



**TÖPFER**  
KULMBACH

# ENVIRONMENTAL DECLARATION 2018



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## Publication dates of the environmental declaration

This environmental declaration with adjustment according to the requirements of the EMAS novation 2017 was passed by the management in August 2018 and subsequently submitted to the EMAS environmental expert for inspection.

Every year, Töpfer Kulmbach GmbH publishes a simplified environmental declaration that is reviewed by the environmental expert and declared valid. Contents of this simplified environmental declaration essentially contain the updated environmental indices and the progress when implementing the environmental targets set.

The next consolidated environmental declaration will be published in 2021.

**This environmental declaration contains the indices for the environmental performance of the reporting year of 2017.**

**Note:** For reasons of better legibility of the environmental declaration, the text uses the male form and does not use several linguistic forms in parallel. All person designations shall apply to all genders equally.

## Preface

Dear Readers,

This environmental declaration informs you in detail about the environmental results of Töpfer Kulmbach GmbH in 2017. Since our initial EMAS certification three years ago, we have been using this method to make the main causes of emissions throughout the value-added chain of our products transparent - thus identifying potentials for continuous improvement. Regular analysis of the environmental data shows repeatedly that looking through the magnifying glass pays off. Our principle is acting in a manner that is ecologically sensible and economically responsible.

The EMAS management and audit system enables us to consistently implement our sustainability philosophy and to practice it in our daily work. This way, it strongly contributes to the growing trust of our customers in our company and our products.

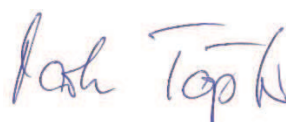
We have striven all the more to ensure that our products will permit careful use of resources throughout their service lives. This way, for example, we ensure that the time to remove our labels in our customers' bottle cleaning machines requires as little energy as possible, while no harmful substances enter the cleaning lyes. We ensure this especially by

consistent quality review, development and inspection of new printing substrates, inks and production methods.

Responsible use of our environment used to and will continue to be a supporting pillar for our action. With the EMAS certification, we face this increasingly important challenge and have this confirmed by an external independent inspection.



Rainer Töpfer  
Managing shareholder  
Spokesman for the management



Mark Töpfer  
Managing shareholder  
Technical management

## Company portrait of Töpfer Kulmbach GmbH

With almost a century of experience, Töpfer Kulmbach GmbH is one of the globally leading manufacturers of labels for the beverage industry and of flexible packaging for the foodstuffs and luxury food industry.

Töpfer produces in the Upper Franconian town of Kulmbach and has been in its current location, Am Kreuzstein 5, since 1951.

In order to strengthen the site, there has been a basic expansion in the gravure printing area here since 2007, by construction of a state-of-the-art production hall and investment in two new gravure printing rotation machines.

In 2017, the company achieved a turnover of approx. 54.3 M Euro thanks to the commitment of its roughly 270 employees.

Töpfer produces with rotation gravure printing and sheet offset printing in the materials of paper, metallised paper and film. Apart from the classified product equipment such as well glue, self-adhesive and all-round labels, shrink sleeves for the beverage and foodstuffs industry and flexible packaging in the form of outer coffee banderoles, outer tea bags and package wrapping papers are part of the production range.

Constant innovation offers our national and international customers many refinements in order to implement individual wishes for exclusive product equipment. This includes embossing, colour and coating effects, encoding, etc.

In addition to the environmental management system EMAS, introduced in 2015, the processes of which are described in detail in this environmental declaration, Töpfer Kulmbach GmbH has several other management systems.

Töpfer is certified to the international quality standard DIN EN ISO 9001:2015 and organised strictly according to the principles of quality management.

By implementing its hygiene management system according to the BRC Global Standard in 2016, Töpfer has a certified system to ensure food safety for consumers by hygienic packaging.

In 2017, Töpfer successfully completed FSC supply chain certification, which enables it to offer products with papers verifiable from responsibly managed forests.

In addition to its internal sales department, Töpfer maintains sales agencies in Germany and various countries in Europe, Asia, Africa and South America.

Töpfer offers comprehensive services for its customers. This includes the sales and application-technical consulting and state-of-the-art techniques in communication and data exchange, as well as the bundled know-how of its production areas. From the pre-press stage to the core processes in the printing area, to the diverse options of further processing, Töpfer offers all the prerequisites in order to meet customer requirements reliably, quickly and flexibly.

It maintains its own lab to monitor the quality requirements for materials and to perform diverse tests for ongoing production. This ensures high quality standards and minimises effects on the environment.



## The products

Labels and packaging must comply with special requirements in order to meet the high standards of economic efficiency and environmental compatibility in processing, use and disposal.

Light fastness and alkaline resilience of printing inks, wetness and lye resilience of label papers, breaking force and friction properties of packaging are just some examples of how label and packaging printing is special.

Töpfer was successful early on in gravure printing with its internally developed technique of printing ink adhesion. A particularly high ink adhesion of the printing inks to the label paper may be required in bottle cleaning systems with sensitive technology. Our printing ink adhesion technology clearly minimises the contamination carried into the cleaning system.

The further internal development is that of heavy-metal-free special printing inks for both printing methods. This development prevents heavy metals from being emitted from the labels into the sewage in the cleaning process. One example for this is the internally developed printing and refining technique for our brilliant MIC® gold and silver inks, which convey a refined and high-quality impression by printing of metal inks without use of heavy metals. Depending on the design, they can be a true alternative to using metallised material. The use of heavy-metal-free inks has a sustainable effect on reduction of environmental stress.

Since 1998, Töpfer has been offering an aluminium-free high-gloss ink to its customers as well. The development of a metal gloss layer on a mineral base makes it possible to prevent the introduction of aluminium into the cleaning lye while at the same time reducing the introduction of contamination into the lye by reducing the ink washed out.

Of course, Töpfer makes use of the know-how and ecological efforts of its suppliers concerning the protection of resources and reduction of environmental stress with a special focus on material use. On the customer's wish, paper materials can be used as printing substrates derived from sustainably managed forests. Our suppliers document this with FSC certificates.

Recycling paper used to be unsuitable for the high quality requirements of a label printing substrate before, due to its fibre structure and lack of homogeneity. Intense cooperation with a paper producer now enables Töpfer to use a recycled paper made of 100% waste paper with outstanding properties.

Use of mineral-oil-free printing inks in offset printing contributes sustainably to protecting the environment due to its use of renewable raw materials.

Nearly all printing substrates - no matter the colour coverage and refinement - can be recycled entirely after their use.

Not least the development of own recycling systems for transport packaging ensures that Töpfer will contribute to reduce the occurrence of packaging wastes among the customers.

Quality is deemed key to sustainable business success at Töpfer Kulmbach GmbH. Töpfer ensures delivery of high-quality products to its customers. According to the company's own commitment to quality alignment, the quality is reviewed and documented in all phases of production according to DIN EN ISO 9001:2015 – from delivery of the raw materials to the finished product.



## Description of the EMAS organisation

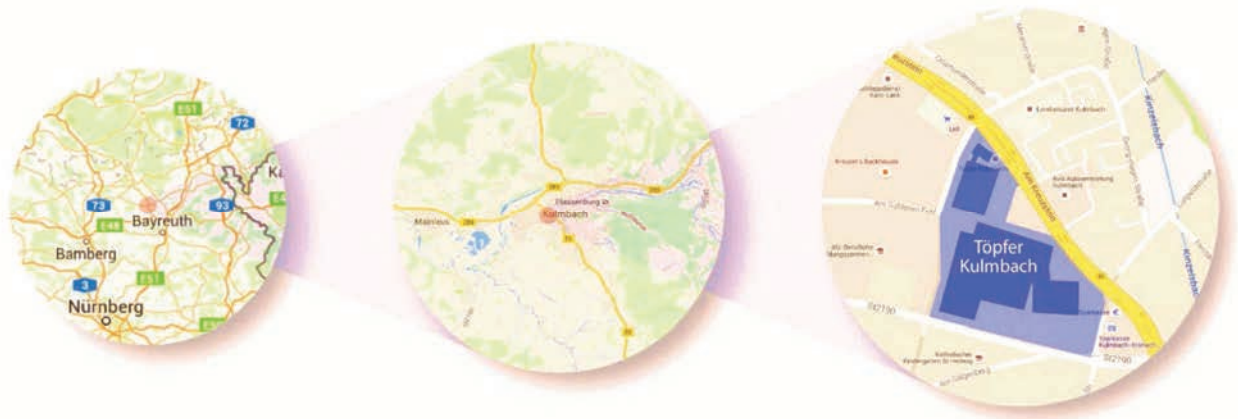
The application area of the environmental management system refers to

Töpfer Kulmbach GmbH  
Am Kreuzstein 5  
D-95326 Kulmbach

NACE code: 18.12 – Printing n. e. s.

Managing shareholders:  
Rainer Töpfer  
Spokesman of the management  
and  
Mark Töpfer  
Technical management

The company's site is located in the Upper Franconian town of Kulmbach. The district centre below the Plassenburg with its roughly 26,600 residents is located at the confluence of the Roter and Weißer Main and in the closer proximity of the Fichtelgebirge, Franconian forest and Franconian Switzerland.



The company premises are located in an industrial park right between the Federal Road B85 and the State Road 2190. The neighbourhood has consumer markets, a petrol station and many other commercial operations. In addition to a small adjacent property with a residential building, there are a day-care centre and a residential area above the state road 2190. The connection to public near-distance passenger transport is ensured by proximity with various bus stops.

