



# Report on Laboratory Testing Activities

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# INTRODUCTION

The Ecodesign and Energy Labelling directives are very powerful tools; by removing the worst performing products from the market and encouraging “a race to the top” in terms of efficiency, they have helped transform the household product market over the last 15 years or so. However, due to the current process in which manufacturers’ claims of conformity with regulations is self-declared, there are sections of the market that do not meet their Energy Label declarations or Ecodesign limits which go undetected. It is estimated that this is the case for around 10–20% of energy-using products, corresponding to lost energy savings of as much as 100 TWh per year<sup>1</sup>.

The MarketWatch consortium conducted a product testing campaign with multiple aims, as follows:

- Identify suspected non-compliant products through data analysis and risk-based approaches
- Develop reduced cost ‘check’ test methods for further intelligence gathering
- Cover a significant section of the market to discover trends related to compliance of specific product types and legislation
- Fully test products to gain concrete evidence of products that fail to meet Energy Label claims and Ecodesign limits
- Request action from manufacturers and appointed national MSAs in the case of suspected non-compliance
- Work with industry to understand issues with compliance, interpretation of regulations and make recommendations
- Forge stronger relationships with Market Surveillance Authorities (MSAs) through liaison over test results
- Report findings factually, objectively and transparently
- Improve the ‘culture of compliance’ by establishing contact with industry and reporting results

A programme of 100 ‘check’ tests was carried out to provide intelligence for further testing. Following this, 27 compliance tests were conducted to assess conformity with energy label claims and against Ecodesign limits.

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<sup>1</sup> A study conducted by the Collaborative Labelling and Appliance Standards Programme (CLASP) (2011) entitled: *Monitoring, Verification and Enforcement Capabilities and Practices for the Implementation of the Ecodesign and Labelling Directives in EU Member States* - found that “Non-compliance levels...appears [to show] that more than 10% of the energy savings potential from Ecodesign measures is being lost”.

The Intelligent Energy Europe funded “ATLETE” project (2009-2011) found a 20% non-compliance rate following the testing of the Energy Label declarations from a range of domestic refrigerators, and concluded: “The final test results show that 80% of appliances subjected to testing and for which testing has been concluded complied with the energy efficiency class declaration and the two related key parameters: energy consumption and storage volume.”

The final report from the Evaluation of the Eco-design Directive was published in 2012 and concluded that *Growing evidence indicates that the level of non-compliance is in the range of 10-20%*.

In CLASP’s *Compliance Counts: a Practitioner’s Guidebook* (2010) the UK Department for Environment, Food and Rural Affairs noted that: “At present the rate of non-compliance in the UK is estimated to be around 10 to 15% at manufacturing level (failure to meet the claim on the label) and 20% at retail level (absent or incorrect labelling).”





# CHECK TESTING

MarketWatch aimed to identify products that did not meet Energy Labelling and Ecodesign requirements in official tests, covering a broad segment of product types. To identify models for testing, a two-fold approach was used. First, the consortium analysed significant test data from a number of sources. These included consumer research testing, test campaigns run by project partners and other NGOs (e.g. ICRT's consumer testing; EST's certification scheme compliance testing), previous European projects (the [ATLETE](#) series, [PremiumLight](#)) and other market intelligence where it was available. From these sources a database of over 750 products was compiled and used to analyse trends to further inform product test selection.

At the same time, the project team developed and [documented](#) 10 'check' test methods. These were intended to give insights into how a product might perform in a subsequent full compliance test, but at a reduced cost. Methods developed in all cases were based on official test standards; however it should be noted that check test methods are not intended to allow for a definitive determination of a product's compliance. The check test methods were produced alongside consultation from accredited test laboratories with expertise in the relevant area. The methods sought to prioritise the aspects of testing of most interest to the consortium, and those deemed more likely to fail. Often methods reduced the number of test runs to reduce costs and enable more products to be tested. For example, tests against the dishwasher check test method were quoted at around 40% of the cost of a full compliance test.

Documentation and generic Ecodesign requirements were also checked for products at this stage. This included checks of product fiches and technical documentation, and the presence of certain required features (for example, identification of the 'standard programmes' on the panel of certain appliances).

The project team developed a test schedule, covering 8 product types subject to energy labelling. Set top boxes, which currently have no energy labelling requirement, were tested against their Ecodesign requirements. Finally, a range of energy-using products were tested for standby power consumption (including networked standby). A total of 100 products were subjected to a check test.

As check-tests carry no legal weight and cannot give a definitive measure of compliance, results from this activity are reported below, but are not attributed to a brand or model number.

## **Communication with manufacturers**

MarketWatch communicated results that showed suspected non-compliance from check tests to the manufacturer, inviting feedback, and with the intention of opening a dialogue on the results. Manufacturer responses in some cases fed into the decision as to whether further testing should take place.





## Summary of check testing by product type

### Washing Machines

MarketWatch included four washing machine models in the check testing programme. Intelligence from consumer testing campaigns and projects such as [ATLETE II](#) fed into the product selection. Testing, using the check testing method developed [here](#) took place in June 2015.

#### Check-test programme

Based on 3 cycles (1x half load 40°C, 1x half load 60°C, 1x full load 60°C) the energy consumption, water consumption, spin drying efficiency and remaining moisture content were determined. The results were interpolated and compared with the manufacturer claimed values which are based on the full compliance test method with 7 cycles (2x half load 40°C, 2x half load 60°C, 3x full load 60°C). The check test programme did not include any noise measurements.

#### Check-test findings

Results are summarised below:

#### Energy Label tests

Sample	Energy Rating		Annual Energy Consumption (kWh)	
	Declared	Measured	Declared	Measured
1	A+++	A+++	162	157
2	A+++	A++	149	153
3	A+++	A+++	137	139
4	A+++	A+++	104	88

Sample	Spin Efficiency Class		Annual Water Consumption (litres)	
	Declared	Measured	Declared	Measured
1	B	B	9240	9020
2	B	B	9209	8580
3	B	B	11799	10340
4	B	B	8500	6600

#### Documentation/Generic Ecodesign assessment

Sample	Product Fiche	Generic Ecodesign requirements
1	Present and compliant	Compliant
2	Present, minor errors	Compliant
3	Accessed from web and compliant	Compliant
4	Present and compliant	Compliant

No major issues were seen in the technical tests. One appliance measured an A++ energy rating rather than the claimed A+++, but was within allowed tolerance limits. Two of the samples had minor issues with documentation.





Results of both technical testing and the documentation checks were communicated to manufacturers by the project team, with action requested to correct any documentation issues.

Overall, the project team did not see anything in this check testing to warrant escalation to a full compliance test. An encouraging result, and a similar outcome to the findings of ATLETE II which showed a high level of compliance of washing machines with their energy label claims.

### Communication with manufacturers

The manufacturer of sample 2 responded on the question of the lower measured energy class, but maintained that the product still met the A+++ rating. As it was within tolerance limits, MarketWatch decided not to pursue any further investigation.

Correction of documentation issues was requested where necessary.

### Outcome

None of the four washing machines were escalated to further testing.

## Tumble Dryers

Tumble driers have not previously been subject to large scale NGO testing as refrigeration and washing machines have been through the [ATLETE](#) projects. Consumer testing and other historical test data obtained by MarketWatch fed into the product selection, and testing was carried out in July 2015 using the check test method developed [here](#).

### Check-test programme

Based on 2 cycles (1x half load (A), 1x full load (A+B)) the energy consumption, programme duration, condensation efficiency and left on mode power were determined. The results were interpolated and compared with the manufacturer claimed values which are based on the full compliance test method with 7 cycles (2x half load (A), 2x half load (B), 3x full load(A+B)). The check test programme did not include any noise and capacity measurements.

