Mat Forming Concepts for Particleboard, MDF and OSB
Know-how
Siempelkamp, a name associated with the manufacture of presses since 1883, has played a major role in the technical and technological development of the continuous press over the past 20 years.

With its ContiRoll® press Siempelkamp was also quick to apply the system philosophy of the forming and press line to all wood-based materials such as particleboard, MDF, OSB and CSL. In the meantime the company has built up an unrivalled wealth of user-oriented experience that is best manifested in the more than 160 ContiRoll® press lines ordered to date by customers all over the world.

Complete solutions from a single source
Together with its various subsidiaries and affiliates Siempelkamp is today in a position to deliver complete plants. All the core components are available from a single source – from machinery and technology for particle/fibre processing, glue blending, mat forming and pressing, to finished board handling systems, complete store logistics systems, and automation of the entire plant.

Tailor-made solutions
Close collaboration between Siempelkamp’s team of process technologists, development and design engineers, and start-up technicians on the one hand and the customer’s own experts on the other are the best guarantee for truly tailor-made solutions.

Quality
High-quality concepts, designs and materials ensure a high level of plant availability, which has a direct impact on every plant’s economic efficiency.

Full service
Siempelkamp offers a fully integrated system of support that extends beyond design, engineering, production and assembly to the plant’s technical/technological start-up (personnel training) and after-sales service (e.g. conversions and repairs).

It is also this expertise as a service provider that has made Siempelkamp into the world market leader for machinery and complete plants in the wood-based panel sector – and a partner you can trust.
A key link in the production chain is the mat forming system, be it for single-layer, homogeneous mats for MDF or CSL, or three-layer mats for particleboard or OSB panels where the core and face layers impose different requirements on the mat forming characteristics. In each case the technological parameters for an optimal mat forming characteristic have to be “translated” into mechanical engineering terms.

Together with its subsidiary CMC Texpan, Italy, Siempelkamp builds state-of-the-art mat forming systems which combine with the ContiRoll® press to form high-tech solutions for the production of high-quality wood-based panels. The systems are protected by numerous patents.

### Classification of Mat Forming Systems

<table>
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<th>System</th>
<th>FL</th>
<th>CL</th>
<th>Type</th>
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<tr>
<td>Particleboard</td>
<td>WindFormer</td>
<td>CageFormer</td>
<td>Classical</td>
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<td></td>
<td>CrownFormer</td>
<td>CrownFormer</td>
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<td></td>
<td>CrownFormer</td>
<td>CageFormer</td>
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<tr>
<td>MDF</td>
<td>StarFormer</td>
<td>–</td>
<td>Mechanical</td>
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<tr>
<td>OSB</td>
<td>DiscFormer</td>
<td>FinFormer</td>
<td>Classical</td>
</tr>
<tr>
<td>CSL</td>
<td>DiscFormer</td>
<td>–</td>
<td>Modified</td>
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The **face layer WindFormer** uses a current of air to separate the particles into coarse fractions near the air nozzles for the core layer and finer particles – according to their size – at the rear end of the wind chamber for the face layer.

The air current can be controlled for the entire system or for individual groups of nozzles. Optimal distribution and exact size separation of the particles is assured by screens, some of them fitted with vibrators. The coarse fraction is discharged by a vibrating screen and a discharge screw.

**Technical features**
- High degree of separation
- Precise mat forming
- Adjustable separation (coarse/fine particles) as required
The core layer CageFormer has a mechanical mat forming head with distribution rollers to produce two product flows.

Doffing rollers for breaking up the material convey the particles continuously to the cage rollers, which deposit the mix – without further size separation on the underlying forming belt.

**Technical features**
- Homogenous particle mix, with no porosity in the core layer
- Consistent particle size distribution plus high forming accuracy

**Customer benefits of the mat forming system**
- Finest face layers for top-quality laminating or direct painting
- Low glue consumption
- High internal bond thanks to the homogeneous core layer

**Particle throughput per meter forming width**
(Wind/CageFormer) approx. 90 – 170 m³/h

CageFormer Face and core layer former
The new face and core layer CrownFormer machines are equipped with patented, mechanical disc orienters.

The face layer CrownFormer has a pre-separating unit (patent pending) for the upper row of rollers, which produce a uniform material flow and feed the underlying row of rollers, i.e. the main separating unit.

Particle throughput per meter forming width (Crown/CrownFormer) approx. 65 – 200 m³/h
A "TwinMech" unit consisting of two special CageFormers can be used with each material bunker for particularly high throughput requirements. No additional dosing bunkers or loading units are needed.

