Luwa

SWISS TEXTILE MACHINERY SEMINAR

April 25 - 26, 2016

Hotel Simorgh, Theran

By: Peter Fallegger – Regional Sales Manager

Swiss Quality
Air Engineering
Worldwide. Since 1935.

Luwa‘s History in Short

History

First Luwa office in Zürich

Newspaper Advertisement in 1940

New company premises in Inda

1935 Formation of Luwa AG

Worldwide expansion

Setup of various business areas

1993 Merging of Zellweger AG und Luwa AG to Zellweger Luwa AG

2004/6 Splitting of the Zellweger Luwa AG and selling in individual companies.
Formation of Luwa Air Engineering AG

2007 Acquisition of Luwa Air Engineering AG by Grünwald Equity GmbH, Munich

2016

Hans C. and Walter A. Bechtler

Luwa office in Zürich until 1998

Since 1998 in Uster

Luwa - Worldwide

Luwa Group

Luwa Air Engineering AG
Group Management, Uster (4)

Luwa Switzerland	Luwa Singapore	Luwa India	Luwa China	Luwa Turkey	Luwa USA
Uster (51)	Singapore (12)	Bangalore (130)	Shanghai (130)	Istanbul (15)	Greensboro (4)

Luwa Switzerland:
- Established 1935
- Headquarter Luwa Group
- Support to Group companies
- R&D department
- Sales and service office for Europe, Russia, Africa and South America
- Manufacturing of some Luwa products
- Sourcing, Spare parts, Logistic

Luwa Singapore
- Established 1965
- Sales and service office for Asia except India and China

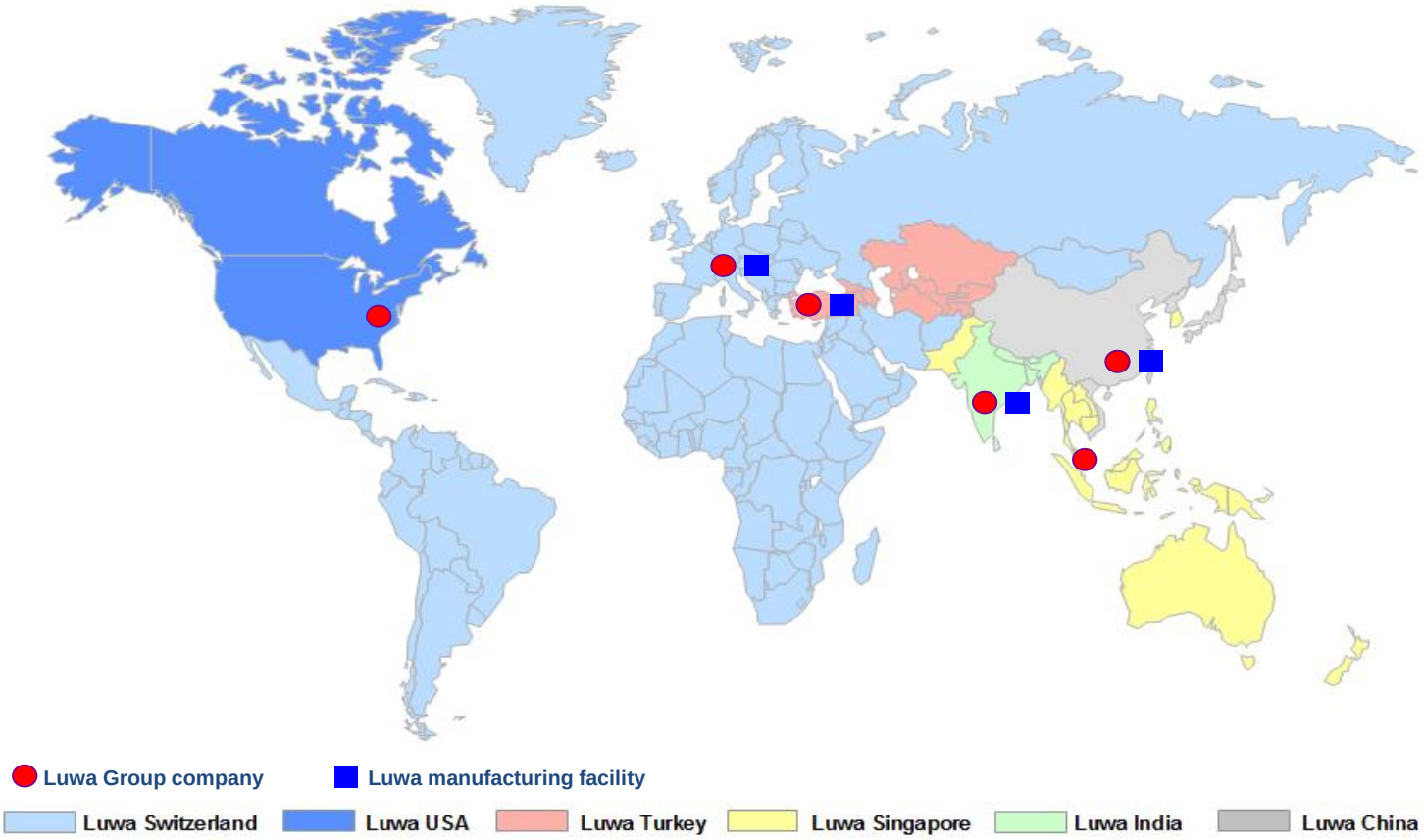
Luwa India
- Established 1993
- Located in Bangalore (construction of new factory/office in 2015)
- Full service setup for India
- Sales and service office in New Delhi and Ahmedabad
- Manufacturing of entire range of Luwa products
- Sourcing, Spare parts, Logistic

Luwa China
- Established 1997
- Located at the outskirt of Shanghai
- Full service setup for China
- Manufacturing of entire range of Luwa products
- Sourcing, Spare parts, Logistic

Luwa Turkey
- Established 2013
- Located in Istanbul
- Sales, engineering, sourcing and service for Turkey and surrounding countries
- Manufacturing of some Luwa products
- Sourcing, Spare parts, Logistic

Luwa USA
- Established 2014
- Located in Greensboro
- Sales, engineering, sourcing and service for USA & Canada
- Manufacturing of some Luwa products (planed)
- Sourcing, Spare parts, Logistic

Locations


Luwa Group company
Luwa manufacturing facility
Luwa Switzerland
Luwa USA
Luwa Turkey
Luwa Singapore
Luwa India
Luwa China

Luwa in Iran

Representative in Iran since more than **10 years**:

