



Printing and the Environment N° 11

Environmental protection at Heidelberg – production, products, advice and knowledge transfer



HEIDELBERG

PowderStar

Die gezielte Druckbestäubung

DryStar

Wasserdampfsensible UV- und Hybrid-Technologie



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Heidelberg is committed to sustainability •

What benefits does the customer get from this?



Bernhard Schreier, Heidelberg CEO

Against the backdrop of its sustainability policy, Heidelberg is committed to continually improving its environmental protection activities in its product development facilities and various sites. Our “Printing and the Environment” series of brochures aims to show how our customers benefit when Heidelberg makes product- and process-related advances in the field of environmental protection. We want to describe how our activities help our customers to become more environmentally compatible and forward-looking in their production environment, the “printshop.”

The demands that our customers have to satisfy are increasing on every front. Not only do they have to supply high quality work, they are also expected to be cost-effective and deliver punctually. At the same time they are also having to respond to their customers increasing demands for environmentally compatible products and processes. In optimizing its products and processes relating to every aspect of the press, Heidelberg is also making concerted efforts to significantly improve environmental and health protection. The use of consumables in presses is significantly reduced. This in turn reduces operating costs. Consequently, ecological and financial benefits go hand in hand.

Integrated environmental protection at Heidelberg also includes efficient environmental management at its various sites and a thorough examination of the whole life-cycle when developing products. This also involves paying close attention to regulatory developments and keeping a keen eye on our customers’ future requirements.

Heidelberg sells its products globally. This means that our presses need to meet a consistently high standard of quality, product safety and environmental compatibility across the world’s markets. The following guideline provide a basis for this. They demonstrate how environmental protection, occupational safety and product safety are tightly intermeshed, both at production sites and in our product development work.

Guideline for environmental protection, occupational safety and product safety.

1. Our activities are based on the model of sustainable development and the principle of continual improvement. With regard to our products, we are therefore committed to identifying and implementing safely operable, cost-effective, environmentally compatible and socially responsible solutions over their entire life cycle, from manufacture to disposal. Environmental aspects and product safety are an integral part of our systematic product development process. We shall strive to actively involve our suppliers and business partners in our efforts to achieve this aim.
2. We implement official requirements, laws and regulations at all Heidelberg sites. Our products meet all the legal requirements laid down in the markets where we are active. Internally, we use the best available technology for occupational safety and environmental protection when putting new investment into our sites and product development. When implementing all these measures, we go above and beyond the legal requirements insofar as this is expedient and cost-effective.
3. Our aim is to safeguard our employees against health hazards and to reduce the potential for impairment of the environment at and around our sites. We are committed to actively preventing accidents and emergency situations at all our sites.
4. We are continually improving occupational safety and environmental protection as well as the environmental compatibility and safety of our products. Wherever feasible, we are committed to conserving resources and to taking advantage of opportunities for recycling and minimizing waste production.
5. In conjunction with employees, management develops and agrees on the required objectives regarding occupational safety and environmental protection and regularly reviews the implementation of the measures resulting from them.
6. We need responsibly minded employees at all levels who actively help to put our occupational safety and environmental protection principles into practice. Through appropriate information and training, we help employees to play an active role in occupational safety and environmental protection and to implement corresponding measures.
7. We shall pursue an open dialog and strive to actively share information with the responsible authorities, shareholders, the public and everyone else involved in the life cycle of our products. We are committed to providing support to our customers on the environmentally compatible and safe operation of Heidelberg products through training and information.

Heidelberg, March 2004



Bernhard Schreier, Heidelberg CEO

Environmental protection at Heidelberg • An ever-present topic at the company, from initial product conception and manufacturing to advising customers.

Heidelberg has long been committed to protecting the environment. As early as the start of the 1990s, the company formulated its environmental policy, published its first environmental report and produced a journal on product-related environmental protection for customers. Heidelberg built up environmental management systems in accordance with ISO 14001 at almost all its production and development sites. Since 1999 environmental protection is an integral part of product development work.

