

Runtech Systems offers high quality availability and energy saving components

Runtech Systems Oy, a highly innovative company, was founded in 1997.

The company's products and services aim to significantly improve the production, quality and efficiency of pulp and paper

machines.

Up to now, the Runtech Systems Oy has conducted more than 200 studies within the field of the pulp and paper industry.

As a result, the company has cre-

ated high technology products that are able to improve the production results, but also to reduce the operating costs.

Runtech's product portfolio consists of vacuum systems (**RunEco**), ropeless tail threading products (**RunPro**) and doctoring products (**RunDry**). In combination with their innovative products, the Runtech consulting service has achieved energy savings by six-digit sums per year for a large number of customers.

RunEco Vacuum Systems

Numerous references show significant savings in energy and / or water due to installed Runtech products.

Ecopump Turbo™ Vacuum Blower

Compact high-speed electric drive and high efficiency turbo blower for energy and water savings. This innovative system is driven completely without the use of any water. Compared to standard water ring pump systems, this system reaches an energy saving level of up to 60%.

The Turbo Blower with titanium or carbon impellers does not need a gear box and clutches, what ends up in higher efficiency and less number of components. The installation can be done on comparatively very simple foundations.



Ecoflow™ On-line Dewatering Measurement

On-line dewatering rate measurements in vacuum systems. For a better understanding and traceability of dewatering processes in the wire and press section, Runtech has already installed thousands of Ecoflows ("on-line" dewatering measurements) at technology leading pulp and paper mills. Due to the installation of these products, the companies have an additional analysis tool for data recording and production-monitoring up to the evaluation of the function of a press section and felts.



EcoSep™ Water Separator

The EcoSep™ water separator with integrated EcoFlow™ meter is ideal for installations with limited space or limited drop leg height. The flow speed of the media entering the water separator diminishes due to the cross sectional flow expansion. EcoSep™ is available in vertical and horizontal versions.



EcoDrop™ Drop Separator

The EcoDrop™ drop water separator with an integrated drop separator unit is ideal for all blower positions. The units are robust and easy to maintain and clean due to complete stainless steel construction.



Vacuum System Engineering And Audits

- The vacuum levels are studied to identify the real vacuum connections
- The paper machine vacuum levels are measured at the vacuum pumps and blowers to identify problem areas
- Pressure and bleed losses are studied to analyze the energy consumption and evaluate if the vacuum levels are too high
- Energy savings are calculated and recommendations and proposals for energy saving are made
- New pipeline connection diagrams can be designed and engineering drawings provided
- Specifications of new vacuum pumps if necessary
- Dewatering analysis
- ROI calculations and reporting



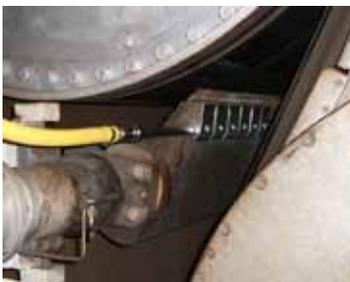
RunPro Ropeless Tail Threading

Runtech Systems Oy has developed a tail threading technology and devices for the most efficient machines in the world. Runtech's tail threading equipment is used at numerous pulp and paper mills worldwide. The abolition of feeding ropes significantly improves the occupational safety.



Press RunShooter™

The Runtech Press RunShooter™ is designed for center roll and separate press tail threading. Quick installation and start-up is possible. Manual, semi-automatic as well as automatic models are available.



Single Blow™

Runtech SingleBlow™ is an easy and trouble free solution for ropeless tail threading for the slalom area. The stainless steel construction of the SingleBlow™ tail threading pipes can be fitted to all types of doctor holders, are easily adjustable and use only the necessary amount of air.



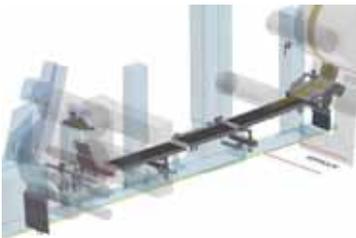
TailBlade M™

TailBlade is a fast and reliable solution for ropeless tail threading. Release from the cylinder surface is guaranteed due to mechanical contact and efficient release blow. The minimal compressed air consumption and the light composite construction are two of the key features of Runtech TailBlade.



RunShooter D™

The Runtech RunShooter D™ is a tail threading mini doctor for double tier dryer groups with full machine doctors. The "Release Blow" technology enables very efficient release from the dryer cylinder surface.



