

# The Conception:

# Modern industrial machine technology for sophisticated standards

## The Requirements

Surface sanders must fulfill a variety of requirements in industrial production. This is true for installations in production lines as well as for individual solutions such as:

- Processing small and large series in rapid succession
- Sanding crosswise and lengthwise veneered parts
- Processing different types of wood, lacquer and foil
- Precisely calibrating and fine sanding of solid wood
- Adapting to the most varied shapes, i.e. round, oval, rectangular or asymmetric
- Sanding warped and differently tolerated parts

## The Tradition

For over 70 years, Heesemann sanders have stood for innovation, reliability and permanent precision. This success was only possible because the demands of industry have always set the standard for developing new generations of machinery.



## The Solutions

Economy and permanent precision result from crucial technical developments to the LSM 8 series:

- the **CSD®** electromagnetic Pressure Beam Technology, which ensures the dynamic stepless pressure control of the individual pressure units, for a consistent material removal, even with the thinnest veneers and lacquer applications
- the workpiece precision sensing which permits flexible and multi-track feeding by the automatic application of the pressure beam
- the cross sanding technology, for high surface quality through the combination of cross and longitudinal sanding units.
- whose automatically starting motors, automatic pressure control during sanding and NC thickness adjustment produce a first class result with the push of a button
- the energy saving sanding belt cleaning system, which effectively cleans while using a minimum of compressed air and thereby extends the life of the sanding belts
- Poly-V-Belt drive technology on the sanding units, as for example a high quality motor construction
- the modular technology which can react to various operational requirements
- conversion is possible even after many years of operation
- the compact construction makes quick installation or retrofitting possible and requires minimal space



**Fine sensing of the workpieces**



**The maintenance free CSD® electromagnetic pressure beam**



**The industrial PC operating terminal**



**The Poly-V belt drive and bearings lubricated for life**

Space saving accommodation in the machine base: the vacuum blower for the workpiece suction device



Compact design, integrated switch cabinets



# Future orientated technology: The innovative CSD®-system

## In detail: The cross sanding method

Presanding across the grain and resanding in longitudinal direction achieves worldwide accepted, best sanding results. Raised fibres of veneer are cut off by the cross belt so that they will not reappear during subsequent staining or lacquering. For solid wood with annual rings of different hardness, washing out of the surface is avoided through the combination of cross and longitudinal units. Furthermore, taping paper can be better removed using the cross belt than the wide belt.

## Computer controlled selective pressure control

A technical revolution in the pressure beam. The contact pressure force of each individual pressure pad adapts continuously to the workpiece shape.



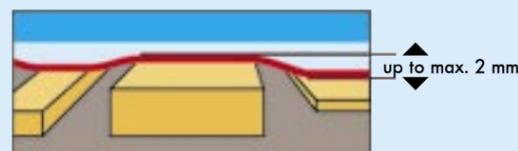
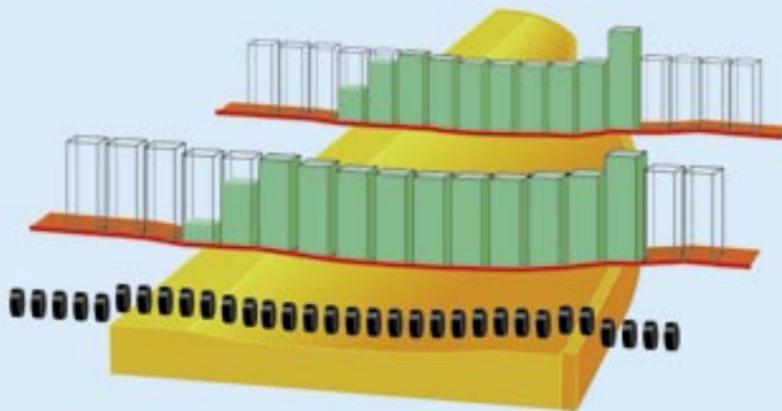
The maintenance free pressure beam: electronically controlled, magnetic pressure, therefore, no sticking or soiling as it is possible with pneumatic elements. Completely encapsulated, thus no soiling through sanding dust.

