

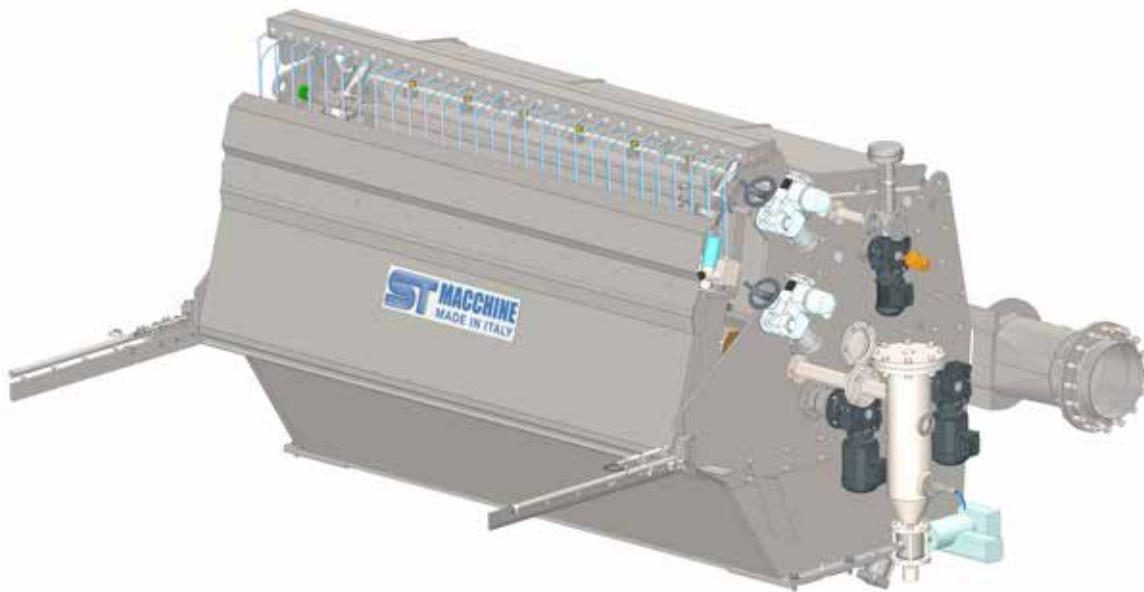
Machinery and Plants for
Paper Industry
Water Treatment Systems



**Head Boxes
& Fourdrinier**



Pressurized Headbox



The pressurized headbox is the most flexible solution that allows to operate in a wide range of consistency and speed for fourdrinier applications. A conical header distributes uniformly the pulp to a two stages plastic step diffuser. After the step diffuser the pulp goes into an expansion chamber that is pressurized. In the expansion chamber two perforated and rotating rolls guarantee an optimal effect of fiber mixing and defloculation. After the rolls the pulp is accelerated in the nozzle until the exit from the headbox where the special geometry of the bottom lip plus the fine adjustment of the top lip allow to

obtain a very good basis weight profile. All the surfaces in contact with the stock are mirror polished with finishing grade of 0,2 μm .

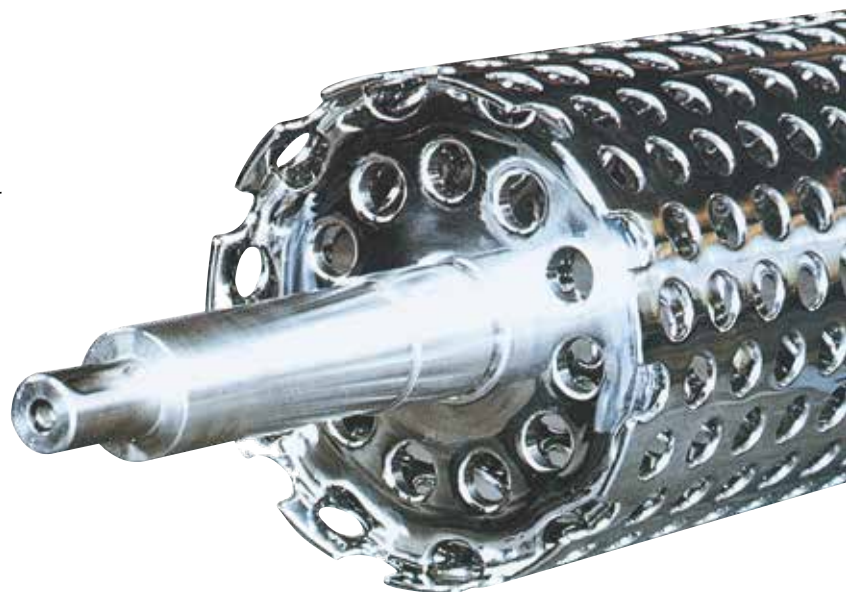
The headbox can be equipped with optional device as per foam extraction and also with a vacuum/pressure system in case of very low speed applications. Inside the pressurized chamber, not in contact with the pulp, a crossing rotating shower for cleaning purpose is positioned. As per option two side deckles can be supplied to prevent the overflow of the pulp from the wire.