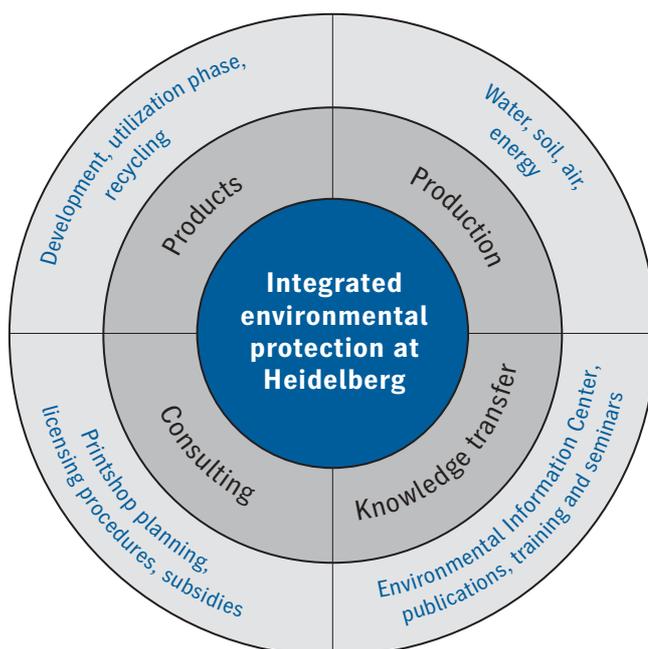
Environmentally sound products

Product development is a crucial area when it comes to protecting the environment. Every Heidelberg press must not only fulfill high quality requirements, be profitable for the customer, and be ergonomic and safe to operate, it must also be environmentally compatible. For the printer this means better air quality in the printroom, less noise, less waste and often reduced costs too, for example in disposing of cleaning agents or in energy consumption. These benefits

meet with a hearty response from printshops, and many ideas for further optimizing presses come from printshop owners.

Heidelberg has accumulated extensive knowledge about environmentally sound product development in the course of numerous projects. One of the realizations made is that presses have their greatest impact on the environment during their utilization phase, i.e. in the printroom. For example, a Printmaster QM 46 press weighs just under a ton, but consumes ten times its own weight in ink over ten years. In the same period, three tons of waste is produced and one ton of cleaning agents is used. An accurate analysis of these figures provides clear pointers for the further development of Heidelberg presses and peripherals. Examples of how engineers can bring about improvements include:

- Reduce energy consumption for the unit by 10 percent
- Reduce noise at the delivery and feeder by 2 dB (A)
- Reduce powder emissions to max. emission limit of 2 mg/m³
- Reduce coating losses by 0.5 liters per cleaning cycle
- Ensure easy maintenance and overhaul of units



Example showing potential savings possible with the Speedmaster SM/CD 102

Material	Without Star units	With Star units	Saving in %
Ink	1,940g	1,840g	5
Coating	5,520g	5,350g	3
IPA	1,400 ml (10%+10%)*	700 ml (5%+5%)*	50
Powder	440g	310g	30
Cleaning Agents	750 ml	75 ml	90

*IPA consumption consists of the percentage by content in the dampening solution circuit plus loss through evaporation

Input on the basis of 1 hour's production

Goals such as these are an established part of the standardized development process that is in place at Heidelberg. By systematically analyzing environmental requirements, goals can be established and tested before products are released on the market.

Product development always involves teams of product managers, product developers, production experts and service staff working together. In-house experts in occupational health and safety and environmental protection are on hand to advise these teams in specialist areas. All staff have access to instruments specially developed for Heidelberg to aid in environmentally sound product development as well as to extensive material and procedural databases. These also take into account the very different regulatory requirements that apply to presses on the global market.