## The CSD® electromagnetic pressure beam technology:

Proportioning of the sanding pressure is a decisive factor for controlled material removal. Using the computer controlled, selective pressure control of the CSD® electromagnetic system, the sanding pressure may be infinitely changed in milliseconds on each element in the pressure beam. Particularly for asymmetric and round parts the unique CSD® electromagnetic system allows precise adaptation of the pressure force in the edge area.

When the edges are designed differently, e.g. because of a solid lipping on one side, the pressure may also be controlled asymmetrically. A fine roller sensing at the infeed ensures exact pressure calculation. The elastic pressure beam causes a compensation of the workpiece tolerances. Thickness differences of max. 2 mm can be compensated within a workpiece or from workpiece to workpiece.

## The CSD®-system



Thickness tolerance

First class sanding results by means of

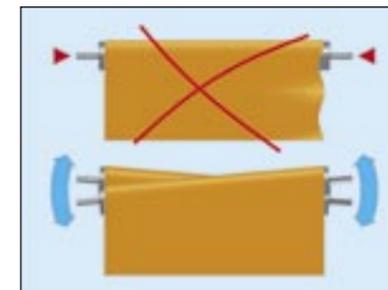


An innovation of



## The sanding units:

All tension top rollers of the longitudinal sanding units in the LSM 8 construction series are equipped with 2 cylinders. Their arrangement on the front side causes the automatic compensation of different belt edge lengths and prevents „knocking“ of the belts.



The pressure beams consist of inter-meshing toothed segments, by means of which striation of the junctions is avoided. The arrangement of the drives on the longitudinal belts results in a large wrap around angle of the drive-belt on the drive shafts leading to a low sanding belt tension and a higher elasticity during sanding. Evidence of state of the art production methods are the bearings of all drive and guide rollers which are lubricated for life, thereby drastically reducing the maintenance commitment. Wear free electronic direct current brakes of the drive motors prevent after-running of the sanding belts after they have been switched off or in the event of malfunctions. The units can run against feed direction or upon request, in and against feed direction.

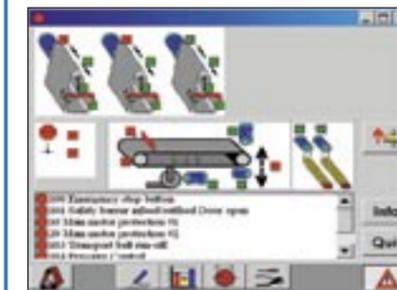
## Operation

Machines are operated by graphic operating terminals enabling a central and simple adjustment of sanding parameters. The use of an Industrial

PC with Touch Screen display makes the machine control comfortable and easy. A programme memory ensures a fast machine conversion to different working tasks by storing values under a certain programme number. Additional control functions are available upon request.

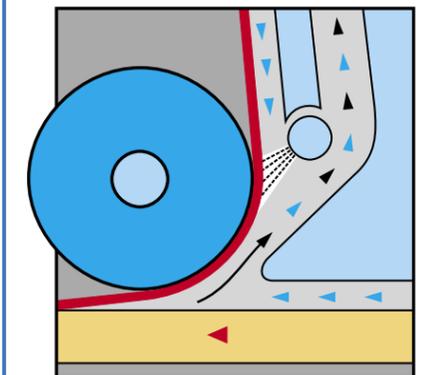


A fault-finding-system enables the operator to find and solve quickly resp. directly machine errors and errors in operation. Upon request interfaces for controlling workpiece height, programme number and feed speed secure a central linking of the machine to a host computer. The industrial PC is the perfect terminal for linking the machine to a higher ranking control. An operating data acquisition module supplies production quantity in m<sup>2</sup>, current metres, quantity, production and rest period for production sequence analysis. Included in the PC is a modem for connecting the machine to the telephone line and giving the possibility to get long distance analysis of malfunctions and assistance directly from Heesemann or other service points.



## The dust extraction:

Each sanding unit is equipped with a combined blasting and extraction unit. The blasting unit is always activated workpiece dependent, keeping the air consumption at a minimum. During sanding belt run in and against feed direction the blasting and extraction unit is mounted on both sides of the unit and may be selected according to the belt running direction. The extraction ducts are arranged directly behind the sanding zone to guarantee minimum extraction and compressed air consumption while achieving first class sanding results. A perfected air flow assists the belt cleaning. Thus, as far as energy savings are concerned, the LSM 8 construction series is a trend-setting machine conception.



