



CROSSLAPPING

AUTEFA Solutions leads the way



AUTEFA SOLUTIONS –

Experience, Know-How and Competence
in Nonwoven Technology

AUTEFA Solutions leads the way

As a system supplier, AUTEFA Solutions represents companies with a long tradition and a history of years of successful participation in the market. Combining the experience of the companies AUTEFA, Fehrer, FOR and Strahm the company stands for high quality, durability and performance made in Europe.

AUTEFA Solutions creates innovative technological concepts for nonwoven products by utilizing the skills and practical experience of its employees. The customers benefit from the dynamic flexibility and specialist know-how of AUTEFA Solutions key technology sites in Germany, Austria, Italy and Switzerland.



STRAHM

FIBER PREPARATION	fiber opening and blending			
WEB FORMING	carding	aerodynamic web forming airlay	airlaid	crosslapping
WEB BONDING	needling	chemical bonding	thermobonding	hydro- entanglement
WEB FINISHING	drying	impregnating/ coating	embossing/ perforating	scattering
WEB HANDLING	winding	cutting	stacking	festooning



AUTEFA Solutions is part of China Hi-Tech Group Corporation (CHTC).

AUTEFA Solutions leads the way to Crosslapping

Weight accuracy in the bonded lapped web is the most important quality feature for a nonwoven installation. The crosslappers of the Topliner series are characterized by high infeed speeds and precise weight distribution. Crosslappers take up the carded web coming from the carding machine with constant speed and gently bring it to the delivery belt.

The crosslappers Topliner increase both web homogeneity and throughput speed and thus eliminate any bottlenecks. The uniform web laydown in conjunction with the WebMax and CLOSED LOOP system helps to save fibre costs.

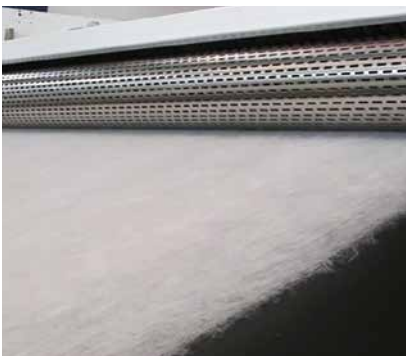
The crosslapper of the Topliner series, combined with WebMax and CLOSED LOOP system prevents the increased weight of the fabric in the edge areas, called the smile effect. This results in an excellent uniformity in the fabric and, thanks to a considerable saving of materials, a reduction in material costs.

These advantages are very important especially for lightweight applications in spunlace lines or for heavy weight applications in carpet and geotextile lines. A new investment or replacement investment with the crosslapper Topliner always leads to a quality and production improvement.

AUTEFA Solutions is the crosslapper market leader. Worldwide more than 800 crosslappers were delivered within the last 30 years.

MAIN CUSTOMER BENEFITS:

- Highest lapping speeds up to 200 m/min at constant web quality thanks to a short web path
- Full productivity potential and precise laying behavior on all working widths due to the use of composite components
- Further reduction of energy consumption (kWh per kg) by utilization of latest drive technology with energy recovery
- User-friendly concept with excellent accessibility and easy maintenance
- Flexible installation variations due to modular machine design and apron guidance
- Fast and easy service support through remote maintenance by means of remote access



