

# Water and energy-efficient induction humidification system for textile, non-woven and hygienic applications (IHS)



Aeris Group is a holding that employs specialised companies operating in the air treatment field, mainly air-conditioning, heating, air filtration and associated services. All companies within the group work to ISO 9001: 2015 quality certification.

The group's shared purpose is to obtain the best efficiency for each solution, minimising investment and management costs as much

as possible and minimising the payback of our customer's investment.

"It is the synergy of the group that makes the difference, a continuous sharing of experiences between the companies, unique in their specificity but all with the same background," explains Eros Nani, CEO of Aeris Group Holding.

"This benefits our growth. The different fields of application allow us to develop



new systems and to approach solutions that can be proposed by our companies in different industrial applications. "

IHS is Aeris Group's response to the textile market's need for a solution that offers not only high reliability and safety, but also addresses environmental and sustainability issues, particularly the reduction of energy and water consumption.

The IHS project proposal received recognition from the European Commission for being innovative and of high quality compared to the other technologies in the market; it subsequently received the 'Seal of Excellence' quality label. The project went on to receive funding from the Horizon 2020 research and innovation programme of the European Union.

Eros explains, "Like all the systems designed by Aeris Group, IHS is unique in the aeraulic scenario of the industry, especially for textile and non-woven, and was developed in compliance with the guidelines of the European Directive Erp2018.

Energetically speaking this leads to an exceptional result: a reduction of up to 80% of the energy impact for the adiabatic humidification plants as well as the reduction of 65% of the water consumption necessary for the process."



The IHS humidification technology is the heart of the system, with performances never obtained before: a performance coefficient (COPH) higher than 40 and a saturation efficiency rate (SEH) of 100%.

Available systems on the market do not exceed COPH 10 and SEH 50%, meaning that if IHS requires only 1kWh of energy consumption to humidify environments with 100% of processed water, traditional systems require at least 4kWh, four times more, and double the water consumption to achieve the same result.

IHS' humidification and cooling capacity have no equal; it is the result of four years of research and is designed to the strictest hygiene standards. Furthermore, it is the only humidification system in textile and non-woven in compliance with VDI 6022 standards, ensuring the absence of

pathogenic spores while simultaneously creating a better internal climate, and optimal well-being and performance for the complete lifetime of the system.

IHS utilises special diffusers of laminar water flow that finely nebulise water and release it directly into the environment. Released air is subsequently captured and recalled by the inductive ducts with patented technology. Already a metre away from the pulsating diffusers, under normal conditions of departmental load, the water is completely evaporated and absorbed by the environment, with saturation levels that until today were unthinkable and obtained, for the first time, with an air distribution system with completely dry ducts. The efficiency of this system is 100% compared to the water used, therefore all the water sprayed by the nozzles is absorbed by the air: 0% wastewater.



**SUMMARY**

IHS water and energy efficient induction humidification system for industrial application is the only system that conforms with the EU regulations for energy efficiency, environmental sustainability and hygiene requirements. Advantages for the end users, never obtained before: Coefficient of Performance (COPH) > 40, Supersaturation Efficiency (SEH) 100%, Water saving (H2O) 65%, and Energy saving (ESH) 80%.

**PROJECT PARTNERS**

Politecnico di Milano are developing research activity aimed at the modelling and simulation by software of the behaviour of humid air in the environments to be air treated. Newton and P&M Impianti are supporting the final tuning of the components of IHS. ALKADIA will be providing marketing and carry out the industrial launch of the product in the market.

**PROJECT LEAD PROFILE**

Mr Nani has over 30 years research and development experience in air engineering, with a specific dedication to industrial applications.

Working on both engineering and prototypes, Mr Nani is today a leading technological expert in industrial air engineering.