Key factors:

Knowledge transfer and consulting

The impact a press has on the environment doesn't just depend on the technology used, it is also heavily shaped by the operator's level of expertise. For example, Heidelberg developers have constructed a device that enables powder to be applied sparingly and consistently. It is up to the operator to then select the appropriate powder and a suitable machine program. For this reason, instructor training is taken very seriously at Heidelberg, since it is the instructors who will transfer their knowledge about e.g. optimized powder application to customers. Only successful cooperation can improve air quality in the printroom.

Heidelberg supports printers in this area with training and detailed documentation on how to operate presses in an environmentally friendly way. This is complemented by seminars on topics such as environmentally efficient printing covered by the Print Media Academy's training program. Practical examples of environmentally friendly, cost-effective and highly automated operation are provided by the Environmental Information Center at the company's headquarter and at high-profile international trade shows using

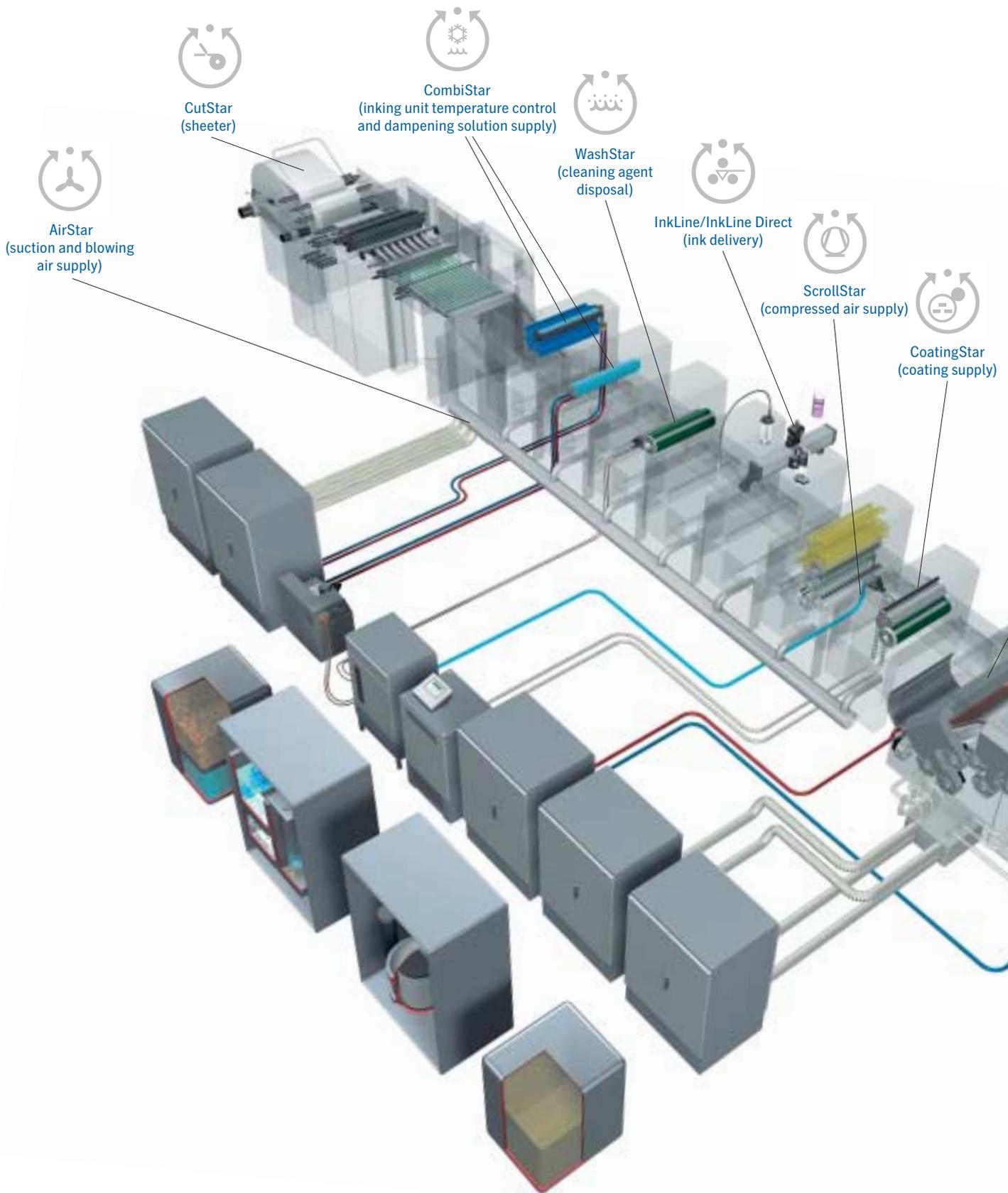
models of peripherals from the Speedmaster Star System.

