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Appliance/Device	Requirements for "Blue Angel" (RAL-UZ), EU Eco-Label and GEEA- Label	Recommendations
<b>Computers</b>		
desktop-computer	<p><b>RAL-UZ 78:</b> The power consumption in energy saving modes must not exceed the following values:</p> <p>1.) CPU in "sleep mode" <math>\leq 30W</math>            2.) Monitor in "sleep mode" <math>\leq 30 W</math>            3.) Monitor in "low power sleep mode" <math>\leq 8 W</math></p> <p><b>EU Eco-Label:</b> <i>monitors:</i></p> <p>1.) sleep mode <math>\leq 10 W</math>            2.) deep sleep mode <math>\leq 3 W</math></p> <p><i>CPU:</i></p> <p>1.) sleep mode <math>\leq 27 W</math>            2.) off mode <math>\leq 5 W</math></p> <p><b>GEEA Label*:</b></p> <p>1.) The power consumption in off mode is 5 W or less.            2.) The power consumption in the sleep</p>	<p>1.) Procurement should be based on the requirements for desktop computers (RAL-UZ 78) and laptops (RAL-UZ 93) according to the "Blue Angel" label.</p> <p>2.) Before buying new equipment it should be examined whether an upgrade is possible.</p> <p>3.) It should be checked whether energy saving modes are activated.</p>

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	<p>mode is 15 W (18 W) or less** for Computer systems without (with) integrated monitor.</p> <p>* Until the end of 2001 the name "Group for Efficient Appliances" will be replaced with "Group for Energy Efficient Appliances" and the abbreviation "GEEA" will be replaced with "GEEA" on all pages and in all documents posted on the homepage.</p> <p>** For the sleep mode: if rated power of power supply is more than 200 W, maximum power consumption in sleep mode is: &lt;200-300]: 20 W, &lt;300-350]: 25 W, &lt;350-400]: 30W , &gt;400: 10 % of maximum continuous output power rating (according to Energy Star Label).</p>	
monitors	<p><b>GEEA Label:</b></p> <p>1.) monitors without USB: <math>\leq 3</math> W in deep-sleep mode 2.) monitors with USB : <math>\leq 5</math> W in deep-sleep mode</p>	
laptops	<p><b>RAL-UZ 93:</b></p> <p>The power consumption in energy saving modes must not exceed the following values:</p> <p>1.) in "sleep mode" <math>\leq 7</math> W 2.) in "off mode" <math>\leq 2</math> W 3.) appliances with communication</p>	

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	<p>interface in "off mode" <math>\leq 5 \text{ W}</math></p> <p><b>EU Eco-Label:</b></p> <p>1.) Sleep mode <math>\leq 5 \text{ W}</math>.</p> <p>2.) Off-mode <math>\leq 3 \text{ W}</math>.</p> <p>3.) Change time by default: Operation to sleep <math>\leq 15 \text{ min.}</math></p>	
<b>Office Equipment</b>		
printer and printer-fax combinations	<p><b>GEEA Label:</b> <i>All printers:</i> The power consumption in <b>off mode</b> is less or equal than 3W.</p> <p><i>standard sized A4 printers and printer-fax combinations: standby power consumption</i></p> <p>1.) PS <math>\leq 7 \text{ ppm:}</math> <math>\leq 6 \text{ W}</math></p> <p>2.) PS <math>&gt; 7 \text{ ppm:}</math> <math>\leq 16 \text{ W}</math></p> <p>(PS = printing speed; ppm = pages per minute)</p>	<p>1.) preference should be given to energy-saving appliances according to the Swiss energy label "Energy 2000" or the european GEEA label.</p> <p>2.) For printers without off mode, the power consumption in off mode should be 3 W or less.</p>
scanners	<p><b>GEEA Label:</b> The power consumption in the <b>low power mode</b> is less or equal than 12 W.</p>	
photocopier	<p><b>GEEA Label:</b> <i>Standard sized copiers:</i> The power consumption in off mode is less or equal than the values listed below:</p> <p>1.) CS <math>\leq 20 \text{ cpm:}</math> <math>\leq 5\text{W}</math></p>	

