

# **IEC 60456**

# **Round Robin Test 2008**

# **Test Protocol**

By Dr. Tom Hilgers, Chairman IEC SC 59D „Home Laundry Appliances“

# ▶ RRT 2008: Tasks and Steps of Preparation

October 2006	IEC Meeting in Jeju: Ring Test Team was established
March 2007	IEC Meeting in St.Gallen: First Ring Test Team meeting Letter to manufacturers, Treatments / Conditions, Questionnaire, Lab list, Invitation
June 2007	IEC Meeting in Milton Keynes: <b>6 machines manufacturers confirmed to support RRT2008</b>
June – August 2007	2007-06-26 Invitation letter was send out to 34 labs 2007-07-06 Invitation was published as 59D/337/INF <b>31 labs confirmed participation</b>
September 2007	Ring Test Team meets in Berlin: Information for manufacturers and labs about logistics
October 2007	IEC Meeting in Mexico: Web page ready to use
November 2007	Shipment of machines started
December 2008	Wascator information and new cards for CLS are available
January 2008	Strips are send out

# ▶ RRT 2008: Labs to choose Treatments

presented by  
wfk Test Materials

	Treatment 1	Treatment 2	Treatment 3	Treatment 4
<b>Platform</b>	HA	HA	VA (h/c fill)	VA (cold fill)
<b>Water hardness</b>	hard: (2,5 ± 0,2) mmol/l	soft: (0,5 ± 0,2) mmol/l	soft: (0,5 ± 0,2) mmol/l	soft: (0,5 ± 0,2) mmol/l
<b>Test machines</b>	Miele / Electrolux	Miele / Electrolux	Mabe / Whirlpool	National / Haier
<b>Test programme</b>	Cotton 60	Cotton 60	Cotton warm	Cotton cold
<b>Water inlet temperature</b>	15°C	15°C	15°C / 60°C	20°C
<b>Reference machine</b>	CLS and/or MP lab	CLS and/or MP lab	CLS and/or MP lab	CLS and/or MP lab
<b>Test programme</b>	Cotton 60	Cotton 60	Cotton 30	Cotton 20
<b>Water inlet temperature</b>	15°C	15°C	15°C	20°C

**Option A)** run always both test machines in parallel to the Wascator  
(all 3 test series per treatment in parallel)

**Option B)** run the test machines "one after the other", each machine in parallel to the Wascator  
(4 test series are necessary per treatment, Wascator needs to run two test series per treatment)

treatment 1 & 2 include:

- test series Miele machine
- test series Electrolux machine
- one or two test series Reference machine

treatment 3 includes:

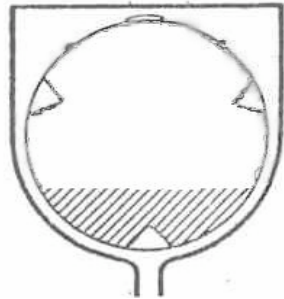
- test series Mabe machine
- test series Whirlpool machine
- one or two test series Reference machine

treatment 4 includes:

- test series Haier machine
- test series National machine
- one or two test series Reference machine

# ▶ RRT 2008: Participation per Treatment

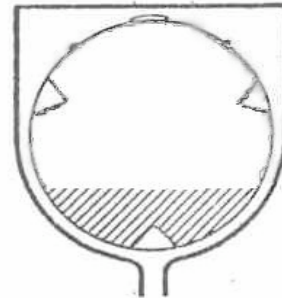
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Treatment 1  
hard water  
Cotton 60  
Miele / Electrolux

26 labs in 16 countries

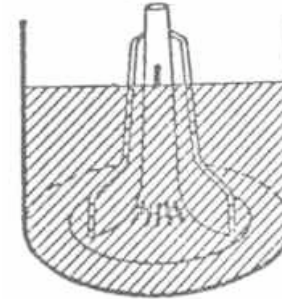
China	Netherlands
Denmark	Slovenia
France	Spain
Germany	Sweden
Italy	Switzerland
Japan	Thailand
Korea	United Kingdom
Mexico	United States



