

Status of the Backward EMC

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PANDA Meeting 21/1 – EMC Session

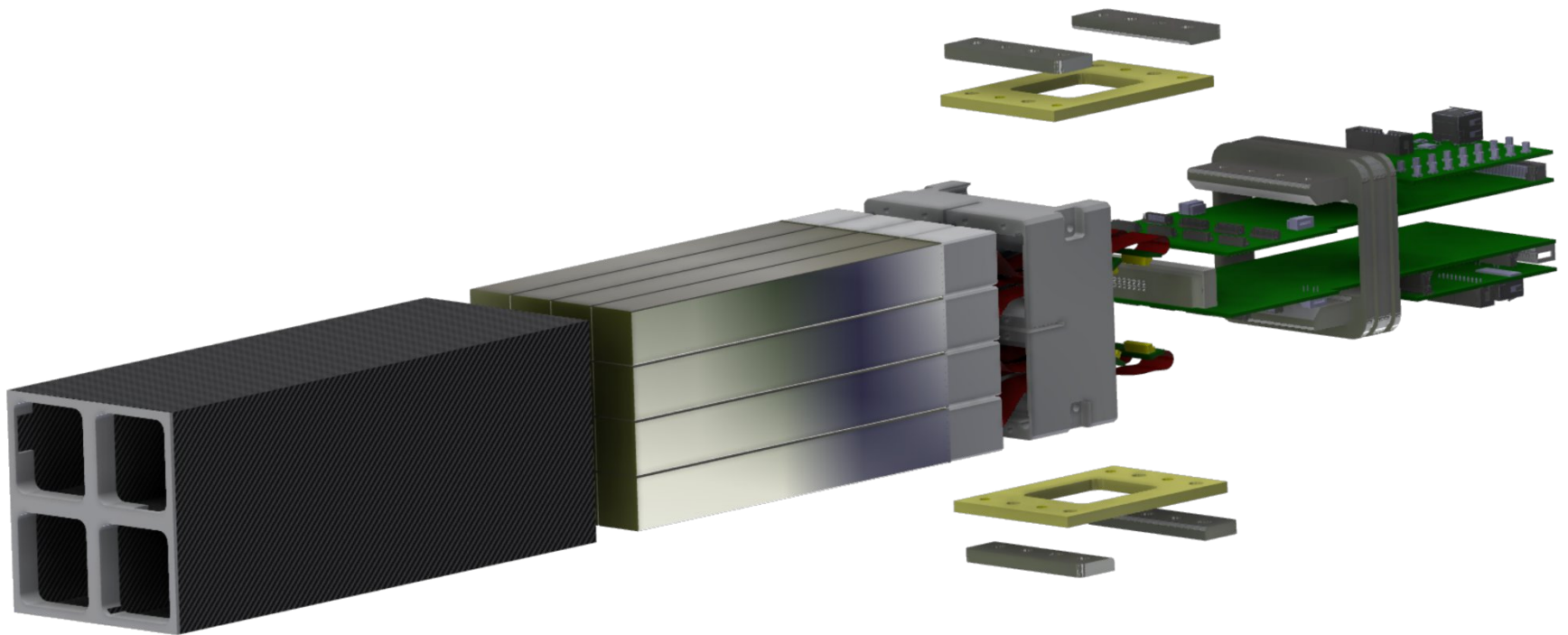
Mainz, 10.03.2021

Outline

1. Submodule Components + Current Status

2. Summary and Timeline

1. Submodule Components



APFEL Case – Parts

- APFEL ASIC (not all usable)
 - second series production ongoing
- Thermal pad ✓
- Heat sink ✓
- Alu capsule ✓
- APD capsule ✓

