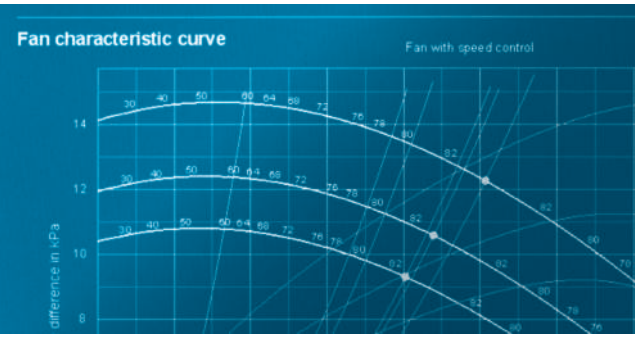
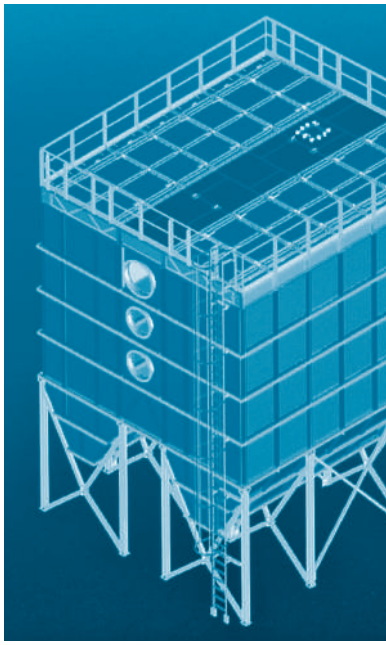
Innovations from Venti Oelde

Know-how and innovation for foil manufacturers,
processors and finishing companies





Venti Oelde

Know-how and innovation for foil manufacturers, processors and finishing companies

Planning, design, construction, production and disposal with air

Venti Oelde is not only a system supplier, but also a process and engineering partner for foil manufacturers, packaging material producers and processors as well as for the developers and operators of extruders, coating plants and punching machines. An extensive range of air handling articles with specific product and system solutions and also planning, consulting and maintenance services are the basis of our international success. Innovations and developments in mechanical, air handling and disposal systems guarantee users productive and uninterrupted processes as well as clean and safe workplaces. Environmental and economic concerns are brought into line 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 worldwide operating air handling specialists.

The foil manufacturing and processing industry is not a homogeneous branch, it is very widely divided. The reason for this is that foil is employed in increasing quantities in countless companies and applications. Classical market segments such as the application as flexible packaging material and innovative outlets based on high-tech foil developments and the resulting, previously unknown applications characterise the branch. Packaging foil, cover foil, shrink and stretch foil, but also electroluminescent foil, photochromatic foil, glass foil, metallised foil, relief printed and decorative foil as well as the numerous laminated foil creations are plastics in their own right and represent the highlights of a branch with a future.

Even the market for PE foil alone is highly diverse: polyethylene is physiologically inert, is virtually odourless and tasteless and is highly impact resistant. Due to these characteristics, PE is highly significant as a packaging material for the food industry and also for the manufacture of foil, bags and sacks for all branches of industry. Based on mineral oil as the raw material, the high-pressure variant of PE is soft and highly flexible. As low-pressure polyethylene, it is more rigid and resistant to abrasion, and as linear polyethylene, it is used together with other types to increase tear strength. Different material properties can therefore be created from one raw material and different products can be manufactured by treatment and processing.

Air as energy and work media

The “common denominator” of all manufacturing and treatment processes is air handling engineering. Air is required in numerous process variants to produce, cool, dry, convey and manipulate, select, clean, separate, discharge, recycle and also naturally for air conditioning. However, the coverage of the requirements, many of which are complex, is inadequate with standard solutions and in some cases is wholly impossible. Even the project planning of machinery and components requires specific knowledge if the environment and economy are to mesh optimally with each other. Many errors in the continually developing and expansive practice were made from incomplete knowledge or failure to observe relevant general parameters. These cost money, time, repute and corporate competence. However, positive examples also prove that the highest possible success can be achieved with appropriate specific knowledge. Venti Oelde is one of the specialists in this branch.

Founded in 1930 as a fan factory, Venti Oelde now employs around 250 people and is successfully active worldwide as a system developer, component and machinery supplier and a planning company, development partner and service provider in all matters of air handling process engineering. One particular field of corporate activity is indicated under the subtitle “Foil” (Flow diagram):

Extruders are the starting point and central feature. Two fields of competence have arisen from this: the field of flexible packaging materials (right bottom part of the diagram) and the field of foil treatment and foil processing (left bottom part of the diagram).

Extruding

True to its company motto “We make air work on your behalf”, Venti optimises, regulates and controls the air handling processes in and around extruders. This is based on trusting co-operation in a partnership for value gain with machine constructors. Ventilation, vapour exhaust, hole punching/edge trim exhaust and recycling are the central topics when investments and low operating costs are concerned. Experience from completely different fields of competence gained by Venti Oelde has led to exemplary innovations in these components and system solutions.

