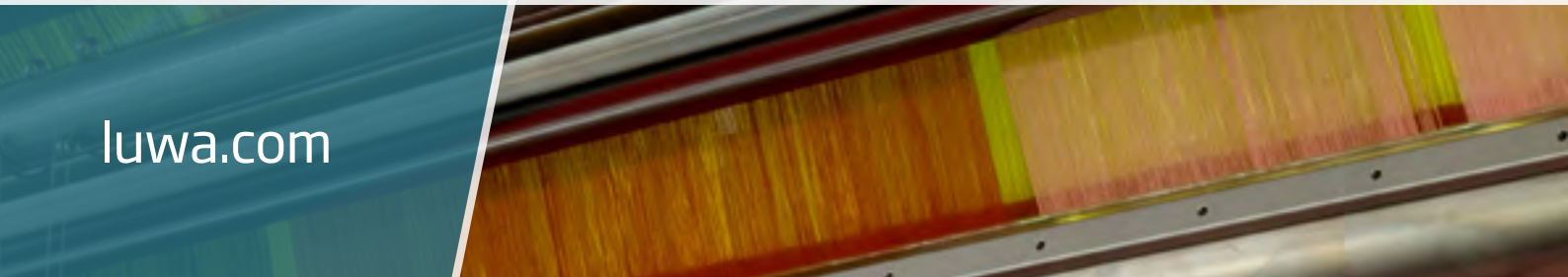
Luwa

Part of the Nederman Group

Weaving Applications

Textile Air Engineering



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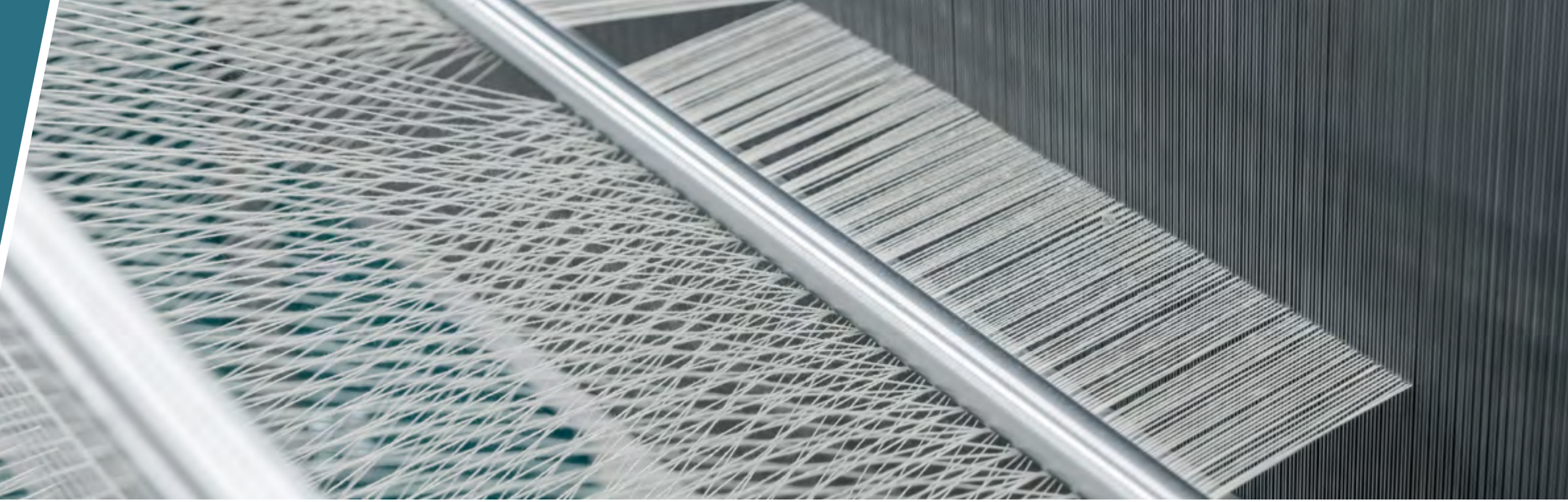


Take control of your Textile Air Engineering

Connected. Clean Air. Performance.

High-performance textile mills have great demands on room climate and process air.
Air engineering plays a vital role in controlling these conditions and providing the necessary climate for machines and processes.

