

Sustainable Public Procurement-fiche-advanced-2010

1) Subject matter

Environmental friendly printers, copiers, fax machines & scanners.

“For <.....> (name of the public authority), the care for the environment and social aspects is important. It is stated in her <strategic policies>, <mission>, <vision>, <procurement policy>, ...”

2) Exclusion criteria

Non compliance with environmental and social legislation, which has been the subject of a final judgment or a decision having equivalent effect, may be considered an offence concerning the professional conduct of the economic operator concerned or grave misconduct, permitting to exclude the party concerned from competing for the contract

Ref:

Art. 53 and 54 of Directive 2004/17/EC and Art. 45 of Directive 2004/18/EC

3) Technical capacity (not exclusive)

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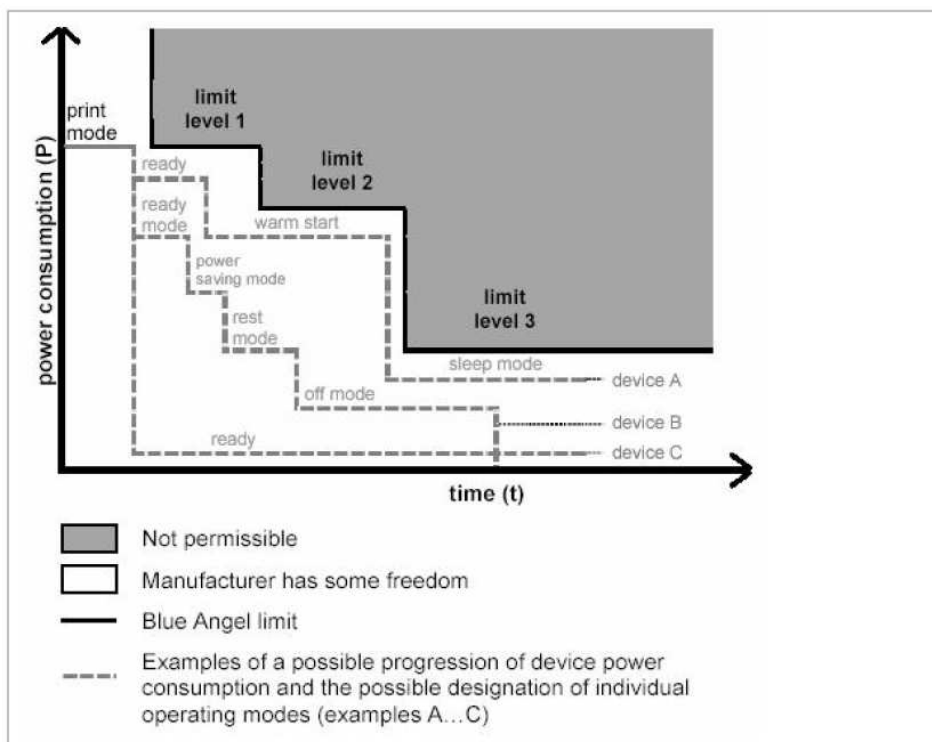
4) Technical specifications

Energy consumption

The product must follow the A scheme (Blaue Engel, Nordic Swan) OR B scheme (Energy Star, EU Toolkit, Nordic Swan)



Scheme A) Power consumption curve and return time limit [Blaue Engel, Nordic Swan]



The power consumption curve of the device for the time elapsing after the end of any primary function – not only copying or printing – and does not perform any other primary function., i.e. in the sleep modes, may not exceed this specified limit curve. The device must meet the limit curve as soon as it has completed any primary function and is not performing any new one. This shall also apply if the device is connected to a data network: signals received via the data network which do not serve the performance of a primary printing function may neither “weak up” the device nor keep it from switching according to the activation times set.

This limit curve is determined:

- by a product specific maximum power consumption defined in Annex A: Power Limit Curves.
- factory default activation times to be set in a way that the device does not exceed the limit curve. The user can change the activation time of individual sleep modes with a fixed upper limit value not exceeding 240 minutes. The limits are given in Annex A: Power Limit Curves.

The return time, the time it takes to return from a low-power consumption mode to “Ready” mode, is limited.

	Limit level 2	Limit level 3
Electrophotographic	$0.4 \times S_{SW} + 10$ (maximum)	$0.5 \times S_{SW} + 30$ (maximum)



devices	35 sec.)	60 sec.)
Ink jet devices	5 sec.	5 sec.

Notes:

- S_{SW} represents the speed of printing in black and white, expressed as the number of A4-size pages per minute.
- in “ready” mode all device functions can be activated by the user or by external electrical signals. It is the power state that the device also enters immediately after the end of the printing process.
- The return time is to be determined as the difference between on the one hand the time required to complete a certain print job starting from the energy-saving mode, and on the other hand the time required to complete this printing job starting from the “ready” mode.



Scheme B) Typical Electricity Consumption (TEC) and Operational Mode (OM) [EU toolkit: core, Energy Star]

The product should not exceed the TEC limits or OM limits. The typical electricity consumption (TEC) is defined as the consumption of a machine during normal use over one week measured in kilowatt-hours (kWh). The measuring procedure is defined within the Energy Star program. (<http://www.energystar.gov>). The operational mode (OM) focuses on product energy consumption in various low-power modes from active (highest consumption) over sleep mode till standby mode (lowest consumption). The OM approach defines power consumption in sleep mode, the mode after the primary function has ended, maximum time limits for the sleep mode before the machine enters the standby mode and maximum power consumption limits for the standby mode.