SPINTEX

Tehran, Iran

Luwa‘s Business

Business Areas

1.) Textile Air Engineering

Spinning, Weaving, Knitting, Technical Textiles

- very narrow control of rel. humidity
- direct influence of machine efficiency from Air Engineering system
- high requirements of dust filtration
- worldwide market and technology leader

2.) Process Air Conditioning

Synthetic Fibers, Technical Textiles Nonwovens

- very narrow control of humidity (± 2 %rh) temperature (± 0.5 ºC) and pressure (± 1%)
- high capacity AHU's (air volume, pressure)
- very high plant dependability required

Business Areas

3.) Industrial Air Engineering

Automobile, Tyre, Food, Manufacturing, Power, Paper, Leather

- customized engineering, considering industry requirements
- turnkey projects
- industrial type AHU's and equipment
- know how in different industries

4.) Heat Recovery and Exhaust Air Cleaning Systems

Textile Processing, Ceramics, Tyre Cord

- heat exchanger for industrial applications
- short Return of Investment (< 2 years)
- know how to handle contaminated exhaust air
- customized solutions for optimized energy recovery
- Certificate for CO_2 reduction

Main Reasons

Customized System Solution

and

Design

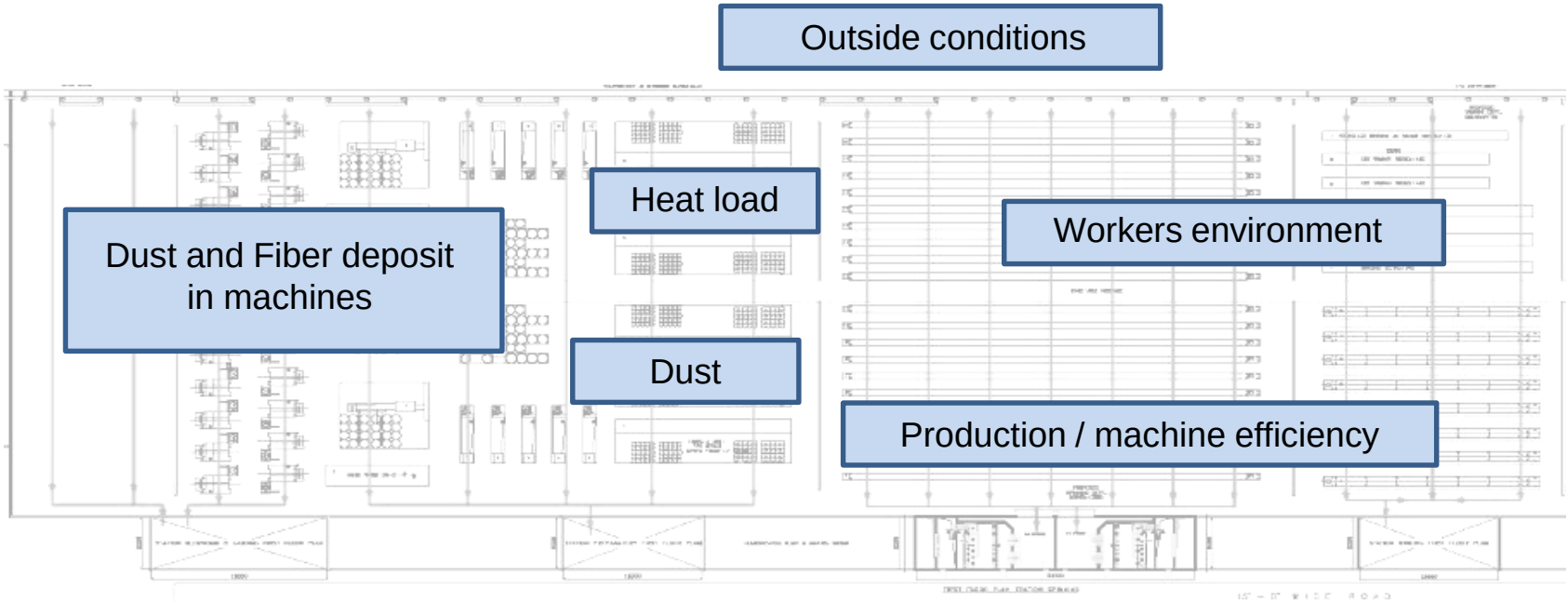
are key factors for:

→ Proper plant performance

→ Optimized energy consumption

→ Optimized and integrated civil work

Requirements of AC Stations



Provide:

- Controlled and constant relative humidity
- Setpoint +/- 2.5% MAX
- Broad coverage over all production areas

Importance of Climatic Conditioning

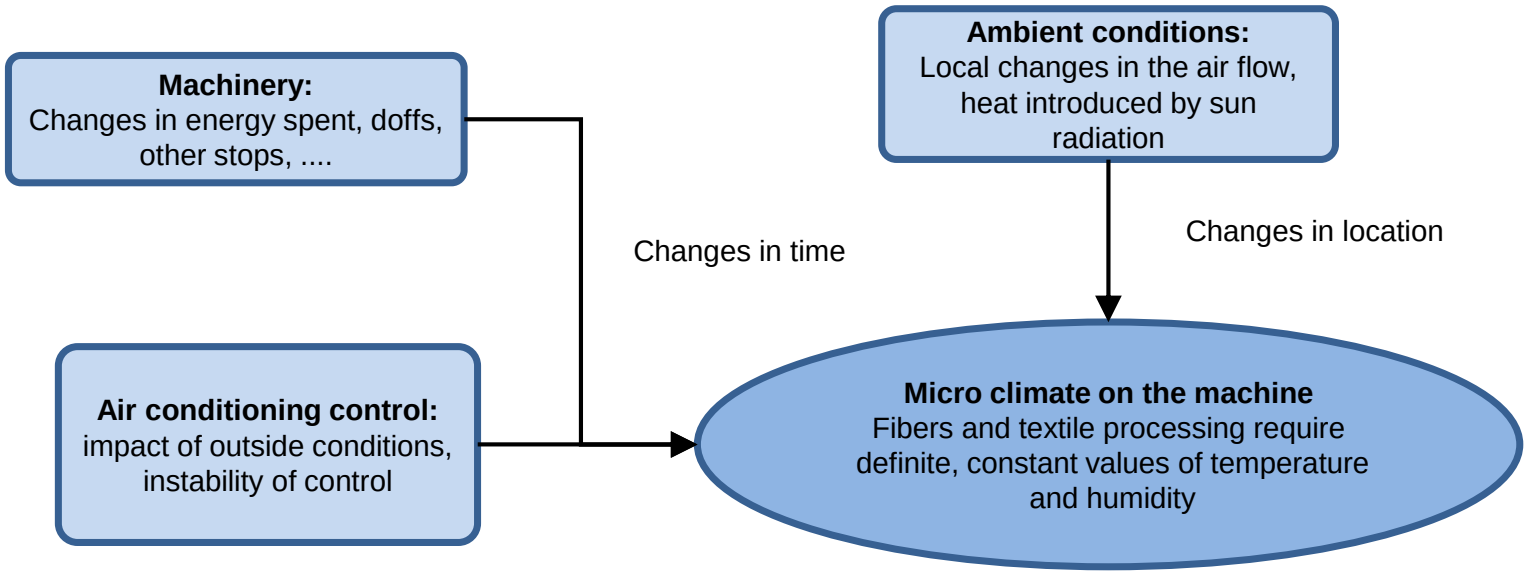
- **Temperature**
  - Lapping
  - Comfort and health of labor

