

Policy recommendations for tumble driers

January 2014

1. Summary

The new Energy Label for driers with classes up to A+++ has been introduced since 2012, and since November 2013 tier 1 of the Ecodesign regulation applies. Product lists on www.topten.eu show that there are already 22 A+++ and A++ driers, 13 of which also reach the best condensation efficiency class. A+++ driers consume nearly 70% less energy than conventional class B driers without heat pump.

The new label allows consumers also to see the large efficiency differences between different heat pump driers, which was not possible with the old label. The Ecodesign regulation bans only the worst performing non-heat pump driers from the market. There is a much higher saving potential, which should be tackled in a near revision of the regulations:

- **Energy efficiency: A+ as future requirement**

Driers without heat pump should be announced to be banned from the future market. Switzerland is going ahead and bans driers less efficient than class A+.

- **More ambitious condensation efficiency requirements**

A condensation efficiency of 70% will be required from November 2015, meaning that still 30% of the humidity can be expelled to the room and cause damages. Thirteen models on Topten.eu reach condensation efficiency values of more than 90% (class A). In a future revision more ambitious condensation efficiency requirements should be announced.

- **Cover excluded tumble driers: washer-driers and professional driers**

With the current old Energy Label for washer-driers their efficiency cannot be compared to that of driers nor of washing machines. And in professional driers a large untackled saving potential lies. Ambitious minimum efficiency requirements and a (better) energy Label should apply also for combined washer-driers and for professional tumble driers.

- **General: Market monitoring**

The development of the markets should be assessed regularly and based on sound sales data. Such a market monitoring allows determining when a revision of the Energy Label and the Ecodesign requirements is due. It also serves as a basis for decisions on the design of a future labelling scale and minimum energy efficiency requirements.

2. Introduction

Electrical laundry drying accounts for a considerable share of a household's electricity consumption: a typical dryer (class B/C) consumes three times more energy per cycle than the washing machine.

The penetration of driers in European households is increasing: 3.8 million tumblers for residential use were sold in 2007 in the EU-27– 14% more than 2002 (data from GfK and Eurostat in PWC, 2008). Therefore it is crucial to implement effective measures limiting the electricity consumption of the increasing drier stock.

Since 2013 the new Energy Label with classes up to A+++ and Ecodesign requirements apply for tumble driers. The new Label allows consumers to detect efficiency differences between different heat pump driers (classes A to A+++), and the Ecodesign regulation bans the least efficient driers from the market (class D since Nov 2013, class C from Nov 2015).

3. Best available technology: high efficiency heat pump driers

Heat pump driers consume 50% less electricity than conventional condenser driers (class B/C). Only heat pump driers reach class A, but most of them are much better than the class limit and already reach the new classes A+, A++ and even A+++.

There is a large number of heat pump driers models on the EU market: in April 2012 there were more than 84 residential and 4 professional heat pump drier models from 18 different manufacturers on the European market (www.topten.eu, April 2012).

Since the new Label has become compulsory in 2013, Tipten.eu only lists tumble driers reaching at least efficiency class A++ and condensation efficiency class B. By the end of 2013, seven months after the new Label became compulsory, there are 17 different models in class A++, while five models even reach the top class A+++ (www.topten.eu, Dec 2013). The Best Available Technology driers have an EEI of 23. This corresponds to an efficiency according to the old label of 0.16 kWh/kg. An A+++ drier consumes only one third the energy of a conventional drier without heat pump.

13 of the 22 drier models on Tipten.eu reach the best condensation efficiency class A (condensation efficiency = 90%). This means that less than 10% of the humidity removed from the laundry is expelled to the room. Too much humidity can cause building damages and the need for a room dehumidifier – resulting in additional electricity consumption.