Standard format* machines need to be evaluated with the TEC method, small† and large‡ format machines need to be evaluated using the OM method. Following exceptions on this rule must follow the OM method:

- standard format fax machines
- standard format inkjet multifunctional devices
- standard format impact printers
- standard format inkjet printers
- standard format scanners

The TEC values for each type of product are given in Annex B: Typical Electricity Consumption. OM products must meet the default-delay time settings, provided in Annex C: Operational Mode limits, upon product shipment. In addition, all OM products must be shipped with a maximum machine delay time not in excess of four hours, which is only adjustable by the manufacturer. This maximum machine delay time cannot be influenced by the user.

* Standard format machines include those designed for standard-sized media (e.g., Letter, Legal, Ledger, A3, A4, and B4), including those designed to accommodate continuous-form media at widths between 210 mm and 406 mm. Standard-size products may also be capable of printing on small-format media.

† Small size machines include those designed for media sizes smaller than those defined as Standard (e.g., A6, 4" x 6", microfilm), including those designed to accommodate continuous-form media at widths smaller than 210 mm.

‡ Large format machine include those designed for A2 media and larger, including those designed to accommodate continuous-form media at a width of 406 millimetres (mm) or wider. Large-format products may also be capable of printing on standard-size or small-format media.



More information on how to determine and apply the correct method (OM or TEC) can be found on (<http://www.energystar.gov>).

Noise emissions

For devices with a printing function the 'Declared A-weighted Sound Level' (LWAd) according to ISO 9296, measured in accordance with ISO 7779, will not exceed the limits set by the following formula:

$$\text{LWAd: } 0.035 \times \text{CPM} + 5.9 \text{ (B)}$$

Where CPM = Copies per minute.

For color printers, the following formula is also valid:

$$\text{LWAd} = 0,03 \times \text{CPM} + 6.1 \text{ (B)}$$

The devices should additionally not exceed 7.5 (B) LWAd except for devices with a CPM >71. (Blaue Engel, Nordic Swann) [EU toolkit: comprehensive]

Others

Automatic doublesided printing should be available according to one of the following schemes:

- SCHEME A [EU toolkit: core, Blaue Engel, Nordic Swan]: Appliances [with a printing function] with a maximum operating speed of more than 45 sheets per minute for A4 size paper must be equipped with automatic doublesided copying (a duplex-unit). All other devices with a lower maximum operating speed must at least offer a manual option (copiers) or an extra software-based option (printers, multifunction devices) for double-sided printing on A4 size paper.
- SCHEME B [Energy star]: Standard-size copiers, MFDs, and printers that use Electrophotography, Solid Ink, and High Performance Ink Jet marking technologies must meet the following duplexing requirements, based on monochrome product speed:

Color Copiers, MFDs, and Printers

Monochrome Product Speed	Duplexing Requirement
≤ 19 ipm	N/A
20 – 39 ipm	Automatic duplexing must be offered as a standard feature or optional accessory at the time of purchase.
≥ 40 ipm	Automatic duplexing is required as a standard feature at the time of purchase.

Monochrome Copiers, MFDs, and Printers

Monochrome Product Speed	Duplexing Requirement
≤ 24 ipm	N/A
25 – 44 ipm	Automatic duplexing must be offered as a standard feature or optional accessory at the time of purchase.
≥ 45 ipm	Automatic duplexing is required as a standard feature at the time of purchase.

Evidence:

The compliance with all the criteria mentioned above can be proved with one of the following labels:



Blaue Engel



Nordic Swan

In case that the tendering company can present one of these labels, any further proof is not necessary. Any other suitable evidence from a recognized body can also be used.

Following label only partly complies with the technical specifications:



Energy Star

5) Awarding the contract:

	<i>Criterion</i>	<i>Weight</i>
1	Price <i>Calculation (e.g.):</i> Lowest offered price/ stated price x 0,70	e.g. 70%
2	Environmental criteria (The public authority formulates the points it wants to assign to the below mentioned criteria) <i>Calculation (e.g.):</i> Total scored points / maximum number of points x 0,20	e.g. 20%
3	...	e.g. 5 %
4	...	e.g. ...

Environmental criteria

Power consumption

Product specific external power supplies must meet the requirements of EU Commission Guideline on External Power Supplies with regard to the efficiency level Their power consumption in sleep mode (see the above-named European Commission Guideline) will not exceed the following limit value: (Nordic Swan, Blaue Engel)

Limit value in watts = Power output in watts × 0.004 + 0.4 watts Alternatively, external power supplies meeting the Energy star requirements for single voltage ac-ac and ac-dc power supplies also comply.

An imaging equipment sold with a DFE (Digital Front End) must use a DFE that meets the Energy Star Imaging Equipment Digital Front End Supply Efficiency Requirements as listed in the Energy Star Program Requirements for Imaging Equipment v1.1.

A fax or MFD sold with an additional cordless handset must use a cordless handset that meets the Energy Star Telephony specifications.

Product design

- The device must have a switch mounted in an easily accessible position in a usual setup position which can at least switch the device to Plug-in Off mode. Easy accessibility must also be ensured if the device is upgraded – for example, with accessories. Standard IEEE 1621 21 should be complied with



when designing switches and buttons. It is highly recommended to follow this standard already now. (Blaue Engel)

- Batteries and accumulators which are not designed for exchange by the user must be replaceable at the end of their useful life without needing to exchange the entire printed circuit board or similar parts holding such batteries or accumulators. (Blaue Engel)

