



## **List of activities and substances TO BE AVOIDED (grey list) to ensure environmentally friendly and compliant products**

### **1. Introduction and Purpose**

KEBA accepts its social responsibilities on a continuing and rigorous basis and is committed to environmental protection and to avoid environmental damage. We recognize the importance of the efficient use of energy, the careful choice of material and processes, the product design to enable reusability and recycling, the careful use of resources and the decrease of waste material.

### **2. KEBA list of activities and substances TO BE AVOIDED (grey list)**

We consider it as self-evident that all legal requirements for environmental protection must be fully respected.

Therefore the KEBA list of prohibited activities and substances (black list) provides an overview of the relevant prohibitions and restrictions of dangerous substances in the electrical and electronic industries to ensure the development and production of environmentally friendly products and services in all areas of business.

The KEBA list of activities and substances TO BE AVOIDED (grey list) specifies materials and compounds which are not prohibited electrical and electronics industries but the use of which should be avoided or at least reduced as far as it is technically feasible.

The Avoidance List does not constitute a legally-binding document but is of an informative nature.

It is the legal responsibility of every product marketing company, that means also of our suppliers, to ensure compliance with all relevant prohibitions and restrictions. According to that we expect that our suppliers have a system in place to consider these Avoidance List.

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Avoiding list (grey list),  
Ver: V1.1 / 12.07.08, grai

| field of application   | Substances   | CAS-No.               | Source<br>Legal<br>requirements<br>Regulations R<br>Directives D<br>EC and other<br>countries | reason  | application - Generic examples -<br>typically used in   |
|--|--|-----------------------|---|---|---|
| alloys<br>display technique<br>flame retardant<br>semiconductor<br>solder<br>synthetic/plastics<br>pigment/dyes<br>synergist | Antimony and its<br>compounds<br>Antimonytrioxide  | 744-36-0<br>1309-64-4 | D 2005/79/EC<br>D 2007/19/ EC   | Antimony is suspected of triggering<br>cancer, hazardous to water               | Banned on plastics to come into contact with<br>foodstuff. Antimontrioxid is synergist<br>(decabromodiphenylether) for flame retardant in<br>plastics. Doping antimon-tin-oxide ATO for display<br>technique. Anti shrinking alloy. Manufacturing<br>semiconductor. Pigment dyes in plastics. |
| adhesives<br>antifouling<br>biocides<br>alloys<br>diode<br>IC<br>semiconductor<br>pigment/dyes<br>transistors<br>wafer       | Arsenic and its<br>compounds   | 7440-38-2<br>etc.     | D 2006/139/EC,<br>D 76/769/EEC  | toxic, hazardous to environment and<br>severely hazardous to water<br>organisms | Restricted (see exemption) in wood protection and<br>antifouling dyes. Metal adhesives, copper and lead<br>alloys (accumulator), color pigments, soft solder,<br>transistors, diodes and semiconductor<br>(gallium/indium-arsenid)  |
| antifouling<br><br>biocides<br>lacquers<br><br>surface treatment   | Antifouling paints: see<br>arsenic, mercury,<br>tinnorganic(stannous)<br>compounds,<br>hexachlorocyclo-<br>hexane (HCH) etc. |                       | D 2002/62/EC<br>D 98/8/EC   | toxic, environmentally hazardous<br>substance, hazardous to water               | Colours are prohibited with biocidal substances<br>(arsenic, tinn, mercury.. ). Protective coatings,<br>lacquers equipped with biocides for coating of ships<br>to prevent from fouling by microorganisms, plants or<br>animals   |

