

# Materials Database Status

02/09/2021

| Institution    | February 2020 – February 2021 | All |
|----------------|-------------------------------|-----|
| BHSU           |                               | 3   |
| CARLETON U     |                               | 4   |
| CIEMAT/LSC     | 8                             | 31  |
| JAGIELLONIAN U | 5                             | 42  |
| LNGS           | 17                            | 64  |
| MSU            | 1                             | 8   |
| PNNL           |                               | 9   |
| PRINCETON U    |                               | 2   |
| SNOLAB         |                               | 7   |
| TEMPLE U       |                               | 9   |

If you have results that are not uploaded – contact me ([krzysztof.pelczar@gmail.com](mailto:krzysztof.pelczar@gmail.com))

# Existing samples requiring further screening

| Sample name (ID)  | Method                            | Remarks  |
|---|-----------------------------------|--|
| Raw Kapton (ID 327)                                       | Po extraction, ICP-MS             | Currently @ HPGe   |
| Copper single wire ... SAMI (ID 323)                      | Po extraction, ICP-MS (?)         | Currently @ HPGe, whole cable  |
| <b>(*) Conformal coating (ID 322)</b>                     | Po extraction/Surface Alpha, HPGe | ICP-MS done<br>Choose between Parylene and Varnish ( <i>Th 39 vs 3 ppt, U 18 vs 64 ppt, K 72 vs 11 ppb</i> ) |
| <b>(*) Teonex PEN ... film (ID 321)</b>                   | Po extraction/Surface Alpha       | ICP-MS done, HPGe finalizing<br>( <i>Th 88.6 ppt, K 1000 ppb</i> )   |
| Conned plastic for tile/FEB connectors (ID 320)           |                                   | Forton HPGe done, give up -><br><i>Was an alternative to PA66</i>  |
| <b>(1) Gadolinium oxide SHIN-ETSU 2nd sample (ID 319)</b> | Po-extraction                     | HPGe, ICP-MS done<br>( <i>U 10, Th 4 mBq/kg, Ra-226 6.6 mBq/kg, the rest upper limits</i> )                  |
| PA66 nylon for FEB veto connectors (ID 318)               | Po-extraction, ICP-MS             | HPGe done<br><i>Much cleaner than Forton</i>   |

# Existing samples requiring further screening

| Sample name (ID)   | Method   | Remarks   |
|--|--|---|
| Harwin connector (ID 317)  | Po extraction, ICP-MS                                    | At Boulby (HPGe), screening will start on Feb 11 (2 weeks per sample)                                   |
| Harwin connector (ID 315)  | Po extraction, ICP-MS                                    |   |
| <b>(*) Micro-D connectors, resin (ID 313)</b>                              | Po extraction, ICP-MS<br><i>for Omnetics A113665-001</i> | 4 samples done @ HPGe<br><i>Is it used at all (alternatives)?</i>                                       |
| <b>(2) Acrylic (multiple samples)</b><br><b>Donchamp Line 4</b>            | <i>Po extraction</i>                                     | <i>As soon as ashing is possible</i><br>ICP-MS done   |
| <b>(3) CMOS ASIC for VETO (ID 302)</b>                                     | Po extraction, HPGe (?)                                  | HPGe @LNGS, ICP-MS done   |
| Electronics (ID 57)  | ICP-MS(? – not priority)                                 | HPGe and Po-extr. done  |
| Electronics (ID 284)   | HPGe for THS4521<br><i>Different LED candidate</i>       | <i>Missing all (assays and tests)</i>   |
| Electronics (ID 285)   | <i>HPGe from DS-50</i>                                   | <i>Capacitors</i>   |
| <b>(4) ATTiny 102</b><br><b>(5) ADM7150ACPZ-5.0-R7</b><br><b>(6) BAP65</b> |  | <b>uC (UDFN or SOIC150)</b><br><b>Linear regulator (8LFCSP)</b><br><b>Diode (tiny – which package?)</b> |