Machine materials and components

- Plastic parts heavier than 25g should have a permanent marking identifying the material, in conformity with ISO 11469: 2000. (Blaue Engel, Nordic Swann): [EU toolkit: comprehensive, Blaue Engel, Nordic Swann]
- Plastic parts need to be of one polymer or compatible polymers, except for casings. To reduce the multitude of materials, plastic casing parts that weigh more than 25 grams must consist of a single polymer or polymer blend. [EU toolkit: comprehensive, Blaue Engel, Nordic Swann]
- Combined plastic casings may consist of up to four separable polymers or polymer blends at the most. (Blaue Engel, Nordic Swann)
- Office equipment must be easily recyclable by allowing easy separation by means of separation aids or by means of recycling technology. These characteristics can include among others (Blaue Engel, Nordic Swann):
 - o Standardized Structure and Joining Technique
 - o Avoidance of non-separable connections (e.g. glued, welded) between different materials, unless they are technically required;
 - o easily separable mechanical connections;
 - o easy detachability of equipment by only one person;
- At least one part heavier than 25 gram must be made of reused plastic or post-consumer and pre-consumer recycled plastic. (Nordic Swann)
- The variety of materials used for plastic components of similar functions must be limited to one polymer or polymer blends. (Nordic Swann)
- Components and materials according to Annex II to the WEEE Directive (e.g. toner modules, mercury-containing lamps for the lighting of liquid crystal displays as well as the liquid crystal displays themselves), must be easily identifiable and removable. (Blaue Engel)
- Large-size casing parts must be so designed as to ensure that the plastics used can be recycled on the basis of existing recycling technologies for the manufacture of high-quality long-life products. Such casing parts may not have a metallic coating. (Blaue Engel)
- The coating of special parts should be kept to a minimum, galvanic coatings of plastic parts will not be permitted (Blaue Engel).
- Recycled plastics and reused parts shall be used with preference (Blaue Engel)



Other environmental criteria

- Maximum emission values (Nordic Swann, Blaue Engel)

Substance	Emission rate Print phase (mg/h)		Emission rate Ready phase (mg/h).	
	Colour Printing Total in ready + print phase	Monochrome printing Total in ready + print phase	Desktop products	Floor-mounted equipment (Volume >250 litres)
TVOC	18	10	1	2
Benzene	< 0.05	< 0.05		
Styrene	1.8	1.0		
Ozone	3.0	1.5		
Dust	4.0	4.0		

Products fulfilling the requirements of EcoMark 117 “Copier version 2.2” or EcoMark 122 “Printers 2.0” also comply. (Nordic Swan)

- Plastic parts heavier than 25g do not contain flame retardant substances or preparations that are assigned any of the following risk phrases as defined in Council Directive 67/548/EEC (Nordic Swann, Blaue Engel)
 - o R 40 (possible risk of cancer)
 - o R45 (may cause cancer).
 - o R46 (may cause heritable genetic damage).
 - o R 48 (danger of serious damage to health by prolonged exposure)
 - o R49 (may cause cancer by inhalation)
 - o R60 (may impair fertility).
 - o R61 (may cause harm to the unborn child).
 - o R62 (possible risk of impaired fertility)
 - o R63 (possible risk of harm to unborn child)R68 (possible risk of irreversible effects)

Exempted from this rule are:

- o Plastic parts weighing less than 25 grams. However, they may not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers), decaBDE or chlorinated paraffins. (This exemption does not apply to keyboard keys.)
- o Special plastic parts located close to heating and fuser elements. They may not, however, contain PBBs, PBDEs, decaBDE or chlorinated paraffins.
- o Large-sized plastic parts which are reused as can be proved and which are marked according to ISO 11469: 2000 They may not, however, contain PBBs, PBDEs, decaBDE or chlorinated paraffins.



- Process-induced technologically unavoidable impurities. The maximum allowable concentrations are 0.1 w-% in homogenous material.
- Halogenated polymers are not permissible. (Nordic Swann, Blaue Engel)
Exempted from this rule are:
 - Fluoroplastics as, for example, PTFE.
 - Plastic parts weighing less than 25 grams. This exemption does not apply to keyboard keys.
 - Special plastic parts located close to heating and fuser elements.
 - Large-sized plastic parts which are reused as can be proved and which are marked according to ISO 11469: 2000.
- Additions of organic halogenated compounds as flame retardants are not permissible. (Nordic Swann, Blaue Engel)
Exempted from this rule are:
 - Fluoroorganic additives (as, for example, anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed 0.5 weight percent.
 - Fluoroplastics as, for example, PTFE.
 - Plastic parts weighing less than 25 grams. However, they may not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers), decaBDE or chlorinated paraffins. (This exemption does not apply to keyboard keys.)
 - Special plastic parts located close to heating and fuser elements. They may not, however, contain PBBs, PBDEs, decaBDE or chlorinated paraffins.
 - Large-sized plastic parts which are reused as can be proved and which are marked according to ISO 11469: 2000 They may not, however, contain PBBs, PBDEs, decaBDE or chlorinated paraffins.
- Process-induced technologically unavoidable impurities. The maximum allowable concentrations are 0.1 w-% in homogenous material. The base material of printed circuit boards may not contain PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) or chlorinated paraffins. (Nordic Swann, Blaue Engel)
- Batteries and accumulators may not contain the heavy metals lead, cadmium or mercury and their compounds. Exempted are technically unavoidable impurities. They may not exceed the limits given in Directive 91/157/EEC on Batteries and Accumulators, as amended (adapted to technical progress by Directive 98/101/EC). (Nordic Swann, blaue Engel)
- Photoconductor drums may not contain selenium, lead, mercury or cadmium or any of their compounds as constituents. (Blaue Engel)
- Chemicals containing the following substances regulated in the Montreal Protocol must not be used in the end production of the machines or in the production of circuit boards: CFCs, HCFCs, 1.1.1 trichloro-ethane or carbon-tetrachloride. (Nordic Swann)



- Toners and inks may not contain substances as constituents which are assigned any of the following risk phrases as defined in Council Directive 67/548/EEC:
 - o R 40 (possible risk of cancer)
 - o R45 (may cause cancer).
 - o R46 (may cause heritable genetic damage).
 - o R49 (may cause cancer by inhalation)
 - o R60 (may impair fertility).
 - o R61 (may cause harm to the unborn child).
 - o R62 (possible risk of impaired fertility)
 - o R63 (possible risk of harm to unborn child)
 - o R68 (possible risk of irreversible effects)
- No substances may be added to toners and inks which contain mercury, cadmium, lead, nickel or chromium-VI-compounds as constituents. Exempted are high molecular weight complex nickel compounds as colorants. Production-related contamination by heavy metals, such as cobalt and nickel oxides shall be kept as low as technically possible and economically reasonable (ALRA principle - as low as reasonably achievable).
- Azo dyes (dyestuffs or pigments) that might release carcinogenic aromatic amines appearing on the list of aromatic amines in Directive 2002/61/EC may not be used in toners and inks.
- Only those substances may be added as active biocides to inks which are listed as so-called existing substances in Annex II to Commission Regulation EC 2032/2003 amended by Regulation EC 1048/2005.

