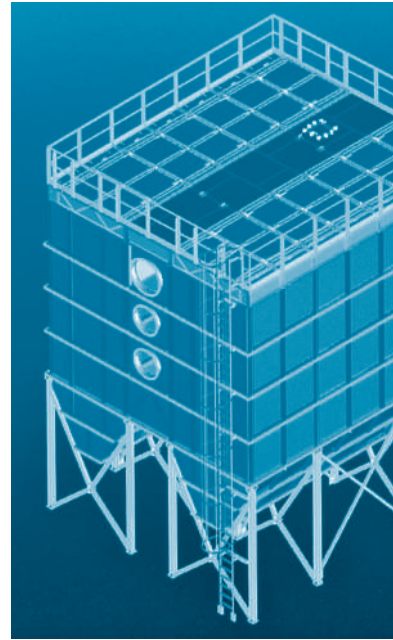
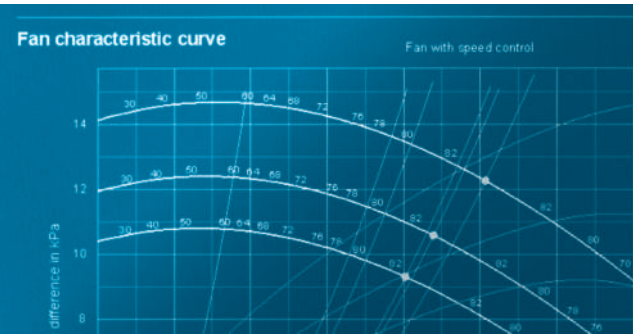


Innovations from Venti Oelde

Air handling technology and system solutions
for the printing and paper industries



Air handling technology and system solutions for the printing and paper industries

As a competent systems supplier, process and engineering partner, Venti Oelde is well known in the international printing and paper industries. An extensive air technology range with special products and system solutions as well as planning, consulting and maintenance services are the basis. Many innovations and developments in mechanical, air handling and disposal systems guarantee uninterrupted production as well as clean and safe workplaces. The latest innovations include bio-filters with living organisms, which dispose of solvent residues. Economy and the environment can be unified with Venti technology. Energy saving and increased productivity are not necessarily in mutual opposition. This article explains several examples of modern engineering and technical services by the world-wide operating air handling specialists.

“The industrial situation of the paper, cardboard and plastics branches in Germany has developed positively in comparison with the overall economic cycle” reported the business press. Although stagnation is otherwise prevalent, these branches are investing, modernising and restructuring. New environmental regulations are challenges for innovation, development, established and new companies. Particularly the VOC Directive of the European Union (VOC stands for Volatile Organic Compounds such as solvents) demands directed preliminary work. Rotation printing, reel offset and illustration gravure printing, laminating, adhesive coating and many more techniques are specifically affected by this. However, increased capacities, faster production and cycle times, computer aided energy management, improvements in the feedback and recycling of residues and the humanisation of workplaces characterise the environment of the economical, technical and environmental improvements in the printing and paper industries.

This is one field of application in which Venti Oelde has become an internationally acknowledged engineering partner and innovative systems supplier: In all machines, production processes and all aspects of the atmospheric process conditions in the manufacture of paper, cardboard and cellulose, in printing, laminating and further processing, air handling processes, components or systems are involved – the domain of the air handling specialists from Oelde.

The range of services (Flow diagram) divided into the subjects of

- production,
- pre-cutting,
- printing/coating,
- finishing and
- residues (or residue feedback, treatment or disposal)

is extremely diverse and extensive.

Optimum results are always achieved when the manufacturers of components and systems are permitted to add their specific knowledge at an early phase of the planning. The developers, consultants and project engineers will verify that the highest efficiency can be achieved in such cases, meaning the best possible performance with the greatest possible saving of energy.

Paper machines / Paper production

In compliance with the company motto “We make air work on your behalf”, Venti optimises, regulates and controls many air handling processes in and around production machines in the paper industry. This is based on trusting co-operation in a partnership for value gain with machine constructors.