Infeed belt – 1st web compressing roller



Belt 1 – 2nd web compressing roller



Belt 2 – tensioning and control system

WebMax – web profile control technology

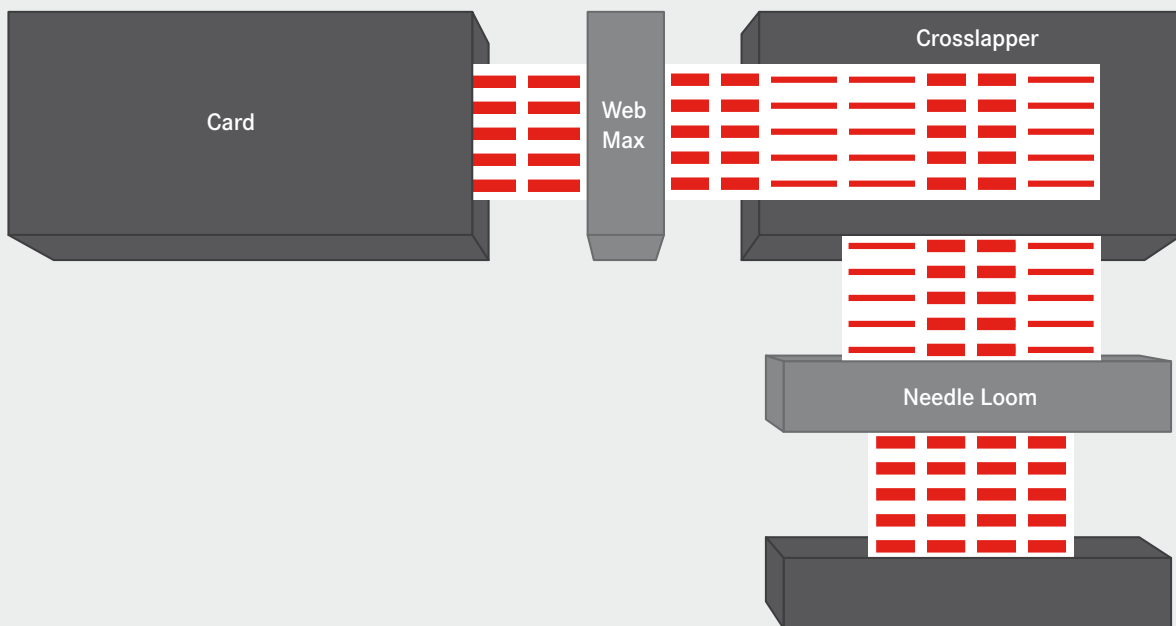
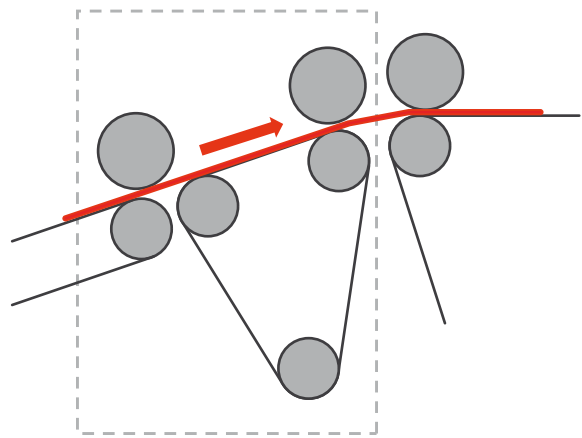
AUTEFA Solutions WebMax produces a counter weight profile to avoid the smile effect. This is the key to product quality. WebMax ensures that the carded web weight is already being altered at the crosslapper infeed. Via the layering carriage control, the carded web is deposited on the layering belt in a way that the lapped web weight is controllably lighter in the edge areas compared to the center areas. This concave weight profile therefore compensates the weight changes due to material shrinkage and leads to the highest possible weight evenness in the final product.

With the improvement of the lapped web profile WebMax also leads to a proportional reduction of raw material consumption. A special advantage of this system is that it relates exclusively to the crosslapper Topliner. The WebMax does not require any separate space, and can be retrofitted with a lapper of the Topliner-series. WebMax can be delivered for card web working widths of 2.0–4.0 m.

