



NEEDLE- PUNCHING

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).



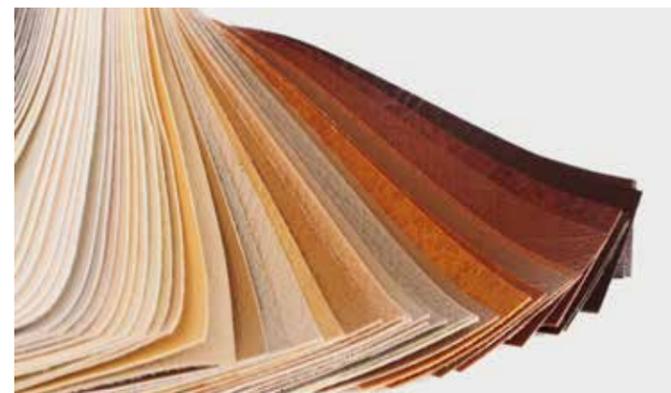
AUTEFA Solutions leads the way in Needle Punching

Needle punching machines from AUTEFA Solutions combine Fehrer's know-how and long-time experience with the latest technology and offer optimum solutions for any kind of needling requirement, as single loom or integrated in complete lines:

- ✓ Machine speeds over 3000 rpm in continuous operation
- ✓ Working widths up to 16 m
- ✓ Needle densities up to 30000 needles per meter

APPLICATIONS:

- Artificial leather
- Automotive felts
- Carpets and carpet backings
- Insulation materials for thermal and noise insulation
- Geotextiles
- Industrial wipes
- Technical Felts
- Blankets (needled)
- Clothing and furniture



FEHRER Drive Technology

VARILIPTIC DRIVE CONCEPT

NL DRIVE CONCEPT

CHARACTERISTIC FEATURES FOR THE VARILIPTIC DRIVE AND NL DRIVE CONCEPT

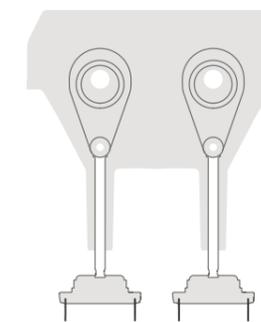
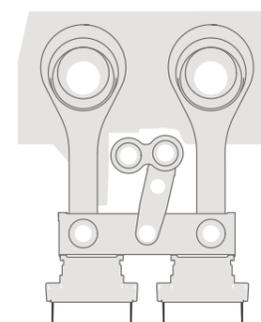
- Vibration-free running
- Highest stroke frequencies in continuous operation
- Working width up to 16 meters
 - High stiffness in needling zone and machine frame
 - Without resonance over full speed range
 - Product consistent over the working width
- Computer-generated needle distribution (i-Point)
 - Mark-free penetration
 - Special patterns possible
- Optional Bed and Stripper plate Quick Exchange System available
 - Easy cleaning
 - Fast exchange of needle pattern

MAIN CHARACTERISTIC FEATURES

- | | |
|--|---|
| <ul style="list-style-type: none"> • One compact module for both vertical and horizontal movement • Automatic grease lubrication • Simple Integration in Machine Frame • Horizontal stroke continuously adjustable during operation range, 0 – 12 mm | <ul style="list-style-type: none"> • Modular design system with fully sealed eccentric drives • Oil lubrication • Highly robust design • Improved mass balancing • Extremely low vibration level |
|--|---|

ADVANTAGES

- | | |
|--|--|
| <ul style="list-style-type: none"> • Energy-efficient <ul style="list-style-type: none"> · Only one drive for horizontal and vertical stroke • High Versatility • Easy maintenance • Reduced draft in needling zone • Higher uniformity • Less shrinkage • Improved felt surface • Higher production speed | <ul style="list-style-type: none"> • Closed Drive System <ul style="list-style-type: none"> · dust protection · less noise • High rigidity <ul style="list-style-type: none"> · well proven for heavy load operation • Cost-saving service intervals of several thousand hours |
|--|--|



TECHNICAL DATA

- up to 2400 rpm
- 30 – 70 mm vertical stroke

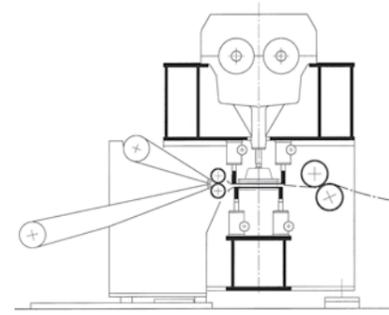
- up to 3050 rpm
- 25 – 76 mm vertical stroke

Stylus Single Board Needlelooms

The Stylus single board needlelooms are highly versatile and offer medium needle densities for both pre- and finish needling. They are suitable for all types of natural, synthetic and recycled fiber webs and are in operation all over the world to create top class needlepunched nonwovens.