The number of toothed rollers in this unit determines the capacity of the plant. The feed clearance between the toothed rollers guarantees a structured mat build-up based on fine and coarse particles. Fine particles end up in the face layer while the coarse particles are directed to the middle of the mat. A gentle current of air underneath the separating unit enhances this process. Excessively large particles are rejected by a discharge screw.
A further option is to combine a CrownFormer for the face layer with a CageFormer for the core layer. Such a system combines the advantages of a mechanical face layer mat forming system with the CageFormer’s excellent mixing of material for the core layer. The result is a particleboard with a fine surface, tight edges and very good internal bond – all provided by mat forming units of low overall height.

Particle throughput per meter forming width (Crown/CageFormer) approx. 60 – 200 m³/h
The core layer CrownFormer uses a bed of identically finished toothed rollers to spread a homogeneous mat on top of the first face layer mat while at the same time ensuring that enough fine material reaches the core of the mat to act as binder. Excessively large particles are rejected via a belt conveyor.

**Technical features**

The face layer CrownFormer:
- Good separation with highest mat forming precision

The core layer CrownFormer:
- Low separating effect with high mat forming precision

The CrownFormer in general:
- Self-cleaning mat forming rollers
- Low overall height
- No need for a disc screen

**Customer benefits of the mat forming system**
- Material cost savings
- Low building costs for halls and steel structures
- Low maintenance costs
Material is fed from the mat forming bunker by means of a bottom dosing belt and disc rollers in the bunker discharge front. Fibre is conveyed by two patented disintegration rollers to the new mechanical mat forming head consisting of toothed rollers. The pitch and speed of these rollers can be varied to control the feed rate and ensure that the fibre is distributed uniformly over the mat forming belt in transverse and longitudinal direction. Both the angle of tilt and height of the mat forming head are adjustable. Downstream from the mat forming head is a leveling head (new patent pending) with a variety of leveling rollers. Its function is to produce a uniform mat with constant weight per unit area independently of the mat height and bulk density.

**Technical features**
- High mat forming precision and best distribution of weight in transverse and longitudinal direction thanks to the homogeneous distribution of fibre and density in the mat
- Optimal distribution of fibre in the mat forming head enables a controlled mat forming process
- A leveling head instead of a scalpel roll means there is no longer any need for fibre recycling at the mat forming machine, thus reducing the number of pneumatic transport systems
- Lower electricity consumption
- Large mat forming bunker replaces a fibre bunker
Customer benefits of the mat forming system

- Enhanced board quality
- Savings in the cost of investment, maintenance and energy

Fibre throughput per meter forming width (StarFormer)
approx. 500 – 1000 m³/h

1 Former for MDF
The service-proven DiscFormer forming rollers and FinFormer forming head for the face and core layer.
The DiscFormer for face layers
Material is discharged through the bunker discharge unit onto the underlying disc forming head, which deposits the strands properly oriented.

The DiscFormer can be adjusted in its angle of tilt and height to match the forming angle. Oversized strands are rejected by a screw.

The FinFormer for core layers
Strands are discharged from the bunker onto the doffing roller distributor which spreads the material onto the underlying Finformer. Designed as a cross-orienter, the Finformer aligns the strands transverse to the direction of production and deposits them thus arranged on top of the first face layer mat. Like the other forming units, the FinFormer is automatically adjustable in its angle of tilt and height.

Technical features
The face layer DiscFormer
- Good orientation of the strands
- Separation brings the biggest strands to the surface
- Low mechanical loading of the strands

The core layer FinFormer
- Minimal separation effect
- Optimal orientation of the strands in transverse direction

Customer benefits of the mat forming system
- Simple but effective mat forming system
- Self-cleaning
- Service-proven
- Maintenance-friendly

Strand throughput per meter forming width (Disc/FinFormer) approx. 195 – 400 m³/h
Sales companies/Representatives

Australia
Siempelkamp Pty Ltd.

Brazil
Siempelkamp do Brasil Ltda.

China
Siempelkamp (Wuxi) Machinery Manufacturing Ltd., Beijing

France
Siempelkamp France Sarl

India
Siempelkamp India Pvt. Ltd.

Russia
Siempelkamp Moscow

Singapore
Siempelkamp Pte Ltd.

Spain
Siempelkamp Barcelona

Turkey
Siempelkamp Istanbul

USA
Siempelkamp L.P.