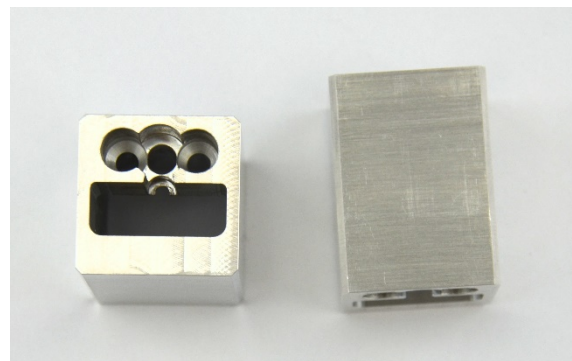
APFEL ASIC



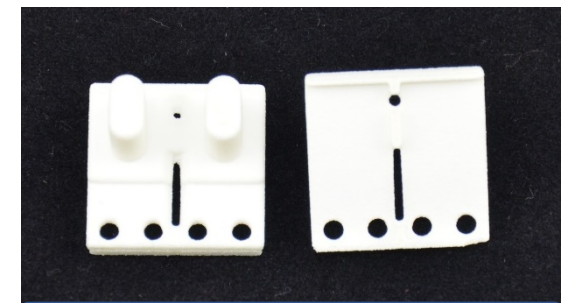
Thermal pad



Heat sink

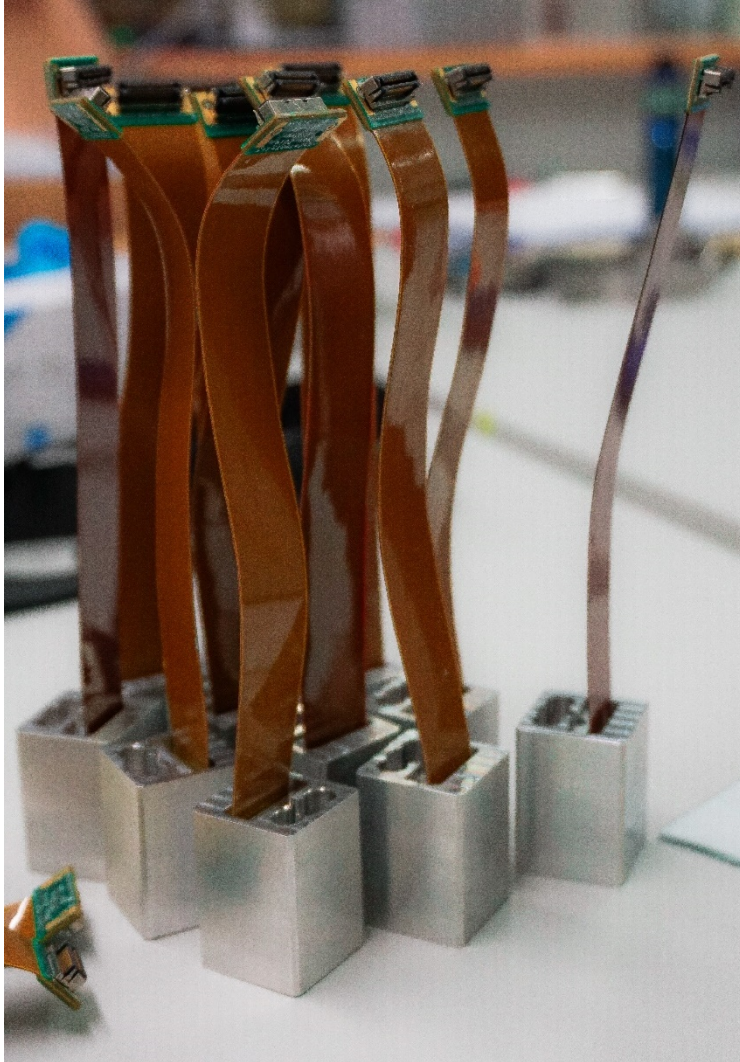


Alu capsule



APD capsule

Assembly of APFEL Cases

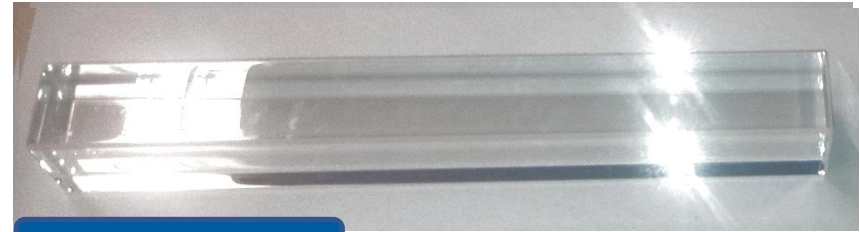


- 362 with long ASICs mounted
- 286 with short ASICs mounted
- to do: 40 with short ASICs

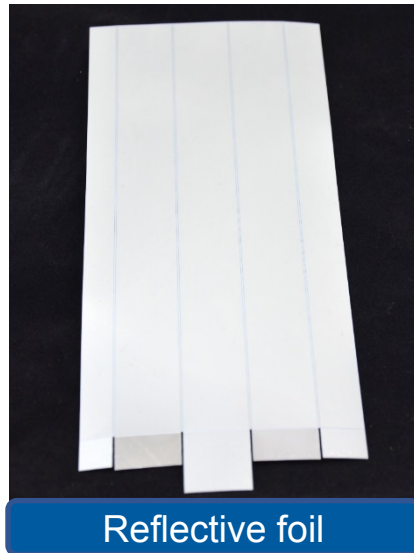


Crystal Unit – Parts

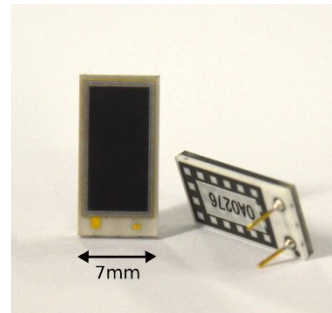
- Crystal ✓
- APDs ✓
- APFEL case (600/640)
- Reflective foil ✓
- Optical cookie ✓



