The latest form of radiochromic (RC) film[1] available is the double layer MD-55-2 that can be used both for brachytherapy and external beam dosimetry in the range 3 to 100 Gy. Post-irradiation film storage time and temperature can have a significant effect on the measured optical density (OD) and hence on the accuracy of the measured dose. We carefully studied these effects by using RC film samples, which were stored and analyzed in a temperature-controlled spectrophotometer. Both the rate at which the film darkens (post-irradiation) and the asymptotic value of its OD were found to depend on the storage temperature. At 12 hours post-irradiation the relative *rise* in net optical density (NOD) for the temperature range 20-45 ^{o}C varied from 14% to 20%, with the highest storage temperature becoming nearly stable after 8 hours. A simple physical model is proposed which describes this *irreversible* increase by assuming two independent first-order reactions that contribute to the absorbance build up. We also examined an independent *reversible* change in the film absorbance, which can affect standard OD measurements. To isolate this effect we performed OD measurements on "stable" RC film samples irradiated at least 12 months prior. For a He-Ne laser densitometer (632.8 nm) the reversible change in NOD was found to be less than 1% over the range 18 - 30 ^{o}C. However, significant deviations (approximately 2% per ^{o}C) result if densitometer light source wavelengths in the range 645-665 nm are used.

[1] GAFChromic film distributed by Nuclear Associates, Carle Place, NY.

[1] Radiochromic (GAFChromic) film distributed by Nuclear Associates, Carle Place, NY.