

# Environmental Report 2008/09

Activities relating to Environmental Issues and Working Environment at Bang & Olufsen.





## Introduction

The Head office of Bang & Olufsen is centred in Struer alongside the Development Department, the Administration and most of the production facilities. In 2006 Bang & Olufsen's factory in the Czech Republic was commissioned, and by the end of this financial year the factory in the Czech Republic employed 215. In Denmark Bang & Olufsen have 1500 employees.

The purpose of this annual environmental report is to describe all the activities relating to environmental issues and working environment at Bang & Olufsen. For each subject our current activities are presented together with our focus areas for the next financial year. This report covers the Danish sites.

### Sustainability

At Bang & Olufsen we develop high-quality products that have long lifetimes. Our designs are timeless and many households have perfectly-working Bang & Olufsen products that are 20-30 years old.

On average, a Bang & Olufsen product has a lifetime of 10-15 years without any loss of audio or video quality. Products are exhaustively tested before they are released for production, to ensure high-quality throughout their lifetime. They are tested to ensure they can withstand cold, heat, knocks, sunlight, dust, etc.

If in the unlikely event that a product develops a fault during its lifetime, it can of course be repaired. We deliver product spare parts for up to twelve years after a product has ceased to be manufactured. We also have mechanical spare parts - for example front and back panels, in the event of a unit becoming scratched or damaged.

The high quality and long lifetime are environmentally positive assets for our products.

### Responsible corporate supply chain

Bang & Olufsen has actively been working with Corporate Social Responsibility (CSR) in the supply chain for the last five years. The CSR supply chain guidelines have been described in the Bang & Olufsen Code of Conduct, which all suppliers must sign as a part of the co-operation agreement. The aim of the code is not to terminate business, but to help suppliers improve on social and environmental standards.

The procedures of the Bang & Olufsen CSR in the supply chain have been implemented in the overall quality management system and are executed by the purchasing department.

The entire Bang & Olufsen supplier portfolio is being risk evaluated once a year. As a result of the risk analysis the suppliers are divided into three risk groups and categorized as a low, medium or high risk supplier.

Suppliers categorised as medium and high risk must also fill out a self assessment survey. The self assessment may result in some corrective actions that the suppliers must implement.

Furthermore, Bang & Olufsen will perform a full audit at all suppliers categorised as high risk based on the Code of Conduct. The audit will be done together with a highly respected partner. If the audit reveals any violations from the Code of Conduct, a corrective action report

will be made based on any possible findings in co-operation with the supplier.

Finally, a re-audit of the supplier will be conducted in order to ensure that the corrective actions have been implemented.

Bang & Olufsen has performed several full audits of different suppliers, and the conclusions of the re-audits show significant improvements at the suppliers in terms of human rights, labour and environment.

### Donation

This financial year Bang & Olufsen auctioned off the number one product of the white limited edition of a BeoSound 9000 and BeoLab 8000. The amount obtained was donated to UNICEF who helps children in need throughout the world.

Babur Kamal from Islamabad went of with the whole lot as he gave the highest bid on 105.000 DKR. Bang & Olufsen are more than happy to help children in need throughout the world.

### Focus areas

Monitoring worldwide legislation

We monitor international legislation regarding product environment. We need to be aware of worldwide legislation to ensure access to all markets for our products. The general tendency for this financial year has been worldwide adoption and implementation of European legislation with some adjustments.

The legal requirements that have impact on our products are ensured through our environmental design standards.

### Product take back – WEEE

Legislation regarding product take back was first adopted in 2003 and implemented in Europe in 2005 through the WEEE1 directive. The directive imposes the responsibility for the disposal of waste from electrical and electronic equipment on the manufacturers of such equipment. Producers should establish an infrastructure for collecting WEEE, in such a way that users of electrical and electronic equipment from private households should have the possibility of returning WEEE free of charge.

As mentioned, legislation similar to the WEEE directive regarding product takeback and producer responsibility has been adopted and implemented worldwide. As Bang & Olufsen has worldwide sale we have chosen to join collective schemes for takeback of our products to fulfill our obligations.