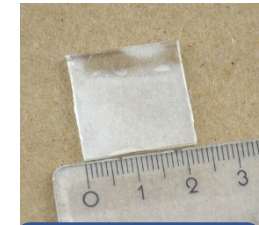
Crystal



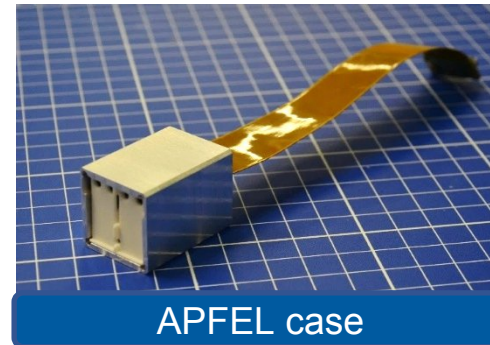
Reflective foil



APDs



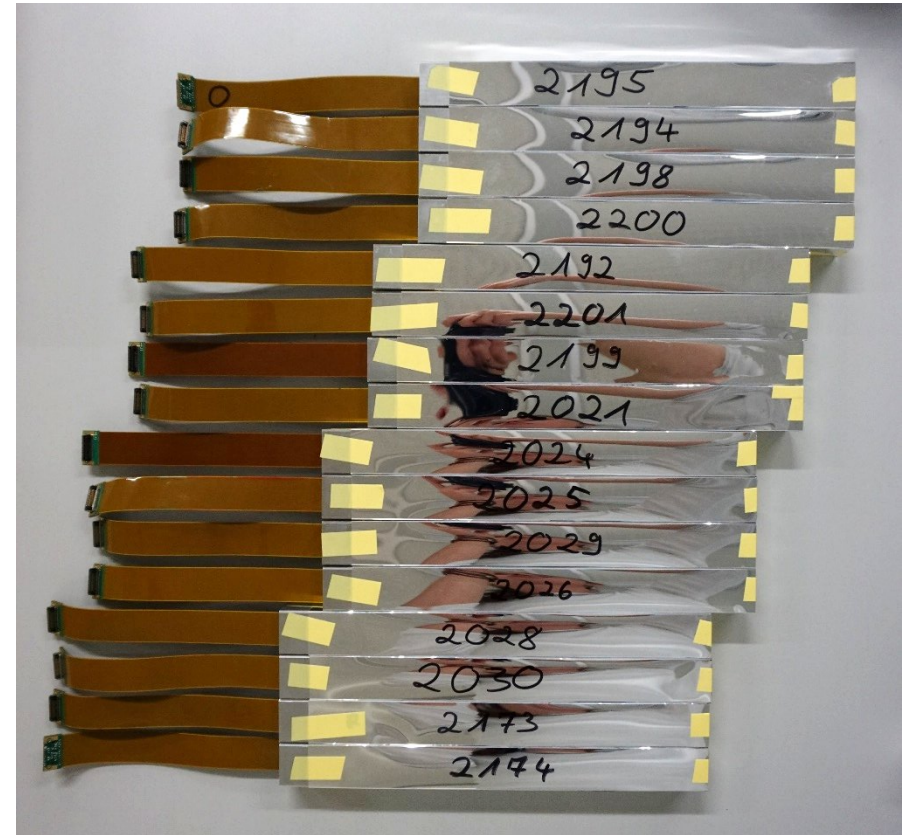
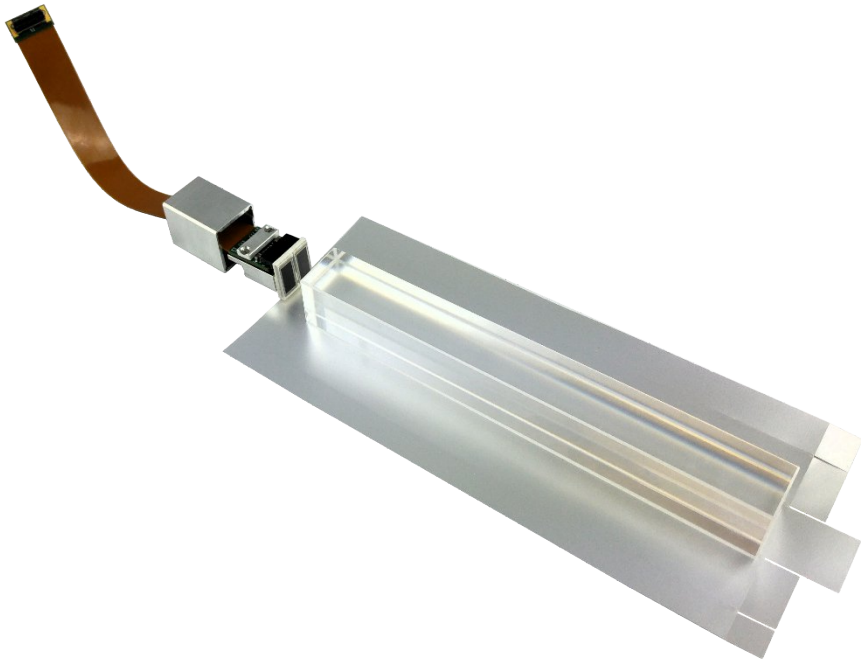
Optical
cookie