**CONTACT DETAILS**

**Santina Torri on behalf of Mr Nani**  
Via Nino Zucchelli n. 2, 24023 Clusone (BG) Italy  
+39 0346 27545  
s.torri@aerisgroup.it  
www.aerisgroup.it



**FUNDING**

After obtained a 'Seal of Excellence', this project received funding from the Horizon 2020 research and innovation programme of the European Union under grant agreement no. 811349.

Eros concludes,

"Today, adopting IHS as a plant solution in your company means greatly taking care of environmental sustainability, a unique plus that you can spend on the market, considering the growing attention to these issues in textiles and fashion."

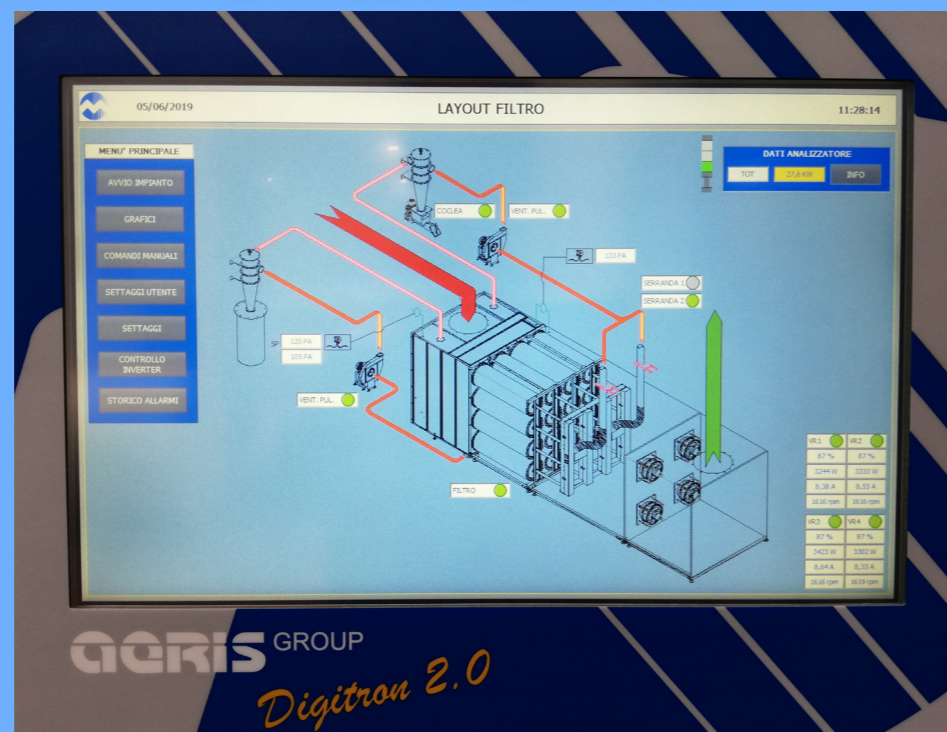
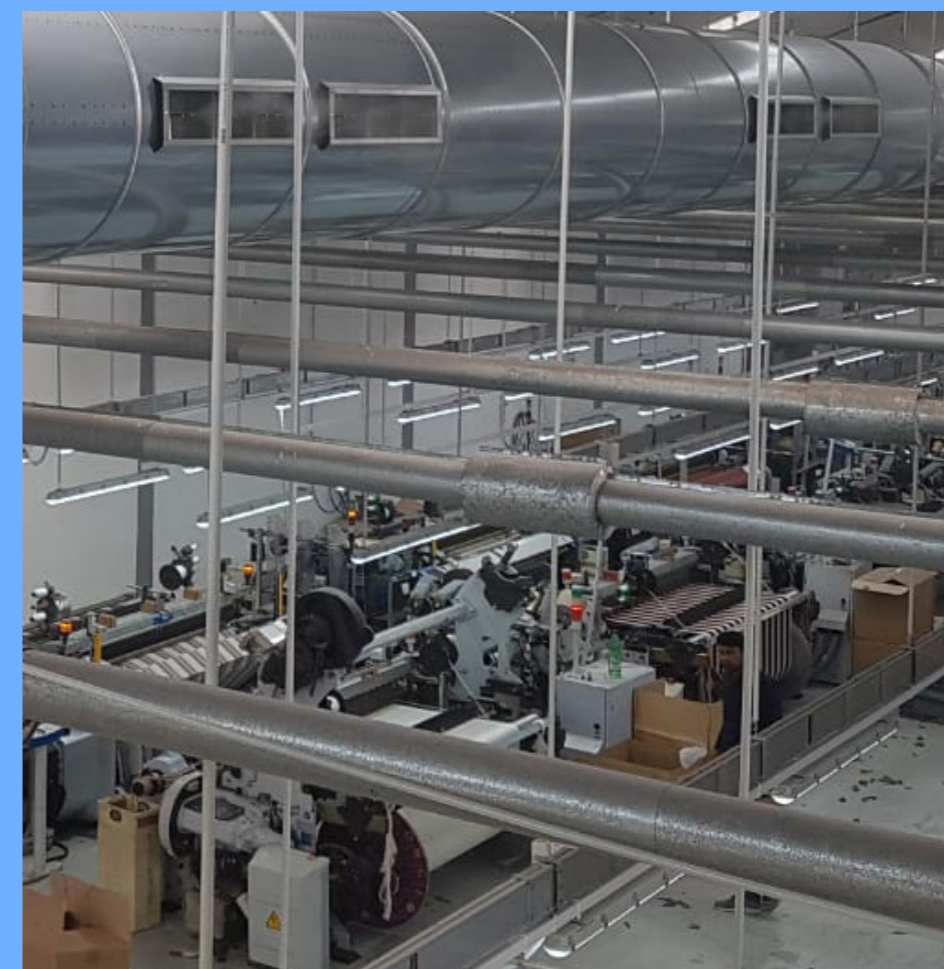