- **Humidity**
  - Testing accuracy
  - Braking force
  - Braking elongation
  - Electrostatic charge

- **Fiber Fly**
  - Failure rate
  - Imperfections
  - Maintenance cost

Factors Influencing the Fiber Behaviour

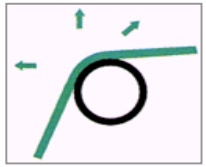
The Micro Climate

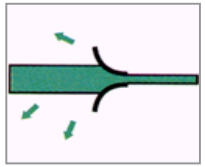


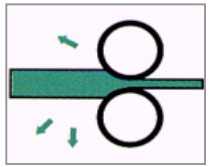
The Spinning Process

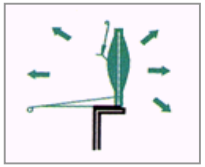
	Too **high** humidity	Too **low** humidity
Indications	- visible fog - water dripping off air ducts - sticking fibers	- poor cohesion of fibers - brittleness of fibers - excessive build-up of fly and dust
Consequences	- top rollers lapping - cleaner rollers accumulating short fibers - deposits of dust on fiber guiding elements	- static electricity - contamination of yarn by foreign fibers - generation of neps

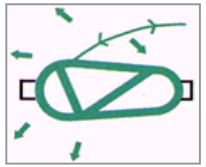
Dust Generation Explained

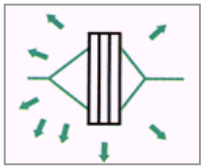

Re-directing

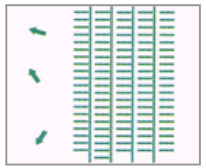

Converting

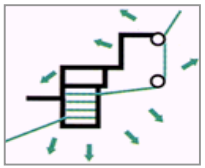

Roving

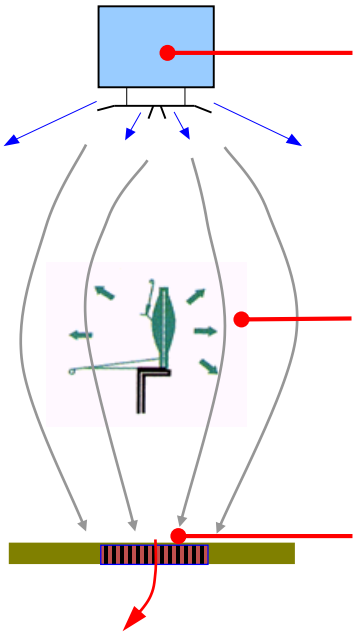

Ringspinning


Winding


Warping


Weaving and Knitting


Fill feeding



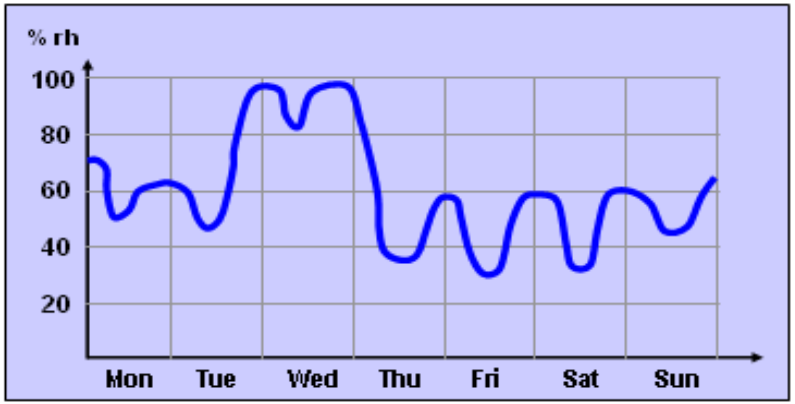
Design of supply air system
- low induction diffusers
- uniform conditions

- sufficient air changes

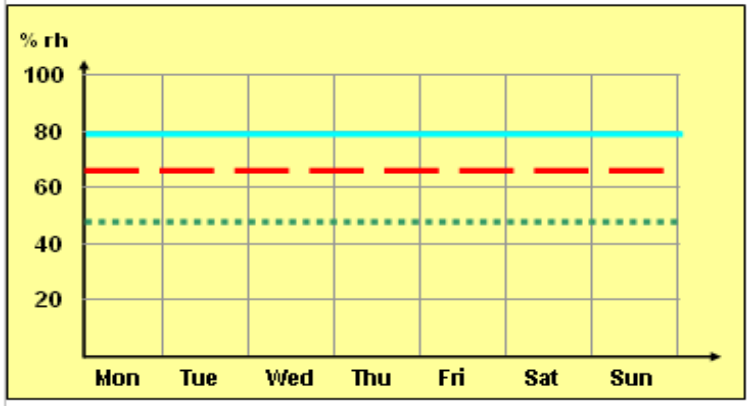
Design of return air system
- uniform suction