Treatment 2  
soft water  
Cotton 60  
Miele / Electrolux

16 labs in 10 countries

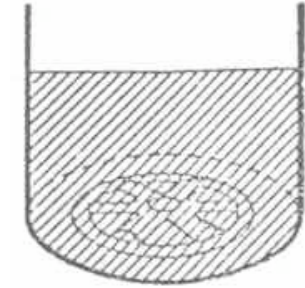
Mexico
Germany
Netherlands
Korea
China
Spain
USA
Switzerland
Thailand
Slovenia



Treatment 3  
soft water  
Cotton warm  
Mabe / Whirlpool

8 labs in 6 countries

Germany
Mexico
Spain
USA
Switzerland
Brazil



Treatment 4  
soft water  
Cotton cold  
Haier / National

8 labs in 6 countries

Germany
Thailand
Japan
USA
Switzerland
Brazil

# ▶ RRT 2008: Machine Logistics

Treatments 1 & 2 – Horizontal Axis – 28 labs >> 10 machines

Treatment 3 – Vertical Axis (Agitator type) – 8 labs = 8 labs

Treatment 3 – Vertical Axis (Impeller type) – 8 labs = 8 labs

**For treatments 1 & 2 up to 4 test labs ,share‘ the machines sent around**

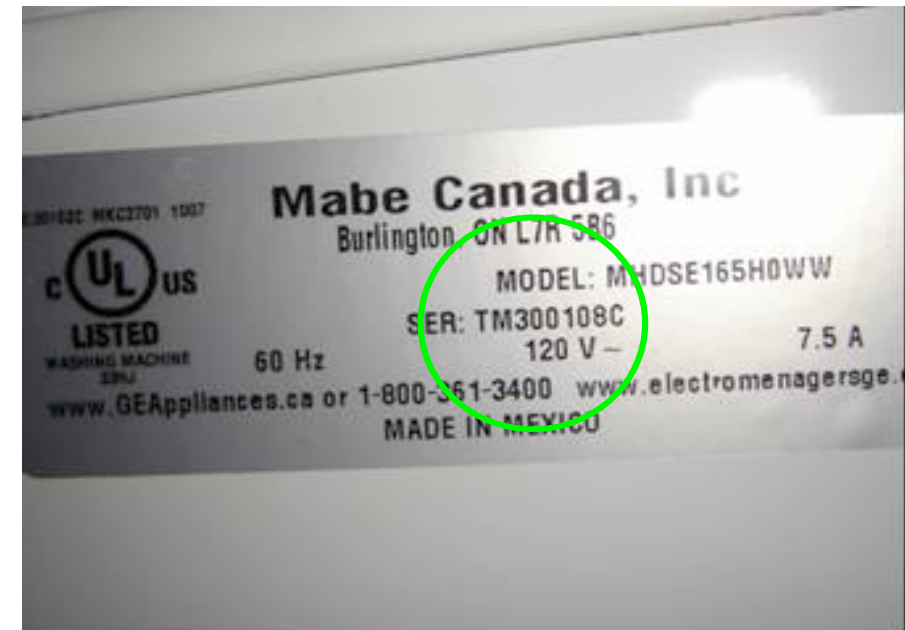
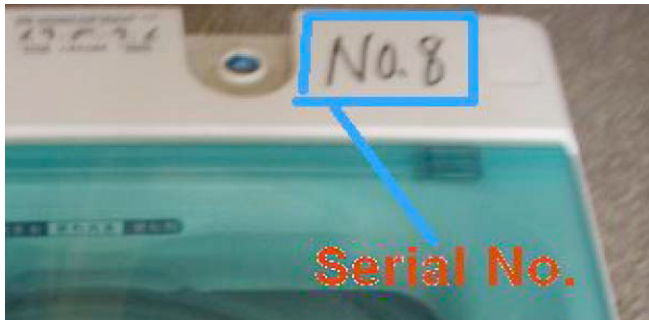
1	LGA (2)	EMPA (2)	National Osaka (1)	
2	VDE (2)	SLG (2)	Samsung (1)	
3	AEG (1)	Electrolux Thailand (1)	EEI (1)	
4	Miele (2)			
5	Teknologisk (1)	Asko (1)	Swedish Energy Agency (1)	
6	BSH (2)	BSH China (2)	Haier (1)	
7	wfk (2)	Intertek UK (1)	Whirlpool USA (2)	
8	Whirlpool DE (1)	Whirlpool Mexico (1)	Mabe Mexico (1)	
9	SOHIT (2)	Gorenje (2)	LCOE (2)	
10	Uni Bonn (1)	CTTN (1)	Merloni (1)	Indesit (1)