6) Performance clauses:

- The applicant undertakes to accept the free return of the original userexchangeable batteries/accumulators. A third party may be subcontracted for this task. (Blaue Engel)
- The devices must be capable of processing recycled paper made of 100% post consumer paper that meets the requirements of EN 12281:2002. The applicant is free to recommend certain types of recycled paper. The user information must include the following note: „This device is suited for processing recycled paper.“ A reference to EN 12281:2002 may be included. (Blaue Engel)
- The bidder must guarantee the availability of spare parts for at least 3 years from the time that production ceases. (EU Toolkit, Blaue Engel, Nordic Swann) [EU toolkit: core]
- Spent photoconductor drums must be taken back by the applicant (free of charge at a return facility) and either be recovered for reuse or subjected to material recycling. The user information should include details regarding take-back and return facility. (Blaue Engel, Nordic Swan)



- Products with combined toner cartridge may be accepted if the cartridge is not designed to prevent reuse. Products must accept remanufactured toner cartridges. (Nordic Swann)
- Plastics used for product packaging may not contain halogen-containing polymers. (Nordics Swann, Blaue Engel)
- Plastic packaging must be marked according to EU Directive 97/129/EEC
- The bidder shall provide information on the disassembly of equipment at recycling or treatment plants with regard to the individual components and materials and about envisaged ways and methods of recycling of components and disposal (recycling and disposal) of devices.
- The user documents shall include instructions for equipment cleaning and maintenance, provided that such measures are necessary. Users shall be informed about a possibly required replacement of the ozone or dust filter.
- Toner modules and containers must be sealed so as to prevent toner dust from escaping during storage and transport. The user information shall include explicit instructions for proper handling of toner modules. In addition, the user information shall include a note warning the user that toner modules may not be forced open and that in case toner dust has escaped as a result of improper handling inhaling the dust and skin contact should be avoided as precaution. The user information shall additionally include instructions on what to do in case of skin contact [Blaue Engel].

References

[Information of the public authority that used these clauses in a procurement case]

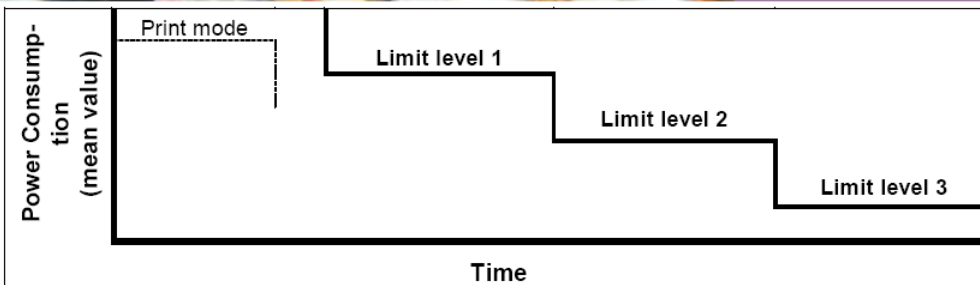


Annex A Power limit curve

Electrophotographic colour devices are divided into group A containing devices whose output speed in colour print mode (SF) is far lower than in monochrome print mode (SSW), e.g. $SF < 0.9 \times SSW$. And a group B with devices whose output speed in colour print mode (SF) is almost or exactly the same as in monochrome print mode (SSW). The following formula applies: $SF \geq 0.9 \times SSW$.

Power consumption limits:





Limits P_i are functions of output speed S_{sw} according to the formula

$$P_i = m \times S_{sw} + b.$$

Factors m and b are first replaced by the basic values given in line 1. If the device possesses functional units and/or printing technologies or functionalities in its delivery status that are listed in lines 2 to 7 the values given there for m and b are added.