APFEL case

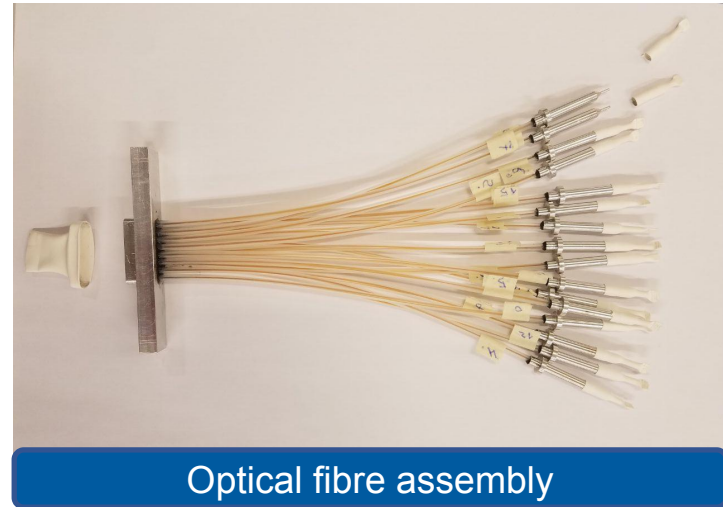
Assembly of a Crystal Unit

- Final tests for the assembly are done while building the new Prototype

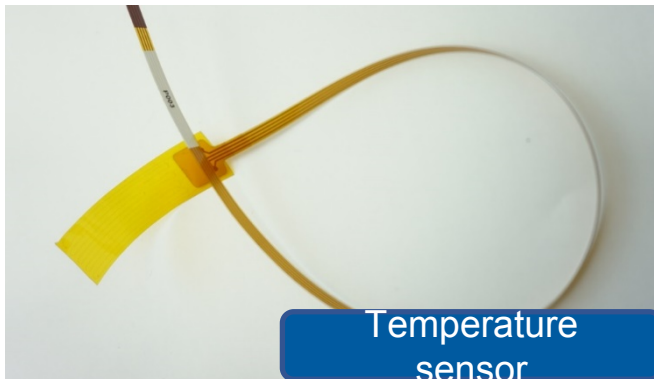


Submodule - Parts

- Crystal units
- Stopper ✓
- Alu insert ✓
- Holding parts ✓
- Temperature sensors ✓
- Alveoli ✓
- Optical fibre assembly
(prototype tested,
55 ordered, first 10 will be delivered next
week)



Optical fibre assembly



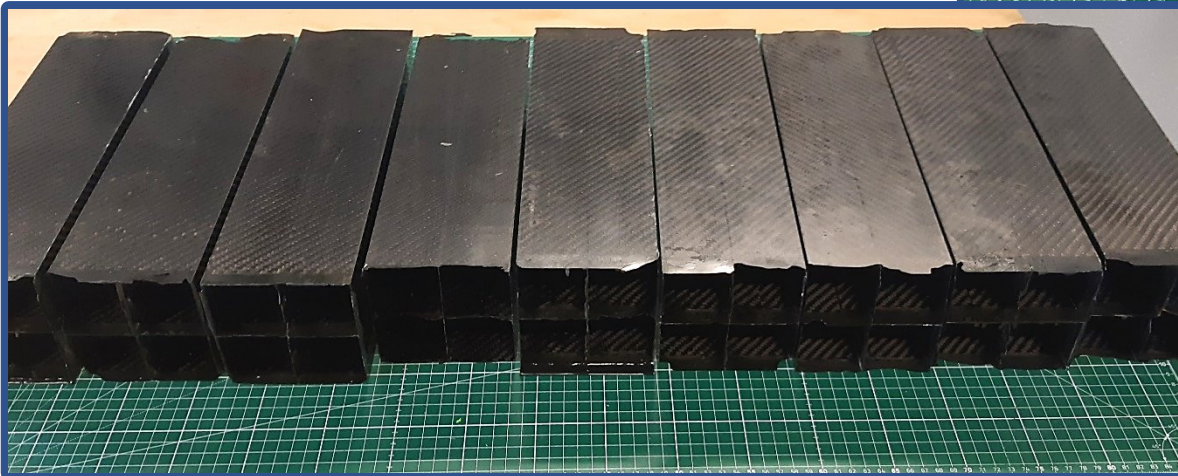
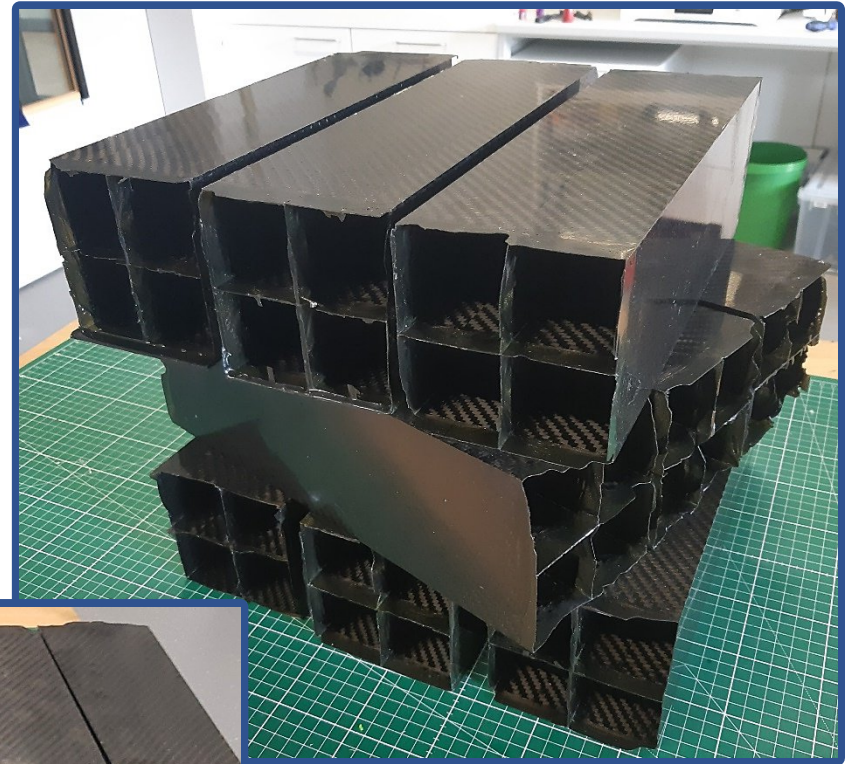
Temperature
sensor