Ventilation, air filters, waste extraction, heat dissipation and heat recovery are the central topics where investment and low operating costs are concerned. Experience from completely different fields of competence gained by Venti Oelde has led to exemplary innovations.

The conditions surrounding the machines, the workshop climate, represent a special field of action and reaction.

Good working conditions are not only fundamental to a good working environment and smooth production, but also fulfil the statutory requirements with regard to the maximum quantities of toxic substances at the various workplaces in industry and trade. Complete air solutions for machine workplaces, booths, rooms and workshops of all sizes have been developed and implemented for this purpose. One highlight of this is a rotary heat exchanger with an efficiency of up to 75 %. It is self-cleaning, requires little maintenance and is controlled according to the temperature. In combination with supply air and exhaust air units and with an intelligent air distribution system, this replaces conventional heating systems in production shops economically and highly effectively.

Pre-cutting / Reel slitter

Edge trim and cutting dust extraction and vacuum transport systems are the characteristic keywords of innovations by Venti in the field of paper reel cutting. In particular, the complex subject of dedusting is an important field of action. Large quantities of microfine dust are produced in the working areas of extremely fast-running machines. This contaminates the inhaled air and creates deposits which can result in substantial quality losses or interruptions during production. Dust must therefore be captured at its point of origin and guided to suitable filters. This applies to dust produced at return rollers, at the longitudinal and transverse cutters, at vertical punches and also to edge trim disposal. Only effective dust

extraction can create the necessary cleanliness and a really “smoothly running” process. Cutting residues and discards can be treated fully automatically with Venti system technology, up to block pressing or compression.

Printing / Coating

Regardless of whether paper is printed or coated, the necessary process air always contains substantial amounts of moisture and/or solvents. Upright photogravure printing machines with several printing mechanisms to manufacture decorative webs for the furniture industry are an extreme example. These machines operate with large volumes of recirculated air which is correspondingly enriched. Venti know-how ensures that the contaminated process air is gathered centrally, continuously discharged and replenished with fresh air. A heat exchanger returns the useful energy to the process. This allows up to 75 % of the heat energy to be recovered.

Air heavily contaminated with solvents is treated thermally, less heavily contaminated air (< 2 g/m³) is cleaned by a new biofiltration system. Special bacteria cultures convert the solvents from the process into water, CO₂ and biomass.

Similar to the plug-and-play method used in computers, Venti develops largely pre-fitted compact units together with the users for printing and coating machines such as for intermediate ink drying and bridge drying in flexo-printing machines. Just as the laboratory coating machines, the modern system solutions are standardised and extensible by a modular principle. Different heating systems can be

simply attached. Electrical cabinets and measuring sensors are integrated in the modules and tested before the final assembly of the printing machines.

Increases in printing speed often require a very precise compliance with defined temperature limits and humidity values in the printing shop. With exact planning and intelligent air handling systems, it is possible to control the temperature and humidity in the working area optimally as required. Workshop air conditioning around the flexo and rotogravure printers requires specialised knowledge not held by 'normal' air conditioning technicians. For example, who would consider that specifically chosen pipe diameters and the appropriate routing of the pipe networks are important factors in energy saving. Using practically proven computer programs, the Venti engineers calculate individual solutions for each system. Their main challenge is to achieve an optimum between investment and operating costs. Energy management, heat dissipation and heat recovery are central topics of this work.

Finishing / Punching

At transverse cutters, rotation and vertical punches, adhesion presses and other machines used in finishing, residues, edge trims, scrap and cutting dust are produced. Venti responses are: residue and edge trim extraction, dedusting systems, waste disposal and recycling. Capturing and transporting production waste ensures efficient work. And afterwards, air handling systems and Venti technology are in use where treatment, packaging and discharge are

concerned. The latest development from Venti is notable in this respect: a patented rotation separator. It replaces cyclones and conventional screen separators and is a compact unit which separates large volumes of material from air streams. Its suitability for edge trims, punching waste, corrugated cardboard, carton card etc, its high operating reliability, protection against fire and explosions (ATEX) and an air volume throughput of up to 35,000 m³/h open diverse fields of application.

