

LVT flooring production and its special features
Let the next flooring revolution roll –
HOMAG is prepared and ready

The success story of laminate flooring started around 15 years ago. The comparatively new product LVT, short for Luxury Vinyl Tiles, has the potential to be the next big thing in the world of flooring. With a range of different technical modifications and new developments, HOMAG has extended its flooring machine spectrum to create a new series specifically designed for LVT production.

The flooring market is on the move – and it is about time. First and foremost it will be end users who benefit, as this move will open up not just greater product diversity but also scope for whole new applications. But for producers and machine manufacturers too, product movement means progress, and with it the knock-on effect of positive pressure for further development. It will drive forward the development of established machines and at the same time provide scope for diversity into whole new areas of application.

In this way, the advent of LVT flooring is injecting new life into what has become a slightly tired laminate sector. The product itself is not a new one, but was previously classified as an off-the-roll material and seen as being a part of the carpet sector. This was due largely to the laying method of full surface gluing, which was performed predominantly by specialist fitters. By changing to sized and profiled plank formats, and particularly by providing products with Clic / Loc profiles, the product has now assumed the character of a laminate floor and has consequently crossed over to the DIY market.

The technical characteristics speak for themselves. The designs offer

everything from simple decor effects to complex structures using embossing-in-register techniques, and laying has now become simplicity itself. The thickness range opens up additional scope as it is now technically possible to produce and supply solid LVT material of between 4 and 12 mm with Clic / Loc profiles.

Additional possibilities are opened up by laminating LVT onto for example MDF substrate panels, which primarily adds variety to the product's rigidity and handling facility.

Generally speaking there are two main types of producer: Some which manufacture the raw material in roll form and who have not operated a flooring rip cutting and profiling plant so far. The others are established laminate or cork flooring producers who buy in the raw material and utilize partly their existing plant technology.

To do full justice to the material-specific properties of PVC belonging to the group of thermoplastic materials, however, a number of technical adjustments are needed. These have already been implemented in a number of LVT lines and proven successful in production.

The main terms of reference which apply here include:

- Adjusted workpiece transport system due to minimal bending and compression resistance of PVC
- Cutting optimization with specially adapted tools
- Optimization of extraction technology as a result of changed chip behavior

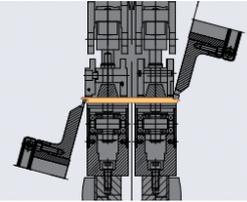
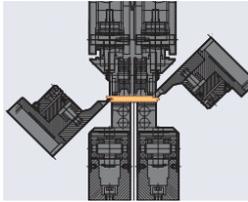
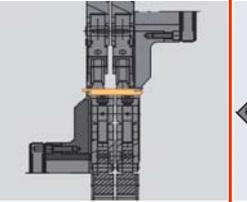
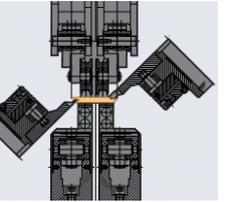
The relevant technical features have been developed at HOMAG to address these different needs.

When selecting the most suitable workpiece transport system, generally speaking the so-called "parquet line" is used, as this ensures optimum

handling of the soft and scratch-sensitive LVT surface. These are profiling machines equipped with workpiece clamping systems without support rails underneath and with integrated pressure shoes from above.

