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D5.3 Marker Printing Module

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Executive Summary

This document describes the assembly of the pad printing module.

The assembly has been documented with pictures and shows the pad printing module including print heads and pedestal with housing.

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1 Introduction

This deliverable describes the assembly of the developed pad printing module corresponding to the available 3D-CAD model (SolidWorks or Step exchange format) from D5.2.

Main components are 2 pad printing heads TAMPONCOLOR® TC 60 SH/G-TPR (each of them prints with a wrapping angle of 180°) and a pedestal with housing.

The work for this deliverable has been carried out by Tamponcolor TC-Druckmaschinen GmbH (TCD).

2 Module description

2.1 Machine frame and housing

The machine pedestal has a size of approx. 1.500 x 1.000 x 2.000 mm (length x width x height).

The main frame and the housing is made out of Al-profile to achieve a high flexibility regarding the additional mounting of equipment or redesigns in the future (Figure 1).

The machine base plate is made of anodized aluminum and prepared for the mounting of the housing, measuring equipment (provided by ICS) and the two printing heads.

The control cabinets as well as the pneumatic service unit can be stored in the lower part of the machine frame.



Figure 1: Machine pedestal – assembly of frame with doors and base plate

2.2 Pad printing head TAMPONCOLOR® TC 60 SH/G-TPR

2.2.1 Parallel movement of printing head (“flying saw” mechanism)

Because of the continuous movement of the guide wire and the necessity to have a not moving product during the printing cycle the pad printing heads have to move along with the wire.

That is the reason why each of the TAMPONCOLOR® TC 60 SH/G-TPR is mounted on 2 guiding rails and driven by a servo electric axis with adjustable speed which moves the printing head parallel to the guide wire (“flying saw” concept, Figure 2).

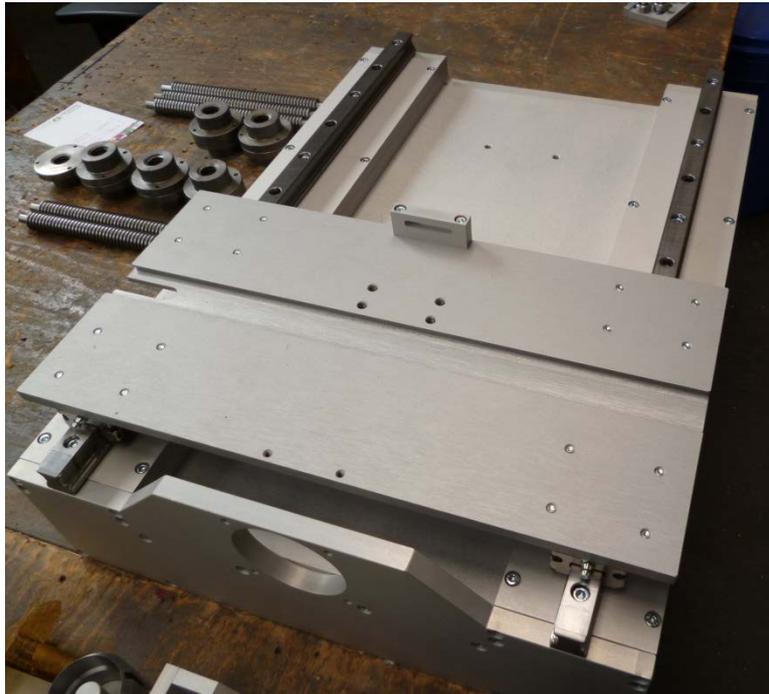


Figure 2: Print head – guiding rails and movement unit



Figure 3: Print head – top view movement unit

2.2.2 Pad printing head TAMPONCOLOR® TC 60 SH/G-TPR

The pad printing head is designed as a swivel head machine which means that the ink will be picked up then the pad turns about 90° and transfers the ink onto the surface of the product.

All parts are made of anodized aluminium or hardened steel.

The movements are completely realised by the use of pneumatic components (compressed air, 6 bar, oil free).