Getting Independend from Outside Conditions

Typical outside condition

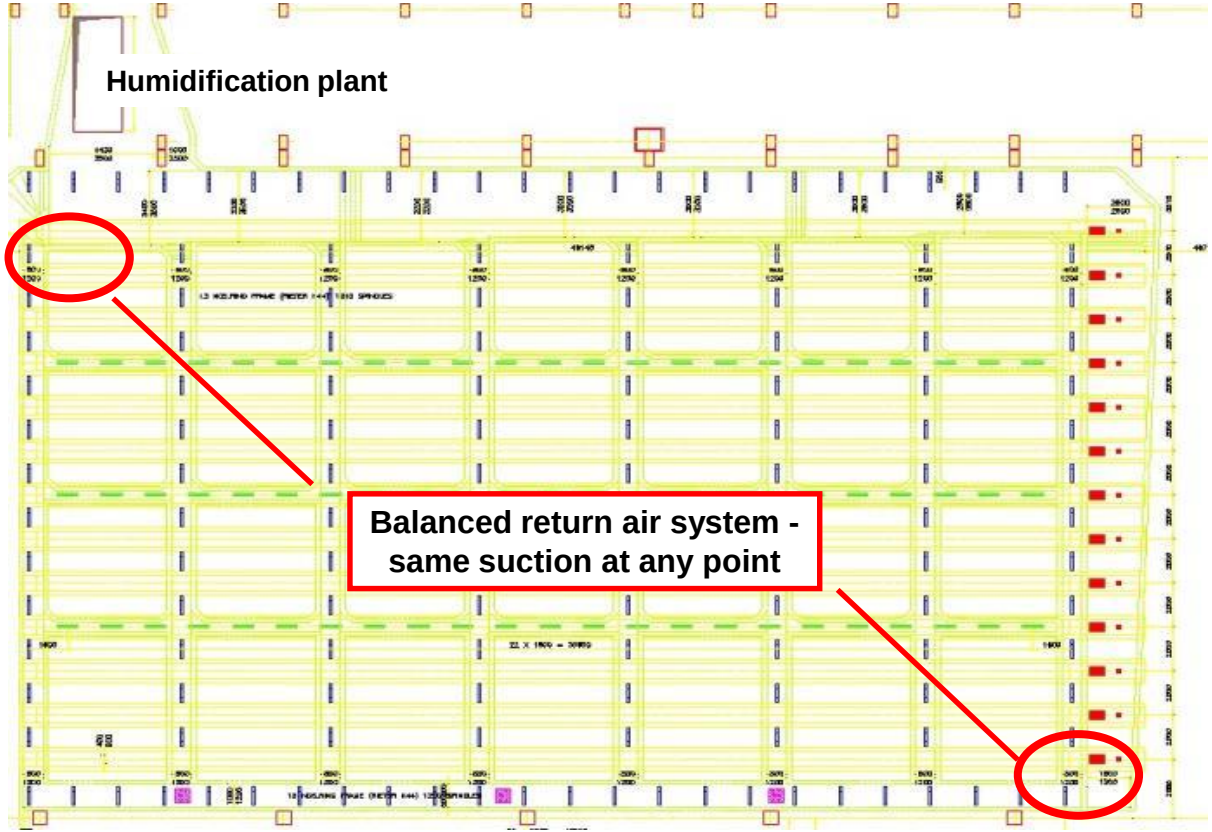


Required room conditions

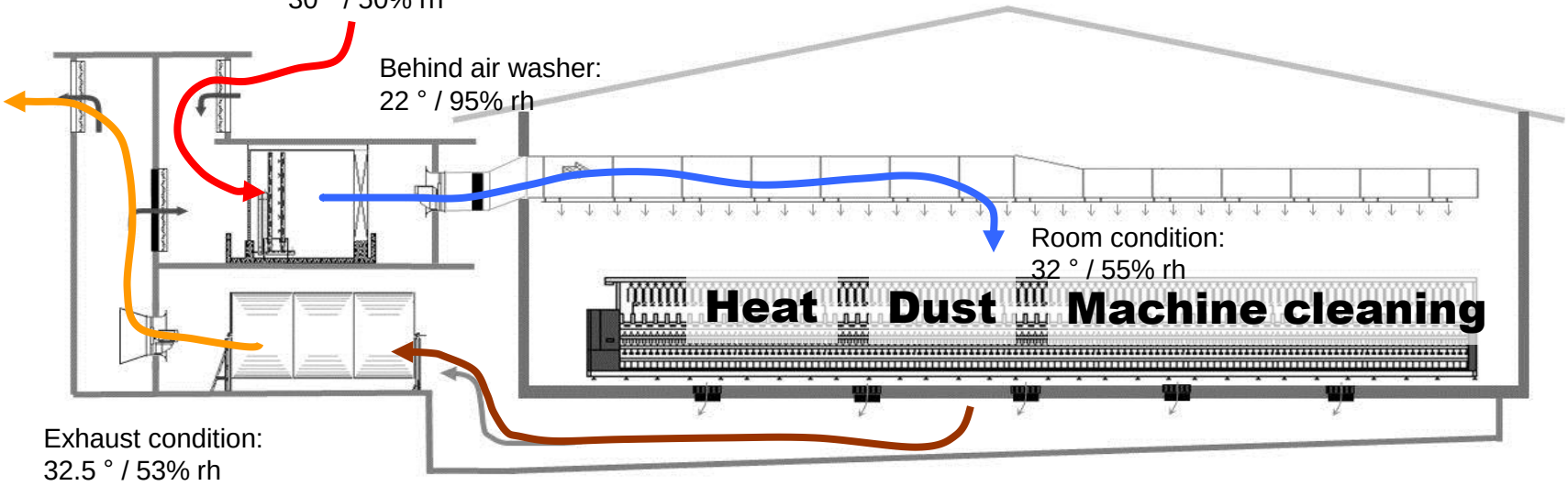


± 2.5 % rh

Balanced Systems



Adiabatic Cooling



Special Energy Saving Solutions

RotorSphere for Rotor Spinning

Optimised air circulation

Luwa

Dust & Waste
Collecting Systems

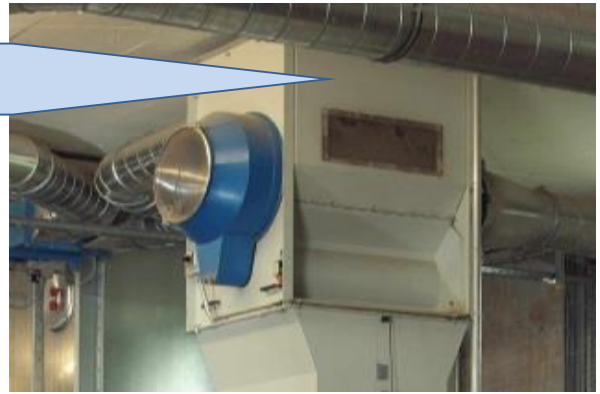
Swiss Quality
Air Engineering
Worldwide. Since 1935.