Air engineering requirements:

Humidity | Temperature | Machine Exhaust | Room Cleanliness

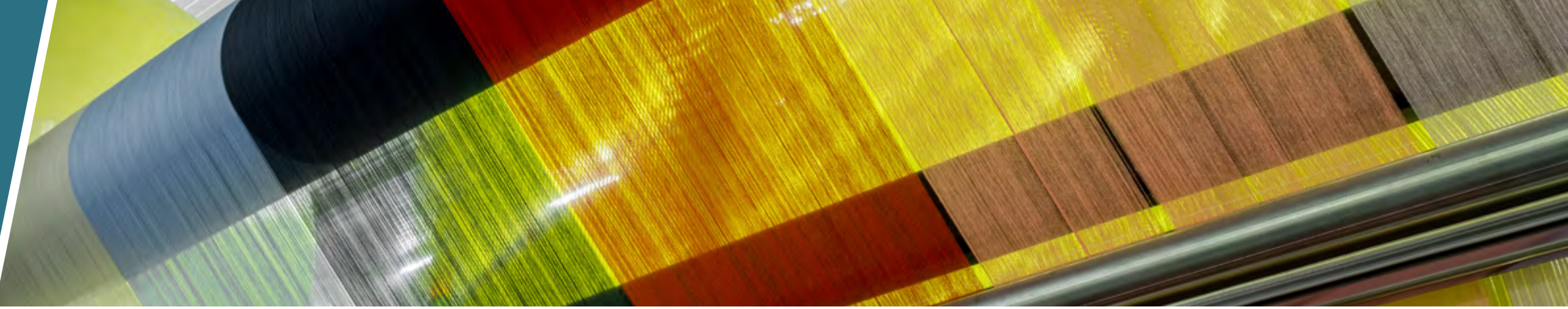
Efficient air engineering is paramount for economical production. Using highest efficiency components in the air conditioning and humidification plant in combination with digital controls, ensure a future proof mill.

Luwa provides Textile Air Engineering for:

- A/C Plant
- Humidification Plant
- Fibre Depositing Plant
- Dust Collection
- Bale Press
- Monitoring and Control
- Overhead Travelling Cleaner
- Ceiling Cleaner Circulaire
- TexGuard Spark Protection
- Vacuum System

Luwa serves the entire textile value chain from the fibre to the textile and related industries.
Air engineering products from Luwa are used in:

- Synthetic Fibre Spinning
- Synthetic Filament Spinning
- Staple Fibre Preparation – Sliver / Web formation
- Ringspinning
- Open End Spinning
- Airjet Spinning
- Textile Lab Air Conditioning
- Yarn and Filament Conversion
- Weaving Preparation
- Weaving, Rapier – Airjet – Waterjet
- Knitting
- Nonwovens Fibre consolidation
- Diaper and Feminine Hygiene Products
- Tyre Cord
- Tyre Building
- Tissue Paper
- Other applications



Key Factors in Textile & Industrial Air Conditioning

Humidity

Maintaining the correct humidity level is essential for smooth machine operation. Moisture reduces electrostatic charges, especially on synthetic fibres. But higher humidity increases lapping and reduces the effectiveness of disentangling and alignment. Also, breaking forces and elongation are directly influenced by the ambient humidity in the department. Optimum values vary depending on the use of the raw material and its mixture. A higher relative humidity will result in a lower room temperature during the evaporative cooling mode.

Temperature

Not all industrial processes are equally sensitive to temperature fluctuations.
For example, quenching air processes are highly sensitive and must be controlled within a narrow range. Other processes such as weaving are moreaccepting of daily temperature fluctuations.
However, all processes prefer a constant temperature, as most fibres and yarns are hydrophilic and the moisture sorption capacity changes with temperature. In addition to reducing count variation, temperature control has a positive effect on

- reduced fibre fly in the mill,
- fewer electronic failures of the machine control system and
- a better working environment for the employees.

Daily room temperature fluctuations can be minimized by using refrigerant cooling instead of evaporative cooling, especially during the summer months and monsoon rains.

Machine Exhaust - Fibre Recovery and Disposal

Most spinning preparation machines have integrated suction points that can be incorporated into a fibre deposit system. The fibre separation and dust filtration plant must be designed in such a way that it can handle the required air volume and also the amount of waste fibre.
Depending on the raw fibres used in the plant, several fibre separators can be installed to separate the different materials from each other.
Modern fibre depositing plants are integrated with bailing press systems to automatically store and bale different qualities of waste fibres. This reduces personnel costs and increases the efficiency of the bale press.
The dependency on the fibre depositing system is essential for the operation of the mill. A standstill of either the fibre depositing plant or the bailing system leads to an immediate shutdown of the entire spinning mill.

Room Cleanliness - Fibre Fly / Dust Contamination

In order to prevent unwanted infiltration of dust from the outside, the mill is kept at constant over-pressure. Depending on the outside air contamination, fresh air filters and, depending on the process requirements, supply air filters are required. Local regulations may set Permissible Exposure Limits (PEL) to protect textile workers from byssinosis. Sufficient air changes throughout the mill are required to dilute the dust levels and keep the departments clean and free of fly liberated from the machines.