4. Switzerland: only heat pump driers on the market

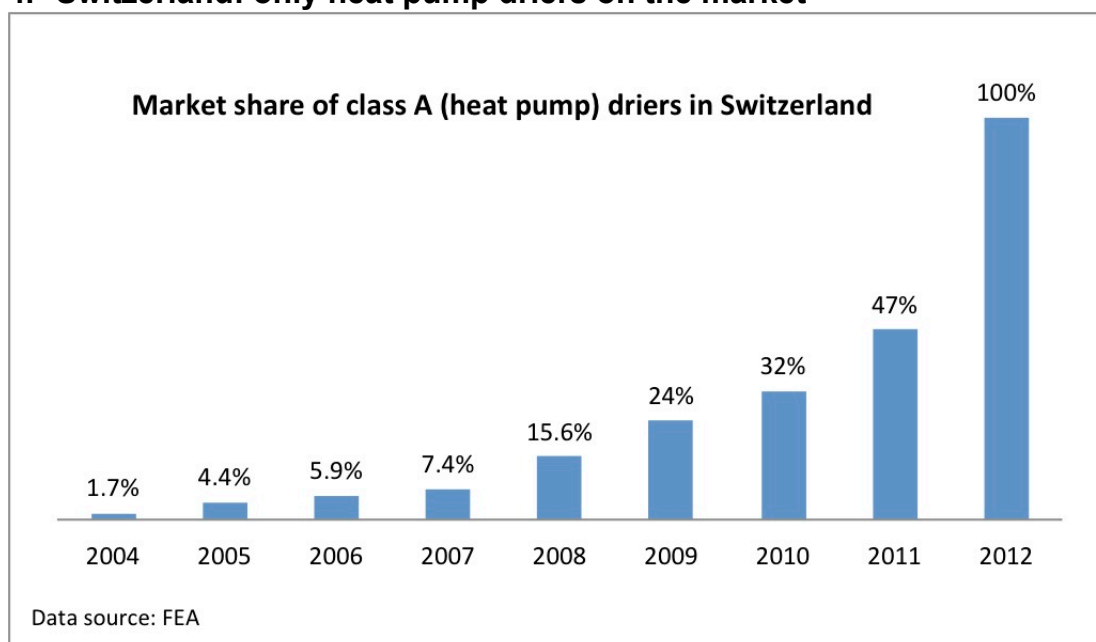


Fig 1: A class driers sales share in Switzerland. Data source: FEA

In Switzerland, heat pump driers reached a market share of 47% in 2011. Since 1st January 2012, only tumble driers of class A (or better) are allowed to be placed and sold on the Swiss market (Bush et al, 2013). The number of efficient drier models on the market has been increasing. Switzerland now adapts the requirement to the new energy Label: the new minimum requirement is A+. With the implementation of this strict and foresighted MEPS Switzerland can realise a considerable electricity saving potential. The sales share of heat pump driers in the EU is on a lower level than in Switzerland, but also on the rise. According to GfK data from early 2012 the sales share of A class driers was 38% in Germany (presented at EEDAL 2013, Bush et al.).

5. Policy measures in the European Union

5.1. New energy label

Since June 2013 the new energy Label for tumble driers (regulation No. 392/2012) with classes up to A+++ is compulsory. The new label allows consumers to distinguish between less and more energy efficient heat pump tumble driers, which has not been possible with the old label. Despite large differences in efficiency, they all heat pump driers were in the old class A.

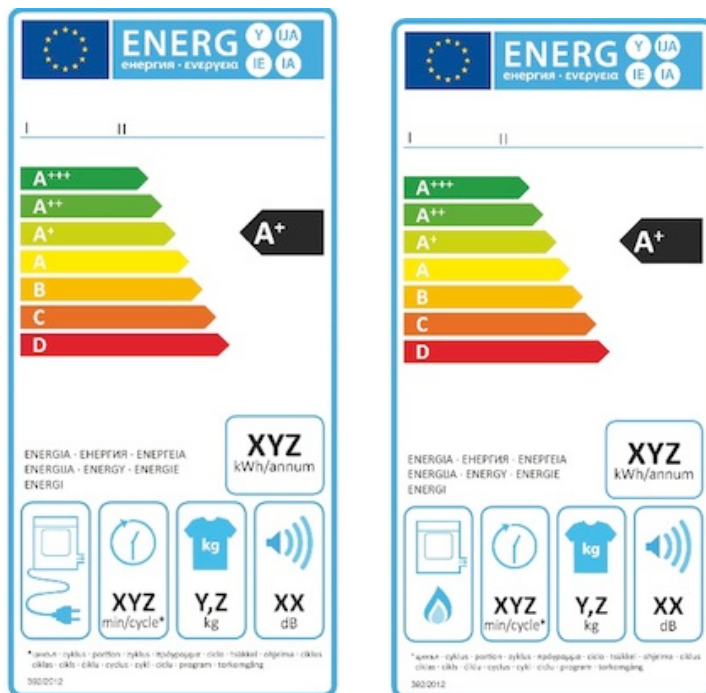


Fig. 2: Layout of the new Energy Label for electric (left) and gas driers (right).

