

# Preventing Humidity Drift in Confined Storing Environment by a Humidity-Controlling Pack

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## Abstract

Although the storage in a closed enclosure is advantageous in view of protection assurance, it is accompanied by some humidity drift in the internal atmosphere. A humidity-conditioning plaque containing Aluminium hydroxalcalite ( $Mg_6Al_2(OH)_3 \cdot 4H_2O$ ) reported at the previous conference was proved to be an useful tool for establishing consistent storing environment.

## A Moisture/Gas Control Card named KeepWell

The feature and ability of KeepWell are introduced as follow.

### 1. Structure

Injection-molded polyethylene sheet incorporates fine dispersion of moisture controller, gas absorbent and color indicator.

### 2. Useful Life Indicator

The incorporated color indicator keeps its blue color as long as the KeepWell in effective.

### 3. Humidity-Optimizing Function

KeepWell controls the storage environment of films, tapes or disks at 30 to 40%RH which is the most suitable for long term preservation.

### 4. Long Life

The rates of gas and moisture absorption is modified by the diffusion process through the low-density polyethylene medium. The useful (i.e., effective) life is over 3 years in a tightly sealed can and approximately 2 years in the unsealed can.

### 5. Non-Hygroscopic Nature

KeepWell retains its dry non hydroscopic surface, as absorbed water is fixed as the crystal water. It does not induce water marks nor stain on the stored materials even after absorbing moisture from the environment.

### 6. Neutralizing Capability

The gaseous acid, if evolved out of film base, are neutralized by alkaline gas absorbent.

### 7. Small, Compact and Splittable Piece

KeepWell is 2mm in thickness, can be easily slipped into even quite narrow space. Also it can be cut down to a size compatible with the space available for the applied objects.

### 8. Adequate Mechanical Strength

KeepWell is non-brittle and the impregnated chemical fragments remain in the sheet even when the KeepWell is cut by hand.

### 9. Adequate Moisture Absorption

KeepWell absorbs moisture as much as 30% of its weight, consequently, one piece (15g) can lower the humidity by 10%RH in case it is placed in insulated space of 1 cubic meter.

### 10. Safe Conditioning

The moderate absorption rate protects long term storage materials from physical damage caused by rapid dehydration. No risk of exothermal temperature rise nor gas evolution. Such slow steady and stable functioning is ideal for long life stability.

### 11. No Sticking, No Rusting and No Mold Growth

KeepWell does not stick to contact enclosures, nor induce rust or mold growth on films, tapes, disks and enclosures.

### 12. Chemical Safety

KeepWell is proved to be safe to human health by the Japan Food Research Laboratory. It is photographically inert, too. However, it should be kept out of the reach of infant. The used KeepWell is classified as a non-recyclable plastic waste.

### 13. Adequate Gas Absorption Capacity

KeepWell scavenges acetic acid. When one piece is applied to 1 liter air, the acetic concentration is reduced 22ppm to nearly 0, and it can be repeatedly used as many as 11 times and more.

### 14. Easy to Use

One piece of KeepWell can be cut into 4 pieces by hand for applying to small size objects.

### 15. Wide Application

It has a wide applications; to safe house keeping of not only films, but also prints, tapes, disks, cameras, lenses, photo-accessories and audiovisual equipment, etc.

## References

1. H.Kishimoto, *J. of The Motion Picture & TV Engineering* (Japan) No 516 (Aug. 1995).