### EuP

The European directive Ecodesign for Energy using products was adopted by the EU commission in 2005. The directive does not include direct requirements for products but provides a framework for setting eco-design requirements for any groups of products which use energy.

This year three implementing measures relevant for Bang & Olufsen entered into force: requirements for standby/off mode, external power supplies and televisions. The requirements are all about energy consumption and we must fulfill the first requirement from the turn of this year.

We have set up activities to ensure that our products comply with these requirements.

**External and working environment certification – ISO 14001 and OHSAS 18000**

Throughout this financial year we have worked for making Bang & Olufsen ready for the external and working environment certification. The certification is expected to be at hand February 2010. Before the final certification we have a pre-audit primo October 2009 which we expect to pass and therefore are recommended to the final certification in February 2010.

All employees throughout the company are involved in the working progress for getting ready for the certification. Especially the safety- and environmental groups have made a great effort.

The certification oblige us to continuous improvements and therefore we have chosen 2 objectives for the next financial year – one respectively for working environment and one for external environment – see table 1. The certification also include our product environment but we have chosen to focus on external and working environment when setting objectives. We manage product environment through our environmental design standards.

Area	Objective	Unit	Currency
Working accidents	5 % reduction per year in working accidents	Frequency	3 year
Energy	5 % reduction per year, totally in consumption of natural gas og electricity	MWh	3 year

Table 1: Objectives for the next financial year.



# Environmental Policy

At Bang & Olufsen we have an integrated thinking about the environmental actions our production and products have on our employees, customers and surroundings. We use the word "environment" broadly covering the disciplines of work environment, product environment and the external environment.

Bang & Olufsen as an environmentally responsible company desires to create sustainable products. The considerations involved in the operation, design, and longevity of our products must be in mutual balance with the environmental impact of production.

## More definitively we aim to:

- Develop and produce products under circumstances that comply with the demands of the standards ISO 14001 and OHSAS 18001.
- Continuously seek to prevent or improve:
  - The work environment with benefit for the health and safety of our employees.
  - Work related illnesses and/or injury.
  - Environmental impact from our production and products that could inflict on the surroundings.
- Communicate openly on environmental issues related to our production and products.
- Maintain a high level of informational transparency to enlighten employees on the environmental initiatives so it becomes a visible and natural part of the daily routine.
- Secure that persons working for, and on behalf, of Bang & Olufsen have the necessary knowledge about environment to carry out their work in a responsible manner.
- Observe Bang & Olufsen's environmental rules and other requirements we have pledged to observe, and as a minimum observe existing legislation in the countries where we produce and sell our products.





## Environmental Impact on Site

### Financial crisis

Bang & Olufsen has as other companies been affected by the financial crisis. Production has been reduced which will show in the figures throughout this chapter.

### Raw materials

The materials we use for our products contribute to the environmental impact through drain on natural resources.

Materials are purchased as raw materials or semimanufactures. In this report we include raw materials purchased to process at Bang & Olufsen which are plastic granulates and aluminium, see figure 1. As mentioned due to financial crisis the amount of purchased materials are decreased compared to last year.

### Energy consumption

In 1996, we established our own combined heat and powerplant. The heat produced is used at the factories in Struer, whereas the produced electricity is sold to the Public Works. In addition to profit gained from the electricity sold, other economic considerations such price of purchased natural gas and the sales price of electricity determine whether the plant operates or not. Figure 2 shows a decrease in CO2 emission

calculated from the consumption of natural gas – again the consumption has decreased due to less production.

The energy consumption is continually recorded for each factory and on some factories even for each machine. In this financial year the energy consumption has decreased compared to last year due to less production but also due to the initiatives taken from our Facility department on reduction of energy consumption – see figure 3.

### Waste

The amount of waste that we produce has an impact on the environment. We put great effort into waste management, sorting waste correctly for recycling. For example, any aluminium that has been scrapped in production is sold to an external aluminium recycling company. The same process applies to plastic. We also sort waste into paper, refuse, plastic film and chemicals. In total 74 % of our waste is recycled – only 4 % is disposed of in landfills, while the rest is incinerated (recovered) – see figure 4.

The amount of waste this financial year is heavily reduced due to less production.

