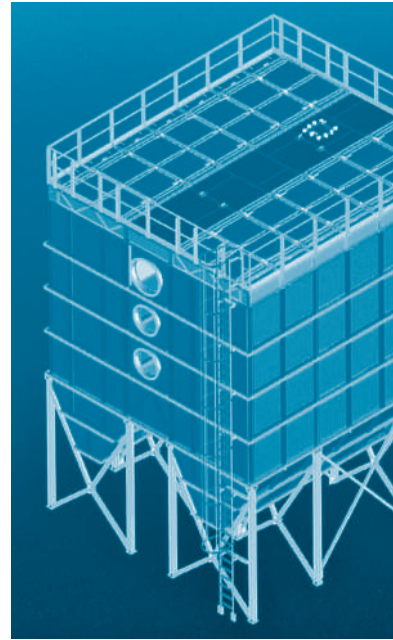
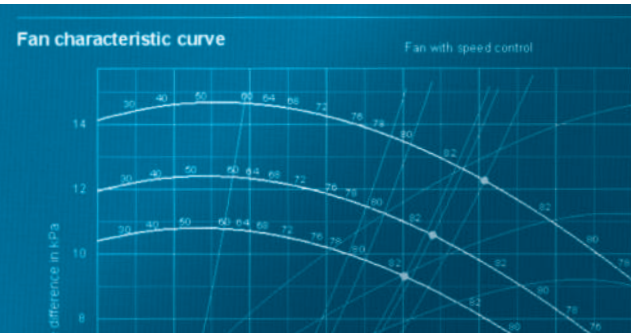


# Innovations from Venti Oelde

Innovative Filter Technology for the Cellulose and Fiber Industry



# Venti Double Pulse Filter RJ

Counterpoint to the filtering of fibrous products

Something which had for a long time been considered impossible by experts, namely economical and continuous filtering with long filter bags, has been factually disproved and actually put into practice by Venti Oelde. Users in factories where cellulose is processed will be particularly appreciative of the advantage of the configuration: functionality in filtering difficult fibers and types of dust and the safe, permanently cost-saving utilization of the filter plant. A new concept, representing a system for operators who make their calculations with an extremely sharp pencil, not only when purchasing new plant but also with regard to operating costs and the availability and efficiency of plant based on plant reliability.

But why take the trouble? There are, after all, enough functioning plants in use around the world. Well, something better will always be the enemy of something good. And innovation means "new ideas". If better materials, methods, concepts and design represent an advantage for the operator, not only with regard to safety but also economically, then there is sufficient reason for implementation, and not only for the developer.

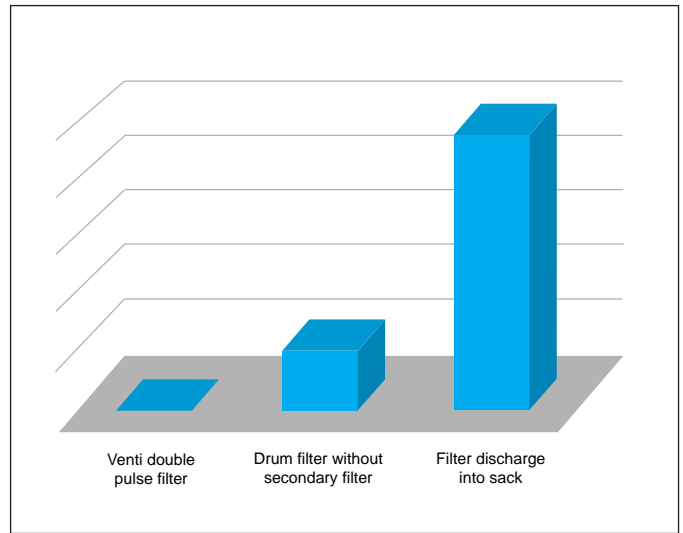
## Advantages and benefits

In the above case the advantage for the user is based on several aspects:

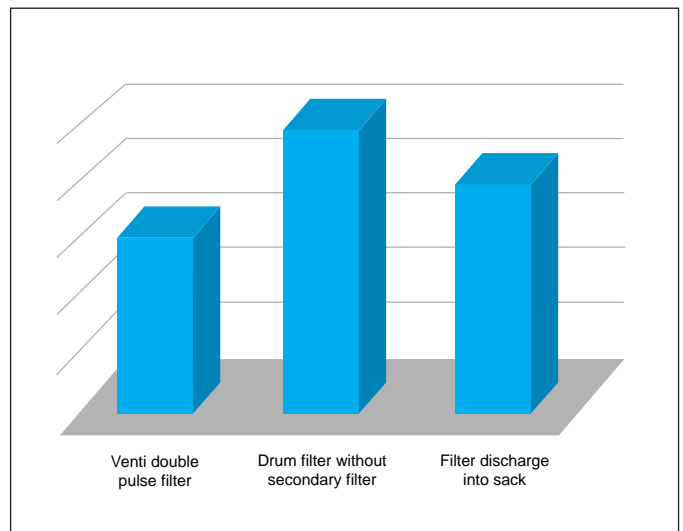
- Better filtering efficiency in a single stage filter makes it possible to return the filtered air directly to the workshop.
- Minimum plant area requirement for better use of floor space

- Best possible distribution of filter bags and cleaning of the spaces between bags prevent blockages, material compacting and deposits.
- Efficient cleaning of the filter bags with corresponding pressure regulation maintains the inlet pressure on the filter at a constant level.
- A matched programmable controller reduces the compressed air consumption.
- The filters can be used as suction or pressure filters
- The plant concept enhances operational safety, efficiency and availability
- A clear improvement is also achieved in the peripheral area thanks to the generously sized, coordinated discharge elements.

On the whole, the new solution takes account of increased demands which become apparent when filtering light mixed dusts, considers the special requirements which occur during filtering of light, voluminous fluffy and fibrous material, ensuring that in the short, medium and long term its "unusual" efficiency and economical operation are absolutely persuasive.



Comparison of Residual Dust



Comparison of Pressure Loss (Energy saving potential)

## Stages of development

Insiders know that dust collection equipment for fibrous products have been in existence since the seventies and eighties and that varying designs have been in use for different applications, e.g.:

- Production and processing of cellulose
- Manufacture and processing of paper
- Textile processing, recycling
- Production of wood fiberboards
- Processing of natural fibers and animal hair
- Insulation material industry

The most simple type of separator is filters discharging into sacks, with inlet ducts arranged at the top. Filter bags were fitted to the spigots which pointed downwards; the filter bags ending in a so-called collecting sack. When these were full, the plant had to be switched off in order to remove the dust. The general filtering efficiency was, however, only "moderate" because of the thin fabric bags and because they had to be shaken manually.

Drum filters, which were specially designed for industrial applications, provided better results. They were used particularly in the textile industry to filter fluff and fibers.

A special material is stretched over a large, rotating filter drum through which the air flows from the outside. Fixed nozzles continuously suck off the dust and fiber layer thus deposited. Their compact size and the apparently relatively low purchase price explain why this type of filter is widespread in the textile industry. The disadvantages are, however, the high filter area load with a large system pressure loss and the residual dust content, which is, in fact, rather high. The air-stream used to remove the separated material must be filtered in a separate separator. A secondary filter is absolutely essential so as to reduce the residual dust behind the drum filter to permit it to be returned to the workshop. Cartridge filters, often used for this purpose, quickly become clogged. Users also mention the following disadvantages: the deposits of specifically heavy dusts at the bottom of the drum filter, which are difficult to remove; relatively high maintenance costs; drum seals and bearings which are subject to wear and also the fact that it is not possible to increase the performance.