Schematic presentation of the air flow

Controlled workpiece dependent transport belt cleaning system prevents soiling of the workpiece bottom face.

# Veneer sanding: Reliable, economical



Cross sander for a perfect surface quality

The application of veneered workpieces is just as large as their multitude of design possibilities. In our daily work we encounter cross or longitudinal veneered workpieces, with rounded, rectangular, irregular shapes, with and without cut-outs. In addition, an increasing spectrum of parts are to be sanded, from soft to hard veneers - in part with inlay work on one side - or with overhanging solid lippings. Due to economic reasons veneers become thinner and thinner. For this reason particularly innovative sanding technology solutions must imply a high degree of flexibility for industrially manufactured veneered parts.

Heesemann veneer sanding machines are equipped for this task with:

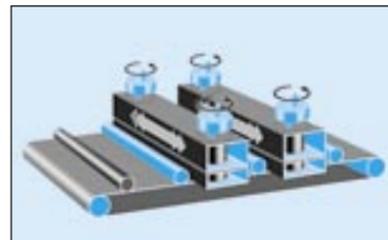
- a wide, elastic pressure beam for the cross and longitudinal belts, in conjunction with sensitive workpiece tracing which ensures a large contact surface with the workpiece

- the unique infinite electromagnetic **CSD**<sup>®</sup> pressure regulation, which also precludes the danger of sanding through in edge areas and cut-outs
- a tolerance compensation of max. 2mm in the pressure beam permitting the clean sanding of warped parts or those with deviating thickness
- computer controlled automatic pressure calculation for the individual pressure shoes, which, for example, calculates an asymmetric pressure application in the event of a solid lipping on one edge
- cross sanding units, which cut off wood fibres across the grain. At the same time the cross sanding units give cross veneered parts a final sanding in veneer direction
- a workpiece suction device, which ensures the secure transport of small parts such as drawer fronts

- safety circuit and electronic brakes on the units avoid damage to the workpieces in the event of a belt rupture
- a programme memory for storing various sanding settings for different veneer types, to reduce setting time to a minimum.
- an energy saving intensive belt blasting device for a longer belt operating life

## Orbital Sanding Units "OSR"

The Heesemann sanding units "OSR" are designed for fine sanding of workpieces with cross and longitudinal wood grains in pass-through operation (for example fancy veneer). This conception considerably reduces the sanding marks caused by the cross and longitudinal belts. The "OSR" unit works with a movable pressure segment belt system (patent pending).



Orbital sander with 2 units

The new conception for this technology works on a frequency controlled eccentric oscillation system with large stroke. An additional lamellar press-on system moves horizontally between a press-on element and an orbital sanding belt crosswise to the feed direction. Hereby, the sanding marks of the orbital sanding belt are interrupted and a homogeneous and regular sanding finish is achieved without having disturbing sanding marks.

# Solid wood, panel and parquet calibration: Permanent precision

## Solid wood processing

Today the surface qualities demanded from solid wood are comparable to those obtained with veneers. Consequently the requirements placed on calibrating machines in the furniture and panel industry have been extended beyond a purely dimensional stability towards a high surface quality. Heesemann have important technical advantages for the calibration of solid lumber panels, parquet material and solid wood frames.

For high stock removal an Oertli cutter head „CU“ is available. Even for solid lumber and solid wood panels with a stock removal of up to 4 mm and with a complete charge the loose fibre chips are constantly channelled into the dust extraction system. The worldwide proven quality of the „Castor“ knife cutter block guarantees an optimum surface quality for this application. This aim is achieved by the extracting cut movement caused by the spiral position of the cutting knives. Afterwards it is considerably easier to calibrate and carry out a final sanding with a segment pressure beam on the same machine.

- Torsion free unit suspension, combined with a solid and

precise NC controlled height adjustment, ensuring dimensionally stable parts throughout the entire machine operating life.

