_{hf} < 0,96$

Dust re-emission class	Dust re-emission (dre)
A	$dre \leq 0,02 \%$
B	$0,02 \% < dre \leq 0,08 \%$
C	$0,08 \% < dre \leq 0,20 \%$
D	$0,20 \% < dre \leq 0,35 \%$
E	$0,35 \% < dre \leq 0,60 \%$
F	$0,60 \% < dre \leq 1,00 \%$
G	$dre > 1,00 \%$

Vacuum Cleaner

■ Endurance

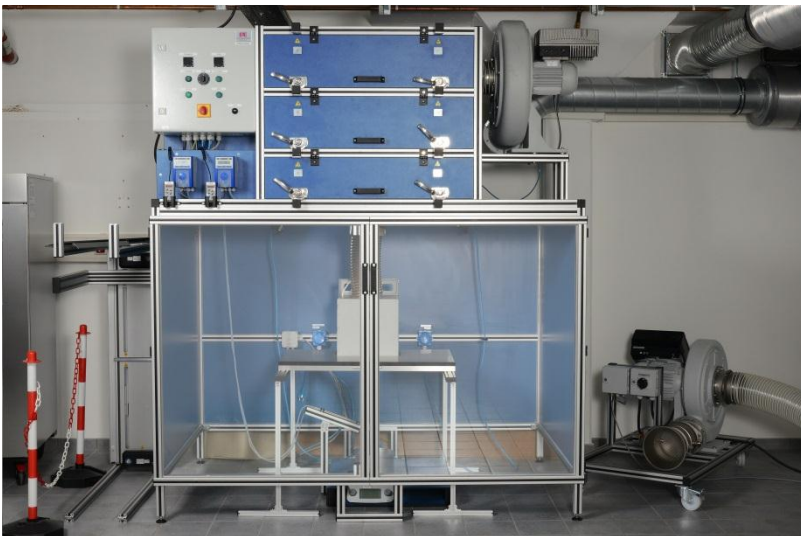
- Motor endurance test (600 h)
- Door post test (500 cycles)
- Drop test nozzle (1,200 drops)
- Cable pullout and tube connection (40,000 turns)



Range hoods



Range hoods



Oven

Performance: What should a oven be able to do?



► grill



► frying



► baking

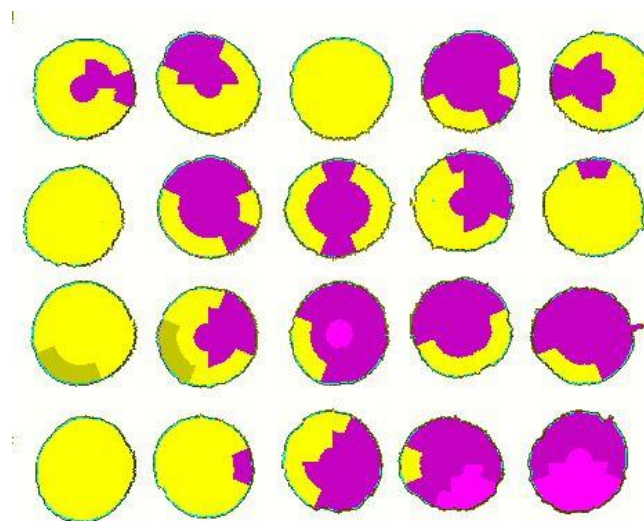
Goal:

Evaluation of
Performance

Qualitative investigation of the oven

Handling and consumer aspects

- *Excellent results of baking tests*
- *Average of browning with low deviation on all tray levels*
- *Difference of browning in relation between top and bottom side very low*



Induction Hob



■ Heat transfer between surfaces

■ Test with milk or sugar to evaluate the easiness of cleaning

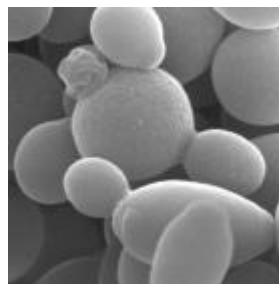
Washing machine

Hygiene effects in washing machines at different temperatures

We all know that!

Bad smell in washing machines due to germs

But it can have also an bad impact for health



Washing machine

The approach of TC59D (laundry) on measuring germ reduction during washing

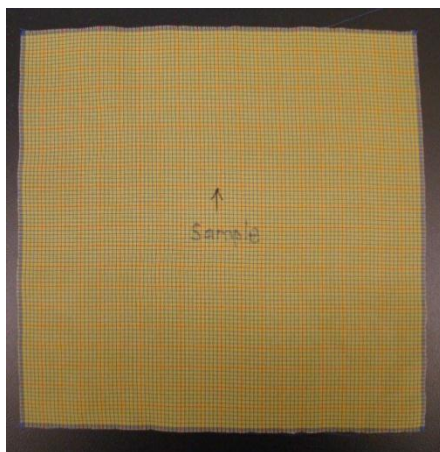
Model is globally applicable – for all household washing machine types

Model reflect germ reduction under consumer relevant condition and expectations even under 40°C wash temperature

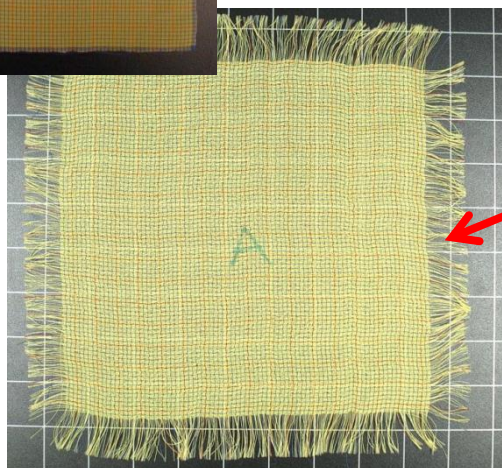


Washing machine

Shrinkage during washing



Before washing



After washing

Thank you for your attention!

VDE – Your reliable Partner
for Testing and Certification

Your contacts:

Christoph Türk
Head of Category AS6
Phone: +49 69 8306 425
Email: christoph.tuerk@vde.com