



Purpose: It is possible that cured rubber components and assemblies are stored for long periods prior to use. Therefore, it is important to minimize any potential deleterious changes to the physical properties of the material. These might include hardening, softening, crazing, blooming, physical deformation and surface cracking.

The intent of this document is to provide guidelines and best practices for defining the shelf life of various rubber polymers and subsequent evaluation on the effects of aging on the materials as well as the best practices for storage to maximize the shelf life of all parts.

Labeling: It is critical to label the product properly to ensure traceability to the date of manufacture. Labels must at a minimum include the following information. If a product is repackaged, the information must be transferred to the new packaging.

- Qty
- Date of MFQ
- Batch number
- Expiration Date

For blended batches, use the shortest shelf life

Storage Conditions: Ideal storage conditions will help maximize, and possibly extend, the shelf life of all materials. The recommend conditions are as follows.

- 15°C to 40°C
- 70% maximum humidity
- Protected from light sources, radiation, and ozone

Packaging: It is important to use the proper materials and packaging techniques to protect the product from damaging stress, interaction with packaging materials, and protection from external interactions.

Recommended Packaging Materials

- Free of materials such as copper naphthenates or creosote preservatives
- UV protective bags or a sealed container
- No PVC
- 3 mil min polyethylene
- Moisture control (may be more important for urethanes)

Recommended Packaging Techniques

- Package to prevent compressive or tensive stresses
- No contact with liquid or semi-liquid materials or their vapors
- No contact with metals or their alloys, except when it is bonded to the rubber
- If dusting powder is used, ensure that it does not have any interaction with the material
- Store only the same materials together



Identification and Inspection of Expiring Materials: There must be a process in place to identify materials that are nearing the end of their planned shelf life to prevent the possibility of release from storage. These parts must be inspected and dispositioned. Products that pass visual inspection are eligible for a shelf-life extension. Products that do not pass must be discarded.

Visually inspect each of the items in the representative sample for the following:

- Distortions of the part shape that could affect product performance
- Damage like tears or surface abrasion
- Surface cracking when viewed under a magnification of 8x
- Changes in hardness or surface tackiness

Storage and extension periods: Storage and extension periods are per the chart below. If there is a blend between the two or more polymer types, then the shortest shelf life would apply.

Reference Documents: MIL-HDBK-695, ISO 2230:2002

Shelf Life Chart for Cured Rubber

Abbreviation	Chemical Name	Common or Trade Name	Shelf Life		Extension	
			Years	Days	Years	Days
TFE/P	Tetrafluoroethylene	Aflas	20	7300	5	1825
BIIR	Bromo-isobutene-isoprene rubber	Bromobutyl	20	7300	3	1095
IIR	Isobutene-isoprene rubber	Butyl	20	7300	3	1095
XNBR	Carboxylic-acrylonitrile-butadiene rubber	Carboxylated nitrile rubber	15	5475	2	730
CM	Chloropolyethylene	Chlorinated polyethylene	10	3650	2	730
CIIR	Chloro-isobutene-isoprene rubber	Chlorobutyl	15	5475	2	730
CSM	Chlorosulfonyl polyethylene	Chlorosulfonated polyethylene	10	3650	2	730
EPDM	Terpolymer of ethylene, propylene and a diene with the residual unsaturated portion of the diene in the side chain	EPDM	20	7300	3	1095



Abbreviation	Chemical Name	Common or Trade Name	Shelf Life		Extension	
			Years	Days	Years	Days
CO, ECO, ECH	Polychloromethyloxiran and copolymer	Epichlorohydrin	10	3650	2	730
EPM	Ethylene-propylene copolymer	EPM, EPR	20	7300	3	1095
FKM	Rubber having fluoro, perfluoroalkyl or perfluoroalkoxy substituent groups on the polymer chain	Fluorocarbon	20	7300	5	1825
HNBR	Hydrogenated NBR (with some unsaturation)	Hydrogenated nitrile	15	5475	2	730
NR	Isoprene rubber, natural	Natural rubber	5	1825	1	365
CR	Chloroprene rubber	Neoprene	15	5475	2	730
NBR	Acrylonitrile-butadiene rubber	Nitrile	15	5475	2	730
NBR/PVC	Blend of acrylonitrile-butadiene rubber and poly(vinyl chloride)	Nitrile/PVC	15	5475	2	730
FFKM	Perfluorocarbon	Perfluoroelastomer	20	7300	5	1825
ACM	Polyacrylic	Polyacrylic elastomer	20	7300	3	1095
BR	Butadiene rubber	Polybutadiene	5	1825	1	365
IR	Isoprene rubber, synthetic	Polyisoprene	5	1825	1	365
EU	Polyether urethane rubber	Polyurethane	5	1825	1	365
AU	Polyester urethane rubber	Polyurethane	5	1825	1	365
SBR	Styrene-butadiene rubber	SBR	5	1825	1	365
VMQ	Silicone rubber having both methyl and vinyl substituent groups on the polymer chain	Silicone	20	7300	5	1825
FMQ	Silicone rubber having both methyl and fluorine substituent groups on the polymer chain	Silicone	20	7300	5	1825
T	Polysulfide	Thiokol	20	7300	3	1095
AEM	Ethylene Acrylic	Vamac	15	5475	2	730