



# First environmental statement 2011 of Tiefdruck Schwann-Bagel GmbH & Co. KG

Location: Grunewaldstraße 59, 41066 Mönchengladbach, Germany

# Contents

- 03** Preface
- 04** Organisation
- 05** Activities, Products
  - 06** Prepress
  - 07** Gravure Printing
  - 09** Technical equipment and installation
- 11** Environmental policy and environment management system
  - 12** Environmental policy
- 13** Environmental protection organisation: management system
  - 13** Continuous improvement
  - 14** Operational organisation
  - 15** Operational control
  - 16** Emergency management
  - 17** Communication
  - 18** Verification of the management system
- 19** Environmental aspects and performance
  - 19** Environmental aspects
  - 21** Description of major environmental aspects
- 24** Environmental performance
- 25** Environmental data 2010
- 29** Environmental objectives
- 30** Environmental programme 2011 – 2013
- 32** Getting involved
- 33** Validation
- 34** Certificate issued by the Chamber of Industry and Commerce

# Preface

## PROXIMITY TO OUR CUSTOMERS INNOVATIVE APPROACH SUSTAINABILITY

This document is the first environmental statement of Tiefdruck Schwann-Bagel GmbH & Co. KG.



Dr. Udo Bogner  
Managing director



Friedrich Scholta  
Managing director



Hans Jürgen Böhm  
Environmental  
Manager

Since 1801, the name of Bagel has been closely related to the development of the printing industry. Over seven generations, the family who owns it has developed the Bagel group from its very first beginnings to the group of successful companies it comprises today.

In 1962 the Mönchengladbach-Neuwerk location was established in line with the latest constructional and technical findings. Then, in 1974, the gravure print shop, Tiefdruck Schwann-Bagel GmbH & Co. KG, abbreviated to TSB, was set up. Today it stands out as one of the most advanced and highest-performing of printing plants in Europe which remain independent of publishing houses. In 1993 we made a commitment to contribute towards the reconstruction of the new Federal Lands of Germany by setting up a reel-fed offset print shop in the Sachsen-Anhalt-Süd industrial park. Since 14 September 2005, this company has operated under the name „Bagel Roto-Offset GmbH & Co. KG“.

The gravure print shop, Bruckmann Tiefdruck GmbH & Co. KG of Oberschleißheim, joined the Group in 1999. All three locations, which are legally independent companies, have decided to implement an environmental management system in line with the Eco Management and Audit Scheme (EMAS). The intention is that economic and ecological factors are addressed together and prepare the ground for further development at all sites in line with our three guiding principles, i.e.,



# Organisation

Tiefdruck Schwann-Bagel GmbH & Co. KG's publication rotogravure print shop is located in the industrial area of Grunewaldstraße 59 at 41066 Mönchengladbach, measuring around 102,000 m<sup>2</sup>. The company has a headcount of 350 people. Each year we use 150,000 tons of paper to produce high circulation promotional literature, magazines and catalogues.

The print shop is conveniently located in direct proximity to the A 44 and A 52 motorways. Public transport stops right in front of the production location gate. Near the site, other industrial business but also residential buildings can be found. The shop is not located in a water reserve area.

The print shop is basically made up of

- prepress (image processing, engraving, electroplating)
- gravure printing area including paper reel supply for 6 printing presses and related equipment (trimming lines, log stackers, palletising equipment)
- technical equipment and installation including supply and disposal of energy and materials

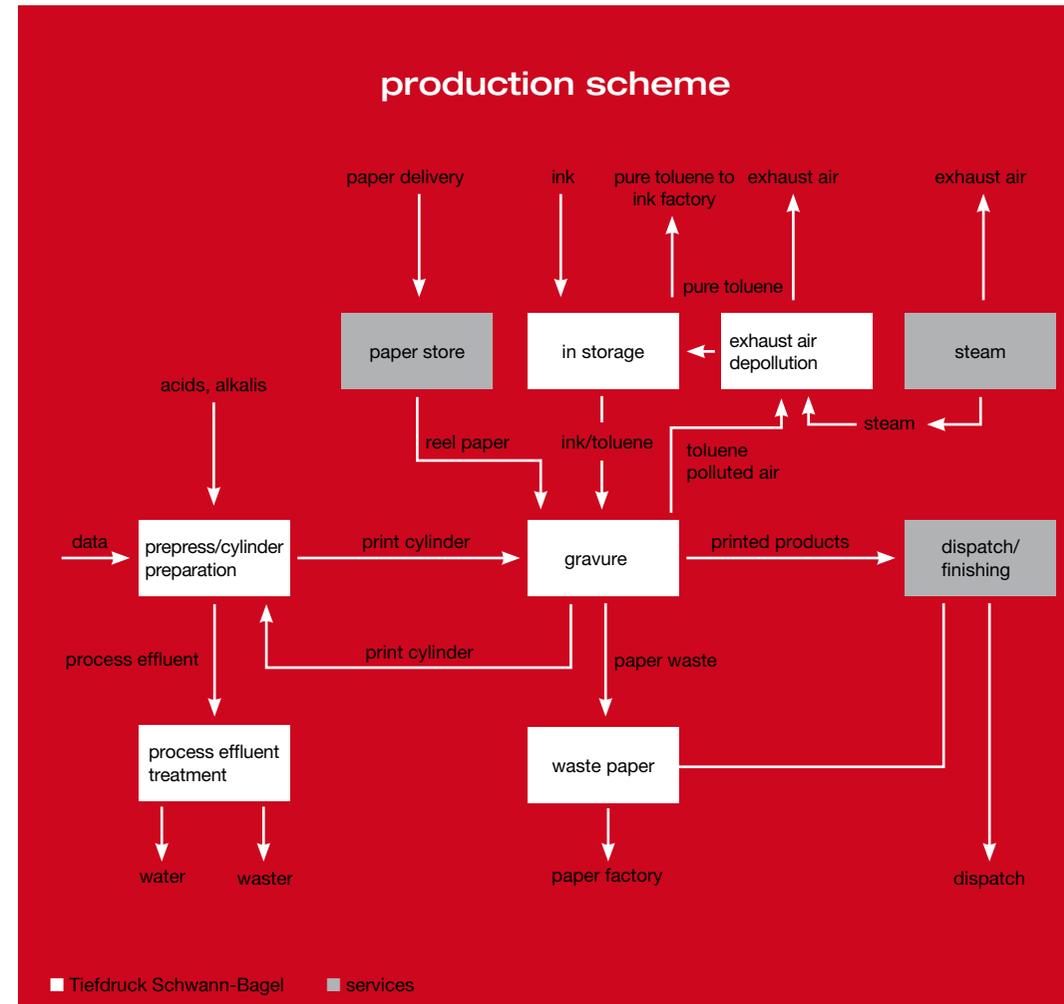
The shop also includes a small administration area. Product processing and dispatch are handled for TSB by qualified service providers.

