

# B/S/H/

## Household appliances, experience with noise emission declarations and labels

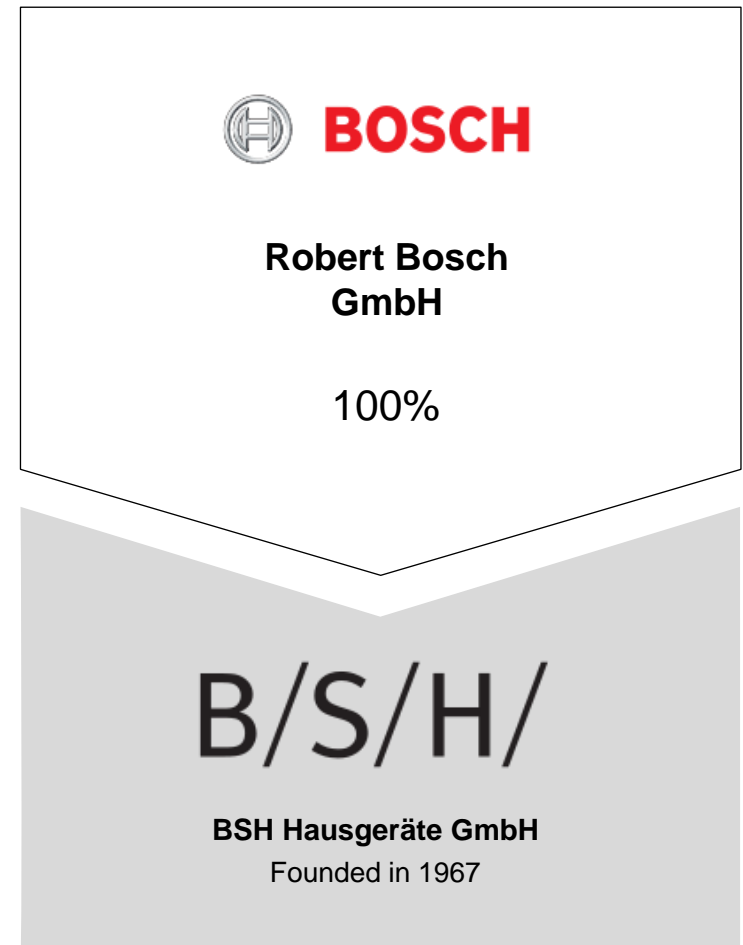
Symposium Buy Quiet  
Hamburg, Germany  
August 25, 2016

Dr. Gerhard Fuchs



## BSH at a Glance

- Founded in 1967 as a joint venture between Siemens AG and Robert Bosch GmbH
- Since the beginning of 2015 BSH fully belongs to the Bosch Group
- Market leader in Europe, No. 2 in the world
- Sales revenue: 12,6 billion Euros (2015)
- Product portfolio: all modern home appliances
- Employees worldwide: 56,500
- BSH named as a top employer in numerous countries
- R&D rate global: 4%
- Around 3,500 R&D specialists in BSH's international production and development network
- Customer service: more than 8,000 specialists in about 50 countries



## Home appliances under the brands

Global Brands



**BOSCH**

**SIEMENS**

**GAGGENAU**



Local Heroes

*Thermador*★



**Balay**

**Coldex**

*Constructa*

**PITSOS**

**PROFILO**

**ufesa**

**zelmer**

Label Brands

**JUNKER**

**VIVA**

BSH Home Appliances Group is a Trademark Licensee of Siemens AG for the brand Siemens and of Robert Bosch GmbH for the brand Bosch.