Prefabricated Compact Filter Unit

- No masonry on site
- Quick installation
- Compact system

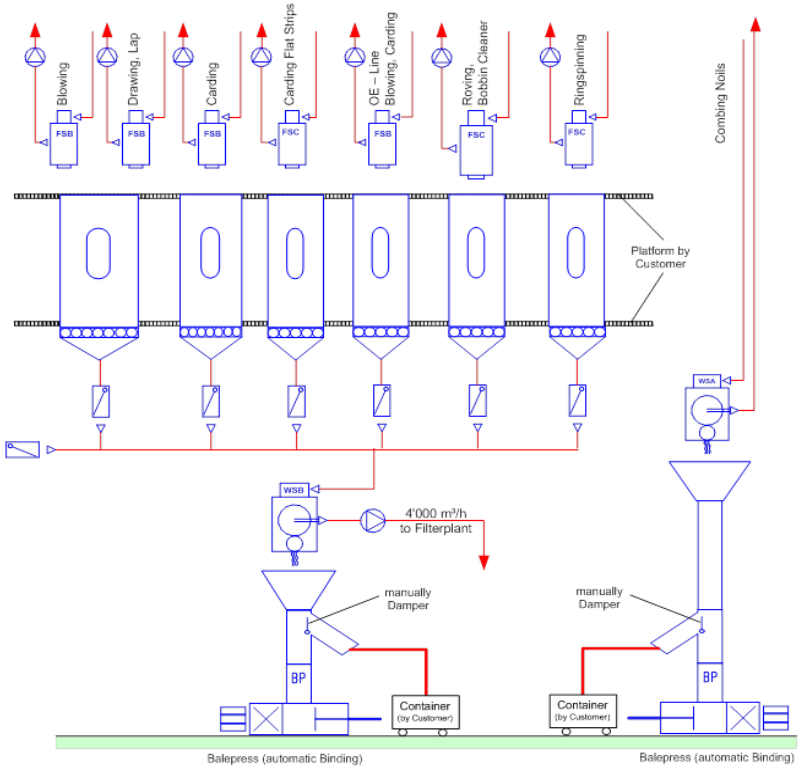
For small air volume

WSA / WSB: up to 4.4 m3/s and 450kg/h



FSB / FSC: up to 2.2 m3/s and 100kg/h

Bale Press System with Silos



Legend

- Shutoff damper
- Wasteseparator
- Material Handling Fan
- Balepress
- Silo with built-in service Door
- Waste Conveying Unit

Bale-Press Plant

09-06-2015 / hzg

Bale Press System with Silos

Bale Press: Type PACOMAT for Automatic Bale Binding

Bale Press: Type PHH for Manual Bale Binding

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Weaving Process

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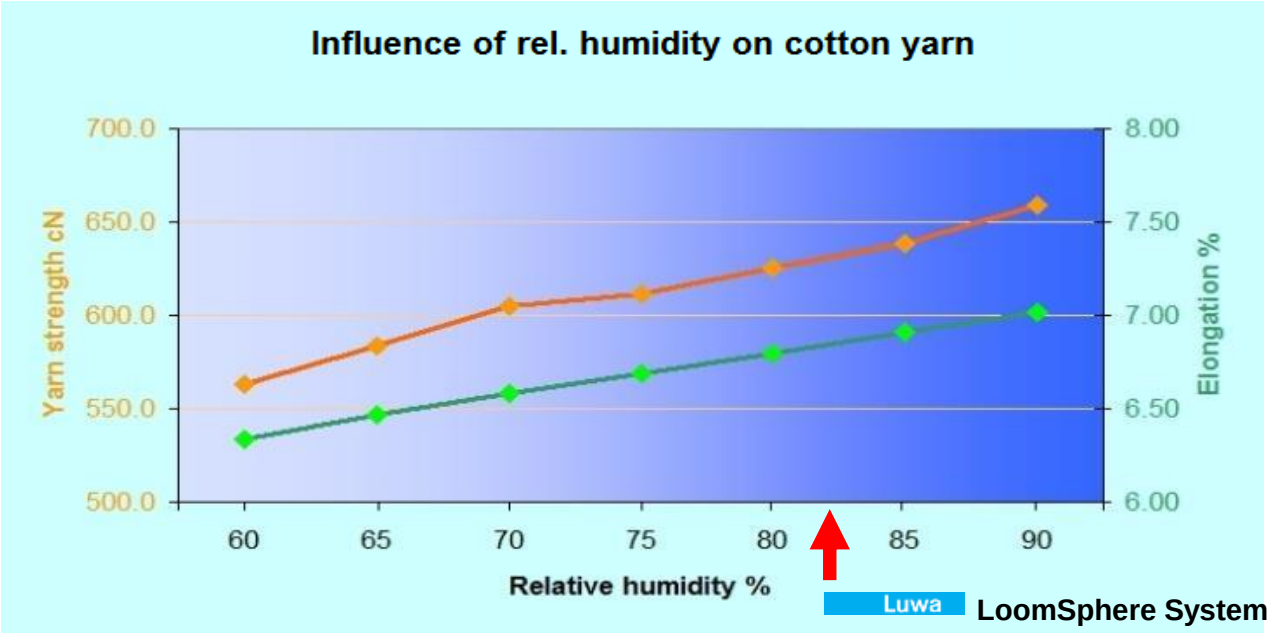
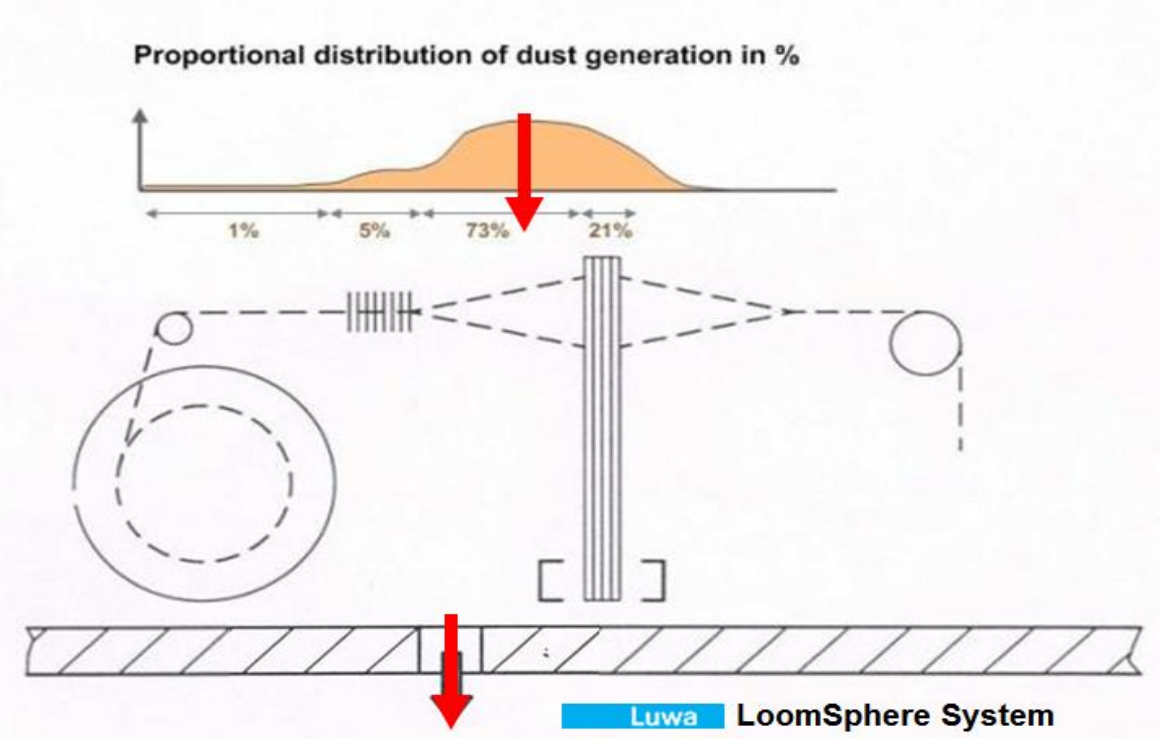
Weaving Process



