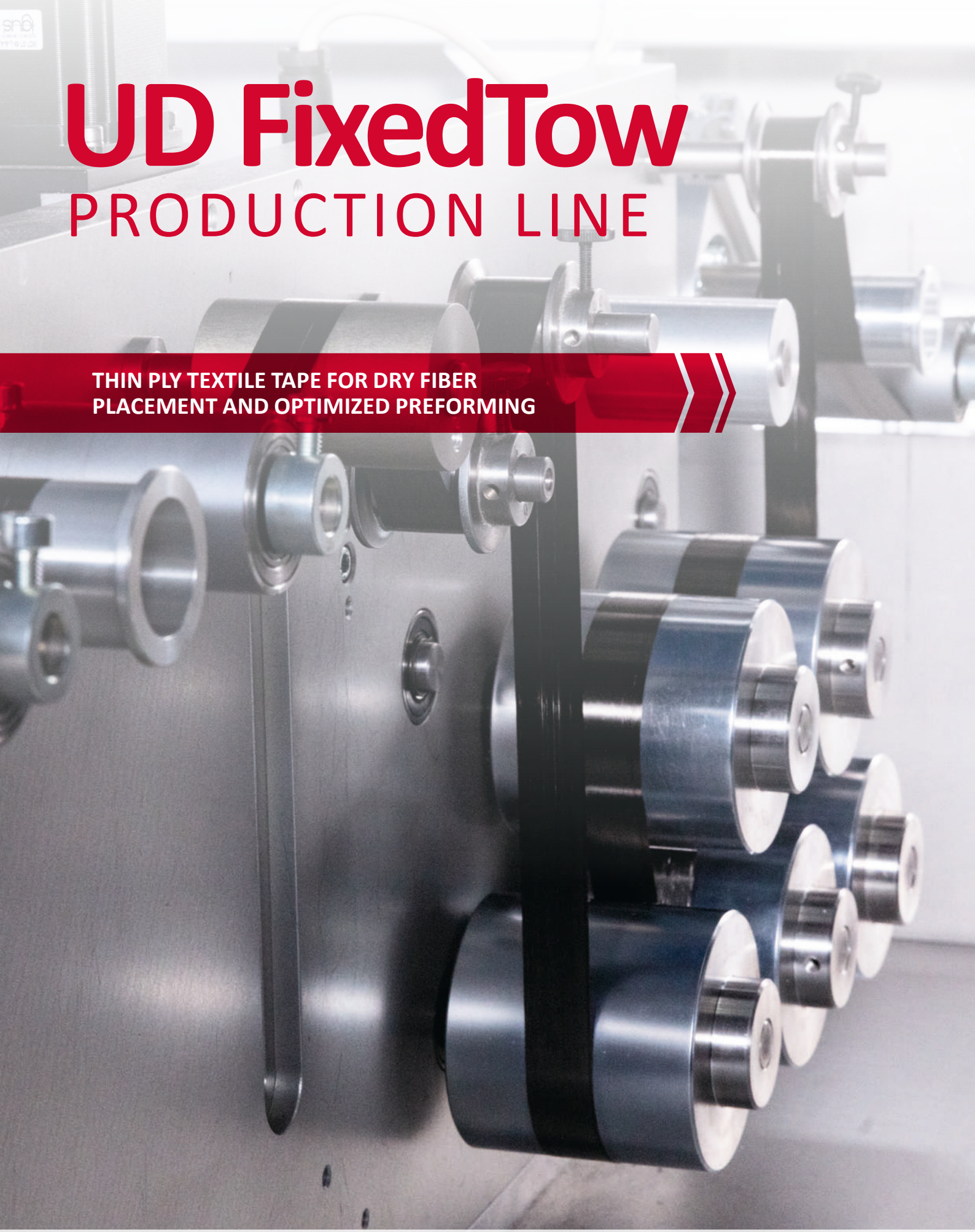
UD FixedTow
PRODUCTION LINE

THIN PLY TEXTILE TAPE FOR DRY FIBER PLACEMENT AND OPTIMIZED PREFORMING



EXPLORE COMPOSITES

M&A DIETERLE MASCHINEN- & APPARATEBAU GMBH

BERATUNG KONZEPTION REALISIERUNG

MACHINE FEATURES

❶ UNWIND

Automatically regulated single spool unwinding. Constant tension of all fibers is ensured. The fiber spool alternates depending on fiber winding pattern on the spool (at the turning points).