The entire property size of approx. 27,800 m<sup>2</sup> is used for operational work. This area is assessed according to the requirements of the environmental management system.

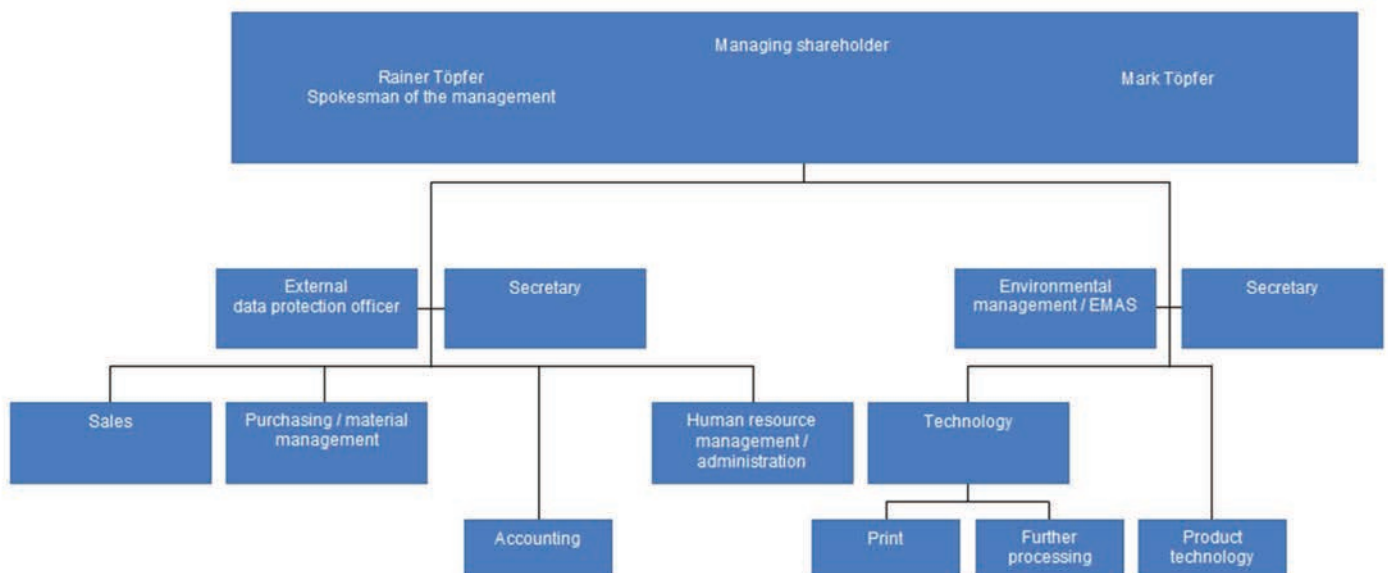
All operational work takes place at the site. This includes administration, production, storage and shipping. Töpfer charges a local forwarding and logistics company with logistics support. At the warehouse there, Töpfer has rented an allocation of storage capacities. Raw materials and finished products are delivered and collected several times per day. The greatest share of the materials and finished goods logistics with suppliers and customers takes place through regional forwarders.

Töpfer's site has facilities requiring approval according to the 4th BImSchV. This includes the gravure printing machines and the exhaust cleaning system for treatment of solvent exhausts.

Stationary machines and devices that emit noise are only encapsulated in buildings.

The drinking and industrial water supply is taken from the public water grid. Any arising sewage, rain and melt water is routed into the public sewers.

## The organisation structure



## Product production

### Pre-press / reproduction:

The printing templates provided digitally by customers and agencies are colorimetrically and graphically adjusted to the printing requirements in the pre-press stage. This includes, for example, revision of contours, bar and QR codes, as well as compliance with statutory provisions - e.g. the marking regulations. The customer's release is granted based on a proof print or a PDF. The printing data for offset printing are optimally reproduced depending on the edition volume, type number and format, transferred directly to aluminium printing plates by direct laser exposure and stabilised by burning in.

*Printing moulds for gravure printing are only produced by cylinder manufacturers that are mostly resident in Southern Germany and Austria. These cylinders are characterised by long resilience for very high printing editions. Minor damage to the cylinder surfaces can be repaired in-house by trained Töpfer employees using existing equipment. Cylinders no longer needed will be reproduced and used for new orders at need.*

### Print / sheet offset:

2 offset printing machines primarily print highly wetness- and lye-resistant papers in a 75 cm x 105 cm format with up to 7 colours and varnish. 2 machines for small-format printing are available. Many different refinements are possible. The raw paper provision takes place in sheets already, or after cutting rolled goods on a cross-cutter. For optimal warranty of the ink-moisture-balance at high machine speeds in combination with opaque white and metal gloss inks, the offset printing plates are moistened with a mixture of isopropyl alcohol and water. Most of the printing inks used are free of mineral oil. Printing powder based on native starch is used in order to prevent sheet blocking by bonding.

### Print / gravure printing:

3 gravure printing machines print from roll to toll with up to 10 colours. Many different refinements are possible. They use highly wetness- and lye-resilient papers for labels, packaging papers and different plastic films. The solvent-containing printing inks are adjusted to the optimal printing viscosity by further dilution with solvents. The solvent exhaust during the drying process is extracted at the site of development and supplied to a regenerative thermal exhaust cleaning system.

### Further processing:

With a variety of systems that ensure the necessary flexibility, the end products are made in multi-stage work steps out of printing stacks and printing rolls. Cutting and punching processes comply with very narrow format tolerances even across large editions. Quality-assuring measures ensure this and ensure that the systems can be operated highly effectively. Cutting and punching wastes are directly extracted, pressed and provided to utilisation as a bale. End products are punched or cut labels, banderoles as single cuttings or rolled goods. Banding options with variable piece numbers (e.g. rod bands) and requirements for the packaging units are produced in a customised manner.

### Shipping:

After completion, the goods will be picked for the specific customer, loaded directly for delivery to the customer by forwarder, or stored in the local forwarding and logistics company's warehouse until delivery. Freight within Germany and Europe takes place by truck only. International customers are mostly supplied by sea. Urgent deliveries may be made by air freight.



## Important environmental aspects and their effects

### Operating premises:

About 77.5% of the operating premises are built-on or sealed. Only the necessary areas were sealed when new production facilities were built on the property. The employee parking place is only covered in gravel and large parts of the terrain are covered in lawns or shrubbery.

Before the new buildings were constructed on the premises, the soil and building substances were analysed in order to determine the environmental effects from the prior use by the former owner. Any existing contamination found during building demolition was professionally disposed of.

Noise-emitting production facilities are encapsulated in buildings. Specified thresholds are observed. The neighbourhood is not impaired by noise. The logistics processes for deliveries and collections have been clearly defined by organisational provisions and take place only during the day and within specified time windows. There have not been any residents' complaints.

Environmental aspect	Environmental effects
Area use / area distribution	Loss of biodiversity
Noise emission from delivery traffic	Causing psychosocial stress reactions

### Electrical power supply:

The entire power required in the company is verifiable produced from renewable energy sources only. There is an agreement with the power supply company on this.

Environmental aspect	Environmental effects
Use of power from renewable energies	Avoiding the greenhouse effect

### Building technology / air conditioning and room-air-technical facilities:

Production of hot water for heating rooms and heating of water for sanitary and air conditioning use mostly takes place by way of heat exchange with the hot exhaust flow from the clean gas from the exhaust treatment facility and with thermal oil in the return flow from the printing machine facilities. Demand peaks are covered by adding natural gas and fuel oil operated peak-load boilers.

Steam generation to optimise the room-air-technical facilities is usually operated by heat exchange with thermal oil. Demand peaks are covered by a fuel-oil-operated steam generator. Air is moistened with an addition of quality-stabilising water additives.

The water demand is covered by the public grid of the Stadtwerke Kulmbach. The main sewage volumes arise in the sanitary and social areas and are routed into the public sewers.

Environmental aspect	Environmental effects
Power consumption (natural gas, fuel oil)	Greenhouse effect, release of air pollutants and use of resources
Use of water	Use of resources
Introduction of sewage	Water contamination

## Production:

One essential environmental aspect of the pre-press stage is the use of offset plate developer. It is disposed of as a hazardous waste after use. Aluminium printing plates used are completely recycled after offset printing.

Supply with thermal oil is necessary for operation of the gravure printing facilities. The oil is heated by way of heat exchange with the hot exhaust flow of the clean gas from the exhaust cleaning facility or, on demand, by gas burner. All printing facilities require cooling water and compressed air. For this, Töpfer has chillers and compressed air compressors.

Quantity-relevant aspects in the printing area include the necessary packaging of the printing substrates. Sorted by type, these are 100% returned to the material circuit.

The vast majority of the purchased inks and varnishes is delivered in leased packages which are returned after use. Emptied small packages are supplied to recycling or disposal based on recycling capacity and danger of its former content.

Effective colour management ensures a low residual ink volume and its most optimal reuse. Gravure printing inks that cannot be used anymore and solvent-containing washing liquids are distilled and the solvent is recovered. Remaining ink wastes are supplied to special disposal. The offset washing liquids and solvent-containing disposable cleaning materials are also subject to special disposal. Recyclable cleaning rags, by contrast, are cleaned externally and will then be reused.

Solvent vapours from the gravure printing area are extracted at the site of occurrence, compressed and burned in the exhaust cleaning system, which works according to the principle of regenerative thermal oxidation. The hot exhaust flow of the clean gas is used in order to heat thermal oil, hot water and warm water by downstream heat exchange. The very high efficiencies of the system ensure that the solvent exhausts will nearly entirely oxidise into CO<sub>2</sub> and H<sub>2</sub>O.