## BSH's product portfolio covers the entire spectrum for daily life



Cooking and  
Baking



Washing and  
Drying



Dishwashing



Refrigeration and  
Freezing

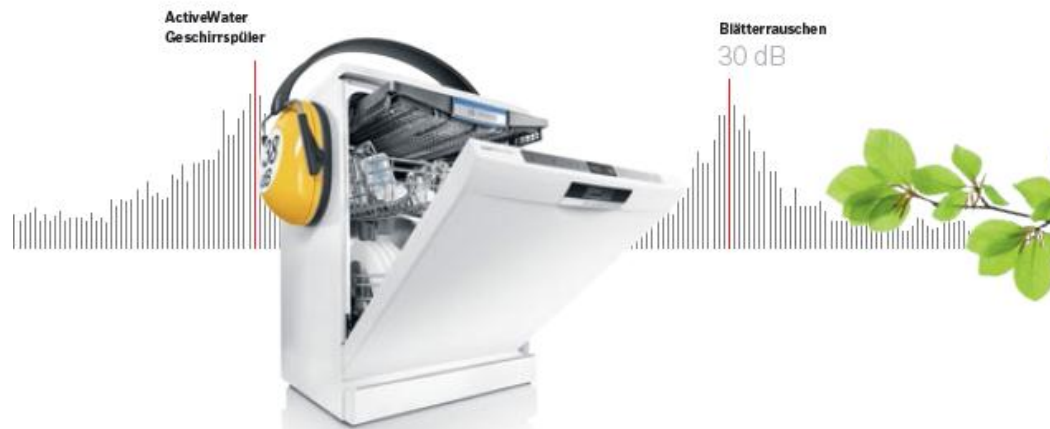


Consumer  
Products



## Bosch SilenceEdition

- Communication of noise emissions
- Comparison of noise levels
- Consumer and user expectation
- Experience of low noise emissions
- Competition



**Für alle, die von Hausarbeit nichts hören wollen.**

Erleben Sie die besonders leisen Hausgeräte der neuen Bosch SilenceEdition.  
Ausgabe 2014 / 2015



 **BOSCH**  
Technik fürs Leben

## Experience low noise emissions

- Daily life sounds versus operating noise of an appliance
- Sound power versus sound pressure
- Visualization of noise emissions
- Ear protectors versus loud speaker symbols



Flugzeug



Bohrmaschine



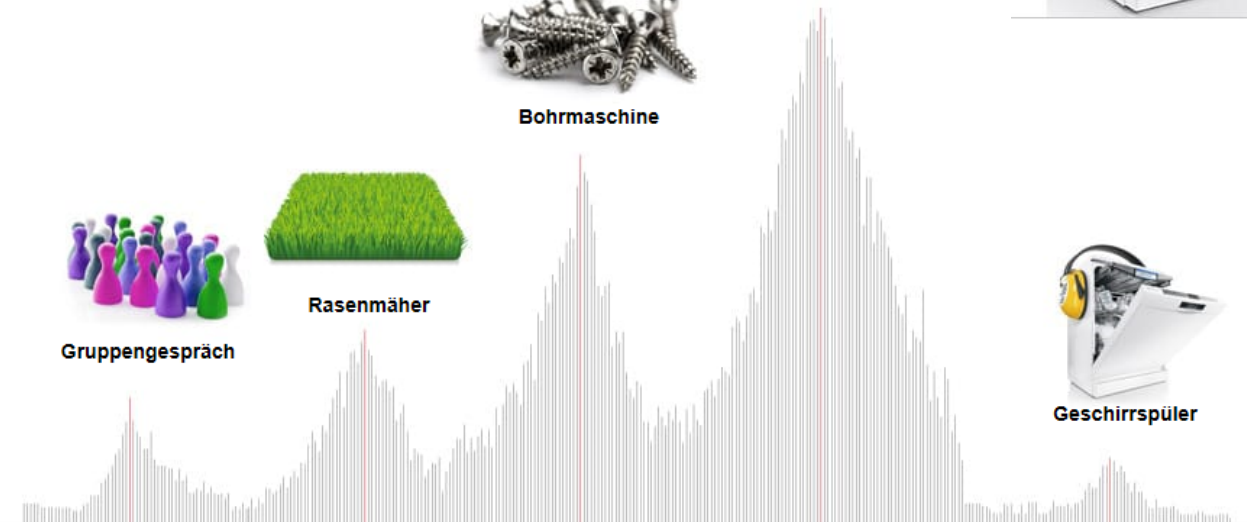
Gruppengespräch



Rasenmäher



Geschirrspüler



## Bosch bagless vacuum cleaner Relaxx'x ProSilence 66

- Relaxx'x ProSilence 66
  - SilenceSound System (innovative insulation materials, motor suspension, optimised airflow and sound reduced accessories)
  - Incredibly quiet 66 dB(A) sound power level
  - Famous tiger TV spot



## Advertising noise emission

- “Silence” – a competition advantage
- “Silence” – an ergonomics and convenience feature
- Annoying noise not appreciated

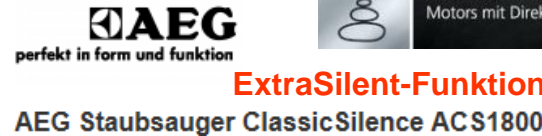
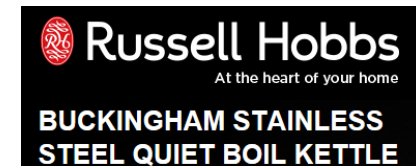
### Other relevant topics

- Explanation of „normal” noise; malfunction
- Acoustical feedback when working with the appliance
- Information requirements

→ **Silence**



## Some marketing catchphrases



**ROWENTA**  
Silence Soft

SilenceSound System



Super Silence

**AntiVibration Design**



— Vacuum in silence —  
**WITH ROWENTA**

Der leisestebeutellose Staubsauger am Markt.