# ▶ RRT 2008: Machine documentation

presented by  
wfk Test Materials

**Each Machine will have an identification number** – important to track single machine:

- Link pre-test results done by the manufacturer to pre-test results of the lab
- HA – up to 4 labs will test one machine – compare results
- HA - up to 6 test series in one machine



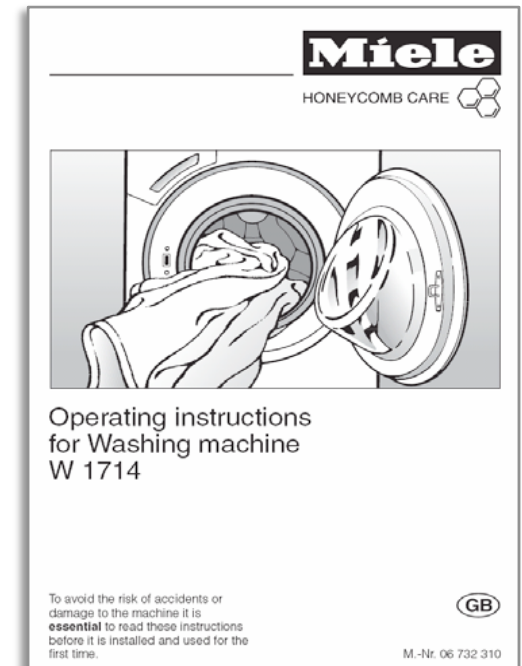
# ▶ RRT 2008: Machine documentation

presented by  
wfk Test Materials

## Each Machine will come with:

- a manual
  - a step-by-step programme setting instructions for the test programme
- Both documents will be available on the website.

1. Water level - Select "Super Plus" for the maximum water level.
2. Temperature - Select "Warm" water setting
3. Rinse plus - Select "Off"
4. Fabric Selection - Select "Normal" (High/High)
5. Cycle Selection - Select "HEAVY" Cycle



# ▶ RRT 2008: Machine shipment

It is essential to keep all transportation bolts and the robust re-usable boxes provided for shipment. In case a machine breaks down during shipment tests needs to be re-organized.

Check machines on arrival. Install machines according to the manual.

Horizontal axis machines (HA) to be used for treatment 1 and treatment 2  
Miele W 1734 – test with 6 kg – connect to 50 Hz 230 V  
Privileg Classic 50614 – test with 5 kg – connect to 50 Hz 230 V

Vertical axis machines Agitator with hot/cold fill (VA h/c fill) to be used for treatment 3  
Mabe MESE1065HWW – connect to...  
Whirlpool WTW5700S – connect to...

Vertical axis machines Impeller with cold fill (VA cold fill) to be used for treatment 4  
Haier XQB50-0588 – connect to 50 Hz / 220 V  
National NA-F S 710 – connect to 60 Hz / 110 V



## Preparation of the washing machine after installation (according to IEC 60456)

After installation, the test washing machine shall be run for two complete normalization runs on the programme with the maximum wash temperature set for the maximum water level possible, the first run without load and with 50 g of the reference detergent and the second run without load and without detergent.

# ▶ RRT 2008: Test Protocol

Test Protocol Version V1 2007-12-12

## **Procedure:**

Testing will be strictly in accordance with the draft IEC 60456 5<sup>th</sup> Edition. The version to be used will be available at the mentioned internet page.

## **The test consists of a pre test phase and the performance test phase:**

It is necessary to check the Wascator and the test machines before starting performance tests. This avoids double test effort in case of wrong installation, damages to the machines or other reasons.