Handling of solvents leads to diffuse emissions in the production area. Enclosed measurements show that these emissions are below statutory limits.

Important volumes of paper and film wastes arise in the production areas of printing and further processing for process reasons. Structured separation of types and cooperation with certified disposal specialist operations ensure near-complete use of these wastes.

Environmental aspect	Environmental effects
Power consumption (natural gas)	Greenhouse effect, release of air pollutants and use of resources
Use of water	Use of resources
Emissions of CO <sub>2</sub> in clean gas or solvent exhaust	Greenhouse effect
Emissions of volatile organic compounds	Air pollution ozone "summer smog"
Use of materials	Use of resources
Development of hazardous wastes for disposal	Environmental stress by disposal methods (for air, soil, water)
Exhaust emissions due to waste disposal	Greenhouse effect

### Packaging:

For the end products to reach the customers of Töpfer safely and protected, they are delivered in stable outer and transport packaging. In order to reduce cardboard wastes at the customer's site, Töpfer provides its internally developed recycling system for the transport packaging.

Environmental aspect	Environmental effects
Occurrence of wastes in countries with an insufficient utilisation system	Environmental stress by disposal methods (for air, soil, water)
Use of materials	Use of resources

### Transport:

Töpfer does not have a dedicated fleet for delivery of the end products. Only a passenger car and a van are available for small transports. A diesel forklift is used for occasional transport work in the outdoor area of the operating premises.

Environmental aspect	Environmental effects
Exhaust emission	Greenhouse effect and release of air pollutants
Use of fuels	Use of resources



## The environmental policy

We consider sustainable thought and action the basis for future alignment. Economy, ecology, and social commitment represent sustainability. These three pillars are equivalent and must be balanced out.

Töpfer Kulmbach GmbH is aware of its environmentally relevant responsibility towards all parties - employees, residents, customers, suppliers and future generations. "Life in our environment is to be and remain worth living"<sup>(1)</sup>.

"Long-term, sustainable and continually developing, ... while designing the future in an ecologically sensible manner and economically responsibly, is the principle of our actions"<sup>(1)</sup>. Resources are used in order to strengthen our site, secure jobs and develop them. Investments in new technical facilities and new technologies serve not only to strengthen our competitiveness but also the effort of continually protecting resources and reducing environmental stress.

The following principles apply in detail:

- Compliance with applicable laws, environmentally relevant legal standards and binding obligations forms the foundation of our entrepreneurial work. Where at all possible, our activities exceed the statutory minimum requirements. The management ensures and monitors that these obligations are met in all company areas.
- We want to continually improve our company's environmental results. We continually assess the environmental effects of our work and products, determining specific targets for further development of environmental protection.
- Activities for reduction and avoidance of present environmental strains are driven forward, as far as economically acceptable aspects permit this. Implementation always takes place under observation of the state of the art. We take comprehensive measures for existing systems by regular maintenance and monitoring in order to avoid environmentally damaging influences. The consistent observation of emergency plans ensures that dangerous emissions for the environment are avoided in case of accidents.
- All employees are actively involved in the processes to improve our environmental achievements. With their commitment and responsibility, they meet the requirements of the management system and thereby work to continually improve sustainable environmental protection. Training, communication and provision of information form the essential instruments. Our managers act as decisive examples in the entire process.
- The dialogue with all stakeholder representatives, based on openness, honesty and trust, contributes to transparent conveyance of the environmental effects of our work and products. The relevance of our efforts for continuous improvement of the environmental performance is thus expressed in a comprehensible manner. To us, however, dialogue also means that we must find innovative options through our network with technology partners from the supplier industry, machine industry and universities as well as technical institutions that can contribute to the use of more environmentally compatible raw and auxiliary materials, as well as gentle protection methods.

<sup>(1)</sup> Rainer Töpfer, spokesman for the management, <http://www.toepfer.de/unternehmen/philosophie/>, 04 July 2018

## Development of the site

### Company and markets:

The family-owned company Töpfer has been producing at the site of Kulmbach for nearly 100 years and has been owner-managed in the fourth generation. It is one of the globally leading manufacturers in the area of label printing for the beverage industry and flexible packaging for the food and luxury food industries. Customers include renowned international and German beverage and food manufactures.

Development, specifically in the most important business field of the company, the beverage market, continues to show a trend towards more and more product diversity through mixed beverages and special beers, and as a result towards smaller editions. On the other hand, the pressure on competitiveness through the sustained international market consolidation is growing.

The realignment of the company that commenced in 2015 was consistently continued in the following years, as well as in 2018 with the future concept "FiMO" - "Fit. Innovative. Modern. Offensive" and process optimisations, further investments and increase of the marketing and sales activities in and outside of the country being implemented. The performance capacity could be improved further with new machine technology in production and the pre-press stage, and automation could be improved. In all company areas, FiMO projects were continued for sustainable development.

In the area of flexible packaging, the production of tea packaging could be developed further. It therefore forms a stable pillar in our product range. In order to serve this market more strongly, the internationally recognised BRC certification was already successfully introduced in 2016 and confirmed in monitoring audits.

### Production and technology:

In the reporting period, the benefits of new technical facilities and materials became evident. They verifiably led to improvements of the environmental performance.

The evaluation shows that the production of compressed air is one of the most energy-intensive processes in the company. Therefore, it was a target to improve energy efficiency after replacing two older compressed air compressors with a speed-controlled compressor with 1:1 drive and IE4 motor. This compressor has been in operation since May 2018. The stationarily installed energy measuring technology that records the power consumptions for compressed air production enabled the achievement of this target. All in all, the producing system now works more efficiently and the load peaks could be visibly reduced.

This first step of modernisation in compressed air generation was followed by replacement of an older compressed air compressor through commissioning of a base load compressor with 1:1 drive and energy-efficient IE3 motor at the end of the reporting period. This compressor is equipped with heat recovery for hot water production to be fed into the central heating grid.

Experience from several participating companies in the energy efficiency network "Impulse for Bavaria", in which Töpfer actively contributes, have shown that it is possible to reduce the compressed air level without causing operational restrictions. The tolerances here were between 10-15%. The positive impulse on power consumption becomes clear. This made us also lower the operating pressure in the central ring grid step by step. Due to the mentioned modernisation of the compressed air compressors, the pressure level was reduced by 0.2 bar in the reporting period. Once the entire modernised system is stably in operation, there will be gradual further reductions.

Reduction of load peaks in power consumption is mainly an economic effort. However, the parallel use of consumers cannot be entirely avoided. The concurrent use of consumers is, on the other hand, usually the cause for producing short-term high load peaks that affect the costs. Our main consumers are equipped with a stationary energy measuring technology. Their consumptions can therefore be assessed continually. Flexibility of use of our

productions systems over time, however, is not present when producing around the clock on working days. The same applies to in-house technology that is usually in operation without interruption. For this reason, the main focus was put on whether there was any peak shaving potential when the systems with power consumptions recorded and assessed based on temporary mobile power consumption measurements were selected in 2018. Solvent distillation, cleaning systems for gravure printing equipment or chargers for industrial trucks are systems in which this potential is considered possible through organisational measures to stipulate their temporary use.

An essential project to improve energy efficiency was the conversion of the existing lighting in further processing to LED lighting in 2017. Our expectations of a power consumption reduction by about 63.5% based on this contributed to the decision to convert further production areas and often-used transport areas to LED lighting. Planning and awarding of the order for the areas of roll cutter, bale press and loading ramp, as well as connecting traffic paths, took place in the reporting period.

The stipulated environmental target of the environmental declaration 2017 was reducing diffuse emissions in offset printing. These occur essentially in the process of moistening and sheet drying, through the evaporation of isopropanol. In early 2018, a moisturising additive with a low VOC content was tested for this. It was able to at least partially replace isopropanol as conventional sole additive. However, since difficulties occurred when printing metal gloss inks under production conditions, it was impossible to achieve the desired results. Intense cooperation with the manufacturer led to another functional additive being used, the ingredients of which do not contribute to the development of volatile organic carbon compounds. Depending on the printing coverage, the isopropanol share in the moisturiser could be reduced by up to 43%.

The desired result does not always occur immediately after a low test effort. Another environmental target of the environmental declaration 2017 was reducing the hazardous substance share in offset cleaners. After creating stable processes in the moisturiser composition named in offset printing, tests were conducted with alternative cleaning agents for cylinder, colour palette and roll cleaning in offset printing. Use under production conditions was an essential standard here. The results to date did not live up to our ideas, however. Environmentally relevant benefits and economic efficiency are still too strongly conflicting through the assessment of evaporation behaviour and cleaning result. Further tests will be performed in a timely manner here.

One positive benefit is expected after old windows with single glazing have been replaced by modern windows with triple glazing in the further processing production hall in the scope of renovation of the outer building shell in the spring of 2018. Not only reduction of the energy effort for air conditioning, but also integrated improvement of the working conditions through pleasant lighting in the hall result from this.

For the first time, Töpfer Kulmbach received an audited CO<sub>2</sub> compensation certificate. Since 2017, we have supported projects such as renewable energies, energy efficiency, reforestation, land fill gas separation and many others through compensation of the fuel amounts we use for the Töpfer fleet. Clean Advantage warrants that the compensation amount paid for CO<sub>2</sub> emissions caused by us will be used to create a sustainable future.