Results of the check testing are summarised below:

Sample	Energy Rating		Annual Energy Consumption (kWh/year)	
	Declared	Measured	Declared	Measured
1	B	C	560	564
2	B	C	617	650
3	C	C	330	320
4	C	C	330	326
5	C	C	561	547
6	C	C	561	541





Sample	Condensation Efficiency		Weighted Programme Time (min)	
	Declared	Measured	Declared	Measured
1	B	B	102	97
2	B	C	unknown	137
3	N/A	N/A	71	73
4	N/A	N/A	71	78
5	D	D	96	97
6	D	D (but outside tolerance limit)	98	97

### Documentation and generic Ecodesign requirements

Sample	Documentation	Generic Ecodesign Requirements
1	Fiche not included with product, but available on website	Compliant, except minor documentation error
2	Fiche not included with product, or available online	Compliant
3	Fiche included with product. Some minor omissions/format errors	Compliant, except no mention of left-on power in booklet
4	Fiche included with product. Some minor omissions/format errors	Compliant, except no mention of left-on power in booklet
5	Fiche included with product, some information in the wrong format.	Compliant
6	Fiche included with product, some information in the wrong format.	Compliant

### Check-test findings

Two driers, samples 4 and 6 showed results in the check testing that suggested they may not meet their claims in a full test.

- 2 driers, samples 1 and 2, measured an energy rating class lower, but within tolerance limits
- Sample 4 measured a longer weighted programme time than declared (regulation 392/2012 specifies this is an average of measurements of full and partial test loads and must be within 6% of the claimed figure).
- Sample 6's measurement for weighted condensation efficiency was 10.4% lower than claimed (the limit in the regulation is 6%)

Other pertinent findings were as follows:

- Sample 2 measured annual energy consumption at 5.4% higher than declared (the limit in the regulation is 6%)
- Regarding documentation, samples 1 and 2 did not come with the product fiche as specified by regulation 392/2012





## Outcome

After consultation with the test laboratory, MarketWatch escalated samples 4 and 6 to a full compliance test.

## Televisions

MarketWatch check-tested 5 TV models suspected of not meeting their energy label claims based on insights from consumer testing, partners' own testing and projects such as [ComplianTV](#).

### Check-test programme

The laboratory determined the correct EEI class, peak luminance ratio, and the standby and off mode power consumption. The results were compared with the manufacturers claimed values which are based on the full compliance test method.

The check test method can be found [here](#). Testing took place in September 2015, with results summarised as follows:

Sample	Energy rating		On-mode power (W)	
	Declared	Measured	Declared	Measured
1	A+	A+	44	36.4
2	A	A	31	29.5
3	A	B	21	25.1
4	A	A	33	22.3
5	A	B	17	19.9

Sample	Documentation	Peak Luminance ratio (limit >65%)	Automatic power down (APD) feature
1	Product fiche available	72%	Active and enabled at required time
2	No product fiche supplied	87%	Active and enabled at required time
3	Product fiche available	88%	Not enabled by default as required
4	Product fiche available	79%	Active and enabled at required time
5	Product fiche available	92%	Active and enabled at required time

### Check-test findings

- Sample 3 measured a B rating but declared A. An issue was also seen with this television's auto power down feature, in that it was not enabled by default
- Sample 5 also measured a B rating instead of the declared A.
- Both samples 3 and 5 also exceeded their declaration for on-mode power

## Outcome

Samples 3 and 5 were taken forward to full testing by the project.





## Simple Set-Top Boxes

MarketWatch check-tested 6 set-boxes using the method developed [here](#). Testing took place in July 2015.

Simple set-top boxes without additional features are required to have on-mode power consumption below 5.0W; sample 5 had HD decoding ability, which grants an extra 1.0W allowance. In standby mode, Regulation 107/2009 specifies products must draw less than 0.5W, or 1.0W if they have an electronic display (this applied to sample 3 only).

### Check-test programme

All parameters were measured according to Ecodesign regulation 107/2009 with a calibrated power meter but with shorter measurement times. This includes the power consumption in active and standby mode and the assessment of the power management function. The results were compared with the manufacturer's claimed values.

Results are summarised below:

Sample	On-mode power (W)		Standby Power (W)		APD activation time (min)	Documentation
	Result	Limit	Result	Limit	Limit = 180	
1	4.0	5.0	0.44	0.5	180	Minor errors
2	3.9	5.0	0.25	0.5	180	Compliant
3	4.5	5.0	0.53	1.0	198	Compliant
4	3.4	5.0	0.41	0.5	180	Compliant
5	5.4	6.0	0.27	0.5	180	Compliant
6	3.3	5.0	0.45	0.5	180	Compliant

### Check-test findings

Overall, measurements showed the majority of products tested achieved the requirements of the regulation on power consumption. On the assessment of required Ecodesign features, sample 3 appeared to have an issue with its auto power down feature. The regulation states that the automatic power-down feature must activate after 3 hours with no user interaction; this sample was measured to power down after 3 hours and 18 minutes.

### Outcome

After consultation with the laboratory, MarketWatch escalated sample 3 to full compliance testing.

## Standby Power

Setting limits on power consumed by household products in standby mode has long been seen as an easy win to save energy and carbon emissions, and reduce bills and waste for consumers and businesses. The IEA's "One-Watt initiative", implemented in various forms world-wide, is generally considered a globally successful example of legislation.

In Europe, this became legislation in the form of Regulation 1275/2008, and later amended by Regulation 801/2013 to cover "networked" standby for internet connected devices. Setting a limit





for standby consumption has enabled a power reduction that has been estimated to account for up to 13% of household energy consumption<sup>2</sup>. The purpose of the standby regulation is to address a small power consumption in a large number of products; a high level of compliance with this regulation is essential for delivering the full energy savings associated with the legislation.

Limits for standby power consumption, detailed in Regulation 1275/2008, are applied as follows:

- 0.5W for products in off-mode, or those without an electronic display in standby mode
- 1.0W for products with electronic displays in standby mode
- 6.0W for products in a networked-standby mode
- 12.0W for products with “HiNA” functionality in a networked standby mode.

However, as with energy label declarations, evidence of meeting standby power limits is self-declared by suppliers. Nationally appointed Market Surveillance Authorities cover this area, as have previous projects such as [SELINA](#)<sup>3</sup>. There are no specific documentation requirements for the products tested by the project on standby power.

### Check-test programme

All parameters were measured according to the Ecodesign regulation 1275/2008 and 801/2013 with a calibrated power meter but with shorter measurement times. This includes the power consumption in active and standby mode and the assessment of the power management function. The results were compared with the manufacturer claimed values.

### Group 1

MarketWatch check-tested a total of 44 products, in three separate tranches. This included off-mode and network standby mode where appropriate, against [this method](#).

Group 1 included 10 household products such as digital radios, soundbars, a microwave and an electric toothbrush.

Check-test measurements from group 1 are summarised below:

Sample	Product type	Test	Limit applied (W)	Measured result (W)
1	Electric toothbrush	Standby	0.5	0.04
2	Microwave	Standby	1.00	1.45
3	Soundbar	Networked standby	6.00	6.45
4	Soundbar	Standby	0.50	0.59
		Networked standby	6.00	1.95
5	Digital radio	Off-mode	0.50	1.06
6	Digital radio	Standby	1.00	0.76
7	Digital radio	Standby	1.00	0.38
8	Digital radio	Standby	1.00	0.94
9	Digital radio	Standby	1.00	1.48
10	Digital radio	Standby	1.00	1.53

<sup>2</sup> <http://www.economist.com/node/5571582>

<sup>3</sup> <https://ec.europa.eu/energy/intelligent/projects/en/projects/selina>





## Check-test findings

Overall, findings suggested there may have been compliance issues in group 1:

- Two of the digital radios and the microwave appeared to consume more in standby than permitted by the regulation
- One digital radio measured in off-mode consumed 1.06W against the limit of 0.5W
- One of the soundbars also measured above the 6W limit when networked – however the date this product became available is not known, meaning the limit may not have applied in this case.

## Next steps

MarketWatch escalated the three digital radios (samples 5, 9 and 10) and the microwave (sample 2) to full testing on the basis of the check test results.

## Group 2

Group 2's product selection of 15 products are detailed in the below results table.

Sample	Product	Test	Limit applied (W)	Result (W)
1	Toaster	Off-mode	0.50	0.00
2	Microwave	Standby power	1.00	0.76
3	Toaster	Off-mode	0.50	0.00
4	Microwave	Standby power	1.00	0.70
5	Microwave	Standby power	1.00	0.76
6	Hairdryer	Off-mode	0.50	0.00
7	Hairdryer	Off-mode	0.50	0.05
8	Hairdryer	Off-mode	0.50	0.02
9	Kettle	Off-mode	0.50	0.00
10	Kettle	Off-mode	0.50	0.00
11	Kettle	Off-mode	0.50	0.00
12	Kettle	Networked standby	6.00	1.16
13	Coffee machine	Off-mode	0.50	0.00
		Standby power	0.50	0.48
14	Coffee machine	Off-mode	0.50	0.36
15	Coffee machine	Off-mode	0.50	0.00

## Check-test findings

Group 2 results showed no suspected non-compliance against the limits above. However, as an additional finding by the lab, it was noted that for sample 12, a kettle with network capability, it was not possible to deactivate the product's WiFi network, which is mentioned in the network standby amendment to regulation 1275/2008.

