

T H E I N K J E T T R A I N I N G / 2 0 1 8 / i P r i n t

Block	Date	Time	Topic	Content	Lab work
1	Monday	13h30 – 14h00	Welcome and Introduction	Introduction to the course	
		14h00 – 17h00	Printer Mechatronics	Overview of printer mechatronics, Terminology, Basics on frame construction, Axes, Drives, Sensors, Dynamics, Resolution, Repeatability, Quality issues, ... Introduction to practical training in the lab	Identify elements of the printer, check printer resolution by microscope, move X axis and check displacement repeatability
		17h15-18h30	Welcome Drink	Optional	
2	Tuesday	9h00 – 12h30	Printheads	Core technologies explained and reviewed, printhead manufacturers (Xaar, KM, Specta, Dimatix, Sii, Kyocera, Ricoh, Toshiba Tec, ...), resolution (npi, dpi, drop volume, variable drop volume, firing frequency), crosstalk, x&y deviation, drop velocity, drop placement accuracy,...	Fill ink reservoirs, adjust meniscus pressure for printheads, purge/spit, print a nozzle check pattern, align all printheads
		13h30 – 17h00	Inkjet Inks	Basics on ink formulation (ink types and properties, components and their function), Drying, curing, pinning, Dispersions (suitable pigments, particle size, suspensions, sedimentation and agglomeration, stability, compatibility)	Drop Watching: principle, nozzle scan, speed and volume measurement, optimum acoustic, play with different pre-defined waveforms
4	Wednesday	9h00 – 12h30	Inkjet Datapath - Electronics and Software	Printhead drivers and driving heads (wave form etc.), data path, required bandwidth, component speed, efficiency of power supply. Software for inkjet.	RIP documents, edit PostScripts, change screening and print using multipass.
		13h30 – 17h00	Rheology	Terminology in rheology, viscosity & rheology, shear thinning – shear thickening, newton and non-newton properties, demonstration gas	Ink measurements (surface tension, viscosity, particle size and distribution). Micro-rheology for inks.
6	Thursday	9h00 – 12h30	Surface Science - Ink Substrate Interaction	Characteristics of different substrates (paper, plastics, textiles, metal, wood, glass, ...), Ink-substrate interaction (Surface tension – surface energy – contact angle, effects of modifying surface energy on print quality, pre-treatment methods, dyne pens)	Measure surface energy, print on untreated and treated substrates, perform adhesion tests.
		13h30 – 17h00	Colorimetry	Colour management (Color & ICC calibration, color space, the impact of restricted color space, CMYK and impact of light colors, typical image artefacts), Workflow	Use color patches for linearization and profiling, measure with the colorimeter, generate ICC profile
		17h15-18h00	Visit iPrint Institute	Optional	
		19h30-22h30	Dinner		
8	Friday	8h30 – 12h00	Inkjet System Design	Fluid supply systems (components, degasing methods, filtering aspects, fluid system design), system integration (general design guidelines, printhead arrangement, single pass vs. multi pass), system maintenance (aspects for reliable print systems, maintenance, effects of damaged nozzle plates)	Degas ink, identify elements of ink supply system, play with pressure regulation and perform circulation on the fluid supply system
		12h00 – 12h30	Wrap up	Wrap up, close the course	

Theoretical part: Marly Innovation Center - Building 170 - Ground floor - Room 034

Practical Part: Marly Innovation Center - Building 180 - 1st floor - LAB 103-109

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