The equipment must be approved in line with the Federal Immission Control Act. It is described in appendix no. 5.1, column 1 of the 4th Regulation on the Federal Immission Control Act, which covers plants which exceed certain solvent quantities when printing web material. The plant is subject to basic obligations defined in the German Hazardous Incident Ordinance (12th Regulation on the Federal Immission Control Act), as some of the quantity limits are exceeded for chemicals used or stored at that site. The provisions on compliance with emission limit values are based on German TA Luft (technical instructions on air quality control), TA Lärm (technical instructions on noise abatement), as well as the 31st Regulation on the Federal Immission Control Act and the Regulation for indirect dischargers relating to polluted waste water.

# Activities, Products

Tiefdruck Schwann-Bagel GmbH & Co. KG print high-quality, high-circulation catalogues, magazines and promotional literature. The print run per job can vary between 100,000 to several million copies.

The following production scheme serves as an overview. The major units are described below.



# Activities, Products

## Prepress

Electronic printing data is provided by our customers to be processed by us. This data is compiled to build a printing form, engraved into the form and then processed electrolytically in the electroplating shop. The printing form consists of a steel cylinder. Prior to engraving, a thin copper layer is placed onto the cylinder, which is later worked into the print image. Engraving is ensured using advanced electromechanical engraving systems. Up to 14 diamond engravers engrave the print image laterally reversed into the copper layer with 8,000 Hz. For each print job, at least 8 impression cylinders are produced, 2 each for yellow, red, blue and black on the front and reverse side. Each year, some 10,000 cylinders are produced using this process. The systems used ensure stable process management as well as high cylinder reproducibility.

Following engraving, the impression cylinder is chrome-plated and polished. The hard chromium layer helps protect the cylinder from wear when the steel doctor blades remove the excess ink in the gravure printing press. Polishing is required to ensure a defined surface roughness. Then the cylinder is processed to the printing press.

After printout, the cylinder comes back, the copper layer and the chromium layer are mechanically removed and processed to metal recycling. Then the cylinder receives a new „Ballard“ copper film so as to be ready to be prepared with the next print image.

### The environmental and security aspects of the prepress stage include the following

- secure operation of electroplating equipment
- economical use and safe handling of chemicals
- handling of polluted waste water and hazardous waste from the electroplating process
- proper maintenance and repair of all equipment, including related safety equipment, e.g., monitoring or catch trays
- regular inspection of exhaust air and effluent cleaning equipment to make sure any environmental impact resulting from exhaust air or flushing water from galvanic baths is minimised



# Activities, Products

## Gravure Printing

After installing the forme cylinder into the printing press, printing can start at a speed of approx. 15 m/s. The paper is fed to the machine on reels and then clamped into reel carriers. Then it runs through the printing press with 8 individual printing units. First, the funda-



mental colours are printed on the front side of the paper in the order YELLOW, MAGENTA, CYAN and BLACK so that four-colour picture information is produced. Then the reverse paper side is printed in the same order. For the printing process itself, i.e., ink transfer onto the paper, first the ink is transferred from the ink trough onto the engraved printing cylinder using an inking roller. Any excess ink is removed across the cylinder width using a thin doctor blade so that the ink just remains in the engraved recesses of the cylinder. The paper is now pressed by an impression roller onto the impression cylinder. The impression roller is made of a flexible material, usually rubber. This ensures that the ink is transferred onto the paper.

After printing, the paper is guided through heated drying chambers so that the damp ink is fixed.

The solvent contained in the ink thereby evaporates. It is sucked off and recycled using the exhaust air cleaning equipment. The paper web, which is up to 3.68 m in width, is cut into strands after the last printing cycle and combined to form a ribbon which runs through the folder unit, where it is trimmed to length, folded and sometimes stapled or glued.

Inline finished products are trimmed on three sides, stacked, placed on pallets and collected by the dispatch division. Trimming must be limited as much as possible so as to avoid unnecessary waste. There-

# Activities, Products

## Gravure Printing

fore paper reels are ordered in a width that exactly matches the product to be printed.

Partial products are positioned in stacks and placed on pallets to be transported to other companies for further processing. Inline finished products are placed using stackers to form full bundles, then palletised and dispatched. Dispatch does not form part of TSB's scope of activities.