## Outcome

Regarding sample 12, the networked capability of the product was not an aspect the project team was originally looking at, and checks of the product suggested it had been placed on the market





before January 2015, from when networked standby limits applied. However, MarketWatch decided to look at an updated version of the product in a full test.

### Group 3

This group included the first product tested by the project with “HiNA” (High-Network Availability) functionality – i.e. one whose primary function is processing network traffic, such as a router.

Measurements from group 3’s selection of 19 products are detailed in the below table.

Sample	Product	Test	Limit applied (W)	Measured (W)
1	Soundbar	Standby power	1.00	0.93
2	Soundbar	Off-mode	0.50	0.00
		Standby power	0.50	0.57
3	Soundbar	Standby power	0.50	0.33
		Networked standby	6.00	2.93
4	Soundbar	Standby power	0.50	0.42
		Networked standby	6.00	7.47
5	Microwave	Standby power	1.00	0.67
6	Toaster	Off-mode	0.50	0.00
7	Electric Toothbrush	Standby power	0.50	1.25
8	Electric Toothbrush	Standby power	0.50	0.44
9	Electric Toothbrush	Standby power	0.50	0.38
10	Electric Toothbrush	Standby power	0.50	0.98
11	Hairdryer	Off-mode	0.50	0.06
12	Hairdryer	Off-mode	0.50	0.06
13	Coffee machine	Off-mode	0.50	0.45
14	Coffee machine	Off-mode	0.50	0.14
15	Coffee machine	Off-mode	0.50	0.00
16	Coffee machine	Standby power	1.00	0.94
		Networked Standby	6.00	0.67
17	Digital radio	Standby power	1.00	0.86
18	Web camera	Networked standby	6.00	1.77
19	Router	Standby power	0.50	0.11
		Networked Standby, HiNA	12.00	5.49

### Check-test findings

Group 3’s testing saw further suspected non-compliance as two electric toothbrushes were seen to exceed standby power limits, and two of the soundbars measured higher than permitted; one in networked standby mode drawing 7.47W and one exceeding the non-networked limit of 0.5W.

### Outcome

After consultation with the test laboratory, MarketWatch escalated samples 2, 4, 7 and 10 and to full tests.





## Lighting

MarketWatch included nine light bulb samples in the check testing programme. Testing took place in October 2015 against the method developed [here](#).

### Check-test programme

Based on 5 lamp samples, the light output, electrical power consumption, calculation of EEI, verification of Energy Class, starting time and lamp power factor were determined. The results were compared with the manufacturer claimed values which are based on the full compliance test method and a set of 20 samples. The check test programme did not include the measurement of switching cycles and lamp lifetime.

Seven LEDs and two halogen bulbs were put on test, with the sample selection informed by recent consumer testing and projects such as [PremiumLight](#). Results of technical testing are summarised below:

Sample	Energy rating		Lumen output		
	Declared	Measured	Declared	Measured	Difference
1 (LED Spot)	A	A	360	319	11% lower
2 (LED Spot)	A+	A+	470	296	37% lower
3 (LED Spot)	A	A+	420	449	7% higher
4 (LED Spot)	A+	A++	480	436	9% lower
5 (LED Spot)	A+	A	345	269	22% lower
6 (LED Bulb)	A+	A+	1055	910	14% lower
7 (Halogen Bulb)	D	D	1200	1096	9% lower
8 (LED Bulb)	A+	A+	600	734	22% higher
9 (Halogen Bulb)	C	D	630	588	7% lower

### Check-test findings

Whilst from a smaller sample size, findings in this area were concerning; 2 of the 9 bulbs measured a lower energy rating than claimed, but what is also significant is the fact that 4 of the 9 bulbs' lumen outputs were lower than their declaration by over 10%, including one bulb a massive 37% dimmer than claimed. Instances were seen where the energy rating was unchanged despite the lower light output, because the wattage measured was also lower than declared. The issue here is that equivalence claims are not realised, despite the lower power use. For example sample 6 declares 1055 lumens, which would be expected to replace a 75W incandescent. However, the measured output for sample 6 of 910 lumens would only put it slightly above an old 60W incandescent in brightness terms, despite the fact that the lamp still achieved its declared energy rating.

### Outcome

After consultation with the laboratory, samples 1, 2, 5 and 6 were escalated to a full test.

## Electric Ovens

MarketWatch included seven oven samples in the check testing programme. Testing took place in November and December 2015 against the test method detailed [here](#). Samples suspected to show problematic results were selected based on insights from consumer and NGO testing.





## Check-test programme

The volume of cavity, energy consumption and energy efficiency were determined with the check test programme. For the determination of the energy consumption and energy efficiency the so called “brick test” was performed but only for the mid temperature setting of the best heat source as labelled by the manufacturer. The results were interpolated and compared with the manufacturer’s claimed values which are based on the full compliance test method with 3 temperature measurements for the “brick test”. The check test programme did not include any noise measurements.

Results are summarised below:

### Energy label tests

Sample	Energy rating		Per-cycle energy consumption (kWh)		Volume (litres)	
	Claimed	Measured	Claimed	Measured	Claimed	Measured
1	A	A	0.88	0.81	66	59
2	A	A	0.87	0.77	65	65
3	A	A	0.79	0.74	65	57
4	A	A	0.85	0.84	61	56
5	A	A	0.80	0.74	65	65
6 – cavity 1	A	B	0.92	0.92	74	68
6 – cavity 2	A	B	0.78	0.76	42	35
7	A	B	0.83	0.87	56	57

### Fiche/Product information booklet

Sample	Product fiche	Product information booklet
1	Present and compliant	Some information missing
2	Present, minor errors	Compliant
3	Present, errors (missing EEI)	Compliant
4	Present and compliant	Compliant
5	Not present	Compliant
6	Present, minor errors	Compliant
7	Present and compliant	Compliant

## Check-test findings

Overall, it is encouraging that no major issues were seen in this testing. Three cavities measured a class below, but were within allowed tolerance limits. Per-cycle energy consumption measurements were actually measured lower than claimed for 6 of the 8 oven cavities tested.

## Outcome

Based on these results and consultation with the test laboratory, MarketWatch did not escalate any of the ovens to further testing.





## Dishwashers

MarketWatch check tested 5 models in December 2015 and January 2016 against the method [developed here](#) to see if models performed as declared.

### Check-test programme

For dishwashers, very few differences exist between MarketWatch's check test method and the full compliance test method; MarketWatch's check testing essentially carried out measurements on fewer runs, i.e. 2-3 runs rather than the 5-8 runs normally used for the purpose of calculating the measured values for verification purposes. In addition no noise measurements were done.

The current Ecodesign minimum ratings that a dishwasher must achieve to be allowed on the market are:

- Energy rating of A+ ("slimline" models of <45cm can still be A rated)
- Cleaning Efficiency index higher than 1.12 (corresponds to rating of A)
- Drying efficiency rating of A

Results were as follows:

### Energy label tests

Sample	Energy Rating		Cleaning Efficiency Class (tolerance 10%)	
	Declared	Measured	Declared	Measured (% I <sub>C</sub> lower)
1	A+	A+	A	C (11.6%)
2	A++	A++	A	B (8.0%)
3	A+	A	A	B (4.5%)
4	A++	A++	A	B (4.5%)
5	A+	A+	A	B (8.0%)

Sample	Drying Efficiency (tolerance 19%)		Annual Water Consumption (tolerance 10%)	
	Declared	Measured (% I <sub>D</sub> lower)	Declared	Measured
1	A	C (26.8%)	3724	3640
2	A	B (18.5%)	2800	2688
3	A	B (11.1%)	4200	4508
4	A	B (1.9%)	2100	2576
5	A	B (13.9%)	4200	3500

### Documentation and generic Ecodesign requirements

Sample	Product Fiche	Generic Ecodesign Requirements
1	Present and compliant	All compliant
2	Present and compliant	All compliant
3	Present and compliant	All compliant





4	Obtained via web. Compliant	All compliant
5	Obtained via web. Compliant	All compliant

## Check test findings

Results showed the first significant examples of potential deviations from declared values among white goods tested by the project. Tolerances stated in Regulation 1059/2010 allow deviation in measured values.