ADVANTAGES OF THE CROSSLAPPER TOPLINER WITH WEBMAX

- Compensation of the smile effect caused by material shrinkage
- Two independently controllable drafting zones create a counterweight profile on the delivery apron
- Can be switched off at any time by lifting the pressure rollers

WebMax system



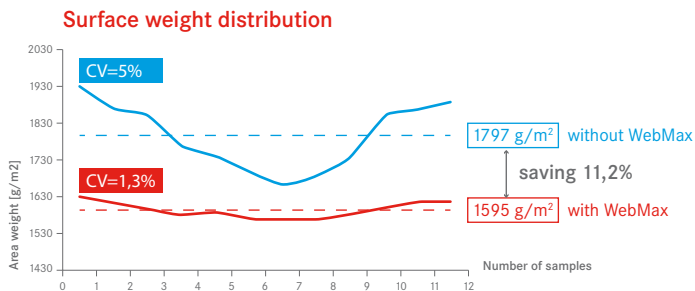
Profile controlled by WebMax – the key to product quality

EASY RETROFIT TO UPGRADE EXISTING NONWOVENS LINES TO INCREASE THE MD/CD RATIO

- No additional space required
- Short conversion times (installation within 3 days)
- No loss of the maximum layering width in case of retrofitting
- Short overall dimension for new crosslappers
- Can be retrofitted keeping the current control system and drives of the machine
- No additional switch cabinet required
- Separately controllable independently of profiling
- Independent of the manufacturer of the weight measuring system

CONTINUOUS SAVING OF FIBERS

In combination with the crosslappers, WebMax ensures maximum weight accuracy in the final product and is the key to a high product quality. WebMax counteracts the smile effect with a counter weight profile, which results in a material saving of up to 11 %. Due to the reduced weight in the edge areas of the deposited web, the average product weight is considerably reduced, which results in a reduced fiber consumption. A measuring system at the end of the line with closed loop control significantly helps to save fibers continuously and to achieve uniformity in the final product over the long term. Parameters such as total draft, shrinkage of the web width and length of the control loop are important factors and are to be taken into account in this complex process. This is an important prerequisite for cost-optimised production, especially for spunlace lines.



Short web path – minimizes false draft

The Crosslapper Topliner is characterised by the following technical highlights, which all improve the quality of the layered web and lead to optimised production costs due to material saving.

Only the Crosslapper Topliner (picture 1) has the unique short web path design, with a deflection of 180° , and its precise web laying minimizes false draft.

DIRECT WEB TRANSFER FROM UPPER CARRIAGE TO LAYERING CARRIAGE

The carded web is delivered from the card to the infeed belt of the crosslapper. Then the web is passed on to belt 1, which transports it to the upper carriage which moves with half of the average speed of the layering carriage. Belt 1 is tensioned by an auxiliary carriage, which is connected to the upper carriage via tooth belts. The upper carriage has the task of storing the arriving web during direction change of the layering carriage.

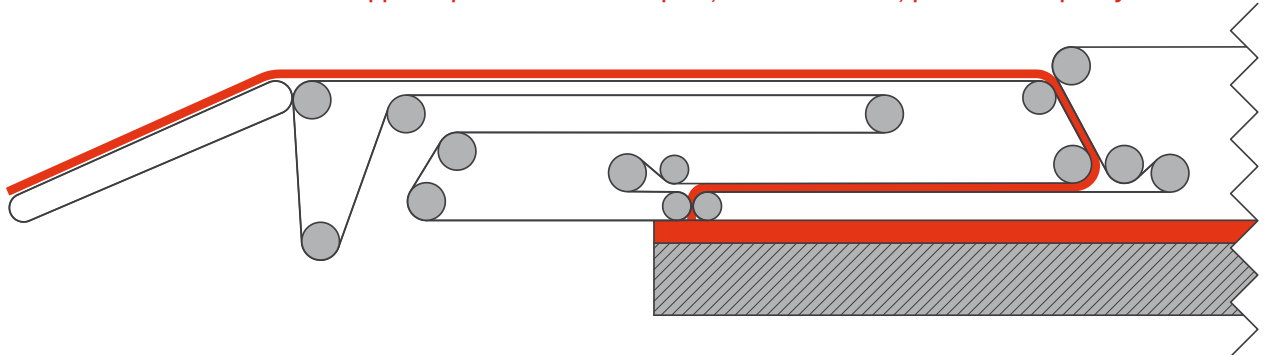
After having passed the upper carriage, the web is transported to the layering carriage in a sandwich and deposited on the delivery belt by both layering belts. Belt 2, which is the sandwich between the carriages, is also tensioned by an auxiliary carriage, that is also connected to the layering carriage via tooth belts. The auxiliary carriages are synchronised with the upper carriage and the layering carriage with an own pneumatically tensioned tooth belt each.

