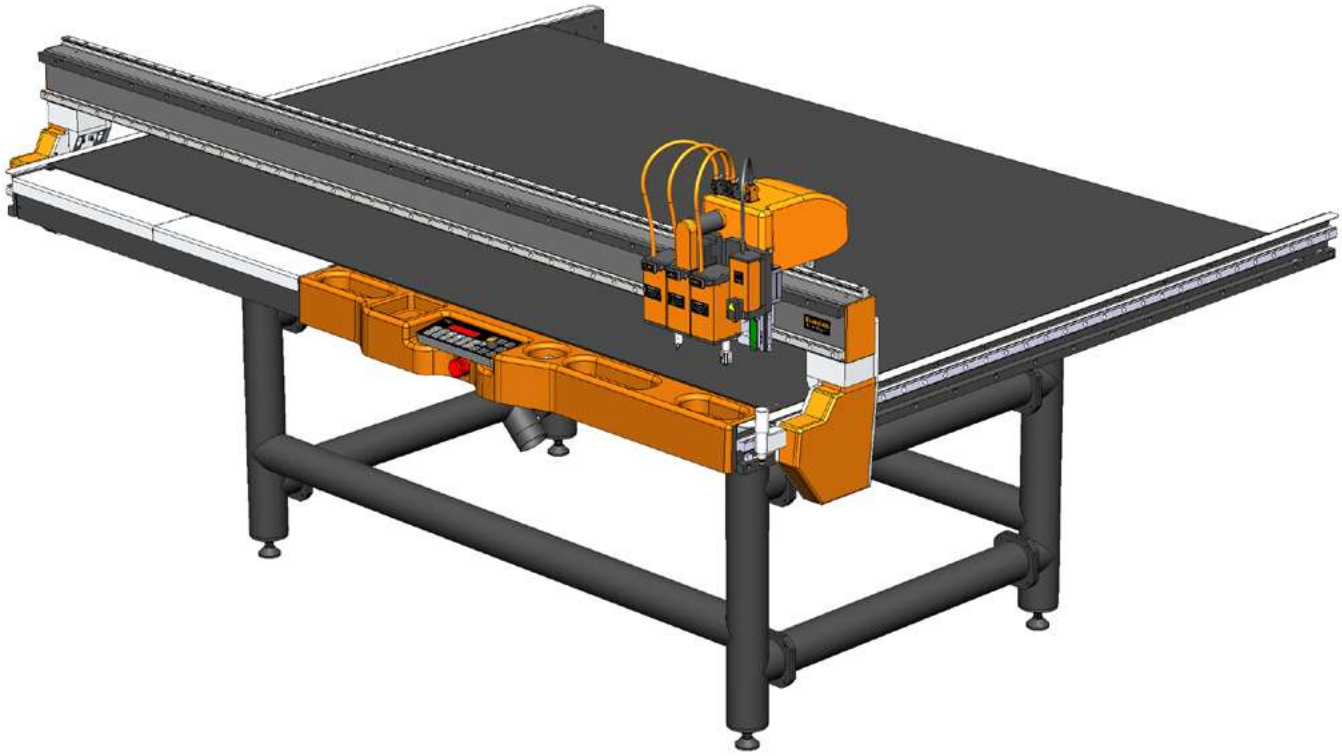
Perpetis flexo



Cutting table for flexo plates

Perpetis is an universal user configurable cutting machine, based on modern electronic concept. Main focus was taken on easy of use, high level of automation, lowest floor space and compactness of the machine.

Flexo variant was developed for easy integration with Kodak "TiffAsembler Plus" software. Machine is capable of importing CFF2 file format including registration marks, cutting commands and texts. Cutting path is during import precisely optimized for satisfactory cutting, on most materials. Software can import also DXF and ACM formats, however not all informations are included in ACM format.

Table is produced for customer plate sizes. Automatic selection of vacuum zones is taken automatically when file is open. Vacuum level can be specified in material definition and also automatically set, on electronically driven vacuum pump.