- A steel roller, which due to its almost unmeasurable wear and a precision bearing is the only system to achieve a high degree of accuracy even with an aggressive sanding attack.
- High motor rating of up to 75 kW for an intensive material removal.
- Segmented press-on lip at the in-feed of the calibration roller permitting an intensive contact pressure on workpieces with differing thickness even with multi-track feeding.
- The cross sanding technology employed for the downstream fine sanding units avoids the washing out effect encountered with soft woods resulting from different annular ring hardness and ensures a flat sanded surface of knots characterized by varying wood hardness. A greater jump in grit sizes is possible between rollers and cross sanding unit due to the aggressive sanding cut of the cross belt



Steel roller with precision bearings followed by a cross sanding unit

- The **CSD**<sup>®</sup> electromagnetic pressure beam technology, with infinite pressure regulation of each pressure element, precludes a rounding of the edges on calibrated surfaces.
- An effective and cost saving extraction and belt cleaning which can even handle large dust quantities.

## Panel processing

Stable dimensions and fine surfaces also play an important role in the calibration of chipboard, MDF, table board and plywood. Surfaces must be perfectly sanded especially for subsequent coating with laminates or foils. To this must be added a high working capacity and functional safety as special processing requirements to be able to cope with large production quantities as encountered in the panel industry. Heesemann calibration machines meet this requirement by combining modern technology and capacity reserves. For production lines bottom and top sanders are available to minimize handling costs and increase the production volume.



Calibration, cross and longitudinal sanding

# For lacquer sanding: Perfect surface finish

## Minimum application quantities

The trend is clear - low quantities applied and stains and lacquers containing as little solvent as possible. For surface finishing UV lacquers with a high solid matter content, water based lacquers, waxes and low solvent stains are increasingly being used. Application quantities of markedly less than 10 g/m<sup>2</sup> are no longer rare occurrences.

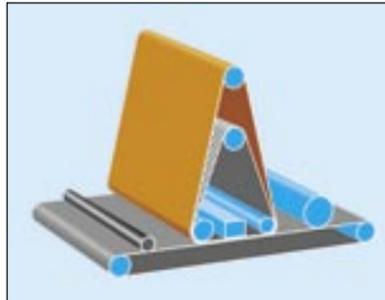
Heesemann sanding machine technology has positively taken this development into account.

- The infinite **CSD**<sup>®</sup> electromagnetic pressure regulation of the individual pressure elements in the pressure beam which permit an intensive but careful sanding of the endangered side, front and rear edges.
- The elastic pressure beam which optimally compensates for frequent tolerances within or between work pieces of max. 2 mm without sanding through
- The intermeshing pressure shoes which ensure gentle transitions on the surface and which avoid stripped marking.
- Wide pressure beams for a uniform and areal sanding attack.
- The frequency controlled sanding belt drives with a wide regulation range of 1 : 40, permitting the belt speed to be infinitely adapted to the individual lacquer and stain quality.
- The wide range of structuring and smooth brushes for special finishing effects.
- The thorough sanding belt cleaning, preventing sanding marks resulting from adhering dust grains.
- A constant working height together with different interfaces serving as the prerequisite for linking into a lacquer line.

## High gloss

The use of a combination of cross and longitudinal sanding belts has proven particularly suitable for this lacquer type. Heesemann employs cross sanders for this work which ensure a uniform material removal rate even with fine grits and a good surface finish with the cross sanding. This technology ensures a uniform and flat surface.

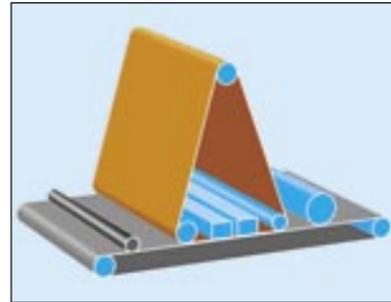
## Longitudinal sanding unit with pressure segment belt:



To achieve an optimum finish for wood and lacquer sanding the longitudinal sanding unit can be equipped with a pressure segment belt. The sanding belt is only pressed on in the area where the segments are. Thus the sanding traces are interrupted and a homogeneous surface finish is obtained.

## CSD<sup>®</sup> plus:

By using a second pressure beam in the longitudinal sanding unit a finer sanding result is achieved. Therefore, the **CSD**<sup>®</sup> plus system works with two controllable **CSD**<sup>®</sup> pressure beams working independently from each other. This system does not replace two succes-



belt grits but the sanding result of a longitudinal head can considerably be improved for various applications.

