

Radiation Physics Note #29

Activation and Cool Off for Shoot Irradiations

The attached graph is a crude approximation of the expected dose rate vs. irradiation time for different amounts of cool off time. The dose rate scale is taken from an 8 minute irradiation of a 4" x 4" x 10' iron plug in the accelerator¹. The cool off is estimated from the following equation²,

$$D_c = D_o \text{Log} \left(\frac{\tau_i + \tau_c}{\tau_c} \right)$$

D_c = Dose rate after "C" minutes of cool off

D_o = Dose rate at $\tau = 0$

τ_i = Irradiation time (minutes)

τ_c = Cool off time (minutes)

I have found the attached graph very useful in educating the physicist and operators concerning how long they can allow a loss monitor to stay saturated.

Since the data the graph is based on is limited, I would appreciate you forwarding any specific activation and cool off data.

¹Casim test file, D. Cossairt, T. Murphy, May 29, 1980.

²Radiation guide, radioactivation at Proton Accelerators
Chapter 12.2.2

