

Guidance: Storage and Shelf-life of Elastomer

All Elastomers either manmade or natural, are susceptible to eventually degrading over time; storage conditions can have a significant impact on the rate of this degradation.

SEP identifies all of its products with a manufactured date; using this manufactured date, and the information / guidance supplied in this document, customers can assess a suggested shelf-life of the products they have purchased, if these products are stored in the correct conditions.

Storage conditions:

Temperature: Products should be stored within a 15°C to 25°C temperature range, and away from direct heat sources (direct sunlight / boilers / radiators / machine exhaust ports).

Note: if the storage temperature falls below 15°C, products may stiffen and become damaged when handled; additional warming measures should be conducted before putting the products into service, whereby the core temperature of the products should be raised to around 30°C.

Humidity: The relative humidity (RH) of the storage area should be maintained in order to prevent condensation being produced; as a general rule, the RH should be maintained at <70%, or <65% for polyurethanes.

Light: Products should be protected from any source of intense light with high UV contents (direct sunlight / intense artificial light).

Radiation: The products should be protected from all sources of ionising radiation, which may damage the product, such as x-rays from an x-ray machine and alpha particles emitted from the radioactive decay of uranium.

Ozone: Ozone should be considered as particularly damaging to rubber products; every effort should be taken to protect products from ozone or equipment that produces ozone such as high voltage equipment.

Chemical material / media: Unless otherwise specified, products should be protected / isolated from any other liquids, semi-liquids, vapours, metals / alloys or powders.

Deformation: Products should be stored in a relaxed, neutral state, allowing the product to form its natural shape, with no external forces upon it (not stacked etc).

Storage periods:

If the storage conditions as described above have been met / followed, products will be capable of achieving the timescales shown as "Initial Storage" listed in the following tables below.

In order for customers to apply the "Extended Storage" times, they will need to perform additional inspection activities to confirm that there has been no deterioration of the physical properties of the products at the end of the Initial Storage period.

Group "A" Rubbers stored at 25°C				
Abbreviation	Known as	Chemical name	Initial Storage	Extended Storage
AU	Polyurethane	Polyester urethane rubber	5 Years from the date of manufacture	2 Years from the end of the Initial Storage date
BR	Polybutadiene	Butadiene rubber		
EU	Polyurethane	Polyester urethane rubber		
IR	Polyisoprene	Isoprene rubber, synthetic		
NR	Natural rubber	Isoprene rubber, natural		
SBR	Styrene-Butadiene	Styrene-butadiene rubber		

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Group "B" Rubbers stored at 25°C				
Abbreviation	Known as	Chemical name	Initial Storage	Extended Storage
ACM	Acrylic	Copolymer of ethylacrylate (or other acrylates) and a small amount of a monomer which facilitates vulcanization	7 Years from the date of manufacture	3 Years from the end of the Initial Storage date
BIIR	Bromobutyl	Bromo-isobutene-isoprene rubber		
CIIR	Chlorobutyl	Chloro-isobutene-isoprene rubber		
CO, ECO	Epichlorohydrin	Polychloromethyloxiran and copolymer		
CR	Neoprene	Chloroprene rubber		
HNBR	Hydrogenated nitrile	Hydrogenated NBR (with some unsaturation)		
IIR	Butyl	Isobutene-isoprene rubber		
NBR	Nitrile	Acrylonitrile-butadiene rubber		
NBR/PVC	Nitrile / PVC	Blend of acrylonitrile-butadiene rubber and poly (vinyl chloride)		
XNBR	Carboxylated rubber	Carboxylic-acrylonitrile-butadiene rubber		

Group "C" Rubbers stored at 25°C				
Abbreviation	Known as	Chemical name	Initial Storage	Extended Storage
CM	Chlorinated polyethylene	Chloropolyethylene	10 Years from the date of manufacture	5 Years from the end of the Initial Storage date
CSM	Chlorosulfonated polyethylene	Chlorosulfonylpolyethylene		
EPM	EPM, EPR	Ethylene-propylene copolymer		
EPDM	EPDM	Terpolymer of ethylene, propylene and a diene with the residual unsaturated portion of the diene in the side chain		
FFKM	Perfluorocarbon	Rubber having fluoro, perfluoroalkyl or perfluoroalkoxy substituent groups on the polymer chain		
FKM	Fluorocarbon, Kalrez, Aflas, Chemraz	Rubber having fluoro, perfluoroalkyl or perfluoroalkoxy substituent groups on the polymer chain		
FMQ (FVMQ)	Fluorosilicone	Silicone rubber having both methyl and fluorine substituent groups on the polymer chain		
MQ	-	Silicone rubber having only methyl substituent groups on the polymer chain, such as dimethyl polysiloxane		
PMQ	-	Silicone rubber having both methyl and phenyl substituent groups on the polymer chain		
PVMQ	-	Silicone rubber having methyl, phenyl and vinyl substituent groups on the polymer chain		
Q	Silicone	Silicone rubber		
VMQ	-	Silicone rubber having both methyl and vinyl substituent groups on the polymer chain		

Note:

Storing products at 35°C, will reduce the potential storage periods by approximately 50%.
Storing products at 15°C, will extend the potential storage periods by approximately 100%.

(The information above is based on the guidance within: BS ISO 2230:2002)