Conventional crosslappers (picture 2), with a common longer web path, lay the web with a deflection of 360° . This kind of layering often caused false draft and the “bubble effect”, the compression of the web.

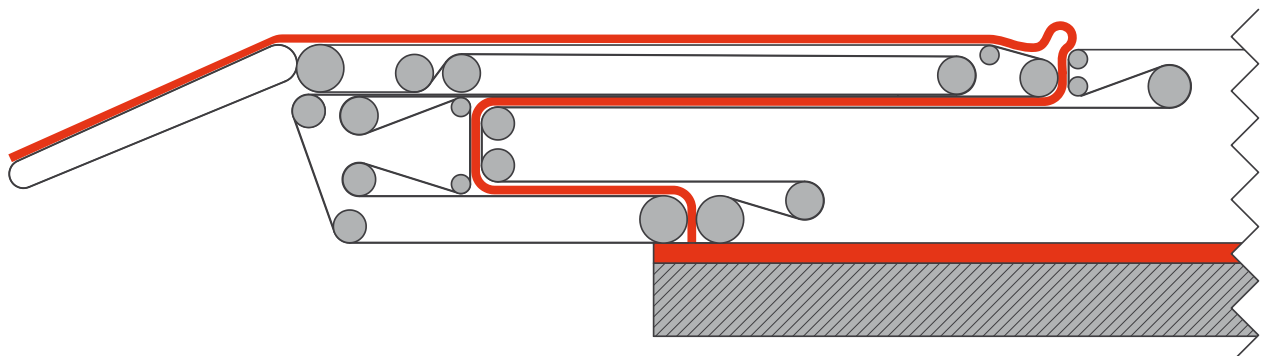
The “synchronisation”, the perfect coordination of the carriage movements, characterises the crosslappers Topliner.

- Common carriage movement
- Direct web transfer from upper to layering carriage
- One web reversal on upper carriage

Picture 1: AUTEFA Solutions Crosslapper Topliner – short web path, deflection 180° , perfect web quality



Picture 2: Conventional Crosslapper with a common web path, deflection 360° , often caused “bubble effect”



OPTIMIZED CV-VALUES THANKS TO INTEGRATED WEB STORAGE WEBPLUS

The patented integrated web storage WEBPLUS increases product regularity and enables an improved CV-value. Contrary to carriage layers, working in opposite direction, the Topliner is equipped with an integrated web storage, which stores the arriving web during reverse movement of the carriages and delivers it during their constant movement. The capacity of the storage depends on speed and is continuously adjustable at the operating panel.

The use of web storage WEBPLUS avoids material accumulations at the turning points of the crosslapper. Thus a uniform web thickness over the entire working width is achieved.

This advantage is particularly important for the further processing, e.g. when a nonwoven fabric is laminated.

- Controlled web laydown on edges
- No edge overfeeding
- Straight edge forming
- No edge wrinkles



Crosslapper Topliner – controlled web laydown on edges

PROFILING REDUCES THE SMILE EFFECT

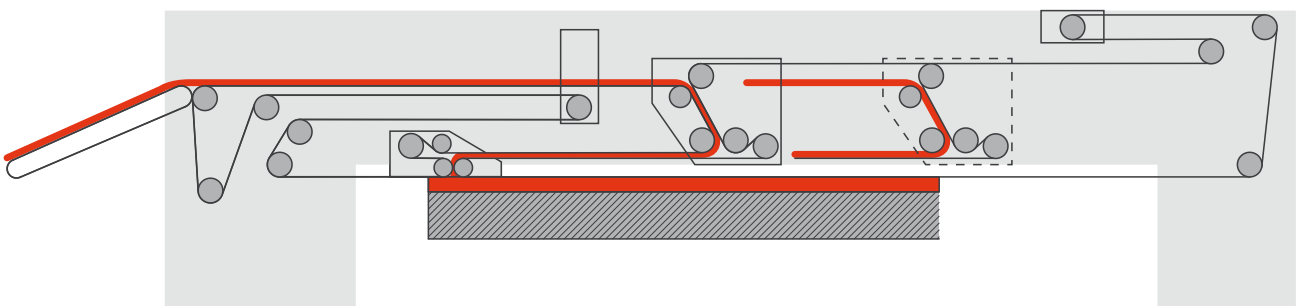
The Topliner is equipped with the proven and patented profiling system.

