Beam Wire Scanners (PS prototype and LIU series) Status Report

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05-September-2017

Contents

- **PS BWS Prototype:** Vacuum tanks, stepped chambers, mechanical components (MME, BI)
- Optical disks (glass and metal)
- Forks
- Commercial components status
- Assembly and installation planning
- LIU Series: Mechanics status

Status of prototype for PS

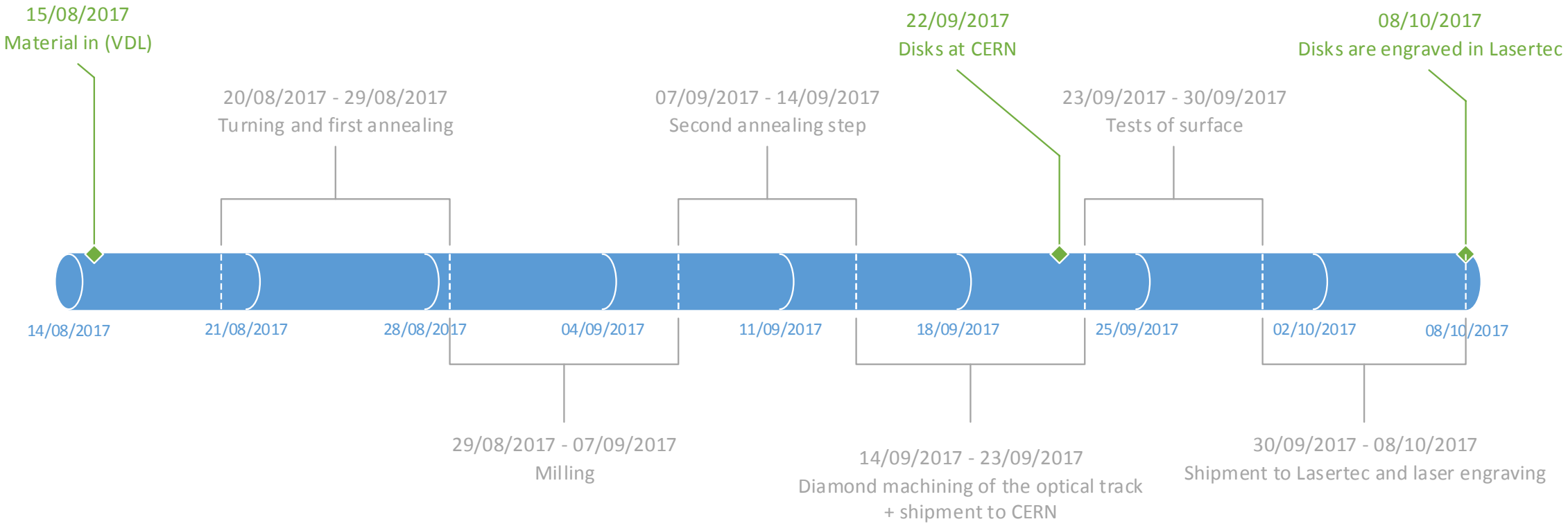
Mechanical components production

Component	Quantity	Manufacturer	Status	Delivery expected
Vacuum tank	2	MME (MWS)	~90%, EBW planned for CW36	30-Sep-2017
Stepped chamber	2	MME (MWS)	~85%, machining complete CW36, then cleaning, EBW CW38	~20-Sep-2017
Mechanical components	2 sets	MME (Subcontracting)	All parts ready except disk protection and shafts (~15..20-Sep-2017)	8-Sep-2017
Wire interface	~50	MME (Subcontracting)	delivered	1-Aug-2017
Supporting structure	1	MME (Subcontracting)	In production	~15-Sep-2017
Forks	4	MME (AM WS)	delivered	31-Aug-2017
Optical disk	2	VDL/Lasertec	See next slides	~10-Oct-2017