Sample 1 measured outside the allowed tolerance for both cleaning and drying efficiency. Samples 2, 3, 4 and 5 all had at least one metric measuring a class below, but were all within these tolerance limits, with the exception of the water consumption of sample 4. Whilst the per-cycle water consumption was measured higher by more than the allowed 10% tolerance, it appeared this was a function of the water management system of the dishwasher, and MarketWatch were advised by the laboratory that this would be expected to be within limits over the further test runs of a full test.

However, it should be noted that none of the 5 samples matched their claims outright in the check test, and use of the verification tolerance to stretch claims is prohibited.

## Outcome

MarketWatch has written to manufacturers and Market Surveillance Authorities with the test results. Samples 1, 2 and 5 have been escalated to full compliance tests.

## Refrigeration

Refrigeration energy label testing has previously been covered on a large scale by the [ATLETE 1](#) project; MarketWatch included 7 fridge-freezer samples in its check test program. Testing was carried out against the method developed [here](#) in December 2015 – January 2016.

### Check-test programme

The automatic functions were assessed and the volume and energy consumption of two test runs determined. The results were interpolated by accepting the stated climate class from the manufacturer and compared with the manufacturer claimed values which are based on the full compliance test method. The check test programme did not include any noise measurements.

Results measured were as follows:

Sample	Energy Rating		Annual Energy Consumption (kWh)		Difference (tolerance 10%)
	Claimed	Measured	Claimed	Measured	
1	A++	A+	242	261	8%
2	A+++	A++	161	205	27%
3	A+	A	193	206	7%
4	A++	A	235	374	59%
5	A+	A+	402	421	5%
6	A+	A	225	298	32%
7	A+	A	183	184	1%





## Documentation and generic Ecodesign requirements

Sample	Product Fiche	Generic Ecodesign Requirements
1	Not available with product	Compliant
2	Not available with product	Some minor omissions in manual
3	Not available with product	Compliant
4	Available with product	Some minor omissions in manual
5	Not available with product	Some minor omissions in manual
6	Not available with product	Compliant
7	Not available with product	Some minor omissions in manual

MarketWatch's check test method was essentially the same as the procedure for a full compliance test if only carrying out energy label measurements; tests such as the temperature rise time and storage temperatures (which are declared in the product fiche) were omitted. Manufacturer's load plans were used in each case.

### Check test findings

Sample 2 was escalated to a full compliance test of three further samples. Due to difficulty sourcing test samples, products 4 and 6 were not subject to further testing but the project team entered into detailed dialogue with manufacturers on the results, which were also provided to relevant market surveillance authorities.

Results seen were concerning in this area. Only one of the 7 refrigerators met its claimed rating in the independent test, and 4 of the 7 measured below the current ecodesign minimum rating of A+.

### Outcome

Sample 2 was escalated to a full test of three samples.

## Vacuum Cleaners

Of the product types tested under MarketWatch, vacuum cleaners were the most recently subjected to energy labelling and ecodesign requirements. Significant consumer performance testing is carried out on this product, but energy label and ecodesign compliance testing remains in its early days.

The project team selected 7 vacuum cleaners to be tested based on intelligence gained largely from consumer testing. A check test method was developed alongside experts from 3 different laboratories.

### Check-test programme

This test method carried out essentially performs the same dust pick-up tests as a full compliance test, enabling an estimate of the energy rating, and cleaning efficiency on both carpet and hard floor but omitted testing of the dust re-emission class and noise. Fewer test runs (two runs) were carried out than would be done for a full compliance test.

Testing took place in January and February 2016 and results were as follows:





Sample	Energy Rating		Annual Energy Consumption (kWh)		Carpet Cleaning Efficiency		Hard Floor Cleaning Efficiency	
	Claimed	Measured	Claimed	Measured	Claimed	Measured	Claimed	Measured
1	C	E	32.9	51.5	F	G	D	G
2	B	C	34.0	39.3	D	F	A	C
3	A	A	25.9	25.0	E	E	D	C
4	A	A	28.0	27.5	C	D	C	A
5	A	A	28.0	26.2	E	E	C	B
6	A	B	28.0	30.2	C	D	A	B
7	A	A	28.0	27.0	D	D	A	A

### Check test findings

Samples 1 and 2 appeared to show discrepancies in more than one energy label metric. Sample 6 measured outside the tolerance limit on carpet cleaning efficiency, however due to budget restrictions, further testing was not carried out.

### Outcome

Samples 1 and 2 were escalated to a full test.

## Summary of check testing

Of the 100 products check tested, a total of 26 were put forward for full testing; this comprised 23 products that were included in the sample and 3 substitute products selected, when the original sample was found to be unavailable. This broke down by product group as follows :

Product Type	No. tested	Tests carried out	No. escalated to full testing
Washing machine	4	Energy label, standby	0
Tumble drier	6	Energy label, standby	2
Simple set-top box	6	On-mode and standby power, auto power down	1
Television	5	Energy label, standby, peak luminance ratio, auto power down	2
Lighting	9	Energy label	4
Soundbar	6	Standby and networked standby	3
Digital radio	7	Standby power	3
Electric toothbrush	5	Standby power	2
Microwave	5	Standby power	2
Toaster	3	Off-mode power	0
Hairdryer	5	Off-mode power	0
Kettle	4	Off-mode power, networked standby	1





Coffee machine	7	Off-mode power	0
Web camera	1	Networked standby	0
Router	1	Standby and networked standby	0
Electric oven	7	Energy label	0
Dishwasher	5	Energy label, standby	3
Refrigerator	7	Energy label	1
Vacuum cleaner	7	Energy label	2
<b>Total</b>	<b>100</b>		<b>26</b>

## COMPLIANCE TESTING

For the second part of the testing programme, MarketWatch conducted compliance testing on the products that showed problematic results in check tests. Full tests are expensive (for example, quotes received for full compliance testing of a dishwasher were in the region of €6,000), a reason for the relatively low number that reported to be carried out in this area.

The project's objective was to carry out around 20 full tests using the budget available, and where necessary conduct triplicate re-tests as detailed in the 'verification procedure' of products' individual delegated regulations. Desired outcomes of the testing were to:

- Provide a basis for requesting action from manufacturers whose products did not achieve their declarations in tests
  - Provide evidence for further investigation of suspected non-compliance by MSAs
  - Identify trends and raise awareness of specific technical issues that were deemed problematic; and work with manufacturers to remedy these issues
- Explore areas where differing interpretations of regulations existed

A total of 27 products were full tested. This comprised 23 products that showed suspected non-compliance in check testing. A further three samples tested were updated models of the product check-tested, or another product from the same manufacturer where the model check tested was no longer available. A 27<sup>th</sup> product was selected for full testing without a prior check test, based on insights from the project team's market analysis.

Where tests showed that products did not meet declarations or limits, MarketWatch has calculated the estimated extra energy that would be used and cost incurred by a user<sup>4</sup>.

### Full Testing Programme

The full testing programme was conducted with the same stringency that would be carried out by a market surveillance authority (MSA) conducting full compliance tests. In some cases, certain tests that would be part of a full compliance test were omitted; this allowed testing of more samples and a more appropriate focus on the more problematic metrics. This is a practise reported to be carried out by MSAs when assigning budget and carrying out testing using a risk-based strategy.

<sup>4</sup> The cost per kWh used is 13.86p, the average UK tariff for 2016. Estimates of product lifetime have been taken from the UK CERT programme, EST's 2012 domestic energy usage report [Powering the Nation](#), and lifetime assumptions used for EST's website savings figures.



All testing was carried out by independent, highly experienced laboratories, suitably accredited against ISO 17025 for the products tested, selected using a competitive tender process. Laboratories used were as follows:

Product Type	Laboratory that conducted tests
<b>Tumble Driers</b>	SLG
<b>Standby power/Networked Standby</b>	SLG/Intertek
<b>Televisions</b>	VDE
<b>Lighting</b>	Laborelec
<b>Simple Set Top Boxes</b>	VDE
<b>Vacuum Cleaners</b>	SLG
<b>Dishwashers</b>	VDE
<b>Refrigeration</b>	VDE

## Individual products subjected to full tests

### 1. Hotpoint V4D01P(UK) Tumble Drier

The Hotpoint V4D01P(UK) Tumble Drier showed problematic results in check testing, as the programme time of the test sample was measured as longer than declared.

