

# **TRT MATERIAL UPDATE**

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**May 4, 2001**

# RECENT WORK ON TRT MATERIAL

In the past month, I have updated the spread sheets monitoring the TRT material. There are two reasons for this update:

1. The simulation group is in the final stages of releasing an updated GEANT3 simulation of the entire inner detector and we need to supply appropriate information about the TRT. The TRT simulation is updated to have the current density of the radiator stacks in the end-cap. There is also updated information for the inner ring region for the end-cap which needs to be put in. There amount of material in the TRT barrel end flange continues to grow but it is not put into the simulation until we discuss it here. There is no recent estimate of the material in the end-cap outer region so the simulation is using the old number.
2. The radiation task force has asked for information about the elemental concentrations in all parts of the TRT. Originally they wanted to know the density of hydrogen in each section of the TRT. Recently they asked for the densities of carbon, oxygen, and nitrogen which I supplied. They also would like to know the densities of most of the metals, Xe, Si, and basically any other element found in the TRT but this will take some more time.

# MATERIAL STATUS

1. TRT Barrel Active Region: No change - 13.8% X0.
2. TRT Barrel Twister Region: No change.
3. TRT Barrel Outer End Region: Large increase ~13.8% X0 vs 7.5% X0 budget. Details of this increase are shown on the next slide.
4. TRT Barrel Cables: 1997 estimate 1.4% X0 - but need to talk with Zbyszek about updating this number.
5. TRT End-Cap Active Region: Some increase from introduction of Tulle. Current totals are A: 6.29% X0, B: 5.17% X0, and C: 5.47% X0 (normal incidence).
6. TRT End-Cap Inner Ring Region: Small increase from using actual weights. Current totals are A: 2.98% X0 (vs. 2.31% X0), B: 2.10% X0 (vs. 1.55% X0), and C: 2.98% X0 (vs. 2.31% X0)
7. TRT End-Cap Outer Service Region: No new information. I will require help from Fido, Hans, et al. after the PAR to adjust these values. The current 3 year old values are A: 11.78% X0, B: 9.76% X0, and 10.80% X0
8. TRT End-Cap Cables: No new estimates since 1998 - so again need to talk with Zbyszek about updating the number.

# TRT BARREL FLANGE INCREASE

List of increases with the largest on top.

Material associated with PPB1 and its connectors is not included.

No allowance for cables is included in either 1998 or the Current column.

**NO ALLOWANCE IS MADE FOR SHIELDING ATTACHED TO THE SPACE FRAME.**

What	May 1998	Current	Difference
Electronics Cooling	0.67%	3.40%	+2.73%
Astral vs. Flex Circuit	0.96%	1.92%	+0.96%
HV Plate	1.72%	2.46%	+0.74%
Space Frame	0.53%	1.17%	+0.64%
Cooling Manifold	0.34%	0.64%	+0.30%
Tension Plate	1.96%	2.40%	+0.44%
Sense Gas Manifold	0.00%	0.37%	+0.37%
Fuses/Fuse Boxes	0.00%	0.19%	+0.19%
Vent Gas Manifold	0.00%	0.16%	+0.16%
End Plug/Twister	0.39%	0.49%	+0.10%
Miscellaneous	0.05%	0.05%	+0.00%
Roof Brd vs. Snake Cable	0.88%	0.53%	-0.35%
<b>Totals</b>	<b>7.50%</b>	<b>13.78%</b>	<b>+6.28%</b>

# MATERIAL CONCLUSIONS & PLANS

- 1. We need to develop a fully detailed spread sheet for the end-cap outer ring region. It is my request that once the PAR is over that Fido, Hans, et al. assist me with doing this. I got most of the needed information last year so all I really need is updates of that information.**
- 2. We need to re-check the amounts of the cables for both the barrel and end-cap with Zbyszek. Again this can wait for after the PAR.**
- 3. I need to sit with the experts and work out estimates for the Faraday cage and electronics shielding because this holds the potential for some nasty surprises.**
- 4. Switching the TRT barrel from a flex circuit to a three board design with connectors would worsen an already bad situation. It would probably be acceptable to switch to triple flex circuit but I haven't made the calculation.**
- 5. For the Radiation Task Force, it is always helpful to have the exact composition of the objects. They are especially interested in metals which can be activated. Also xenon can be activated so they want an estimate of the amount of xenon in the TRT.**
- 6. A final request: please weigh as many things as possible! Having actual weights is the best way to estimate the material.**