Through the change of the carriage speeds with the profiling system, the weight distribution of the laid web in transverse direction is improved. This results in an improvement of the regularity and a reduction of material accumulation on the web edge, the so-called smile effect.



Graphic menu “profiling” setup

Crosslapper Topliner – Integrated web storage WEBPLUS

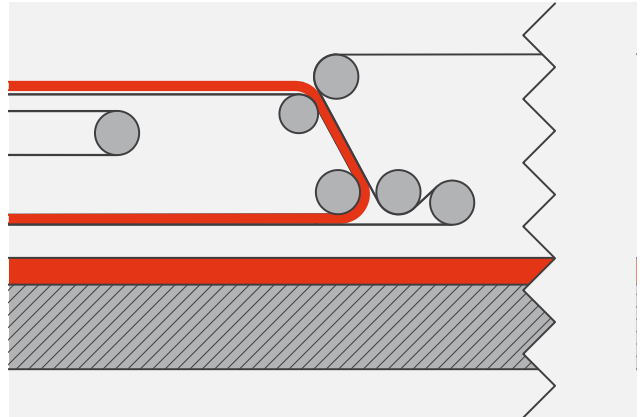


Special features Crosslapper Topliner



PATENTED UPPER CARRIAGE DESIGN

The upper carriage guided the web by a patented roller arrangement. Deflection of the web is done in 2 steps each less than 90 deg. The web guiding between the sandwich belt system secures the carded web transport without additional mechanical parts draft between the belts.



SANDWICH APRON SYSTEM

The Topliner is equipped with new designed transport aprons, which cover and secure the carded web. These aprons are antistatic treated, have a low surface weight and a high lateral stability. The apron tension can be adjusted pneumatically and is infinitely variable. The automatic belt alignment is done by guiding rollers which ensure an exact belt guidance by means of light sensors. The covered web on the delivery apron ensures perfect web guidance.

For web delivery a lattice conveyor is used, which provides the necessary grip due to its surface properties.



TOOTH BELTS

The Topliner is equipped with robust high-efficiency tooth belts, which are pneumatically tensioned and controlled.



CARBON ROLLERS

With a smooth and corrosion-resistant surface, very stable and extremely light carbon rollers improve the web quality. The carbon rollers low mass moment of inertia ensures a smooth running and prevents false draft.

This is of special importance at higher layering width and high lapping speeds.



HIGH DYNAMIC DRIVE TECHNOLOGY

The Topliner is driven from five infinitely variable high dynamic servo drives without external cooling. One motor each drives the upper carriage, the layering carriage, apron 1, apron 2 and the delivery belt. In this way the best laying results are achieved with an optimal coordination of speeds.

The crosslapper Topliner is equipped with Siemens “Sinamics” converters. Only force-ventilated servo motors are used. The control is done from a Siemens D-controller. For data communication a modern data bus technique is applied.



CONTROL & SAFETY TECHNOLOGY

The machine is controlled via a Siemens Simotion D-Controller, which is equipped with a high performance processor, in order to control the position-regulated movement sequences.

By means of a touch panel the machine parameters can easily be adjusted. The individual machine components are connected via Ethernet.

Topleveler crosslappers are monitored via safety limit switches and thus fulfil the required safety standards.