Custom made Flexo camera is capable of exact automatic finding circular registration marks on any known flexo plate, including transparent plates. By analyzing multiple pictures, camera finds the cirle edge and shape and calculates circle center. Process of mark recognition is fully automatic. Automatic file selection based on first registration mark, is under development.

Macro programming is designed for easy customization of machine behavior. Start of job, end of job, pressing of most of buttons, including custom definable buttons, will call macro file, if defined and user can set behavior of the machine, based on its needs. Ease of use and increase of eficiency by pressing a single button, can make work more convenient.

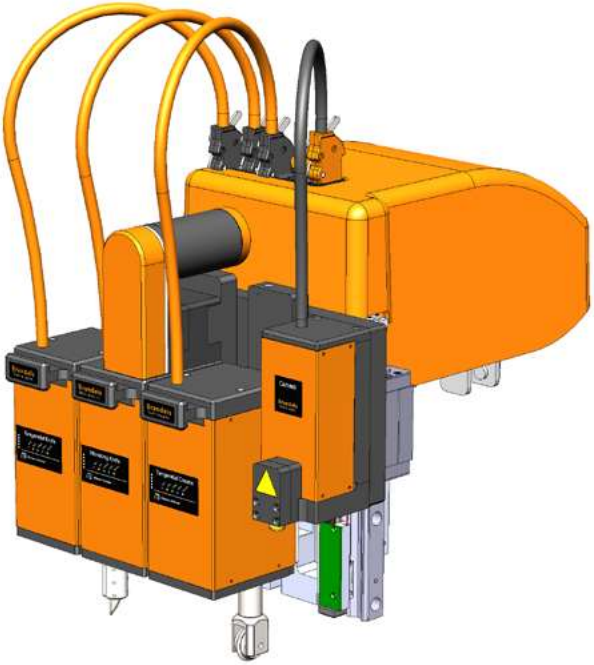
Printing device, for plate marking, is under development and should be avaliable at end of year 2018. Printer is based on HP tij 2.5 printing technology. Texts, or its part, avaliable in CFF2 file format can be printed on flexo plates, prior to cutting, for easy plate recognition after cutting.

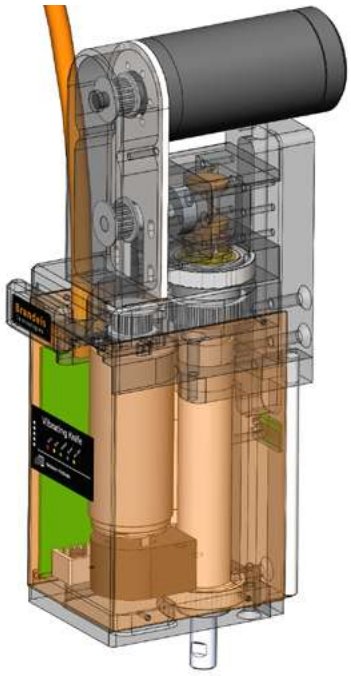
Machine Concept

DC Servo driven machine is compact size. Machine total width is only 150 mm wider each side, compare to cutting area. All electronics is near motors, inside tools etc. All electronic components are fanless, including power suply. No electronic cabinet needed. System communicates on plastic optical fibres, having maximum communication robustness with minimum wires.

Connection to machine by IP protocol, allows control of multiple machines from any computer within the network. Acces to diagnostics of every controller in the machine, from the network, opens posibilities to complex remote diagnostics. Software libraries for every controller allows upgrade of any electronic component.

Concept without toolhead increases posibilities of the machine. Simple communication protocol toward tools alows future tool development, without much compromise. Optical "Toolbus" brings data to electronics inside tool. Tool is servo driven, icluding tool selection. No compress air is needed.





