

# Toscotec launches new TT Headbox-SL generation design for paper and board

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## INTRODUCTION:

Considered the very demanding operating conditions of headboxes, and in order to guarantee high quality and uniform profiles, Toscotec has developed a strict design and quality control protocol especially devised for headbox manufacturing.

This protocol involves raw materials tracing, manufacturing control of single parts, and final pre-assembly in the workshop with the objective of certifying the following features of the final headbox assembly:

- Lip opening uniformity (at different slice openings and during slice movement)
- Surface integrity, planarity, and roughness
- Sharp lip edges integrity and linearity
- Stability under operating conditions (pressure test)
- Material quality

Toscotec has installed more than 100 TT Headbox on tissue and paper and board machines. Based on its vast experience in design and operation, Toscotec has recently introduced the new generation design of TT Headbox-SL for paper and board application by benefiting from the experience of its headboxes for tissue machines. Considering their high performances, tissue production is very demanding due to the following features:

- High speed required at the jet (up to 2200 m/min) with corresponding high structural strength required due to high internal pressure. This pressure poses the challenge of reducing headbox deformation or allowing manifestation of inherent minor manufacturing issues.
- High flow due to typical low consistencies used in tissue machines (up to 0,15%) with corresponding large size headboxes to fit into a typical gap forming geometry.
- Most tissue market headboxes manufactured are prepared for the installation of a dilution control system in order to ensure very precise paper profile control on a very low basis weight (11-12 gsm).

## TT Headbox-SL for paper and board: key technical features

Toscotec's TT Headbox-SL has a robust structure to withstand internal pressure and large machine width, and a compact design for easy installation both on new machines and on rebuilds.

The internal components are designed to guarantee good fiber distribution across the machine width and good fiber mixing before jet delivery to the forming section (both on Fourdrinier or gap former).

The special design of the tube bank's tubes ensures an optimal uniformity in cross direction and good preparation of the fiber slurry before the converging zone with minimal head losses.

After the tube bank, a series of lamellas (blades) are installed to maintain a high level of microturbulence for optimal fiber mixing just before leaving the headbox making it optimized for the final jet delivery out of the lip.

On both sides of the tube bank structure, specially designed valves control the flow at the extreme edges of the headbox, in order to ensure a uniform fiber orientation on the entire width up to the edges.

A comprehensive system of mechanical jacks and electrical motor reducers allows operators to have full control of the top slice to adjust jet thickness across the lip and the jet landing (impingement) according to production needs.



Figure 1: Toscotec's TT Headbox-SL



Figure 2: Toscotec's TT Headbox-SL

A pulse attenuator is normally installed just before the inlet of the headbox header to reduce disturbances coming from the approach flow system, in terms of pressure pulsation in the incoming stock. The complete headbox and pulse attenuator are manufactured in solid stainless steel with tight mechanical finish for all surfaces in contact with the stock.

**Toscotec's new TT Headbox-SL generation design**

Toscotec has recently started up a new generation design TT Headbox-SL for a packaging paper application in Russia. The TT Headbox-SL is designed to operate on a Fourdrinier machine with 2,830 mm wire width producing fluting and test liner in the range from 90 to 175 gsm, using 100% mixed recycled and raw fibres. The headbox was supplied with TT D-Profiler dilution system for precise bone dry profile control.

The TT Headbox-SL is part of a complete refurbishing two-step plan for the paper machine, where the headbox was planned in the first step and is prepared for future speed-ups to 900 m/min.

During this first project step, Toscotec also modified the Fourdrinier table adding new dewatering elements to increase the drainage capacity of the wire section and supplying a new flume and the complete approach flow system feeding the new headbox and its dilution system.

After the rebuild, the paper machine achieved good paper formation and the expected performances.

In particular, the headbox was started up with a uniform slice opening and there was no need to adjust the lip profile using the profiling screw jacks installed on top of the headbox slice. The TT D-Profiler dilution control system operated at full capacity from the first day, delivering immediate response on the profile, in line with the guaranteed values of two sigma variation below 0,5 COV for all productions, and all parameters of the system ran according to the design.

Toscotec was awarded an order for another TT Headbox-SL with TT D-Profiler dilution control system to be installed in the United States on an existing MG machine. This new headbox will have a pond width of 3405 mm and an expected maximum speed of 800 m/min. Start-up is planned for the last quarter of 2021.

In the first quarter 2022, Toscotec will also start up two new special TT Headbox-PF operating on new pressure former units installed on an existing multi-layer board machine. It is worth mentioning that these special headboxes feature a dilution control

Figure 3: TT Headbox-SL with TT D-Profiler dilution control system. (Below)

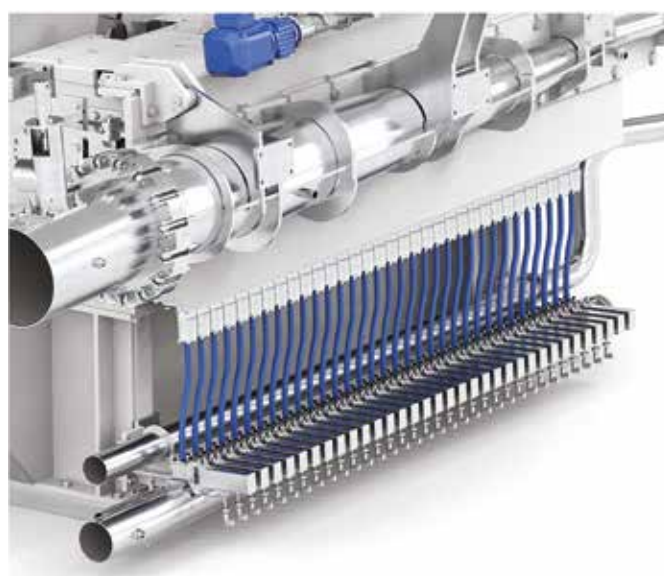
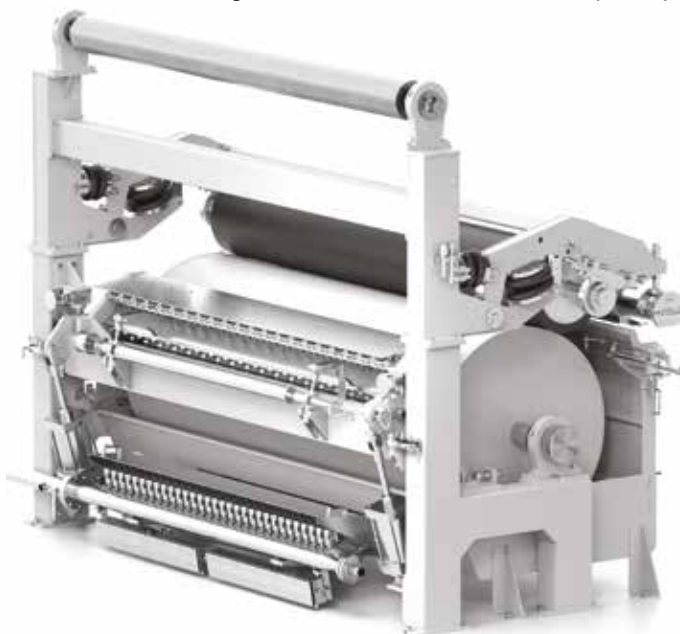


Figure 4: Toscotec's TT Headbox-PF (Below)



system specially developed for this project. The target of this rebuild is to increase machine production and to improve paper quality in terms of paper profile.