WHAT ARE MOTHBALLS?
Mothballs are compressed from crystals comprised of either Para dichlorobenzene or Naphthalene. In addition to the “BALL” type of product, the same chemicals are available “FLAKED” (paper sachet) or as “BLOCKS” (closet hangers).

HOW DO MOTHBALLS WORK?
Para dichlorobenzene and Naphthalene mothballs sublime, that is, they change from a solid to a gas at room temperature. The rate at which this happens depends on ambient temperature and airflow. Higher temperatures and faster air velocities increase the rate of sublimation. This is like the say dry ice (solid carbon dioxide) changes from a solid to a gas (although this occurs at a much lower temperature). The vapors from each chemical are toxic to moths. The vapors are absorbed through respiration; it is the vapors not the mothball odor that kills moths.

PARADICHLOROBENZENE AND NAPHTHALENE
Para is the ideal chemical to effectively kill moths. It is clean, stainless and leaves no clinging mothball odor. Although it does have a slight odor, this will disappear after a few minutes or airing. The vapor is heavier than air and drifts downward (just a steam is lighter than air and always rises). Moth preventive products should always be placed above stored articles. The heavier gas replaces much of the air in a tightly sealed container or closet and permeates into every thread of fabric. Naphthalene is produced from crude oil and basically works the same as Para. The difference is that the residual odor dissipates slower and the odor is very offensive.

WHICH PRODUCT IS BETTER?
- PARADICHLOROBENZENE is superior to Naphthalene in several aspects:
  - Para is more effective as a mothproofing agent.
  - Para has a higher vapor pressure and provides a greater concentration of active ingredient during use.
  - Para dissipates more readily.
  - Para has a less offensive odor.
  - Para is a synthetic product.
  - Para has a higher purity than Naphthalene.

ARE MOTHBALLS HAZARDOUS?
When used in accordance to the label directions, mothballs pose no unusual risk to the consumer. Keep in mind, however that all chemical products may cause an allergic reaction or some irritation to sensitive individuals. If you suspect an allergic reaction or sensitivity to either Para dichlorobenzene or Naphthalene, discontinue use and consult your physician. Material Safety Data Sheets (MSDS) can be sent to you or your physician on request. Exposure to high concentrations from overuse or exposure to high temperatures may be harmful. High temperatures also cause a fire hazard since both chemicals are combustible. Flash points for these products are as follows:

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<tr>
<td>NAPHTHALENE</td>
<td>190°F</td>
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<tr>
<td>PARADICHLOROBENZENE</td>
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Temperatures in excess of the above are DANGEROUS from both a fire/explosion and toxicity standpoint due to the concentration of vapors released. These products are designed to be used at typical room temperatures (60-80°F). Temperatures within an attic, heated air duct or fireplace can easily exceed the flash points.
HOW ARE MOTHBALLS USED?
The most common use of mothballs is the protection of natural fabrics (wool, cotton, fur) prone to attack by moths. Mothballs, sachets, closet hangers, crystals and flakes all function the same way. Depending on the product, they can be used in a closet, clothes chest, garment bag, clothes drawer or other areas where clothes may be stored. Our products are registered with the E.P.A. as a moth preventive. Our products should be used in airtight storage units with articles of clothing. If the storage area is not airtight, layer tissue paper between clothing and place mothballs flakes or crystals on the paper.

CAN I USE MOTHBALLS IN MY GARDEN?
NO. This is a common misuse for mothballs and will likely cause more harm than good. The vapors can be absorbed into fruits and vegetables in the garden as well as through the root system.

CAN I USE MOTHBALLS IN MY ATTIC TO REPEL SQUIRRELS?
No. This is another common misuse for mothballs. The vapor is heavier than air and will drift downward penetrating living areas. The vapor produces an order that is generally intolerable to most people.

WHAT CAN I DO TO ELIMINATE MOTHBALL ODOR?
The first step to eliminating mothball odors is to eliminate the source. A common cause of excessive odor is excessive use and/or exposure to high temperatures. To remove mothball odors accumulated throughout a room or house, use activated carbon (charcoal) filters in your HVAC system. Our best suggestion is to ventilate the home. Open windows improve air circulation in the room/home. To remove odors from clothing, simply air clothing outside or away from the storage area.

ADDITIONAL QUESTIONS
Will the sun kill moths?
No. The sun will kill moths only on parts of the fabric exposed to the sun. Moths will still live inside the lining, under collars, in cuffs, etc.

Will air conditioning kill moths?
No. Moths live in any temperature over 50°F.

Can I put mothballs in a stocking?
No. Stockings do not allow adequate rate of evaporation to effectively kill moths.

Do moths eat nylon or synthetic fabrics?
Yes. While moths prefer natural fabrics, they will eat synthetic fabrics that have food stains/spills and will eat a hole in the fabric to get to the stain or spill.