Rectifier Rolls

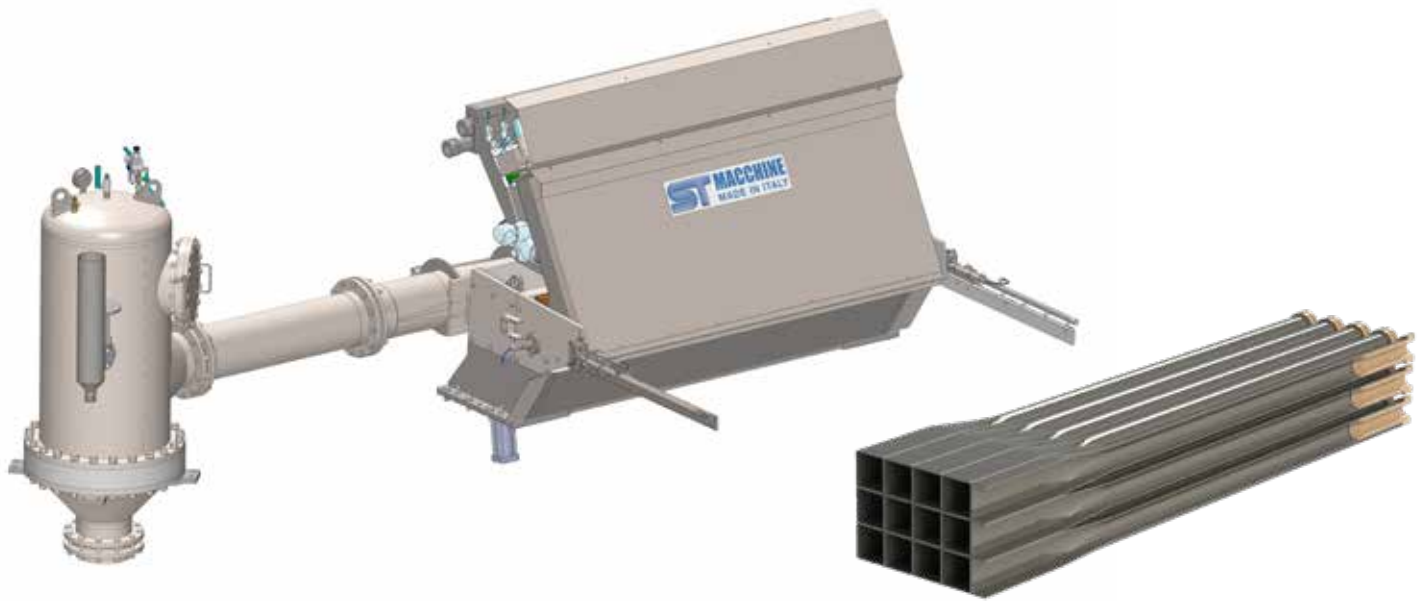
ST Macchine has been a manufacturer of rectifier rolls for many years and is supplying the most important paper machine builders in Italy and abroad.

Our high qualification and specialization, the very large experience in this field and the use of the most modern available equipment, allow us to realize rectifier rolls which can meet any particular requirement of the customers.

Finishing is particularly accurate and the perfectly smooth and specular surfaces can be achieved with mechanically or electrolytically polishing treatment.



Hydraulic Headbox



The hydraulic headbox is required mainly for medium and high speed machines for fourdrinier applications. The consistency and speed range is reduced if compared with a pressurized headbox but the quality formation is increased. A conical header distributes uniformly the pulp to a three stages step diffuser that is the most technological component because it induces to the pulp the micro-turbulences necessary for the fiber mixing and the defloculation effect. Depending of paper grade and quality requirements we can offer a plastic three stage step diffuser (the third step has a circular shape) or as per alternative a stainless steel tube bank where the third step has a square shape.