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|---|---|------------|---|---|--|
| dyestuff  | Azo dyes, with<br>carcinogenic amino -<br>components            |            | D 2004/21/EC<br>D 2002/61/EC  | carcinogen  | Certain azo groups, prohibited in textile and leather.<br>Further application used in plastics   |
| synthetic/plastics  | Amine, which can form<br>carcinogenic<br>Nitrosamines, selected |            | D 2002/61/EC  | carcinogen  | Polyurethan foam, corrossions inhibitor, rubber,<br>colorants, herbicides, lubricants  |
| alloys<br>contact/spring material<br>IC<br>semiconductor<br>relays<br>resistor<br>transistors | Beryllium and its<br>compounds                                  | 7440-41-7  | D 97/56/EC<br>D 67/548/EEC  | (only when editing) poison, suspect<br>of carcinogenic effects, toxic by<br>inhalation and swallow      | Copper or nickel alloys. Electrical Contact and<br>spring material, Be- copper used in IC, ceramic<br>berylliumoxide compounds ceramics, high-<br>temperature materials, Be-Ni as well as thermostat,<br>Be-oxid used as isolator in high frequently power<br>transistor and resistor ( alternative per examples<br>aluminiumoxide etc.) |
| PCB<br>synthetic/plastics<br>flame retardant  | Brominated flame<br>retardants                                  |            |   | non-recyclable hazardous waste,<br>because formation of dioxins   | Flame retardants in printed boards, plastic formed<br>(molded) components and electrical assemblies  |
| flame retardant<br>synthetic/plastics<br>PCB  | Deca-BDE<br>bromodiphenylether                                  |            | see april Case<br>C14/06 ex 1.<br>July 2008 legal<br>and prohibited                           | non-recyclable hazardous waste,<br>because formation of dioxins   | Flame retardants in printed boards, plastic formed<br>(molded) components and electrical assemblies  |
| flame retardant   | HBCD Cyclododecan,<br>hexabrom                                  | 25637-99-4 | EU risk<br>assessment   | non-recyclable hazardous waste,<br>because formation of dioxins   | Flame retardants in printed boards, plastic formed<br>(molded) components and electrical assemblies  |
| detergent<br>solvent  | Chlorinated (aliphatic)<br>carbons                              |            | see prohibited list   | health risk, hazardous to water,<br>persistent and seriously degradable                                 | Solvents, detergent and surface agents   |
| flame retardant<br>plasticiser/softener<br>synthetic/plastics                                 | Chlorinated paraffins   | 10871-26   |   | short chained paraffins are<br>carcinogenic, hazardous to water,<br>persistent and seriously degradable | Additives in solid lubricants, softener and flame<br>retardants in plastics, adhesive agents in lacquers   |

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|--|---|------------|---|---|--|
| biocides                               | DBB Di- <i>i</i> -oxo-di-n-butylstanniohydroxyboran   | 75113-37-0 | D 76/769/EEC<br>D 89/677/EEC  | toxic, harmful to health/noxious,<br>hazardous to water   | Antifouling dyes   |
| detergent<br>refrigerant/cooling agent | H-FCKW und FKW  |            | see prohibited list   | deplete the ozon layer, climate<br>changing   | Cooling agent, refrigerant, propellant   |
| biocides                               | Insecticides (Aldrin, DDT, Dieldrin, Endrin, HCH -hexachlorocyclohexane, HCB (hexachlorobenzene), Lindan, Mirex, Toxaphen, PCP penta chlorophenol etc.) |            |   |   | Biocides, insecticides, flame retardant  |
| flame retardant                        | Aldrin  | 309-00-2   | Stockholmer<br>convention 2004<br>general ban on<br>POPs =<br>persistent organic<br>pollutants<br>EC R No 850/240 | poison, environmentally hazardous<br>substances   | Insecticides, flame retardants   |
| flame retardant                        | Endrin  | 72-20-8    |   |   | Insecticides, flame retardants   |
| insecticides                           | DDT 1,1,1 Trichloro-2,2-bis-(4-chloro-phenyl) ethane and its isomere  | 50-29-3    |   |   | Insecticides, wood protection,<br>exemption: fighting malaria  |
| flame retardant                        | Mirex   | 2385-85-5  |   |   | Insecticides, wood protection,<br>exemption: fighting malaria  |
| surface agent                          | Alkylphenole  |            |   |   |  |
| detergent<br>surface agent             | Nonylphenole  | 25154-52-3 | see<br>D 2003/53/EC   | harmful to health (caused<br>oestrogenic effects), irritand, caustic,<br>hazardous to environment | Raw materials for synthetic resins and coatings. Non<br>ionogenic tenside, cleaning products for commercial<br>/ industrial purposes. Degreasing of metal surfaces |
| detergent<br>surface agent             | Nonylphenol-ethoxylate  | 9016-45-9  | see<br>D 2003/53/EC   | harmful to health (caused<br>oestrogenic effects), irritand, caustic,<br>hazardous to environment | Surface active agent (surfactant), additives and<br>lubrication solvent  |
| surface treatment                      | Nickel  | 7440-02-0  |   | Nickel is suspected of triggering<br>cancer, awareness- allergization                             | Nickel alloy and corrosion protection  |