A technically improved filter generation was represented by the so-called "Jet bag filters", cleaned by compressed air pulses. The compacted dust fell off and was fairly simple to remove. This type of filter has been in use since the eighties and is still operating



Venti Double Pulse Filter

reliably in many works. However, their bag length of up to 2.20 meters and the heavy, complicated housings mean that, for economical reasons, the use of these filters can hardly be recommended.

This last filter type formed the basis of a new filter generation for the cellulose industry. Under consideration of all relevant conditions, filter bags up to 5.40 meters long are used and, by applying a range of individual measures within the plant configuration, extremely good performance and profitability are achieved.

#### **Function and effect / Double pulse filter RJ system**

With this new filter generation for the separation of dust and fibers when processing fluff, Venti Oelde wants to make available to plant operators in the areas of industry specified a reliable complete system, which because of its operating costs and low maintenance costs has an extremely short payback time.

The return of investment (ROI), by reducing as far as possible the operating costs, was the main point of consideration when the plant was being designed and, therefore, placed the main emphasis on operational safety and low operating costs. For an economical and efficient filtering of light, voluminous and fluffy fibrous material, such as cellulose, other rules apply as for normal dust particles.

The fact that the dust tends to form local deposits and fluffing necessitates counter-measures which are effective, ensure that the material is handled with care and yet also have a cost-saving effect. In particular the handling of bag cleaning with the extremely light, interlaced fluff, strands and clusters requires of the planners exact knowledge of the effective mechanisms and the necessary counter-measures. The result was a precisely mathematically calculated configuration and arrangement of the filter bags with individual spacing from one another. Venti Oelde engineers maximized the actual air volumes and arranged outside the filter bags on the dust-laden air side so-called pulse nozzles as well as the inner pulse cleaning. The compressed air shoots out of quick-opening valves (pulse approx. 0.1 s). this includes a great deal of secondary air

so that the dust particles and dust deposits are loosened from the filter bags and blown down towards the discharge equipment. Gravity supports this process. Discharge worms, or, depending on the application, other optional collecting and discharge equipment remove the dust and fluff from the filter. The operator can determine how far the system should be automatically controlled, monitored and integrated into existing networks. The adequately configured programmable controller permits the inclusion of individual requirements and wishes.

#### **Compact, efficient, and economical**

Unlike other filter systems, the compact plant is designed for installation outside of the workshops, which means that the space is then available inside the workshops and can be used for other purposes. Secondary filtering

is not needed. The filtered air is really "pure" (residual dust  $< 0.1 \text{ mg/Nm}^3$ ). The filtered air, still containing residual heat, can be returned to the workshop without further filter stages or other processing. The filter bags and peripheral systems have an extremely long useful life and this together with the low maintenance costs were points considered important at the design stage. Practical experience with the new generation of filter provided excellent results so that they were welcomed by those who at first had been skeptical.

Lastly, to clarify, emphasize and evaluate the above, a repetition of the motives stated at the beginning, which led to new paths in plant configuration, may be useful:

The increased demand for filter systems requiring little maintenance led to Venti

Oelde carrying out intensive research to achieve an optimization of existing technology. It was quickly recognized that increased efficiency and cost-saving demanded new starting-points for their realization. These should also be able to cope with the highest demands for a continuous, trouble-free operation. Further central aspects of the engineering were: The specific, local dust deposits in filtering systems in the cellulose industry mean that specific measures and the use of special materials and components are needed. To reduce the equipment size, a "height effectiveness" was preferred to a "width effectiveness". The sum total of all the considerations, insights and experience now forms the new "DOUBLE PULSE FILTER RJ", putting into practice all the above aspects. The result is thus of financial as well as technological importance.



Ventilatorenfabrik Oelde GmbH  
P.O. Box 37 09  
D-59286 Oelde  
Robert-Schuman-Ring 21  
D-59302 Oelde  
Phone: + 49 25 22 75-0  
Fax: + 49 25 22 75-2 50  
info@venti-oelde.de  
www.venti-oelde.de