Combined with one of the well proven and tested Fehrer feeding systems those machines are the perfect pre-needling solution wherever light pre-needling with or without elliptical needling is required.

All single board machines are available in both down- and up-stroke execution and can be equipped with the patented Variliptic drive system.

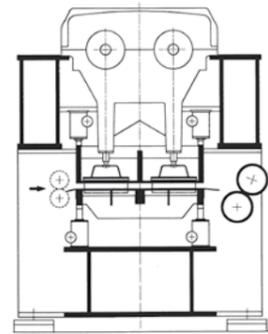


MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL9/S + RS	1800 rpm	1.2 – 8.1 m	30 – 76 mm	–	1000 – 7500
STYLUS NL2000/S + RS	2300 rpm	1.2 – 8.1 m	30 – 70 mm	–	3000 – 7500
STYLUS NL3000 +R	3050 rpm	0.7 – 6.2 m	25 – 45 mm	–	5000
STYLUS VARILIPTIC SZ-D, -R	2400 rpm	1.2 – 8 m	30 – 70 mm	0 – 12 mm	1000 – 7500

Stylus Double Board Needlelooms

The Stylus double board needlelooms ensure enhanced performance through increased penetration density due to two back-to-back needling zones integrated in a highly rigid welded steel frame. Suitable for numerous applications the double board machines can be used for pre- and finish needling.

In order to avoid unfavourable drafting of the material during the needling process the double board machines can be equipped with the patented Variliptic drive system. The elliptical needle movement exceptionally improves the web quality especially when applied during pre-needling. All double board machines are available in both down- and up-stroke execution.

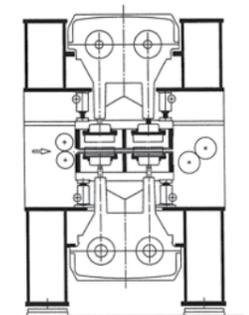


MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL21 + R	1800 rpm	1.2 – 8.1 m	30 – 76 mm	–	6000 – 15000
STYLUS NL21/S + RS	2300 rpm	1.2 – 8.1 m	30 – 70 mm	–	6000 – 15000
STYLUS VARILIPTIC DZ-D	2400 rpm	1.2 – 8 m	30 – 70 mm	0 – 12 mm	2000 – 15000

Stylus Four Board Counter Stroke Needlelooms

The Stylus four board counter stroke needlelooms offer the advantage of penetrating the material from both sides simultaneously and thus creating identical surface properties on bottom and top side of the felt. As the single and double boards needlelooms the base is again a highly rigid welded steel frame in the well-established Fehrer quality. Used for the creation of products like filters, shoe linings, technical felts etc. the counter stroke machines are ideal for finish needling but can as well be used for pre-needling when combined with a feeding system.

In order to avoid unfavourable drafting of the material during the needling process the four board machines can be equipped with the patented Variliptic drive system. The elliptical needle movement exceptionally improves the web quality especially when applied during pre-needling. All counter stroke machines are available in both down- and up-stroke execution.

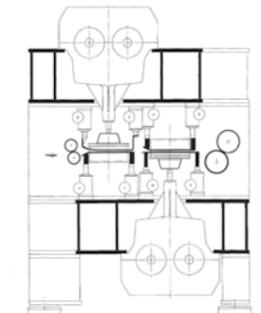


MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL88/QP	1300 rpm	1.2 – 8.1 m	60 – 70 mm	–	12000 – 30000
STYLUS VARILIPTIC DZ-C	1800 rpm	1.2 – 8 m	60 – 70 mm	0 – 12 mm	4000 – 30000

Stylus Double Board Tandem and Counter Stroke Needlelooms

Derived from the thought of economical optimization the double board tandem as well as the counter punch needlelooms are characterized by two needling zones positioned in either serial or adverse arrangement. The needling zones of the tandem needleloom can either be executed from above and below or vice versa.