Figure 1: Purchased raw materials

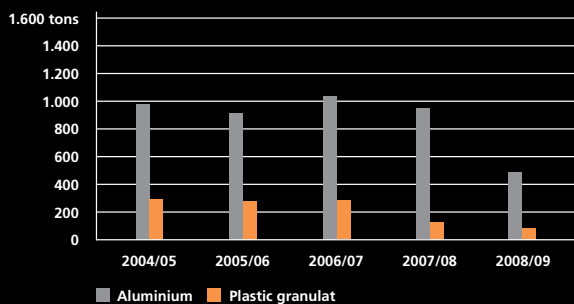


Figure 3: Total energy consumption in MWh

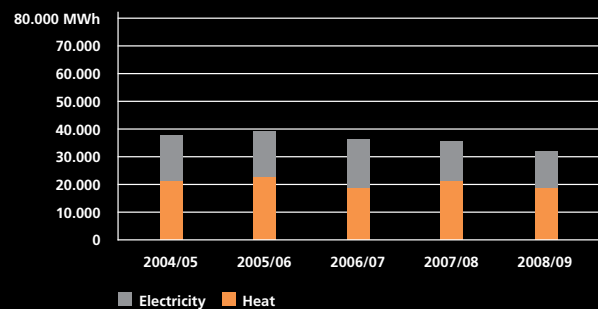


Figure 2: CO2 emission from the combined heat and power plant is calculated from the consumption of natural gas in m3.

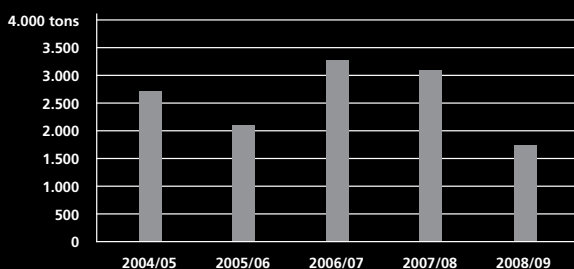
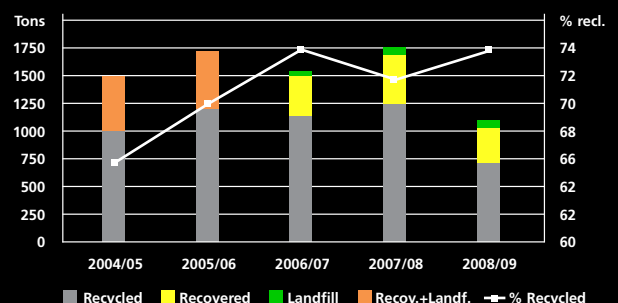


Figure 4: Total weight of waste and recycling percentage



### Water consumption

Water is used for sanitary and production purposes primary in the anodising plant. In this financial year the total water consumption is decreased by nearly 11.000 m3 compared to last financial year - see figure 5.

### Sanitary use

For sanitary use the water consumption has decreased by nearly 5700 m3 compared to last year. The water consumption for sanitary use has presumably decreased due to fewer employees in the production plant. 54% of the total water consumption is used for sanitary purpose.

### Production process

In addition to sanitary use we use water in our production process in the anodising plant. There is an decrease in water consumption compared to last year by nearly 5200 m3 due to less production. 46 % of the total water consumption in 2008/09 were used in the anodising plant.

Since the water consumption in the anodising process is correlated to the surface of the aluminium anodised, we use that as an index. The index has increased compared to the water consumption – see figure 6. The reason for the increase of consumption of water for the anodising plant is due to idling operations because of less production but also due to quality issues.

### Waste water

Waste water from the factories consists of sanitation waste water which is led directly to the municipal purification plant and waste water from the anodising plant.

Adjacent to the mechanic factory which houses the anodising plant is our own purification plant used for a simple purification process of waste water from the anodising plant.

The rinsing baths can be slightly alkaline or acidic and contain

particles of aluminium and colouring agents. The purification process neutralises the water through the addition of liquid caustic soda or acid to a pH value approximately 7-9. At this pH the aluminium particles tie up the colour particles in the sludge. The purified waste water is led to the municipal purification plant and the sludge is recycled through the production of construction material.