Figure 1. DIGITRON 2.0 Vario software

Thanks to the inductive diffusers, the air capacity moved is ten times more than the real capacity allowing to have the conditions guaranteed not only close by the inductive ducts but in the environment too..

The main advantages of this system, compared to the competitors are:

- elimination of possible proliferation of bacteria and mucilage
- elimination of possible corrosion risks of the components
- elimination of any risk of condensation
- temperature and humidity values homogeneity in all the process and in the treated environment
- total de-stratification especially for high buildings
- total recovery of all the endogenous heat produced in the room (motors, lighting, etc.)
- no obstacles in the room due to no diffusers at floor level, close by the operators and process line
- possibility of introducing directly into the department, air at low temperature, without condensation problems, without creation of fastidious air flow at low temperature
- complete absence of water wasted
- air diffusion system with completely dry ducts
- fewer pipes in the production department

If IHS is the beating heart of the system, the filter unit is the green lung.

UNI EN 13779 is a mandatory regulation that has never received proper consideration in the textile and non-woven aeraulic field. It provides clear guidelines related to the performance requested by all the filtration systems used for cleaning air recirculation. Our VDF16 filtering unit provides the solution.

It is a modular piece of equipment, made up of filtering drums with airflow from inside to outside keeping the filtration chamber clean. Wide filtration surfaces and the efficient regeneration system allow the installation of filter media with filtration efficiency up to ISO 16890 ePM1 85% (ex F9), with a total absence of maintenance up to replacement for normal wear.

VDF16 can be equipped with fibre pre-separation sections or condensers for heavy particles (SAP) and always completed by a ventilating section with automatic stabilisation of the operating pressure.

The brain of IHS is the DIGITRON 2.0 Vario software; an advanced user interface with an open platform that makes the complete system Industry 4.0 ready.

The software, alongside the thermo-hygrometric control of the process and environments, constantly checks the correct operation of filters and motors, stabilises the pressures, verifies the correct execution of the given commands with field feedback allowing the continuous supervision of positions, anomalies and consumption and an immediate reply, correction or adjustment of the system.