Advanced low temperature particle and strand drying

2018 PANEL & ENGINEERED LUMBER INTERNATIONAL CONFERENCE & EXPO™

stela® drying technology

Dipl.-Ing.(Fh)/M.Sc. Yves-Marc Schade
at Panel & Engineered Lumber International Conference & Expo
CNN Center, Atlanta, 2018

Who I am

M.Sc./Dipl.-Ing. (Fh) Yves-Marc Schade

- University of Applied Sciences Rosenheim
  Wood technology engineering
  (1996-2000)
- Technical University Munich (TUM)
  Master of Science Sustainable Resource Management
  (2003-2005)
- more than 15 years experience in the field of
  industrial drying systems, specialized in biomass & timber drying and usage of renewable energy
- nearly 10 years working for stela
  product management
  industrial drying systems

Who we are

unique customers, individual solutions

- family business in its third generation
- head office & manufacturing in Massing, Germany (Bavaria)
- approx. 170 qualified employees, including 23 trainees
- development, planning, design, manufacturing and service of drying equipment
- high in-house production depth
- more than 4000 installed drying plants in more than 60 countries all over the world

The basics

good to have heard about

- **Convective heat transfer**

often simply referred to convection, is the transfer of heat from one place to another by the movement of fluids. Convection is usually the dominant form of heat transfer (convection) in liquids and gases. […]

[https://en.wikipedia.org/wiki/Convective_heat_transfer]

- **Mr. Mollier‘s h-x diagram**

Richard Mollier (30 November 1863, Triest – 13 March 1935, Dresden) was a German professor of Applied Physics and Mechanics in Göttingen and Dresden, a pioneer of experimental research in thermodynamics, particularly for water, steam and moist air.

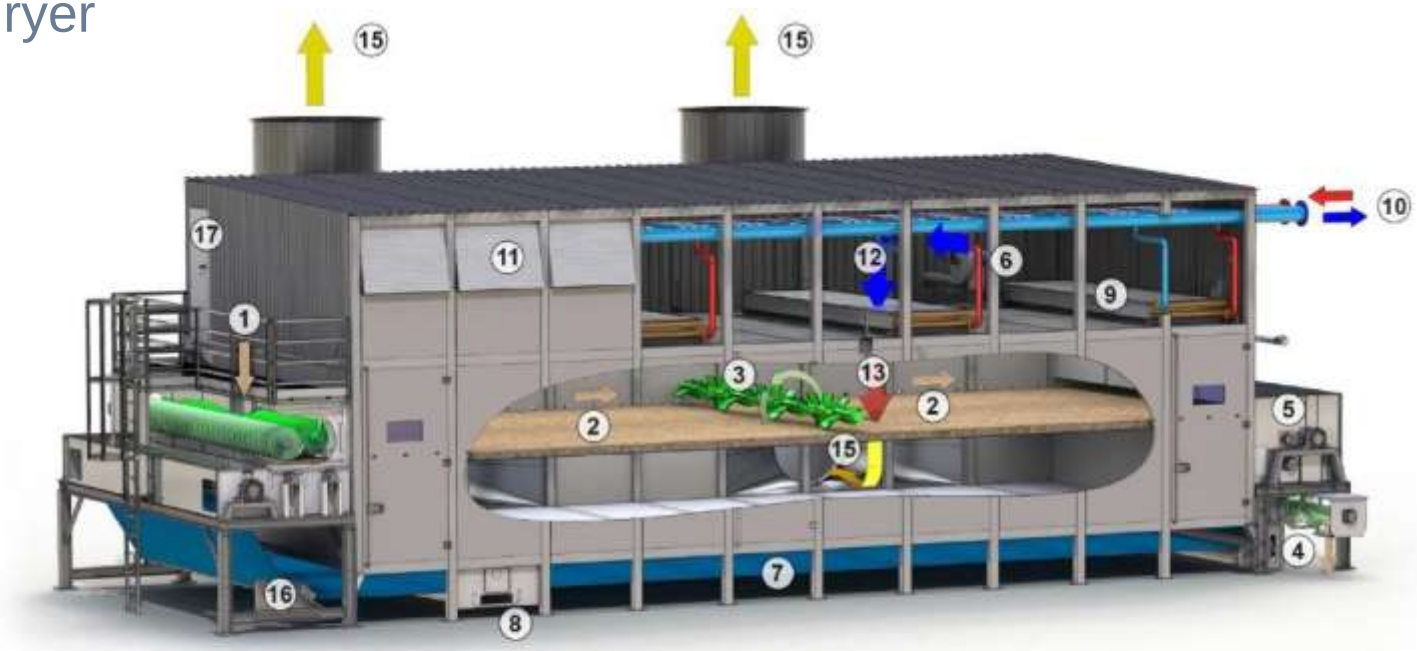
Mollier diagrams (enthalpy-entropy charts) are routinely used by engineers in the design work associated with power plants (fossil or nuclear), compressors, steam turbines, refrigeration systems, and air conditioning equipment to visualize the working cycles of thermodynamic systems.