Analogue to the single, double and four board also the tandem and counter punch needlelooms can be delivered with the material friendly Variliptic drive system for reduced draft. Once more the extremely robust Fehrer frame design paves the way for resonance-free operation and high durability.

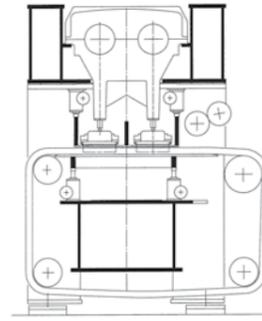


MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL9/S-TP	1300 rpm	1.2 – 8.1 m	60 – 70 mm	–	6000 – 15000
STYLUS NL9/SRS	1500 rpm	1.2 – 8.1 m	40 – 70 mm	–	6000 – 15000
STYLUS VARILIPTIC SZ-C	1800 rpm	1.2 – 8 m	60 – 70 mm	0 – 12 mm	2000 – 15000

Stylus Velour Needlelooms

The Stylus double board velour needlelooms are designed specifically for the manufacture of random velour material. Equipped with self-aligning brushes a long service life by a special cleaning roller system is ensured. The special brush conveyor system offers a perfect penetration basis for mark-free material surfaces.

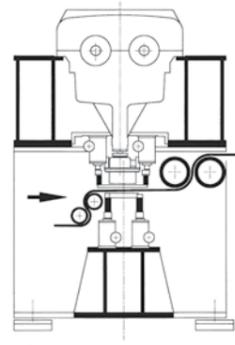
For the production of rib velour products special needle patterns are available.



MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL21/RV	1600 rpm	1.2 – 6.7 m	35 – 40 mm	–	10000/15000
STYLUS NL21/SRV	2200 rpm	1.2 – 6.7 m	35 – 40 mm	–	10000/15000

Stylus Structuring Needlelooms

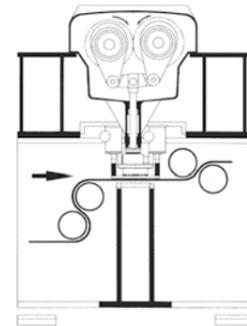
The structuring needleloom Stylus NL 2000/SLV is equipped with a lamella bed plate to ensure the manufacture for ribbed products. The machine combines high stroke frequencies with a robustness derived from the distribution of penetration loads on two drive shafts.



MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL2000/SLV	1800 rpm	1.2 – 6.7 m	30 mm	–	Up to 6000

Stylus Patterning Needlelooms

The patterning needleloom Stylus NL 11/SE is a structuring needlepunching machine purpose-built for the manufacturing of patterns with short, medium and long repeat for exclusive floor and wall coverings. The machine is characterized by a dynamic and precise drive system which offers high production speeds even with short repeats. A quick advance system provides felt transportation during penetration pauses and the extremely rigid steel frame permits heavy duty applications.



MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL 11/SE	1500 rpm	1.2 – 5.6 m	30 mm	–	Up to 6000

Accessories

I-POINT

Fehrer and the Fraunhofer-Institute Kaiserslautern have developed the world-wide unique program i-Point to customize needle patterns. With a patented flexible composition of various numbers of needles per hole high needle densities for elliptical needling can be reached. Product properties in regard to homogenous appearance, tensile strength, filtration behavior and abrasive resistance are improved.

QUICK EXCHANGE DEVICES

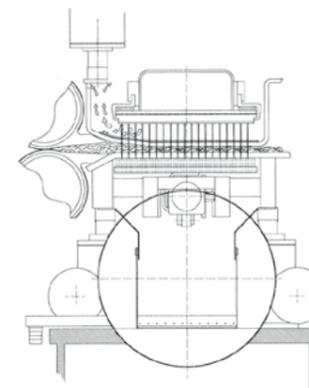
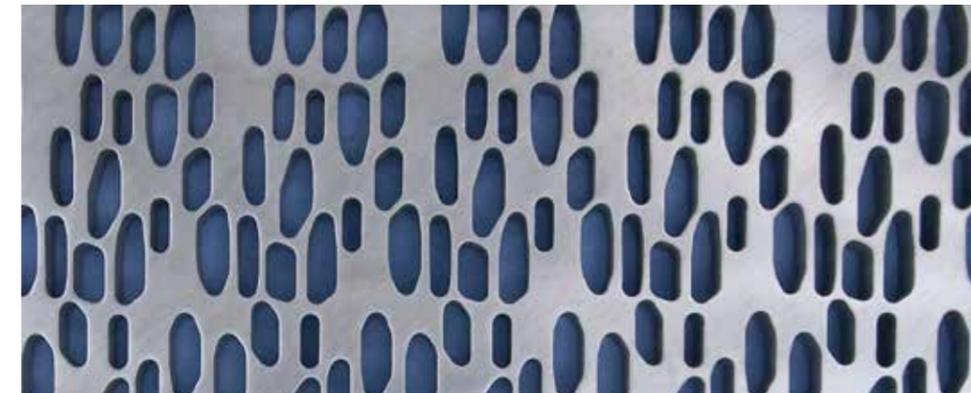
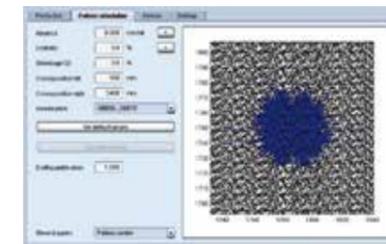
Bed and/or stripper plate unit is mounted on rail guides to allow the quick and efficient cleaning of the bed and/or stripper plate. Exact repositioning is ensured by means of a mechanical lock.