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|----------------------|------------|---------|---|-------------------------------|---|
| alloys               |            |         |   | through skin contact, noxious |   |

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|--|--|-------------------------|---|---|--|
| synthetic/plastics<br>plasticiser/softener | Phthalates (DeHP,<br>BBP, DBP)   | 131-11-3 etc.           | D 2005/84/EC  | harmful to health (effect like<br>hormones) caused diabetes and<br>overweight                                       | Softener in plastics, insecticides   |
| insulation<br>synthetic/plastics           | Polyvinylchloride and<br>its compounds   | 9002-86-2               | D 2007/19/EC<br>D 76/769/EEC  | by firing outcome chlorine gas and<br>include plasticiser/softener (see<br>phthalate)                               | Electrical insulation pipes, seals, hoses, films   |
| electrodes                                 | Radioactive elements<br>Uranium, Plutonium,<br>Radon, Americium,<br>Thorium, Cesium,<br>Strontium etc. |                         |   | radioactiv  | Measurement instrument, lightning arrester, thorium<br>in welding electrodes   |
| diode<br>semiconductor                     | Selen und its<br>compounds   | 7782-49-2               |   | poison, harmful to health, toxic by<br>inhalation and swallow   | Photo-Electric coatings, diodes, rectifier   |
| health and environment                     | carcinogenics,<br>mutagenics or toxic to<br>reproduction<br>(CMR=k/f/e<br>substances)                  |                         | D 2003/34/EC<br>D 2005/90/EC<br>(CMR)   | The substances are listed in D<br>2005/90/EC, cause cancer, lead to<br>reproductive hazards and heritage<br>changes | The avoidance of substances in<br>D 2005/90/EC are listed chrom (VI) trioxide, etc.  |
| alloys<br>pigment/dyes                     | cobalt (II) chloride,<br>cobalt (II) sulfate   | 7646-79-9<br>10124-43-3 | D 2003/34/EC<br>CMR   | poison, environmentally hazardous<br>substances Carcinogens: category 2   | Alloys, galvanic, element in metals, Zn-Co-plating,<br>hard metals   |
| synthetic/plastics                         | 1,3 butadiene  | 106-99-0                | D 2003/36/EC<br>(CMR)   | 1,3 butadiene see directive<br>concentration limits: poison,<br>carcinogenic  | Manufacturing of synthetic rubber for tires,<br>copolymerisate with Styrene(SBR) or Acrylonitrile<br>(NR), softener, residual monomer in ABS |
| insulation                                 | beryllium oxide  | 1304-56-9               | D 2003/36/EC<br>(CMR)   | beryllium oxide very poisonous,<br>carcinogen   | see above  |
| synthetic/plastics<br>surface treatment    | BCME<br>bis(chloromethyl)ether   | 542-88-1                | D 2001/59/EC<br>(CMR)   | carcinogen  | Surface treatment of vulcanized rubber to increase<br>adhesion and in the manufacture of flame retardant<br>fabrics                          |

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|---|---|-------------------|---|--|--|
| synthetic/plastics<br>surface treatment | CMME<br>chlor(methylmethyl)-<br>ether   | 107-30-2          | CMR   | carcinogen   | Surface treatment of vulcanized rubber to increase<br>adhesion and in the manufacture of flame retardant<br>fabrics  |
| insulation                              | carcinogenic,<br>mutagenic or toxic to<br>reproduction  | see<br>exemptions | D 2001/41/EC<br>(CMR)   | biopersistent fibres Carcinogens:<br>category 2  | Refractory ceramic fibres: Special Purpose Fibres,<br>with the exception of those specified elsewhere in<br>Annex I to Directive 67/548/EEC (silicats)   |
| health and environment                  | The following guidelines apply only for substances that intended to come into contact with foodstuffs |                   |   |  |  |
| synthetic/plastics                      | Acrylonitrile than<br>residual  | 107-13-1          | D 2005/79/EC<br>amending D<br>2002/72/EC  | dangerous to health, harmful   | ABS, San copolymers and other copolymere are<br>prohibited to contact with food  |
| synthetic/plastics                      | Butadiene than residual   | 106-99-0          | D 2005/79/EC<br>amending D<br>2002/72/EC  | dangerous to health, harmful   | ABS, San copolymers and other copolymere are<br>prohibited to contact with food  |
| synthetic/plastics                      | Vinyl chloride as a<br>residual   | 75-01-04          | D 2005/79/EC<br>amending D<br>2002/72/EC  | dangerous to health, harmful   | ABS, San copolymers and other copolymere are<br>prohibited to contact with food  |
| product                                 | REACH<br>Registration<br>Evaluation,<br>Authorisation of<br>Chemicals                                 |                   | R EC No<br>1907/2006 D<br>2006/121/EC,  | use such substances that do not<br>adversely affect human health or the<br>environment | Amending Directive 1999/45/EC and repealing<br>Council Regulation (EEC) No 793/93 and<br>Commissio Regulation (EC) No 1488/94 as well<br>as Council Directive 76/769/EEC, 93/67/EEC,<br>93/105/EC and 2000/21/EC |