# Existing samples requiring further screening

| Sample name (ID)                         | Method                      | Remarks  |
|--|-----------------------------|--|
| Arlon PCBs (raw and assembled)           | HPGe                        | Surface Alpha (ongoing)  |
| <b>(7) Solder ChipQuik (ID 295)</b>      | Po extraction, HPGe         | ICP-MS done ( <i>Th 2.8 mBq/kg, U &lt; 1.2 mBq/kg, K &lt; 2000 ppb</i> )       |
| Solder paste Indalloy #4 (ID 44)         | HPGe                        | <i>(Po-210 1.2 Bq/kg, Th-232 0.5 mBq/kg, U-235 0.2 mBq/kg, U-238 4 mBq/kg)</i> |
| <b>(*) Indalloy 1E solder (ID 55)</b>    | HPGe, re-do ICP-MS          | <i>(Po-210 14 Bq/kg, Th, U upper limits &lt; 2 mBq/kg)</i>                     |
| FormLabs resin (ID 283, 296)             | Looks clean                 | Await complete connector   |
| <b>(8) Field cage resistors (ID 291)</b> | Po extraction, ICP-MS, HPGe | After cleaning, some resistors already in Ciemat                               |
| Optical fibers                           | Full chain                  | After purchase   |
| <b>(9) Silver loaded epoxy (ID 294)</b>  | Po extraction, HPGe         | For VETO? ( <i>Th 850 ppt, U 1300 ppt</i> )                                    |

# Samples in Kraków (Po extraction)

| Sample name (ID)           | Remarks                         | ID No.                        |
|----------------------------|---------------------------------|-------------------------------|
| <del>Zero ohm jumper</del> | <del>Used?</del>                | <del>603-RC0402JR-070RL</del> |
| THS 4521                   | Po done, repeat?, Missing HPGEe |                               |

# Resistors – a new mixture for HPGe, Po, ICP-MS?

| Sample name (ID)   | Remarks   | ID No. |
|--------------------|---|--------|
| MCT06030C1005FP500 | HPGe missing, ( <i>Po-210 17 Bq/kg, Th 1400, U 4300 ppt</i> ) | 286    |
| CPF0402B10K7E1     | 12 per PDM (previously 11)                                    | 57     |
| CPF0402B10R5E1     | 4 per PDM (previously 16)                                     | 57     |
| CPFA0402B49R9E1    | 8 per PDM (previously 15)                                     | 57     |
| CPFA0402B1K0E1     | 7 per PDM (previously 3)                                      | 57     |
| CPF0402B249RE1     | 6 per PDM   | 57     |
| CPFA0402B750RE1    | 1 per PDM   | 57     |
| CRG0402ZR          | 1 per PDM (previously 5) (zero ohm jumper)                    | 57     |
| 716-8153           | 4 per PDM (previously 18)                                     | 57     |
| CPF0402B61R9E1     | 12 per PDM  | N/A    |
| CPF0402B499RE1     | 1 (?) per PDM   | N/A    |
| CPF0402B2K0E1      | 1 per PDM   | N/A    |
| CPF04022K94        | 1 per PDM   | N/A    |
| CPF0402B300RE      | 1 per PDM   | N/A    |

# Summary – foreseen screening

| Method               | Expected # of assays   | Remarks  |
|----------------------|------------------------|--|
| <i>Po extraction</i> | <i>O(20) -&gt; 1 y</i> | <i>Plenty of samples piled-up</i>                    |
| ICP-MS               | O(10)                  | Shared over different sites – OK.                    |
| HPGe                 | 5 + cross calibration  | Small components requiring high sensitivity          |
| HPGe                 | 5 + cross calibration  | Bulk material (e.g. solder paste) ordinary screening |

## **MDB – remember about the:**

- 1) Queuing sub-system
- 2) Uploading results
- 3) Verifying sample status (shipped/in assay/done)
- 4) ... or contact me ([krzysztof.pelczar@gmail.com](mailto:krzysztof.pelczar@gmail.com))

**Send some of the new samples to idling labs to confirm readiness**

Ensure enough resources and throughput for upcoming screening