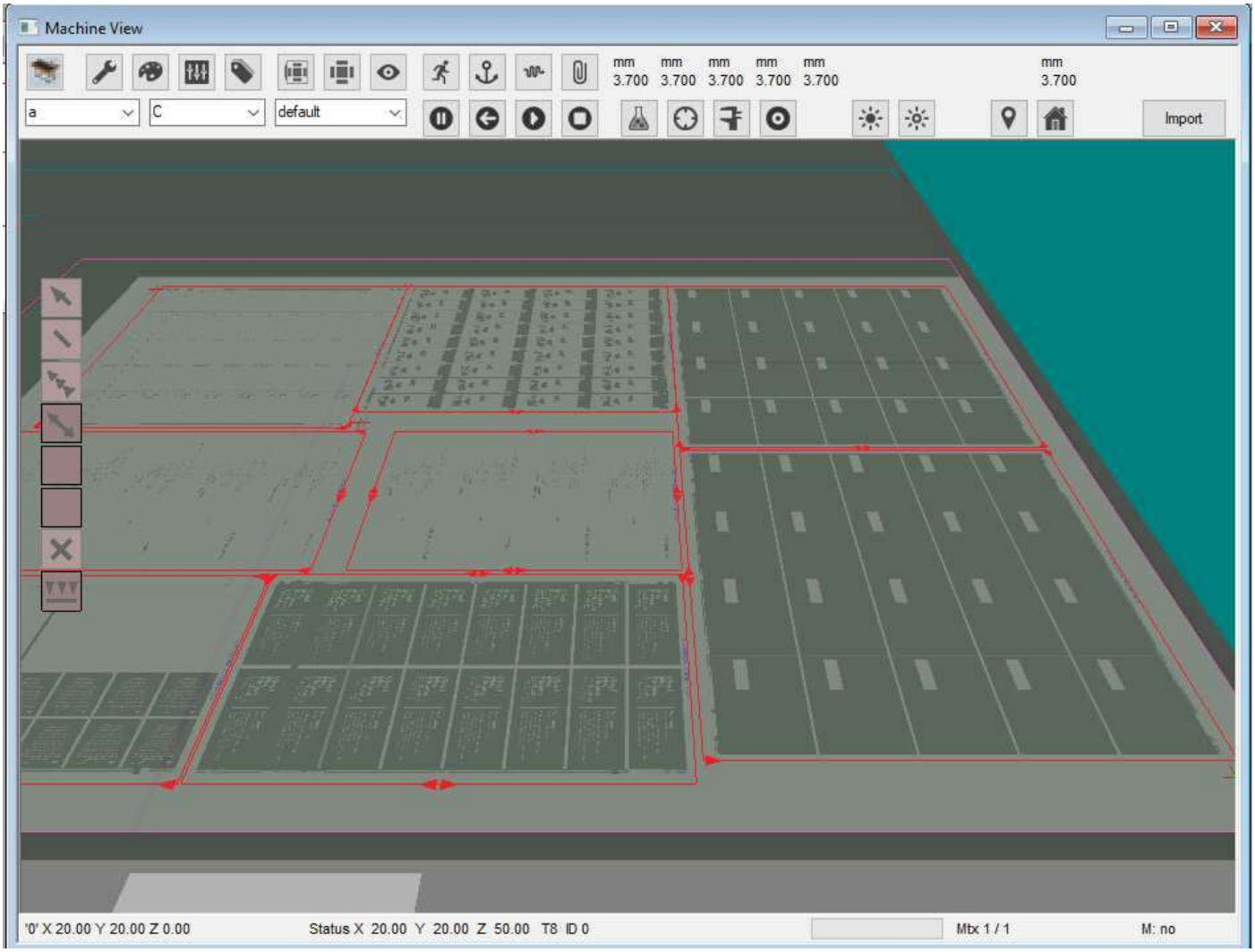
Flexo Import

Data from CFF2 format can contain:

- material type => for camera, speed, vacuum settings
- material thickness => for tool heigh including camera
- name of customer,
- names of individual files,
- position and size of text for printing
- registration marks positions
- cutting data

System analyzis all these informations. First three cut marks are saved for automatic camera recognition. Shapes are cut separate. Cutting data are then optimized, within predefined resolution for removing double cuts. Cuts are optimized for correct cutting order, to be cut from outer parts towards inner parts, with cutting order from center to side. If there is need for cutting too close to side, manual editor of cutting is avaliable. User can select special cutting order for close to border cuts, or cut of any line can be disabled with single click.