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	<p>2.) <math>20 &gt; CS \leq 44</math> cpm: <math>\leq 15</math> W                  3.) <math>CS &gt; 44</math> cpm: <math>\leq 20</math> W</p> <p>The power consumption in the <b>low-power mode</b> is less or equal than the values listed below:</p> <p>1.) <math>CS \leq 20</math> cpm: <math>\leq 2*CS</math> [W]                  2.) <math>20 &gt; CS \leq 44</math> cpm: <math>\leq 5+3,85*CS</math> [W]                  3.) <math>CS &gt; 44</math> cpm: <math>\leq 5+3,85*CS</math> [W]</p> <p><i>Large format copiers (in off mode):</i>                  1.) <math>CS \leq 40</math> cpm <math>\leq 10</math> W                  2.) <math>CS &gt; 40</math> cpm: <math>\leq 20</math> W</p> <p><i>Large format copiers (in low-power mode):</i>  <math>CS \leq 40</math> cpm: <math>\leq 5+3,85*CS</math> [W]</p>	
Fax machines (stand alone)	<p><b>GEEA Label:</b>                  The power consumption in <b>sleep mode</b> must be <math>\leq 2</math>W.</p>	
energy saving devices	<p><b>GEEA Label:</b>                  The proper power consumption of the ESD in any of its operation modes must be <math>\leq 1</math> W</p>	
<b>audio-visual media</b>		
TV	<p><b>RAL-UZ 91:</b> the power consumption of the appliances must not exceed the following values:                  1.) "stand-by" <math>\leq 4</math> W, or</p>	<p>1.) Procurement should be based on the requirements for audio-visual media (RAL-UZ 91) according to the "Blue</p>

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	<p>2.) "stand-by" <math>\leq 7</math> W, if the appliance shuts down automatically after 1 h.</p> <p><b>EU Eco-Label:</b> Mains operated television receivers (TV) with a visible screen diagonal of more than 20 centimetres.</p> <p>1.) with auto-power-off: <math>\leq 5</math> W in standby 2.) all other TV: <math>\leq 1</math> W in standby</p>	<p>Angel"-label.</p> <p>2.) TV should be switched off by Hardware to avoid power consumption in "idle-mode"</p>
Set Top Box (STB)	<p><b>GEEA Label:</b> <i>analogue satellite receiver:</i></p> <p>1.) device must have an on/off switch and the consumption in <b>off mode</b> must be <math>\leq 0,5</math> W 2.) if available, the power consumption in standby mode must be <math>\leq 1</math> W</p> <p><i>IRD-S (C, T): reception of digital broadcast signals by satellite (cable, terrestrial)</i></p> <p>1.) device must have an on/off switch and the consumption in <b>off mode</b> must be <math>\leq 0,5</math> W 2.) if available, the power consumption in standby mode must be <math>\leq 1</math> W 3.) device must have a <b>standby-active, low mode</b> and the consumption in this mode must be <math>\leq 7,5</math> W for IRD-S, C <math>\leq 5</math> W for IRD-T</p>	

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audio equipment	<p><b>GEEA Label:</b>  <i>audio sets:</i>                  The power consumption in <b>standby mode</b> must be less than 2 W.</p> <p><i>audio components:</i>                  1.) device must have an on/off switch and the consumption in <b>off mode</b> must be ≤ 0,5 W                  2.) if available, the power consumption in <b>standby mode</b> must be ≤ 2 W</p>	
<b>accumulators, batteries, battery chargers and solar-powered products</b>		
zinc-oxygen-batteries	<b>RAL-UZ 16:</b> the content of mercury is less than 1 %.	1.) alternatives to battery-supplied products should be considered.  2.) power supply from grid should be preferred.
Hg- and Cd-free Li-batteries	<b>RAL-UZ 50:</b> free from Hg and Cd (specification not used at this point of time/1999)	see above

