New Structures and Fiber Materials for Filter Media in Different Areas of Application

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Abstract

As a supplier of needle-punched and hydroentangled nonwovens, Norafin supplies a wide range of different product solutions in different areas of filtration. Here, among other things, hot gas filtration is one of the most growing markets, in which more and more innovative solutions for the various challenges are required. The ability to process a wide range of polymer-based and non-organic fibers enables Norafin to offer tailor-made product solutions. The production method, which is based on several independently working carding systems, allows a combination of different fiber layers and support structures, which are then consolidated in further steps using the water jet process (Fig. 1). With this advantage, Norafin offers several products with a unique selling point for filtration.

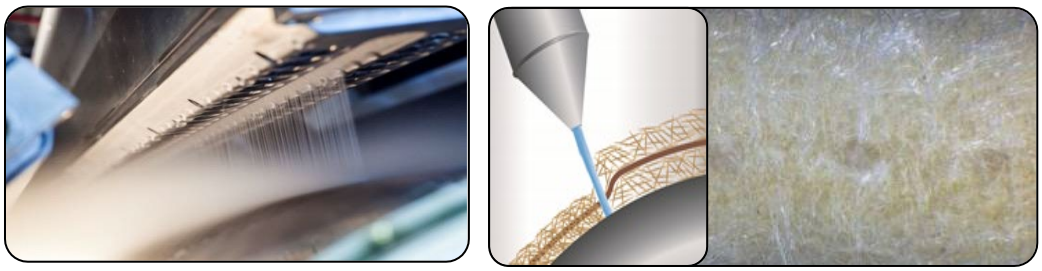

Fig. 1: schematic representation of the hydro-entanglement process

The readiness of many users to use new types of fiber materials or nonwoven structures has increased due to new findings in research and ever-increasing demands on the filter media with rising raw material prices. The filtration market has been in a state of upheaval for years and there is a constant search for completely new approaches for different areas of application. With various new developments, Norafin sees itself as a competent innovation partner for future filter solutions for its customers.

New approaches with regard to the structural design of the filter are being investigated. For example, by combining different layers of different staple fibers, a 2-sided filter medium can be produced, which on the one hand can convince with its filtration performance and on the other hand with its thermal resistance. Furthermore, it is possible to incorporate highly efficient textile layers into the nonwoven during production. (See Fig. 2) These ensure very efficient particle separation even in the temperature range of> 180 ° C and do not affect the stability of the nonwoven fabric.

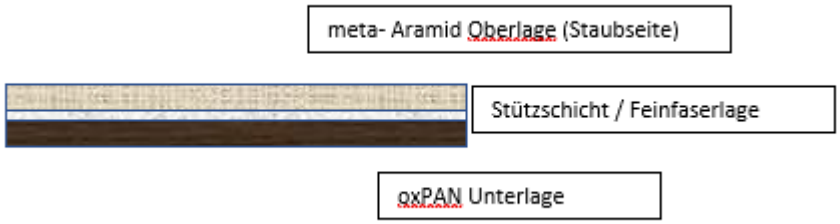

Fig. 2: exemplary, schematic representation of the structure of a multilayer filter structure based on meta aramid and oxPAN fibers

In addition, prototypes were produced on the basis of pre-oxidized PAN fibers (oxPAN filter medium) (see Fig. 3), which have a very high thermal stability due to their chemical structure (see Fig. 4). A further thermal treatment increases the temperature resistance up to 250 ° C. The new type of filter medium is used in the field of hot gas filtration and offers a flexible, pleatable and lightweight alternative to PTFE-based filter media, which has a similar temperature and chemical resistance.

Fig. 2: exemplary, schematic representation of the structure of the oxPAN filter medium

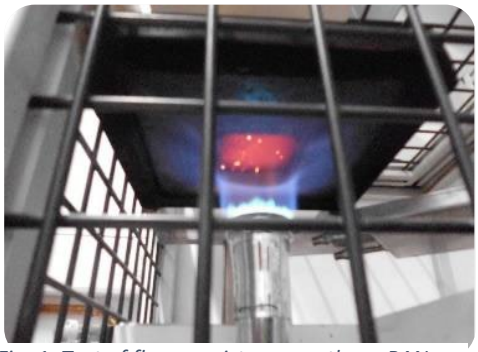

Fig. 1: Test of flame resistance on the oxPAN filter medium