### The environmental and security aspects of the printing stage include the following

- safe handling of equipment and materials
- efficient energy use
- efficient use of paper and ink as well as the minimization of spoilage
- regular in-house and external checking and maintenance of machines to ensure the functionality of safety equipment
- due to the solvent-containing ink, fire precautions are important

The gravure printing ink used mainly consists of toluene, resin and pigments. The toluene content at the time of delivery makes up between 40% and 60%. During printing, it is increased to approx. 70% to 80%. The solvent is expelled and recycled during the printing process. The total solvent loss is below 5%. The recycled solvent is blended into the ink and excess quantities are given back to the ink manufacturers.

# Activities, Products

## Technical equipment and installation

The technical equipment and installation division covers workshops, operations supply (steam, compressed air, electrical power, water), effluent and exhaust air cleaning as well as the disposal of any waste and dispatch of hazardous goods, mostly returns of toluene to ink manufacturers.

In addition, this division is responsible for the maintenance and repair of all production plants, vehicles or other equipment. In addition,

they ensure that equipment is monitored and tested in line with the applicable regulations.

Energy, auxiliary energy and consumables to operate all the production plants are provided, including steam, electrical power, water, compressed air, ink, fresh air, exhaust air etc.

The related equipment includes autoclaves with connected deionisation system for water dehardening, adsorbers for toluene recycling (exhaust air cleaning), effluent treatment, ink/toluene store including tanking and evacuation equipment, as well as fresh air and exhaust air plants.

Toluene recycling, effluent treatment and the autoclave system are important not only from a production perspective, but also with a view to their emissions and limiting them.

In the exhaust air cleaning system, the solvent-polluted air from the printing unit is sucked off and cleaned using activated carbon adsorbers. Once the activated carbon has taken up a defined toluene quantity, the exhaust air is led to another adsorber. The activated carbon of the full adsorber is cleaned using steam. The toluene water mixture thereby produced is cooled down in a closed system so that the toluene, due to its limited water solubility, separates from the water. After that, the two resulting phases are separated. The water runs



# Activities, Products

## Technical equipment and installation

over a so-called stripper, where any toluene residues are removed from the water and fed back to the exhaust air cleaning system.

In the effluent treatment plant, the effluent produced in electrolytic surface treatment is captured and cleaned. For this purpose, the effluent runs through various treatment stages. Any metal or metal compounds (chromium and copper) that it contains are reduced or precipitated and the pH value of the effluent must be in line with our indirect discharger approval. Only after that and after checking the effluent for various parameters can the effluent be processed into the canalisation to be fed into the public water treatment system. In this context, „indirect“ means that the effluent is not poured directly into the water.

With our 2 autoclaves, we can produce steam to be used to operate the toluene recycling plant. The combustion of heating oil causes emissions to be produced. The autoclaves are used in the event of a failure of the equipment described below. Together they perform at around 14 MW. As the autoclaves are virtually only used when the steam supply fails, they are not operated with natural gas but with heating oil.

Steam is sourced from an external supplier. This supplier operates at our location an advanced firing plant fuelled by lignite dust. The plant was set up in 2009 and has an output of 16 MW.

The focal points are the control and monitoring function, as well as operation, troubleshooting, checking, maintenance, repair, sampling and sample analysis. This is where it is documented that the approved limit values are complied with. The department's tasks include the practical handling of waste disposal as well as verification of proper disposal.

### **In the technical equipment and installation department, environment and security aspects include**

- equipment security, which is of major importance in technical equipment and installation
- ensuring that the plant's approved emission limit values for toluene recovery and noise emissions are met
- cleaning of effluents from electroplating as well as checking that the limit values for batchwise effluent discharge are complied with
- ink and toluene storage including inspections and measurements
- efficient use of different types of energy and substances
- the technical equipment and installation department has the highest share of safe, legal and energy-efficient plant operations.

# Environmental policy and environment management system

We are aware of our responsibility towards our employees, customers, contract partners, the local community and the environment. In the light of our equipment and our resource consumption, we are particularly committed to making every effort to ensure that our company runs safely and uses resources sparingly.

Our environmental policy, as well as a management system designed to respond to these challenges help us reach our goals. Our corporate policy has been implemented at the top level of management.



# Environmental policy and environment management system

## Environmental policy

- We are fully committed to the protection of our employees and of the environment because of our sense of responsibility. We promote awareness of health, safety and environmental matters at all levels of our company.
- Our corporate policy is based on sustainability objectives wherever this is feasible and economically reasonable. To us, sustainability means meeting general economic, ecological and social standards.
- We are committed to making our production safer, more environmentally compatible and more efficient. When new processes, activities or products are to be implemented, we always analyse, assess and evaluate their impact on the environment beforehand.
- We encourage our suppliers and customers to introduce environmental and occupational health and safety management systems. We very much welcome these objectives being given high priority. We ensure that third parties working on our premises comply with our environmental protection and occupational health and safety standards.
- We are committed to meeting all the legal norms and we cooperate with the competent authorities.

- We take measures to avoid causing an impact on health or the environment at our location or in the local area and we agree these measures with the competent authorities. In doing so, we place particular importance on equipment safety so as to minimise potential risks.

### **This leads to the following activities (among others):**

- we continuously improve our environmental protection measures, which go beyond meeting the legal environmental standards
- our staff is actively involved in our environmental protection measures
- we are committed to saving resources
- we are committed to avoiding emissions and reducing waste as far as possible
- we handle hazardous materials with care
- we are committed to avoiding environmental impacts
- our suppliers and contract partners are involved in our activities
- we maintain cooperative relationships with the authorities
- we are committed to checking and assessing our environmental impact on a regular basis.