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rechargeable Alkali-Mn-batteries	<b>RAL-UZ 92:</b> must be free from dangerous substances as Cd and Hg; must be rechargeable at least 25 times. (specification only used by one product at this point of time/1999)	see above
battery chargers	<b>GEEA Label:</b> The power consumption in <b>standby mode</b> is $\leq 1$ W.	
solar-powered products (without accumulator)	<b>RAL-UZ 47:</b> (no further information)	
<b>motor vehicles</b>		
passenger cars (Otto / Diesel)	<p><b>Euro III:</b> since 2000</p> <p><b>Euro IV:</b> with effect from 2005</p> <p>1.) 1999-2004: CO<sub>2</sub>-emissions max. 120 g CO<sub>2</sub>/km <b>fuel consumption max. 5,1 l/100 km</b> <b>(4,5 l Diesel)</b></p> <p>2.) with effect from 2005: CO<sub>2</sub>-emissions max. 90 g CO<sub>2</sub>/km <b>fuel consumption max. 3,8 l/100 km</b> <b>(3,4 l Diesel)</b></p>	

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busses and lorries (Otto / Diesel)	<p><b>Euro IV:</b> for utility vehicles up to 3,5 t (1999-2000)</p> <p><b>Euro III:</b> for diesel powered utility vehicles above 3,5 t (since 2000)</p>	<p>1.) diesel powered utility vehicles above 3,5 t that are mainly used in cities should be equipped with particle filters.</p> <p>2.) on-board diagnosis systems (ODS) may help to reduce emissions.</p>
gas-powered vehicles	<b>RAL-UZ 59 b:</b> for utility and communal vehicles and busses (since 1995)	the use of low sulphur fuels is recommended
special purpose municipal motor vehicles	<b>RAL-UZ 59a:</b> for low-noise diesel vehicles (since 1990)	<p>1.) low-sulphur diesel fuels should be used.</p> <p>2.) it should be examined whether private City-cleaning-businesses could be forced by contract to use low-noise municipal motor vehicles.</p>

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<p>tyres</p>	<p><b>RAL-UZ 89:</b> for low-noise and fuel-saving tyres (since 1997)</p> <p>maximum noise level and wheeling resistance coefficient (Rollwiderstandsbeiwert):</p> <p>normal tyre  175/70R13:      <math>\leq 72</math> dB(A), <math>\leq 1.1</math>  195/65R15      <math>\leq 72</math> dB(A) , <math>\leq 1.1</math></p> <p>winter tyre  175/70R13:      <math>\leq 72</math> dB(A) , <math>\leq 1.2</math>  195/765R15:     <math>\leq 72</math> dB(A) , <math>\leq 1.2</math></p>	<p>1.) retreated tyres with “Blue Angel” or “AIR” signet should be preferred.</p> <p>2.) wide-base tyres cause higher costs and environmental stress.</p>
<p><b>building components and materials</b></p>		
<p>heat and noise insulating materials</p>	<p><b>RAL-UZ 49:</b> includes insulating materials using recycled glass with a share of 50 % of weighth or 71 % of volume (since 1987).</p>	<p>1.) concerning existing buildings additional measure for heat insulation are recommended.</p>
<p>windows</p>	<p><b>RAL-UZ 52:</b>  <i>for low-emissive multiple pane glazing (since 1988)</i></p> <p>1.) U-value <math>\leq 0,55</math></p> <p>2.) light transmitting factor <math>\geq 0,75</math>  (DIN 67507)</p> <p>(requirements for material and treatment are included in the RAL-GZ 520)</p>	<p>1.) installation of low-emissive windows with low U-value is recommended. Procurement according to RAL-UZ 52.</p> <p>2.) annual testing on functionality and proper shutting.</p>