**Doppelendprofiler Baureihen von Homag
Transportsystem Parkett + LVT**

**DET-Lines from Homag
Transport system Parquet + LVT**

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|---|--|---|---|
|  |  |  |  |
| <p>Wood flooring / LVT – Double standard chain</p> <ul style="list-style-type: none"> • Integrated dual pressure pads • High-precision chain • Powered pressure beam belt <p>Parkett/LVT – Standardkette doppelt</p> <ul style="list-style-type: none"> • Integrierte Doppeldruckschuhe • Hochpräzise Kette • Angetriebener Oberdruckriemen | <p>Narrow chain W2</p> <ul style="list-style-type: none"> • Integrated pressure pads • High-precision chain • Powered top pressure belt <p>Schmale Kette W2</p> <ul style="list-style-type: none"> • Integrierte Doppeldruckschuhe • Hochpräzise Kette • Angetriebener Oberdruckriemen | <p>Wood flooring / LVT – Narrow chain</p> <ul style="list-style-type: none"> • Integrated pressure pads • High-precision chain • Powered pressure beam belt <p>Parkett/LVT – Schmalkette</p> <ul style="list-style-type: none"> • Integrierte Druckschuhe • Hochpräzise Kette • Angetriebener Oberdruckriemen | <p>Wood flooring / LVT – Narrow chain W1</p> <ul style="list-style-type: none"> • Pneumatic rollers in the pressure beam • High-precision chain • Powered top pressure belt <p>Parkett/LVT – Schmalkette W1</p> <ul style="list-style-type: none"> • Pneumatische Rollen im Oberdruck • Hochpräzise Kette • Angetriebener Oberdruckriemen |

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Solutions for flooring production

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Fig 1. Parquet DET lines

In conjunction with the high-precision HOMAG transport chain which has proven highly successful for a number of years in the parquet sector, using this system height tolerances of +/- 0.03mm can be guaranteed without endangering the sensitive surface.

Depending on the minimum workpiece width to be implemented, one of the transport systems depicted above is selected, always with a view to achieving the maximum workpiece contact surface to the chain pads. Due to the low flexural strength of the material, particular attention is paid to achieving the maximum possible workpiece clamping to ensure the optimum absorption of cutting forces.

For each individual processing step, an individual 3D CAD cross-section drawing is generated together with the workpiece, the tool and the profile used.

To address the growing demand for narrow parts, and to eliminate any tool application angle restrictions, a new series with a narrow chain 30 mm in width was developed for lower production speeds of up to max. 100 m/min (lengthwise) (see picture above).

As impact sound insulating, soft materials are being increasingly used also for reverse side lamination of LVT flooring, the technical requirements for this product also had to be taken into account in the development.

This issue was solved with the application of pressure shoes from above with integrated rollers.

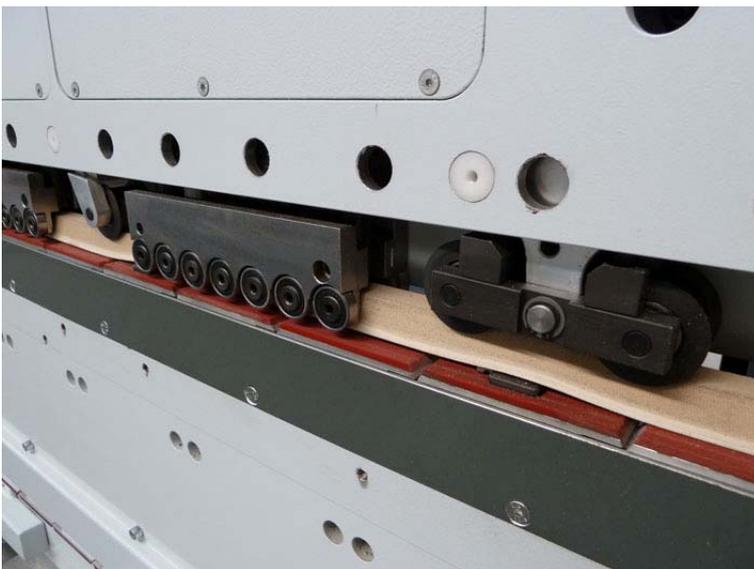


Fig 2. Integrated pressure skids

In the case of the cross machine, particular attention was paid to these flexible material characteristics in the magazine area, with the development of a magazine specifically for processing LVT.



