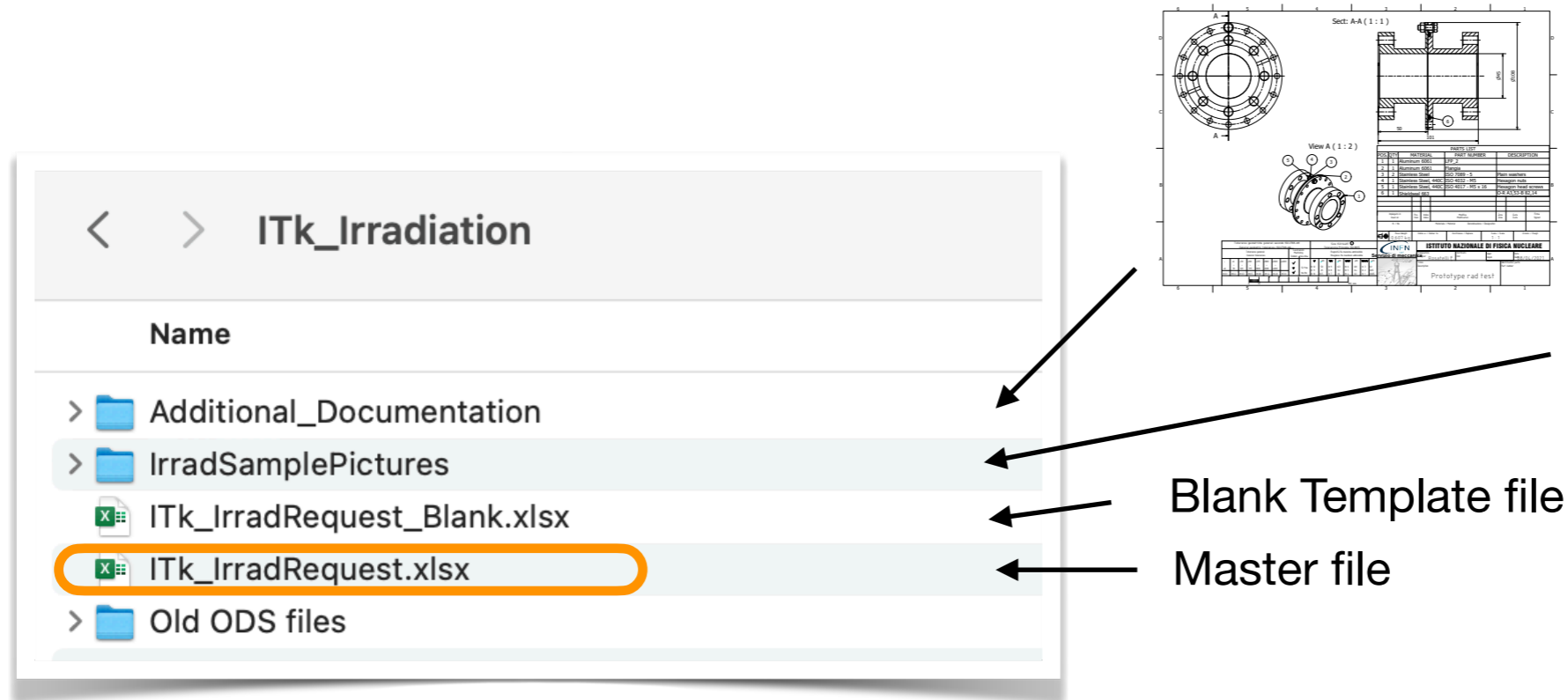


ITk Irradiation

Short reminder : All samples are announced and traced via the EXCEL file “**ITk_IrradRequest.xlsx**”, available as a share on CERNBox since ≈ 2 years.



The screenshot shows a file explorer interface for the 'ITk_Irradiation' directory. The files listed are:

- Additional_Documentation
- IrradSamplePictures
- ITk_IrradRequest_Blank.xlsx
- ITk_IrradRequest.xlsx** (highlighted with an orange circle)
- Old ODS files

Arrows point from the highlighted file to a technical drawing of a detector component and a photograph of irradiation samples. The technical drawing is labeled 'Sect: A-A (1:1)' and 'View A (1:2)'. The photograph shows several black and red cables and a white rectangular object.

Blank Template file

Master file

- https://cernbox.cern.ch/files/spaces/eos/user/m/mjaekel/ITk_Irradiation
(<https://cernbox.cern.ch/s/dzfcGe0w1MtACUV>)
- Shared with e-group “**ep-irradiation-itk**”
If you need access, just let me know.