---

# Environmental protection organisation: management system

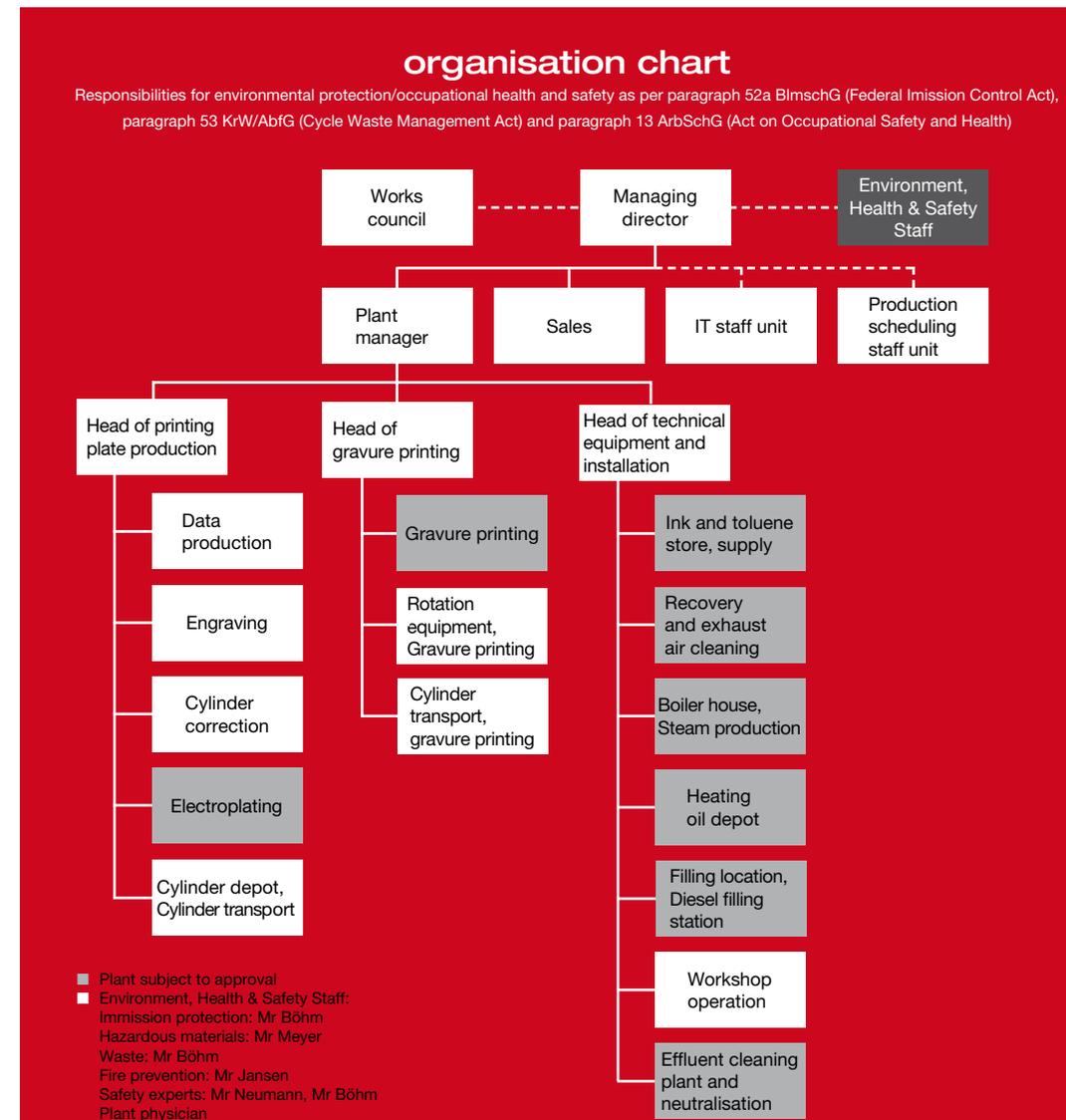
## Continuous improvement

The management system is designed to ensure the continuous improvement of our company's environmental compatibility. A range of tools are used for this purpose, including operational organisation, process organisation, communication, control loops for monitoring and correction in the event of deviations from specifications.

# Environmental protection organisation: management system

## Operational organisation

The operational organisation can be illustrated using a chart in which the accountability and responsibility for plants are defined. The technical management team is responsible for the environmental management system and the environment staff takes care of maintaining the management system. His/her reports and the environment and occupational health and safety staff support these activities.



---

# Environmental protection organisation: management system

## Operational control

The required controls are defined in the environmental management manual. Based on process and environmental instructions, processes are described relating to such matters as waste, hazardous goods, hazardous materials, emergency management or handling substances which are hazardous to water. The emergency plans cover dealing with accidents, failures or incidents which may impact the environment. The instruction contents must be checked and adjusted on a regular basis or in the event of any operational changes.

# Environmental protection organisation: management system

## Emergency management

Due to the chromium acid used in electroplating, our operations are subject to the basic provisions of the Hazardous Incident Ordinance and must implement suitable measures to ensure safety and to protect staff, the local community and the environment.

So far no failures as contemplated in the accident decree have occurred. We want this situation to continue and, in the event of an accident, we want to make sure that action is taken quickly. We therefore have contingency plans which have been agreed with the authorities.

In areas where easily flammable liquids are used, explosion protection measures have been taken and mobile and/or stationary fire extinguishers and CO<sub>2</sub> extinguishing systems are available. We have a training schedule which ensures that employees are regularly instructed on handling fire extinguishers.