Benefit of high relative humidity of cotton yarn in weaving process

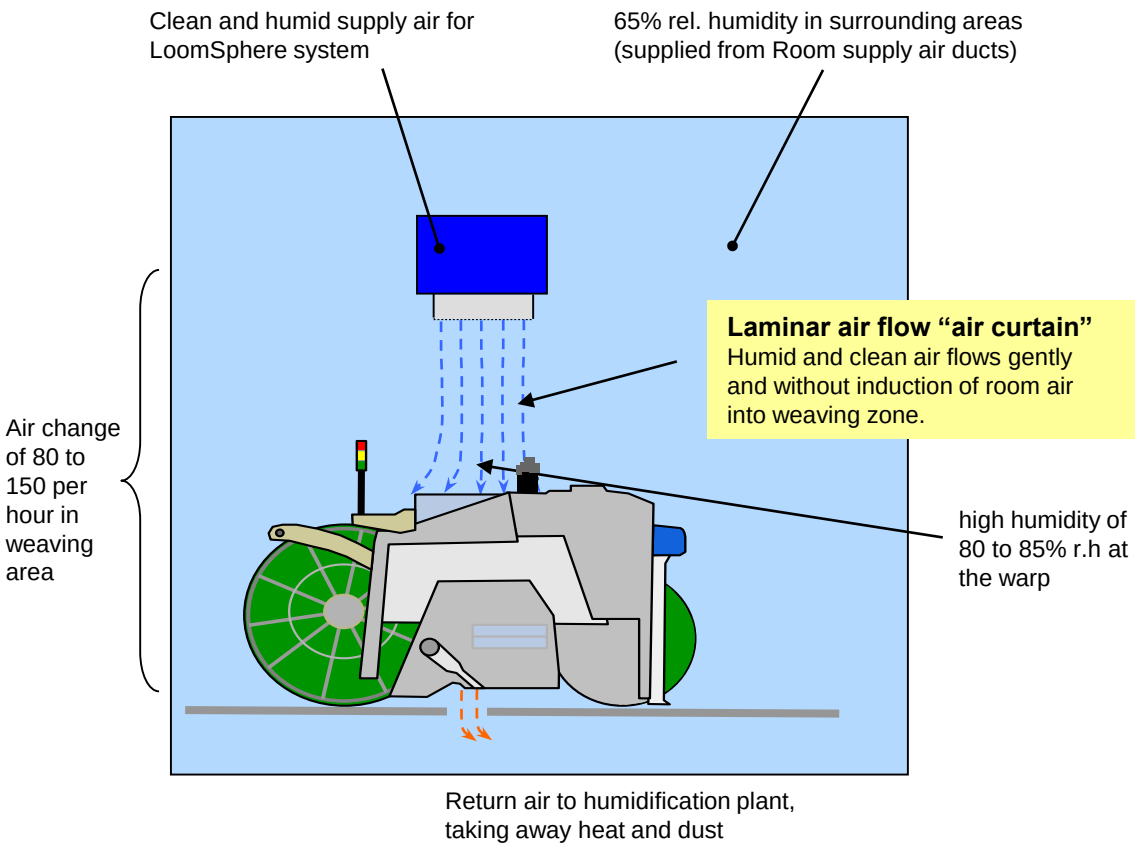
- increased elongation
- increased yarn strength
- smoothen the yarn surface

Weaving Process



Abrasion between yarns, mainly in the shed area, removes short fibers and size dust from the warp yarn

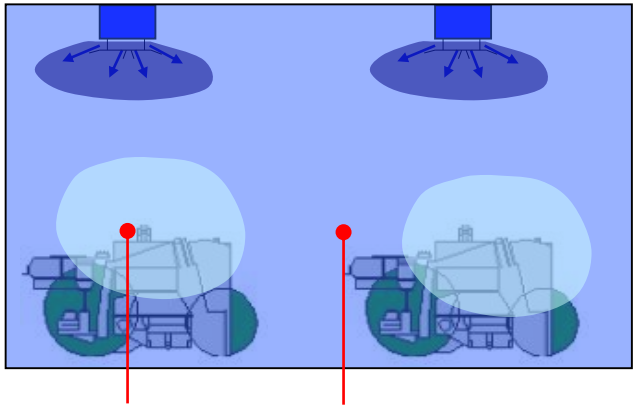
Weaving process



Laminar air flow of Loomsphere, demonstrated by smoke

Conventional vs LoomSphere System

Conventional system

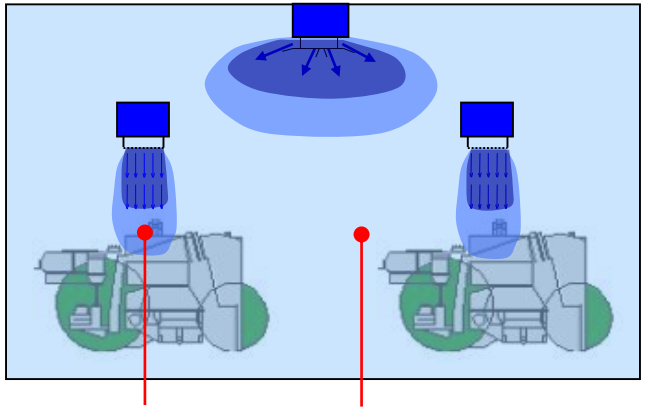


65-70% rel. humidity at the warp

75-80% rel. humidity in the room

Humidity in the room: 75 % rh
Supply air volume: 323,000 m^3/h
Consumed power: **139 KW**

