Veto radioactive budget

BIANCA BOTTINO - 14/07/2020

Acrylic

Mass : 13 ton for the bulk and ~ 500 kg for sector separators

Samples from the DonChamp company. Assay done.

$^{238}U_{up}$ mBq/kg	$^{238}U_{mid}$ mBq/kg	$^{238}U_{low}$ mBq/kg	^{232}Th mBq/kg	N bg / 100 t yr
1.8×10^{-1}	1.2	1.2	1.3×10^{-2}	1.5×10^{-3} 1.3×10^{-4}

In the future need to measure the acrylic mixed with Gd oxide to evaluate eventual contamination due to the different production process.

Gd oxide

Mass : ~ 300 kg

Samples from many different companies.
The **best** sample is the one from **ShinEtsu company**. A new sample, from the same company has been ordered, as soon as we get it we will request new assay to cross check the purity.

$^{238}U_{up}$ mBq/kg	$^{238}U_{mid}$ mBq/kg	$^{238}U_{low}$ mBq/kg	^{232}Th mBq/kg	N bg / 100 t yr
13.6	14	14	27	1.9×10^{-4}

In parallel we are organising a dedicated meeting with our russian colleagues.

Stainless Steel

Mass : 3251 kg

Assumed for now the DS50 SS.

$^{238}U_{up}$ mBq/kg	$^{238}U_{mid}$ mBq/kg	$^{238}U_{low}$ mBq/kg	^{232}Th mBq/kg	N bg / 100 t yr
0.4	0.4	0.4	0.8	5.2×10^{-4}

We are asking quotations to the Walter Tosto, same company of DS50. All the material will be from the same batch. We will measure several samples of the final SS.
Electropolishing foreseen.

Copper

Mass : 1327 kg

No samples yet. Where do the numbers come from?...cleaner than the MB structure?

$^{238}U_{up}$ mBq/kg	$^{238}U_{mid}$ mBq/kg	$^{238}U_{low}$ mBq/kg	^{232}Th mBq/kg	N bg / 100 t yr
0.33	0.33	0.33	15	4.1×10^{-6}

Surface cleaning will be needed.

ESR - Vikuiti

Mass : > 100 kg

Same material as the TPC. Assay in progress. Where do the google sheet numbers come from?

$^{238}U_{up}$ mBq/kg	$^{238}U_{mid}$ mBq/kg	$^{238}U_{low}$ mBq/kg	^{232}Th mBq/kg	N bg / 100 t yr
1.6	1.6	1.6	0.9	3.5×10^{-5}

WLS: TPB or PEN

Two WLS options are under investigation for the veto:

1. TPB : we can assume the TPC activities. We will do the calculation to estimate the mass.

2. PEN: no assays done yet. Marcin should send samples soon. Activity in the “materials” sheet: where does it come from?

The choice between the two will take into account also the radio purity.

Electronics

Tile

Same as the TPC, but bigger substrate.

3000 pieces

FEB

Pyralux substrate. LED and optical components on it.

3000 pieces

SM

Pyralux substrate.

~ 250 pieces

Cables

- SAMI cable as the TPC. 250 pieces.
- Kapton or pyralux strips to connect FEB to SM or SAMI cable also here

Fibers

Same as the TPC.

3000 pieces, need to decide the length

Connectors options tile/FEB:

- in Nylon 66 by a Chines company
- in Ultem or Peek by Omnetics, samples next week

Connectors options:

- Between FEB and SM same as tile/FEB
- Between SM and SAMI cable Micro D from Omnetics in Ultem 1000