

Shelf Life vs Service Life

There can be some confusion between the difference between the service life of a rubber part, and its corresponding shelf life.

Service Life is the actual maximal recorded life of a rubber product. The service life of a rubber product is an important parameter in many customer applications, particularly with regard to installations that require a high product reliability level. The costs for the repair or exchange of a critical rubber part can be much higher than the initial cost of the rubber part itself. In that case it is essential to determine the expected service life of the specific rubber application prior to selection of the polymer compound to produce it.

Shelf life is the maximum period of time, starting from the time of manufacture, that a rubber product, appropriately packaged, may be stored under specific conditions after which time it is regarded as unserviceable for the purpose for which it was originally manufactured.

Cure Date is the time of manufacture for rubber thermoset (vulcanized cured) elastomers. Cure date is normally considered the manufacture date for rubber products.

Frequently asked questions regarding shelf life of rubber products.

1. **Is the shelf life an issue for storage only or usage?**
 - a. It is an issue for storage only. Shelf life is one issue and service life is another. However, one should keep in mind that storage conditions can affect the service life of rubber products.
2. **How close to the end of the expiration date of the shelf life can rubber products be used?**
 - a. It depends on the storage conditions, which can affect the quality and shelf life of rubber products. If stored under the most suitable conditions, it could be used through or even beyond the expiration date of its shelf life. Poor storage conditions can shorten the expected shelf life. Storage utilizing the recommended guidelines should increase the shelf life as well as the service life of most rubber products.

Recommended shelf life does not guarantee the quality of a product; therefore, rubber products should remain in storage for as short time as possible. During storage, rubber products can undergo changes in physical properties and ultimately become unusable.

If the shelf life has expired, rubber products should be carefully evaluated for possible use as originally intended before discarding the products solely based on the suggested shelf life.

Recommended shelf life of products made from various polymers

The recommended (storage) shelf life generally associated with products fabricated from various polymers is listed below and is based on information provided in MIL-HDBK-695D Military Standardization Handbook Rubber Products: Recommended Shelf Life. These numbers represent average shelf life under normal dry/cool storage conditions and should be used for guidance purposes only.

Shelf life varies depending on product specifications and compound design. Remember, the values in this chart are minimal values. In practice, longer storage periods may be used especially when 10 or 20 year categories are involved provided the parts are properly stored and periodic checks are performed.

Common or Trade Name	ASTM D1418	Recommended Shelf Life*
Silicone	Q	20 years
Fluorosilicone	FVMQ	20 years
Viton®	FKM	20 years
Hypalon®	CSM	5-10 years
Neoprene®	CR	5-10 years
EPDM	EPDM	5-10 years
Butyl	IIR	5-10 years
Nitrile, NBR	NBR	5-10 years
Urethane	EU	5-10 years
SBR	SBR	3-5 years
Isoprene	IR	3-5 years
Natural Rubber	NR	3-5 years

*Per MIL-HDBK-695D Military Standardization Handbook Rubber Products: Recommended Shelf Life

See our Material Data Sheets for more detailed information about specific polymers