Creating the right conditions for optimal loom efficiency

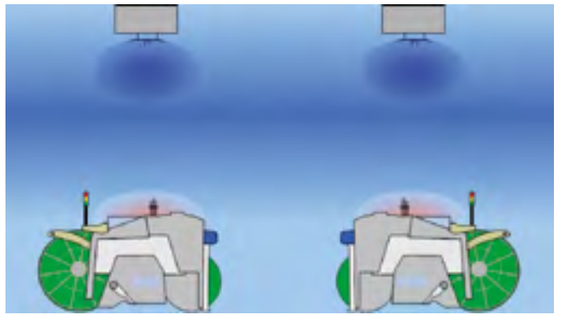
The Loomsphere System unites all requirements

Profit of a weaving mill is driven by weaving machine efficiency.
Weaving machine efficiency is mainly determined by the downtime in the weaving process due to yarn breaks.
The relative humidity of the environment is an important factor in reducing yarn breaks in natural fibres. There is a direct correlation between the yarn parameters, yarn strength and elongation, and the relative ambient humidity in the production room.
Besides conditioning the yarn with air of high relative humidity, keeping the entire weaving area clean is another prerequisite for an efficient weaving process.

- Laminar airflow - clean air is supplied directly into the weaving zone
- Direct conditioning
- High number of air changes only where it is effective
- Low energy consumption

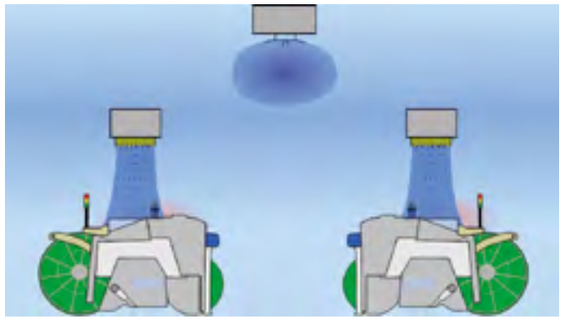
Functionality

The concept is to ensure high air exchange and humidity precisely where it is needed, rather than throughout the production area. The LoomSphere system is a very targeted air conditioning system. The LoomSphere diffuser is installed approx. 800 mm above the weaving loom, as required for the harness and beam change. This arrangement is a result of the high air changes of 80 to 150 per hour required in the weaving area to extract the dust generated in this area. The particularly wide air diffuser with integrated filter creates a laminar air flow that enters the weaving zone without mixing with the dry and dusty ambient air. This laminar airflow concept allows a high humidity of more than 80% at the critical points of the weaving loom.



Conventional system

The entire production room is conditioned to 80% relative humidity. Large supply air volumes are required. The localised heat loads of the looms reduce the relative humidity in the weaving zone to below 70%.