Fig 3. Cross machine infeed DET

This permits product contact over the entire surface coupled with added flexibility for different product lengths. In addition, in the dog infeed area, the lowest plank is drawn downwards using vacuum to guarantee absolute infeed reliability.

Downstream from the workpiece infeed, a wider roller conveyor takes on the role of supporting the workpiece over its entire profile length, so preventing material deflection and minimizing product tolerances.

In addition, special dogs are used for reliable separation of the minimal material thicknesses.

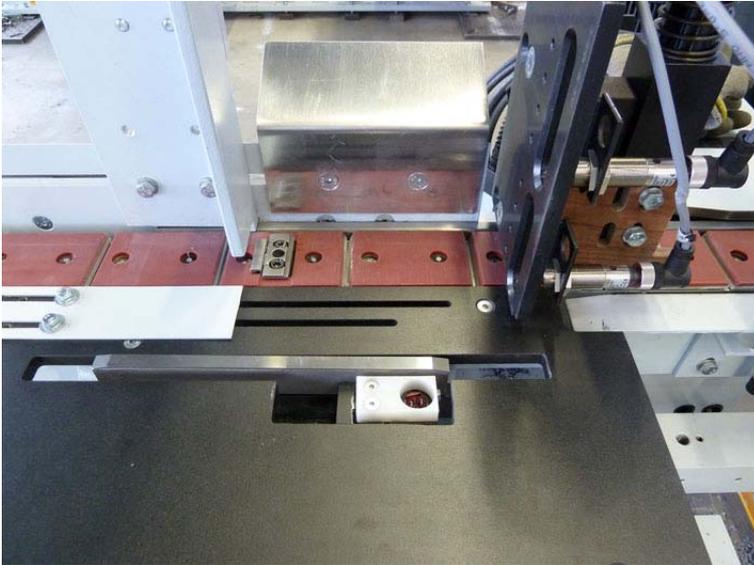


Fig 4. Cross magazine DET

In terms of tooling, the control system has been upgraded to include a selector switch for switching over between 50 and 100 Hz.

As the low melting point of vinyl gives the material a tendency to "smear" easily, this adjustability means that continuous chips can be avoided, making for more reliable extraction.

Due to the wide range of different PVC material compositions available in the marketplace, an individual overriding frequency specification often has to be added at the converter.

To combat the static naturally generated by PVC, dust hoods specially designed for use with this material and equipped with a deionization system are used.

This allows the produced chips to be more easily extracted and prevents them from becoming "stuck" in the plant.

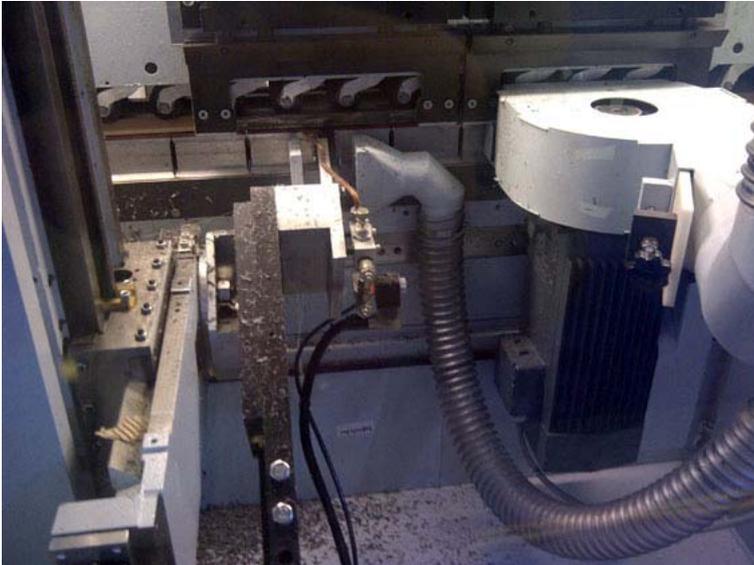


Fig 5. Scraper blade and dust hood

A scraper blade for chamfering or jointing has also been developed which produces extremely good results and eliminates the ever-present risk of corrugated cuts.