## Products:

After intense cooperation with a paper manufacturer, it is now possible for Töpfer Kulmbach to offer its customers a recycled paper with outstanding properties in labelling and quality. This paper was produced fully from waste paper - i.e. without addition of any fresh fibres. This is a milestone for use as label paper in the beverage industry. Although the degree of whiteness of this paper is slightly below the one of conventional label papers, the homogeneity of the fillers in the recycling pulp ensures that the opacity is higher for identical grammage and the label on the bottle thus seems more opaque by comparison. The advantages for the environment are enormous according to external studies. Use of water and power can be reduced by approx. 60% due to the use of recycled paper. Forest resources are protected.

Another subject that is relevant for Töpfer Kulmbach in connection with forest resources: We are FSC-supply chain certified and able to offer paper packaging and labels from raw materials that were produced with careful handling of forest resources. Using the FSC logo on our products, we create the required transparency for the end consumer and guarantee that the papers used come from responsibly managed forests. The globally valid principles of FSC regarding ecology and economy match the principles of the environmental policy of Töpfer. FSC papers are verifiable responsible alternatives.

In addition to the sustainable developments in the printing substrates, environmentally relevant developments in the areas of inks, varnishes and additives are also very important. Although our printing substrates can be recycled almost completely - and paper even to 100% - the deinking sludge cannot generally be returned into any biological or closed technical circuit due to the printing ink, mixtures, fibre and filler residues it contains. Nevertheless, our paper recyclers also pursue an eco-effective approach. The entire deinking sludge is used as a porosing medium in brick production and creates a heat-insulating effect.

In order to ensure return of the deinking sludge into the biological cycle, requirements must be met in the production and use of printing inks, varnishes and additives. The concept of the environmental label Cradle to Cradle with its very high standards gives clear guidelines: Printing inks, varnishes and printing aids contain renewable raw materials and vegetable oils, have cobalt-free recipes and meet the criterion of deinking capacity according to the test method. Specification continues in printing and further processing. Doing without undesired substances and limiting solvent emissions are worthy of mention.

After use and deinking, this therefore does not lead to any wastes. Valuable raw materials are preserved and returned to the cycles.

The hubergroup Deutschland GmbH with its offset colour series hubergroup Eco-Offset Ink Premium Plus is certified to the environmental label Cradle to Cradle Silver. In addition to this, Töpfer Kulmbach meets the prerequisites for printing and further processing of these components. Thus, we meet the requirements of one of our renowned customers who wants to express and advertise their environmental commitment.

We will proactively offer Cradle to Cradle to our customers in future.

Our findings from the reporting period have shown: Less ink application - without reducing colour brilliance. We were able to fulfil this endeavour. The ink used in the scope of the ink dosage device used since late 2016/early 2017 for offset printing has a much higher pigmentation. This often enables us to reduce the printing ink application without changing quality.

## Employees:

After the pervasive measures to secure the site and preserve the company's competitiveness in 2016 and 2017, the personnel structure has clearly stabilised now. In the company, about 270 employees ensure smooth processes in meeting the tasks. The employee base is supported by employees of a regional employee lending company depending on production load.

As agreed between the management and employee representation, the positive corporate result also permitted distribution of additional remuneration to the employees in early 2018.

For Töpfer, the year of 2018 is also running under the motto "Optimisation of production processes". The entire subject takes place under the name "OpEx" (Operational Excellence). In order to permit continuous optimisation of all processes and systems along the production chain in this respect, the ideas and commitment of the employees are essential requirements. Only this way can subject focuses be put into practice, in order to reduce equipment times and increase productivity, as well as industrial safety. Many measures are in direct harmony with the improvement of our environmental results.

In order to specifically recognise the existing potentials and to be able to complement them, 6 employees of the company were trained as CIP facilitators. In already-completed workshops with fixed themes, the originating causes and possible solution approaches for effects found are determined and implemented based on the Japanese Kaizen method. All employees are directly asked to contribute.

Of course, it is also important for Töpfer to align itself with the future specialist needs as a long-term training operation. In addition to participation in the Kulmbach and Bayreuth training fairs, where Töpfer has been present for many years, the company was also represented on the training fair in Hollfeld, about 30 km away, for the first time in March 2018. The target was making our diverse training offers better known in the surrounding regions as well.

Apart from the Kulmbach ABITURA, Töpfer also ventured onto new ground as the sole supporter of the first application day for Gymnasium and Fachoberschule pupils. Applicants were able to choose from an offer of 150 training positions with 18 companies, having their job interviews right on site in the Gymnasium and handing their application documents over to the HR manager - the demographic change leads to new ideas and paths.

In order to improve quality of the operational training of the young talent acquired, trainer meetings with external facilitation were introduced in the spring of 2018. The trainers will process important subjects concerning operational training every two months in future in the scope of the "trainers' circle". We have found that the confident working manner, avoidance of environmental damage and environmentally conscious action start with well-founded training already.

Based on the safety day, hosted for the first time in 2017, which was viewed as a great success by all parties involved, the next full-day Safety Day in October 2018 is currently being planned. Diverse subjects of industrial safety, health and environmental protection can be conveyed even more sustainably this way. Again, in addition to the contents of the general and workplace-specific instructions, illustrative lectures and demonstrations from external specialist lecturers are planned on subjects such as origins of fire and how to avoid it, behaviour when working with means of transport, first aid and health preservation at the workplace.

We consider the commencement of an innovative mobility concept to be a valuable contribution to keeping the employees healthy. Töpfer Kulmbach started offering its active employees the option of leasing a bicycle by way of conversion of remuneration in June 2018. The response has been promising. 20 employees (as of: 23 July 2018) have made use of this offer to date. Another advantage is evident: Every ride on a bike instead of in a vehicle with a combustion engine protects the fuel resources and prevents harmful emissions into the air.



## Networking:

Impulses for economically efficient measures that can be put into practice for more efficient use of energy in the company: This target made Töpfer participate in the energy efficiency network "Impulse for Bavaria" since 2017. This network, sponsored by E.ON Energie, is aligned with a multiple-year exchange of information and experience of eleven North-Bavarian companies from many different industries - supported by the technical support of the research company for energy technology, Munich, as well as by competent specialists on the respective relevant subjects.

In March 2018, Töpfer Kulmbach hosted the periodic network meeting. In addition to shared processing of the theme focuses of peak load optimisation and internal data recording/visualisation, Töpfer was able to present already-implemented energy efficiency measures in a tour of the operations.

Based on the energy consulting in the company through the research company for energy management, the potential for possible measures has been determined after analysing the current energy situation at Töpfer. In the reporting period, FfE compiled an initial consulting report based on these results. Under consideration of the economic feasibility, this report serves to implement measures to improve energy efficiency at Töpfer. Some elements of this target achievement were already implemented in 2018 and described here (exchange of compressed air compressors and connection to heat recovery / reduction of pressure level). Further elements will be appropriately reflected in the environmental program of this and future EMAS environmental declarations.

The exchange of information triggering positive impulses in our thought processes is impossible to miss. When planning a new production facility that produces exhaust when drying, our thoughts go beyond the conventional options of heat recovery. We review whether the heat potential will be present to operate a system according to the ORC technology or an absorption chiller.

## The environmental management system

Töpfer Kulmbach GmbH has assessed environmental effects for many years, and has documented the results in a sustainability report in the past. Since the end of 2015, Töpfer Kulmbach has now held a registered environmental management system according to EMAS III that refers to all corporate areas of the site. At the moment, Töpfer Kulmbach operates the system in an expanded manner with the application of changes from the EMAS novation from 2017.

The management is responsible for maintenance and continuous improvement of the environmental management system. It provides financial and personnel resources for this purpose. Implementation in everyday operational use is the environmental management officer's task. He was appointed by the management and given specific tasks and rights.

A core environmental team, comprising employees with operational and technical competence from the areas of environment, quality, management of operations, industrial safety, fire protection, waste, hazardous goods and immission protection, was predominantly active in the development of the environmental management system until the first validation audit, and no longer exists - at least under that name. However, Töpfer Kulmbach GmbH has another management system in implementation of the BRC Global standard, in addition to the quality management system DIN EN ISO 9001 and EMAS III, the requirements of which are equivalent in many areas. As a logical consequence, the management team has the same members and is reinforced by persons responsible from the departments.

Therefore, results from the respective inspections on site and audits of operations, as well as any identified influences from the existing risk and danger analyses are always considered as synergies in the respective other

management system. This helps with target-oriented assessment of processes, effective taking of measures and objective analysis of their effectiveness. This not only has a positive effect on corporate processes, quality and hygiene of the products, but also strengthens acceptance of the employees in implementation of the systems, in addition to contributing to environmental protection.



## Compliance with applicable laws, environmentally relevant legal standards and binding obligations:

Consistent action in the scope of statutory requirements is specified in the company's environmental policy. It is ensured that these obligations are met in all company areas.

There have not been any complaints or notes in the reporting period according to which Töpfer Kulmbach GmbH violates any statutory requirements.

The task of the environmental management system is supporting the management in targeted internal evaluation of public information sources concerning changed or new legal provisions, the relevance review and passing on of relevant information to the responsible persons.

In particular use of the internet rules of "umwelt-online" with specific adjustment of the directory set up there contributes to quick and targeted assessment of the relevance for the company in the monthly updates.

The internal legal directory with all legal provisions relevant for the company is regularly subjected to a review for whether it is still up to date and adjusted on demand. If a changed or new legal provision requires actions to be taken in the company, the requirements are determined and measures for implementation are initiated. This internal legal directory is available on the company's Intranet to everyone who is interested.