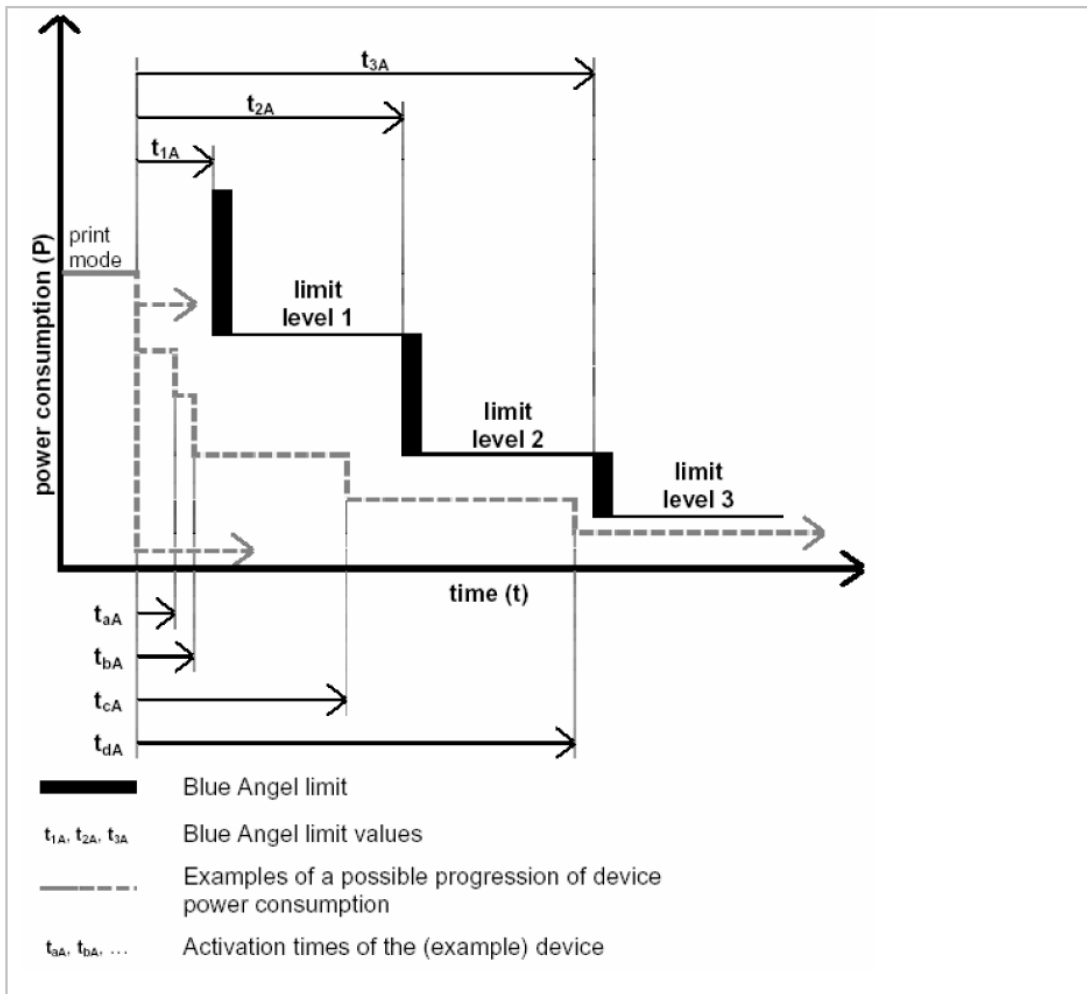
Limit value	P _i Values in Watts					
	Limit level 1		Limit level 2		Limit level 3	
	P ₁ = Σm × S _{sw} + Σb		P ₂ = Σm × S _{sw} + Σb		P ₃ = Σm × S _{sw} + Σb	
	m	b	m	b	m	b
1. Devices with print unit (i.e. all devices)	0.3	2	0.3	2	0.3	2
Bonus for individual functional units						
2. † Scan unit	—	5	—	5	—	—
3. † Telephone modem and/or † LAN interface	—	15	—	15	—	10
Bonus for individual functions						
4. † Multifunctionality of electrophotographic devices	2.2	5	2.2	5	—	—
Bonus for individual printing technologies						
5. Electrophotography, monochrome printing only	2.5	20	1.5	—	0.1	—



Limit value	P _i Values in Watts					
	Limit level 1		Limit level 2		Limit level 3	
	P ₁ = Σm × S _{sw} + Σb		P ₂ = Σm × S _{sw} + Σb		P ₃ = Σm × S _{sw} + Σb	
	m	b	m	b	m	b
6. Electrophotography, monochrome and colour printing, † group A	2.5	70	2.5	—	0.1	—
7. Electrophotography, Monochrome and colour printing, † Group B	3.0	100	3.0	50	0.1	10
Example:						
For a multifunction device, electrophotographic, colour printing, Group B and the functions printing, copying as well as sending an receiving of faxes (via telephone modem) the limits P _i are calculated as follows:						
1. Devices with print unit	0.3	2	0.3	2	0.3	2
2. Scan unit	—	5	—	5	—	—
3. Telephone modem and/or LAN interface	—	15	—	15	—	10
4. Multifunctionality	2.2	5	2.2	5	—	—
7. Electrophotography, monochrome as well as colour printing, Group B	3.0	100	3.0	50	0.1	10
Total:	5.5	127	5.5	77	0.4	22
Limit values:	P ₁ = 5.5 × S _{sw} + 127		P ₂ = 5.5 × S _{sw} + 78		P ₃ = 0.4 × S _{sw} + 22	

Time limits:





The following table defines the maximum factory default time limits:



all devices with an output speed S_{SW} of	t_{1A}	t_{2A}	t_{3A}
> 0 ... 5 pages/minute	3	5	10
> 5 ... 10 pages/minute	5	10	15
> 10 ... 20 pages/minute	5	10	20
> 20 ... 30 pages/minute	5	10	30
> 30 ... 40 pages/minute	5	10	45
> 40 pages/minute	10	15	60



Annex B: TEC limit values

Used annotations:

- Multifunction device (MFD): A commercially-available imaging product, which is a physically-integrated device or a combination of functionally-integrated components, that performs two or more of the core functions of copying, printing, scanning, or faxing.
- Direct Thermal (DT) – A marking technology that transfers an image by burning dots onto coated media as it passes over a heated print head. DT products do not use ribbons.
- Dye Sublimation (DS) – A marking technology where images are formed by depositing (subliming) dye onto the print media based upon the amount of energy delivered by the heating elements.
- Electrophotography (EP) – A marking technology characterized by illumination of a photoconductor in a pattern representing the desired hard copy image via a light source, development of the image with particles of toner using the latent image on the photoconductor to define the presence or absence of toner at a given location, transfer of the toner to the final hard copy medium, and fusing to cause the desired hard copy to become durable. Types of EP include Laser, LED, and LCD. Colour EP is distinguished from monochrome EP in that toners of at least three different colours are available in a given product at one time. Two types of colour EP technology are defined below:
 - Parallel Colour EP – A marking technology that uses multiple light sources and multiple photoconductors to increase the maximum colour printing speed.
 - Serial Colour EP – A marking technology that uses a single photoconductor in a serial fashion and one or multiple light sources to achieve the multi-colour hard copy output.
- Impact – A marking technology characterized by the formation of the desired hard copy image by transferring colourant from a “ribbon” to the media via an impact process. Two types of impact technology are Dot Formed Impact and Fully-formed Impact.
- Ink Jet (IJ) – A marking technology where images are formed by depositing colourant in small drops directly to the print media in a matrix manner. Colour IJ is distinguished from monochrome IJ in that more than one colourant is available in a product at any one time. Typical types of IJ include Piezo-electric (PE) IJ, IJ Sublimation, and Thermal IJ.
- Solid Ink (SI) – A marking technology where the ink is solid at room temperature and liquid when heated to the jetting temperature. Transfer to the media can be direct, but is most often made to an intermediate drum or belt and then offset printed to the media.



- Stencil – A marking technology that transfers images onto the print media from a stencil that is fitted around an inked drum.
- Thermal Transfer (TT) – A marking technology where the desired hard copy image is formed by depositing small drops of solid colourant (usually coloured waxes) in a melted/fluid state directly to the print media in a matrix manner. TT is distinguished from IJ in that the ink is solid at room temperature and is made fluid by heat.



Note: In all of the following equations, x = Monochrome Product Speed (ipm).

TEC Table 1

Product(s): Copiers, Digital Duplicators, Fax Machines, Printers	
Size Format(s): Standard-size	
Marking Technologies: DT, Mono DS, Mono EP, Mono Stencil, Mono TT, Mono High Performance IJ	
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 15	1.0 kWh
$15 < x \leq 40$	$(0.10 \text{ kWh/ipm})x - 0.5 \text{ kWh}$
$40 < x \leq 82$	$(0.35 \text{ kWh/ipm})x - 10.3 \text{ kWh}$
> 82	$(0.70 \text{ kWh/ipm})x - 39.0 \text{ kWh}$

TEC Table 2

Product(s): Copiers, Digital Duplicators, Fax Machines, Printers	
Size Format(s): Standard-size	
Marking Technologies: Color DS, Color Stencil, Color TT, Color EP, SI, Color High Performance IJ	
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 32	$(0.10 \text{ kWh/ipm})x + 2.8 \text{ kWh}$
$32 < x \leq 58$	$(0.35 \text{ kWh/ipm})x - 5.2 \text{ kWh}$
> 58	$(0.70 \text{ kWh/ipm})x - 26.0 \text{ kWh}$

TEC Table 3

Product(s): MFDs	
Size Format(s): Standard-size	
Marking Technologies: DT, Mono DS, Mono EP, Mono TT, Mono High Performance IJ	
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 10	1.5 kWh
$10 < x \leq 26$	$(0.10 \text{ kWh/ipm})x + 0.5 \text{ kWh}$
$26 < x \leq 68$	$(0.35 \text{ kWh/ipm})x - 6.0 \text{ kWh}$
> 68	$(0.70 \text{ kWh/ipm})x - 30.0 \text{ kWh}$

TEC Table 4

Product(s): MFDs	
Size Format(s): Standard-size	
Marking Technologies: Color DS, Color TT, Color EP, SI, Color High Performance IJ	
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 26	$(0.10 \text{ kWh/ipm})x + 3.5 \text{ kWh}$
$26 < x \leq 62$	$(0.35 \text{ kWh/ipm})x - 3.0 \text{ kWh}$
> 62	$(0.70 \text{ kWh/ipm})x - 25.0 \text{ kWh}$



Annex C: Operational Mode limits

Large format machine include those designed for A2 media and larger, including those designed to accommodate continuous-form media at a width of 406 millimetres (mm) or wider. Large-format products may also be capable of printing on standard-size or small-format media.

Small size machines include those designed for media sizes smaller than those defined as Standard (e.g., A6, 4" x 6", microfilm), including those designed to accommodate continuous-form media at widths smaller than 210 mm.

Standard format machines include those designed for standard-sized media (e.g., Letter, Legal, Ledger, A3, A4, and B4), including those designed to accommodate continuous-form media at widths between 210 mm and 406 mm. Standard-size products may also be capable of printing on small-format media.

Imaging products with a functionally-integrated DFE that relies on the imaging product for its power, the power consumption of the DFE should be excluded; the DFE must however not interfere with the ability of the imaging product to enter or exit its lower-power modes.

Power limits sleep mode



OM Table 1

Product(s): Copiers, MFDs	
Size Format(s): Large Format	
Marking Technologies: Color DS, Color TT, DT, Mono DS, Mono EP, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	30

OM Table 2

Product(s): Fax Machines, MFDs, Printers	
Size Format(s): Standard-size	
Marking Technologies: Color IJ, Mono IJ	
	Sleep (W)
Marking Engine	1.4

OM Table 3

Product(s): MFDs, Printers	
Size Format(s): Large Format	
Marking Technologies: Color IJ, Mono IJ	
	Sleep (W)
Marking Engine	15

OM Table 4

Product(s): Mailing Machines	
Size Format(s): N/A	
Marking Technologies: DT, Mono EP, Mono IJ, Mono TT	
	Sleep (W)
Marking Engine	7



OM Table 5

Product(s): Printers	
Size Format(s): Small Format	
Marking Technologies: Color DS, DT, Color IJ, Color Impact, Color TT, Mono DS, Mono EP, Mono IJ, Mono Impact, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	9

OM Table 6

Product(s): Printers	
Size Format(s): Standard-size	
Marking Technologies: Color Impact, Mono Impact	
	Sleep (W)
Marking Engine	4.6

