

Scintillator HCal Layer Structure

First Draft

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Layer structure of the CALICE Scintillator HCal

(see <https://twiki.cern.ch/twiki/pub/CALICE/SoftwareMain/hcalTBeam.pdf>)

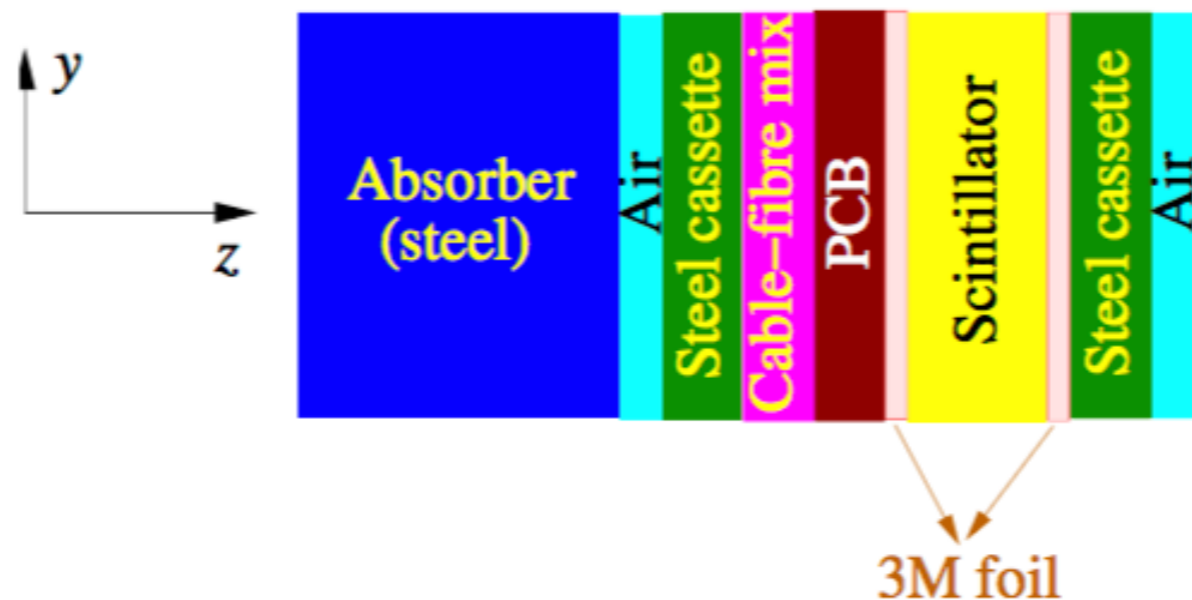


Figure 3: Schematic drawing of an AHCAL layer. Note that, for a better visibility, the dimensions are not to scale.

Volume	Parameter	Value [mm]
Absorber	<i>steel_thickness</i>	variant
Air gap	<i>airgap_thickness</i>	1.25
Cassette	<i>steel_cassette_thickness</i>	2
Cable-fibre mix	<i>cablefibre_mix_thickness</i>	1.5
PCB plate	<i>pcb_thickness</i>	1
3M foil	<i>foil_thickness</i>	0.115
Scintillator	<i>poly_thickness</i>	5

Table 1: Dimension of the constituents of an AHCAL layer.

SiD implementation

Scintillator HCal Barrel

```
<layer repeat="34">
  <slice material = "Steel235JR" thickness = "16.7*mm" /><!-- absorber -->
  <slice material = "Air" thickness = "1.25*mm" /><!-- gap -->
  <slice material = "Steel235" thickness = "2.0*mm" /><!-- cassette -->
  <slice material = "CFmix" thickness = "1.5*mm" /><!-- cable-fibre mix -->
  <slice material = "PCB" thickness = "1.0*mm" />
  <slice material = "Polystyrole" thickness = "0.115*mm" /><!-- 3M foil -->
  <slice material = "Polystyrene" thickness = "5.0*mm" sensitive = "yes" li
  <slice material = "Polystyrole" thickness = "0.115*mm" /><!-- 3M foil -->
  <slice material = "Steel235" thickness = "2.0*mm" /><!-- cassette -->
  <slice material = "Air" thickness = "1.25*mm" /><!-- gap -->
</layer>
<layer repeat="1">
  <slice material = "Steel235JR" thickness = "20.5*mm" /><!-- absorber -->
</layer>
```

RPC HCal Barrel

```
<layer repeat="40">
  <slice material = "Steel235" thickness = "1.89*cm" />
  <slice material = "PyrexGlass" thickness = "0.11*cm" />
  <slice material = "RPCGasDefault" thickness = "0.12*cm" sensi
  <slice material = "PyrexGlass" thickness = "0.11*cm" />
  <slice material = "G10" thickness = "0.3*cm" />
  <slice material = "Air" thickness = "0.16*cm" />
</layer>
```

Scintillator HCal Endcap

```
<layer repeat="38">
  <slice material = "Steel235JR" thickness = "16.7*mm" /><!-- absorber -->
  <slice material = "Air" thickness = "1.25*mm" /><!-- gap -->
  <slice material = "Steel235" thickness = "2.0*mm" /><!-- cassette -->
  <slice material = "CFmix" thickness = "1.5*mm" /><!-- cable-fibre mix -->
  <slice material = "PCB" thickness = "1.0*mm" />
  <slice material = "Polystyrole" thickness = "0.115*mm" /><!-- 3M foil -->
  <slice material = "Polystyrene" thickness = "5.0*mm" sensitive = "yes" li
  <slice material = "Polystyrole" thickness = "0.115*mm" /><!-- 3M foil -->
  <slice material = "Steel235" thickness = "2.0*mm" /><!-- cassette -->
  <slice material = "Air" thickness = "1.25*mm" /><!-- gap -->
</layer>
<layer repeat="1">
  <slice material = "Steel235JR" thickness = "20.5*mm" /><!-- absorber -->
</layer>
```

RPC HCal Endcap

```
<layer repeat="45">
  <slice material = "Steel235" thickness = "1.89*cm" />
  <slice material = "PyrexGlass" thickness = "0.11*cm" />
  <slice material = "RPCGasDefault" thickness = "0.12*cm" sensi
  <slice material = "PyrexGlass" thickness = "0.11*cm" />
  <slice material = "G10" thickness = "0.3*cm" />
  <slice material = "Air" thickness = "0.16*cm" />
</layer>
```