LoomSphere system



75-80% rel. humidity at the warp

65% rel. humidity in the room

Humidity in the room: 65 % rh
Supply air volume: 185,000 m^3/h
Consumed power: **85 KW**

Energy saving (Example):

Operating hours: 8,000 h / year
Energy costs: Euro cents 0.05 / kW

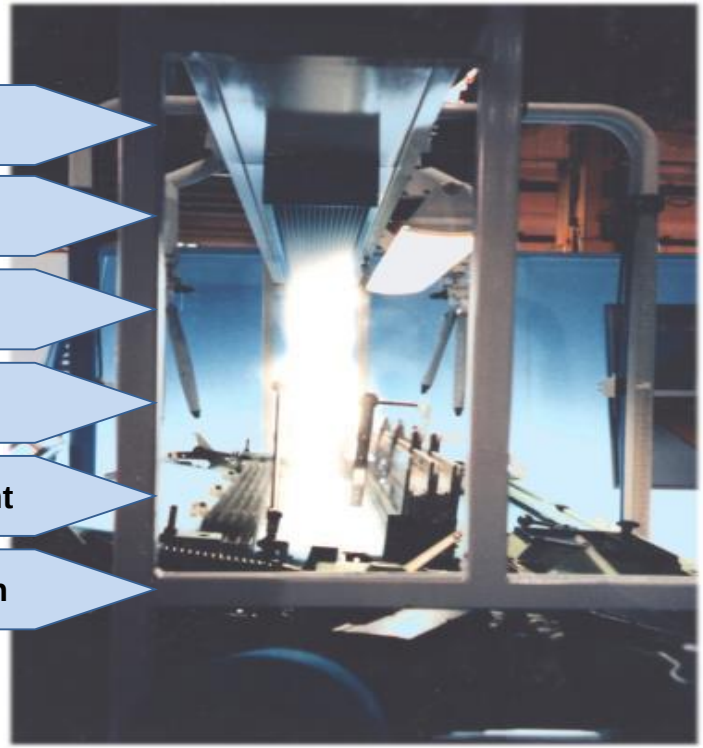
Difference in energy consumption: 139 KW - 85 KW = 54 KW
Energy saving per year: 8,000h x 54 KW = 432,000 KWh

Cost saving per year: 432,000 Kwh x 0.05 = **21'600.- per year**

Weaving process

LoomSphere® and Loom TRAVCLEAN®

- High humidity
- Laminar air low
- Low induction
- Low air volume
- Low energy requirement
- Low water consumption