Alu insert

Submodule - Alveoli Production

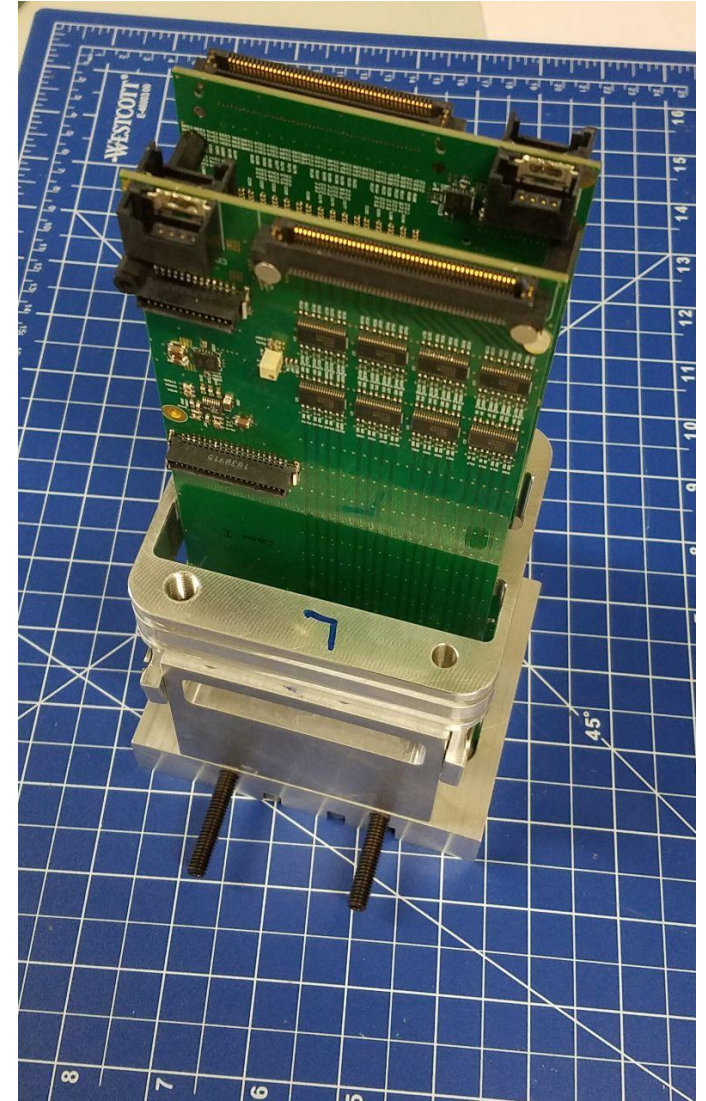
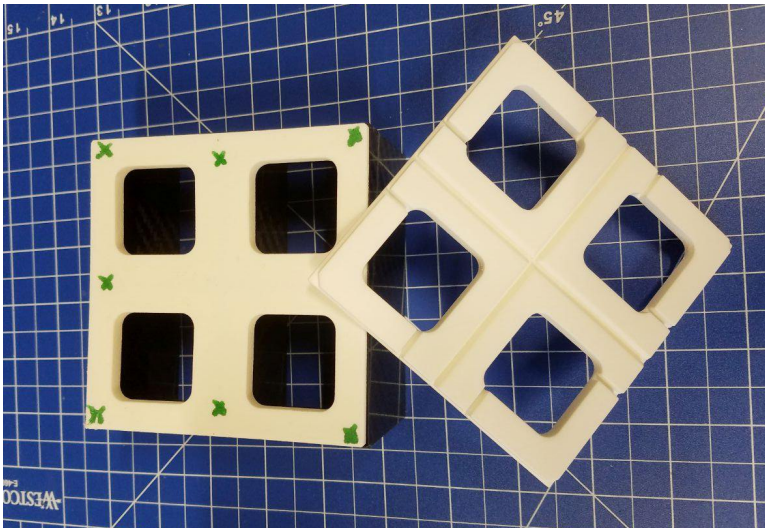
- All 48 + spare alveoli for Phase-0 produced ✓
- need to be cut (mechanical workshop is closed till mid of march)
 - alveoli will be cut this month
- Production for PANDA with different shapes ongoing