E-group Members	
Goto	1-11 Page Size: 100 Apply Delete Memt
<input type="checkbox"/>	Name
<input type="checkbox"/>	PATERJO
<input type="checkbox"/>	PGRENIER
<input type="checkbox"/>	BUTTAR, Craig Macleod (EP-UAT)
<input type="checkbox"/>	CHEN, Hucheng (EP-UAT)
<input type="checkbox"/>	HARTMAN, Neal David (EP-UAT)
<input type="checkbox"/>	JAEKEL, Martin (EP-DT-DD)
<input type="checkbox"/>	PACIFICO, Nicola (EP-DT-TP)
<input type="checkbox"/>	PERNEGGER, Heinz (EP-ADE-TK)
<input type="checkbox"/>	SEIDEL, Sally (EP-UAT)
<input type="checkbox"/>	TAYLOR, Jonathan Thomas (EP-UAT)
<input type="checkbox"/>	atlas-itk-pixel-coordinators

Please announce new samples via email, then fill in the excel sheet
(or fill in the blank template and mail it to me, if you prefer)

To be filled out by the requestor :

ITk Pixel Irradiation Request – Summary Table																
Sample ID	Rad. Type	Dose (MGy)	Dose Received	Min.	Due Irrad.	Due Tested	FDR & Date	Status	Requestor	Nr. Samples	Sample Description	HS CODE	Dimensions [mm]	Material List	Test after Irradiation	Comments
ITk-OS-G-001	Gamma	5.30		-	10-Jun	01-Aug	Module - 04/10/2021	DONE	Richard Bates	2	LBNL prototype quad hybrid		60 x 60 x 3	PI, Copper, Acrylic glue, SMDs, solder	Build into a module and perform electrical tests	Damaged during Irradiation
ITk-OS-G-002	Gamma	5.30		-	10-Aug	10-Sep	Module - 04/10/2021		Richard Bates	2	Common quad hybrid		60 x 60 x 3	PI, Copper, Acrylic glue, SMDs, solder	Build into a module and perform electrical tests	Availble 1st August
ITk-OS-G-003	Gamma	5.30		-	01-Dec	10-Sep	Module - 04/10/2021		Richard Bates	10	Hybrid PCB QA test parts		120 x 240 x 0.3	PI, Copper, Acrylic glue, SMDs, solder	Electrical tests and peel tests	Available 10th August. Felixble, can be rolled up.
ITk-IS-G-004	Gamma	7.50		-	10-Aug	10-Sep	Module - 04/10/2021		Richard Bates	2	Triplet hybrid			PI, Copper, Acrylic glue	Build into a module and test + Electrical tests, peel tests	Available 10th August
ITk-PX-G-001	Gamma	5.00	5	N/A	10-Jun	10-Jul	Module - 04/10/2021	Retuned Liverpool	J. Taylor	1	Silicon sample with wirebonds and parylene C in PETG carbon fibre holder		120 x 55	Silicon, Al, SiO2, parylene N, carbon fibre, PETG	Pull tests, cross cut tests	C131_4
ITk-PX-G-002	Gamma	5.00	5	N/A	10-Jun	10-Jul	Module - 04/10/2021	Retuned Liverpool	J. Taylor	1	Silicon sample with wirebonds and parylene N in PETG carbon fibre holder		120 x 55	Silicon, Al, SiO2, parylene C, carbon fibre, PETG	Pull tests, cross cut tests	N135_5

Most important information :

- Radiation type : gamma, neutrons...
- **Dose in MGy**
- Sample description : Dimensions and material composition, number of samples...
- **HS Code for shipping / tax** (mandatory since 1.May 2023)
- Due date and testing date (> 2 months)

Sample handling :

- If preferred, you can send samples to CERN / me
 - Samples will be announced to the irradiation facility or coordinator by me, to avoid confusion.
 - Samples shipped by me will normally return to me, and can be either picked up or re-shipped back to you.
- If passing via CERN is unreasonable (e.g. USA internal), shipping can be done directly. Still, you need to announce the samples to me, and I will inform the irradiation facility in advance.
 - Please inform me about actual shipments & returned samples !

No sample testing :

- Unfortunately, I currently have no testing capabilities available (e.g. for tensile tests)
- Testing has to be performed by you / providing technicians
- I still have several samples available in my office, that needs to be collected & tested. Please pick them up.

Irradiation Options (Gamma):

- We currently have the opportunity to irradiate samples free of charge, thanks to Sally Seidel and the SANDIA Gamma Irradiation Facility (US).
- Unique facility, providing $\approx 60 \text{ kGy/h} \approx 1 \text{ MGy/d}$
- Samples will be irradiated when free time is available
 - Timescale not precise to predict, but normally in the range of 2 months from shipping to return
 - Can unfortunately vary, especially during the summer months (3-4 months in some cases). Also depends on the total dose.
- When samples are shipped and handed to SANDIA, it's not possible to change priority
- All samples go for a single irradiation, not possible to split samples after some dose. e.g Samples for 5, 10 & 15 MGy will be 3 Irradiation campaigns taking $30 \text{ MGy} \approx 30 \text{ Days}$. -> Realistic irradiation plans please !!

Alternatives : Few

- Europe : Max available $\approx 1 \text{ MGy}$ per week (!) for 1 to 4 k€ / MGy

Proposed Improvements to Irradiation Campaigns :

- We would like to better follow the still outstanding irradiation campaigns, and optimise the usage of the available facility
- **Please provide a list of still outstanding samples** that will need to be irradiated in the next 6 months (and beyond)
- We will then try to prioritise the most urgent samples and group samples according to their required dose
- **Please provide feedback about the irradiation results !**
We need to know if a irradiation needs to be redone

Good news :

- Outstanding samples are either currently shipped back, or in the irradiator. We can send new samples.