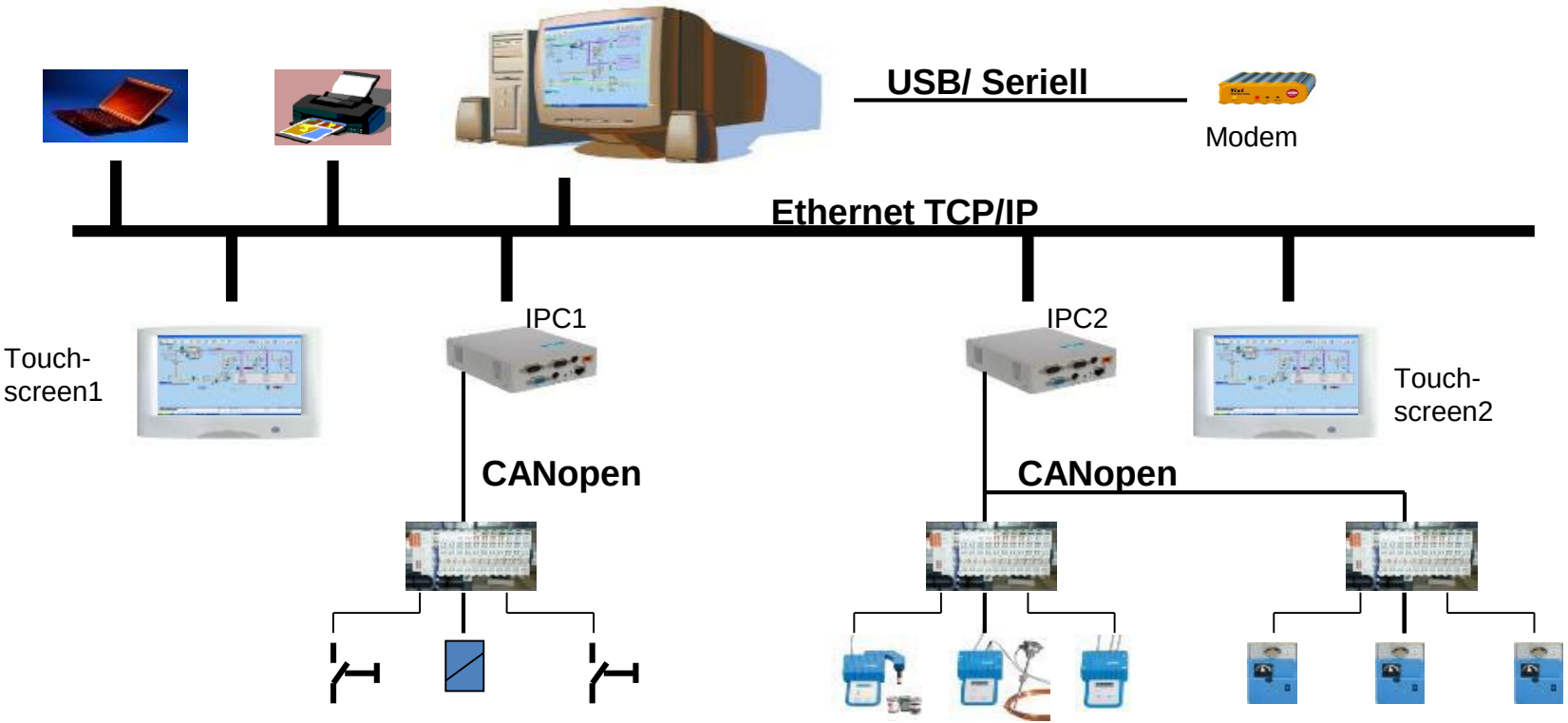
High cleaning efficiency

Luwa‘s Digi5

DIGI 5 CONTROL

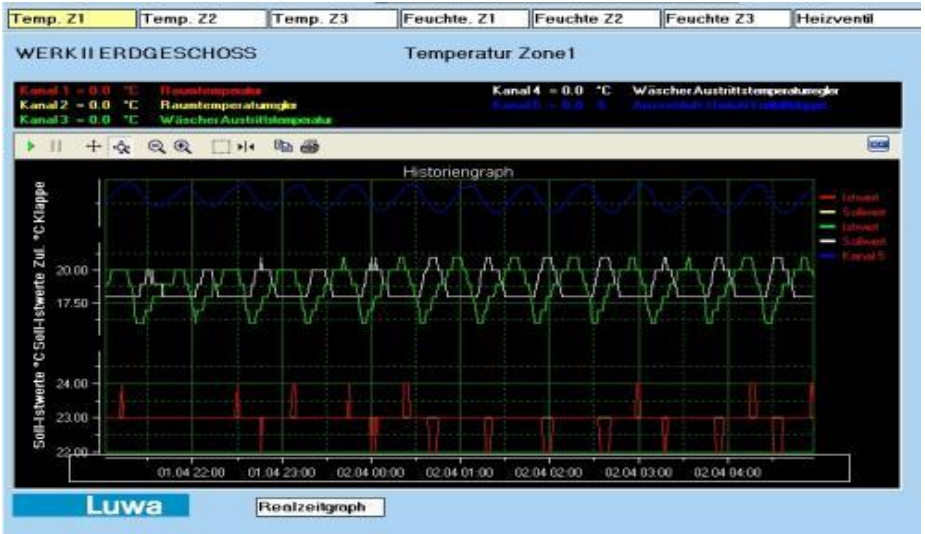
Swiss Quality
Air Engineering
Worldwide. Since 1935.

Overview

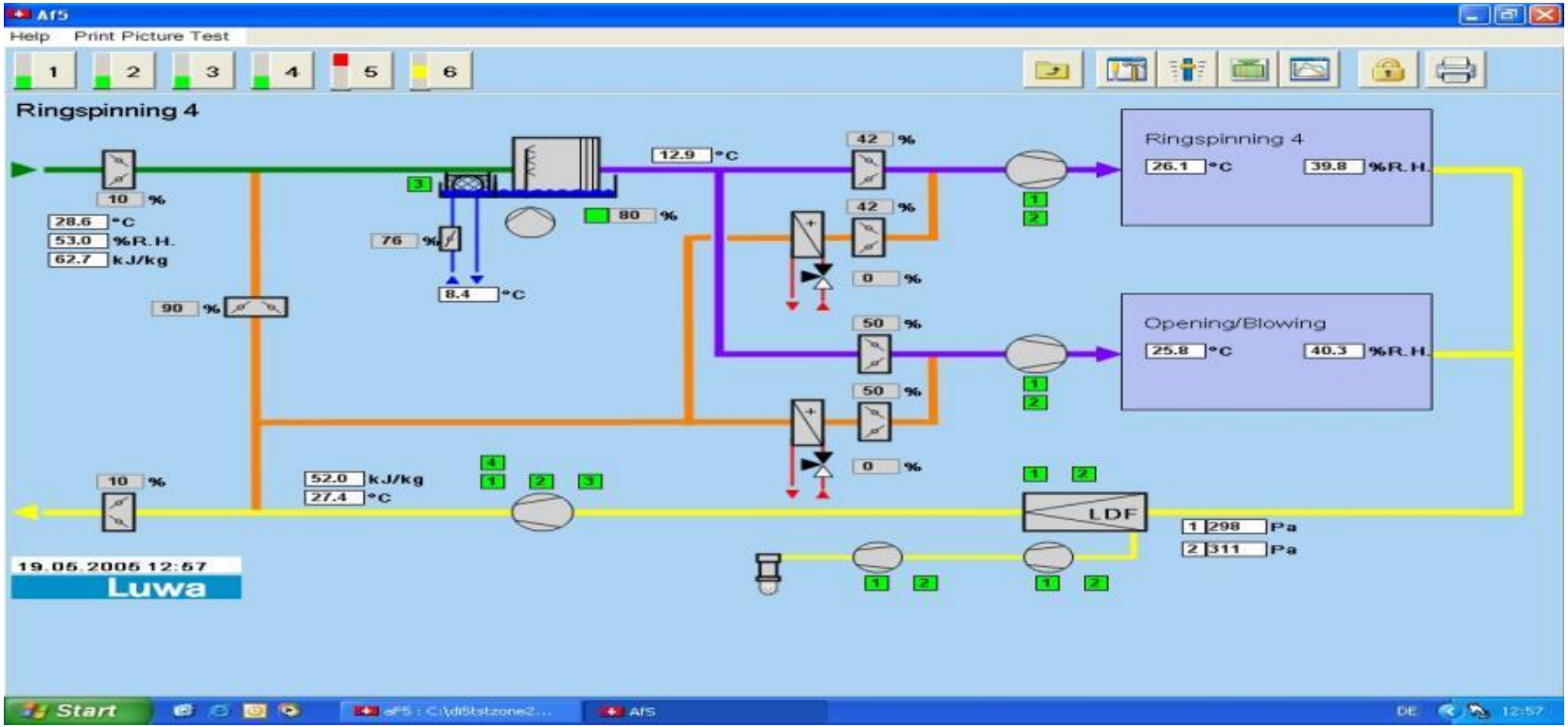

USB/ Seriell
Modem
Ethernet TCP/IP
Touch-
screen1
IPC1
IPC2
Touch-
screen2
CANopen
CANopen

Graphs


Luwa


Temp. Z1
Temp. Z2
Temp. Z3
Feuchte. Z1
Feuchte Z2
Feuchte Z3
Heizventil
WERK II ERDGESCHOSS
Temperatur Zone1
Historiengraph
Soll-Istwerte °C Soll-Istwerte Zul. °C Klappe
20.00
17.50
24.00
23.00
22.00
01.04 22:00
01.04 23:00
02.04 00:00
02.04 01:00
02.04 02:00
02.04 03:00
02.04 04:00
Luwa
Realzeitgraph

Navigation


AF5
Help
Print Picture Test
1
2
3
4
5
6
Ringspinning 4
10 %
28.6 °C
53.0 %R.H.
62.7 kJ/kg
90 %
76 %
8.4 °C
12.9 °C
80 %
42 %
42 %
0 %
50 %
50 %
0 %
Ringspinning 4
26.1 °C
39.8 %R.H.
Opening/Blowing
25.8 °C
40.3 %R.H.
10 %
52.0 kJ/kg
27.4 °C
LDF
1 298 Pa
2 311 Pa
19.05.2005 12:57
Luwa
Start
AF5
DE
12:57

Sensors

Only precise and high quality industrial sensors are used

T = +/- 0.2°C
rH = +/- 0.5%

HTT-V

DPGT-V

TT-V

Thank you for your attention!