The waste water is analysed before it is sent to the municipal purification. The analysis are made six times a year. The evaluation of compliance to permit limits are done by statistical methods (DIF). Figure 7 shows the result of the analysis– the analysis results are way below the permit limit.

In addition to the data in figure 7 we analyse for cadmium, lead and mercury but the values for these analysis are below the detecting area so these numbers are not illustrated.

### Transportation

All transport between and from the factories is purchased as a standard service.

The transportation of goods between the factories in Struer, the warehouse in Herning and the factory in the Czech Republic is carried out by truck. The outgoing transport of goods is carried out either by truck, ship or plane. The disposition by weight is shown in figure 8.

The environmental impact from the transportation on each market is reported yearly from our transport-suppliers. The impact is based on actually weight that is being transported. The CO2 emission dispositioned by weight transported can be seen in figure 9. Even though most of our products are transported by truck our greatest CO2 emission comes from transportation by plane. Our transportation by plane is a necessity as we are a order producing company. Our stock is placed in Denmark and to reduce the time for delivery we need to fly our products to e.g. the United States and the Eastern part of the world to keep the delivery time as low as possible.

Figure 5: Water consumption in m3

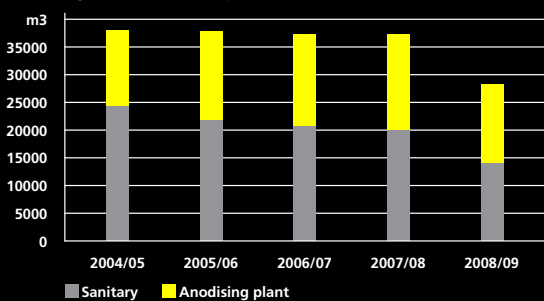


Figure 6: Water consumption in m3

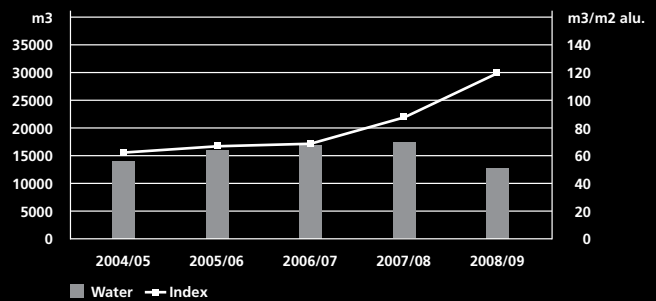


Figure 7: Result of waste water analysis

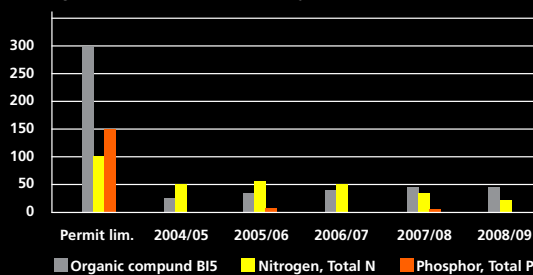


Figure 8: Disposition by weight

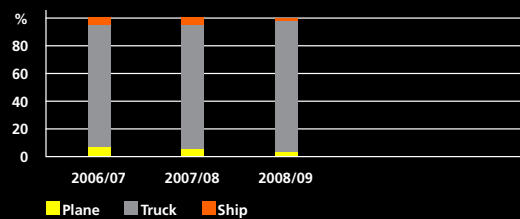
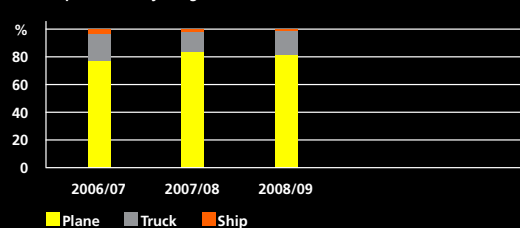


Figure 9: CO2 emission from the different type of transportation dispositioned by weight



# Environmental Impact from Products

Environmental design standards control a product's environmental equalities

At Bang & Olufsen we include environmental thinking as early as possible in our product's life cycle. This is why we already have comprehensive environmental specifications laid down in the development phase.

Environmental design standards include mandatory requirements as well as more stringent company specifications that cover areas where there are yet no mandatory requirements. A product environmental impact gatekeeper has been assigned that is responsible for the environmental design standards.