## Declarations and limits

- Sound power level
  - Mandatory label and fiche
  - Mandatory information
- Mandatory sound power limit
- Marketing story
  - Sound power level
  - Sound pressure level
  - Sone level
- Mark (voluntary)

## Examples



## ProSilence 66



## Testing and declaration of noise emissions

- IEC 60704 Household and similar electrical appliances – Test code for the determination of airborne acoustical noise –
  - Part 1: General requirements
  - Part 2-x: Particular requirements
  - Part 3: Procedure for determining and verifying declared noise emission values
- Principle / test room
  - anechoic / semi-anechoic (over reflecting plane) or
  - special reverberation or
  - reverberation test room  
(ISO 3743-1, -2, ISO 3744, ISO 3745)
- Program cycle averaging method ( $L_{eq}$ )
- Standardized loads and environment conditions (aligned with product specific performance standard)
- A-weighted sound power level, in dB re 1 pW
- Declaration and verification according specific regulations (national / regional level) and/or agreements amongst market players

## **IEC 60704 series Household and similar electrical appliances - Test code for the determination of airborne noise**

IEC 60704-1	General requirements
IEC 60704-2-1	Particular requirements for vacuum cleaners
IEC 60704-2-2	Particular requirements for fan heaters
IEC 60704-2-3	Particular requirements for dishwashers
IEC 60704-2-4	Particular requirements for washing machines and spin extractors
IEC 60704-2-5	Particular requirements for electric thermal storage room heaters
IEC 60704-2-6	Particular requirements for tumble dryers
IEC 60704-2-7	Particular requirements for fans
IEC 60704-2-8	Particular requirements for electric shavers
IEC 60704-2-9	Particular requirements for electric hair care appliances
IEC 60704-2-10	Particular requirements for electric cooking ranges, ovens, grills, microwave ovens and any combination of these
IEC 60704-2-11	Particular requirements for electrically operated food preparation appliances
IEC 60704-2-13	Particular requirements for range hoods
IEC 60704-2-14	Particular requirements for refrigerators, frozen-food storage cabinets and food freezers
IEC/PAS 60704-2-15	Particular requirements for household food waste
IEC 60704-3	Procedure for determining and verifying declared noise emission values

## Sound power measurement principles for household appliances



Semi-anechoic room



Special reverberant room



Reverberant room



## And sound design



- Definition of a pleasant sound
- Identifying and reduction of annoying sound
- Application of Sone scale

Semi-anechoic room

## Noise labelling of household appliances in Europe

- ~1970 Noise/energy labels in some counties of the European Community (voluntary)
- 1986 Directive of the Council of the European Communities on „airborne noise emitted by household appliances” (86/594/EEC)
- 1992 Directive of the Council of the European Communities on “the indication by labelling and standard product information of the consumption of energy and other resources by household appliances” (92/75/EEC)
- ≥ 1994 Product specific Directives of the Council of the European Communities (e.g. Refrigerators (94/2/EC))
- 2005 Directive of the European Parliament and of the Council on „ecodesign requirements for energy using products“ (2005/32/EC); integrated approach on noise; Directive 86/594/EEC is repealed
- 2009 Directive of the European Parliament and of the Council on „establishment of a framework for the setting of ecodesign requirements for energy-related products“ (2009/125/EC)
- 2010 Directive of the European Parliament and of the Council on „the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products” (2010/30/EU)
- ≥ 2008 Product specific measures implementing Directives 2005/32/EC and 2008/125/EC and delegated acts supplementing Directive 2010/30/EU

Website of EU Commission DG Growth <https://ec.europa.eu/growth/single-market/european-standards/>