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<b>heating equipment</b>		
oil burner ≤ 120 kW rated power	<p>Def. “efficiency (%) under standard conditions”*:</p> <p>To determine the “ efficiency under standard conditions“ the boiler has to be tested on a test rig under different loads (12,8%, 30,3%, 38,8%, 47,6%, 62,6%). Afterwards the value of “efficiency under standard conditions” is calculated from these five test results.</p> <p>Quelle: <a href="http://www.myshk.com/ikz-praxis">http://www.myshk.com/ikz-praxis</a></p> <p><b>RAL-UZ 9:</b> (no further information)</p>	<ol style="list-style-type: none"> <li>1.) it should be checked of existing units confirm to the ordinance on small boilers (Kleinf Feuerungsanlagenverordnung), otherwise a replacement should be considered.</li> <li>2.) concerning small units it should be examined whether optimised boiler-burner-units are suitable.</li> <li>3.) it should be examined whether gas-fired condensing boilers are suitable (especially in case of replacement).</li> <li>4.) the installation of speed-controlled pumps is recommended.</li> </ol>
free-standing gas boiler ≤ 70 kW	<p><b>RAL-UZ 39:</b> rated power 10 kW: ≥ 90 %</p> <p>rated power 70 kW: ≥91 %</p>	see above
wall-mounted gas boiler ≤ 30 kW	<p><b>RAL-UZ 40:</b> 10 kW: ≥ 89,5 %</p> <p>70 kW: ≥ 90 %</p>	
gas burner and boiler unit ≤ 70 kW	<p><b>RAL-UZ 41:</b> 10 kW: ≥ 90 %</p> <p>70 kW: ≥ 91 %</p>	

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oil burner and boiler unit ≤ 70 kW	<b>RAL-UZ 46:</b> 10 kW: ≥ 90 % 70 kW: ≥ 91 %	
gas condensing boiler ≤ 70 kW	<b>RAL-UZ 61:</b> 10 kW: ≥ 100 % 70 kW: ≥ 101 % (at 75°/60°) 10 kW: ≥ 103 % 70 kW: ≥ 104 % (at 40°/30°)	
gas room heater ≤ 11 kW	<b>RAL-UZ 71:</b> ≤ 4 kW: ≥ 82,5 % “efficiency” > 4 kW: ≥ 84,5 %	
gas heating set ≤ 22 kW	<b>RAL-UZ 71:</b> ≥ 89 % “efficiency”	
gas burner with fan ≤ 120 kW	<b>RAL-UZ 80:</b> (no further information)	
solar panels	<b>RAL-UZ 73:</b> (since 1991) 1.) the focus is on high efficiency and HFC-free isolation. 2.) since 1998 the annual output must be ≥ 525 kWh/m <sup>2</sup> (at 40 % solar coverage of the annual heat demand).	
<b>lighting systems</b>		
lamps, ballasts, luminaries, controls	<b>RAL-UZ 81:</b> for high- frequency ballasts (since 1994)	1.) it is also recommended not to use incandescent lamps (incl. halogen).

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	<p><b>EU Eco-Label: (light bulbs)</b>            Energy efficiency (Dir. 98/11/EC)            1.) Single-ended : A or B class            2.) Double-ended : A class            3.) No compact fluorescent magnetic ballast</p> <p><b>GEEA Label: (domestic luminaries)</b>             If standby mode is applicable, the power consumption must be less than 1 W (0 W in off mode)</p>	<p>2.) for all fluorescent lighting high-frequency ballasts are recommended.             3.) examine whether lighting controls could be installed.</p>
<b>air conditioning and ventilation</b>		
air conditioning		<p>1.) are there alternatives to the use of air conditioning (e.g. controlled ventilation with “free cooling” during the night)?             2.) cooling liquids containing CFCs should be replaced as soon as possible.             3.) in case of a new installation the use of solar energy should be considered.             4.) temperature in EDP rooms can be up to</p>