The competent managers in the departments are responsible for implementation of the requirements. Operating, work and test instructions ensure clear procedures for meeting the requirements. Process instructions stipulate organisational processes in order to structure diverse tasks in the entire company in a clear manner. The operating officers monitor the processes, ensure compliance with the statutory provisions of their tasks, report to the management and advise it.

Töpfer Kulmbach GmbH must comply with a number of environmentally relevant provisions. The following are some examples for this:

- Federal immission protection act (BImSchG) and its execution regulations (e.g. 4.BImSchV, 11. BImSchV, 31. BImSchV)
- Water management act (WHG)
- Sewage regulation (AbwV)
- System regulation for water-hazardous substances (AwSV)
- Hazardous substance regulation (GefStoffV)
- Recycling management act (KrWG)
- Energy saving regulation (EnEV)

## Employee involvement

For all employees to be able to meet their responsibilities in the scope of the environmental management system, they will be informed and instructed at regular intervals. This way, they can actively contribute to avoiding and reducing environmental stress. They are also asked at all times to make contribute suggestions on the subject of the environment so that they proactively contribute to the continual improvement process.

Further process optimisations that are part of the "FiMO" future concept often also have an important relevance for improving the company's environmental performance. Analysis of the processes, finding solutions to optimise and implement improvements involves employees from all corporate areas more than ever.

The necessary integration of the temporary workers into the management system's processes has become much more stable. Of course, their work must also comply with the requirements to avoid and reduce environmental stress and to improve our environmental performance. The number and frequency of temporary workers to be trained and the connected considerable time effort for conveying the information has reduced a lot. However, auditing of the observation of requirements remains highly topical. The supervisors act as decisive examples in the entire process.

In order to actively involve the employees in EMAS and to promote communication, semi-annual written employee information concerning the environmental management system's activities is issued. Thus, the available media and environmental data are sensibly supplemented through the Töpfer Intranet and the selected subjects of the EMAS information panel.

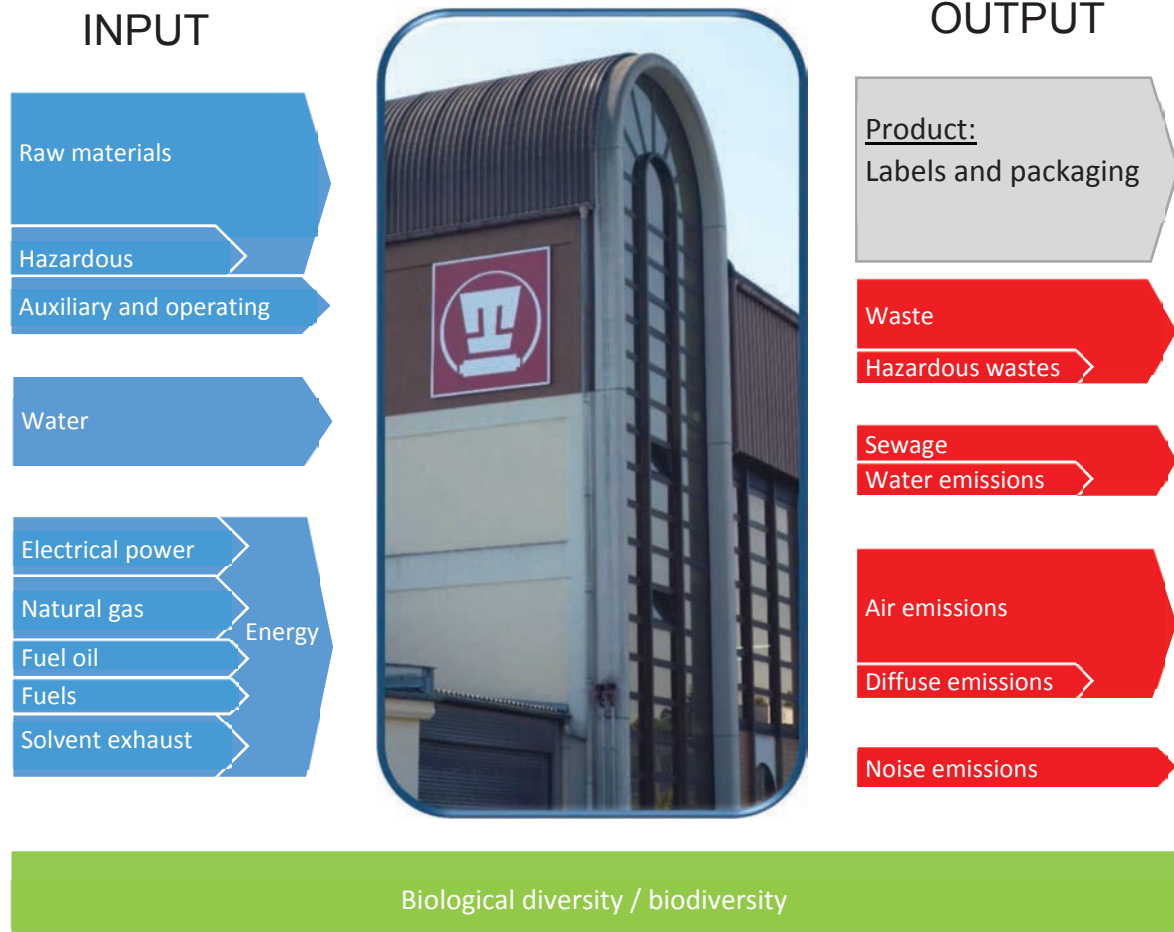
#### Internal environmental operating inspections:

Review of effectiveness and permanent improvement of the environmental management system is very important for the company in order to ensure avoidance and reduction of environmental pollution at all times. Therefore, various internal audits were performed, their results documented, evaluated and - if necessary - measures were taken to improve the situation.

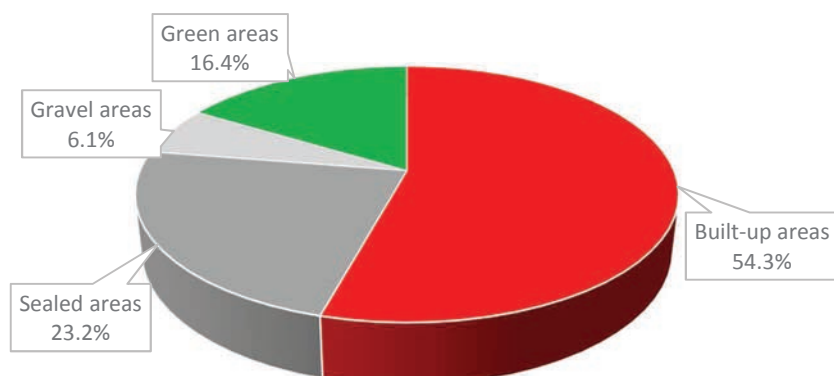
In order to always keep an up-to-date overview of possible influences on the environment in connection with our corporate activities, the "tools" of the EMAS novation 2017 have now been integrated into the ongoing business processes in addition to the risk and danger analysis already present. The features from determination of the organisational context, recording of stakeholders, analysis of the product life cycle and determination of the risks and opportunities have been recorded in writing and will be brought to discussion by the environmental management officer at fixed dates in the present participant group.

Independently of specified internal audits, regular tours of the operations by the management officer and the area officers were conducted. This way, it was always possible to react in a timely manner to required adjustments.

## Environmental performance



## Distribution of space



No construction activities in the outdoor area of the site were performed in the reporting period. For this reason, the area distribution is identical to that of the prior year.

## Overview of the environmental performance

Important indicators are recorded as a basis for the documented environmental performance. The quantity flows of the environmentally relevant indicators necessary for production (input) and those caused by the company (output).

INPUT	Unit	Annual volume 2017
<b>MATERIAL</b>	t	17,384.32
Raw materials		
Printed material paper	t	14,373.68
Printed material film	t	1,039.00
Ink / varnish gravure printing and offset printing	t	885.83
Solvent gravure printing	t	873.13
Auxiliary and operating materials		
Plate winder	t	2.16
Offset printing plates	t	7.67
Printing additives offset	t	17.74
Offset cleaner	t	14.95
Packaging cardboard	t	166.56
Water additives	t	3.60
<b>HAZARDOUS SUBSTANCES</b> of listed material	t	1,701.58
<b>WATER</b>	m <sup>3</sup>	12,649.00
<b>ENERGY</b>	kWh	28,723,425
Electrical power	kWh	7,387,339
Natural gas	kWh	11,220,341
Fuel oil	l kWh	27,000 288,900
Solvent exhaust	t kWh	1,310 9,809,156
Diesel fuel (internally)	l kWh	1,612 17,173

OUTPUT	Unit	Annual volume 2017
<b>WASTE</b>	t	3,876.82
Production waste paper	t	3,354.44
Production waste film	t	114.82
Waste ink gravure printing and offset printing	t	11.38
Production-related residual materials (packaging, etc.)	t	244.13
Other residual materials	t	152.05
<b>HAZARDOUS WASTE</b> of listed waste	t	16.84
<b>SEWAGE</b>	m <sup>3</sup>	2,914.00
<b>EMISSIONS</b>		
Air emissions from fuel combustion		
CO <sub>2</sub> -equivalents / Scope 1-3 (calculated)	t	5,055.37
SO <sub>2</sub> -equivalents / Scope 1-3 (calculated)	t	5.60
Dust and particles / Scope 1 (calculated)	t	0.01
Air emissions VOC as diffuse emissions		
from gravure printing	t	70.81
from offset printing	t	28.71
Water emissions		
Chemical oxygen demand (COD)	t	0.27

In order to make the indices comparable between the individual business years, the reference standard used is the produced annual volume in million square metres of printed material. Detailing – in particular in the area of material and waste - increase the quality of indices and their comparability considerably. For example, the annual volumes of printed goods were broken down by printing method and by printed material type.

