

O-Ring Material Shelf Life

Overview

Global O-Ring and Seal adheres to the SAE International Aerospace Standard **AS5316** for all elastomer product shelf life and storage conditions. Previously known as ARP5316 (Recommended Practice), this standard is based upon both cumulative studies and industry input regarding practical storage limits and FIFO requirements. Please note compliance to this standard is voluntary - Global O-Ring and Seal meets all customer requirements set forth.

Shelf Life

Elastomer Family	ASTM	Shelf Life
Aflas®		Unlimited
Butyl Rubber, Isobutylene Isoprene	IIR	Unlimited
Chloroprene (Neoprene®)	CR	15 Years
Epichlorohydrin (Hydrin®)	ECO	NA
Ethylene Acrylic (Vamac®)	AEM	15 Years
Ethylene Propylene, EPDM or EP	EP	Unlimited
Fluorocarbon (Viton®)	FKM	Unlimited
Fluorosilicone	FVMQ	Unlimited
Hydrogenated Nitrile, HNBR or HSN	HNBR	15 Years
Nitrile (Buna-N or NBR)	NBR	15 Years
Perfluorelastomer	FFKM	Unlimited
Polytetrafluoroethylene (Teflon®)	PTFE	N/A
Polyacrylate	ACM	15 Years
Polyurethane (Polyester or Polyether)	AU / EU	5 Years
Silicone	VMQ	Unlimited
Styrene Butadiene (Buna-S)	SBR	3 Years

* Note AS5316 deals only with the storage of elastomeric parts and carries no justification for components post application/assembly.

Storage Conditions

Proper storage conditions are pivotal to ensure the shelf life standard of the above-stated materials are met. Listed below are various factors that can affect shelf life followed by the AS5316 requirement.

Temperature: Storage temperature must be between 59 °F (15 °C) and 100 °F (38 °C).

Humidity: Relative Humidity (RH) must be less than 75% unless stored in sealed moisture proof bags.

Light: Material must be protected from direct sunlight and/or intense artificial light having U.V. content.

Radiation: All precautions must be taken to block sources of ionizing radiation likely to cause damage.

Ozone: Storage room shall be free of any equipment that may generate ozone (mercury vapor lamps or high voltage electrical equipment) or combustible gases/vapors.

Deformation: Material shall be stored in a strain-free condition, avoiding stress and other causes of deformation.

Dissimilar Materials: Avoid contact with other materials such as liquids or semi-solids (gasoline, grease, acids, disinfectants, cleaning fluids), metals (copper, manganese, iron), and other elastomers.

Packaging Requirements

AS5316 allows for individual or bulk packaging provided batch traceability is maintained. The standard shelf life has been demonstrated, through testing, to be the same for individual or bulk packaging. Global O-Ring has adopted bulk packaging because it provides our customers with better operational efficiencies. We do offer individual packaging at customer request.

Cure Date

Global O-Ring and Seal recognizes the time of manufacture as the time of cure. The cure date of an item will be notated in following format: "[quarter] Q [last 2 digits of the year]". For example, a product made in April of 2017 will have a cure date of 2Q17.

History

Age control of elastomeric seals and assemblies started after World War II on hydraulic, fuel and lubrication seals on aircrafts. The first document on age control was released in 1958 and was a compilation of several studies on age control done since WWII. After several more studies and papers, MIL-STD 1523 was released in 1973 and gave 12 quarters as maximum shelf life. This was extended to 40 quarters in 1984 with the release of MIL-STD-1523A. This standard was cancelled in 1995 when the release of AS1933 was issued. AS1933, "Age Controls for Hose Containing Age-Sensitive Elastomeric Materials" only addressed elastomeric hoses and seals were essentially released from control.

In the past, MIL-HDBK-695C, MIL-STD-1523A, and its replacement, AS1933, were applied to rubber seals. MIL-STD-1523A was cancelled in 1995; the cancellation notice referred to AS1933 as a potential replacement. However, AS1933 specifically deals with rubber hose, and does not deal directly with the concerns of the seal industry. In like manner, MIL-HDBK-695C applies to any and all rubber goods -- but does not satisfy the needs of the seal industry. ARP 5316 was written to "fill the void" and provide a foundation upon which seal manufacturers, distributors, and users could generate realistic shelf life criteria.

Previous Documentation

- MIL-STD-1523 (Sep. 1973)
- MIL-STD-1523A (Feb. 1 1984)
- EPRI NP-6608 (May. 1994)
- AS1933A (Jan. 1995)
- ARP5316 (Nov. 1998)
- AS5316 (Nov. 2017)

Summary

AS5316 represents the latest and most accurate information concerning shelf life of elastomer seals. Global O-Ring and Seal recommends that all distributors and customers work to incorporate the new guidelines in the most appropriate manner. AS5316 is a copyrighted document. Copies of AS5316 may be purchased from SAE by calling (724) 776-4970 or at <https://www.sae.org/standards/content/as5316>.