❷ SPREAD

Curved and coated spreading cylinders spread the fiber tow. The wrapping angle can be varied via system control. Two cylinders are heatable. Tension can be reduced before impregnation.

❸ IMPREGNATE

Powder to fix the spread tow is supplied by a reservoir and dosing drum. Powder impregnation amount is adjustable and hence the binder areal weight. Powder is applied uniformly. Overspray is recycled.

❹ HEAT

Melting of powder occurs via infrared radiation; Select heating from top, bottom or both. Temperature setting is monitored by pyrometer. Nip rollers for fixedTow compression before cooling.

❺ COOL

The fixedTow is cooled down by air cooling before winding.

❻ WIND

Measure Tape width constantly and record the output. FixedTow is coiled onto standard spools with a quick release. Different creel size is possible.

❼ CONTROL PANEL

Intuitive and user-friendly controls. Adjust Tape width, binder content, line speed, tension, temperature.

ABOUT UD FIXEDTOW

UNIFORM STARTING MATERIAL TAILORED TO SUBSEQUENT PROCESSES

The machine spreads a fiber roving to a thin ply tape. This spread tow is sprinkled with powder. Afterwards, the powder is melted and pressed into the tow. The produced fixedTow is then cooled and coiled up onto a pancake coil for further processing. The fixedTow has good drapability since it keeps a textile character. It is also a uniform starting material for dry fiber placement, preforming followed by resin infiltration (RTM or VARI). You can tailor the UD Fixed-Tow to your needs, and remain flexible to quickly change the starting fiber and powder material.

The production line produces fixedTow with low areal weights, tailored binder type and content. This increases laminate quality, material efficiency, and further weight reduction compared to conventional lay-up structures. The dosing amount of powder on the fixedTow is controlled. The production line ensures uniform fixed tape edges. The tape width is constantly monitored and recorded in an output file. Tension control throughout the process ensures an equal filament distribution and orientation. You can “tune” the material to your next processing steps. Compared to fabrics, for preforming, you have less variance in areal weight, better resin distribution, less material scrap and more degrees of freedom in fiber orientation. Innovative and individual designs become possible.

YOUR BENEFIT

- Better quality in final part
- Cost and material efficient production
- Great process control and fixedTow quality
- Service and user-friendly machine design and software
- For flexible tape production, adjust
  - Fiber tow areal weight & width
  - Binder type & content

TECHNICAL SPECIFCATIONS

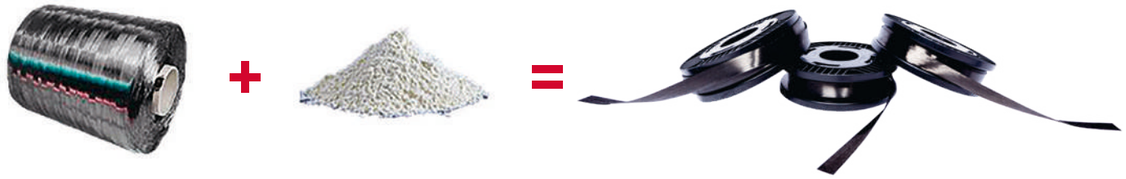
Machine Dimensions (L x B x H)	5500 x 800 x 2200 mm
Production Speed	20 m/min
Power required	32 A
Heating	Infrared
Cooling	Compressed air
Starting material, standard Fiber spool	800 – 3500 tex; 12 - 50 k
Produced material, FixedTow spool size	Ø 800 mm (~ 3.000 m fixedTow)
Powder material	Thermoplastic, thermoset; Particle size: 30 – 300 µm
Binder content	> 6 g/m2 (depends on spreading factor)

EXAMPLE FOR FIXEDTOW MANUFACTURING

Carbon Fiber Roving	24 k
Binder powder	Reactive (Epikote)
FixedTow width	20 mm ± 0,5 mm
Areal weight	80 g/m²
Binder content	7 g/m²