Every Bang & Olufsen product has its own product requirement database, which follows the product throughout the development phase where the environmental design standards are specified.

For each product there is a project manager who must accept the specifications, and sign-off that the product will meet the specifications. The product simply cannot progress to the next development stage unless it has accepted the relevant environmental design standards.

At the end of the development phase, the product environmental impact gatekeeper must verify that the specifications laid down in the product database have been met – the product cannot be produced otherwise. The implementation of environmental design standards ensures that our products meet international regulations in those markets where our products are sold. Bang & Olufsen strives to comply with the most stringent regulations. If one particular market tightens a particular regulation, say for chemical compounds, then Bang & Olufsen will strive that product specification is met in every market where the product is sold.

## Energy consumption from products

In environmental terms, the amount of energy used by consumer electronics when they are operated have the greatest impact. Life cycle studies have shown that over 80 % of the total impact on the environment from our products occurs at the customer. For this reason, we have focused for years on minimising product energy consumption, and especially standby consumption. We have focused on standby because many people would consider this wasted energy.

Our efforts have resulted in that all of our products use 1 W or less in standby apart from a few exceptions. This affects the yearly CO<sub>2</sub> emission from product standby in relation to the sales weight area as shown in figure 10.

We use energy-efficient Bang & Olufsen ICEpower amplifiers. An ICEpower amplifier uses only 10 % of the energy used by a standard amplifier. This means that when BeoLab 4000 loudspeakers were updated with ICEpower technology in 2007, energy consumption was reduced by 25 %.

Some of our TVs have several functions, such as the BeoCenter 6 which has a built-in radio. Energy consumption is reduced here, because only a single function is powered up as it is used. If for example, you are using the BeoCenter 6 radio, then only the radio circuitry is powered up and radio channel information is displayed on the information display, and not on the TV screen.

All of our audio and acoustic products have a Power Management function, which means that they will switch automatically to standby if they are have not been used for thirty minutes.

The amount of energy used on standby is negligible compared to energy consumption of the unit when it is switched on. As a manufacturer we have to reduce the amount of energy consumed by our products as much as possible without compromising audio and visual quality. This factor is important when you consider that the unit is switched on say, from two to four hours, every day.

The technological shift from analogue to digital TV means that televisions in the future will have digital receivers. Bang & Olufsen has chosen a solution that does not require an increase in standby power. The digital signal receiver module is an integrated part of the TV. When the TV is set to standby, the receiver module is switched off. Thus the TV's standby power consumption is not increased. Updating and background functions that traditionally run on standby are instead carried out when the TV is switched on. If a background/update function is not complete when the television is switched off, then the module receiver will stay on until the function/update is finished and then switch off automatically.

We also look at ways of reducing energy consumption when the TV is switched on.

We use energy-efficient Bang & Olufsen ICEpower amplifiers. An ICEpower amplifier uses only 10 % of the energy used by a standard amplifier. This means that when BeoLab 4000 loudspeakers were updated with ICEpower technology in 2007, energy consumption was reduced by 25 %.

Some of our TVs have several functions, such as the BeoVision 7-40" which has a built-in blue ray disc. Energy consumption is reduced here, because only a single function is powered up as it is used. If for example, you are using the TV, then only the TV is powered up, and not the blue ray disc. Furthermore BeoVision 7 has a built in surround sound modul which provide the customer with excellent sound.

All of our audio products have a power management function, which means that they and the loudspeakers automatically switch to standby if they are have not been used for thirty minutes.

The amount of energy used in standby is negligible compared to energy consumption of the product when it is switched on. As a manufacturer we have to reduce the power consumption of our products as much as possible without compromising audio and visual quality. This factor is important when you consider that the unit is switched on say, from two to four hours, every day.

The yearly CO<sub>2</sub> emissions from the on-mode energy consumption in a sales weight area are shown in figure 11. There is an increase in CO<sub>2</sub> emission compared to last year. The reason for is a larger sale of TV's with larger screen sizes which have high impact on on-mode consumption.