Submodule - Gluing Tests

Current status:

- gluing tests for the stopper finished ✓
- gluing tests for the feedthrough ongoing
- gluing tests for the insert will be done when more alveoli are cut



Submodule - Electronics

Front-End boards:

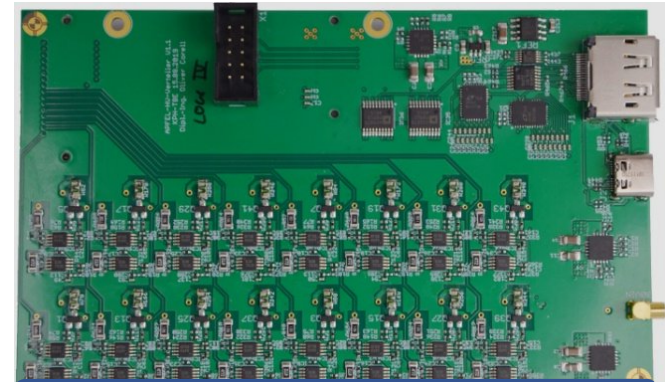
- first tests started in Nov 2020
- had to be re-worked
- back in our lab for two weeks
- new tests will start next week



Front-End boards

HV boards:

- 5 pairs in Mainz for first tests
- software for the communication with HV boards ready
- next step: tests with APDs



HV board

2. Summary and Timeline

Submodule Parts

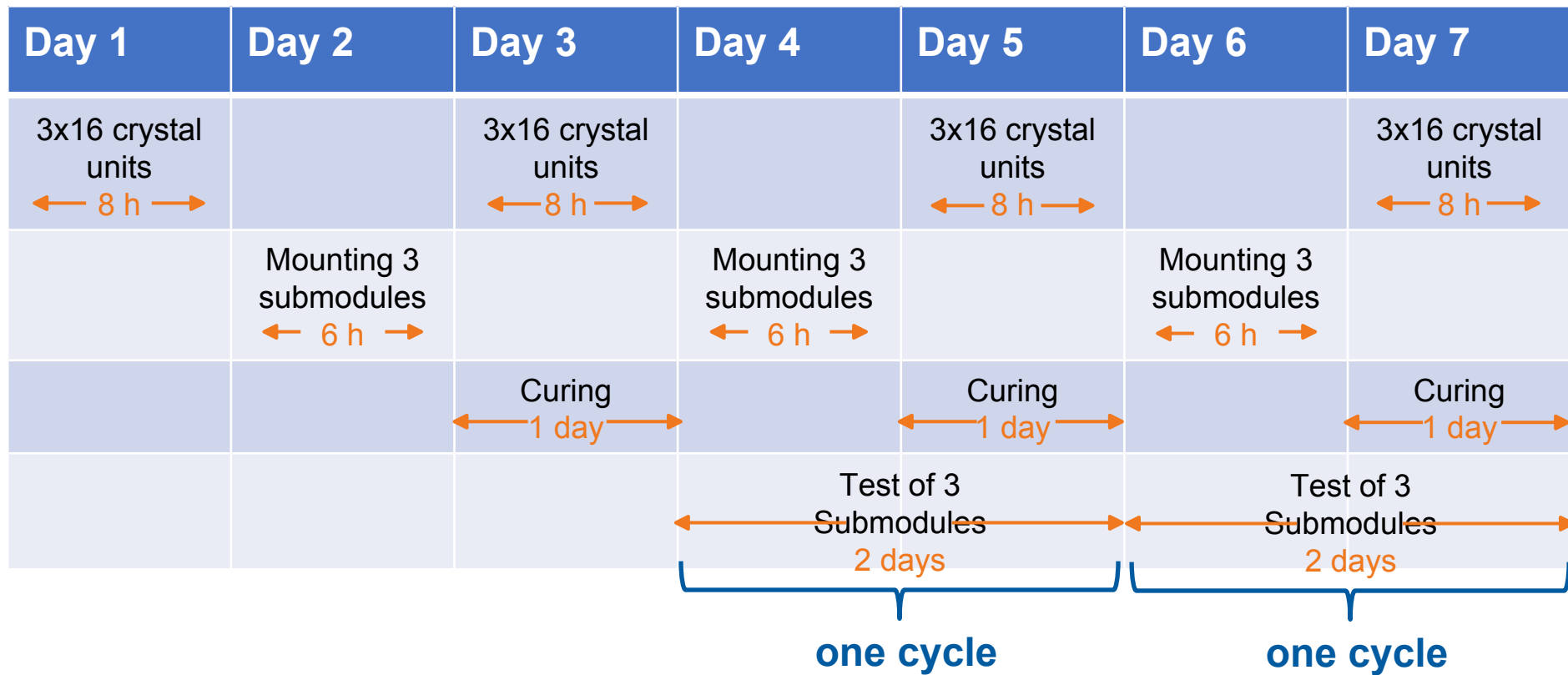
Part	Needed [#]	In Mainz [#]	Annotation
Crystal	640	640	
APD	1400 (incl. spares)	1400	
APFEL Boards	640	658	40 short ones missing
Temperature sensor	160	160	
Front-End Board	96	96	
Alveolus	48	48	Will be cut this month
Holding Parts	48	48	
Optical Fibre Assembly	48	1	Prototype tested, next 10 will be delivered next week