## Perfection in combination:



For the last longitudinal sanding unit a combination of pressure segment belt and **CSD**<sup>®</sup> plus double pressure beam is useful to get an even smoother sanding result.

# The modular system: Equipment for every task

## Solid wood calibrating



**LSM 8 Cu/R/L** Planing, calibrating and fine sanding machine in one pass



**LSM 8 R/C/L** Calibrating and fine sanding machine for high surface qualities



**LSM 8 R/R/L** Calibrating and fine sanding machine for high stock removal



**LSM 8 R/R/L/L** Calibrating and fine sanding machine for high stock removal and higher feed speeds



**LSM 8 R/C/L/L** Calibrating and fine sanding machine for high surface qualities with fine final grits

## Veneer sanding



**LSM 8 C/L** Cross sanding machine for slow feed speeds



**LSM 8 C/L/L** Cross sanding machine for medium feed speeds



**LSM 8 C/L/L/L** Cross sanding machine for higher feed speeds



**LSM 8 C/L/OSR2** Cross sanding machine with subsequent orbital sanding units for a perfect surface quality when sanding cross veneered parts and frames



**LSM 8 L/C/L/L** Cross sanding machine for high feed speeds with a considerable proportion of cross veneered parts

## Lacquer sanding



**LSM 8 L** Sanding machine for small application quantities



**LSM 8 L/L** Sanding machine for medium application quantities



**LSM 8 C/L/L** Sanding machine for higher application quantities



**LSM 8 C/L/C** Sanding machine for a higher gloss with finer grits



**LSM 8 C/L/C/C** Sanding machine for high gloss lacquers

## Bottom sanding machines



**LSM 8-U R/R** Calibrating machine



**LSM 8-U C/L/L** Cross sanding machine for medium feed speeds



**LSM 8-U R/C/L/L** Calibrating and fine sanding machine for high surface qualities and fine final grits

# The LSM 8 series: Variable and expandable

## Expansion without problems:

The LSM 8 machine construction series can be made even more flexible by means of different accessory equipment. A calibration roller on the longitudinal sanding unit, activated by the operating terminal, also enables calibration work.



A workpiece suction device with a minimum power consumption is available to safely transport workpieces shorter than approx. 700 mm length. The vacuum ventilator used for this purpose is integrated in the machine base, sound insulated and space saving. As support aids non driven rollers may be provided at the infeed and outfeed.



For lacquer sanding, an additional free space may be equipped e.g. with a 2nd brush (Vlies or Anderlon).

A flexible adaptation to all conceivable processing tasks is possible thanks to the modular construction of the LSM 8 series. Planned future applications of the machine can be taken into consideration by providing the machine with free mounting positions for the later fitting of additional units. As an option a working width of 1,400 mm for the LSM 8 can be realized without any problem. The LSM 8 series can be equipped for high feed speeds of up to 80 m/min.

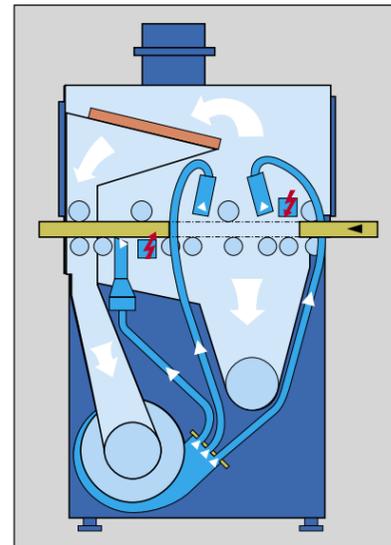
## The following control extension stages are available:

- Interfaces permitting linking into higher ranking control systems in accordance with the application requirements.
- An automatic thickness measuring device, which automatically adjusts the machines to varying workpiece thickness without manual intervention.