While the old Label's classification was based on a simple kWh/kg (consumption per cycle divided by the capacity) efficiency at full load and with 60% initial moisture content, the new Label is based on a more complex Energy Efficiency Index (EEI). The EEI is the relation of a model's annual energy consumption to a reference model's (of the same capacity) energy consumption (in %). The EEI calculation formula assumes 160 drying cycles per year (around three per week), of which 4 out of seven are assumed to be operated with a half load filling. The table below shows how the new Label classes relate to the old specific energy consumption – more or less, because the new label also takes additional factors (half load performance, programme duration and power management) into account.

New energy label 2012		Ecodesign requirements	Old Energy Label from 1995	
Class	EEI		Specific consumption (kWh/kg)	Class
A+++	EEI < 24		0.18 / 0.19	A
A++	32		0.25	A
A+	42		0.32	A
A	65		0.5	A
B	76		0.59	B
C	85	Banned from Nov 2015	0.64	B
D	$85 \leq \text{EEI}$	Banned since Nov 2013	> 0.64	C/D

Tab 2: Energy efficiency classification scale of the new Energy Label.

New is the declaration of the condensation efficiency of condenser driers on the label. The condensation efficiency classification scale is sensible and simple and provides an important consumer information (Tab. 3). As the energy consumption, also the calculation formula of the condensation efficiency assumes that 4 out of 7 cycles are operated with half load filling. A good condensation efficiency is important, because if too much humidity is expelled into the room instead of condensed and collected, building damages can be caused. In order to avoid these, an air dehumidifier might be needed – leading to additional electricity consumption.

Condensation efficiency class	Weighted condensation efficiency	Ecodesign requirements
A	$C > 90$	
B	80	
C	70	
D	60	Banned from Nov 2015
E	50	Banned since Nov 2013
F	40	
G	$C < 40$	

Tab. 3: Condensation efficiency classification scale

Finally the tighter measurement tolerance of 6% is a considerable improvement which allows for a more precise declaration and avoids overlapping classes, while being technically attainable.

5.2. Ecodesign requirements

Tier 1 of the Ecodesign regulation for tumble driers No 932/2012 applies since 1st November 2013: tumble driers must reach at least energy efficiency class C and condensation efficiency class D. This means that the worst performing driers are banned from the market. In November 2015 the requirements will be made more ambitious, and drier models must reach the energy efficiency class B and condensation efficiency class C (see table 3).

Ecodesign requirements for driers		Minimum energy efficiency		Min. condensation efficiency
		New EEI	Class	
Tier 1	Nov. 2013	< 85	C	60%
Tier 2	Nov. 2015	< 76	B	70%

Tab. 4: Ecodesign requirements for driers adopted in October 2012.

6. Purchase price and life cycle costs

GfK data from Germany from early 2012 presented at EEDAL 2013 (Bush et al. 2013) shows that life cycle costs are clearly lower with a heat pump drier than with a non-heat-pump drier: life cycle costs of an A class drier were calculated to be EUR 2166.-, with a B class drier 3264.-.

An own online research on www.geizhals.de in mid-January 2014 reveals the price premium by A++ and A+++ driers compared to non-heat-pump class B driers. The table below shows the median of all prices for A+++ (N=8), A++ (N= 91) and class B driers (N= 88) on the German price comparison website www.geizhals.de (accessed on January 9th, 2014). According to the median values the purchase price of A++ driers is nearly 90% higher than that of B driers, the price of A+++ driers even 170% higher. Despite these higher purchase prices consumers are better off with efficient driers: thanks to the much lower electricity costs a household with an A++ drier can save around EUR 300 during its lifetime of 15 years. Lifecycle costs of A+++ driers are similar as with class B driers – despite the high price premium.

Class	Geizhals.de: Price Median, EUR	Electricity costs in 15 years* (7kg)	Total life cycle costs, 15 years
A+++	989.-	350.-	1339.-
A++	690.-	450.-	1140.-
B	372.-	1118.-	1490.-

Tab. 1: Purchase price and electricity costs of driers. *Electricity costs have been calculated for a 7kg-drier, based on the declared annual energy consumption according to the Energy Label and assuming an electricity tariff of EUR 0.15/kWh (Topten.eu).

With their market share continuing to increase in the future purchase prices of efficient heat pump driers will keep decreasing.

