



Member of CEAG AG

FRIWO Gerätebau GmbH · Postfach 11 64 · D-48342 Ostbevern

Ansprechpartner / Contact

Durchwahl / Direct call

Tel 02532/81-

Fax 02532/81-

eMail

18. März 2008

## **Comments to EnergyStar Eligibility Criteria (Version 2.0) Revised Final Draft**

### 1.) efficiency:

- a. Low voltage limit should apply to voltages  $\leq 9V$  (or at least  $\leq 8V$ )
- b. Only 1%-point difference in efficiency between a 5V/50W and a 24V/50W is unrealistic and not achievable. Please find the attached calculation example.
- c. There is no unit in the Dataset 5V/ $>15W$ , that fulfils the newly announced requirements.
- d. UL1310 requires a lead-length of at least 6 feet. So in these cases there is no potential in shortening the output lead.
- e. The possibility of increasing the wire gauge is limited by the usability of consumer power supplies.
- f. [Where is the differentiation between power supplies with and without output lead?]  $\rightarrow$  probably, because EPS always have a lead, otherwise not covered by ES-EPS
- g.  $\sim +5$  to  $+10\%$ -points, in the lower power range  $<18W$  is way too much and not technically marketable in the time left.
- h. Recommendation: 2 steps. First step  $\sim +3\%$ -point. Another 3%-point in  $>3$ years
- i. Medical/ industrial equipment: LED leads to worse efficiency in lower wattage range.
  - i. In e.g. MEPS (Australia) specification, medical devices are exempted.

#### **Geschäftssitz**

FRIWO Gerätebau GmbH  
Von-Liebig-Straße 11  
D-48346 Ostbevern  
Tel +49 2532/ 81-0  
Fax +49 2532/ 81-112  
www.friwo.de  
www.ceag-ag.com  
WEEE-Reg.-Nr. DE 70846847

#### **Geschäftsführung**

Rolf Endreß (Vorsitz)  
Frank Gumbinger  
Felix Zimmermann  
St.-Nr. 346/5840/0923  
Finanzamt Warendorf  
USt.-Ident.-Nr. DE811114890  
Amtsgericht Münster  
HRB 9325

#### **Bankverbindung**

Sparkasse Münsterland-Ost  
BLZ 400 501 50 (EUR) Kto. 5 000 526  
IBAN DE42 4005 0150 0005 0005 26  
BLZ 400 501 50 (USD) Kto. 86 0000 23  
SWIFT WELADED1MST  
Commerzbank AG, Frankfurt a. M.  
BLZ 500 400 00 Kto. 5 811 419  
IBAN DE05 5004 0000 0581 1419 00



- ii. The same with CEC specification
  - j. EMC vs. efficiency (e.g. fast switching of FET influences EMC negatively)
  - k. Market requires wide range units (→ worse efficiency and NL)
- 2.) No load power:
- a. The low-wattage cut-off should not be increased to 50W (from 10W)
  - b. Power supplies with LEDs: e.g. medical & industrial equipment where output signalization/ communication is needed (e.g. via CAN-Bus or by relay contacts)  
→ Exemption from EnergyStar or higher values for No Load (+ 150mW)!  
→ Table 4 in the Rev. Final Draft should be extended by the following details:  
e.g. “\* in case of optical signalization by LED or equivalent or in case of external communication capability 150mW of additional No-Load Maximum Power is allowed”)
- 3.) power factor:
- a. We agree to the commitment that units with power values >100W must have a PF of greater than 0.9.

Suggestion for new energy-efficiency criteria:

Standard models (U>9V):

>1W to <=49W	$\geq 0.075 * \ln(P_o) + 0.569$
>49W	$\geq 0.86$

Low voltage models (U<=9V; no requirements to the output current):

>1W to <=49W	$\geq 0.077 * \ln(P_o) + 0.54$
>49W	$\geq 0.84$

Suggestion for energy-consumption criteria for No Load:

0 to <10W	$\leq 0.3W *$
$\geq 10W$ to <=250W	$\leq 0.5W *$

“\* in case of optical signalization by LED or equivalent or in case of external communication capability 150mW of additional No-Load Maximum Power is allowed”)



Member of CEAG AG

comparison of "EnergyStar version 2.0 Revised Final-Draft" and the "FRIWO-suggestion"  
(on the basis of three different output voltages and two power ranges)

EnergyStar - Revised Final DraftV2.0

examples:	5V/10A	12V/4A	24V/2A	
output voltage	5	12	24	V
output current	10	4.167	2.083	A
output power	50	50	50	W
target efficiency (end of lead)	86.00%	87.00%	87.00%	
kappa of lead-copper	56			
lead-length	1.8	1.8	1.8	m
lead-type	4	1	0.75	mm <sup>2</sup>
lead-resistance	0.016	0.064	0.086	ohms
plug-resistance	0.02	0.02	0.02	ohms
total-resistance	0.036	0.084	0.106	ohms
power-loss (lead & plug)	3.61	1.46	0.46	W
efficiency @ end of lead	86.00%	87.00%	87.00%	
input power	58.14	57.47	57.47	W
required efficiency @ end of PCB	<b>92.20%</b>	<b>89.55%</b>	<b>87.80%</b>	

acc. ES Revised Final Draft V2.0

acc. UL1310 (>1.8m)