The Mollier diagram (h-s chart) of enthalpy of moist air versus its water vapour content (h–x diagram) is equivalent to the Psychometrics Chart commonly used in the US and UK.

[https://en.wikipedia.org/wiki/Richard_Mollier]

The basics

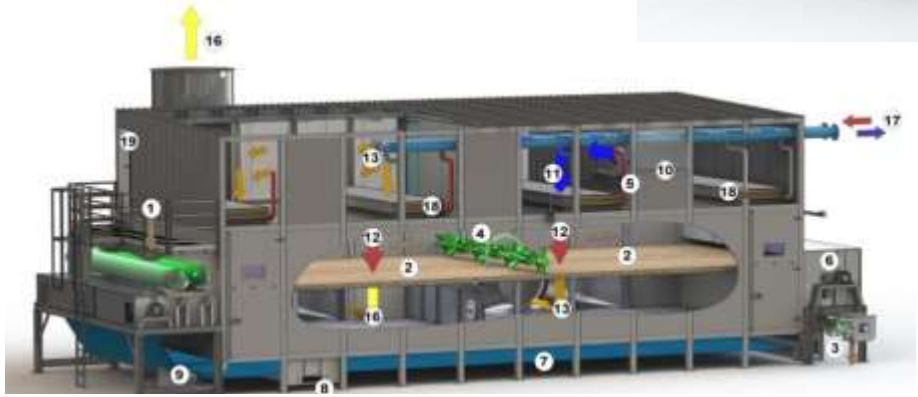
classic belt dryer



1 = Feeding station
2 = Product layer
3 = Turning device
4 = Discharge screw
5 = Belt cleaning system (dry)
6 = Fan for belt cleaning system
7 = Web belt
8 = Belt cleaning system (wet)
9 = Heat exchanger
10 = Heat supply
11 = Fresh air intake
12 = Fresh air
13 = Drying air
14 = Exhaust air fan
15 = Exhaus air
16 = Belt alignment
17 = Access door housing

The basics

recirculation belt dryer



Operational principal

Standard belt dryer BT

Heat recovery system BTU Recu Dry®

- Foundation
- Air technology
- Web belt
- Sprinkler system
- Construction
- Housing
- Doors
- Product layer
- Turning device
- Belt cleaning system (dry)
- Belt cleaning system (wet)
- Heat exchanger
- Air flow
- Anti-freeze protection
- Image composition

Key figures & features

energy

- specific heat demand — 0,90 – 1,10 MW/ to evaporation
- specific electrical demand — 20 – 30 kW / to evaporation
- working with waste heat (eg. steam turbine, ORC)

safety

- indirect heating systems — water or steam based
- low process temperatures — NO risk of fire or explosion

emissions

- dust emissions — < 10 mg/Nm³ without additional filters no
- VOC — RTO and/or WESP needed

Key figures & features

capacity & footprints

- line concept up to 30 to/h evaporation capacity
- footprint up to 10m by 50m

installation

- easy strip foundations
- no welding needed - screw able frame work
- shortest installation times 6 to 10 weeks
- shortest start- up & down times

OSB pre – drying

SWISS Krono GmbH, DE - Heiligengrabe

- BT 2/6200-25.5
- year: 2015
- capacity: 12,0 t/h BD
- 53% MC (112% BD) to 42% MC (72% BD)
- usage of waste heat at 90°C

OSB final drying

SFC Integrated Forestry Products, TR-Kastamonu

- BTU 2/6200-45-10/4
- year: 2014
- capacity: 25,0 t/h BD
- 50% MC (100% BD) to 2% MC (2% BD)
- replacement of drum dryers due to emission issues
- frequent safety and fire issues placed the new belt dryer