## Accessory equipment:

- ▶ connectable calibration roller
- ▶ additional brush (Vlies/Anderlon) for lacquer sanding
- ▶ dust removing unit EA 8 or rotating blasting nozzles
- ▶ interfaces
- ▶ sanding belt running in and against feed direction
- ▶ pressure segment belt
- ▶ **CSD® plus**-electromagnetic-double-pressure beam

## Dust removing unit EA 8:



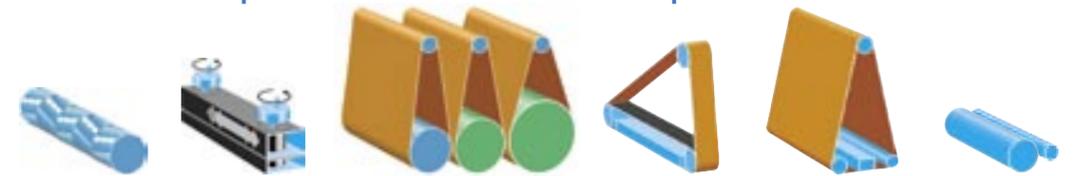
For thorough removal of adhering sanding dust from the workpiece surfaces and edges, the LSM 8 may either be linked to a rotating blasting device or to the dust removing unit EA 8. An additional ionization device increases the cleaning effect by reducing the electrostatic charge of the particles.



# Heesemann LSM 8

The surface sanding machine

## Modules



	Cutter head	Orbital sanding unit	Calibrating roller	Cross unit	Longitudinal unit	Brush unit
<b>Dimensions</b>						
Standard (mm)	1,350	1,300	2,620 x 1,350	5,400 x 150	2,620 x 1,350	Ø 150*
Option (mm)		1,400	3,250 x 1,350	6,200 x 150	3,250 x 1,350	Ø 250
			Steel Ø 250 Rubber coated Ø 300 Optional Ø 400 depending on shore hardness and application			
<b>Drives</b>	22	5.5 kW	22 24	13/17 12/24	13/17 10/20	1.5
Power/belt speed		Motor/Freq.	30 24	16.5/21 12/24	16.5/21 10/20	2.2
(kW - m/s)	30		37 24	11/17 0.5-12/24	11/17 0.5-12/20	4.0
			45 30	11 0.5-12	11 0.5-12	5.5
			55 30	22 0.5-24	22 0.5-20	7.5
			75 30			
<b>Extraction quantity**</b>	35.0	20.0	89.5	30.5	30.5	18.5
(m³/min.)	Ø 250	Ø 140	Ø 250 + Ø 180	Ø 180	Ø 180	Ø 140
Socket						
<b>Air speed (m/s)</b>	20	20	20	20	20	20

\* Bristle trimming: for example Fibre, Sisal strings, Anderlon, Vlies

\*\* Extraction quantity for cleaning of conveyor belt 18.5 m³/min.

## Machine base: working height 880 mm/sanding width 1300 mm\*

	W 2,300 H 2,250 L = for 2,620 mm	W 2,300 H 2,620 L = for 3,250 mm	Weight kg = for 2,620 mm	Feed (kW) Motor/Freq. (m/min.)	Workpiece suction device (kW) (m³/min.)
<b>1-belt machine</b>	1,955	2,285	4,200	1.5 / 3.0 5 - 25	5.5 25
<b>2-belt machine</b>	2,955	2,985	6,000	2.2 / 4.0 5 - 25	5.5 25
<b>3-belt machine</b>	3,855	3,685	7,500	3.0 / 5.5 5 - 25	7.5 40
<b>4-belt machine</b>	4,455	4,385	10,000	4.0 / 7.5 5 - 25	11.0 60
<b>5-belt machine</b>	5,165	5,085	12,000	5.5 / 11.0 5 - 25	15.0 66
<b>6-belt machine</b>	5,865	5,785	15,000	7.5 / 15.0 5 - 25	15.0 66

\* Working width 1,400 on demand

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Reliability by proven design

# LSM 8

The surface sanding machine



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The offer applies exclusively with regard to the machine equipment and technical design.



Production range for wood, lacquer and foil sanding  
Cross sanding machines  
Longitudinal sanding machines  
Lacquer sanding machines  
Veneer sheet sanding machines  
Universal edge and profile sanding machines, NC and CNC controlled  
CNC profile and surface sanding machines for 2 and 3D shaped parts

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Reliability by proven design

# LSM 8

The surface sanding machine