Import of one bit TIFFs



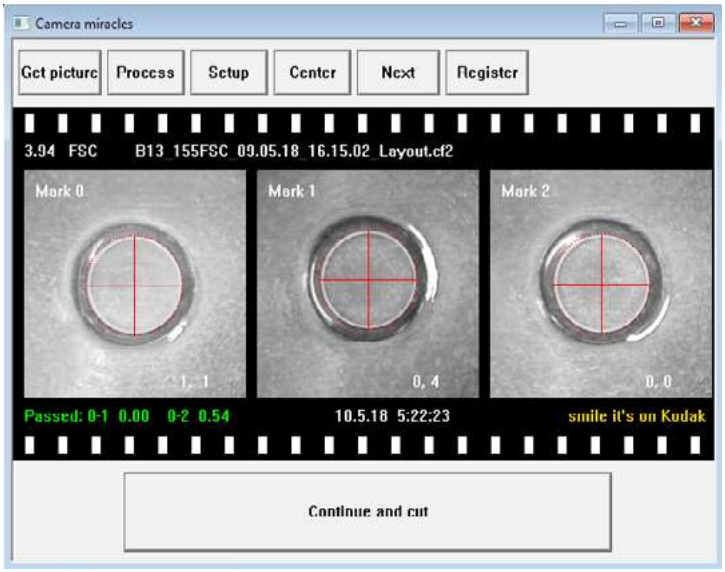
It is possible to import one bit TIFFs from TiffAsembler togther with cut data:

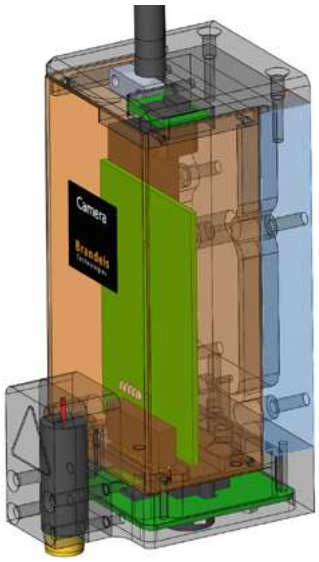
- Automatic import of Tiff file with coresponding file name
- One bit TIFF can be in standard resolution, or resolution for Digi Cap
- Import is processed in separate thread and is not obstracting other work (searching marks)

- Implementation of tiff is used for:

  - easy orientation of operator during import
  - automatic marking of plates in to space with no printing area
  - marking of plates will be avaliable soon

Tiff preview can be switched on and off by single mouse click, same as display of cutting directions, non-cutting paths and selected vacuum zones. 3D Open GL user interface allows easy orienttion when handling the plates.





Camera fit

Flexo camera is used to find position of three regmarks, created anywhere on the flexo plate. Regmarks have no desity change, so complex image processing is necessary to find marks correctly. For higher plates also position of camera is important, for correct shape detection. Several camera settings is avaliable in material definition to allow automatic reliable reading without any user intervention on all current or future plate types.

Result of camera registration is displayed in dialog. If regmarks are recognized within specified tolerances, result is displayed green and cutting can continue. Cutting data are positioned to camera readings using rotation and linear move by spreading error towards all marks.

Technical data

Cutting size(can be changed)	2200 mm x 1500 mm
Total Size	2442 mm x 1854 mm
Heigh	1500 mm
Power Machine	1300 W 176 - 242 VAC
Vacuum	3x 400V 6 kw (variable speed)
Computer, Monitor	not specified
cutting speed max	900 mm/s (700mm/s each axis XY)
max acceleration	0.5 G (0.35G each axis XY)
Safety	optical SICK

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