FRIWO - suggestion

examples:	5V/10A	12V/4A	24V/2A	
output voltage	5	12	24	V
output current	10	4.167	2.083	A
output power	50	50	50	W
target efficiency (end of lead)	84.00%	86.00%	86.00%	
kappa of lead-copper	56			
lead-length	1.8	1.8	1.8	m
lead-type	4	1	0.75	mm <sup>2</sup>
lead-resistance	0.016	0.064	0.086	ohms
plug-resistance	0.02	0.02	0.02	ohms
total-resistance	0.036	0.084	0.106	ohms
power-loss (lead & plug)	3.61	1.46	0.46	W
efficiency @ end of lead	84.00%	86.00%	86.00%	
input power	59.52	58.14	58.14	W
required efficiency @ end of PCB	<b>90.06%</b>	<b>88.52%</b>	<b>86.79%</b>	

acc. FRIWO-suggestion

acc. UL1310 (>1.8m)

**Geschäftssitz**  
FRIWO Gerätebau GmbH  
Von-Liebig-Straße 11  
D-48346 Ostbevern  
Tel +49 2532/ 81-0  
Fax +49 2532/ 81-112  
www.friwo.de  
www.ceag-ag.com  
WEEE-Reg.-Nr. DE 70846847

**Geschäftsführung**  
Rolf Endreß (Vorsitz)  
Frank Gumbinger  
Felix Zimmermann  
St.-Nr. 346/5840/0923  
Finanzamt Warendorf  
USt.-Ident.-Nr. DE811114890  
Amtsgericht Münster  
HRB 9325

**Bankverbindung**  
Sparkasse Münsterland-Ost  
BLZ 400 501 50 (EUR) Kto. 5 000 526  
IBAN DE42 4005 0150 0005 0005 26  
BLZ 400 501 50 (USD) Kto. 86 0000 23  
SWIFT WELADED1MST  
Commerzbank AG, Frankfurt a. M.  
BLZ 500 400 00 Kto. 5 811 419  
IBAN DE05 5004 0000 0581 1419 00



Member of CEAG AG

EnergyStar - Revised Final DraftV2.0

examples:	5V/3A	12V/1.25A	24V/0.625A	
output voltage	5	12	24	V
output current	3	1.250	0.625	A
output power	15	15	15	W
target efficiency (end of lead)	76.41%	79.15%	79.15%	
kappa of lead-copper	56			
lead-length	1.8	1.8	1.8	m
lead-type	1	0.75	0.5	mm <sup>2</sup>
lead-resistance	0.064	0.086	0.129	ohms
plug-resistance	0.02	0.02	0.02	ohms
total-resistance	0.084	0.106	0.149	ohms
power-loss (lead & plug)	0.76	0.17	0.06	W
efficiency @ end of lead	76.41%	79.15%	79.15%	
input power	19.63	18.95	18.95	W
required efficiency @ end of PCB	80.27%	80.02%	79.46%	

acc. ES Revised Final Draft V2.0

acc. UL1310 (>1.8m)

FRIWO - suggestion

examples:	5V/3A	12V/1.25A	24V/0.625A	
output voltage	5	12	24	V
output current	3	1.250	0.625	A
output power	15	15	15	W
target efficiency (end of lead)	74.85%	77.21%	77.21%	
kappa of lead-copper	56			
lead-length	1.8	1.8	1.8	m
lead-type	1	0.75	0.5	mm <sup>2</sup>
lead-resistance	0.064	0.086	0.129	ohms
plug-resistance	0.02	0.02	0.02	ohms
total-resistance	0.084	0.106	0.149	ohms
power-loss (lead & plug)	0.76	0.17	0.06	W
efficiency @ end of lead	74.85%	77.21%	77.21%	
input power	20.04	19.43	19.43	W
required efficiency @ end of PCB	78.64%	78.06%	77.51%	

acc. FRIWO-suggestion

acc. UL1310 (>1.8m)

**Geschäftssitz**  
 FRIWO Gerätebau GmbH  
 Von-Liebig-Straße 11  
 D-48346 Ostbevern  
 Tel +49 2532/ 81-0  
 Fax +49 2532/ 81-112  
 www.friwo.de  
 www.ceag-ag.com  
 WEEE-Reg.-Nr. DE 70846847

**Geschäftsführung**  
 Rolf Endreß (Vorsitz)  
 Frank Gumbinger  
 Felix Zimmermann  
 St.-Nr. 346/5840/0923  
 Finanzamt Warendorf  
 USt.-Ident.-Nr. DE811114890  
 Amtsgericht Münster  
 HRB 9325

**Bankverbindung**  
 Sparkasse Münsterland-Ost  
 BLZ 400 501 50 (EUR) Kto. 5 000 526  
 IBAN DE42 4005 0150 0005 0005 26  
 BLZ 400 501 50 (USD) Kto. 86 0000 23  
 SWIFT WELADED1MST  
 Commerzbank AG, Frankfurt a. M.  
 BLZ 500 400 00 Kto. 5 811 419  
 IBAN DE05 5004 0000 0581 1419 00