The environmental experts at Heidelberg also offer extensive consulting services. These can include environmental issues when planning printshops as well as licensing procedures for presses subject to the German Federal Immissions Control Act. Since several countries offer state subsidies to encourage investment in environmentally friendly printing technology, Heidelberg advises companies on how to apply for these funds.

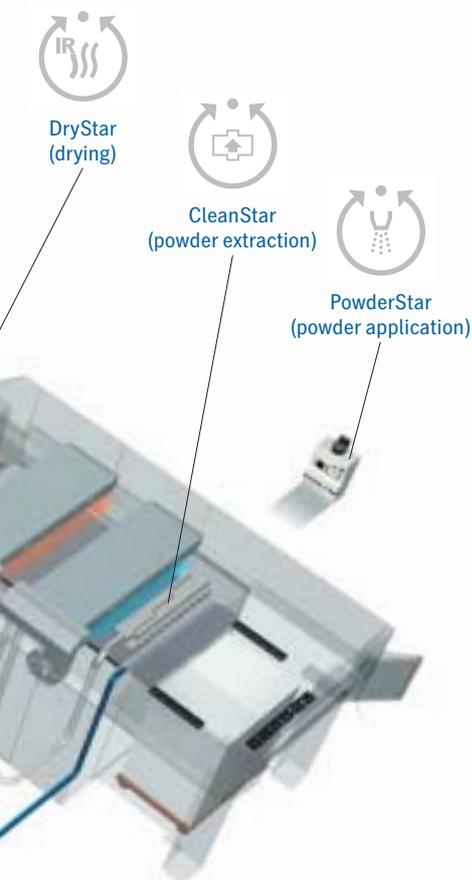
Environmental goals of product development

- Reduce paper waste
- Minimize emissions (IPA, VOCs, powder dust, etc.)
- Reduce noise
- Environmentally sound design of cleaning procedures
- Reduce quantities of waste (ink, cleaning agents, dampening solution, etc.)
- Lower energy consumption

The Speedmaster Star System • Each component features environmentally sound solutions that make good business sense, creating the ideal conditions for high-powered production that is both profitable and kind on the environment.



The Star System stands for productivity, printing quality and reliability in production. It shows that profitable and environmentally sound printing are perfectly compatible. The Berufsgenossenschaft Druck und Papierverarbeitung e. V. (German Institution for Statutory Insurance and Prevention in the Printing and Paper Industry) has awarded midsize and large Speedmaster presses equipped with Star products the “Emission-tested” certificate, while the German state provides subsidies for presses equipped with the Star System. Even in high-performance production, the Speedmaster performs well within all legal emission limit values.



Save energy

- **AirStar:** The central suction and blast-air supply for the printing press is regulated completely automatically in line with consumption levels. This reduces power consumption by up to 50 percent.
- **DryStar:** The new dryer version delivers improved efficiency with the same connected load. Improved thermodynamics ensure optimized heat transfer to the sheet.
- The water-cooled version saves the printshop heating costs in winter, since with air cooling the fresh air supplied has to be heated up to room temperature. In summer, water-cooling replaces or reduces energy consumption for air conditioning.

Reduce paper waste

- **CutStar:** The sheeter saves paper thanks to its variable cutoff length and more reliable and consistent printing stock feed.
- **CombiStar:** The combination of inking unit temperature control and dampening solution preparation ensures optimum printing conditions in every climate, thereby reducing paper waste.

