

# Attenuation

## Test Methods

Among various attenuation testing methods, OTDR and cut-back methods are well known in the optical fiber field. In POF, the cutback method is the only method used in the industry. The OTDR is ineffective as a test method for POF because of higher attenuation such as 150 dB/km at visible wavelength.

Figures below illustrate the cutback methods of attenuation measurement. First, measure transmitted optical power ( $P_0$ ) of the fiber at certain length ( $L_0$  m), then cut the fiber to  $L_i$  m (usually 2m or 1m) and measure transmitted optical power ( $P_i$ ) of the cut fiber in  $L_i$  m.

The attenuation is shown:

$$\alpha = \frac{10^4}{L_0 - L_i} \log \frac{P_i}{P_0}$$

Where  $\alpha$  is attenuation dB/km.

In this method, the factor of coupling loss between light source and fiber is neglected. Therefore, accuracys of the length and launching condition are the main factors affecting accuracy of the measurement.

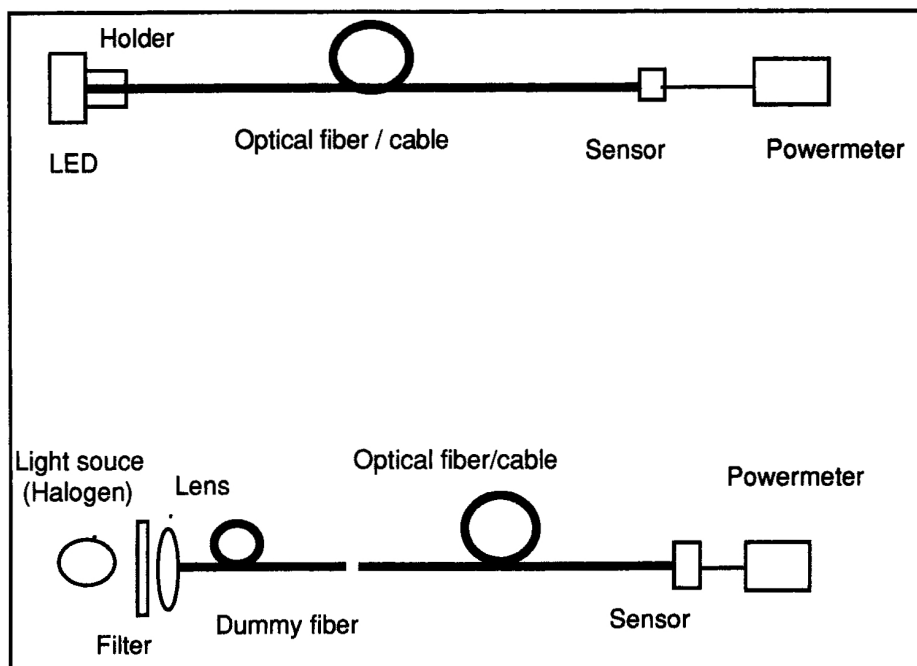
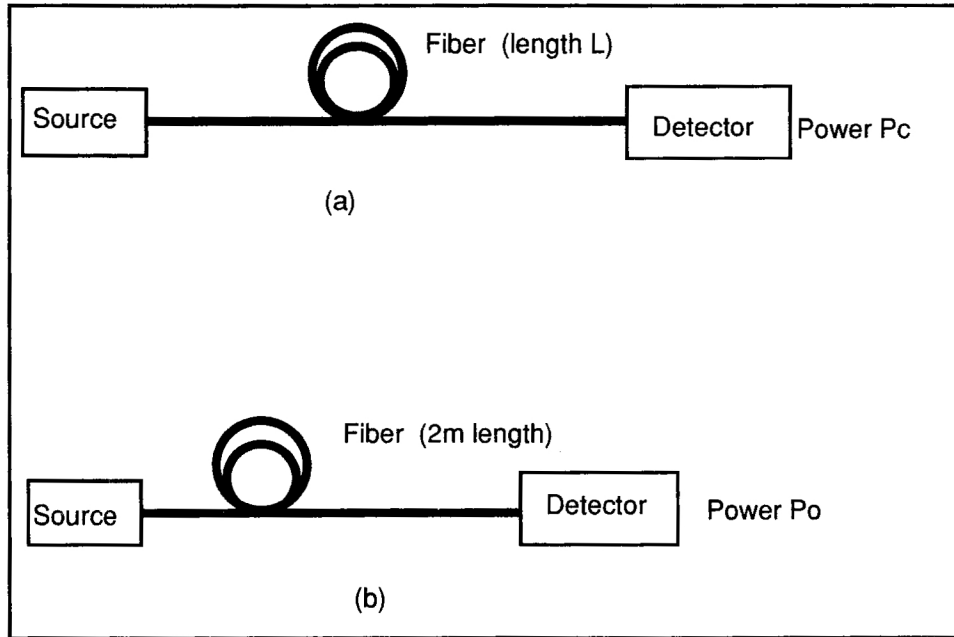


Figure 6.10 Cut Back Methods for Attenuation Measurements



**Figure 6.11 Cut Back Methods of Attenuation Measurements  
(Fiber Length)**