Figure 10: Yearly CO<sub>2</sub> emission from product standby. The curve shows a sales weight average. Preconditions: standby for 18 hours a day. Conversion factor: 0.4945kg/kWh (www.1tm.dk)

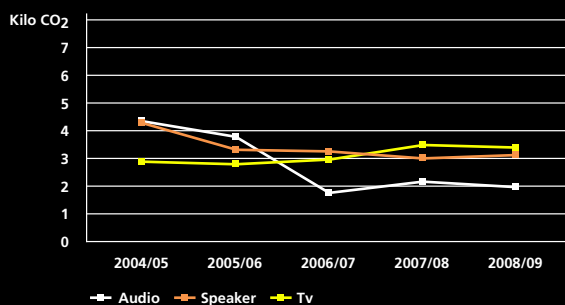


Figure 11: The yearly CO<sub>2</sub> emissions from the on-mode energy consumption in a sales weight average. Preconditions: on for 6 hours a day. Conversion factor: 0.4945kg/kWh (www.1tm.dk)

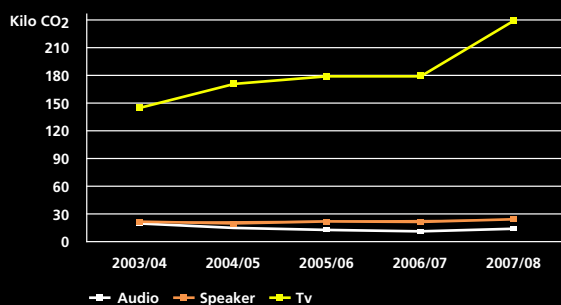
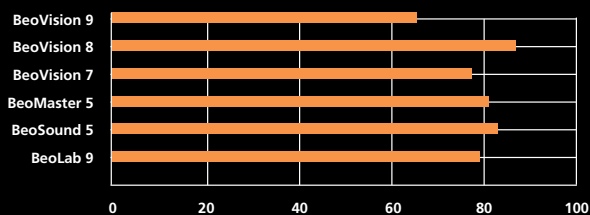


Figure 12: Results of the disassembly tests, percentage recycling



### Product disposal

When handled correctly, electronic waste can become a valuable source of raw materials.

In many parts of the world disused electrical and electronic products have to be collected and recycled at an approved recycler. The products are disassembled into their constituent parts – metal, printed circuit boards, plastic, glass and displays. Often this work is done by hand. Alternatively, a shredder is used and the different metals and plastic parts are automatically sorted and recycled for the manufacture of new raw material. Copper and other metals from PCBs are also recycled. Material that cannot be recycled is sent for incineration where the heat energy can be utilised (recovery), or it is buried in a landfill.

Bang & Olufsen also thinks about disposal when designing new products. Among other measures, we mark up plastic parts so that recyclers can identify the material. We carry out a disassembly test that shows how much of the product that can be recycled. Naturally, if a design improvement is identified during this process, we will use that in future products.

The disassembly tests show that more than 65 % of the materials in our products can be recycled. The EU Waste Electrical and Electronic Equipment (WEEE) Directive, requires that at least 65 % of the material from an electronic consumer product must be recyclable – we meet the requirements of that directive as shown in figure 12.

BeoVision 9 contains wood which cannot be recycled and this is why it is not as recyclable as the other televisions.

### The phasing-out of hazardous chemicals in products

At Bang & Olufsen we endeavour to design environmentally friendly products. This means that we think about the entire life cycle of the product early on in the development phase. This is important because

much of a product's eventual environmental impact is determined here.

Electronic products contain a series of materials that can have a negative impact on the environment if the product is not disposed of in the right way. Therefore, Bang & Olufsen has chosen to phase out a number of materials and replace them with less hazardous materials.

PVC is an example of a substance we have chosen to phase out. If PVC burns or if it is not disposed of properly, it may harm the environment. So back in the nineties we banned the use of PVC plastic in our products and only allowed it to be used in cables.