Environmentally friendly cleaning

- **WashStar:** Collects the soiled mixture of cleaning agent and water and uses it to rinse the catch pans.
- **EcoClean:** The filter system can reduce cleaning agent consumption by around 90 percent.

Reduced ink and coating consumption

- **InkLine:** Automatic ink metering reduces consumption by three to five percent. Virtually complete emptying of ink cartridges and reduced fill levels in the ink fountain cut ink waste and the associated disposal costs.
- **CoatingStar:** The new universal coating unit with its low-maintenance, long-life annular piston pumps helps cut setup times when changing coatings and minimizes the amount of coating left over.

Cleaner air

- **PowderStar:** Targeting powder where it is needed on both sides of the print sheet, consistent volume metering and specific nozzle geometries cut powder consumption by up to 30 percent.
- **CleanStar:** Extraction of excess powder particles from the enclosed delivery and subsequent cleaning of exhaust air reduces dust levels in the printroom by around 80 percent.

Quiet, environmentally friendly compressed air

- **ScrollStar:** Using a screw-type compressor and an air-cooling dryer, compressed air can be generated entirely free of oil and condensation. Sound-deadening console casings reduce compressor noise levels.

Alcohol-reduced printing

- The IPA consumption of a Speedmaster CD 74 working in three-shift operation can for example be reduced by up to 3,000 liters per year.

Product development highlights • Heidelberg project teams are committed to the continuing optimization of its presses. Four examples illustrate how this benefits business and the environment alike.

Reducing paper waste

Paper waste is an issue for every printshop. It costs a lot of money and uses up resources, and is therefore a key issue in all Heidelberg’s product development work. For example, the inking unit temperature control maintains a constant temperature in the inking unit. When the press is started up, the inking unit is pre-heated, then cooled down again during the production run. This increases the stability of the process and reduces paper waste in the startup phase and production run. Remote distributor adjustment allows the operator to precisely control lateral oscillation on the monitor. This helps the printer to quickly get to grips with the visible reduction in the ink applied between the sheet’s front and rear edges, and results in less paper waste in the delivery.

ColourFast Solution software accelerates inking-up, thus reducing unwanted paper consumption in

the startup phase. It enables the operator to briefly “over-control” the inking unit when printing begins, and supports automatic adjustments to the quantity of dampening solution, and adaptation of pre- and post-dampening phases if production is interrupted. The quality and color control systems Prinect Image Control and Axis Control support the printer in achieving the desired result. They automatically detect color deviations and suggest corrective measures that the printer can confirm online.

Reduced paper waste is also an issue in Heidelberg postpress machines. For example, sensors located along the paper path identify even the smallest faults immediately and bring saddlestitchers, folders or other devices to a halt as and when required. On saddlestitchers, technical solutions such as automatic format presetting and sequential feeder monitoring also contribute to significantly reducing the amount of paper waste. In this way

a raft of individual measures all play their part in reducing paper consumption.

Environmentally friendly cleaning

Automatic washup devices can produce savings, benefit employees’ health and deliver environmental benefits. In printshops, for example, the choice of cleaning agent and how it is handled are both crucial. On the technical side, engineers developed a modular system solution that further relieves the load on printshops and the environment.

WashStar replaces manual cleaning of the catch pans on the blanket and impression-cylinder washup devices of the Speedmaster 102 with a fully automated washup program. The equipment traps used cleaning agent in a collecting tank and removes the worst of the dirt from it. It is then ready for rinsing the catch pans. Using a WashStar soon pays off – on one single Speedmaster SM 102-8 working in two-shift operation, for example, over 100 working hours and up to 30 machine hours per year can be saved.

The EcoClean filtration unit from technotrans AG adds recycling capabilities to the system. With EcoClean, used cleaning agent is no longer disposed of as waste, but is instead purified and re-used. Up to 90 percent of cleaning agent can be recycled in this way, considerably reducing procurement and disposal costs.