Our store for highly flammable liquids or ink are sensitive areas where no employee works on a permanent basis. Gas sensors ensure continuous monitoring. Depending on the identified concentration, they trigger alarms early on or switch off the plant if solvent escapes. Furthermore, the tanks have double walls and leakage monitoring equipment is positioned in catch trays so that no substances can penetrate into the ground or the ground water. The area is monitored using automatic fire detectors which are connected to an automatic alarm system and trigger the installed CO<sub>2</sub> extinguishing equipment.

The alarm informs both our staff and the fire brigade, which can usually be on site within less than 8 minutes. The reception of the fire brigade and transfer to the location of the fire is organized. To date, the stationary CO<sub>2</sub> extinguishing system has not yet been triggered. We are currently working with our supervision authority and an external expert to prepare a risk analysis aimed at identifying and eliminating potential safety loopholes. In this area, all reasonable measures have been implemented to ensure plant safety. To us, plant safety has the top priority. In addition to the measures already mentioned for protecting people and the environment, production availability is of major importance to us and our customers.

We are not aware of any situation resulting in site pollution due to material escaping into the soil or water at this location.

# Environmental protection organisation: management system

## Communication

In order to be able to sustainably anchor our regulations in our plant and to ensure employee awareness, these regulations are communicated in various ways. For internal communication, regular instruction notices, bulletins, our environmental statement, the internet and intranet are used. The works council supports our management system and is actively involved through the plant manager as well as the committees for environment and health and safety at work. All managers, the works council and employees are encouraged to suggest ideas and improvements. We are aware that there is still a long way to go and that there is potential for further improvement.

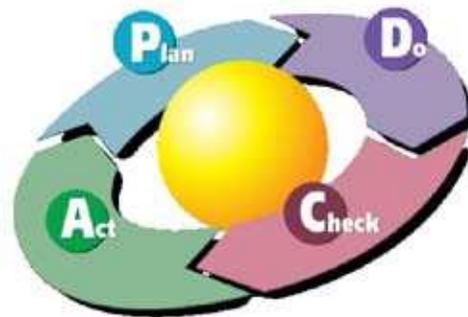
For external communications, we use our internet platform, our environmental statement, written communications with our customers and suppliers and our local community. In addition, we maintain relationships with the authorities and employer's liability insurance. Furthermore we are active members of the German Printing and Media Industries Federation and use this membership to stay informed about news in the field of environment protection as well as health and safety at work.

# Environmental protection organisation: management system

## Verification of the management system

To make sure that the regulations described are complied with and implemented, annual audits of the management system and company are undertaken. This includes compliance with statutory provisions and requirements based on EMAS. The management system is evaluated based on compiled KPIs, a comparison of their development over time and the derived environmental aspects. The audit results, as well as details of KPI development are provided to the plant management team to form the basis for further improvements in management as well as system verification by the plant management team.

The system follows the PDCA cycle (i.e., plan, do, check, act)  
„Diagram by Karn G. Bulsuk (<http://www.bulsuk.com>)“



# Environmental aspects and performance

## Environmental aspects

The environmental aspects of the company are considered and evaluated holistically. The objective of the management system is, among other things, to limit the environmental impact of our activities to a minimum. The objectives developed and included in our environment programme should therefore always consider those topics which, based on our evaluation, have a relevant impact on the environment. „Relevant impact“ and „high relevance for the environment“ are very elastic concepts which can be interpreted differently. For instance, „relevance for the environment“ includes both a global and a local perspective.

To evaluate our relevant environmental aspects, we therefore use a system which enables environmental relevance and improvement potential to be easily demonstrated. It is based on quantities, consideration for environmental aspects and their evaluation criteria as well as a related evaluation scheme. Potential improvement approaches and feasibility studies are also taken into consideration. The process is in line with the so-called „BUWAL“ (Federal Office of the Environment, Forestry and Landscape) approach and is based on environmental KPIs from 2010.

Other environmental aspects to evaluate may result from discussions with customers, the local community, the authorities, our employees and the management team.

We evaluate these aspects in order to find out the potential for improving our environmental performance or limiting our environmental impact, sometimes even by simple measures. We are committed to identifying objectives and developing activities for our environmental programme for the areas shown in the following table, which have medium to high environmental relevance and feature medium to high feasibility.

When it comes to indirect environmental aspects, our influence is limited. We have identified important aspects and we intend to protect the environment beyond the limits of our premises and to this end we intend to work in close cooperation with our major suppliers. The objective is to improve environmental performance throughout our production chain. For this purpose, we are active on the appropriate committee of the German Printing and Media Industries Federation, and we support the principles identified by the Federation.

# Environmental aspects and performance

## Environmental aspects

Environmental relevance	high	Equipment to handle substances hazardous to water (substances incompatible with water, pollutant accumulation in the soil)  Land occupancy (sealed ground)	Supplier evaluation, share of suppliers with environmental management system (purchasing, suppliers)  Fire protection measures (environmental risk due to fire)  Resource efficiency (ink, colour)	CO <sub>2</sub> , NOx (Pollutant emissions due to energy consumption, climate change)  Copper (pollution of effluent water, pollutant accumulation in the water)
	medium	Water consumption (water)	Solvent emissions (other pollutant emissions into the air)  Resource efficiency (others)	Local community (noise emissions)  Training of staff, awareness raising amongst staff
	low	Pollutant emissions due to traffic  Solvent smells (odor emissions)  Waste disposal (except for paper waste)		
	low		medium	high
<b>IMPACT/improvement potential</b>				

The table gives an overview of the environmental aspects identified so far and how we have graded their relevance. The environmental aspects identified are revised and adjusted as necessary on a regular basis.

