The US Department of Energy has a proposition on the table to move external power adapter requirements to **Level VI** efficiency. The final announcement is expected this summer which will give a very short lead-time to **July 2013** requirement date.

**Bulletin No: 120322-01**

**Bulletin Title: US Department of Energy (DoE) Proposed Rule for Battery Chargers and External Power Supplies**

**Requirement Effective: July 1, 2013**

**Summary Description:**

The US Department of Energy (DoE) issued a Notice of Proposed Rulemaking (NOPR) detailing a regulation on "Energy Conservation Standards for Battery Chargers and External Power Supplies". Within this NOPR, is a plan that would either create limits, or set tighter limits on the efficiency of consumer, commercial, and industrial products that include battery charging systems (BCS) and/or external power supplies (EPS). Any product in scope of the regulation that charges a battery and/or has an EPS would be impacted. The regulation includes provisions for labeling of product, and will most likely require online registration of products with DoE. The likely effective date is July 1, 2013.

**Detailed Description:**

**External Power Supplies:**

Efficiency levels for EPS are defined in Table 1. **Additionally EPS products would need to be labeled with the Roman Numeral VI**.

| **Table 1: Proposed Energy Conservation Standards for Direct Operation External Power Supplies** | | |
|---|---|---|
| **AC-DC, Basic-Voltage External Power Supply** | | |
| **Nameplate Output Power (Pout)** | **Minimum Average Efficiency in Active Mode (expressed as a decimal)** | **Maximum Power in No-Load Mode [W]** |
| 0 to ≤ 1 watt | ≥ 0.5 * Pout + 0.16 | ≤ 0.100 |
| > 1 to ≤ 49 watts | ≥ 0.071 * ln(Pout) - 0.0014 * Pout +0.67 | ≤ 0.100 |
| > 49 watts to ≤ 250 watts | ≥ 0.880 | ≤ 0.210 |
| > 250 watts | 0.875 | ≤ 0.500 |

| | | |
|---|---|---|
| **AC-DC, Low-Voltage (<6V) External Power Supply** | | |
| **Nameplate Output Power (Pout)** | **Minimum Average Efficiency in Active Mode (expressed as a decimal)** | **Maximum Power in No-Load Mode [W]** |
| 0 to ≤ 1 watt | ≥ 0.517 * Pout + 0.087 | ≤ 0.100 |
| > 1 to ≤ 49 watts | ≥ 0.0834 * ln(Pout) - 0.0014 * Pout + 0.609 | ≤ 0.100 |
| > 49 watts to ≤ 250 watts | ≥ 0.870 | ≤ 0.210 |
| > 250 watts | 0.875 | ≤ 0.500 |
| | | |
| **AC-AC, Basic-Voltage External Power Supply** | | |
| **Nameplate Output Power (Pout)** | **Minimum Average Efficiency in Active Mode (expressed as a decimal)** | **Maximum Power in No-Load Mode [W]** |
| 0 to ≤ 1 watt | ≥ 0.5 * Pout + 0.16 | ≤ 0.210 |
| > 1 to ≤ 49 watts | ≥ 0.071 * ln(Pout) - 0.0014 * Pout +0.67 | ≤ 0.210 |
| > 49 watts to ≤ 250 watts | ≥ 0.880 | ≤ 0.210 |
| > 250 watts | 0.875 | ≤ 0.500 |
| | | |
| **AC-AC, Low-Voltage (<6V) External Power Supply** | | |
| **Nameplate Output Power (Pout)** | **Minimum Average Efficiency in Active Mode (expressed as a decimal)** | **Maximum Power in No-Load Mode [W]** |
| 0 to ≤ 1 watt | ≥ 0.517 * Pout + 0.087 | ≤ 0.210 |
| > 1 to ≤ 49 watts | ≥ 0.0834 * ln(Pout) - 0.0014 * Pout + 0.609 | ≤ 0.210 |
| > 49 watts to ≤ 250 watts | ≥ 0.870 | ≤ 0.210 |
| > 250 watts | 0.875 | ≤ 0.500 |
| | | |
| **Multiple-Voltage External Power Supply** | | |
| **Nameplate Output Power (Pout)** | **Minimum Average Efficiency in Active Mode (expressed as a decimal)** | **Maximum Power in No-Load Mode [W]** |
| 0 to ≤ 1 watt | ≥ 0.497 × Pout + 0.067 | ≤ 0.300 |

| | | |
|---|---|---|
| > 1 to ⩽ 49 watts | ⩾ 0.075 × ln (Pout) + 0.561 | ⩽ 0.300 |
| > 49 watts | ⩾ 0.860 | ⩽ 0.300 |

## Battery Chargers:

Battery Chargers are classified in Table 2. Table 2 also shows the regulated Unit Energy Consumption (UEC) for each product class.

**Table 2. Proposed Energy Conservation Standards for Battery Chargers**

| Product Class # | Input / Output Type | Battery Energy (Wh) | Special Characteristic or Battery Voltage | Maximum UEC*** (kWh/yr) |
|---|---|---|---|---|
| 1 | AC In, DC Out | < 100 | Inductive Connection* | 3.04 |
| 2 | | | < 4 V | = 0.2095(Ebatt**) + 5.87 |
| 3 | | | 4 – 10 V | For Ebatt < 9.74 Wh, = 4.68<br>For Ebatt ⩾ 9.74 Wh, = 0.0933(Ebatt) + 3.77 |
| 4 | | | > 10 V | For Ebatt < 9.71 Wh, = 9.03<br>For Ebatt ⩾ 9.71 Wh, = 0.2411(Ebatt) + 6.69 |
| 5 | | 100 – 3000 | < 20 V | For Ebatt < 355.18 Wh, = 20.06<br>For Ebatt ⩾ 355.18 Wh, = 0.0219(Ebatt) + 12.28 |
| 6 | | | ⩾ 20 V | For Ebatt < 239.48 Wh = 30.37<br>For Ebatt ⩾ 239.48 Wh = 0.0495(Ebatt) + 18.51 |
| 7 | | > 3000 | - | = 0.502(Ebatt) + 4.53 |
| 8 | DC In, DC Out | - | < 9 V Input | 0.66 |
| 9 | | - | ⩾ 9 V Input | No Standard |
| 10a | AC In, AC Out | - | Basic (i.e. no Automatic Voltage Regulation) | For Ebatt < 37.2 Wh, = 2.54<br>For Ebatt ⩾ 37.2 Wh, = |

| | | | | |
|---|---|---|---|---|
| | | | | 0.0733(Ebatt) – 0.18 |
| 10b | | - | Contains Automatic Voltage Regulation | For Ebatt < 37.2 Wh, = 6.18<br>For Ebatt ≥ 37.2 Wh, = 0.0733(Ebatt) + 3.45 |
| 11 | AC In, DC Out | < 100 Wh | Wireless Charging Capability (for dry environments) | Reserved |

* Inductive connection and designed for use in a wet environment (e.g. electric toothbrushes)

**Ebatt = Measured battery energy as determined in section 5.6 of Appendix Y to Subpart B of Part 430.

***UEC can be determined using the information in the ANNEX of this bulletin.