## Production volumes

	2015	2016	2017
Printed material, total, in M m <sup>2</sup>	169.961	187.810	194.547

The classification of relevance took place after evaluation of the effects on the environment regarding resource consumption / volume and environmental pollution / hazard level. Evaluation of the influenceability is based on the analysis of current operational processes and the state of the art, as well as the ability of economically reasonable improvement.

Current developments can lead to more effects on the environmental indices. If an improvement was not considered in the stipulation of the "strategic environmental targets by 2020", influence that can be taken in the short term is to contribute to positive development. This is made clear with the term "operative" in the column "target" of the following overviews and explanation in the chapter "environmental program and targets".

## Environmental indices

### Material / raw materials:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Printed material paper	kg/M m <sup>2</sup> Paper	95,703	83,779	86,401	⇒	high	low	
Printed material film	kg/M m <sup>2</sup> Film	60,564	50,168	36,870	⇩	high	low	
Ink / varnish gravure printing	kg/M m <sup>2</sup> Gravure printing	5,679	5,231	4,757	⇩	high	medium	✓ <sub>1</sub>
Ink / varnish offset printing	kg/M m <sup>2</sup> Offset printing	4,022	3,603	3,754	⇒	medium	low	
Solvent gravure printing	kg/M m <sup>2</sup> Gravure printing	6,445	6,336	5,633	⇩	high	low	

Not only the characteristic of the end product - for example, label papers have a lower grammage than packaging papers / the film material used for production of shrink sleeves affects the indices in the raw materials area.

The industry-related changes in our customers - e.g. development towards a high type diversity in beverages - directly influence the raw material use in the company. The trend towards smaller print editions that essentially influenced the number of equipment processes in particular in 2015 and 2016, continued in offset label printing in 2017 as well. The required equipment raw material of printed materials and ink reduce the share of printed goods that can be sold. By contrast, development in offset printing towards higher printing editions was positive, which is illustrated by the lower indices in ink and solvent consumption.

It has been evident for years that the quantities of metallised papers used are reducing more and more. High-quality replacement results from combining white paper with high-brilliance metal gloss inks. The CO<sub>2</sub> footprint of this combination in raw material production is much lower than that of the required aluminium vaporisation of the paper.

### Material / auxiliary and operating materials:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Plate winder	kg/M m <sup>2</sup> Offset printing	89	65	55	↘	medium	low	
Offset printing plates	kg/M m <sup>2</sup> Offset printing	198	193	194	⇒	medium	low	
Printing additives offset	kg/M m <sup>2</sup> Offset printing	99	94	86	↘	low	low	
Offset cleaner	kg/M m <sup>2</sup> Offset printing	723	485	378	↘	high	medium	✓ <sub>2</sub>
Packaging cardboard	kg/M m <sup>2</sup> Labels	1,425	1,343	1,486	⇒	medium	low	✓ <sub>3</sub>
Water additives	kg/M m <sup>2</sup> Total	21	17	19	⇒	medium	low	

Of course, material consumption of auxiliary and operating materials is also influenced by the number of equipment processes. Therefore, it is good to see that investments of the last few years in new technical systems clearly result in a noticeable improvement at once:

- In the pre-press stage, a new developer plant for the production of offset printing plates was taken into operation in 2016. A reduction of the developer demand by approx. 15% as compared to the prior year could be achieved in 2017 this way.
- A new offset printer with efficient roll washing technology was taken into operation in 2016 as well. Although the number of equipment processes was a little lower in 2017, the detergent use concerning the produced amount could be reduced by another clear scope of 22%. Another reduction at this magnitude is mostly due to this technology.

Composition of the packaging cardboard depends strongly on the individual customer wishes for packaging and the logistic feasibility of using our recyclable packaging. Therefore, it was not possible to maintain the reduction achieved in the prior year.

### Hazardous substances:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Share of hazardous substances in material	%	9.54	10.46	9.79	⇒	high	medium	✓ <sub>4</sub>

In spite of a clear increase of the production volume in gravure printing by approx. 9.3%, the absolute consumptions of gravure printing inks and solvents reduced as well. In gravure printing, hazardous substances in paints, varnishes, additives and pure solvents are predominant for production reasons. They therefore have a greater influence on this index. The clear reduction of dangerous auxiliary and operating materials also had a positive effect in offset printing.



### Water:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Water	m <sup>3</sup> /M m <sup>2</sup> Total	71.99	67.69	65.02	↘	medium	low	✓5

The water demand essentially results from the areas of steam generation, air humidification, cooling water generation and production. Air conditioning of the storage and production areas is a basic prerequisite for optimal printing and further processing of the printed materials. The air conditioning effort is essentially influenced by external weather and utilisation of the production capacity.

After the absolute water consumption rose by approx. 4% as compared to the prior year in 2016, a slight reduction could be achieved again now. The relative index dropped more clearly as compared to the prior year: by 4%.

### Energy:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Electrical power	kWh/M m <sup>2</sup> Total	45,781	41,838	37,972	↘	high	medium	✓6
Natural gas	kWh/M m <sup>2</sup> Total	58,296	60,182	57,674	↔	high	medium	✓7
Fuel oil	l/M m <sup>2</sup> Total	19	37	139	↗	low	low	
Solvent exhaust	kg/M m <sup>2</sup> Gravure printing	9,617	9,191	8,454	↘	medium	low	
Diesel (internal)	l/M m <sup>2</sup> Total	15	9	8	↘	low	low	

After the lowest value since commencement of the recording for the environmental management system was achieved in 2016 for the relative index of power consumption, this value once again reduces by approx. 9.2%. In addition to the control technology and an improved reactive current compensation, the completed conversion of the present lighting to LED lighting will also have a positive effect on this development in some areas.

Solvent steams from gravure printing are burned via the regenerative thermal exhaust cleaning system RTO. The waste heat use of the hot exhaust flow of solvent combustion for the heating of thermal oil, hot water, steam and warm water reduces the demand in fossil fuels considerably. However, since the combustion process must be kept up permanently to heat up thermal oil for reasons of viscosity, an insufficient solvent concentration must be compensated by use of natural gas as fuel. In 2017, lower solvent shares in gravure printing than in 2016 were possible (approx. 9.6% less solvent exhaust as compared to the produced volume). This was compensated by additional use of natural gas. Nevertheless, the consumption of natural gas in general was reduced as compared to the prior year. Reduction of the relative index was approx. 4.2%.

The common supply of building and production facilities with hot water or steam takes place through the heat exchange named. Only demand-dependent coverage of load peaks for heating of water for hot water and for steam takes place through combustion of fuel oil. However, two repairs of facilities were required in 2017, which made it necessary to cover the basic supply through the fuel oil burners. The effects on consumption and the index are immense in this case.

The brief usage times of the fleet for internal traffic at Töpfer make this aspect of subordinate relevance only.

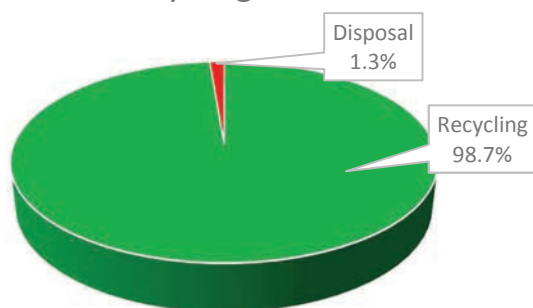
### Waste:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Production waste paper	kg/M m <sup>2</sup> Paper	23,830	22,400	20,160	↘	high	low	✓ 8
Production waste film	kg/M m <sup>2</sup> Film	7,020	5,260	4,070	↘	medium	low	✓ 9
Old ink gravure printing / offset	kg/M m <sup>2</sup> Total	110	90	60	↘	high	low	✓ 10
Production-related residual material wastes	kg/M m <sup>2</sup> Total	1,490	1,390	1,250	↘	medium	medium	✓ 11
Other residual materials	kg/M m <sup>2</sup> Total	520	640	780	↗	medium	low	

### Hazardous waste:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Share of hazardous wastes in the total	%	1.33	0.88	0.43	↘	high	low	

### Recycling ratio 2017



The strict separation of waste according to the principle of avoidance before recycling before disposal was effectively performed. Raw materials could be recycled sorted this way. Wastes that had to be disposed of were kept separated so that no increased danger from mixed-in materials resulted, in particular in hazardous wastes. Only waste for which no more effective disposal option is available was disposed of as commercial domestic waste. This is also made clear by an improved utilisation ratio of 98.7% of the overall waste volume.

For production-related reasons, paper waste forms the main share of our wastes. Waste will occur automatically depending on product type - more waste for punched labels / very little for cut labels and packaging. Several years in sequence, the absolute waste volumes for paper could be reduced. There was another clear reduction by 9.5% as compared to the prior year in 2017. After reduction of the index in the prior year as compared to the production volume, this value now dropped by another 10%. This is mostly due to the quantity distribution among the product types. The greatest growth resulted in the packaging segment. Paper waste is lower there.

The development in film waste is more clearly evident. A clear increase of the production volumes is facing a slight reduction of the waste volumes for disposal. This is expressed by a reduction of the 2017 index by nearly another 23% as compared to the prior year.

Consistent ink management – now also in offset printing. The specific use of residual inks and reduction of ink wastes: This can be considered a formula for another reduction of the waste share in this segment as well by approx. 1/3 again.