On this basis, the product was escalated to a full test of the original sample, followed by a further three samples. While the programme was measured again slightly higher, (but within tolerance limits) the issue seen in check testing was not observed in the subsequent tests. However, a different issue was seen. A light on the panel that could not be switched off prevented the product from fully powering down.

Hotpoint's declaration in technical documentation was that the product could enter a true 'off-mode', consuming 0.00W. However, in the full tests this issue was seen in all samples and measured at an average of 0.36W.

No deviations from the product's energy label declaration were observed.

Test	Declaration	Sample 1	Average, Samples 2-4
<b>Energy rating</b>	C	C	C
<b>Energy efficiency index</b>	$76 \leq EEI < 85$	82.6	81.6
<b>Annual energy consumption (kWh)</b>	330	319.88	316.15
<b>Weighted standard programme time (min)</b>	71	74	74
<b>Programme time at full load (<math>T_{dry}</math>)</b>	94	101	100
<b>Programme time at partial load (<math>T_{\frac{1}{2}dry}</math>)</b>	53	54	54
<b>Off-mode power consumption (W)</b>	0.00	0.36	0.36

Regulation 1275/2008 specifies that a product must provide either standby or off-mode, and where consumption is declared below 1.00W, a tolerance limit of 0.1W is allowed, resulting in this product failing against its off-mode declaration.





A measurement of 0.36W does not exceed the limit of 0.5W for off-mode specified in 1275/2008 and an update of product documentation would correct this issue.

### Manufacturer Response

Hotpoint did engage in dialogue with MarketWatch on the matter, and stated that the test result and declaration would be investigated. At the time of writing, the declaration had not been confirmed to be updated.

### Extra energy use

From the higher standby-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	2.63 kWh
Extra cost	€0.50
Lifetime (based on 12 years use)	
Extra electricity consumption	31.54 kWh
Extra cost	€6.03

## 2. CDA CI560WH Tumble Drier

MarketWatch's check test programme appeared to find an issue with the CDA CI560WH tumble drier; whilst achieving the same energy rating, the condensation efficiency was measured 10.4% lower than the claimed figure (against a tolerance limit of 6%). No issues were seen with any other energy label declarations.

Test	Declaration	Result
Energy rating	C	C
Energy efficiency index	$76 \leq EEI < 85$	82.9
Annual energy consumption (kWh)	561	550.4
Full load program time (min)	126	125
Weighted standard program time (min)	98	98
Condensation Efficiency (%)	70	63.4

Measurements from the full test were again similar and over 6% lower than the declaration.

### Manufacturer Response

CDA responded to the project's communication and entered into dialogue with the project. They reported that they had sought the advice of the UK Market Surveillance Authority, the NMRO and the claim they made was based on figures seen in their own internal testing, which had consisted of models achieving a value closer to 70%.

However, CDA also reported that no further production of this model was taking place. Therefore MarketWatch did not pursue any further lab testing. Amendment of the product fiche for models already in the supply chain was proposed; however this had not taken place at the time of writing.





### 3. Gelhard GTV-2253 Television

The Gelhard GTV-2253 showed suspected non-conformity in MarketWatch's check testing of televisions; based on these results the project team proceeded with full testing on this model.

Results seen from the first full test confirmed the check test finding that the higher on-mode power consumption measured placed the product in the B band, rather than the declared A band. A further three samples tested confirmed this finding. In addition, check testing found the automatic power down feature was not enabled by default as is mandatory. This feature was found to be non-compliant in each of the full tests conducted.

#### Sample 1

Test	Declaration	Result
Energy Label	A	B
Energy Efficiency Index	$0.23 \leq EEI < 0.30$	0.33
On-mode Power	21	25.10
Peak Luminance Ratio (%)	>65	88
Standby Power	0.40	0.47
Auto power down enabled by default?	Required	No

#### Samples 2-4

Test	Sample			Average, samples 2-4
	2	3	4	
Energy Label	B	B	B	B
Energy Efficiency Index	0.32	0.31	0.31	0.31
On-mode Power	24.05	23.84	23.23	23.71
Peak Luminance Ratio (%)	84	86	84	85
Standby Power	0.47	0.47	0.47	0.47
Auto power down enabled by default?	No	No	No	No

#### Manufacturer Response

Gelhard is a brand available on the German market. Ultramedia, the brand owner responded to the project's communications and looked into the matter. Ultramedia reported making an update to the TV's software which corrected the auto power down issue and reduced the power consumption in line with the energy label declaration.

MarketWatch did propose the remedy action of communicating to retailers and consumers who may have already purchased this product, details of the discrepancy in energy rating and higher energy consumption. However, reporting that this model was no longer in production, Ultramedia have not agreed to this remedy action. MarketWatch also provided details of this case to the German market surveillance authorities for investigation.





### Extra energy usage

From the higher on-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	5.91 kWh
Extra cost	€1.13
Lifetime (based on 11 years use)	
Extra electricity consumption	65.04 kWh
Extra cost	€12.43

## 4. Reflexion LDD-197 Television

Check testing of the Reflexion LDD-197 measured a higher on-mode power consumption, resulting in it achieving a B rating instead of the declared A. MarketWatch subjected this model to a full test which confirmed the finding. A further three samples were then bought and tested.

Full test of the further three samples showed the TV measuring an A+ rating, but in these samples the auto power down rating was off by default, which was not seen in the previous samples.

### Sample 1

Test	Declaration/ requirement	Result
Energy Label	A	B
Energy Efficiency Index	$0.23 \leq EEI < 0.30$	0.3126
On-mode power consumption (W)	17	19.90
Peak luminance ratio (%)	>65	92
Standby power consumption (W)	0.40	0.43
Automatic power down enabled by default?	Required	Yes

### Samples 2-4

Test	Sample			Average, samples 2-4
	2	3	4	
Energy Label	A+	A+	A+	A+
Energy Efficiency Index	0.2193	0.2210	0.2275	0.2226
On-mode power consumption (W)	13.40	13.50	13.90	13.60
Peak luminance ratio (%)	68	68	66	67
Standby power consumption (W)	0.20	0.20	0.22	0.21





Automatic power down enabled by default?	No	No	No	No
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### Manufacturer response

Ultramedia are also the brand owner of Reflexion. Ultramedia confirmed that the first sample tested was in fact the current model; samples 2-4 were the same model with an older firmware. Therefore the result of sample 1 was the most pertinent and reflective of current production.

As with the Gelhard model, Ultramedia responded to the project's communications and reporting making a further firmware update to reduce the energy consumption in line with its claim. MarketWatch has reported this case to the German MSA for investigation.

MarketWatch did propose the remedy action of communication of details of the discrepancy in energy rating and higher energy consumption to retailers and consumers who may have already purchased this product. However, reporting that this model was no longer in production, Ultramedia have not agreed to this remedy action.

### Extra energy usage

From the higher on-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	6.35 kWh
Extra cost	€1.21
Lifetime (based on 11 years use)	
Extra electricity consumption	69.86 kWh
Extra cost	€13.35

## 5. Roberts Radio Stream 107 Digital Radio

Check testing of the Roberts Stream 107 digital radio measured standby power consumption higher than the limit of 1.00W. Check tests were carried out with two different settings of the backlight; both the factory setting of 'high' and with the backlight changed to 'low'. In both cases, the power consumption was higher than the 1W limit.

A full compliance test against EN 50564:2011 was carried out on the check test sample; results of this were similar to those seen in the check test. Therefore, three further samples were bought and tested, again achieving very similar results.

Limit (1275/2008, Annex II, 2b)	Sample				Average, samples 2-4
	1	2	3	4	
1.0W	1.47W	1.50W	1.51W	1.52W	1.51W





### Manufacturer response

Roberts Radio responded to the project's communication and accepted the result. The release of an "over the airwaves" update was reported to reduce power consumption to under 1.0W in light of the project's finding.