# Environmental aspects and performance

## Description of major environmental aspects

The top line of the table shows the environmental aspects which we have evaluated to be important.

### Equipment to deal with substances hazardous to water

We work with large quantities of substances hazardous to water, i.e., ink or chemicals used for the electroplating stage. These substances bear a potential risk to soil and water. However we have already implemented a number of measures in this area so that we feel there is only limited potential for further improvements.

### Land occupancy/sealed natural ground

This also holds true for sealed natural ground, i.e., the relationship between the built-up area and the non-built-up area. Our premises are limited, and due to strong growth over the past few years, the share of undeveloped land had to be reduced. The built-up area (sealed natural ground) in the industrial area amounts to about 82 %.

### Supplier evaluation

To us, our suppliers are another major environmental aspect, as they provide us with all our raw materials. In this area, we see the possibility of working together with our suppliers to improve environmental protection and sustainability so as to achieve lasting improvements. As a first step, we ask our suppliers to share their opinions so we can build them into our regulations, which are then communicated to our suppliers.

### Resources

In print shops, power, paper and ink always play an important role and are therefore always a major ecological aspect due to their high consumption and the resulting emissions and in economic terms due to their high cost. As is often the case, working ecologically is equivalent to working economically.

For exhaust air cleaning, steam is required which we receive from a lignite dust-firing plant or produce ourselves in autoclaves if supply fails. The share of used energy and the toluene thereby recycled is subject to regular checks so as to ensure that a higher level of consumption does not go unnoticed over a longer period of time. Currently we investigate the possibilities of achieving energy savings through more efficient plant management. Printing presses and electroplating equipment consume a great deal of electrical power. For printing presses, we see the potential for savings in energy and electricity and they form part of the current environment programme as a project.

In order to boost conservation and the efficient use of resources, data is collected on a regular basis and compared over time. That way, deviations can be identified quickly and corrective action can be taken early on. Benchmarking with competitors helps us to determine our position.

# Environmental aspects and performance

## Description of major environmental aspects

### Fire protection measures

Resources such as paper and ink at our location always represent a high fire risk, which from our perspective has high environmental relevance. In this area, we see some potential for improvement and we are committed to implementing measures aiming at reducing the risk of fire and its potential impact. In this context, we will be conducting training courses.

### Emissions

The use of solvent-containing ink produces emissions which also represent a relevant environmental aspect. Total emissions and solvent losses respectively are less than 5 % of the toluene used, i.e., over 95 % are recycled back into the ink or given back to our suppliers. Thus we are easily surpassing the provisions regarding emissions of the 31st Regulation on the Federal Immission Control Act applicable to our company, i.e., 10 % of the solvents used. The exhaust air limit for that location was defined to be 20 mg/m<sup>3</sup> and our operations fall below that value.

Concerning noise emissions, the approved limit values are complied with. In our mixed area, noise immission guide values vary depending on the point of measurement. The lowest values are defined for areas with residential buildings nearby, i.e., 55 dB (A) during the day and 40 dB (A) at night. The measured value at all the points of measurement defined by the authorities is more than 6 dB (A) below the immission

guide value. Despite compliance, there have been complaints from our neighbours concerning noise disturbance. We have investigated these and have implemented various noise protection measures.

Emissions due to steam generation are under the supplier's control. We work closely with our supplier and on request receive information about emissions produced. The emissions from our own autoclaves can be ignored, as these are operated just a few hours per year.

With regard to transport, we are currently unable to identify any alternative to receiving deliveries by truck as there is no railway or waterway connection.

# Environmental aspects and performance

## Description of major environmental aspects

### Effluent

Processes in electroplating produce effluent which, among other things, contains copper, which has to be largely removed in the effluent treatment plant. Early in 2011 we worked on the process so as to ensure that our effluent emissions remain positively below the approved values, and the chemicals used to reduce the copper portion were considerably reduced. The following table gives an overview of the results of external measurements.

Results of effluent analyses 3rd quarter 2011							
Parameter	Temp. in °C	pH value	BTX in µg/l	Chrome/ chromium-VI in mg/l	Nickel in mg/l	Zinc in mg/l	Cooper in mg/l
Limit values	35	6.5 - 10	5000	0.5/0.1	0.5	2	0.5
July	20.2	7.9	290	< 0.05	0.05	< 0.05	< 0.05
August	19.9	7.4	1	< 0.05	0.05	< 0.05	< 0.05
September	22.1	7.3	100	0.06	0.03	< 0.05	< 0.05

### Qualifications

The qualifications and expertise of our staff ensure that our operations take place safely and in a way which is compatible with the environment. We are constantly working to raise awareness and enhance knowledge. For this purpose, we have developed a training schedule, defining who must provide/attend what training course.

### Statutory provisions

Compliance with statutory provisions forms the basis for reducing environmental impacts. For this purpose, a legal register was set up and considered in terms of compliance with statutory requirements. We continuously track any amendments to provisions in a variety of ways, for instance a revision service notifies us of any revised provisions and we also receive information from trade magazines, associations and the authorities. Our goal is to always comply with new requirements in good time. In addition, we provide regular legal training for our environmental staff and have our in-house database to monitor audit obligations and these measures also help us meet the statutory provisions.

On this basis, we try to continuously improve our environmental performance.

# Environmental aspects and performance

## Environmental performance

Over the years, we have constantly implemented new measures to enhance our environmental performance. Some examples include:

### Heat recovery

Waste process heat is recovered from the exhaust air system using heat exchangers and supplied either to the heating system or used to heat the boiler feed water. Exhaust air from the air compressor station is also used to heat the paper store.