Metallic optical disks manufacturing

Schedule based on the information received from VDL and Lasertec

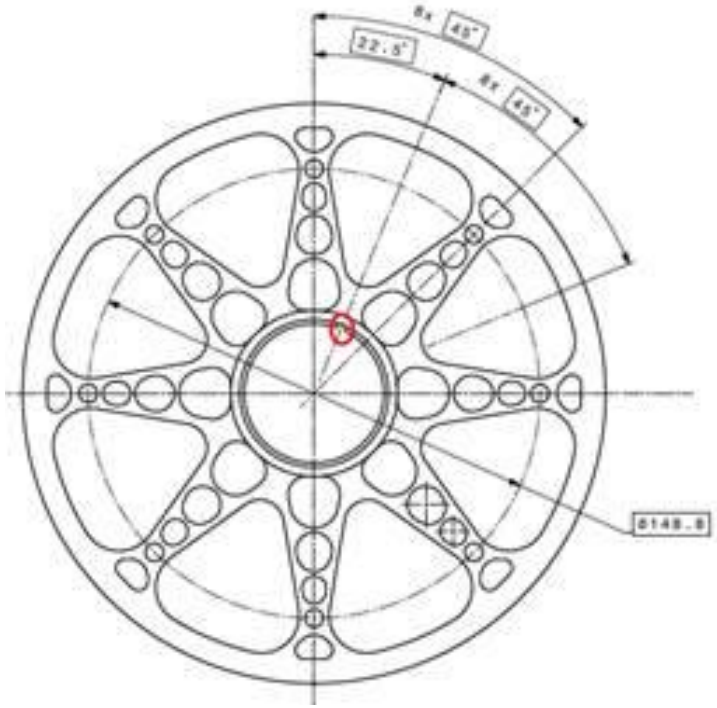
Status by 22-09 from VDL: delivery on CW39



Glass disks + holders are at CERN, ready for installation

Parts are pre-machined last evening

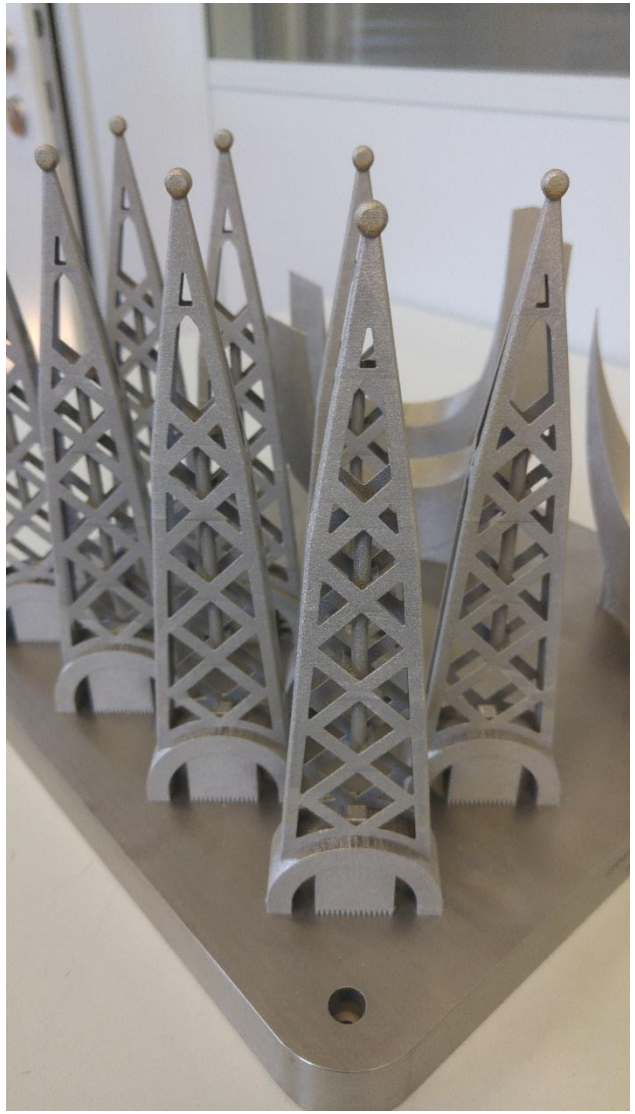
Next step is the making of the groove by wire erosion