7. Policy recommendations

7.1. Market monitoring

The development of the markets since the introduction of the Energy Label (sales shares of efficiency classes) should be assessed regularly and based on sound sales data. Such a market monitoring allows determining when a revision of the Energy Label and the Ecodesign regulation is due. It also serves as a basis for decisions on the design of a future labelling scale and minimum energy efficiency requirements. After some years the data can further allow for precise stock models.

7.2. Near revision

Both the energy labelling and the Ecodesign regulation should be revised soon – before loosing effect due to the market development. Since there are already A+++ driers on the market, the revision should be planned now so that the Label continues posing an incentive for further development towards higher efficiency. A future energy label would ideally consist of the original A to G scale, with an A class reserved for the very best products.

The current Ecodesign regulation is not ambitious and leaves the inefficient class B driers (without heat pump) on the market even in tier 2. Class B driers consume three times as much energy as the best heat pump driers (A+++). A revision of the Ecodesign regulation should phase out driers without heat pump and the least efficient heat pump driers. These ambitious minimum efficiency requirements would lead to considerable energy savings.

7.3. Ecodesign regulation revision: specific recommendations for ambitious MEPS with no loopholes

- **Energy efficiency: A+ as future requirement**

The Ecodesign regulation for driers does not phase out driers without heat pump; class B driers are left on the market even in tier 2 - with an energy consumption three times as high as that of the BAT. There is a vast market offer of more than 80 heat pump drier models from 18 different manufacturers and of different sizes, for household, semi-professional and professional use (www.topten.eu, April 2012). 17 different models today reach the top classes A++ and A+++ plus a high condensation efficiency corresponding to class A (topten.eu). A revision of the Ecodesign regulation should set a clear sign for the heat pump technology by announcing an A+ as minimum requirement soon. This would leave all heat pump driers except for the least efficient ones on the market and set an incentive to develop new more efficient products instead of less efficient ones (class A). Switzerland is going ahead and bans driers below class A+.

- **More ambitious condensation efficiency requirements: class B / A**

The Ecodesign regulation sets new minimum requirements regarding condensation efficiency. This is important, as low condensation efficiency can lead to wet rooms and the need for additional room drying equipment and thus increase the need for electricity consumption. The values of 60% (tier 1) and 70% (tier 2) are however very low. A condensation efficiency of 70% means that 30% of the humidity remains in the room, which can still cause damages without drying measures. Thirteen models on Topten.eu reach condensation efficiency values of more than 90% (class A). In a revision more ambitious condensation efficiency requirements should be aimed at: class B (80%) as a first step, then class A (90%).

- **Cover excluded tumble driers: washer-driers and professional driers**

Washer-driers are neither covered by the Ecodesign regulation for washing machines nor by the regulation for driers, they are only covered by the old labelling regulation from 1993. Most washer-driers are inefficient, and experts expect their market share to rise in the future. In the UK for example washer-driers already account for 23% of the drier sales. There is also a large untapped energy saving potential in the professional drier sector and we encourage the EU to take similar action. There are highly efficient driers for pro use (see examples below and on www.topten.eu), and Ecodesign requirements and an energy label could lead to more efficient products for this sector.

8. References and Links

A++ and A+++ heat pump driers on the European market: www.topten.eu

Swiss Association of the Domestic Electrical Appliances Industry (FEA)

Bush, Damino, Josephy, Granda: Heat pump tumble driers: New EU Energy Label and Ecodesign requirements in Europe, MEPS in Switzerland, Initiatives in North America. EEDAL, Portugal, September 2013.

www.topten.eu/uploads/File/EEDAL13_Eric_Bush_Heat_Pump_Driers.pdf

New energy labelling regulation for tumble driers 392/2012:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:123:0001:0026:EN:PDF>

Corrigendum to 392/2012:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:124:0056:0056:EN:PDF>

Ecodesign regulation for tumble driers 932/2012:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:278:0001:0010:EN:PDF>

Old labelling Directive: Commission Directive 95/13/EC

PriceWaterhouseCoopers (PWC), December 2008: Ecodesign of laundry dryers. Preparatory studies for Ecodesign requirements of Energy-using-Products (EuP) – Lot 16. Draft final report.

Labelling directive for combined washer-driers 96/60/EC:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1996:266:0001:0027:EN:PDF>

Coolproducts: www.coolproducts.eu/product/tumble-driers