In addition, Heidelberg certifies cleaning agents for the automatic

Model calculation using a midsize printshop by way of example

	Without cleaning agent recycling		With cleaning agent recycling	
Cleaning agent	15,000 l,	15,000 Euro p.a.	1,500 l,	1,500 Euro p.a.
Disposal volume	28,500 l,	17,100 Euro p.a.	1,425 l,	855 Euro p.a.
Filter material				2,160 Euro p.a.
Water treatment				450 Euro p.a.
Total costs		32,100 Euro p.a.		4,965 Euro p.a.
Potential savings				27,135 Euro p.a.
Payback time				approx. 1.5 to 2 years

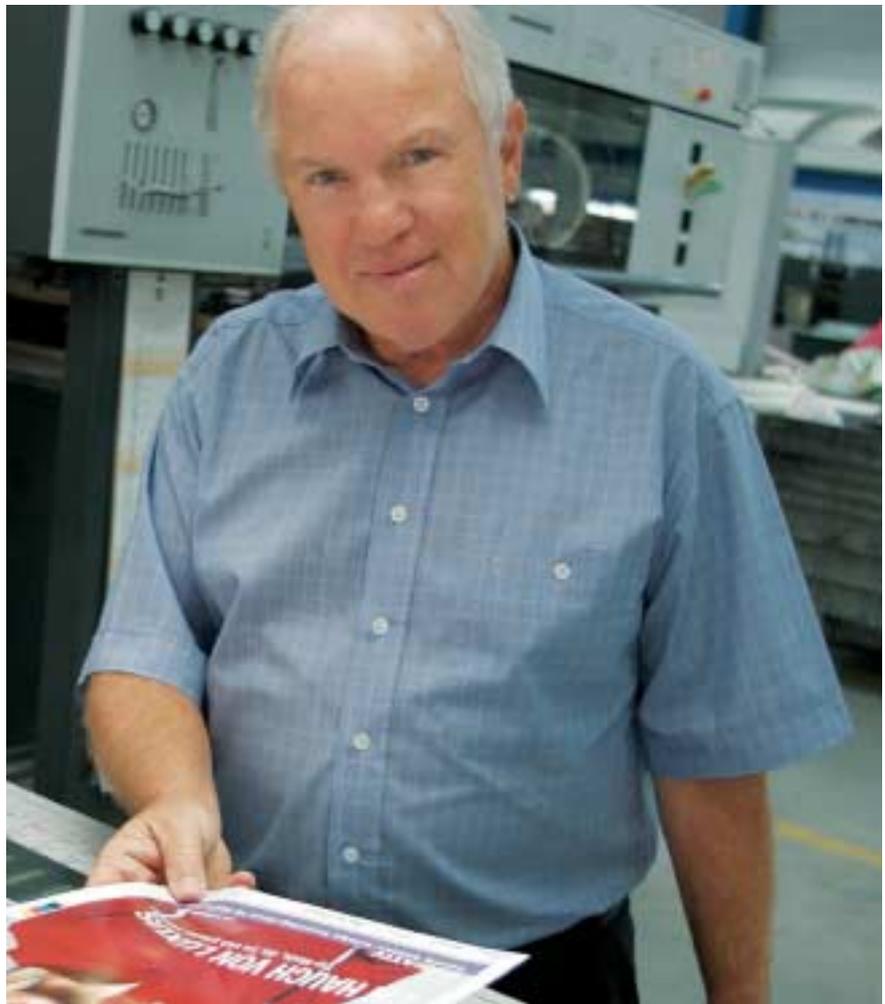
Erwin Ackenheil, Managing Director of Kehler Druck GmbH, Kehl.

washup devices in the Speedmaster series. Before cleaning agents are certified, the Berufsgenossenschaft Druck und Papierverarbeitung verifies their environmental compatibility, toxicological and safety aspects, and the Forschungsgemeinschaft Druck e. V. (FOGRA) tests that they comply with the technical printing parameters defined by Heidelberg. The current list of certified cleaning agents can be found at the Heidelberg website or at www.fogra.org.