OM Table 7

Product(s): Scanners	
Size Format(s): Large Format, Small Format, Standard-size	
Marking Technologies: N/A	
	Sleep (W)
Scanning Engine	4.3

OM Table 8

Product(s): Printers	
Size Format(s): Large Format	
Marking Technologies: Color DS, Color Impact, Color TT, DT, Mono DS, Mono EP, Mono Impact, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	14

The values above should be increased if the machine has additional functions besides printing, following table defines the amounts that must be added to the power consumption values in sleep mode. For the adder allowances shown in the table, distinctions are made for “Primary” and “Secondary” types of adders. These designations refer to the state in which the interface is required to remain while the imaging product is in Sleep. Connections that remain active during the OM test procedure while the imaging product is in Sleep are defined as Primary, while connections that can be inactive while the imaging product is in Sleep are defined as Secondary. A maximum of three primary functional adders can be applied, but as many secondary as present.



Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
Interfaces	A. Wired < 20 MHz	0.3	0.2
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate < 20 MHz. Includes USB 1.x, IEEE488, IEEE 1284/Parallel/Centronics, RS232, and/or fax modem.		
	B. Wired ≥ 20 MHz and < 500 MHz	0.5	0.2
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate ≥ 20 MHz and < 500 MHz. Includes USB 2.x, IEEE 1394/FireWire/i.LINK, and 100Mb Ethernet.		
	C. Wired ≥ 500 MHz	1.5	0.5
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate ≥ 500 MHz. Includes 1G Ethernet.		
	D. Wireless	3.0	0.7
	A data- or network-connection interface present on the imaging product that is designed to transfer data via radio-frequency wireless means. Includes Bluetooth and 802.11.		
	E. Wired card/camera/storage	0.5	0.1
	A physical data- or network-connection port present on the imaging product that is designed to allow the connection of an external device, such as flash memory-card/smart-card readers and camera interfaces (including PictBridge).		
G. Infrared	0.2	0.2	
A data- or network-connection interface present on the imaging product that is designed to transfer data via infrared technology. Includes IrDA.			



Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
Other	Storage	-	0.2
	Internal storage drives present on the imaging product. Includes internal drives only (e.g., disk drives, DVD drives, Zip drives), and applies to each separate drive. This adder does not cover interfaces to external drives (e.g., SCSI) or internal memory.		
	Scanners with CCFL lamps or non-CCFL lamps	-	0.5
	The presence of a scanner that uses Cold Cathode Fluorescent Lamp (CCFL) technology or a technology other than CCFL, such as Light-Emitting Diode (LED), Halogen, Hot-Cathode Fluorescent Tube (HCFT), Xenon, or Tubular Fluorescent (TL) technologies. This adder is applied only once, regardless of the lamp size or the number of lamps/bulbs employed.		
	PC-based system (cannot print/copy/scan without use of significant PC resources)	-	-0.5
	This adder applies to imaging products that rely on an external computer for significant resources, such as memory and data processing, to perform basic functions commonly performed by imaging products independently, such as page rendering. This adder does not apply to products that simply use a computer as a source or destination for image data.		
	Cordless handset	-	0.8
	The capability of the imaging product to communicate with a cordless handset. This adder is applied only once, regardless of the number of cordless handsets the product is designed to handle. This adder does not address the power requirements of the cordless handset itself.		
	Memory	-	1.0 W per 1 GB
	The internal capacity available in the imaging product for storing data. This adder applies to all volumes of internal memory and should be scaled accordingly. For example, a unit with 2.5 GB of memory would receive an allowance of 2.5 W while a unit with 0.5 GB would receive an allowance of 0.5 W.		
	Power-supply (PS) size, based on PS output rating (OR) Note: This adder ONLY applies to products which fall under OM Tables 2 and 6.	-	For PSOR > 10 W, 0.02 x (PSOR – 10 W)
	This adder applies to only those imaging products which fall under OM Tables 2 and 6. The allowance is calculated from the internal or external power supply's rated DC output as specified by the power supply manufacturer. (It is not a measured quantity). For example, a unit that is rated to provide up to 3 A at 12 V has a PSOR of 36 W and would receive an allowance of $0.02 \times (36-10) = 0.02 \times 26 = 0.52$ W of power supply allowance. For supplies that provide more than one voltage, the sum of power from all voltages is used unless the specifications note that there is a rated limit lower than this. For example, a supply which can supply 3A of 24 V and 1.5 A of 5 V output has a total PSOR of $(3 \times 24) + (1.5 \times 5) = 79.5$ W, and an allowance of 1.39 W.		

PSOR: Power supply output rating



Time limits sleep mode

Table A: Maximum Default Delay Times to Sleep for Small-format and Standard-size OM Products, Excluding Mailing Machines, in Minutes

Monochrome Product Speed (ipm)	Fax Machines	MFDs	Printers	Scanners
0 - 10	5	15	5	15
11 - 20	5	30	15	15
21 - 30	5	60	30	15
31 - 50	5	60	60	15
51 +	5	60	60	15

Table B: Maximum Default Delay Times to Sleep for Large-format OM Products, Excluding Mailing Machines, in Minutes

Monochrome Product Speed (ipm)	Copiers	MFDs	Printers	Scanners
0 - 10	30	30	30	15
11 - 20	30	30	30	15
21 - 30	30	30	30	15
31 - 50	60	60	60	15
51 +	60	60	60	15

Table C: Maximum Default Delay Times to Sleep for Mailing Machines in Minutes

Product Speed (mppm)	Mailing Machines
0 - 50	20
51 - 100	30
101 - 150	40
151 +	60