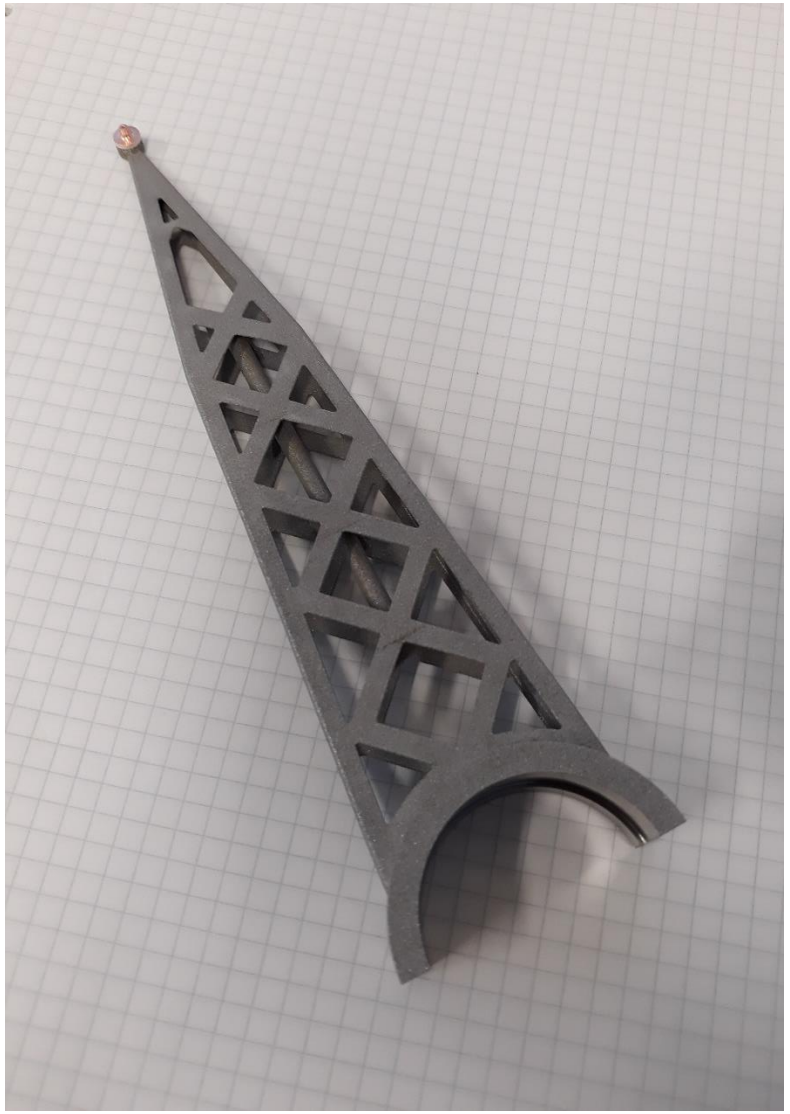
Afterwards the UP turning has to be done. Estimated finish date end of next week.

Forks manufacturing

SLM at CERM AM Workshop (optimized design)