List of moving parts:

- | | |
|--------------------------|---------------------|
| 1. cliché table | → round cylinder |
| 2. ink cup clamping | → compact cylinder |
| 3. pad stroke | → compact cylinder |
| 4. swivel function | → semi-rotary drive |
| 5. pad cleaning device | → compact cylinder |
| 6. cleaning tape feeding | → semi-rotary drive |

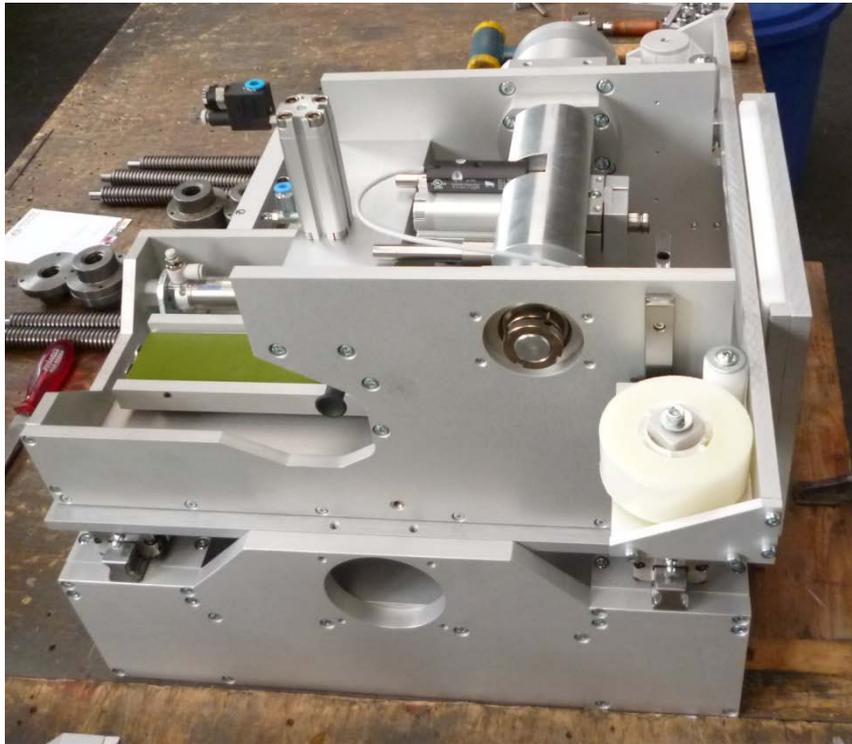


Figure 4: Pad printing head TAMPONCOLOR® TC 60 SH/G-TPR

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Instead of using a standard ink cup magnet we use a pneumatic device which pushes the ink cup on the cliché because of the ink with metal particles (see D5.1, Figure 5). The cliché holder is prepared for a cliché size 200x60x10 mm. An etched steel cliché has to be used but it is possible to use a magnetic backing plate and photopolymeric clichés in case of printing with standard pad printing inks.