OSB final drying

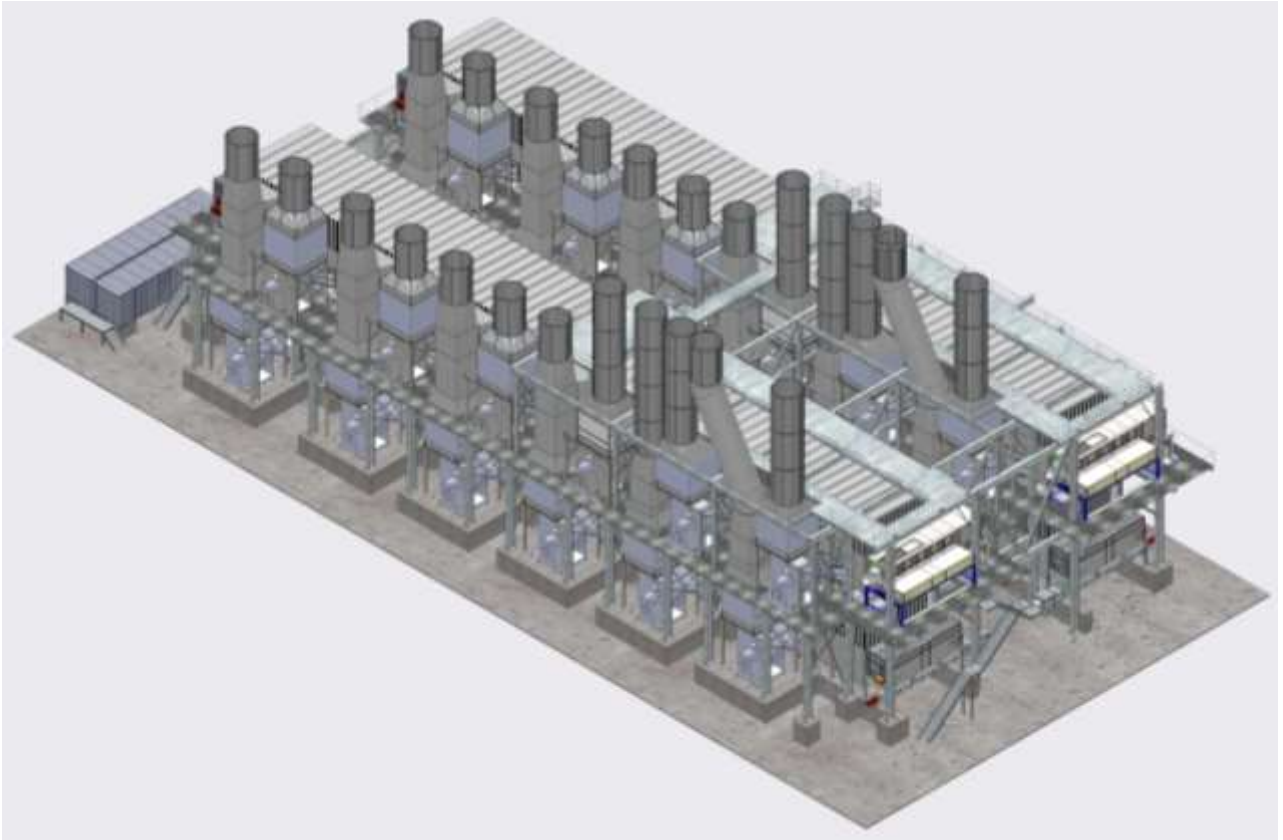
I-PAN SPA, IT-Coniolo

- BTU 1/6200-42
- year: 2011
- capacity: 12,0 t/h BD
- 56% MC (127% BD) to 3% MC (3% BD)
- EU funding project
- Replacement of drum dryers

OSB final drying

Kronospan Sanem S.A., LU-Sanem

- 2x BTU 2/6200-57-12/6
- year: 2018 under construction
- capacity: 60,0 t/h BD
- 122% BD to 2% BD



Particle board final drying

Invernizzi S.P.A., IT-Solarolo Rainerio

- BTU 1/6200-27-3/2
- year: 2016
- capacity: 6,0 t/h BD
- 55% MC (120% BD) to 1% MC (1% BD)
- cost for new filtering system (WESP) made the drum dryers uneconomical

Pallet board final drying

Pfeifer Holz GmbH, DE-Uelzen

- 2x BT 1/6200-33
- year: 2007
- capacity: 18,0t/h BD
- 42% MC to 3% MC

Pallet board final drying

Pfeifer Holz GmbH, DE-Unterbernbach

- 4x BT 1/6200-36
- year: 2007
- capacity: 40,0 t/h BD
- 50% MC to 3% MC

stela® drying technology

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