Post-machined, ready for installation

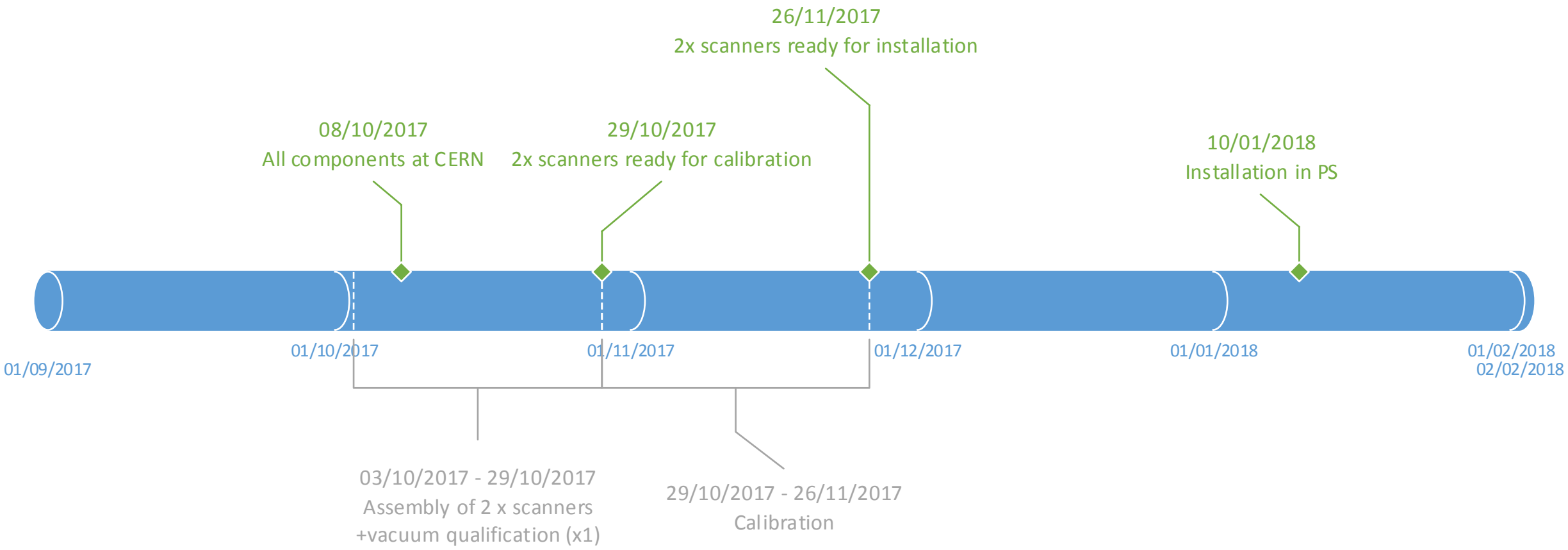


Status of prototype for PS

Commercial components

Component	Quantity	Manufacturer	Status	Delivery expected
Motor	2	Alxion	Delivered	July'2017
Bearings	2 sets	CeramicSpeed/Uiker	Delivered	-
Feedthrough for wire diagnostics + connectors	**2 sets**	**Hositrad**	Delivered	
Components for optical focusers	**2 sets**	**Thorlabs**	Delivered	
Lenses	**8 pcs.**	**Asphericon**	Delivered	
Viewport DN100	**2**	**Vacom**	Delivered	
Resolver	**2**	**Admotec**	Delivered	
Feedthrough (RF)	2	PMB	Delivered	
Viewport DN16 (F-S)	8	Vacom	Delivered	
Fasteners	**2 sets**	**Vacom**	Delivered	