Only among residual materials from outside of production is increase of the annual disposal volumes by approx. 33 tons to be found. Here, the cause can be found, among others, in a completed warehouse cleaning. Comparison to the prior years is hardly practical here due to the variability of disposal over time.

The complete removal of liquid solvent wastes from offset printing and a clear reduction in disposed-of hazardous wastes contribute to more than halving of the share of dangerous wastes in the total waste volume at Töpfer in 2017 as compared to the prior year.

### Sewage:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
Sewage	m <sup>3</sup> /M m <sup>2</sup> Total	14.22	14.02	14.98	↗	low	low	

Although the absolute water consumption and prorated volume of the consumption water for steam and air conditioning reduced in 2017 as compared to 2016, the calculated volume of sewage introduction reduced by approx. 10,7%. This has a direct effect on the relative index.

Actual sewage and, as a result, effects on the environment do not. For example, the water consumption is specified as moistening agent of the offset printing machines. Although no sewage returns from this process (the moistening agent evaporates by oxidative drying), the quantity is calculated via sewage.

However, the necessary change of the water in the central cooling water tank for gravure printing machines has an essential share in this as well. The pumped-off sewage was supplied to professional disposal in containers. Topping up of the tank with fresh water is not opposed by discharge into the sewage.

### Emissions:

	Unit	Volume 2015	Volume 2016	Volume 2017	Trend	Relevance	Influenceability	Target
<i>Air emissions from fuel combustion</i>								
CO <sub>2</sub> -equivalent (Scope 1 – 3)	t/M. m <sup>2</sup> Total	44.06	40.77	25.98	↘	high	medium	✓ <sub>12</sub>
SO <sub>2</sub> -equivalent (Scope 1 – 3)	t/M. m <sup>2</sup> Total	0.03	0.03	0.03	→	medium	medium	
Dust and particles	t/M. m <sup>2</sup> Total	< 0.01	< 0.01	< 0.01	→	low	medium	
<i>Air emissions VOC as diffuse emissions</i>								
Share of emissions in the solvent use TD	%	5.11	4.74	5.01	→	low	low	
Share of emissions in the solvent use OD	%	81.67	91.20	98.03	↗	low	medium	✓ (operative)
<i>Water emissions</i>								
COD, BOD, ammonium-nitrogen, phosphor	t/M. m <sup>2</sup> Total	0.01	0.01	0.01	→	low	low	

Energy carrier combustion considers emissions that come from the energy conversion of natural gas, fuel oil, solvent exhaust and fuels in internal traffic and business travel with different means of transport.

The power supply company supplying Töpfer Kulmbach GmbH with power only indicates its CO<sub>2</sub> emissions. Since Töpfer Kulmbach has verifiably been purchasing power made from wind, water, solar power or biomass, CO<sub>2</sub> emissions are avoided entirely since early 2017. Töpfer thus makes a considerable contribution to avoiding air pollutants. This becomes particularly clear in analysis of the index.

Only fuel oil showed a higher additional consumption in 2017. Consumption of all other fuels could be reduced. Without considering electricity, CO<sub>2</sub> emissions for the goods produced thus could be reduced by 3%.

Extraction of the gravure printing solvent vapours at the site of occurrence and the very high efficiency of the exhaust cleaning system continues to keep the share of diffuse emissions in the area low.

All in all, the consumed amounts of solvents with volatile organic carbon compounds in offset printing are low (only 2.1% of the volume consumed in gravure printing in 2017). The high percentage share of diffuse air emissions in solvent use in offset printing of 98.03% must therefore be viewed in a differentiated manner:

The roll washing technology does reduce the consumption of fresh washing agent, but the roll washing agent used is no longer bound in the discharged waste liquid - as it was until 2015 - but mostly released into the environment by evaporation. Because all machines now work with this technology, and the evaluation first considered a full year with the new technology in 2017, the relevant index increased once again now.

The offset cleaner volumes used could be reduced considerably in total. This led to a reduction of the emissions there in the absolute assessment.

Töpfer has remained clearly below the emission limit of 1100 mg per litre at most for chemical oxygen demand in sewage for years.

## Environmental program and targets

The following strategic environmental targets were implemented in 2015 with the object of realising them by 2020. Measurable target data were specified at the time based on recognisable developments of environmental data from the sustainability reports of past years. The first interim balance is drawn in the scope of this detailed, consolidated environmental declaration.

Changed market conditions, many different new requirements for materials and products, the feasibility of implementation of planned measures in terms of time and economic aspects, etc., essentially influence the achievement of strategic environmental targets. This is made clear by reconciliation of the current indices of our environmental performance with the intended targets that were recorded in 2015. Three years after the first specification, we are on a good path. Targets achieved must be stabilised.

However, it is also evident that we were too optimistic in some targets and that the environment does not permit some of the necessary improvements. We will objectively assess development over the next few years and consider it in time. Where adjustments may be necessary, we will give factual reasons for these.

## Strategic environmental targets until 2020

No.	Target	Intended target 2020	Measures	Interim balance sheet 2018
✓1	Reduction of solvent-containing ink and varnish use in gravure printing	< <b>5,200</b> kg/M m <sup>2</sup> from gravure printing per year	Consistent optimisation of ink management concerning product requirements	The target is currently clearly achieved at 4,757 kg/M m <sup>2</sup> .
✓2	Reduction of the demand in offset cleaners	< <b>600</b> kg/M m <sup>2</sup> from offset printing per year	Optimisation of the washing technology of offset printing machines	Currently clearly achieved at 378 kg/M m <sup>2</sup> .
✓3	Reduction of the demand of packaging cardboard	< <b>950</b> kg/M m <sup>2</sup> labels per year	Increased use of recyclable packages	Currently clearly missed at 1,486 kg/M m <sup>2</sup> .
✓4	Reduction of the hazardous substance share in material use	< <b>9.0</b> % per year	Reduction of the quantities or replacement of hazardous substances by harmless substances	Currently missed by far at 9.79%.
✓5	Reduction of the water consumption	< <b>55</b> m <sup>3</sup> /M m <sup>2</sup> from total production per year	Further optimisation of room-air-technical parameters and cooling water preparation / increase of awareness of the employees in handling of water	Currently clearly missed at 65.02 m <sup>3</sup> /M m <sup>2</sup> .
✓6	Reduction of electricity consumption	< <b>40,000</b> kWh/M m <sup>2</sup> from total production per year	Specific use of more efficient consumers / further increase of employee awareness in handling power / avoiding energy loss	Currently achieved at 37,972 kWh/M m <sup>2</sup> .
✓7	Reduction of natural gas consumption	< <b>45,000</b> kWh/M m <sup>2</sup> from total production per year	Optimisation of the processes for natural gas demand in the exhaust cleaning system	Currently clearly missed at 57,674 kWh/M m <sup>2</sup> .
✓8	Reduction of the waste occurrence in production wastes with paper	< <b>22,500</b> kg/M m <sup>2</sup> paper per year	Reduction of defective material / reduction of start-up materials	Currently achieved at 20,160 kg/M m <sup>2</sup> .
✓9	Reduction of the waste occurrence in production wastes with film	< <b>5,000</b> kg/M m <sup>2</sup> film per year	Reduction of defective material / reduction of start-up materials	Currently clearly achieved at 4,070 kg/M m <sup>2</sup> .
✓10	Reduction of the waste occurrence of waste ink from gravure printing and offset printing	< <b>120</b> kg/M m <sup>2</sup> from total production per year	Further optimisation of the ink management systems when reusing residual inks / warranting the optimal yield of distillation	Currently clearly achieved at 60 kg/M m <sup>2</sup> .
✓11	Reduction of the waste occurrence on production-related residual material wastes	< <b>1,380</b> kg/M m <sup>2</sup> from total production per year	Specific use of more efficient systems / further optimisation of material demand planning to avoid small packaging wastes	Currently achieved at 1,250 kg/M m <sup>2</sup> .
✓12	Reduction of CO <sub>2</sub> -emissions	< <b>30</b> t/M m <sup>2</sup> from total production per year	Process optimisations when using fuels / purchasing power from primarily renewable energies	Currently achieved at 25.98 t/M m <sup>2</sup> .

In the environmental program of the published, past environmental declarations, future targets were defined. Evaluation of the degree of performance of these targets takes place in the following overview.

In order to achieve the desired strategic targets that are to be implemented by 2020, the targets for the period from 2016 to 2019 are expanded by new measures that can be achieved.

Töpfer not only looks at direct environmental aspects that can be influenced by its own actions. Indirect influences that already arise in production of the materials we need from suppliers or aspects that are relevant for the environment in the use and disposal of our products by customers are included in the considerations as well.

We see particular potential in increasing energy efficiency, reducing fuel consumptions and saving water. Since Töpfer is a company that uses considerable amounts of hazardous substances for production-related reasons, this is also where we put our efforts to reduce volumes and dangers.