The conditions surrounding the machines, the workshop climate, represent a special field of action and reaction. Good working conditions are not only fundamental for a good working environment and smooth production, but also fulfil the statutory requirements with regard to the MWC values (maximum workplace concentration); the highest quantities of toxic substances at 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 exhaust and vacuum systems for reel-specific material handling are the objects of innovation by Venti in the field of foil pre-cutting. The correct air throughput and pipe cross-sections and the optimum routing of the pipe networks reduce energy costs and ensure smooth operation. Cutting residues, the edge trims produced as continuous tape during trimming, can be captured, transported, shredded and processed fully automatically with Venti system technology and are returned to the process or discharged.

Printing Machines

If foil is printed, the large quantities of process air required are contaminated with moisture and/or environmentally hazardous solvents. Printing machines generally operate with large volumes of recirculated air which become enriched accordingly. 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 by proven processes and is free of environmentally hazardous contaminants.

Similar to the plug-and-play method used in computers, Venti develops pre-fitted compact units together with the users for printing machines such as for intermediate ink drying and bridge drying in flexo printing 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. With exact planning and intelligent air 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. Here also, the specifically designed pipe diameters and appropriate routing of the pipe networks are significant factors for 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.

Punching

During finishing, residues, edge trims and waste are produced. Venti responses are: residue and edge trim extraction, waste disposal and recycling. Capturing, transport and disposal with air handling systems is often the best means of ensuring efficient work. Various techniques ensure that edge trims, cutting residues and scrap are shredded effectively and efficiently before or during conveyance even if these are produced intermittently. Tearing fans, pipe cutters and cutting mills are therefore also included in Venti system solutions. In particular, the latest development is notable: a patented rotating screen separator. It replaces cyclones and conventional screen separators and is a compact unit which separates large volumes of materials from air streams. It is suitable for diverse applications due to its suitability for edge trims and punching waste, high operating reliability, fire and explosion protection (ATEX) and an air volume throughput of up to 35000 m^3/h.

Foil coating, finishing, punching

A similar range is available for the left bottom section of the flow diagram for the indicated field of “coating machines” and “punches”: However, the differences are in the details. Whereas the entire production and processing in the right sector nearly always takes place within one company, several companies are usually involved in the left processes. In the right section of the diagram, a production line is over 50 metres long and a project order can encompass up to 16 integrated air handling systems, but individual insular solutions and often strong technical challenges as well as secrecy agreements and confidentiality obligations are often common in the left section. The air conditioning and control systems or machine linking also differ.

Together with its customers, Venti Oelde develops special control systems for the respective tasks in all fields of application. Data critical to operation is also acquired and the necessary countermeasures and safety facilities are integrated. Depending on the configuration and the needs, simple, compact units can be implemented or highly complex plant control systems with PLC and PC networks. Process monitoring, early detection, signalling and rectification of faults and process documentation directly at the machine or centrally are included. 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.

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”: the “hotline” is available and ready round the clock for customers with urgent maintenance and repair needs.

Extruder

Ventilating

- Workshop air exhaust
- Ventilation of drives
- Combustion air exhaust

Workshop air conditioning

- Temperature regulation
- Air replenishment
- Humidity regulation

Drying

- Coating plant
- Laboratory drying tunnels
- Injector drying tunnels

Discharge air cleaning

- Solvent recovery
- Thermal solvent oxidation
- Biological solvent decomposition

Workshop air-conditioning

- Ventilating plants
- Heat recovery
- Refrigerating plants
- Air humidifying plants

Coating plant

Exhaust of residual material

- Discharge airlocks
- Screw conveyor
- Conveyor belts

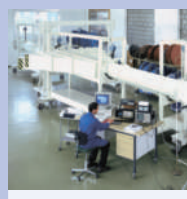
Edge trim exhaust

- Injection conveyor plants
- Screw conveyor
- Conveyor belts

Waste disposal, recycling

- Zig-Zag sifter
- Sorting plants
- Container loading

Punch



Vacuum plants

- Negative pressure generation for secure web guiding

Edge trim exhaust

- Automatic diverter valves
- Material handling fans
- Spark extinguishing plants and fire protection systems

Recycling

- Dry filter plants
- Cyclone-separators
- Rotary screen separator

Reel slitter

Vapour exhaust

- Ozone exhaust
- Exhaust of the extruder vapours

Exhaust

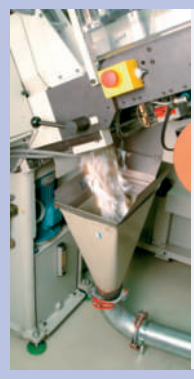
- Edge trim of the shredded or continuous trims
- Punch clipping exhaust

Recycling

- Sorting, separating and return to the manufacturing process

Workshop air conditioning

- Ventilation
- Temperature regulation with heat recovery
- Air replenishment
- Humidity regulation



Exhaust of residual material

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

Drying

- Drying equipment for flexo printers
- Air drying plants for rotogravure printers

Edge trim exhaust

- Injector handling
- Diverter valves
- Tearing fans
- Controls

Discharge air cleaning

- Thermal solvent oxidation
- Biological discharge air cleaning
- Air scrubber

Waste disposal, recycling

- Collecting, separating, sorting, packing, pressing of waste and valuable resources for recycling

Printing machine

Punch

Subject to alterations B 0/05/10/8.Stu

Ventilatorenfabrik Oelde GmbH
P.O. Box 37 09
D-59286 Oelde
Phone: +49 25 22 75 - 0
Fax: +49 25 22 75 - 2 50
info@venti-oelde.de
www.venti-oelde.de

- 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