### Extra energy usage

From the higher standby-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	3.72 kWh
Extra cost	€0.71
Lifetime (based on 8 years use)	
Extra electricity consumption	29.78 kWh
Extra cost	€5.69

## 6. Sangean WFC-29R Digital Radio

MarketWatch's check testing uncovered that the Sangean WFC-29R digital radio showed a possible problem with the product's power consumption in off-mode. It was observed that when switching the power button off, the radio still drew just over 1W, against the off-mode limit of 0.5W specified in 1275/2008. A full test against EN 50564:2011 confirmed this finding; a test on a further three samples gave similar results:

Limit (Reg. 1275/2008, Annex II, 2a)	Sample number				Average, samples
	1	2	3	4	2-4
0.5W	1.09W	1.15W	1.02W	1.13W	1.10W

### Manufacturer response

Sangean responded to the project's communication and as a remedy action proposed updating their software to disable certain features and lower power consumption to reach the limit of 0.5W.

### Extra energy usage

From the higher off-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	4.38 kWh
Extra cost	€0.84
Lifetime (based on 8 years use)	
Extra electricity consumption	35.04 kWh
Extra cost	€6.69





## 7. Ted Baker Finisterre Digital Radio

Check tests of the Ted Baker Finisterre showed higher standby power consumption than the limit of 1.00W specified for products with an electronic display. The product was escalated to a full test against EN 50564:2011. Again a higher consumption was measured:

Limit (1275/2008, Annex II, 2b)	Result
1.0W	1.40W

MarketWatch did not conduct a further three tests as the project team were unable to procure further test samples. However a dialogue ensued with the manufacturer on the result.

### Manufacturer response

Ted Baker Audio did respond to the project's communication on this matter. An independent test report that formed the basis of their CE declaration was provided detailing independent energy consumption tests previously carried out.

MarketWatch and Ted Baker Audio had different interpretations of the regulation, as to which mode is off-mode. MarketWatch's position was that the factory setting is the default mode which for the test sample was a mode with the backlight in a 'high' setting. Ted Baker Audio's testing showed the 'low' setting was used.

### Extra energy usage

From the higher on-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	2.92 kWh
Extra cost	€0.56
Lifetime (based on 8 years use)	
Extra electricity consumption	23.36 kWh
Extra cost	€4.46

## 8. OBH Nordica Antares 7519 Microwave

Check testing of the OBH Nordica Antares 7519 Microwave measured standby power consumption at 1.45W, exceeding the limit of 1.00W for products with an electronic display. The project team carried out a full test on the microwave against EN 50564:2011. This again measured comfortably higher than the limit, at 1.38W. Thus the product was escalated to a full test.

Limit	Result
1.0W (1275/2008, Annex II, 2b)	1.38W

OBH Nordica have not to date replied to the project's communications on either the check testing or the full testing.





### Extra energy usage

From the higher on-mode power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	2.77 kWh
Extra cost	€0.53
Lifetime (based on 12 years use)	
Extra electricity consumption	33.29 kWh
Extra cost	€6.36

## 9. OBH Nordica Andoria Retro Microwave

Following the single full test of the Antares 7519, MarketWatch intended to conduct a full test on 3 samples. However at this time, it was not possible to source the original model, as it was discontinued. The project team replaced it with another similar model from the current range, the Andoria Retro and conducted a single full test on this product. Results were as follows:

Limit (EC 1275/2008, Annex II, 2b)	Result
1.00W	0.65W

The newer microwave was measured within limits, but MarketWatch is still pursuing a response on the original results that exceeded the limit, and seeking assurance that current product ranges do comply with this aspect of legislation.

## 10. Zehnder DX860E Set Top Box

Full compliance tests were run on further samples of the Zehnder DX860 set top box following the finding in check testing that the product had an auto power down feature that was suspected as non-compliant with regulation EC 107/2009.

Full test results confirmed the finding, as the issue was present in each of the further three test samples.

Test	Limit/ Requirement	Result, sample 1	Average, samples 2-4
Active mode power (W)	5.0	4.5	4.5
Standby power consumption (W)	<1.0	0.53	0.53
Time for activation of automatic Power Down (APD) (min)	<180	198	198





## Manufacturer response

The project team attempted to contact Zehnder, however it transpired the company had since gone out of business and the new owner of the brand was not backing warranties on this product.

Therefore, on this occasion, obtaining a commitment from the manufacturer for corrective action was not possible, but the results do highlight issues with this product type. Also of concern is the relative ease with which a product such as this can pass through the supply chain unchecked with compliance issues that are not addressed, to the detriment of the consumer.

## 11. Star Trading 358-70 LED Bulb

MarketWatch performed energy efficiency measurements on 20 samples, of the Star Trading 358-70 LED lightbulb. This followed check tests which looked at another model from this manufacturer, which was not available at the time of full testing.

Results from the full test were as follows:

Test	Declaration	Result
Energy rating	A+	A+
Useful Luminous Flux	1050 lm	871 lm
Wattage	12W	11.9W
Equivalent wattage	75W	64W
Switching cycles	Test passed	

Useful luminous flux measured was lower than that declared by more than the 10% threshold specified in Regulation 1194/2012. This made the lamp's equivalence claim closer to the brightness of a 60W incandescent bulb, rather than the 75W claim made.

## Manufacturer response

Star Trading responded to the project's communication and reported problems with their supplier; specifically that internal measurements may have been incorrect and packaging declarations from the supplier had been used without further quality checks. Star Trading reported that the products tested would not be produced any longer and gave details of stronger internal processes, liaison with the Swedish MSA to improve compliance, and confirmed implementing the use of measuring equipment in their Swedish facility to check production more closely.

## 12. Waterpik SR-3000 Electric Toothbrush

MarketWatch carried out extensive check testing of products in standby mode to gain insight into levels of compliance with regulations in this area. One of the products subjected to further testing was the Waterpik SR-3000 electric toothbrush.

MarketWatch's check test was deemed by the laboratory to have sufficient stability and accuracy of measurement to constitute a full test. A further three samples were bought and tested to see if the higher power consumption in standby was more widespread for this product. Results seen were as follows:





Limit (1275/2008, Annex II, 2a)	Sample				Average, samples 2-4
	1	2	3	4	
0.5W	1.25W	1.14W	1.15W	1.16W	1.15W

### Manufacturer response

Findings were confirmed, and the project team reported this to Waterpik. However a response has yet to be received from the company. Results have also been disseminated to relevant market surveillance authorities.

### Extra energy usage

From the higher standby power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	4.75 kWh
Extra cost	€0.91
Lifetime (based on 5 years use)	
Extra electricity consumption	23.73 kWh
Extra cost	€4.53

## 13. Remington SFT100 Electric Toothbrush

Results for this product confirmed the check test findings, with average power consumption from the three samples around 1W, against the limit of 0.5W.

Limit (1275/2008, Annex II, 2a)	Sample				Average, samples 2-4
	1	2	3	4	
0.5W	1.25W	1.14W	1.15W	1.16W	1.15W

### Manufacturer response

Spectrum brands, the brand owner of Remington responded to MarketWatch's communication and reported that this product was placed on the market before the regulation applied to this product type, and samples tested were old stock still in the supply chain.

MarketWatch has followed up communication with Remington to confirm the date the test samples were placed on the market, but ultimately the project team was unable to assign a status to this product regarding applying the appropriate limit.

## 14. Azatom Stealthbar AZHD1 Soundbar

The Azatom Stealthbar AZHD1 was measured to consume 7.47W in network standby in check tests, above the limit of 6.0W stated in legislation. This test was also deemed by the laboratory to have sufficient accuracy and stability to constitute a full standby compliance test. Therefore the project team bought and tested a further 3 samples, with results as follows:





Limit (1275/2008, Annex II, 3e)	Sample				Average, samples 2-4
	1	2	3	4	
6.0W	7.47	7.75	7.50	7.45	7.57

The re-test confirmed the check-test findings, with the average measured value exceeding the limit by over 25%.

#### Manufacturer response

Test results have been communicated to Azatom, based in the UK, but no response has been received by the project team to date.

#### Extra energy usage

From the higher networked standby power measured for this product, extra energy and cost that would be incurred are estimated as follows:

<b>Annual</b>	
<b>Extra electricity consumption</b>	11.46 kWh
<b>Extra cost</b>	€2.19
<b>Lifetime (based on 11 years use)</b>	
<b>Extra electricity consumption</b>	126.07 kWh
<b>Extra cost</b>	€24.09

## 15. Blaupunkt LS162e BK Soundbar

After check testing suggested the Blaupunkt LS162e Soundbar may exceed the standby power limit of 0.5W (which covers products with no electronic display) MarketWatch carried out tests on three further samples. The original check test was deemed by the laboratory to have the necessary stability and accuracy of measurement of a full test.