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		26°C without any risks
ventilation devices	<b>RAL-GZ 652:</b> for ventilation devices	<ol style="list-style-type: none"> <li>1.) speed-controlled fans are recommended.</li> <li>2.) regular maintenance is important, especially in case of integrated filters.</li> </ol>
<b>washing machines</b>		
washing machines	<p><b>EU Eco-Label:</b></p> <ol style="list-style-type: none"> <li>1.) energy consumption: better than class A, <math>\leq 0,17</math> kWh/kg</li> <li>2.) water consumption: <math>\leq 12</math> l/kg (standard programme cotton, 60°C)</li> <li>3.) cleaning performance: class A or B</li> <li>4.) rinsing performance: <math>\geq 30</math> dilution factor</li> <li>5.) spin drying performance: class A or B</li> <li>6.) avoidance of detergent-losses:</li> <li>7.) drainage over detergent-drawer <math>\leq 5</math> %.</li> <li>8.) labelling of plastic: parts <math>\geq 50</math> g have to be labelled</li> </ol> <p><b>RAL-UZ 96:</b></p> <ol style="list-style-type: none"> <li>1.) energy efficiency: A</li> <li>2.) cleaning performance: A</li> <li>3.) spin-drying performance: A or B</li> <li>4.) enhanced producer guarantee</li> </ol>	<ol style="list-style-type: none"> <li>1.) procurement of washing machines with low water- and energy consumption.</li> <li>2.) there is no need for prewash program for normal polluted clothes.</li> <li>3.) “cooking”-laundry can also be washed at 60 °C.</li> <li>4.) one load should be about 4-5 kg.</li> <li>5.) check possibility for installing hot fill machines or hot fill upgrade sets.</li> </ol>

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	<p>5.) recycling conform construction          6.) low-emission insulation          7.) stand-by energy consumption:          max. 5 W after end of programme          max. 1 W in “off-mode”</p> <p>(further information can be found in the appendix II to RAL-UZ 96)</p>	
<b>kitchen appliances (Weiße Ware)</b>		
refrigerators and freezers	<p><b>“Blue Angel” label:</b></p> <p>1.) Energy label class A          2.) no halogenous organic compounds in the refrigerant.          3.) no halogenous organic compounds in the lubricants of the refrigerant-compressor.          4.) avoidance of harmful substances in plastics: Cd- and Pb- free primarily-plastics.          5.) plastic parts above 25 g have to be labelled.</p> <p><b>EU Eco-Label:</b></p> <p>1.) devices have to meet an energy efficiency index of 0,42 or lower according to the EU energy efficiency guidelines (better than energy class A).</p>	<p>1.) procurement of freezers/refrigerators according to the actual need of size.          2.) freezers/refrigerators should not be placed near sources of heat.          3.) sufficient air circulation in the rear area of the device should be ensured.          4.) a non-polluting waste disposal should be guaranteed.          5.) procurement of low noise emitting devices (also listed on the EU label).</p>

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	<p>2.) concerning refrigerants and leavenings (insulation of the device) the use of halogenous organic compounds is admitted if they do not show any ozone-reduction-potential and the greenhouse-potential (GWP) is below 15.</p> <p>3.) plastic parts above 50 g have to be labelled.</p> <p>4.) the noise-emission level may not exceed 42 dB(A).</p>	
ovens	<p><i>EU energy and environment labels for gas and electric ovens are under preparation. The main requirements will be:</i></p> <p>1.) enhanced producer guarantee</p> <p>2.) recycling conform construction</p> <p>3.) low-emission insulation</p> <p>4.) low energy consumption</p> <p>5.) retraction of the appliances</p> <p>6.) low formaldehyde emissions during the heating of the appliances</p> <p>7.) low carbonic-monoxide-emissions through gas devices.</p>	<p>1.) provision of canteens with gas pipes in order to use gas stoves.</p> <p>2.) with the procurement of ovens, forced convection appliances should be chosen.</p> <p>3.) an eye should be kept on the right dishes for the respective stove-type.</p>
dishwashers	<p><b>EU Eco-Label:</b></p> <p>1.) energy consumption according to energy efficiency class A, B (or C if less than 10 place settings)</p> <p>2.) water consumption (l/cycle) <math>\leq 0,6 \text{ s} +</math></p>	

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	<p>11,2, (s = number of standard place settings)</p> <p>3.) cleaning effect according to class A, B or C of the EU labelling direction.</p> <p>4.) drying effect according to class A, B or C of the EU labelling direction.</p> <p>5.) noise emission less than 55 dB(A) for free-standing devices, 51 dB(A) for integrated devices.</p> <p>6.) plastic parts above 50 g have to be labelled.</p>	
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