Dilution

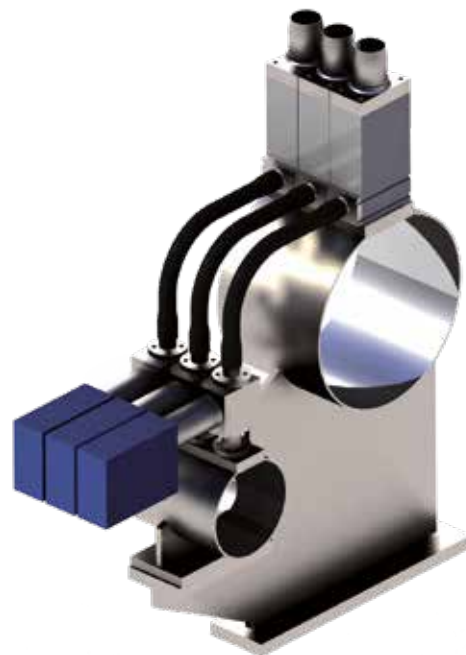
For a better profile control of the paper **ST Macchine** can provide the dilution solution composed by two conical headers (one for the dilution water) that are separated by the headbox.

The water is dosed by the dilution valve and is injected in a plastic element where is mixed with the pulp. Each mixing chamber is connected to the headbox with a flexible hose. The pulp goes into an expansion chamber and then to the three stages step diffuser inlet.

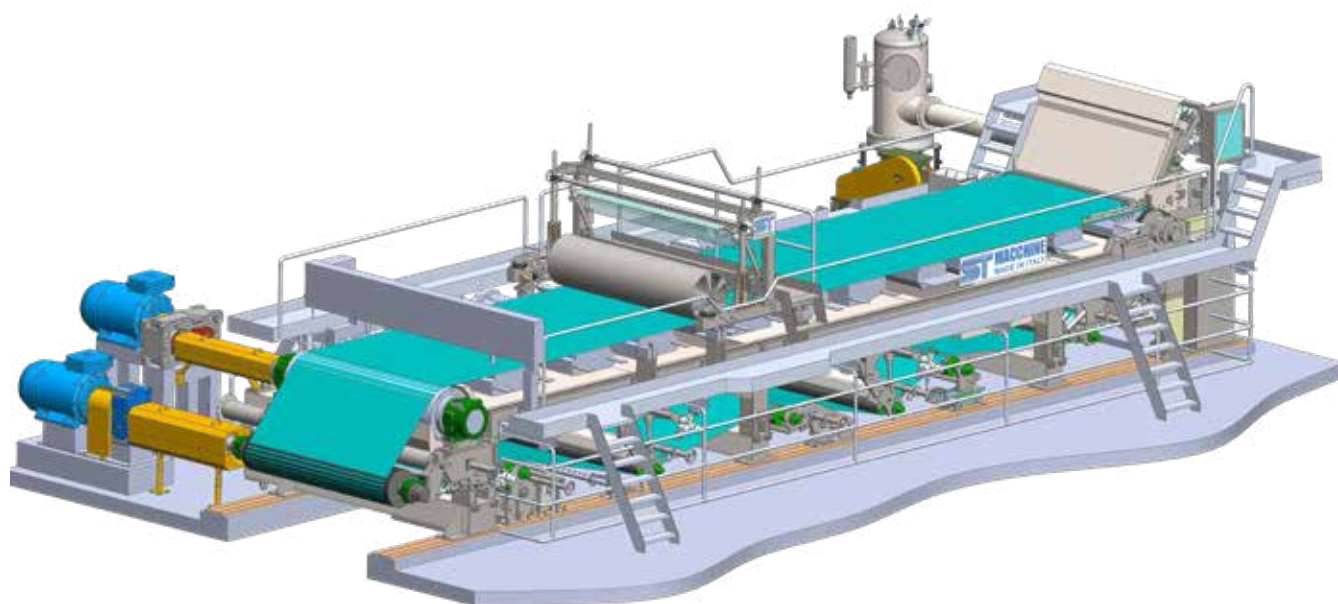
Our dilution system can be interfaced with a wide choice of QCS brands. As option we can provide turnkey solution with software and hardware.