The pre-test data sheet should be send to [gundula.czyzewski@bshg.com](mailto:gundula.czyzewski@bshg.com)

Please wait for the answer that everything is correct before starting any performance tests.

# ▶ RRT 2008: Pre-Testing test machines

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**Each machine is pre-tested from the manufacturer:**  
**One empty run**  
**One run with test load but no detergent/strips**

The following data will be collected:

- main wash water consumption
- total water consumption
- main wash duration
- total duration
- energy consumption
- final spin speed
- remaining moisture content

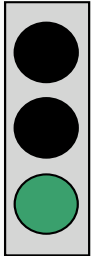
**Each machine is re-tested on arrival in the test lab.**

Results are compared and feedback is given to each single lab if:

- > Pre-tests were ok – Performance tests can start
- > Results not ok - Clarification needed

Pre Test - Test Machines:		Measured Values by LABORATORY	
Green cells need to be filled with your data			
		Hot water supply temperature	°C
		Cold water Supply temperature	°C
		Voltage	V
		Frequency	Hz
Laboratory	Name		
Machine	Manufacturer		
	Model		
	Serial Number		
Mode	Selected cycle and Options		
	Test condition	No Load	Test load
	Load mass	kg	
Main Wash	Water consumption	l	0,0
		Hot	l
		Cold	l
	Max. temperatur	°C	
	Duration 1 (suds valve ON)	Min	
	Duration 2 (initial water intake first rinse)	Min	
Rinse	No of rinses	n	
	Water consumption rinse 1	l	
		Hot	l
		Cold	l
	Water consumption rinse 2	l	
		Hot	l
		Cold	l
	Water consumption rinse 3	l	
		Hot	l
	Cold	l	
Spin	Spin speed	rpn	
	Remaining moisture content	%	
Total energy consumption corrected		kWh	
Total programme duration		Min	

Pre-tests ok !





# ▶ RRT 2008: Test Protocol

## Treatment overview:

	treatment 1	treatment 2	treatment 3	treatment 4
Test program	HA	HA	VA (h/c fill)	VA (cold fill)
Reference	Platform: HA	Platform: HA	Platform: Agitator	Platform: Impeller
Water inlet temperature	Cotton 60	Cotton 60	Cotton warm	Cotton cold
Water hardness	Cotton 60	Cotton 60	Cotton 30	Cotton 20
	15°C	15°C	15° and 60°C	20°
	hard	soft	soft	soft

## Programmes:

Programme cards will be sent to those labs participating with CLS-machine.

Reference CLS programme 60°C (treatment 1 and treatment 2)

Reference CLS programme 30°C (treatment 3)

Reference CLS programme 20°C (treatment 4)

Please use the document "8 MP-Lab RRT 2008 Programming list Vers 2E 070601" to check and adjust MP lab programmes

Reference MP-lab programme 60°C (treatment 1 and treatment 2)

Reference MP-lab programme 30°C (treatment 3)

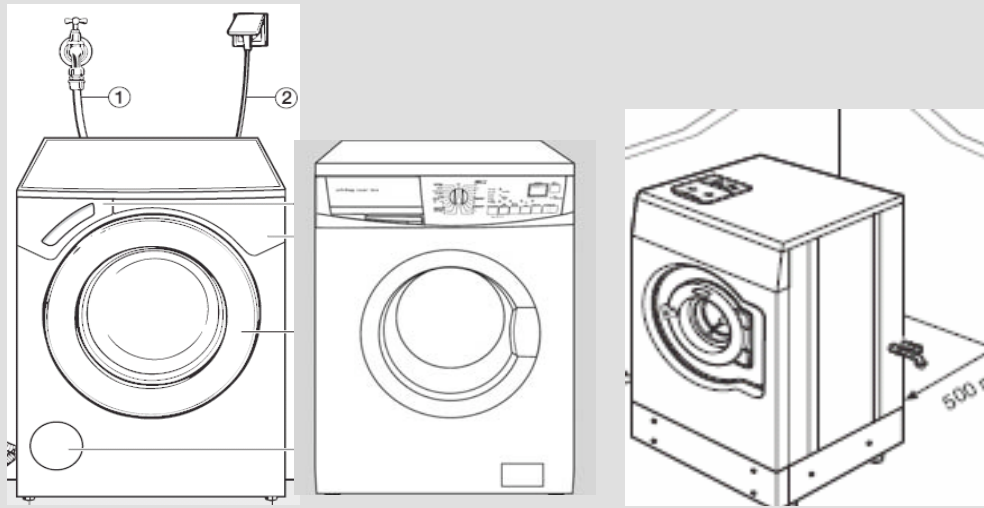
Reference MP-lab programme 20°C (treatment 4)