RunShooter F™

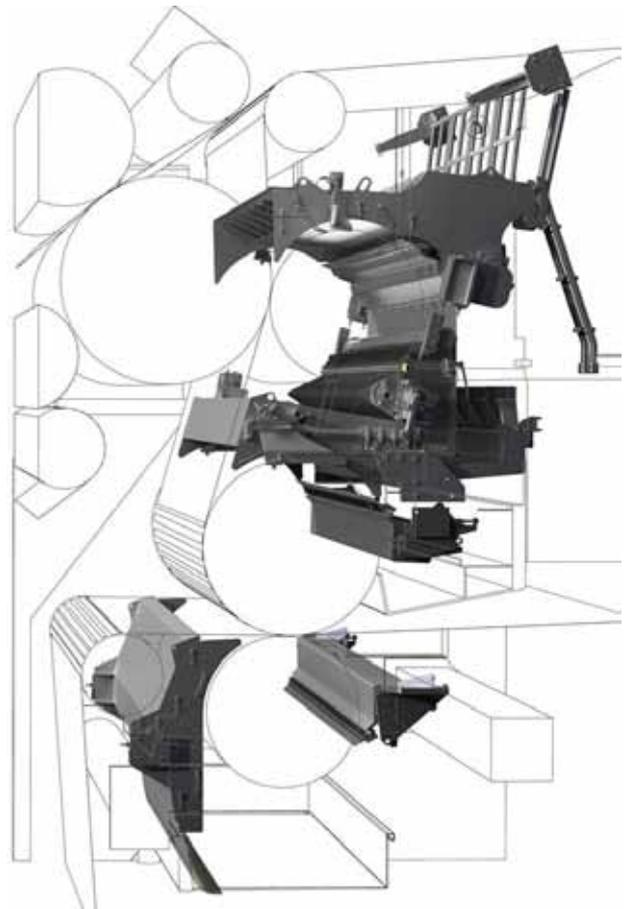
The Runtech RunShooter F™ is a cost efficient tail threading system for long open draws. The system is characterized by minimized compressed air consumption and the minimized break time and amount of broke. It is easy and safe to use.

RunDry Doctoring Systems

High performance doctoring products for demanding customers and challenging positions. Improvements through state of the art equipment and consulting by well experienced specialists.

RunDry products:

- **AirBlade™** doctors for grooved and suction rolls
- **CompoAdapt™** retractable blade holder
- **CompoFit™** blade holder
- **CompoDoc™** doctor beams made of Carbon
- Double doctors
- **Ecoflow™** family
- Save-alls
- **WingBlade™** shaped doctor blades for suction rolls



Air Blade™ - Advanced Doctoring

AirBlade™ is an optimal solution for doctoring on the grooved and suction rolls. The technology improves runnability, sheet dryness and sheet profiles. Energy savings can be achieved as well.

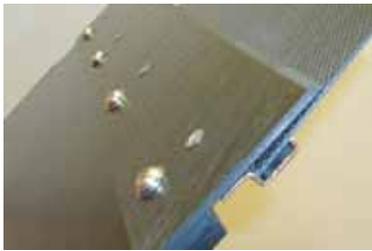
CompoDoc™ - Composite Doctor Beam

Runtech CompoDoc™ doctor beams are applicable for particularly challenging doctoring positions. The doctor beam is available in carbon and glass fiber construction and convinces with minimal space requirements, due to its small size and light-weight construction. Excellent doctoring up to 12 m is possible.



CompoAdapt™ - Retractable Blade Holder

The tube loaded carbon composite blade holder is also suitable for sheet knock down positions, due to its robust design. The blade holder has been specially designed for composite doctor beams, but can also be used with conventional steel doctors.



CompoFit™ - Carbon-/Glass Fiber Composite Blade Holder

The cost effective CompoFit™ blade holder is easier, more flexible and light-weight compared to conventional systems.

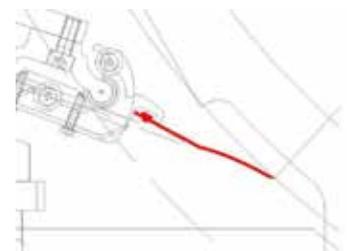


Double Doctors

Double doctors are solutions for optimal doctoring for suction couch and press rolls and can be used with Air Blades, WingBlade or conventional doctors. The robust AISI316 construction is maintenance friendly and easy to clean.

WingBlade

The patented curved shape generated maximum vacuum behind the blade without air. It is specially designed for high speed machines with very efficient water removal due to the foil effect and good mechanical contact to the roll surface.



Save-Alls

The Runtech Save-alls are specially designed to be used with the AirBlade™ and the EcoFlow™. The 316L stainless steel construction has low maintenance requirements and enables easy roll changes.



Sheet Stability Systems

Air Curtain™

The Air Curtain™ neutralizes the pressure difference between the top and bottom surfaces of the paper sheet after the center roll by creating an air curtain under the sheet. This relieves sheet tension at the center roll, and allows potential for speed increases.

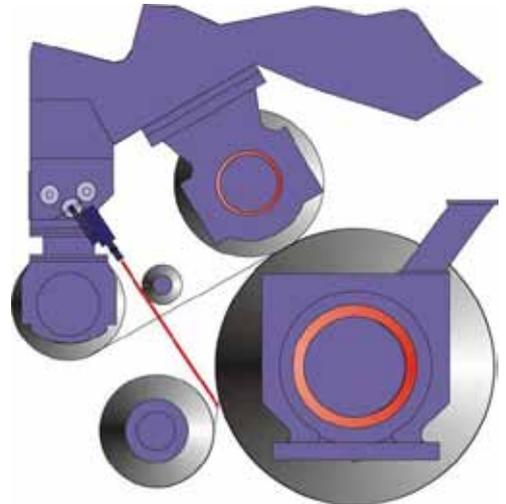
Benefits:

- Less draw
- Less breaks
- Less porosity
- Wider sheet
- Better bonding strength
- Better tensile strength



Laser

For better control of the press section speed differences. The laser is a release point measuring device that uses a laser beam to locate the paper web release from the center roll in the press section. With this information, the number of breaks in the press section can be reduced by adjusting the release point to the correct position.



Service and Consulting

Runtech Systems Oy offers consulting and service in all areas of paper production, in order to realise energy savings and quality improvements.

Runtech is particularly specialized on vacuum systems, doctoring and save-all optimizations in wire, press and dryer sections, as well as tail threading systems of press up to pope reel / winder.

There is also the possibility to significantly contribute to optimizations of entire systems.