MACHINE AND PROCESS

PROCESS



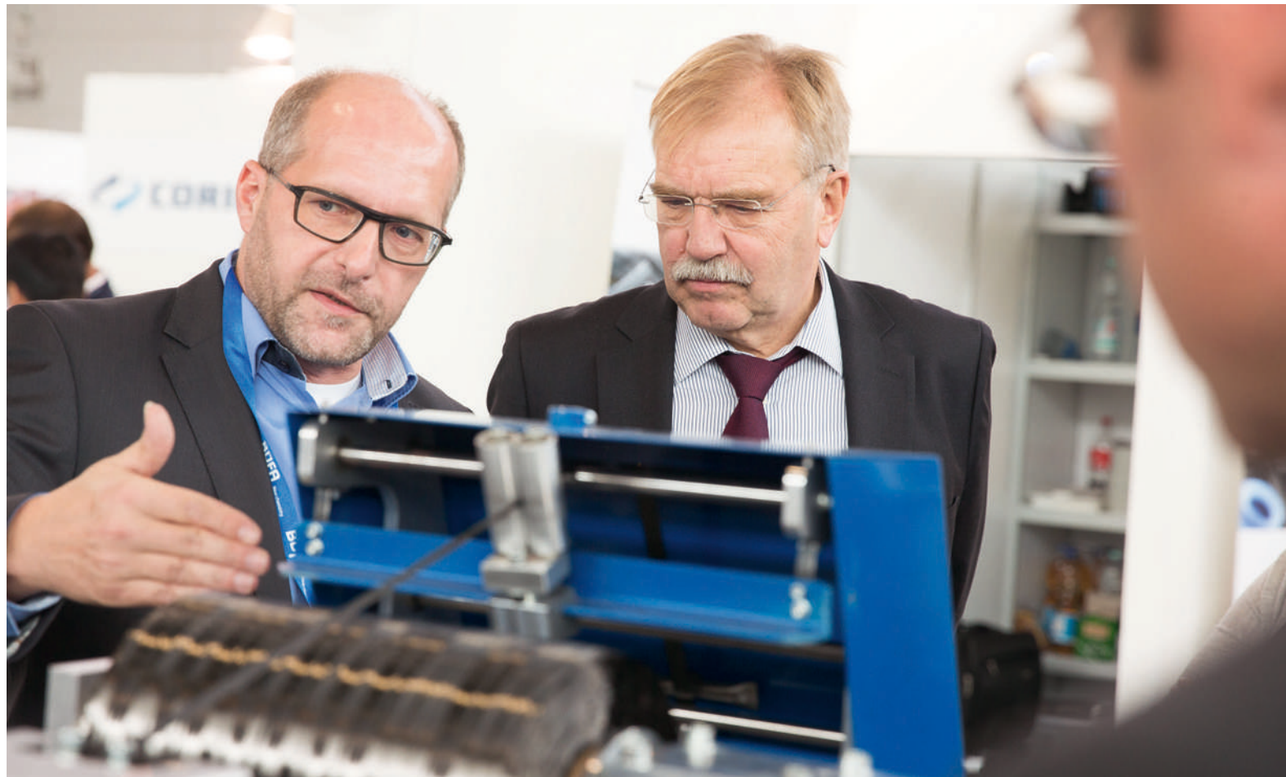
Carbonroving + Powder = fixedTow

PROCESS CONTROL

- Continuous recording of tape width and length
- Tension control (unwind, wind, impregnate)
- Temperature control
- Powder dosing amount

FEATURES

- Production of spread and powder-bindered fixedTow
- Adjustable material parameters and properties
- Cost efficient
- For local reinforcement, dry fiber placement, preforming



FLEXIBLE MACHINES FOR CHANGING PRODUCTION DEMANDS

WHO WE ARE

M&A Dieterle is a medium-sized family-owned business with a workforce of 100 people. We have more than 60 years of experience in metal processing for a wide range of applications.

This includes the development and construction of tailor-made machinery and components e.g. in the field of textile and paper industry, such as the production of drying fabrics, filter screens and felts. Our interdisciplinary team of engineers customizes each machine to the specific requirements of your intended application – from engineering to the manufacturing process and final commissioning.

The Composites Business Unit @ M&A Dieterle was initiated in 2015. We build machines for fiber-reinforced material production and processing.

WE OFFER MACHINES FOR FIBER PROCESSING

- Spreading
- Impregnation
- Fixedtow and tape production
- Dry fiber placement

Alongside, we offer material production, process development & simulation, machine training, and feasibility studies.

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