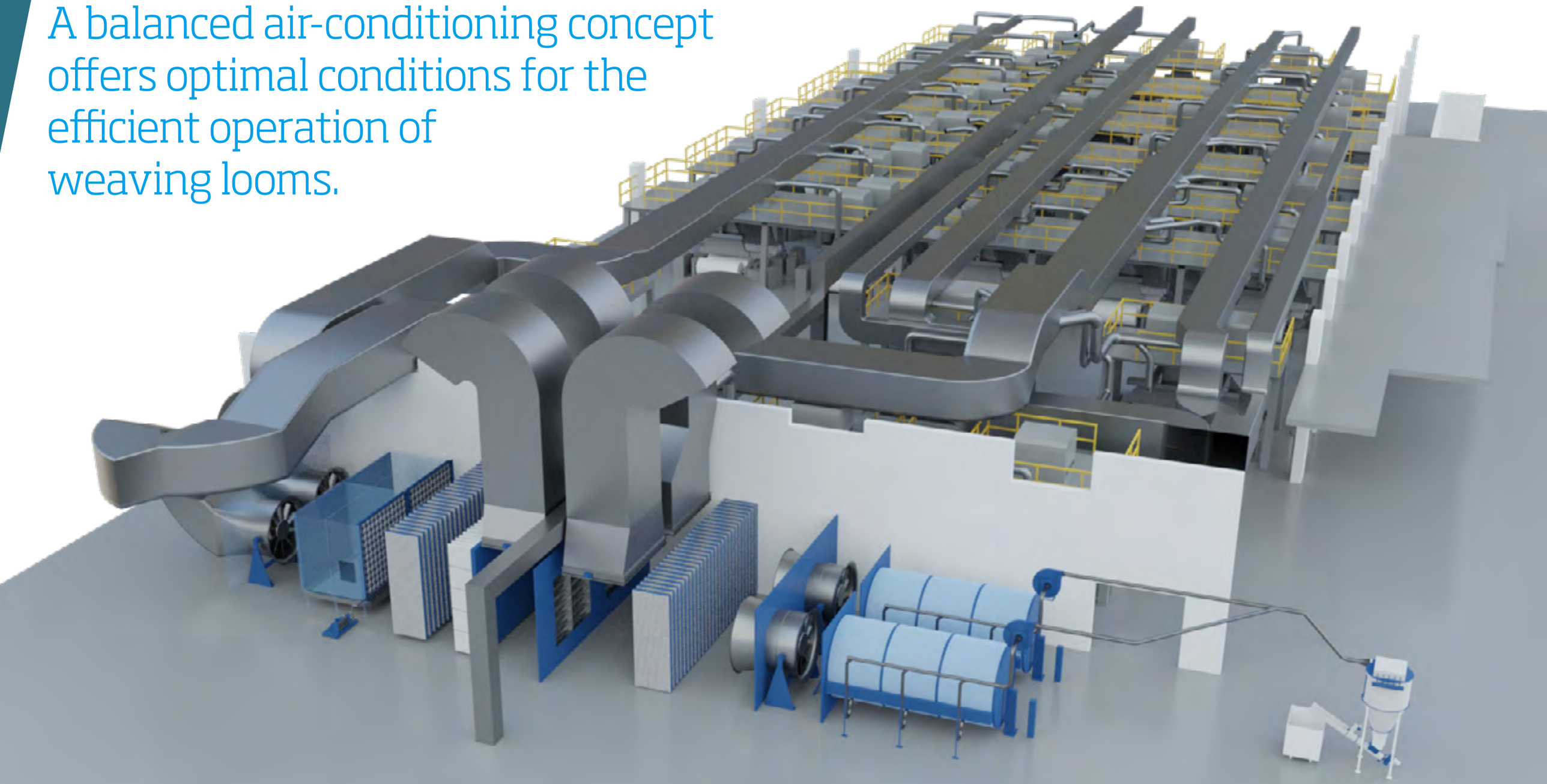


Luwa LoomSphere System

The laminar air supply directly to the loom achieves greater than 80% relative humidity in the weaving zone. The heat load of the weaving loom affects only the ambient room air resulting in a relative humidity in the production room of 65%.

	Conventional System	LoomSphere System
Relative humidity room	80 % rh	65 % rh
Relative humidity at warp	< 70 % rh	> 80 % rh
Air volume of humidification plant	100 %	60 %
Air change room	45 . . . 60 per h	30 . . . 35 per h
Air change at warp level	45 . . . 60 per h	80 . . . 150 per h
Power consumption	100 %	60 %

A balanced air-conditioning concept offers optimal conditions for the efficient operation of weaving looms.



SCAN ME
to watch an animation
of a weaving plant

Process Air Engineering in Weaving Preparation

Importance of Air Engineering

Increased room humidity helps to reduce fibre fly when unwinding the cones and when changing the direction of the yarn on the warping machine. To a lesser extent, this also applies to ball warping and long chain beaming.
High-speed warping machines create a draft of air from the creel to the warping machine. Skillfully placed return air slots in combination with a warper hood reduce fibre fly in the section.

Economy

- Air Flow from 20,000m³/h to 600,000m³/h per AHU
- Variable Air Flow control

Flexibility

- Designs for Indoor and Outdoor installation
- AIr handling unit in modular design
- Components according to process requirement

Luwa Process Support

- Humidity
- Fibre Fly

Main System Components

- Axial Flow Fans
- Air Washer
- Rotary Air Filter
- Air Control Dampers

Textile Air Engineering in Weaving Rapier / Airjet / Waterjet

Importance of Air Engineering

Increased yarn strength improves weaving efficiency. This is achieved when weaving cotton with a high humidity of up to 80% relative humidity. Other fibres, such as viscose, require lower humidity or, like polyester fabrics, moisture to reduce static charge.
High air exchange over the weaving machine is desirable to reduce fly release in the department. Temperature control is used to protect the machines and electronics.

Economy

- Loomsphere System for Energy saving and increased air change across Loom
- Air Flow from 20,000m³/h to 600,000m³/h per AHU
- Variable Air Flow control

Flexibility

- Designs for Indoor and Outdoor installation
- AIr handling unit in modular design
- Components according to process requirement

Luwa Process Support

- Yarn strength
- Humidity
- Temperature
- Loomsphere

Main System Components

- Axial Flow Fans
- Air Washer
- Rotary Air Filter
- Air Control Dampers

Luwa Air Engineering, founded in Switzerland in 1935, is a global market leader in textile air engineering and a quality and performance leader with a global brand in the fibre and textile industry. Luwa has been part of the Nederman Group since 2018. The Luwa Group's activities include the design and engineering of single components and whole systems as well as manufacturing, assembly, installation and after sales services. With subsidiaries in China, India, Singapore, US and Turkey, the group has a significant global installed base that is the source of Luwa's deep understanding of the technical demands as well as the local requirements of customers.

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