Timeline Submodule Production

	2020	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Deliveries	█								
Part manufacturing									
Alveoli	█								
Temperature sensors	█								
Component Testing									
Readout/Control	█								
Front-End Boards	█			█					
APFEL				█					
Holding structures	█								
Mounting/testing						█			

Thank you for your attention

Submodule Production



Submodule Production - Next Steps

Procedure	Working time	Curing time
Mounting 16 crystal units	2h 30min	
Feedthrough preparation	2h	2 day
Mounting of the Submodule	2h	1 day
Production of one submodule	6h 30min	
Production of 48 submodules	~320 h	

Submodule - New Part

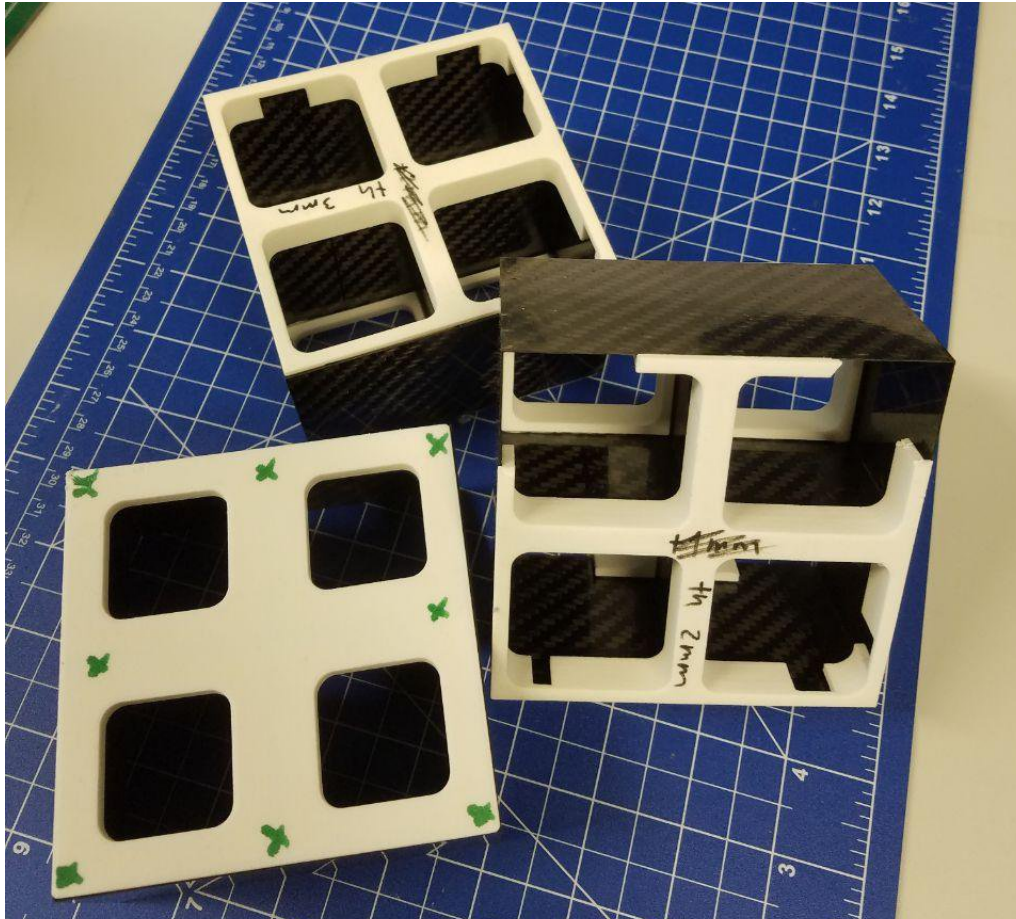
Graphite sheets:

- put between crystals
- serve as spacers
- **high conductivity**



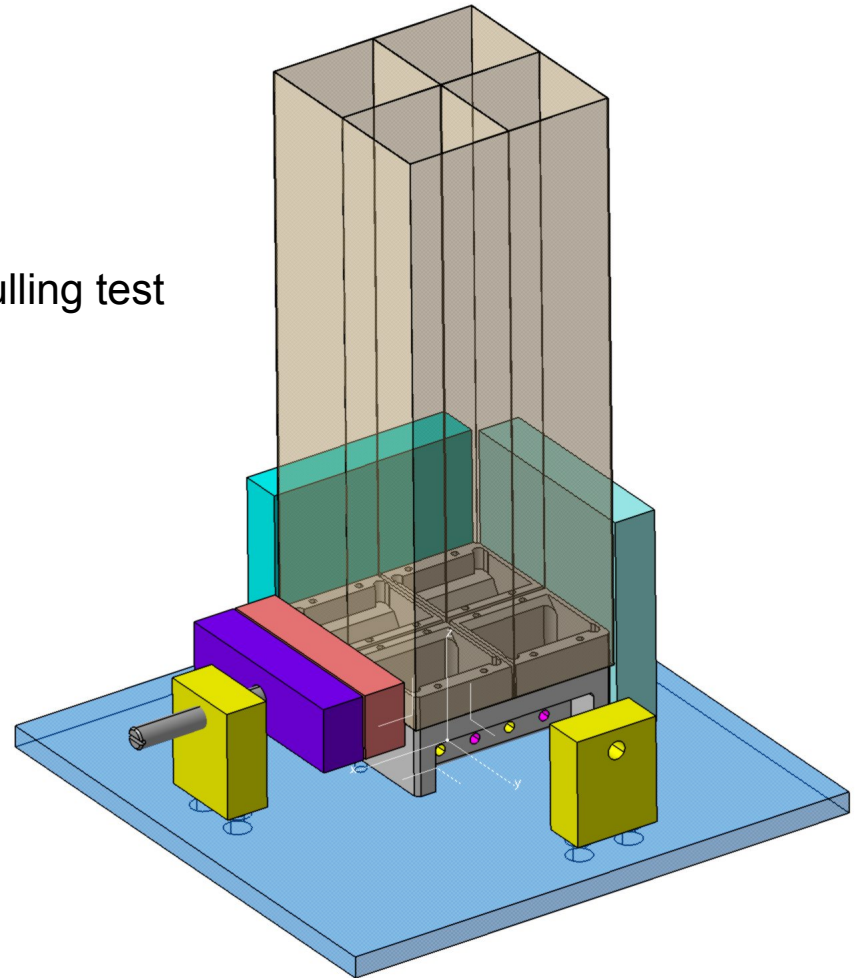
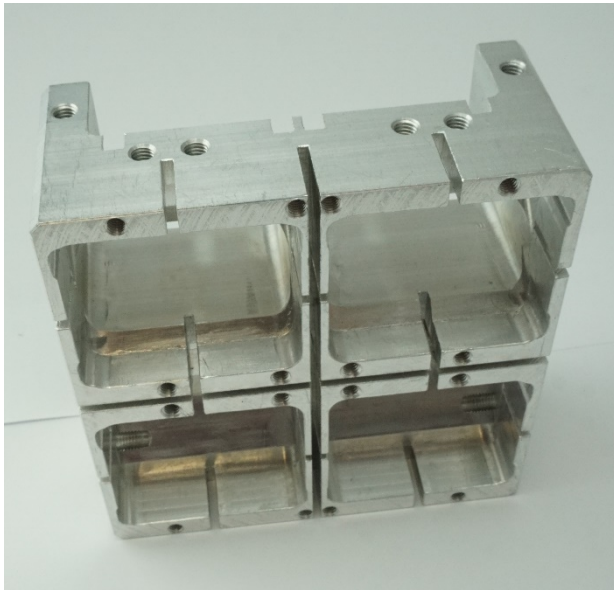
Submodule - Gluing Tests

Gluing of the stopper:



Gluing the Alu Insert (Submodule)

- Alu insert glued in one side of the alveolus
- Gluing tool designed for precise positioning
- Working time: 15 min
- Time for curing: 24 h
- Quality assurance: gap measurement and pulling test



Can be done before the submodule assembly

Feedthrough Preparation

- Feedthrough and multi-fiber connector are glued together with intermediate fiber connector
- For detailed description see:
„Manufacturing procedures: FEE board”
by D. Rodríguez Piñeiro
- Working time: 2 h
- Time for curing: 48 h

