

## Guides to Dimensional Stability: Isolation of Dimensional Change

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### Ensuring Dimensional Film Stability

#### The Basic Steps in Isolating Dimensional Changes to Film

The stability of film can be altered by various environmental factors including heat and humidity.

If changes occur, it is important to isolate the variables (both environmental and equipment) before taking corrective action.

Films perform better when they are moisture conditioned.

#### Equilibration

The length of time necessary for a film to reach moisture equilibrium is dependent on environmental conditions of the film.

**G.** After development, allow diazo film to stand for 15 minutes and measure again the diazo and silver original. Determine if change has occurred.

These basic steps will allow the user to determine at what point changes is occurring. This knowledge will be an aid to determining if environment or equipment is the primary cause for change.

#### IV. Rule of Thumb for Dimensional Change

EXTERNAL CONDITIONS	FILM CHANGE
1. Increased Temperature	Film Growth
2. Increased Humidity	Film Growth
3. Decreased Temperature	Film Shrinkage
4. Decreased Humidity	Film Shrinkage



#### V. Equilibration of Polyester Film

It is important to remember that if the film is exposed to a given temperature for a given period of time that film **does not** equilibrate immediately. Equilibration is a function of time as well as environmental conditions.

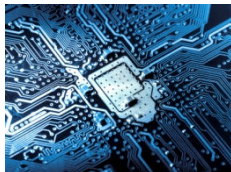
The length of time necessary for a film to reach moisture equilibrium is dependent upon the thickness of the film. If a single sheet of film is fully exposed to air, the gel layers will reach equilibrium within minutes. The support takes longer and its thickness is an important factor. Film on 4 mil polyester base will take about four hours to reach at least 95% of total equilibrium. With a 7 mil polyester base film, a period of eight hours is necessary to reach 95% of equilibrium.

These values apply to a single sheet of film which is freely exposed to the air. If the film is left in a stack, or if it is on a roll, time periods of two or three months may not be sufficient for equilibrium. Film for the most critical work should be removed from the box or roll and be allowed to moisture condition prior to exposure by having a good circulation of room air around the sheet. This is best accomplished by hanging the sheets in the darkroom or by placing the film on a screen platform within a light-tight drawer.

#### RATE OF CONDITIONING

The percentage specified in the following chart is the rate of equilibration. For example, the film in one hour has reached 45% of equilibration. In 10 hours, the film is fully equilibrated for 7-mil film.

	6 Min.	30 Min.	1 Hr.	2 Hrs.	5 Hrs.	10 Hrs.
4-mil	40%	68%	80%	91%	100%	100%
7-mil	20%	32%	45%	63%	88%	100%



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