Fig 6. Scraper blade

The whole HOMAG throughfeed saw range is suitable for upstream rip cutting of the LVT panels. Depending on the starting format of the unfinished panels and the end format ready for rip cutting, a wide range of different saw models is available. The expected degree of convenience and the required overall level of plant flexibility are also deciding factors

which determine the optimum saw for each application.

In comparison to the punching method used predominantly to date in the LVT sector, using this technology not only drives up output, importantly also it offers the benefit of allowing decor-specific alignment. Using a suitable position detection and decor alignment system, products which have been manufactured using the embossing-in-register technique can be precisely divided.

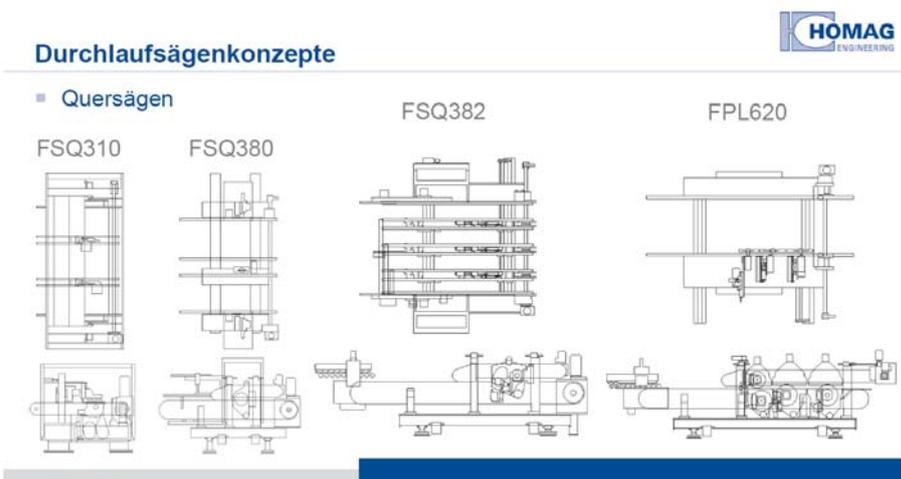
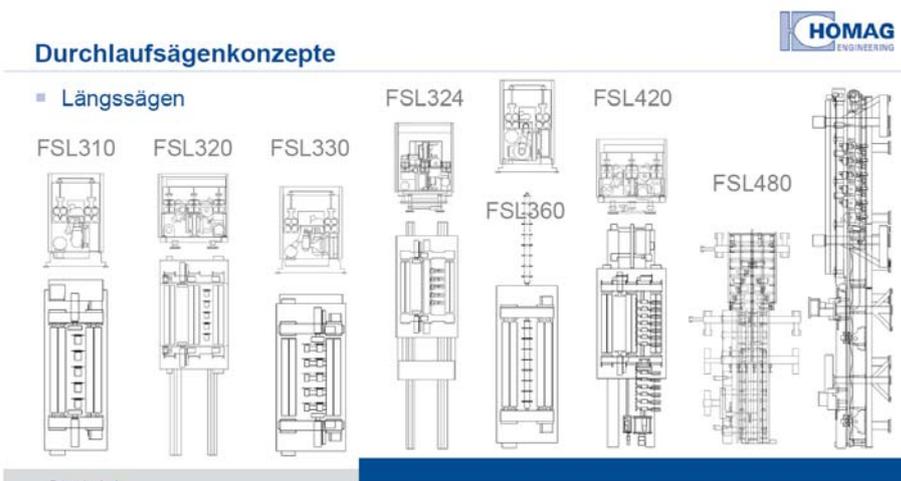


Fig 7. Rip/cross cut sawing concepts

These developments make HOMAG ideally placed to meet demand arising from the growing interest in LVT flooring.

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