Limit (1275/2008, Annex II, 2a)	Sample				Average, samples 2-4
	1	2	3	4	
0.5W	0.57W	0.57W	0.57W	0.59W	0.58W

However, results from these tests, while consistent, and above the 0.5W threshold, did not exceed the allowed tolerance limit of  $0.5W + 0.1W$  specified in Regulation 1275/2008. Therefore this product was deemed to comply with the regulation.

## 16. SONOS Playbar

Following check testing, MarketWatch carried out a further test on the SONOS Playbar, a networked soundbar for multi-room audio. Power limits for networked products are defined in regulation 1275/2008, specifically the network standby amendment, 801/2013.

From January 2015, networked products are required to power down to a standby mode when they are not performing their main function. As they are still network connected, the regulation allows





for higher power consumption than non-networked equipment. Allowances specified differ, depending on whether the product is intended for High-network Availability (HiNA) or not.

Previous check testing had measured levels above 6.0W in both networked-mode, but at the time of the check test the date this product was placed on the market could not be determined.

The project team carried out a further test, using a different laboratory to compare results and assess whether there was agreement in terms of the standby mode selection for measurement. Feedback from Intertek, the laboratory used for full testing was that the appropriate limit to be used in this case was the 12.0W 'HiNA' threshold, as documentation referred to high network availability. However, measurements of the test sample were also below the 6.0W non-HiNA threshold.

Results seen were as follows:

Limit applied (1275/2008, Annex II, 3a, HiNA)	Result
12.0W	5.84W

Full test measurements showed this product complied with the technical requirements of regulation 1275/2008.

## 17. Megaman 141401 LED spot

Check testing of lighting showed 4 of the 9 products tested gave a lumen output over 10% lower than their packaging claim. One of these was the Megaman 141401 LED spot, which measured an average lumen output of 22% lower. MarketWatch carried out a full test on 20 samples with results as follows:

Test	Declaration	Result
Energy rating	A+	A
Useful Luminous Flux	345 lm	277 lm
Luminous Intensity	500 cd	423 cd
Wattage	6W	5.8W
Equivalent wattage	50W	42W
Switching cycles	Test passed	

Results from the 20 samples again saw a lower light output than claimed on the packaging, this time by 20%, and an energy rating measured one class lower. No lamp in the sample had a brightness of over 300lm. Regulation 1194/2012 specifies a 10% tolerance limit for the average result of the batch.

## 18. Megaman MM27442 LED spot

A second Megaman product was escalated to a full test after measuring an 11% lower average useful luminous flux in check tests. Findings from 20 samples were as follows:





Test	Declaration	Result
Energy rating	A	A
Useful Luminous Flux	360 lm	308 lm
Luminous Intensity	650 cd	451 cd
Wattage	7W	7.1W
Equivalent wattage	50W	46W
Switching cycles	Test passed	

Measurements on the larger sample size saw the average lumen output measured 15% lower than the claim, and outside the 10% tolerance threshold. A further non-compliance was seen in the luminous intensity, as the average candela measured was only 69% of the claimed value; 1194/2012 states this must achieve at least 75% of the declaration.

#### Manufacturer response

MarketWatch has communicated both sets of findings to Megaman, but has yet to receive a response.

## 19. Lightme LED LM85236-3

A fourth product from the lighting category was escalated to a full test; the Lightme LED LM85236-3 measured an average useful luminous flux 14% lower than declared in tests. Results from 20 samples were as follows:

Test	Declaration	Result
Energy rating	A+	A+
Useful Luminous Flux	1055 lm	973 lm
Wattage	12W	10.2W
Equivalent wattage	75W	70W
Switching cycles	>40,000	1 failure in batch; test passed

In this case, testing the full set of 20 samples brought the average value back to within the tolerance limit of 10%. Whilst this is not deemed non-compliant, it was pertinent to observe that none of the samples in the batch achieved the declared lumen output of 1055lm.

#### Manufacturer response

MarketWatch contacted Lightme LED with the results, and recommended that the packaging claim could be more suitably amended in light of the test results.

## 20. Smarter iKettle 2.0

MarketWatch performed a standby power compliance test on the Smarter iKettle 2.0, following insights from earlier check testing on the iKettle 1.0. Focus was placed on two aspects; the non-networked standby power consumption, and whether it was possible to deactivate the product's wireless network.





Limit applied (Reg. 1275/2008, Annex II, 2a)	Result
0.5W	0.87W

As with the iKettle 1.0, MarketWatch's test laboratory found that it was not possible to deactivate the WiFi network.

### Manufacturer response

A difference in interpretation of the regulation was highlighted between the project's testing and that of the manufacturer, who did provide MarketWatch with details of their own testing from an independent, accredited laboratory. Smarter define the iKettle 2.0 as a "networked product" and thus identified the networked standby limit (6.0W from January 2015, 2.0W from September 2017) as the correct one to be adhered to. However, MarketWatch's interpretation was that the product was in an 'off-mode' condition; the figure of 0.87W was measured in a condition where the product was not performing a function and the same consumption was measured both with and without a data connection established.

Regarding the activation of the Wi-Fi network, point 3 of Article 8 of 1275/2008 (amended by Regulation 801/2013) states:

*"Any networked equipment that can be connected to a wireless network shall offer the user the possibility to deactivate the wireless network connection(s). This requirement does not apply to products which rely on a single wireless network connection for intended use and have no wired network connection."*

Interpretations differed on this point; Smarter stated that the last sentence of this clause did appropriately define the product; MarketWatch's position was that boiling water is the primary function of the kettle and the network connectivity aspect was a supplementary feature.

In the end a common position was not reached, and as Smarter were able to provide justification for their position, the test result cannot be deemed as suspected non-compliant. However, this product provides an interesting case study on the potentially increased power consumption of networked products, and possible loopholes in the standby regulation as a result.

## 21. Amica ESP 14386V Dishwasher

The Amica ESP 14386V dishwasher measured close to tolerance limits for cleaning and drying efficiency in check testing. MarketWatch's check test method uses two runs (with a third if the product featured a water regeneration cycle) compared to at least five in a compliance test. A single full test was conducted to see if this product measured within limits over the greater number of runs. Results were as follows:

Test	Declared	Measured
Energy Rating	A++	A++
Annual Energy Consumption (kWh)	266	263
Cleaning Efficiency	A	B
Drying Efficiency	A	B
Annual Water Consumption (litres)	2716	2800
Length of cycle (min)	179	175





Findings were similar to the check test, and the product did again measure lower classes, but within the tolerance limits. Ultimately, the product was found to comply with the regulation.

#### Manufacturer response

Amica did respond to the project's check testing letter, confirming that the results seen were unexpectedly different from their internal testing, and would monitor this more closely in future.

## 22. Whirlpool ADP2300A Dishwasher

As with the Amica dishwasher, the Whirlpool model tested was close to tolerance limits in the reduced check test – again the full five verification runs were carried out to see which side of the limit would be measured. Results showed similar findings to the Amica full test – again this product was measured within limits. Despite cleaning and drying efficiency being in lower classes, results were within accepted tolerances.

Test	Declared	Measured
Energy Rating	A+	A+
Annual Energy Consumption (kWh)	291	281
Cleaning Efficiency	A	B
Drying Efficiency	A	B
Annual Water Consumption (litres)	4200	3500
Length of cycle (min)	165	174

#### Manufacturer response

Whirlpool responded to the letter on the check test result and pledged to monitor production closely in their facilities regarding the slightly lower measurements of cleaning and drying efficiency.

## 23. OK ODW 451 FS Dishwasher

MarketWatch's check testing of dishwashers showed some potentially concerning trends as all 5 models tested measured lower than their label claims on drying and cleaning efficiency, although only one was outside the allowed tolerance limits stated in regulation 1016/2010. The OK ODW 451 FS had the largest deviation from its claims and was escalated to a single full test. Results seen were as follows:

Test	Declared	Measured
Energy Rating	A+	A+
Annual Energy Consumption (kWh)	237	221
Cleaning Efficiency	A	C
Drying Efficiency	A	B
Annual Water Consumption (litres)	3640	3752
Length of cycle (min)	172	170

The project team purchased a further 3 samples and carried out a re-test, as per the regulation.





