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Rev. A

## Recommended Long-Term Elastomer Product Storage (Work Instruction)

### REVISION HISTORY

Rev	Changes Made	Review / Approved	MOC	Date
A	Complete re-write / renumber to API Q1	R. Schnell / B. Robinson	21-013	12/16/2021

#### 1.0 PURPOSE

Gilmore designs and manufactures high quality valve products that are used in drilling and production control systems, and water or mineral oil-based hydraulic fluid applications.

Gilmore products are inspected, tested, suitably packaged, and ready for long-term storage prior to shipment from the manufacturing facility.

This instruction describes recommended long-term storage methods for Gilmore seal kits, repair kits, and valve products.

#### 2.0 SCOPE

This document describes the recommended practices for the long-term storage of Gilmore products which typically contain elastomeric O-Rings. This instruction is intended to comply to SAE AS5316 in reference to Seal Kits and Repair Kits containing O-Rings.

SAE AS5316 deals solely with the life of elastomeric parts when they are being stored; it does not apply to the service life of any elastomeric component after installation in any assembly, sub-assembly, or any other hardware. Gilmore's commitment to a quality product still maintains a 3-year recommended expiration date in elastomers installed within a valve assembly or subassembly when properly stored.

#### 3.0 REFERENCES

- 3.1 SAE AS5316 Storage of Elastomer Seals and Seal Assemblies Which Include an Elastomer Element Prior to Hardware Assembly.



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**4.0 ABBREVIATIONS AND DEFINITIONS**

**Table 1 – Terms and Definitions**

<b>Term</b>	<b>Abbreviation / Definition</b>
FIFO	Assets produced or acquired first are sold, used, or disposed of first.
Elastomer	A material that possesses elastic properties and has undergone vulcanization and/or conversion into a finished product.
O-Ring	A mechanical gasket typically round; it is a loop of elastomer with a round cross-section, designed to be seated in a groove and compressed during assembly between two or more parts, creating a seal at that interface.
Polymer Type	General Polymer name used to group similar elastomer compounds e.g. NBR, FKM, EPDM, etc.
Seal	An elastomeric finished product or an assembly with an elastomeric element, which prevents the excursion of media on one side of the product from migrating to the other side.
Service Life	The time after installation that the seal(s) will be required to perform the intended function.
Storage Life	Maximum time period, starting from the date of manufacture, that an elastomeric O-Ring seal element, appropriately packaged, may be stored under specific conditions, after which time it is regarded as unserviceable for the purposes for which it was originally manufactured. The manufacture date is the cure date for thermoset elastomers or the time of conversion into a finished product for thermoplastic elastomer.
UV	“Ultra-Violet.”

**5.0 STORAGE PERIODS AND EXPIRATION DATES**

**Table 2 – Warranty and Recommended Storage Periods for Gilmore Products**

<b>Valve Warranty</b>	18 months after shipping or 12 months after installation .
<b>Seal Kits Storage Period</b>	Determined by the end user (see section 8.0).
<b>Repair Kits Storage Period</b>	Determined by the end user (see section 8.0).
<b>Valve Assembly Storage Period</b>	3 years after shipping when stored in proper conditions.

These storage periods will be in effect unless otherwise specified by the customer on the Purchase Order.



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### 6.0 PROPER STORAGE CONDITIONS

Prior to shipment, valves, seal kits, and repair kits are suitably packaged and ready for long-term storage. O-Rings are shipped in airtight UV resistant, labelled bags in accordance with SAE AS5316 and contain the part number, material, QTY, lot/batch, and cure date. Valve assemblies are shipped with an internal coating of Oceanic HW443, which contains a vapor phase corrosion inhibitor. Valve assemblies are shipped with plastic thread protectors in all open ports. Finished product is boxed as required.

The original packaging and labelling provided by Gilmore should not be disturbed and remain fully intact.

The outside packaging includes the oldest O-Ring cure date; this means that all O-Rings within the package will have the same or newer cure date than what is listed on the exterior of the package.

Gilmore products that are subject to long-term storage should be placed in an environment such that the average relative humidity is below 75% and the temperature is between +59° F and +100° F.

Gilmore products should not be stored near ozone generating electrical devices (such as welding machines or laser jet printers) or exposed to radiation.

Gilmore products subject to long-term storage should not be exposed to unnecessary handling, damaging environmental contamination or ambient weather conditions.

Long-term storage of Gilmore products in storage facilities that do not meet the above stated environmental conditions will have a detrimental effect on listed expiration dates and is the responsibility of the end user if product elastomer failure occurs.

Please refer to the storage section of SAE AS5316 for additional references and guidelines.

**Caution:** Improper long-term storage of Gilmore products may result in contamination and degradation of O-Rings, therefore shortening the maximum storage period.

### 7.0 O-RING CURE DATE AND WAREHOUSING

Repair kits and seal kits list the oldest O-Ring cure date and polymer type(s) on the outside label of the packaging; this means that all O-Rings inside the package have the same or newer cure date than what is listed on the exterior product label.

Gilmore recognizes the importance of elastomer cure dates and their direct affect to the storage period. Our warehoused components, including elastomeric seals are used following First In – First Out (FIFO) principles. Gilmore ensures that O-Ring cure dates in



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our stores are at a minimum of seven years away from their expiration. This ensures the optimum storage period for our product to better serve our customers.

**Caution:** This excludes specialty sets of elastomers (e.g. T-Seals and PEEK and Teflon backup rings).

### 8.0 O-RING STORAGE PERIOD

#### 8.1 Repair and Seal Kits

SAE AS5316 uses the polymer type to group maximum storage periods for elastomers. Determination of the actual storage period before elastomer seal elements become unserviceable is the responsibility of the end user. We recommend following the general requirements storage conditions and storage life guidelines set forth by SAE AS5316 and summarized below for our most common elastomer polymer types. For more information, please reference SAE AS5316.

**Table 3 – Maximum Elastomer Storage Periods**

Maximum Storage Period from Cure Date Under Proper Storage Conditions per AS5316:	
15 Years - NBR (Nitrile, Buna-N)	25 Years - EPDM (Ethylene-Propylene)
15 Years - CR (Neoprene)	25 Years - FKM (Viton)
15 years - HNBR (Hydrogenated Nitrile)	25 Years - FFKM (Chemraz, Kalrez)
15 Years - XNBR (Carboxylated Nitrile)	25 Years - PTFE (Teflon, Fluon)

#### 8.2 Elastomers Within Valve Assemblies

Listed storage periods for elastomeric O-Rings installed in valves are recommended to ensure that the quality of the Gilmore product remains high. Beyond this storage period, it is the responsibility of the end user to verify the integrity and proper function of valves in storage longer than 3 years prior to operational use.

The storage periods for installed elastomers (inside valves) are reduced compared to the elastomer manufacturers typical expiration dates. This precaution is due to unknown handling and storage conditions that may occur to product received and warehoused by the end user. Elastomeric seals within valve assemblies may take on a permanent set over a period greater than three years and may affect the reliability of our product.