

How should your rubber products be stored?

Over time, rubber products can undergo changes in physical properties and become unusable due to excessive hardening, softening, cracking, crazing, blooming, or other surface degradations. These changes may be the result of one particular factor or a combination of factors, such as the action of oxygen, ozone, light, heat, humidity, oils, water, or other solvents. The detrimental effects of these factors can, however, be minimized by proper storage conditions. Experience has demonstrated that storage conditions are as much or more important in determining the useful life of rubber products than is time.

Ames Rubber Manufacturing has compiled a series of recommendations based on SAE-ARP5316 which addresses the general requirements for data recording procedures, packing, and storing of aerospace elastomeric seals. This information is provided to help you give your rubber products the shelf life and longevity that's expected based upon the polymer type you've selected.

PACKAGING

An appropriate packaging material should be free from substances having a degrading effect on the rubber. **For individual packaging** heat sealable opaque materials should be used unless it is not practical or may distort the packaged product. Suitable materials include approved polyethylene (PE) Bags, polyethylene (PE) coated Kraft paper, aluminum foil/paper.

For Bulk packaging, when packaged in a strain free condition, rubber parts should be stored in their original packaging such as sealed cardboard boxes.

TEMPERATURE

The optimal ambient temperature for the storage of rubber products is between 40°F and 80°F.

High temperatures will accelerate the deterioration of rubber products, so sources of heat in storage rooms should be arranged such that the temperature of stored items never exceeds 120°F.

The effects of low temperatures are not as damaging or permanent as high temperatures, but rubber parts may become stiffer and care should be taken to avoid distorting them at temperatures below 40°F.

HUMIDITY

The relative humidity in the storage area should be below 75%. Very moist or very dry conditions should be avoided. Where ventilation is necessary, it should be kept to a minimum. Condensation should not be allowed to occur.

LIGHT

Rubber products should be protected from light, especially direct sunlight and strong artificial light with high ultraviolet (UV) content. Polyethylene bags stored in large cardboard containers and polyethylene lined craft bags offer good protection against light.

Note: It is advisable that windows of storage rooms where elastomer are stored in bulk be covered with a red or orange coating to minimize degradation of product by sunlight.

OXYGEN AND OZONE

Oxygen (O^2) and Ozone (O^3) are very damaging to rubber products, so wherever possible, they should be stored in airtight containers to protect them from circulating air. Ozone is particularly damaging to the carbon backbone polymer chain of many rubber compounds. Rubber products should be kept away from ozone generating equipment such as electric motors, mercury vapor lamps, and high voltage electrical equipment. Combustion gases and organic vapor should be excluded from storage rooms as they may give rise to ozone via photochemical processes.

DEFORMATION

Rubber products should be stored in a relaxed state, free from tension, compression, or other deformation since these may lead to cracking or change of shape

Never hang rubber parts such as O-rings or molded seals on pegs or unsupported pipes as this may cause severe deformation and deterioration. O-rings of a large inside diameter should be formed into at least three (3) superimposed loops so as to avoid creasing or twisting.

Note: It is not possible to achieve this condition by forming just two loops. Three are required.

INFESTATION

Since certain rodents and insects thrive on rubber products, adequate protection should be provided against them.

RADIATION

Precautions should be taken to protect stored rubber products from all sources of ionizing radiation likely to cause damage to stored articles.

CONTACT WITH LIQUID OR SEMI-SOLID MATERIALS

Rubber products should not be allowed to come in contact with liquid or semi-solid materials such as (gasoline, greases, acids, disinfectants and cleaning fluids) or their vapors at any time during storage unless these materials are by design an integral part of the component or the manufacturer's packaging. When elastomeric seals are received coated with their operational media, they should be stored in this condition.

CONTACT WITH METALS AND INSERTS

Certain metals and their alloys (in particular, copper, manganese, and iron) are known to have deleterious effects on elastomers. Rubber products should not be stored in contact with such metals (except when bonded to them or impregnated by them), but then should be protected by individual packaging. Any preservative used on the metal should be such that it will not affect the elastomeric element or the bond to such an extent that the item will not comply with product specifications.

CONTACT WITH DUSTING POWDER

Dusting powders are sometimes used while processing rubber, particularly in extrusion curing or to prevent tacking or sticking to similar parts or to itself during packaging. In such instances, the minimum quantity of powder to prevent adhesion should be used.

CONTACT BETWEEN DIFFERENT ELASTOMERS

Contact between different elastomer and different rubber parts in general should be avoided.

STOCK ROTATION

Elastomeric stock and finished rubber products should be rotated on the FIFO (First In, First Out) principle.