## Product information on noise, since 1978

Example: Refrigerator / freezer

Produkt-Information		
Kühl-Gefriergerät	XYZ	-18°C ABC
Nutzzinhalt	gesamt	
	Kühlteil	
	Gefrierenteil	
Gefriervermögen	00 kg	
Lagerzeit bei Störung	00 Std	
	Gefrierenteil	
Abtauen	Kühlteil	automatisch
	Gefrierenteil	von Hand
Betriebsgeräusch		
Schalleistung	dB (re 1 pW)	
Stromverbrauch in 24 Std	0,00 kWh	
Norm	EN 153 21 007 DE 2 000 4	
Ausführliche Produkt-Information im Prospekt		

Source: ZVEI

starting 1978  
ZVEI label, Germany

Energie	
Hersteller	BOSCH
Modell	KGV70320
Niedriger Energieverbrauch	<b>A</b>
	A
	B
	C
	D
	E
	F
	G
Hoher Energieverbrauch	
Energieverbrauch kWh/Jahr	<b>292</b>
<small>(Auf der Grundlage von Ergebnissen der Normprüfung über 24 h)</small>	
<small>Der tatsächliche Verbrauch hängt von der Nutzung und vom Standort des Gerätes ab.</small>	
Nutzzinhalt Kühlteil I	176
Nutzzinhalt Gefrierenteil I	55
Geräusch (dB re 1 pW)	<b>40</b>
<small>Ein Datenblatt mit weiteren Geräteangaben ist in Prospekten enthalten.</small>	
<small>Norm EN 153, Ausgabe Mai 1990 Kühlergeräte-Richtlinie 94/2/EG</small>	

1994 – 2010  
„old“ EU energy label

ENERG	
Y IA	IE IA
enerгия · ενεργεια	
BOSCH	KGE49BI40
A+++	<b>A+++</b>
A++	
A+	
A	
B	
C	
D	
ENERGIA · ЕНЕРГИЈА ΕΝΕΡΓΕΙΑ · ENERGIJA ENERGY · ENERGIE · ENERGI	<b>175</b> kWh/annum
301 L	111 L
	<b>34 dB</b>
2010/1060	

since 2010  
„new“ EU energy label

Source: BSH



## The icon



- Neutral loudspeaker symbol
- A-weighted sound power level re 1 pW
- No further explanation
- No classification
- No indication about noise level of market representative products

***“The vast majority of respondents across all groups deemed the information ‘very useful’ or ‘useful’. Very few respondents were negative or responded ‘I don’t know’.”***

Source:., Ecofys by order of European Commission, 2014; *Background report II: Survey results, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive* “

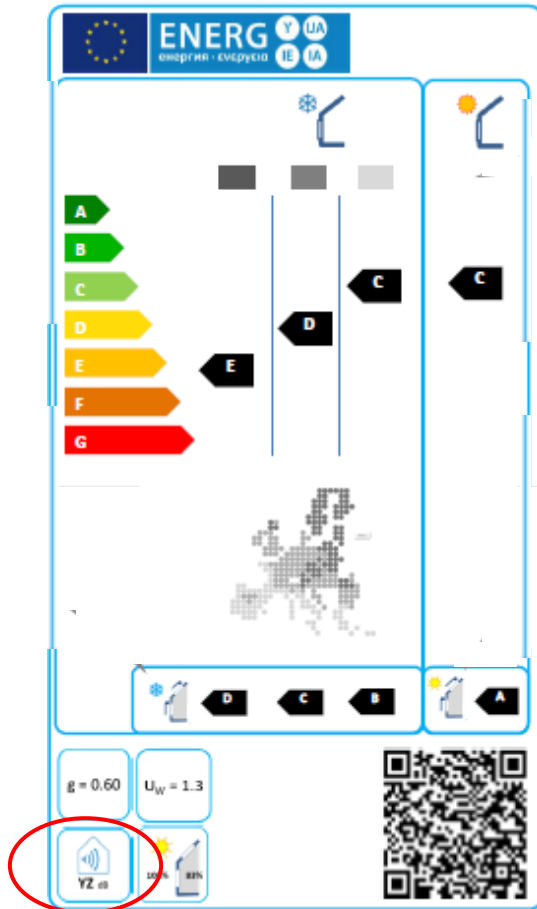
## EU energy label; sound power level to be declared

The image displays ten different EU energy labels for various household appliances. Each label features a color-coded energy efficiency scale from A+++ (green) to G (red). A red circle highlights the 'YZ dB' field on each label, indicating the sound power level to be declared. The labels are arranged in two rows:

- Top Row:** Water heaters, Air conditioners, Refrigerators, Range hoods, Washing machines.
- Bottom Row:** Space heating, Heat pump heating / water heaters, Dishwashers, Tumble dryers, Vacuum cleaners.