Gathering, transporting, separating and utilising residues

In all processes summarised above, various types of waste are produced. Air handling systems to gather, transport and dispose of this are often the best solution.

Venti air handling technology offers tested and economical solutions for:

- Dust caused by abrasion in production, which penetrated the respiratory tracts, affects control systems and the mechanisms of machines, and often impairs the printed results
- Punching waste and cutting residues before finishing
- Edge trims produced as end-less material during cutting or trimming
- Discards from starting-up or stopping the machine
- Slops which are too dry and with which valuable substances are to be retrieved

The material is conveyed by special fan impellers designed for shredding through the pipe network to the separator. Various techniques ensure that edge trims, cutting residues and discards are effectively

and efficiently shredded during transport even if they occur intermittently. Tearing fans, pipe cutters and cutting mills are therefore also included in the Venti system solutions.

Proven efficiency of 85 % with closed fan impellers for air conveyance and 65 % with open fan impellers for material conveyance are impressive figures for state-of-the-art technology. These top values allow a measurable reduction of the energy costs.

Air is separated from the material by separator systems manufactured by ourselves. These include cyclones, screen separators, fabric filter systems, wet dedusting systems (scrubbers) and rotary airlocks. They are supplemented by bale or container presses.

A diverse range of services such as maintenance, repairs, tests, machine modernisation, rationalisation and extension completes the package. Venti also offers the unusual in this “customer service sector”: keywords are teleservice and remote diagnostics. The Venti hotline is available and ready round the clock for customers with urgent maintenance and repair needs. Remote diagnostic systems allow communications with machines without personal presence. This serves well in monitoring and in the analysis of problems, or provides information for the replacement of wear parts. Service engineers can prepare site visits optimally and/or bring along the required spare parts. This substantially reduces machine stoppage times.



Workshop ventilation

- Ventilation plants with heat recovery, humidity separator and air conditioning



Exhaust plants

- Wet and dry filter plants for dust and coating media



Recycling

- Separating waste paper
- Drying and separating of rejects
- Return of production waste into the pulper
- Wet scrubber plant with return into the pulper



Fans

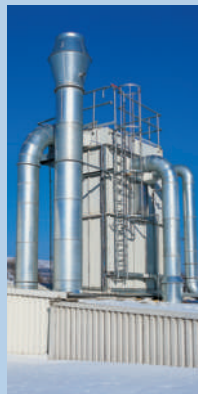
- Fans for the drying process

Paper machine



Vacuum plants

- Vacuum plants for automatic reel replacement
- Paper web guiding in cutting area
- Paper web guiding for automatic edge-to-edge pasting



Dust collection plants

- Continuously operating bag filter for removal of dust from the web
- Dust collection from roll slitters



Edge trim exhaust

- Continuous trim handling with injector plant
- Continuous trim handling with material discharge into silo
- Edge trim shredding by means of cutting mill
- Edge trim shredding through tearing fans



Recycling

- Separation of various materials and re-feeding to the paper machine

Reel slitter



Web drying

- Drying equipment for flexo and rotogravure printers as compact solution with choice of air heating systems



Solvent oxidation

- Biological exhaust air treatment plants to comply with the German Immission Law 31. BImSchV



Printing shop air conditioning

- Ventilation
- Temperature regulation
- Air replenishment
- Humidity regulation



Exhaust plants

- Dust removal from the web
- Edge trim exhaust
- Punch clipping exhaust

Printing machine



Dust removal

- Wet scrubber plants for laser perforation
- Exhaust plants for the paper web
- Dust removal for cross cutters and reel slitters



Exhaust of residual material

- Exhaust
- Shredding of die-cutter lattices
- Handling of die-cutter residual material



Edge trim exhaust

- Edge trim exhaust on rotary die-cutter



Workshop air conditioning

- Workshop air conditioning depending on the building, heat produced during production process and the product requirements

Punch



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- ▶ Industrial fans
- ▶ Dust collection and process air cleaning plants
- ▶ Exhaust air treatment plants
- ▶ Ventilating, heating and air conditioning plants
- ▶ Recycling and waste processing plants
- ▶ Surface technology