After the step diffuser the pulp is accelerated in the nozzle until the exit of the headbox where the special geometry of the bottom lip plus the fine adjustment of the top lip allow to obtain a very good basis weight profile. In order to increase the fiber mixing our headboxes can be equipped with optional blades installed in the nozzle. The pressure pulsations induced by pumps and screens are reduced by the pulsation damper that is external to the headbox and it is equipped with a plastic two stages step diffuser.

All the surfaces in contact with the stock are mirror polished with finishing grade of 0,2 μm .



The Fourdrinier



The fourdrinier is the section of the paper machine positioned between the headbox and the presses where the sheet is formed and dewatered. It can be one or more layers and it has always a specific configuration according with the type of production, the paper machine speed and the available spaces. **ST Machine** is able to design and produce tailor made solutions as small modification, or a fourdrinier length extension or a completely new turn key solution. Main components of the fourdrinier that **ST Machine** produces are:

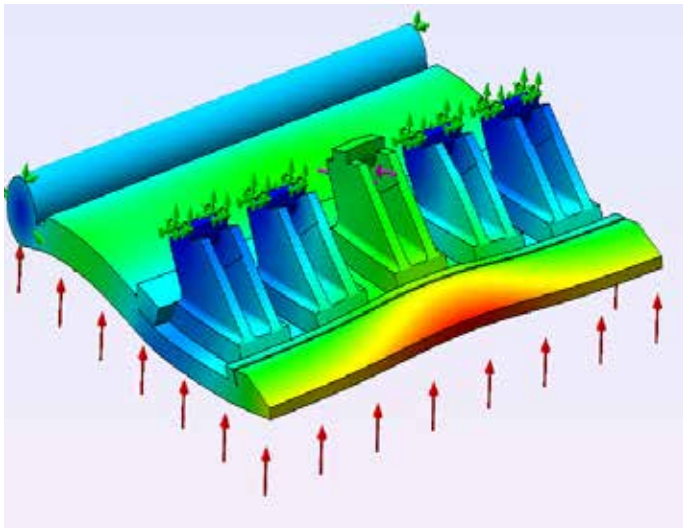
- Beams and cantilever simple or C-frame
- System for lowering the breast roll or the wire drive roll
- Doctors fixed or oscillating
- Wire tensioners manual, electric or pneumatic
- Saveall, channel and silo for white water, designed in order to improve the deaeration
- Suction couch rolls
- Automation



Verification

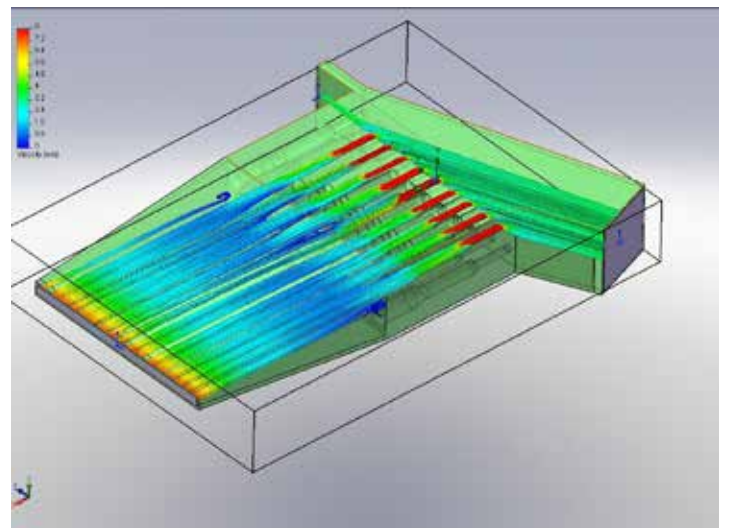
FEM analysis

One of the main target we aim when we design each headbox is to limit the deflections under the effect of the inside pressure. This is very important in order to achieve a good profile and also to reduce the necessity to modify the top lip adjustment during the speed changes. For this reason all our headboxes are designed using the 3D cad and the most important structured are verified by using a FEM software.



Flow simulation

Another target we aim during headbox designing phase is to check the flow speed on each part of it. Extremely important is also to verify the entity of the micro-turbulence that is responsible of the good fiber mixing and defloculation effect. For this reason we use a flow simulation software that allows us to control pressure, speeds and trajectories of the flow.



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