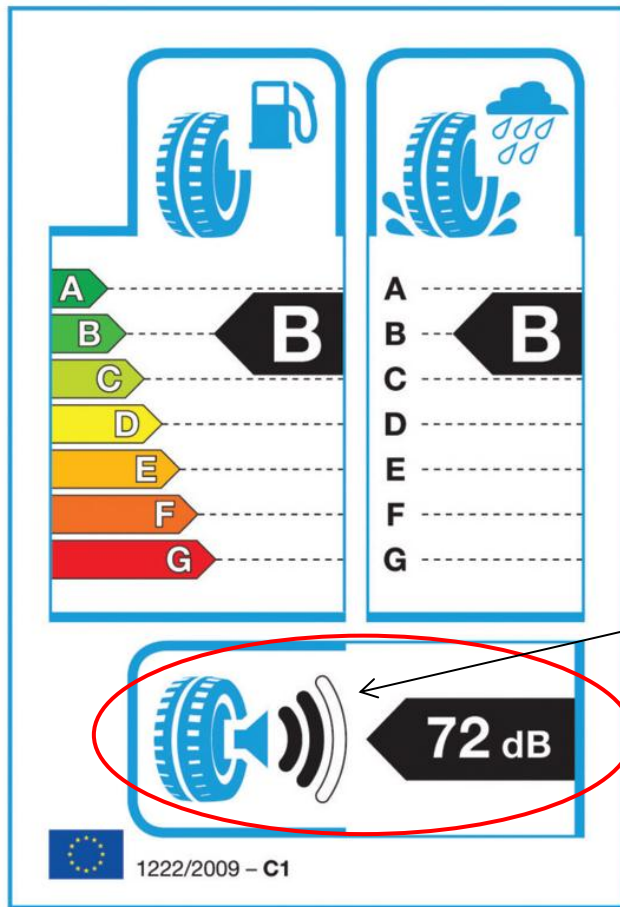
Each label includes the 'ENERG' logo, a scale of energy efficiency classes, and a field for the sound power level (YZ dB). The labels also contain various technical specifications and icons representing different energy-saving features.

## Other EU energy label



Windows (Draft)