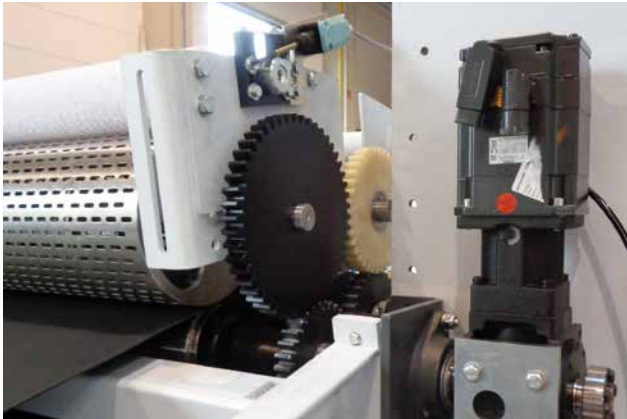
Technical Data:

TYPE	MAX. WEB LAY-DOWN SPEED (m/min)*	MAX. LAYERING WIDTH (M)
UNILINER ONE	80	5
ECOLINER CL 3000	80	9
TOPLINER CL 4000	100	9
TOPLINER CL 4002	130	9
TOPLINER CL 4004 / CL 4004 SL	160	9
TOPLINER CL 4006 / CL 4006 SL	200	9
TOPLINER CL 4000 PF	80	16

* The fiber technological maximum speeds depend on certain influencing factors such as room humidity, room temperature, fiber quality etc.

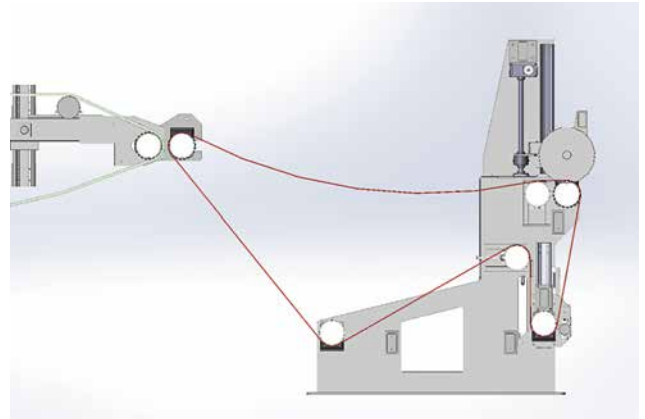
All lapper models can be delivered for card web working widths of 1.0–4.0 m.

Special features Crosslapper Topliner SL version



DRAFTING UNIT-INFEED

The drafting unit at the infeed compresses the web and forms a counterweight profile on the delivery apron. This compensates the smile effect due to material shrinkage. Topliner crosslappers ensure weight uniformity after the bonding process. The drafting unit is part of the machines and needs no separate space.



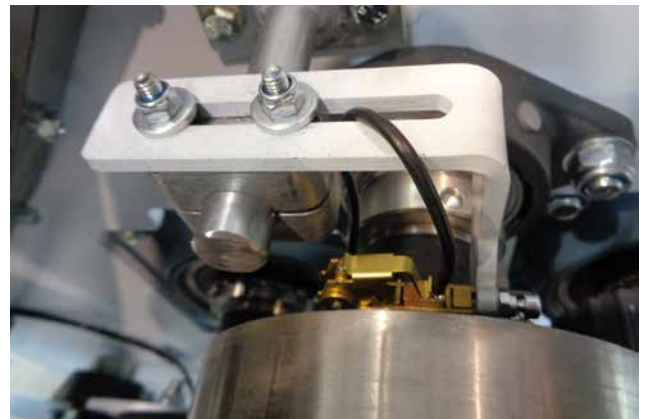
SPEED COMPENSATION BELT SC 123

The speed compensation belt SC 123 ensures a continuous and smooth transport to the following machine without any false drafts. It compensates the discontinuous speed of the crosslapper's discharge apron and acts as an intermediate storage. This feature is of special importance when light webs (e.g. for spunlace applications) are produced.



ANTISTATIC ADJUSTMENT

The special ionization bars ensure an automatic adjustment of the polarity and level the static electrical load.



CONTROLLED MACHINE GROUNDING

The grounding brushes provide appropriate derivation of static electricity load in the machine.





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