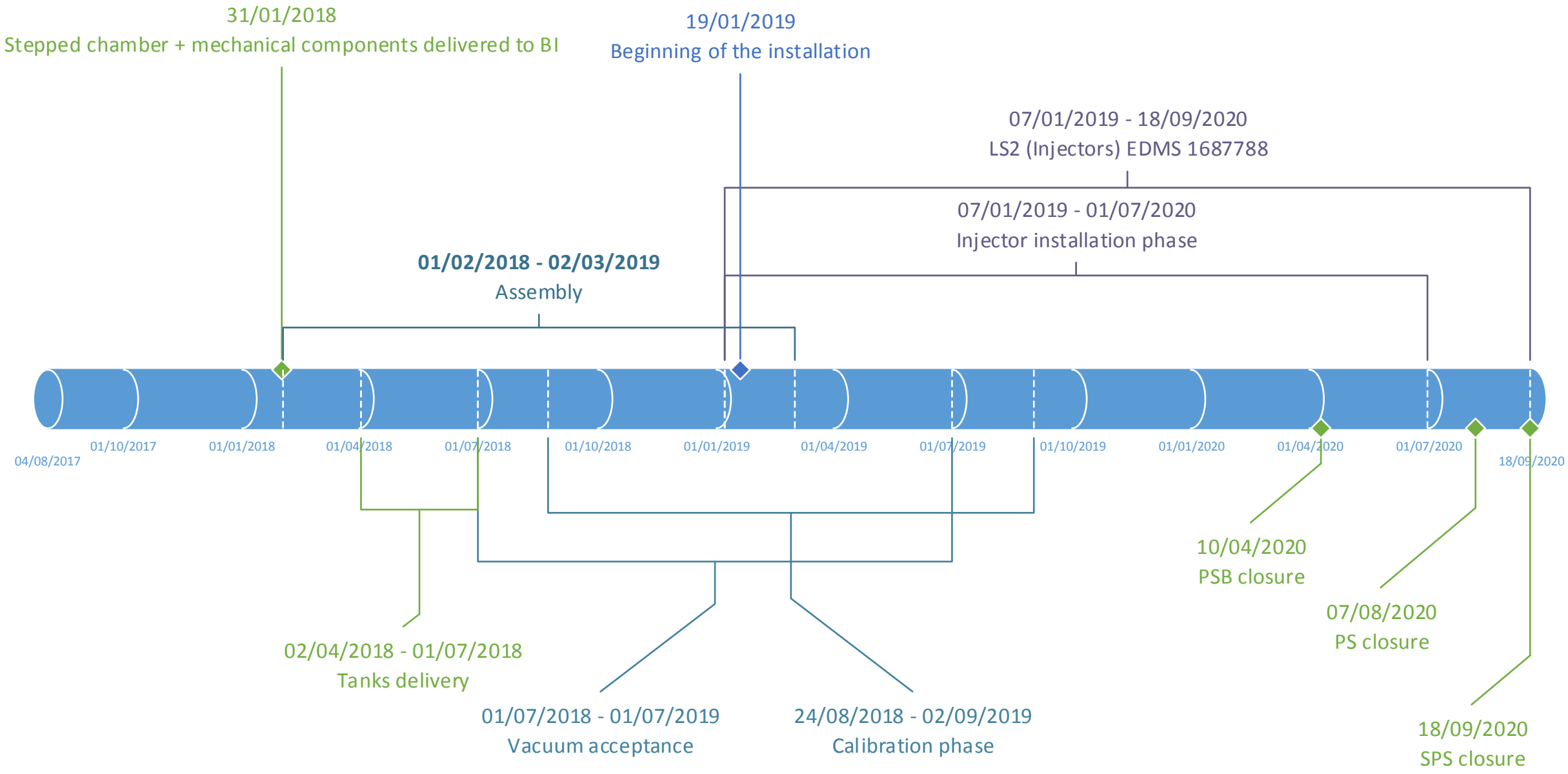
Assembly and installation planning



LIU Series: Mechanics status

	Launch of tender /price inquiry	Contract placement	Delivery of pre-series to CERN	Delivery of series to CERN
Vacuum tanks	Sep'17	Sep'17	Dec'17	Apr'18 – Aug'18
Stepped chambers	Sep'17	Sep'17	Jan'18 (x5)	Apr'18
Mechanical components (MME)	Sep'17	Sep'17	Apr'17	Apr'17
Forks	TBD	TBD	TBD	TBD
Parts (micromachining)	Oct'17	Oct'17	-	Jan'18
Motors		Jul'17		Nov'17
Bearings	TBD	TBD	TBD	TBD
Resolvers	TBD	TBD	TBD	TBD
Feedthroughs		TBD		TBD
Optical system (lenses, holders)		TBD		TBD
Viewports		TBD		TBD
Supporting system (PS)		Oct'17		Mar'18
Supporting system (SPS)		Oct'17		Mar'18
Supporting system (PSB)		Oct'17		Mar'18

LIU Series: Installation planning



EXTRA SLIDES (Previous status report)

Beam Wire Scanners (PS prototype and LIU series)

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12-May-2017

Contents

- Status of prototype for PS
- Optimised fork design
- Vacuum compatible cables for wire diagnostics

Status of prototype for PS

Mechanical components production

Component	Quantity	Manufacturer	Status	Delivery expected
Vacuum tank	2	MME (MWS)	Production launched, 25%	September’2017
Stepped chamber	2	MME (MWS)	Production planned (May’17)	September’2017
Mechanical components	2 sets	MME (Subcontracting)	Offers received, production planned	September’2017
Supporting structure	1	MME (Subcontracting)	Detailed design finished, production planned	August’2017
Forks	4	3T	Design to be confirmed (next slides)	August’2017
Optical disk	2	VDL/Lasertec	Production launched	July’2017 machining August-September’2017 - engraving
Wire installation interface	10 sets	MME (Subcontracting)	Still have several sets, need to order more	July’2017 if order soon