### Use of reduced solvent ink

So-called reduced solvent ink is not ink with a reduced share of solvent, but instead is an ink made using a recipe that ensures that the residual solvent content in the product is minimised. We only use this kind of ink.

### Use of less hazardous chemicals

The solid chromium trioxide which used to be used is not applied any more today. It has been replaced by a readily mixed chromium acid so that virtually no manual handling of this hazardous material is required. However the gravure printing industry has no substitute at present for this material.

### Use of rainwater

We collect rainwater from the roofs in large cisterns to use as feed water for the cooling equipment (cooling tower feed water).

In order to show our environmental performance, we have compiled the most important corporate data in the following overview. The data available from the previous year was insufficient and the effort involved in collecting it at this stage would have been unreasonable. From this point onwards, the data will continued to be compiled and compared in the environmental statements for years to come.

Data is gathered on an annual basis and is used for our evaluation with a view to reducing our environmental impact and making more efficient our use of raw materials.

The indicated values are absolute values. The core indicators are relative values related to the product output.

# Environmental aspects and performance

## Environmental data 2010

### Facts and figures

	2010	Unit
<b>Paper and ink</b>		
Paper used	151490	tons
Ink used, including additives	6541	tons
	thereof toluene solvent	3554 tons
Total toluene input, calculated as per 31st Regulation of the Federal Immission Control Act	11570	tons
<b>Total product output</b>	<b>143951</b>	<b>tons</b>
Material efficiency, input/output (paper + ink input/product output)	1.10	tons/tons

<b>Energy consumption</b>		
Electrical power	43373	MWh
Heating oil	776	MWh
Purchased steam from lignite dust firing plant	56403	MWh
Resulting CO <sub>2</sub> emissions (supplier data, corresponds to 387 g/kWh)	21804	tons
<b>Total energy consumption</b>	<b>100552</b>	<b>MWh</b>
	thereof renewables	7807 MWh
Specific total energy consumption (quantity/product output)	0.699	MWh/t
	Specific consumption of renewable energy (quantity/product output)	0.054 MWh/t

# Environmental aspects and performance

## Environmental data 2010

### Facts and figures

	2010	Unit	
<b>Water balance</b>			
Total water (town water, rain water)	98506	cbm	
Specific water consumption (quantity/product output)	0.684	cbm/tons	
Total waste water	54484	cbm	
	thereof sanitary waste water management	264	cbm
	thereof neutralisation waste water (electroplating)	4547	cbm
Evaporation	44022	cbm	

<b>Greenhouse gas emissions (CO<sub>2</sub> equivalent)</b>		
Emissions (heating oil, steam, coolant)	24504	tons
Specific total greenhouse gas emissions (total greenhouse gas/total product output)	0.17	tons/tons

(Coolant emissions 2010 = 0 kg (no leaks, no refills))

# Environmental aspects and performance

## Environmental data 2010

### Facts and figures

	2010	Einheit
<b>Pollutant emissions (steam, heating oil)</b>		
Sulphur dioxide	8.56	tons
Specific total SO <sub>2</sub> emission (quantity/product output)	0.06	kg/tons
Nitric oxides	15.74	tons
Specific total NO <sub>x</sub> emission (quantity/product output)	0.11	kg/tons
Dust	1.18	tons
Specific total PM emission (quantity/product output)	0.01	kg/tons
Toluene	505	tons
Total toluene emission (quantity/product output)	3.77	kg/tons

<b>Waste</b>		
<b>Total waste</b>	<b>11045</b>	<b>tons</b>
Specific waste sum (total waste/total product output)	0.11	tons/tons
<b>Waste by disposal method</b>		
Waste recycling	10875	tons
Waste disposal	170	tons
<b>Waste type</b>		
Non-hazardous waste (without paper)	362	tons
Specific non-hazardous waste (quantity/total product output)	2.51	kg/tons
Hazardous waste	157	tons
Specific hazardous waste (quantity/total product output)	1.09	kg/tons

# Environmental aspects and performance

## Environmental data 2010

### Facts and figures

	2010	Einheit
<b>Major waste fraction</b>		
Waste paper	10526	tons
Specific waste paper (quantity/total product output)	0.07	tons/tons
Municipal waste	139	tons
Specific municipal waste (quantity/total product output)	0.97	kg/tons
Sludge from effluent treatment	33	tons
Specific waste, wood packaging material (quantity/total product output)	0.23	kg/tons

### Biologic diversity

Land	102327	m <sup>2</sup>
Sealed with buildings and factory access roads	83677	m <sup>2</sup>
Specific sealed land (sealed land/total product output)	0,58	m <sup>2</sup> /tons

Conversion factors based on GEMIS 4.2

---

# Environmental aspects and performance

## Environmental objectives

Our environmental objectives are developed based on a range of approaches. Firstly, the relevant environmental aspects previously mentioned define the direction of environmental objectives and implementation measures to be developed. In doing so, we are committed to always incorporating at least one goal into our environment programme which has high environmental relevance or potential impact. On the other hand, our environmental policy allows us to derive other objectives which then need to be mapped in our environmental programme.