Phthalates are frequently used in PVC cables to soften the plastic. This does make cables flexible and malleable but there is suspicion that phthalate exposure may be detrimental to health. Therefore Bang & Olufsen has phased out the use of phthalates in all new non-standard cables since the beginning of 2007. Furthermore we are phasing out phthalates from all of our existing PowerLink cables. We expected the phase out to be completed by the end of 2008 but due to less sale the phase out is first to be completed by the end of 2010. The phase out of phthalates in our MasterLink cables has just recently started and is expected to end mid 2010

## Occupational Health and Safety

Bang & Olufsen operates a well-functioning safety organisation consisting of a general safety committee, three factory safety committees and a number of safety groups.

The safety groups have recently extended their responsibility and working areas to include external environment to endeavour the external and working environment certification.

Every year the general safety committee selects special focus areas. As the problems regarding the physical and ergonomic work are minor the focus has changed to softer issues. This year the focus areas are 'getting ready for our external and working environment certificate' and 'motivation'.

### Accidents

Twice a year every safety group makes a safety inspection where the general impact on external environment, safety and working environment in the area is checked.

The safety groups focus on preventing industrial accidents. One of the methods is the registration and analysis of 'nearby accidents' with the purpose of preventing serious accidents.

In the financial year 08/09 we had 8 accidents which resulted in more than one day of absence. It results in an accident frequency of 4 accidents per 1 million working hours. The 8 accidents resulted in 40 days of absence in total.

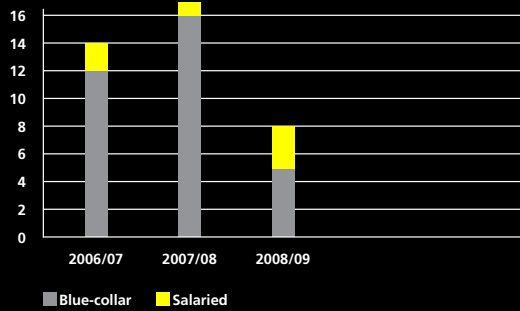
The number of accidents have decreased significant this year – especially the number of accidents reported for our blue-collar people. The accidents reported was only 5 compared to 16 last year – see figure 13.

As a consequence of last years increase in accidents at the blue-collar people initiatives was taken this financial year to reduce the number of accidents e.g. a game called wheel of fortune about accidents. The environmental department made a preventive effort with focus on 'nearby accidents'. The result is clearly visible in the numbers of accidents.

### Policy on Mental Health in the work place

As part of our efforts to continue to be a good, attractive work place for top-class employees it is essential for Bang & Olufsen that staff thrives at the company. Among other that the employees work on exciting, challenging assignments, and that management provides the necessary guidance and support if and when required.

Figure 13: Number of accidents divided into salaried and blue-collar people.



We have therefore drawn up the following document outlining the company's position on how we wish to encourage well-being and prevent and/or handle stress.

- Bang & Olufsen wishes to create and maintain a good, psychosocial work environment in which its employees can thrive.
- Bang & Olufsen will work actively towards strengthening the conditions that promote greater work satisfaction, motivation and commitment among its employees.
- Bang & Olufsen is concerned about stress among staff and take the subject seriously.
- Bang & Olufsen recognizes that there are many factors that can affect the general well-being of its employees, and that both private and personal factors may play a role.

#### Health promotion

Bang & Olufsen has an opinion to health and health promotion. It is important for Bang & Olufsen that every employee feels healthy so they have the mental and physical energy to meet the daily challenges.

Bang & Olufsen's objectives with health promotion are to make the weekday healthier and to motivate our employees to take care of their own health and life style. We believe that good health increases well-being and job satisfaction, increase the efficiency and decrease the absence due to sickness.

Since 2006 we have had a special offer for employees with inconveniences. These people can get a personal health profile. The purpose of the health profile is, through dialog, to clarify the employees' motivation for working with their own health and to contribute to setting concrete and realistic objectives. Furthermore the health profile gives Bang & Olufsen the possibility to implement initiatives according to the employees' wishes and needs. All the participants now have fewer inconveniences and are more motivated to do preventing actions. Both managers and participants evaluate the offer as very positive.

#### First-aid organisation

We have a well-organised first-aid organisation which primary purpose is to give qualified emergency treatment to colleagues. There are first-aid assistants in all factories and on all turns. In addition there is a first-aid room on every factory.

All the first-aid assistants undergo a 30 hours first-aid course and are offered every second year a follow-up course