## Measures for the years of 2016 - 2019

No.	Environmental target	Expected use	Measure	Status of implementation	Start	End	Refers to target
1	Reduction of the hazardous substance use	Reduction of the demand in roll washing agents in offset by 20% as compared to 2014	Commissioning of a new offset printer with improved washing technology	Improved washing technology is active in both production printers in offset. The demand could be reduced by 66.6%. <b>Environmental target achieved!</b>	03/2016	12/2017	✓ <sub>2</sub>
2	Reduction of the fuel demand	Reduction of the power demand for lighting of production facilities in further processing by 15% as compared to 2015	Exchange of luminescent tubes in the first systems in the WV for LED-lamps	Retrofitting took place beyond the plan in the entire WV. Thus, the power demand could be reduced by 66.1%. <b>Environmental target achieved!</b>	05/2016	12/2017	✓ <sub>6</sub>
3	Reduction of the sewage volume at our customers' sites	Reduction of the share of heavy-metal-containing high-gloss inks by 30% in reference to 2015	Replacement of heavy-metal-containing high-gloss inks by heavy-metal-free ones	Heavy-metal-free high-gloss inks could not be placed with the customers so as to achieve the target. Reduction only reached 5.7%. <b>Environmental target missed!</b>	01/2016	12/2017	General indirect environmental aspect
4	Reduction of CO <sub>2</sub> emissions	Reduction of the volume of CO <sub>2</sub> emissions caused per M m <sup>2</sup> by 35% in comparison to 2016	Referring to the total electrical power from renewable energies	Power has been purchased from renewable energies since 01 January 2017. Reduction of CO <sub>2</sub> emissions caused by 36.3%. <b>Environmental target achieved!</b>	01/2017	12/2017	✓ <sub>12</sub>
5	Reduction of the fuel demand for electricity	Reduction of the electricity demand for transport of thermal oil by 30% as compared to 2016	Removal of the conveyor pumps of the thermal oil system for line strands no longer in use	The removal could not be implemented to date due to massive cost increase. The end date had to be extended. <b>Target achievement still uncertain!</b>	03/2017	12/2019	✓ <sub>6</sub>
6	Reduction of the fuel demand in natural gas	Reduction of the natural gas demand per operating hour of the burner for heating thermal oil by 5% in comparison to 2016	Removal of line strands no longer needed / shortening of the thermal oil line system	The removal could not be implemented to date due to massive cost increase. The end date had to be extended. <b>Target achievement still uncertain!</b>	03/2017	12/2019	✓ <sub>7</sub>
7	Reduction of diffuse emissions in offset printing	Reduction of the share of diffuse air emissions of VOC in solvent use in offset printing by 15% in comparison to 2016	Partial replacement of isopropanol as moistening agent additive by additions with VOC shares	VOC-free additive has partially replaced isopropanol since the spring of 2018. <b>Target achievement still</b>	10/2017	05/2018	✓ (operative)
8	Reduction of the hazardous substance share in material use	Reduction of the hazardous substance share in offset cleaners by 40% in comparison to 2016	Partial to complete replacement of dangerous offset cleaners by cleaners with harmless	Test execution of cleaners negative so far, since not economically usable under our production conditions. Further tests. <b>Target achievement still uncertain!</b>	03/2018	12/2018	✓ <sub>4</sub>
9	Reduction of the fuel demand	Reduction of the power demand for production of compressed air by 5% as compared to 2016	Reduction of compressed air loss by leakage management and repair of leaks	Detected leaks must now be processed quickly by repairs. <b>Target achievement still uncertain!</b>	01/2018	12/2018	✓ <sub>6</sub>
10 NEW	Reduction of waste load at disposal	Reduction of the share of heavy-metal-containing high-gloss inks in packing printing by 40% in reference to 2017	Replacement of heavy-metal-containing high-gloss inks by heavy-metal-free ones in packaging	Test execution to achieve optimal coverage and gloss results in large packaging prints already in the 2nd half of 2018	10/2018	12/2019	General indirect environmental aspect

11 NEW	Reduction of the fuel demand	Reduction of the electricity demand for production of compressed air by 7% as compared to 2017	Reduction of the pressure level at the compressed air compressors	First reduction stage already completed. Further reduction after stable work of the generator circuit, incl. new compressed air compressors.	10/2018	12/2019	✓6
12 NEW	Reduction of the water consumption	8% water saved in sanitary areas for 2017	Exchange of water fittings with mix by dial valves for modern single-lever mixing taps	Taking up the present offers and complementing gradual exchange.	03/2019	12/2019	✓5

## Declaration of validity

### DECLARATION OF THE ENVIRONMENTAL EXPERT ON THE INSPECTION AND VALIDATION WORK

The next consolidated environmental declaration will be submitted for validation no later than December 2021.

The next updated environmental declaration will be submitted to the environmental expert for validation no later than December 2019.

#### Environmental expert / environmental expert organisation

Dr.-Ing. R. Beer (license no. DE-V-0007)  
Intechnica Cert GmbH (license no. DE-V-0279)  
Ostendstraße 181  
D-90482 Nuremberg

The undersigned, Dr. Reiner Beer, EMAS environmental expert with registration number DE-V-0007, accredited or licensed for area 18.12 (NACE-code) and confirms to have assessed whether the site as named in the environmental declaration of the organisation

Töpfer Kulmbach GmbH  
Am Kreuzstein 5  
D-95326 Kulmbach

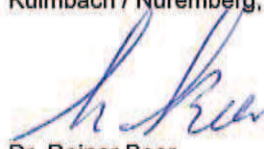
meets all requirements of the regulation (EC) no. 1221/2009 of the European parliament and the council from 25 November 2009 on the voluntary participation of organisations in a common system for environmental management and environmental audit of operations (EMAS) and the regulation (EU) 2017/1505 concerning modifications of the EMAS upon its entering into effect on 18 September 2017.

The signature under this declaration confirms that

- the inspection and validation were performed in full correspondence with the requirements of the regulation (EC) no. 1221/2009 and amendment regulation (EU) 2017/1505,
- the result of the inspection and validation confirms that there is no proof for non-compliance with the applicable environmental provisions,
- the data and information of the environmental declaration of the site provides a reliable, credible and true image of all activities of the site within the area indicated in the environmental declaration.

This declaration cannot be considered equivalent to EMAS registration. EMAS registration is only possible through a relevant office according to the regulation (EC) no. 1221/2009 / amendment regulation (EU) 2017/1505. This declaration must not be used as an independent basis for informing the public.

Kulmbach / Nuremberg, 28.11.2018



Dr. Reiner Beer  
EMAS environmental expert  
Registration number DE-V-0007



## Glossary

BRC/IoP packaging standard	British Retail Consortium / Institute of Packaging – A globally applicable standard for comprehensive presentation of the requirements to the production of food packaging and packaging materials.
Deinking	Removal of printing ink from printed waste paper. Printed products are considered verifiably deinking-capable if they meet the references of the "Deinkability score card" after application of the INGEDE test methods.
Printing viscosity	Toughness of printing inks. The higher the viscosity, the thicker the ink. In gravure printing, viscosity of the delivered, already-thickened ink is optimised by adding solvent. This is important for best printing results.
Diffuse emissions	Volatile organic compounds released by evaporation of liquids that are not collected and that will be emitted to the environment without defined exhaust volume flows.
FiMO	Fit. Modern. Offensive - The future concept of Töpfer Kulmbach GmbH for strategic realignment with the focuses on process optimisations, further investments and increase of marketing and sales activities.
FSC	Forest Stewardship Council – International certification system for forest management. Globally valid principles ensure that wood and paper products with the FSC stamp come from responsibly managed forests.
CO <sub>2</sub> -equivalent	Substances with greenhouse gas potential. Töpfer evaluates CO <sub>2</sub> , CO, methane and volatile organic compounds without methane for this (NMVOC).
COD	Chemical oxygen demand - indicator and sum parameter for quantification of the pollution of sewage with organic substances.
DIN EN ISO 9001	The nationally and internationally most common and most important standard in quality management for companies and organisations of all sizes and from all industries as basis for the continuous improvement process.
EMAS III	Eco-Management and Audit Scheme – Voluntarily instrument of the European Union that supports companies and organisations of all sizes and industries in improving their environmental performance continually.
MIC®-Gold / MIC®-Silver	High-brilliance, heavy-metal-free metallic inks in gravure printing to reinforce the refined impression of labels for sales-promoting effects. Considerably reduces stress on the environment.
Opacity	Lack of or low transparency. A high opacity in label designs ensures, for example, that the bottle glass colour shining through does not impair the visual quality of the print image.
ORC technology	Organic Rankine Cycle – Method of the operation of steam turbines with organic liquids with low evaporation temperature as a working medium. Used for power generation, e.g. through exhaust heat, above 70 °C already.
Peak Shaving	Lowering and thus smoothing of current load peaks through time delays of the load of individual consumers or demand coverage from additional power generation of storage systems.
RTO	Regenerative thermal oxidation system for exhaust cleaning. Stores the thermal energy of the combustion process in ceramic materials of the combustion chambers and emits them again to the exhaust to be cleaned. Thus, the combustion process can be continued without use of other fuels with sufficient energy.
Safety Day	Campaign day for legally required employee instructions for general operational and workplace-specific subjects such as safety and health, supported by annually changing lectures and practical demonstrations by external technical competences.

Shrink Sleeves	All-round labels printed on a film type with optimised thermal shrinking properties. The film is glued into a hose, separated above the bottle and applied true to shape by the heat.
SO <sub>2</sub> -equivalents	Air pollutants that may, among others, be the cause for acid rain. Töpfer evaluates sulphur dioxide, nitrous oxides and ammoniac.
VOC	Volatile organic compounds – carbon-containing substances that evaporate easily and that are gaseous even at low temperature.

## Imprint

### Editor:

Töpfer Kulmbach GmbH  
Am Kreuzstein 5  
D-95326 Kulmbach

Phone: +49 (0) 9221 / 70 8-0  
Telefax: +49 (0) 9221 / 70 8-1 65

Internet: [www.toepfer.de](http://www.toepfer.de)  
Email: [info@toepfer.de](mailto:info@toepfer.de)

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