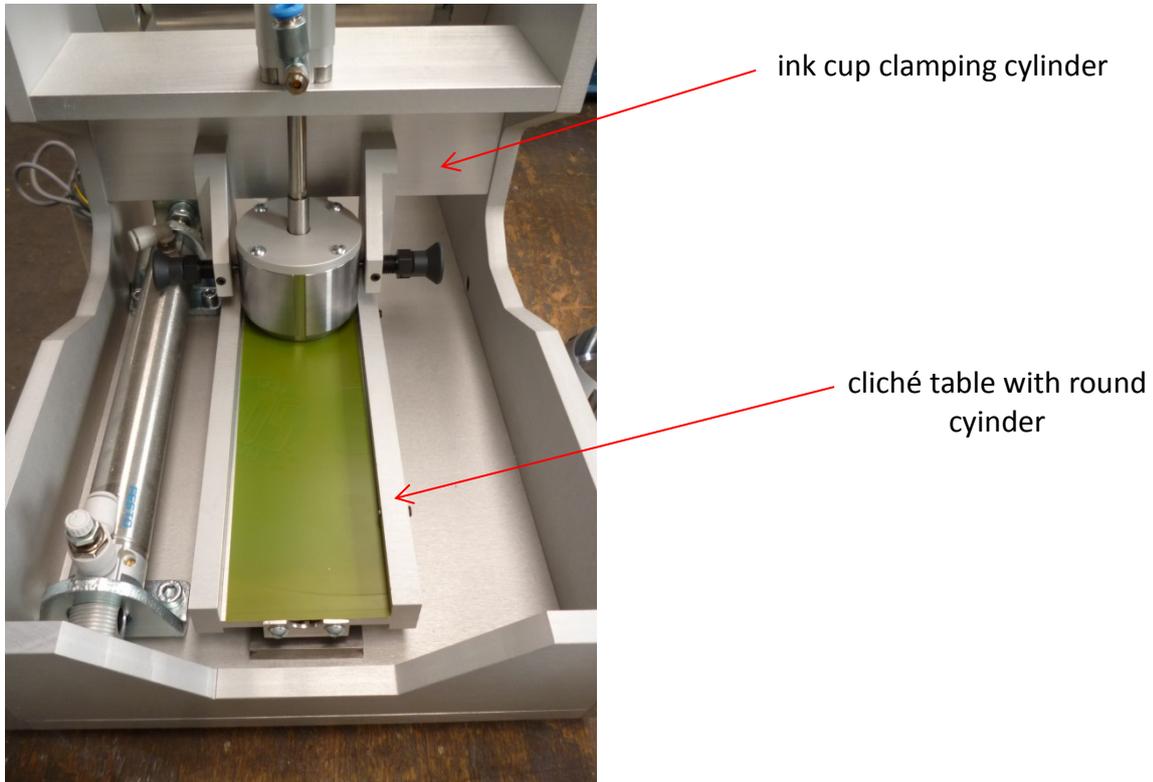


Figure 5: Ink cup clamping and cliché table

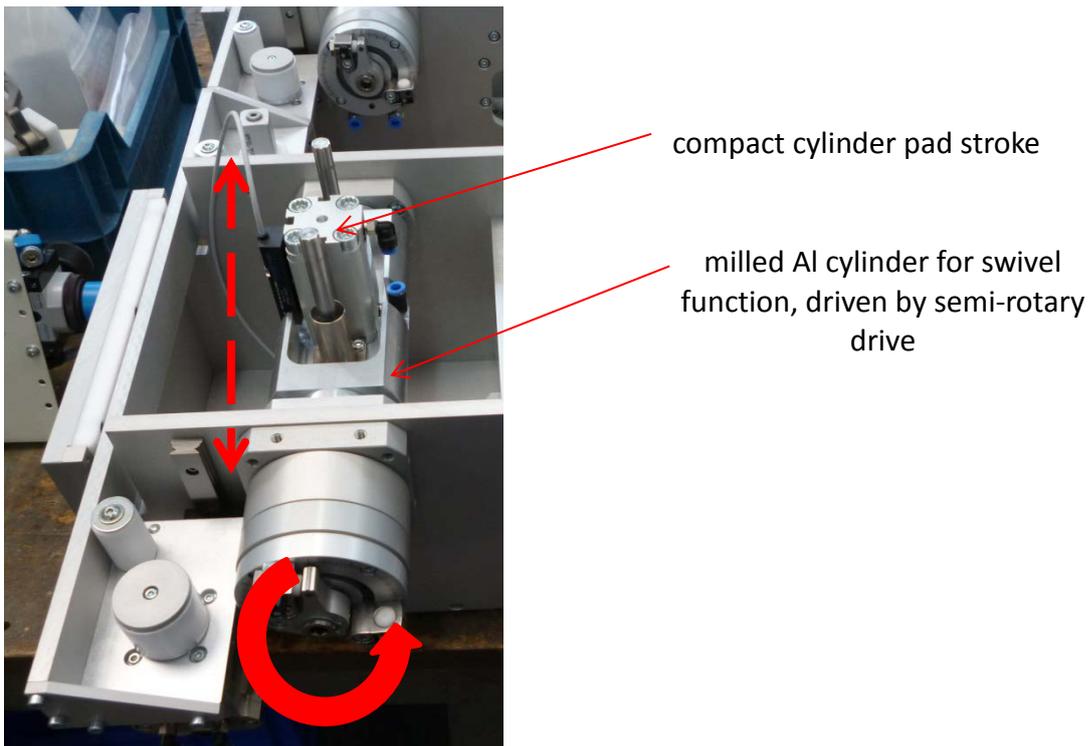


Figure 6: Swivel unit with cylinder pad stroke

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The parts of the pad stroke unit (cylinder, bushings, pad holder and position sensor) are mounted in a milled Al-cylinder which is driven by a semi-rotary drive with adjustable turning angle (0-270°). The pad stroke itself can be adjusted by the use of a position transmitter. This allows us to adapt the pad stroke to different product diameters.