Power limits Standby Mode

Table D: Maximum Standby Power Levels for OM Products in Watts

Product Type & Size Format	Standby (W)
All Small Format and Standard-size OM Products without Fax Capability	1
All Small Format and Standard-size OM Products with Fax Capability	2
All Large Format OM Products and Mailing Machines	N/A

Table D: Maximum Standby Power Level for OM Products in Watts

Product Type	Standby (W)
All OM Products	1



Annex D: R-PHRASES

<u>R1:</u>	Explosive when dry.
<u>R2:</u>	Risk of explosion by shock, friction, fire or other sources of ignition.
<u>R3:</u>	Extreme risk of explosion by shock, friction, fire or other sources of ignition.
<u>R4:</u>	Forms very sensitive explosive metallic compounds.
<u>R5:</u>	Heating may cause an explosion.
<u>R6:</u>	Explosive with or without contact with air.
<u>R7:</u>	May cause fire.
<u>R8:</u>	Contact with combustible material may cause fire.
<u>R9:</u>	Explosive when mixed with combustible material.
<u>R10:</u>	Flammable
<u>R11:</u>	Highly flammable
<u>R12:</u>	Extremely flammable
<i>R13 (obsolete):</i>	<i>Extremely flammable liquid gas (This R-phrase is no longer designated by the version of the GefStoffV published on 26.10.93.)</i>
<u>R14:</u>	Reacts violently with water.
<u>R15:</u>	Contact with water liberates extremely flammable gases.
<i>Merck R15.1</i>	<i>Contact with acid liberates extremely flammable gases.</i>
<u>R16:</u>	Explosive when mixed with oxidizing substances.
<u>R17:</u>	Spontaneously flammable in air.
<u>R18:</u>	In use, may form flammable/explosive vapour-air mixture.
<u>R19:</u>	May form explosive peroxides.
<u>R20:</u>	Harmful by inhalation.
<u>R21:</u>	Harmful in contact with skin.
<u>R22:</u>	Harmful if swallowed.
<u>R23:</u>	Toxic by inhalation.
<i>Riedel-de Haen R23K:</i>	<i>Also toxic by inhalation.</i>
<u>R24:</u>	Toxic in contact with skin.
<i>Riedel-de Haen R24K:</i>	<i>Also toxic in contact with skin.</i>
<u>R25:</u>	Toxic if swallowed.
<i>Riedel-de Haen R25K:</i>	<i>Also toxic if swallowed.</i>
<u>R26:</u>	Very toxic by inhalation.
<i>Riedel-de Haen R26K:</i>	<i>Also very toxic by inhalation.</i>
<u>R27:</u>	Very toxic in contact with skin
<i>Riedel-de Haen R27A:</i>	<i>Very toxic in contact with eyes.</i>
<i>Riedel-de Haen R27K:</i>	<i>Also very toxic in contact with skin.</i>
<i>Riedel-de Haen R27AK:</i>	<i>Also very toxic in contact with eyes.</i>
<u>R28:</u>	Very toxic if swallowed.
<i>Riedel-de Haen R28K:</i>	<i>Also very toxic if swallowed.</i>
<u>R29:</u>	Contact with water liberates toxic gas.
<u>R30:</u>	Can become highly flammable in use.
<u>R31:</u>	Contact with acids liberates toxic gas.



<i>Merck R31.1</i>	<i>Contact with alkalis liberates toxic gas.</i>
<u>R32:</u>	Contact with acids liberates very toxic gas.
<u>R33:</u>	Danger of cumulative effects.
<u>R34:</u>	Causes burns.
<u>R35:</u>	Causes severe burns.
<u>R36:</u>	Irritating to eyes.
<i>Riedel-de Haen R36A:</i>	<i>Lacrimating</i>
<u>R37:</u>	Irritating to respiratory system.
<u>R38:</u>	Irritating to skin.
<u>R39:</u>	Danger of very serious irreversible effects.
<u>R40:</u>	Possible risk of cancer. <i>CAUTION: Until 2001 this R-phrase was used for possible mutagenic or teratogenic risks as well. These risks are now labelled with R68!</i>
<u>R41:</u>	Risk of serious damage to eyes.
<u>R42:</u>	May cause sensitization by inhalation.
<u>R43:</u>	May cause sensitization by skin contact.
<u>R44:</u>	Risk of explosion if heated under confinement.
<u>R45:</u>	May cause cancer.
<u>R46:</u>	May cause heritable genetic damage.
<i>R47(obsolete):</i>	<i>May cause deformities. (This R-phrase is no longer designated by the version of the GefStoffV published on 26.10.93.)</i>
<u>R48:</u>	Danger of serious damage to health by prolonged exposure.
<u>R49:</u>	May cause cancer by inhalation.
<u>R50:</u>	Very toxic to aquatic organisms.
<u>R51:</u>	Toxic to aquatic organisms.
<u>R52:</u>	Harmful to aquatic organisms.
<u>R53:</u>	May cause long-term adverse effects in the aquatic environment.
<u>R54:</u>	Toxic to flora.
<u>R55:</u>	Toxic to fauna.
<u>R56:</u>	Toxic to soil organisms.
<u>R57:</u>	Toxic to bees.
<u>R58:</u>	May cause long-term adverse effects in the environment.
<u>R59:</u>	Dangerous for the ozone layer.
<u>R60:</u>	May impair fertility.
<u>R61:</u>	May cause harm to the unborn child.
<u>R62:</u>	Possible risk of impaired fertility.
<u>R63:</u>	Possible risk of harm to the unborn child.
<u>R64:</u>	May cause harm to breastfed babies.
<u>R65:</u>	Harmful: may cause lung damage if swallowed.
<u>R66:</u>	Repeated exposure may cause skin dryness or cracking.
<u>R67:</u>	Vapours may cause drowsiness and dizziness.
<u>R68:</u>	Possible risks of irreversible effects.