Test	Sample			Average, Samples 2-4
	2	3	4	
Energy Rating	A+	A+	A+	A+
Annual Energy Consumption (kWh)	218	222	225	222
Cleaning Efficiency	C	C	C	C
Drying Efficiency	C	B	C	C
Annual Water Consumption (litres)	3640	3752	3780	3724
Length of cycle (min)	172	172	172	172

### Manufacturer response

No response has been received by the project team to date on this test result.

### Extra energy usage

Whilst this product did not deviate from its claimed energy rating, the cleaning efficiency metric is an important one. A dishwasher that fails to effectively clean dishes on the test cycle may have to be put on more often or a higher temperature program that uses more energy may be chosen. MarketWatch estimates this may result in around a 33% higher annual energy consumption for this machine, which measured two classes below the current Ecodesign minimum rating of A. Therefore, from the test results measured for this product, extra energy and cost that would be incurred are estimated as follows:

<b>Annual</b>	
Extra electricity consumption	79.00 kWh
Extra cost	€15.09
<b>Lifetime (based on 8 years use)</b>	
Extra electricity consumption	632.00 kWh
Extra cost	€120.75

## 24. AEG S53530CNX2 refrigerator

From earlier check testing of refrigeration, the AEG S53530CNX2 refrigerator was deemed a suitable candidate for a full compliance testing. The check test method for this product type is similar to the procedure for a full test (the only difference being the omission of certain tests for metrics defined on the product fiche but not the energy label). 3 further samples of this product were purchased from the general market and tested, with results as follows:

Test	Declaration	Sample			Average
		1	2	3	
Energy rating	A+++	A++	A++	A++	A++
Energy Efficiency Index	EEl < 22	25.0	24.8	23.7	24.5
Annual Energy Consumption (kWh)	161	184	183	174	180

Measurements from the triplicate testing showed an energy rating of A++ for all 3 samples, and average annual energy consumption 12% higher than the label claim of 161 kWh per year.





## Manufacturer response

AEG engaged very early with project, at the time of reporting check tests. At the time of writing, dialogue remained in progress to resolve the issue.

### Extra energy use

From the higher in-use power measured for this product, extra energy and cost that would be incurred are estimated as follows:

Annual	
Extra electricity consumption	19.00 kWh
Extra cost	€3.63
Lifetime (based on 12 years use)	
Extra electricity consumption	228.00 kWh
Extra cost	€43.56

## 25. Kunft KVC 1119 Vacuum Cleaner

Results from MarketWatch's check testing of vacuum cleaners suggested that the Kunft KVC1119 vacuum cleaner should be escalated to further testing. In the full compliance test, measurements of the dust re-emission class and sound power levels were also included. Results were as follows:

Test	Declared	Measured
Energy rating	C	E
Annual energy consumption (kWh/year)	32.9	50.8
Carpet cleaning efficiency rating	F	G
Hard floor cleaning efficiency rating	D	G
Dust re-emission rating	G	E
Sound power level (dB)	84.3	87.1

Multiple parameters were seen to not meet declarations in the tests. Full test results measured the annual energy consumption very close to the check test figure, at 50.8 kWh/year - 54% higher than the energy label claim. In addition, the carpet and hard floor cleaning performance ratings, which declared an E rating, were measured in the G-band, and lower than the current minimum ecodesign limit. Finally, measurements of sound power levels were above the declaration; regulation 666/2013 specifies this must not exceed its claim.

## Manufacturer response

Worten, the brand owner of Kunft and one of Portugal's largest home retailers have replied to the project team's communications and are currently looking into the matter; they supplied details of their own internal testing which did show the product meeting its energy label claim. At the time of writing, no remedy actions had been proposed.





Annual	
Extra electricity consumption	17.90 kWh
Extra cost	€3.42
Lifetime (based on 8 years use)	
Extra electricity consumption	143.20 kWh
Extra cost	€27.36

## 26. Rowenta RO6673EA Vacuum Cleaner

MarketWatch's check testing of vacuum cleaners suggested that further analysis of the Rowenta RO6673EA Intensium may show non-conformity against aspects of ecodesign and energy labelling regulations.

Findings from the full compliance test were as follows:

Test	Declaration	Measured
Energy rating	B	C
Annual energy consumption (kWh/year)	34.0	37.1
Carpet cleaning efficiency rating	D	D
Hard floor cleaning efficiency rating	A	C
Dust re-emission rating	C	G
Sound power level (dB)	82	81.5

Check test findings appeared to be confirmed by the full test. The annual energy consumption measured a class below, but within allowed tolerance limits. The main issues seen in the testing were with the hard floor rating and dust re-emission. The hard floor rating measured two classes below in its dust pick-up ability, and dust re-emission for the test sample performed poorly, measuring in the G band.

### Manufacturer response

Rowenta have actively communicated with MarketWatch on this testing, and responded as soon as check test results were received. Remedy actions had not yet been confirmed at the time of writing.

Annual	
Extra electricity consumption	3.10 kWh
Extra cost	€0.59
Lifetime (based on 8 years use)	
Extra electricity consumption	24.80 kWh
Extra cost	€4.74





## Further testing

A 27<sup>th</sup> product was tested by MarketWatch, however results seen were inconclusive. After dialogue with the product manufacturer, further testing is planned, and the project team has referred the case to relevant MSAs.

## Summary of Compliance Testing

By product type, overall results seen from testing were as follows. As the MarketWatch consortium is not an appointed MSA, it does not have the power to attribute a definitive compliance status to a product. Hence the term “suspected non-compliance” has been used to describe products that did not meet the relevant limit or claim in MarketWatch’s testing.

### Products that did not meet claims or requirements in MarketWatch tests

Product	Type	Problematic parameter
Hotpoint V4D01P(UK)	Tumble Drier	Off-mode
CDA CI560WH	Tumble Drier	Condensation efficiency
Sangean WFR-29C	Digital Radio	Off-mode
Roberts Radio Stream 107	Digital Radio	Standby mode
Ted Baker Finisterre	Digital Radio	Standby mode
Reflexion LDD-197	Television	Energy rating
Gelhard GTV-2253	Television	Energy rating
Zehnder DX860 E	Set-Top Box	Automatic Power Down
OBH Nordica Antares 7519	Microwave	Standby mode
Waterpik SR-3000	Electric toothbrush	Standby mode
Azatom Stealth Bar AZHD1	Soundbar	Networked standby
Megaman 141401	LED Spot	Energy rating, lumen output
Megaman MM27442	LED Spot	Lumen output
Star Trading 358-70	LED Bulb	Lumen output
OK ODW 451 FS	Dishwasher	Cleaning efficiency, drying efficiency
AEG S53530CNX2	Fridge-freezer	Energy rating
Kunft KVC1119	Vacuum Cleaner	Energy rating
Rowenta RO6673EA	Vacuum Cleaner	Hard floor cleaning efficiency rating

## Conclusions

Conducting check tests before full tests appeared to be an effective strategy; check test data fed into a full test where suspected non-compliance was seen in 18 of 27 cases (67%).

The level of engagement from manufacturers was encouraging and to date responses have been received for 12 of the 18 products that showed problematic results in full tests. Whilst there were challenges to some test results, the majority of manufacturers were keen to work with the project to agree a position and in some cases provide remedy actions.



Testing uncovered useful insights for future work on monitoring and compliance. This included insights into testing of product types subject to recent regulations (vacuum cleaners and networked standby). Useful insights were also provided from dialogue with the test labs and manufacturers on interpretation of regulations; different positions were taken in some test cases of standby and networked standby. As an overall trend, results for cleaning efficiency of dishwashers suggest that further investigation into overall compliance could be done in this area.

The findings showed that there is still work to do to ensure a high level of compliance with energy labelling and ecodesign requirements. Whilst testing was on targeted samples, a relatively high proportion (26%) showed some suspicion of not meeting claims in the check tests.

However, there is also good news. Some product categories were measured very close to their claims in check tests, an encouraging finding on compliance. None of the four washing machines and seven electric ovens check tested deviated from claims such that a full test was considered necessary. Measurements of off and standby mode power for products with no electronic display were in almost all cases seen to meet requirements.