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|----------------------|---|----------|---|--------|---|
| <b>Legend:</b>       |   |          |   |        |   |
| <b>biocides</b>      | The <i>Biocidal Products Directive 98/8/EC (BPD)</i> , the classification of biocides is broken down in four main group and into 23 product types (i.e. application categories), with several comprising different subgroups  |          |   |        |   |
| biocides             | Disinfectants and general biocidal products<br>Preservatives: for examples - wood, preservatives, rubber and polymerised materials (synethics) protection, dyestuffs, synthetics<br>Pest control: Pesticides<br>Other Biocides: Antifouling productes   |          |   |        |   |
| <b>REACH</b>         |   |          |   |        |   |
|                      | The purpose of this Regulation is to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market whole enhacing competitiveness and innovation. |          |   |        |   |
| <b>CPU</b>           |   |          |   |        |   |
|                      | circuit printed board<br>all of the above mentioned materials can be used (included) in the printed circuit board   |          |   |        |   |
| <b>Phthalate*</b>    | DEHP  | 117-81-7 | Bis(2-ethyl(hexyl) phthalate  |        |   |
|                      | DBP (DOP)   | 84-74-2  | Dibutylphthalate  |        |   |
|                      | BBP   | 85-68-7  | Benzyl butyl phthalate  |        |   |

## History:

| DATE       | VERSION | DESCRIPTION   | ISSUER | RELEASED BY |
|------------|---------|---|--------|-------------|
| 19.12.2007 | V1.0    | first version avoiding list constructed und approved  | grai   | mog         |
| 11.03.2008 | V1.1    | Generic example typically used in   | grai   | mog         |
| 04.04.2008 | V1.1    | article of daily use Bedarfsgegenstände and foodstuff<br>RL 2005/79/EG  | grai   | mog         |
| 22.04.2008 | V1.1    | Nickel  | grai   | mog         |
|            |         | Flame retardant deca bromo-diphenylether  | grai   | mog         |
|            |         | REACH   | grai   | mog         |
| 20.05.2008 | V1.1    | CMR=k/f/e included D 2003/34EC  | grai   | mog         |
| 22.05.2008 | V1.1    | filter after application  | grai   | mog         |
| 28.05.2008 | V1.1    | Legend included   | grai   | mog         |
| 30.05.2008 | V1.1    | CMR=k/f/e D 2003/34EC cobalt sulfate, cobalt<br>chloride  | grai   | mog         |
|            |         | CMR=k/f/e D 2003/36EC 1, 3 butadien; beryllium<br>oxide   |        |             |
|            |         | CMR=k/f/e D 2001/41EC ceramic-persistent fibres   |        |             |
|            |         | RL 2005/90/EG CMR (chromtrioxid etc.)   |        |             |
|            |         | Legend abbreviations statement  |        |             |
| 03.06.2008 | V1.1    | HBCD (brominated) flame retardant EU risk<br>assessment   | grai   | mog         |
| 10.06.2008 | V1.1    | BCME, CMME CMR substances   | grai   | mog         |
| 10.06.2008 | V1.1    | amines which can form carc.nitrosamines, selected<br>RL 2002/61/EG  | grai   | mog         |
| 01.07.2008 | V1.1    | Exemption (RoHS) of DecaBDE in polymeres was<br>cancelled. See Case C14/06 april is legal ex<br>01.07.2008 and prohibited | grai   | mog         |