# Environmental aspects and performance

## Environmental programme 2011 – 2013

Activity fields	Objective	Quantification	Measures, programme	Deadline
Supplier handling	Identification of the status of supplier commitment concerning environmental management	–	Survey and data collection amongst suppliers (→ environmental protection, health and safety at work, GEP)	2012-02-01
Resource efficiency	Reduction of compressed air loss, reference periods 2011 vs. 2012	Halving of loss rate	Extended controls, minimisation due to attention (BT), elimination of leakage	2013-02-01
Resource efficiency	Reduction of energy consumption per dryer. Comparison of half year before and after implementation	- 30 %	Analysis of project dryer efficiency (BT, USAS)	2012-05-01
Resource efficiency, waste minimising	Elimination of resource consumption conc. filter mats and the resulting waste for printing units which can be retrofitted	- 100 % / realised printing unit	Functional test on a printing unit, replacement of disposable filters with durable filters (TD)	2012-02-01
Resource efficiency, waste minimising	Reduction of spoilage in the reference period 01.01 – 31.07.2011 vs. 01.08. – 31.12.2011	- 0.5 percentage points	Paper project (processes, handling, controls) (TD)	2012-02-01

# Environmental aspects and performance

## Environmental programme 2011 – 2013

Activity fields	Objective	Quantification	Measures, programme	Deadline
Resource efficiency, waste minimising	Extension of the service life of copper electrolyte bath. Reference period January 2011 – July 2011 vs. same period after implementation	- 75 % used electrolyte	Project planning for electroplating plant, copper reduction (HDP)	2012-07-01
Resource efficiency, waste minimizing	Additional spoilage reduction envisaged for 2012 vs. 2011	Reduction of spoilage vs. 2011	Other paper projects, feasibility checks for steering, controls (TD)	2013-02-01
Training, qualification, raising of awareness	Enhancement of health and safety at work at all levels	–	Training/instruction as per training plan (environmental protection, health and safety at work)	2013-01-01
Plant safety	Reduction of fire and environmental risk in gravure printing	–	Process to identify and track failures. Extension of fire alarms (USAS/TD)	2011-12-31
Environmental safety	Management support in dealing with environmental protection		Naming and training of "local environmental staff", comparable to the safety staff (all divisions)	2012-04-01

The staff responsible for implementing these items have been defined, and the required budget is available. The environmental programme is a regular item on the agenda of our environment/employee committee meetings. At these meetings, an update on the current status is provided and new issues are discussed. Each year, the implementation quota is evaluated and an explanation is provided for any projects which have not been implemented.

# Getting involved

Do you have any questions concerning environmental protection at TSB?

Do you need a printed copy of the statement?

Would you like to learn more about TSB?

Would you like to learn more about Bagel Group?

Would you like to learn more about the printing industry?

Would you want to learn more about professional training in printing and media?

We are happy to talk to you. Please contact:  
Hans Jürgen Böhm, Environmental Manager,  
[hans-juergen.boehm@tsb.de](mailto:hans-juergen.boehm@tsb.de)

Information about Tiefdruck Schwann-Bagel is available on the internet at [www.tsb.de](http://www.tsb.de)

Information about the company is available on the internet at [www.bagel.de](http://www.bagel.de)

Information about the printing industry and environmental protection in the printing industry, as well as professional training is available from the German Printing and Media Industries Federation at [www.bvdm-online.de](http://www.bvdm-online.de)  
[www.medientechnologe.org](http://www.medientechnologe.org)

# Validation

## STATEMENT BY THE ENVIRONMENTAL VERIFIER ON ASSESSMENT AND VALIDATION ACTIVITIES

I, the undersigned, Dr. Andreas Riss, EMAS environmental verifier, registered under the number DE-V-0115, accredited or approved for the area (NACE Code) 18.1, confirm that I have assessed whether the site as stated in the environmental statement of Tiefdruck Schwann-Bagel GmbH & Co. KG complies with all the requirements of Regulation (EC) no. 1221/2009 of the European Parliament and Council dated 25 November 2009 regarding the voluntary participation by organisations in a Community eco-management and audit scheme.

### In signing this statement, I declare that

- the assessment and validation fully comply with the requirements of Regulation (EC) no. 1221/2009
- the results of the assessment and validation confirm that there is no evidence for non-compliance with the applicable environmental regulations
- the data and information contained in the environmental statement 2010 for the location is a reliable, plausible and true picture of all the activities at the location within the area defined in the environmental statement

This statement is not equivalent to an EMAS registration. EMAS registration may only be issued by a competent office as per Regulation (EC) no. 1221/2009. This statement must not be used as the independent basis for public information.

The environmental statement has been verified and declared valid.

Dr. Andreas Riss  
Environmental verifier

# Certificate issued by the Chamber of Industry and Commerce

NIEDERRHEINISCHE INDUSTRIE- UND HANDELSKAMMER  
DUISBURG WESEL KLEVE ZU DUISBURG  
ALS GEMEINSAME REGISTERFÜHRENDE STELLE VON INDUSTRIE- UND HANDELSKAMMERN  
IN NÖRDRHEIN-WESTFALEN NACH UMWELTAUDITGESETZ  
- REGISTERUNGSTELLE -

## Certificate of Registration



**EMAS**  
VERIFIED  
ENVIRONMENTAL  
MANAGEMENT

The Company  
Tieldruck Schwann-Bagel GmbH & Co. KG

Site  
Grunewaldstraße 59  
41066 Mönchengladbach

Registration-No.: DE-137-00034

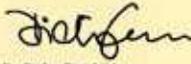
Date of first registration  
23<sup>rd</sup> December 2011

This certificate is valid until  
26<sup>th</sup> November 2014

This organisation has established an environmental management system according to EU-Regulation Nr. 1221/2009 and EN ISO 14001:2009 section 4 to promote the continual improvement of environmental performance, publishes an environmental statement, has the environmental management system verified and the environmental statement validated by a verifier, is registered under EMAS and therefore is entitled to use the EMAS-Logo.



Duisburg, 23<sup>rd</sup> December 2011



Dr. Stefan Dietzfelbinger  
General Manager