2.2.3 All-automatic pad cleaning device

Each pad printer in the module is equipped with an own pad cleaning device.

The number of printing cycles before cleaning is freely programmable and the device makes it possible that the pad cleaning can be done without losing any time while the machine drives back in its home position.

The feeding of the cleaning tape can be adjusted manually on the semi-rotary drive. All parts are made of anodized aluminum or stainless steel.

The movements are completely realised by the use of pneumatic components (compressed air, 6 bar, oil free).

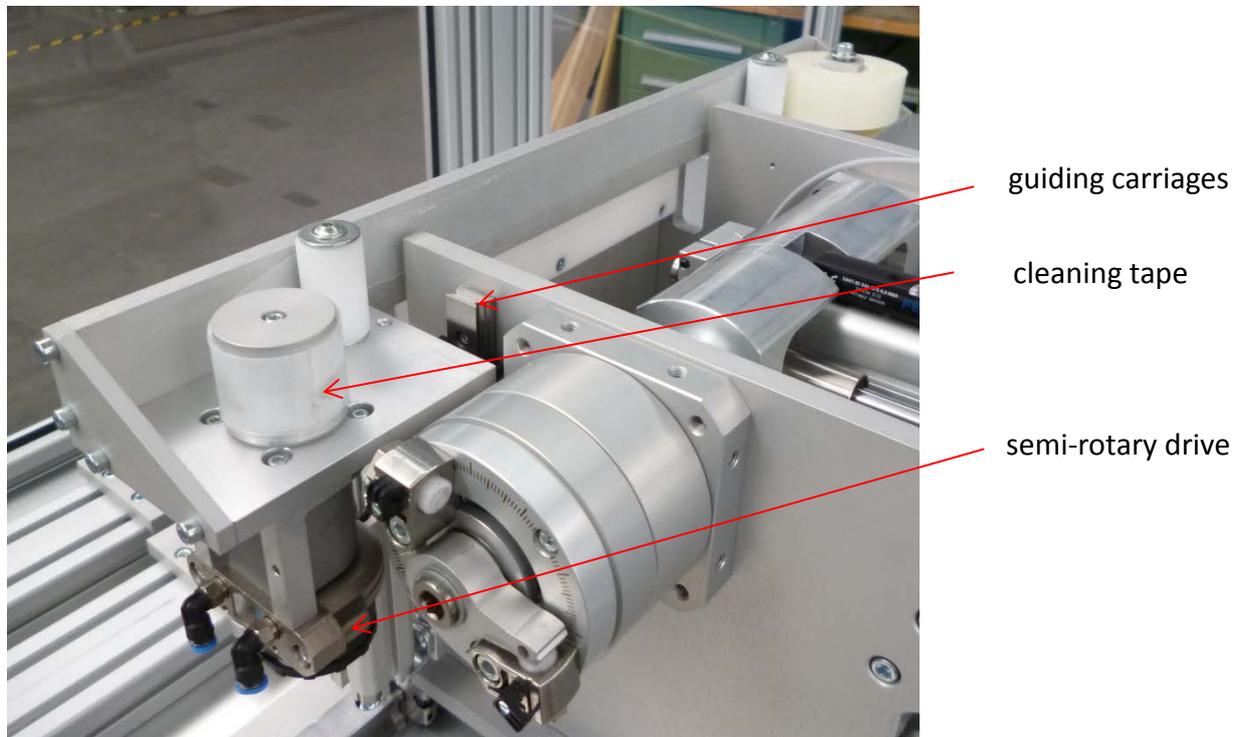


Figure 7: Pad cleaning device



Figure 8: Print head – mounted on movement unit

2.2.4 Guiding unit guide wire

The guiding unit is used to eliminate parasitic movements of the guide wire that result from the feeding through the different machine components.