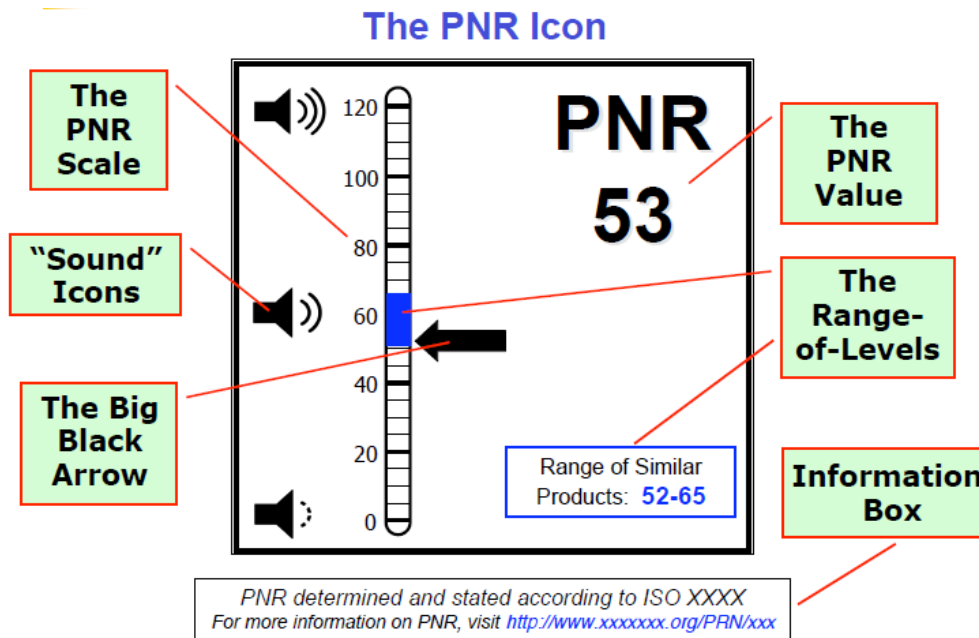
## Other EU energy label



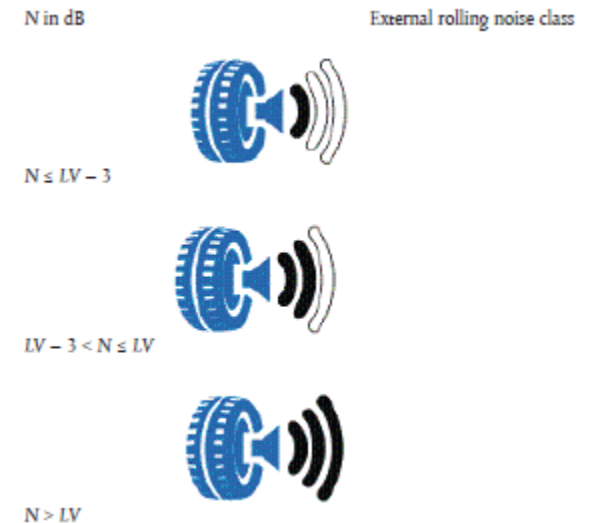
Tyres

## A noise classification scheme for household appliances?

### ■ Ideas



Source: M. Nobile, 2011



Source: EU labelling for tyres, (EU) No 1222/2009

→ No plan for a noise classification at the moment.

**dB value versus tiger?**



**versus**



## Contact

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Secretary of CENELEC/TC 59X Performance of household and similar electrical appliances  
Member of CENELEC/TC 59X/WG 14 Measurement of noise emission  
Member of IEC/TC 59/WG 2 Acoustical noise of household appliances

## Annex

4.c Labels also provide information on other product- specific parameters. Please rate the overall usefulness of this information:

4.c Noise (for Washing Machines and Dishwashers)

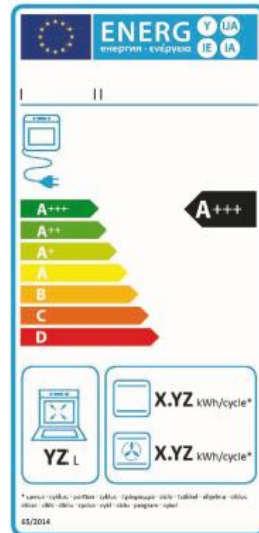
	Consumer	Ind. Retail	Ind. Manu	Totals
Very useful	69	12	11	92
Useful	41	21	10	72
Neutral	10	1	3	14
Not useful	1	4	0	5
Not useful at all	0	1	1	2
Don't know	0	0	1	1

Source:., Ecofys by order of European Commission, 2014; *Background report II: Survey results, Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive* , p.195

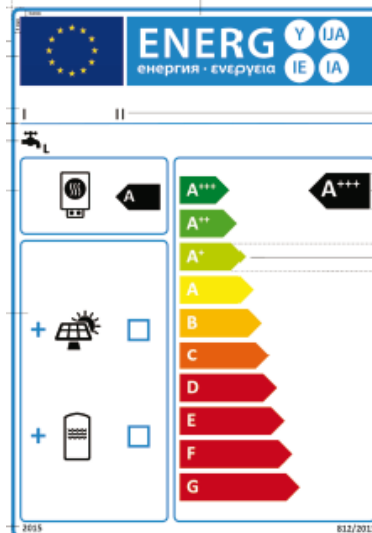


## EU energy label - no noise to be declared

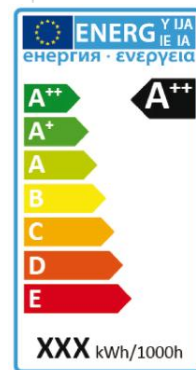
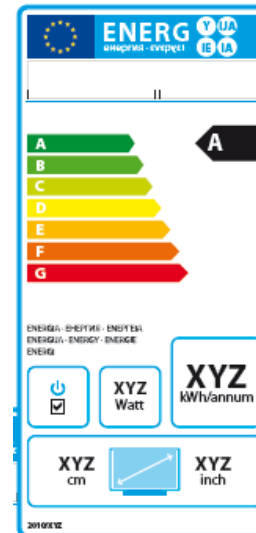
Ovens



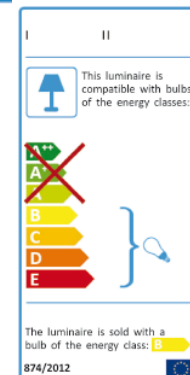
Water heaters (incl. solar)



TVs



Lamps



Luminaires