Alcohol-reduced printing

Special surfaces on the dampening form rollers and water pan rollers create an optimum film of dampening solution on the printing plate and are an important factor in reducing alcohol consumption. Alongside consistent water quality and suitable dampening solution additive, alcohol levels can also be reduced through precise dosing with the AlcoSmart and IPASonic measuring and metering systems, which also function effectively with low IPA concentrations. An inking unit temperature control ensures the required consistency in production run conditions.

Alcohol-reduced printing offers businesses distinct benefits. As well as reduced procurement costs, the main advantages are reduced health risks for staff, lower requirements for storing less alcohol, a related reduction in the risk of fire or explosion, and less strain on the environment.



Water-cooling at Kehler Druck

Kehler Druck GmbH has been using a water-cooling system for two Speedmaster CD 102 five-color presses for some years. The system makes a significant contribution to the stability of printing processes, thereby ensuring high quality, particularly on hot days. "This is why inking unit temperature control with water-cooling is so valuable in summer. This investment has certainly proven its worth," says Managing Director Erwin Ackenheil.

Using air cooling, the equipment fans alone would use 50 percent more power than the two power-consuming elements of the water-cooling unit, i.e. the pump unit and the glycol coolers. The unit typically pays for itself within one to two years.

Environmentally sound production • A global network of professionals make sure that on-site production processes at the Heidelberg Group are environmentally sound.



The TÜV certificate attests to fully functional environmental and quality management at Heidelberg based on the international ISO 14001 and 9001 standards.

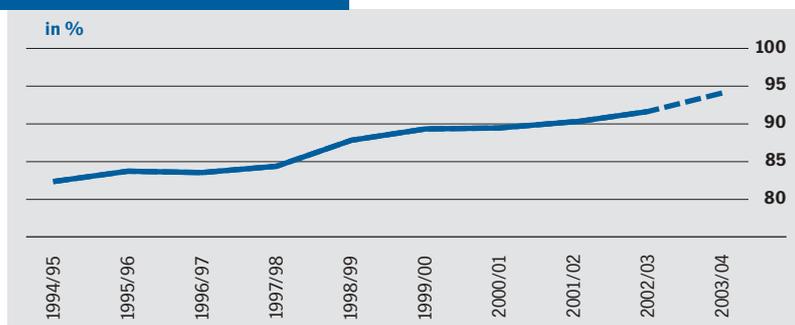
Heidelberg's commitment to environmentally sound practices doesn't just relate to its development work alone, but also extends to the press manufacturing processes. Accordingly, environmental management systems complying with the international ISO 14001 standard have been established at nearly every development and manufacturing site. Environmental officers at the various sites make sure that statutory regulations are adhered to and that continuous improvements are made in environmental matters. These staff analyze weak points and support decision-makers in establishing environmental goals and measures for reducing environmental loading.

A whole raft of individual measures for the environment

All Heidelberg sites focus their efforts on recycling waste rather than just getting rid of it. Thanks to the commitment of Heidelberg staff, recycling rates have increased steadily over the last ten years to what is now a high level. In-house facility management specialists systematically establish new ways of saving energy. These include new control equipment, optimizing energy management software, improving air conditioning units and training staff.

Individual projects are conducted to analyze the environmental effects of production. For example, by precisely determining all the energy and material flows taking place in the foundry, it is possible to make optimum use of resources. One particularly successful environmental measure is the broad changeover from liquid coatings to powder when coating parts. This not only reduces VOC emissions by many tons each year, it also cuts procurement and disposal costs. Through these measures, Heidelberg is underlining the fact that environmental benefits can be achieved cost-effectively. In addition, Heidelberg's sites are harnessing future-focussed technology to maintain a high level of quality in their press manufacturing processes.

