9.0 Environmental Impact

In principle any industrial activity has an impact on the environment. With the introduction of the EMS, Hako-Werke have committed themselves to conserving resources and by following certain rules and procedures avoid harmful impact on the environment.

9.1 Waste

The waste produced at Hako-Werke, at the site in Oldesloe, is composed of five categories laid down by law.

- Waste for recycling that does not require monitoring
- Waste for recycling that requires monitoring
- Waste for recycling that requires specialised monitoring
- Waste for disposal that requires monitoring
- Waste for disposal that requires specialised monitoring

9.1.1 Waste balance sheet

The waste balance sheet is updated annually by our waste co-ordinator.

9.0 Environmental Impact

9.1.2 Production of waste volume

At the site in Oldesloe products with a total weight of 3149 t were produced during the planning period of 2003. Compared with this the total volume of waste was around 993 t = 31,5% of the total amount produced.
This is an increase of 77 t compared to 2002, but the overall percentage of waste against the total volume produced per year remains stable compared to the previous year.
The main waste components were scrap metal, shredder waste, cardboard, wood, household waste and general outdoor waste. The levels of the different components are listed in the output analysis.

9.1.2.1 Figures of Waste Volume Production

annual % of residual waste in relation to product output

Year	Finished product in t/a	Total waste volume in t/a	Recyclable scrap metal in t/a	Residual waste in t/a	% of residual waste	% of recyclable scrap metal
2000	**2714**	857	451	406	15.0	**16.6**
2001	**2639**	888	427	461	17.5	**16.2**
2002	**2889**	1004	564	440	15.2	**19.5**
2003	**3149**	1081	592	489	15.5	**18.8**
2004	**3764**	1166	654	512	13.6	**17.4**

9.2 Water

The water consumption for 2002 was around 10.000 m³, of which 100% was taken from the public supply as drinking water quality. The usage can be separated into two areas:

- Water for production
- Water for drinking and general usage

The main consumption at Hako-Werke occurs in the pre-treatment zone for the surface treatment plant. Since the installation of a new coating facility in the year 2000 the water consumption together with a increase in production volume was, according to the data index, demonstrably reduced. The dismantling and scrapping of the old powder coating facility and the building of the new coating facility led to a rise in water consumption in the year 2000.

9.2.1 Sewage

The biggest amount of sewage at Hako occurs in the pre-treatment zone of the surface treatment plant, which consists of four baths. By installing a pre-treatment zone that produces less sewage, the amount that is passed into the sewers after neutralisation, is reduced by around 10-15%.

Reason: The pre-treatment zone is arranged as a cascade, that means the water overflow of bath 4 returns to bath 3 and onwards to bath 1. A collecting basin catches the overflow of bath 1. The collected, used water is then led to a vaporizer. The vaporizer separates the used water through vaporisation into usable VE-Water and a concentrate {hazardous waste}. The VE-Water is led via a VE-ring back into bath 4. This closes the water circuit. In order to maintain quality, the contents of bath 1 and 2 are led as sewage after neutralisation into the sewers in a 6/8 weekly cycle and the baths are restarted again.

9.3 Energy

9.3.1 Electricity and Gas

The main energy sources for the site at Bad Oldesloe are gas and electricity. In 2002 6,6 MWH of Gas and 3,3 MWH electricity were used. Our main consumption of gas and electricity occurs in:

- The surface treatment plant, particularly in the sintering furnace, detention water drier and in the pre-treatment zone
- The jet facility, pyrolysis and spray booth
- Compressed air supply
- The machine holding bay during pre-construction, testing and welding

The use of a data index shows that from the year 2000 onwards there has also been a positive development in the consumption of gas and electricity. The main savings in energy are due to the construction of a new surface treatment plant.

9.3.2 Energy for heating

The primary energy source for the three boilers of the central heating system is gas. In case of emergency or during energy peaks in winter it is still possible to change to fuel oil. The boilers date from 1976 to 1980. All Internal radiators have thermostats. It is our aim in the medium term to optimise the efficiency of the boilers by switching to a modern calorific value technology. The thermostats are gradually being upgraded during general maintenance tasks with more modern technology.

9.4 Compressed air network

The station for the compressed air supply was completely renewed in the years 2000 and 2003. As the consumption of compressed air is not measured no data regarding manufactured products per kg can be established. Regular inspections are carried out by the maintenance team in order to discover leakages within the compressed air network. Separate from this the commonly used brass couplers are gradually being replaced by pivot couplers made from steel, because the losses incurred are less. The efficiency of the pivot couplers at the exit areas is higher in comparison to the brass couplers, which makes it possible to decouple the consumer without pressure. With this technology the safety of our workforce, in the area of production, is Improved while the efficiency is higher and the loss of compressed air compared to the previous technology is minimised.

9.5 Lighting

In the administration block and the production areas fluorescent tube technology is mainly used for lighting. In new buildings and during routine maintenance we only use the latest technology with electronic starters {SVSG}.

9.6 Emissions

The major types of emission are Carbon Dioxide (CO2) Carbon Monoxide (CO), Nitrogen Oxide (NOX), dust, soot particles and steam. These originate on site through direct and indirect emissions. Direct emissions can be mainly traced back to pyrolysis, central heating system, powder coating facility, final tests of equipment and the company’s own transport fleet.

9.0 Environmental Impact

9.7 Pyrolysis .....

..... Is used for the thermal cleaning of tools and other devices and requires official approval by law.
The process involves adhering to certain statutory conditions. Every three years the reactor has to undergo an external assessment examining permissable emmissions data.

Emissions through	ME	2000	2001	2002	2003	2004	% change to 2003
Sintering furnace / warm water preparation							
o CO_2	**t**	88	86	84	95	112	**17,89**
die Pyrolysis							
o Dust (0,0020 kg / h)	**kg**	3	3,3	3,7	2,6	2,7	**2,27**
o NO_2 (0,0046 kg / h)	**kg**	7	7,3	8,2	6,1	6,2	**2,27**
o CO (0,0400 kg / h)	**kg**	60	66	74,5	52,8	54,0	**2,27**
Spray booth							
o Paint consumption / A	**kg**	2415	2589	2850	2834	1860	**-34,37**
o 60 % solvent vapour	**kg**	1449	1553	1710	1700	1116	**-34,37**
o VOC-Emissions / h	**kg/h**	0,91	0,97	1,07	1,06	0,7	**-34,37**
Central heating system							
o CO_2	**t**	1550	1436	1418	1610	1493	**-7,27**
o NO X	**kg**	815	754	745	845	784	**-7,22**
Final tests / Diesel							
o CO_2	**t**	27	32	37,4	39,2	47,5	**21,17**