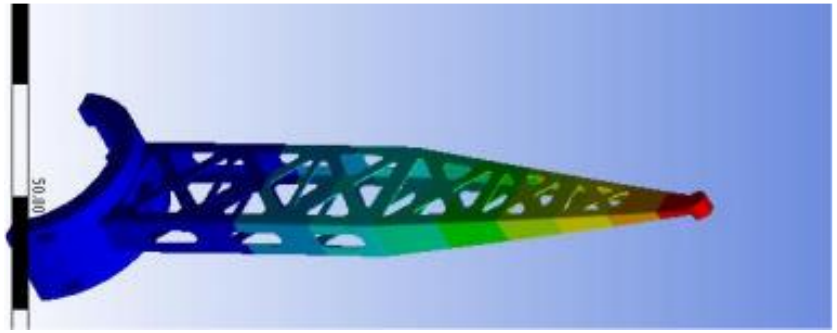
Status of prototype for PS

Commercial components

Component	Quantity	Manufacturer	Status	Delivery expected
Motor	2	Alxion	Ordered	July'2017
Bearings	2 sets	CeramicSpeed/Uiker	Delivered	-
Feedthrough for wire diagnostics + connectors	**2 sets**	**Hositrad**	**To be ordered**	
Components for optical focusers	**2 sets**	**Thorlabs**	Delivered	
Lenses	**8 pcs.**	**Asphericon**	**To be ordered**	
Viewport DN100	**2**	**Vacom**	**1 to be ordered**	
Resolver	**2**	**Admotec**	**Tests planned/to be ordered**	
Feedthrough (RF)	2	PMB	Delivered	
Viewport DN16 (F-S)	8	Vacom	Delivered	
Fasteners	**2 sets**	**Vacom**	**To be ordered**	

Forks design update

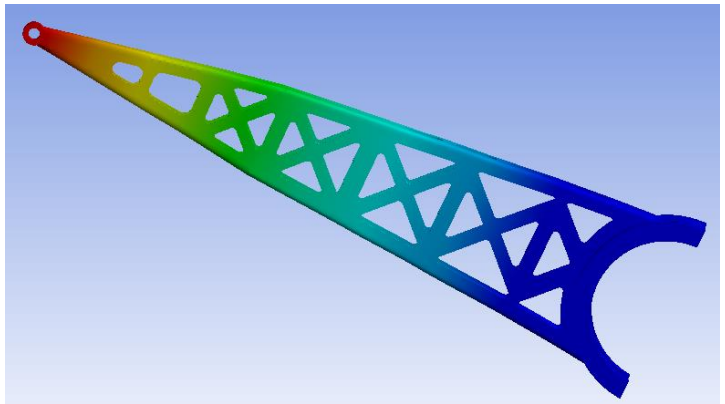
Current fork design (182.5 mm)
Tip deflection: 0.040 mm

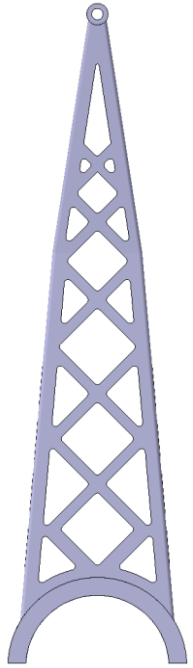


Design is currently used in SPS prototype

- Wall thickness 0.3 – difficult for production, can be distorted during printing or heat treatment
- Design is not optimised for series production (for production of more than 20 pcs. orientation is vertical)
- Central tube

Proposal (182.5 mm)
Tip deflection: 0.017 mm





Optimized design

- Wall thickness 0.4..0.5 – easier for production, distortions are unlikely
- Design is optimised for series production (material support is on cylindrical part only)
- External shape is optimised for reduced tip deflection
- Central tube is removed (it does not affect fork stiffness) – do we need it?
- Wall thickness is increased next to fork base
- We plan to order both AM and Post machining from the same company