DUST SUCTION DEVICES

This device is a major advantage for the processing of fibers which produce large quantities of dust or are subject to frequent fiber breakage.

COMPOUND STRIPPER

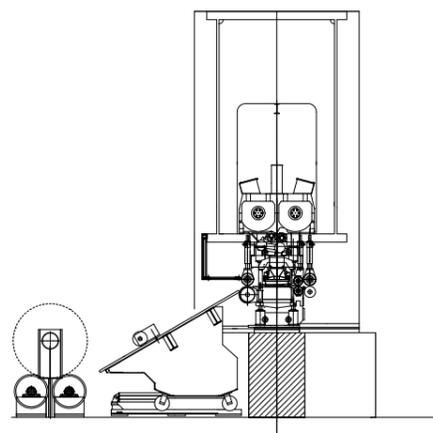
The compound stripper prevents distortion in the web caused by air turbulences originating from the reciprocating movement of the needle beams at high speeds. A special layer between stripper and cover plate ensures that air is not pressed through the perforations in the stripper plate.



Paperfelt Needlelooms

Stylus Pre-Needleloom NL16 Varilptic

The Stylus pre-needleloom for papermaker felts was developed as a direct response to the demands for new felt qualities. It ensures maximum production efficiency by separating web forming from finish needling. Utilizing the patented Varilptic drive modules the NL16 Varilptic provides for improved felt surface, higher production speeds, reduced draft and thus less shrinkage and higher uniformity. Available in working widths of up to 17 m and continuous speeds of up to 1200 rpm it is well equipped to meet various customer's requirements.



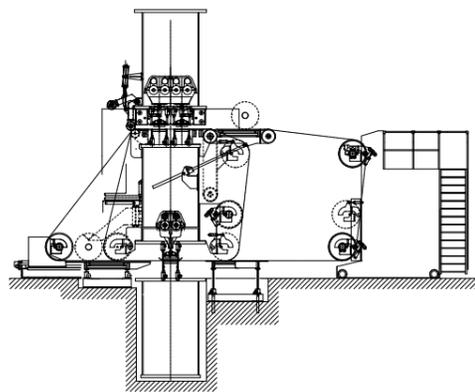
MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS VARILPTIC NL 16	1200 rpm	1.2 – 17 m	40 – 70 mm	0 – 7 mm	up to 2000

Stylus Finish-Needleloom NL19 + NL20

The Stylus finish-needlelooms mark the high-end of needlepunching technology. Working width, number and arrangement of needling zones, needle pattern, stroke frequency, feeding tables and the felt tensioning system are designed to the customer's needs.

Full automatic felt manufacturing by recipes including exact stops for splicing as well as felt tension control is state of the art.

The rigid steel frame provides high-precision needling and minimum vibration levels even at 15,8 meters working width and a continuous stroke frequency of 1200 rpm.



MACHINE TYPE	MAX. CONTINUOUS STROKE FREQUENCY	WORKING WIDTH	VERTICAL STROKE	HORIZONTAL STROKE	NEEDLE PATTERN
STYLUS NL19	1200 rpm	1.2 – 15.8 m	40 – 70 mm	0 – 7 mm	up to 4000 per zone
STYLUS NL20	1200 rpm	1.2 – 15.8 m	40 – 70 mm	0 – 7 mm	up to 4000 per zone





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