Recycling rates at sites



Recycling rates have increased year after year at all Heidelberg sites.

Environmental labels for Speedmaster presses •

The certificates make it easier to claim subsidies and simplify dialog with local authorities.

Heidelberg increasingly offers presses with environmental certificates. These help pave the way for customers to access subsidies when extending their machine parks. Certificates also make it easier to answer local authority inquiries on health implications, product safety and presses' environmental compatibility.

Emissions under control

With the "Emission-tested" certificate, the testing center of the Berufsgenossenschaft attests that the press adheres to statutory regulations for the following emissions:

- Alcohol (IPA)
- Cleaning agent
- Dust
- Ink mist
- Noise
- Ammonia
- Ozone

The certificate attests that a tenth of the limit values enshrined in law in, for example, Germany are not exceeded. Speedmaster presses fitted with the "reduced-alcohol printing" package, automatic washup devices and peripherals for efficient powder application bear this commendation.



In October 2003, Albrecht H. Glöckle, head of the technical inspection service and the Prevention Section of the Berufsgenossenschaft Druck- und Papierverarbeitung e.V., presents the certificate to Dr. Klaus Spiegel (right), member of the Heidelberg Board.

Environment and UV printing fit together perfectly

The "Optimized UV Printing" certificate includes the "Emission-tested" certificate and verifies that the requirements of the UV protocol recognized throughout the graphics industry worldwide have been met.

The protocol goes beyond statutory requirements and describes a UV press that is optimally configured in terms of health and environmental protection and operational safety. The Speedmaster CD 74 UV is the world's first press to be accorded this certificate. Certified presses are equipped with a package for environmentally sound, cost-effective UV printing, e.g. with ink mist and odor extraction, InkLine and ink agitator.



Knowledge transfer • Environmentally sound technology is just one half of the story. The other half is environmental expertise within printshops. Environmental protection, health and occupational safety prosper when these elements are combined.



Over the years Heidelberg has gathered a wealth of environmental knowledge. This is reflected in numerous publications about the company and its products. The following documentation is available:

Print media

Sustainability Reports

- Sustainability Report 2003/2004 (from September 2004)
- Sustainability Report 2002/2003
- Report 2001/2002
- Report 2000/2001

Printing and the Environment brochure series

- N° 11 “Environmental protection at Heidelberg”
- N° 10 “UV Technology”
- N° 9 “Printing with less alcohol”
- N° 8 “Effective Use of Cleaning Agents”
- N° 7 “Speedmaster Star System”
- N° 6 “Environmentally Sound Solutions”

Print Process brochures

- N° 23/03 “Focus on paper”
- N° 14/01 “New Ecology”
- N° 6/99 “Paper”

These publications can be ordered by e-mail from environment@heidelberg.com, fax from +49-6221-92-3329 or on the Internet at www.heidelberg.com > About us > Environmental Protection > Brochure Ordering

Internet

At www.heidelberg.com > About Us > Environmental Protection you can find:

- Sustainability Reports
- The “Printing and the Environment” brochure series
- A list of certified cleaning agents for presses
- A list of banned and notifiable critical substances for Heidelberg suppliers

Print Media Academy

The Print Media Academy’s program includes events with environmental themes. You can find information about the current program on the Internet at www.print-media-academy.com

Environmental Information Center

Visit the Environmental Information Center in the Print Media Center, Heidelberg, or in the Print Media Academy in Kuala Lumpur, Malaysia. Please arrange an appointment via your Heidelberg representative.

Inquiries

Heidelberg is happy to assist with your inquiries:

- For inquiries about specific sites, please contact relevant personnel at the site. Address information can be found in the Sustainability Reports.
- For inquiries about subsidies for environmentally sound investments, please contact your local Heidelberg office, or send an e-mail to environment@heidelberg.com.
- For other environment-related inquiries, please contact Heidelberg by e-mail at environment@heidelberg.com.

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Speedmaster

Gerät:
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Fachwissen
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Emission geprüft



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