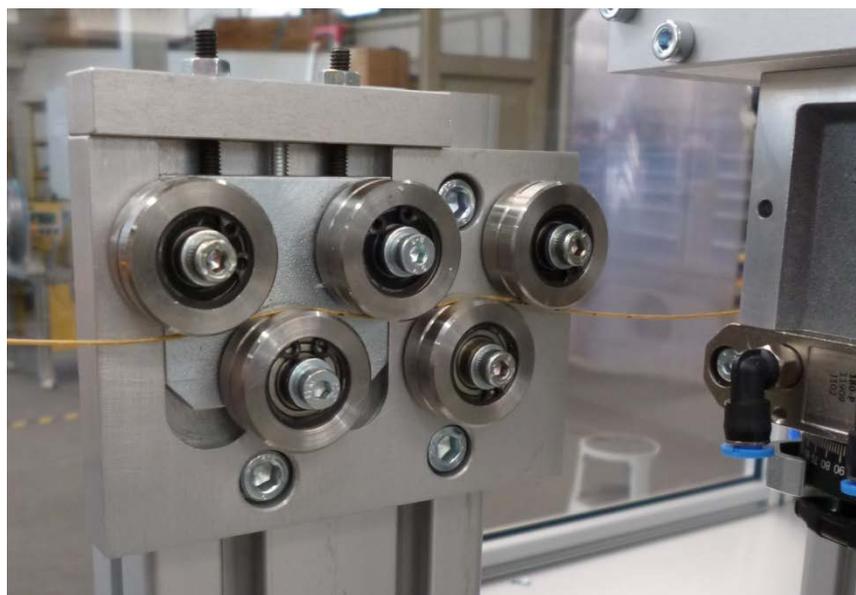


Figure 9: Adjustable guiding unit with guide wire sample

3 Conclusion

This document describes the recently assembled marker printing module for the Openmind process chain. After the installation of the electrical control cabinet, the new module will be tested in the initial operation test phase.

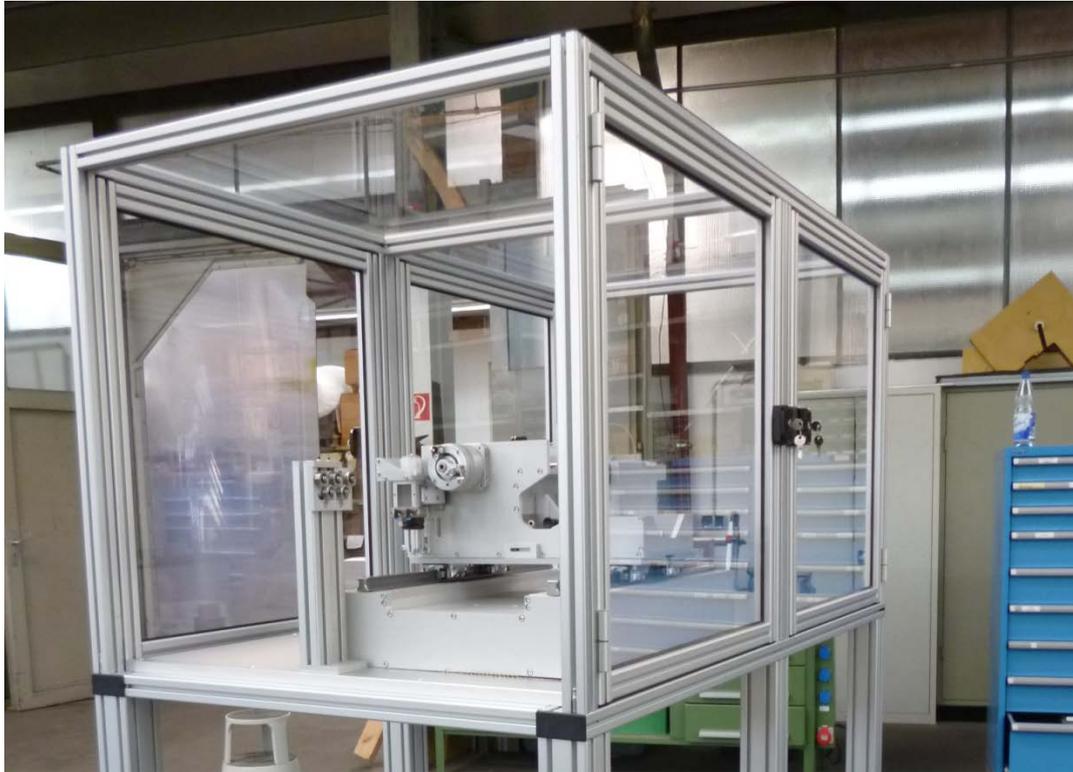


Figure 10: Total view of pad printing module