# ► RRT 2008: Test Protocol

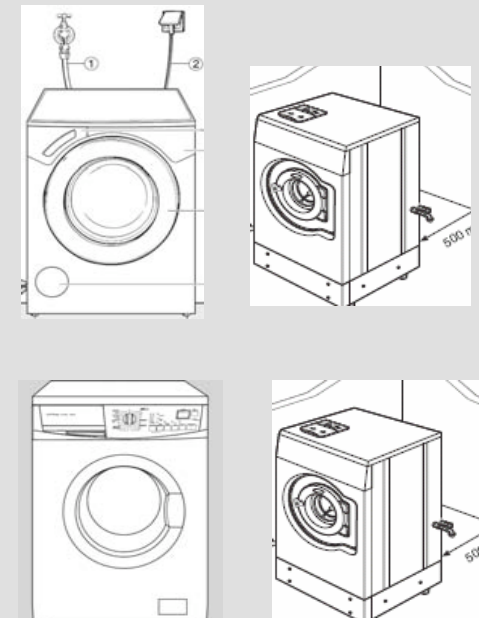
## Order of test:

Please make sure that Wascator and household machines are run in parallel (at the same time). As far as possible they should be tested under identical environmental conditions and be supplied with identical services and materials such as water and electricity, detergent and test strips.

Option A:  
both machines  
and reference machine run in parallel



Option B:  
One machine and reference machine  
run in parallel



# ▶ RRT 2008: Test runs

presented by  
wfk Test Materials

Miele  
Test series  
Treatment 1  
Hard water  
Cotton 60°C

Privileg  
Test series  
Treatment 1  
Hard water  
60°C E

Wascator  
Test series  
Treatment 1  
Hard water  
Cotton 60°C

Mabe  
Test series  
Treatment 3  
Soft water  
Heavy duty

Whirlpool  
Test series  
Treatment 3  
Soft water  
Heavy

Wascator  
Test series  
Treatment 3  
Soft water  
Cotton 30°C

Machines ready to test  
Material available: detergent strips loads  
Run the test series in parallel  
Record all data -> data collection file  
Report data for evaluation

Miele  
Test series  
Treatment 2  
Soft water  
Cotton 60°C

Privileg  
Test series  
Treatment 2  
Soft water  
60°C E

Wascator  
Test series  
Treatment 2  
Soft water  
Cotton 60°C

National  
Test series  
Treatment 4  
Soft water  
Regular

Haier  
Test series  
Treatment 4  
Soft water  
Cotton

Wascator  
Test series  
Treatment 4  
Soft water  
Cotton 20°C

# ▶ RRT 2008: Updated Timeline

<b>January 2008</b>	<b>CDV and all other documents for RRT are available Material (strips and detergent), new CLS card in place Machines available to all labs of first round Start pre-tests</b>
<b>January 2008</b>	<b>Workshop in Thailand (other countries may follow)</b>
<b>March 2008</b>	<b>Tests of treatment 1&amp;2 (round one) are started</b>
<b>May 2008</b>	<b>Meeting of Orga Team in Brussels</b>
<b>July - August 2008</b>	<b>Tests of treatment 1 – round 1&amp;2 are finished</b>
<b>August 2008</b>	<b>Check collected data (treatment 1 round 1&amp;2)</b>
<b>September 2008</b>	<b>Start evaluation</b>
<b>September 2008</b>	<b>First results presented in Sydney</b>
<b>December 2008</b>	<b>Finish evaluation</b>

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Thank you for your attention!