Does dry cleaning prevent moth damage?
No. Dry cleaning will kill moths immediately but moths may still crawl over from a soiled item and eat a hole in a newly cleaned item.

How do moth infestations start in a home?
Most clothes moth infestations in homes are carried in on carpeting, woollen goods, furniture and other home furnishings. Infestations may also start when woolens are improperly stored in dark places and left undisturbed for long periods of time.

Does cedar prevent moth infestations?
Cedar contains volatile oils that may kill larvae if when the oils are highly concentrated. Moths, eggs and pupae are not affected by these oils. The oils are not repellant to the adult stages.
SOME THINGS NOT TO DO WITH MOTHBALLS

NEVER MIX PARA & NAPHTHALENE products. The reason is that vapors from this combination can be very irritating. Also, the vapors can combine and liquefy due to the ambient temperature fluctuations. This liquid can be absorbed into porous surfaces and is destructive to certain fabrics.

- DO NOT use mothballs where high temperatures exist; such as near a hot air duct, fireplace or in an attic.
- DO NOT mix mothballs with any other pesticide.
- DO NOT use mothballs in a crawl space or other areas that are inaccessible.
- DO NOT use mothballs in a garden or other area to repel rodents.
- DO NOT use mothballs in an electric vaporizing device as harmful concentrations will be generated.
- DO NOT use mothballs in a normally occupied room or other enclosure.
- DO NOT use mothballs in areas accessible by children.
- DO NOT use mothballs in plastic baggies, trash can liners, dry cleaning bags or any type of polystyrene plastic container/hanger.
- DO NOT use mothballs in the pantry or near perishables.

HELPFUL HINTS
Periodically clean areas of a home that may harbor clothes moths to prevent or control infestation. Those areas include many seldom-cleaned spots, such as:

- Under heavy pieces of furniture
- Along baseboards and in cracks where hair and debris accumulate
- Closets, especially those in which woolens and furs are kept
- Heaters and the areas behind them, and vents
- The vacuum cleaner is the best tool for most of this cleaning. After using it in infested areas, dispose of the bag contents promptly; they may include eggs, larvae or adult insects.
- Make sure clothing is cleaned before placing into storage; insects are less likely to feed on clean fabrics than on heavily soiled one.
- Remove bird or rodent nest in our near the home as clothes moths larvae will feed on feathers and hair in the nest.
HELPFUL FACTS ABOUT MOTHS

Clothes moths are weak flyers and are not attracted to lights. They tend to hide when disturbed, and for this reason, infestations of clothes moths are not usually noticed until damaged fabrics, furs or feathers are found. Close examination of the objects reveals the presence of silken webs that are spun by the larvae. The webbing clothes moth (figure 1) is the most common fabric moth. Adults are golden color with reddish golden hairs on the top of the head. Wings with a span of about ¼”, are fringed with a row of golden hairs. They are usually found very close to the ingested items, such as in dark areas of the closet. Case making clothes moths (figure 2) are similar in size and appearance to webbing clothes moths. The wings of the case making clothes moth are more brownish than those of the webbing clothes moth and have faint dark colored spots. Larvae of both species are identical, except that the larvae of the case making clothes moth always carry a silken case with them as they feed. They never leave this silken tube, but enlarge as they grow. They feed from either end and retreat into it when disturbed. This case takes on the coloration of the fabric eaten by the larvae. Don’t confuse the clothes moth with the common food and grain eating moths that are frequently seen flying around the house. At rest clothes moths are only about ¼” in length, whereas most food-infesting moths are ½” in length. Clothes moths are relatively easy to catch when they land. Clothes moths usually only fly around the immediate area of the house where the infestation is found. Their flight pattern is distinctive: they tend to flutter about rather than fly in a direct, steady manner like the food-infesting moth.

Females of both species of clothes moths lay an average of 40-50 eggs over a period of 2 to 3 weeks and die once egg laying has been completed. Eggs are attached to threads of fabric with an adhesive secretion; they hatch in 4 to 10 days. The larval period lasts from 35 days to 2-1/2 years. Larvae are shiny white with a dark head capsule (figure 3). They spin webbing as they feed and may partially enclose themselves in a webbing cover or feeding tube (figure 4) depending on the species. When they are ready to pupate, larvae wander away from their food source to find crevices. With the casemaking clothes moth, pupation takes place inside the case. Pupation lasts from 8-10 days in the summer, 3-4 weeks in the winter. The larva is the damaging stage of the clothes moth. Both species feed on wool, carpets, upholstered furniture, and furs, animal bristles in brushes, wool piano felts and mixtures of natural and synthetic fabrics. Damage generally appears in hidden locations such as under collars or cuffs of clothing, in crevices of upholstered furniture and in areas of carpeting covered by furniture. Fabrics stained by foods and perspiration are more subject to damage.