



CHLOREP Bulletin

Issue Date: November 16, 2022

Subject: New Inspection and Storage Guidance for Chlorine Institute Emergency Kits

Background: For many years, The Chlorine Institute's (CI's) Emergency Kits "A" (A-Kit), "B" (B-Kit), and "C" (C-Kit) Viton® gaskets had a recommended maximum shelf-life of four years. More specifically, the instruction booklets for each of these kits recommends that the Viton gasket be replaced after each use in an emergency or after a four-year shelf-life (from the manufacturing date stamped on the gasket).

During the last reviews to update the instruction booklets for the A-Kit and B-Kit (final editions approved in January 2021 and available in CI's [bookstore](#)), a request was made to consider revising the recommended shelf-life for the Viton gaskets based on various challenges that first responder departments and small end-users experience with the frequency of the replacement. CI's Emergency Preparedness Issue Team (EPIT) determined that this was a valid request that requires further investigation. Therefore, a task force was chartered to investigate supplier recommendations and develop new guidance for the kit instructions, accordingly.

Task Group Investigation: As the task group considered the request and reviewed current guidance, it realized the chlorine kit instruction booklets could benefit from more thorough guidance on proper inspection and storage of the kits and gaskets. In fact, the task group felt that proper inspection and gasket condition should be the primary driver for determining if gaskets need to be replaced, while still providing a maximum shelf-life recommendation.

The task group also reviewed shelf-life recommendations from The Chemours Company, the manufacturer of raw Viton, and gasket suppliers used for the chlorine emergency kits. Information obtained from Chemours indicated that certain raw, uncured Viton products can have a shelf-life of at least four years. Information from the gasket suppliers indicated they follow the [MIL-HDBK-695E](#) specification for various cured rubber materials. In this military specification, it was found that several types of gaskets made of cured fluorocarbon (FKM) rubbers used for various applications can last as long as 20 years when properly stored and cared for.

However, the task group realizes that the recommendations that were reviewed do not necessarily reflect the specific application of the molded Viton gaskets used in chlorine emergency kits, which can be handled in harsh environments, particularly during emergencies. For that reason, the task group is not yet ready to change the Viton gasket shelf-life recommendation.



Conclusion: The task group developed new inspection and storage guidance for the chlorine emergency kits (attached to this CHLOREP Bulletin). This guidance provides recommendations for proper storage and inspection for conditions to identify when gaskets need to be replaced. In this guidance, CI recommends at least an annual inspection of the chlorine emergency kits. Gaskets should be replaced in any of the following situations:

- after each use in an emergency;
- if certain adverse conditions are identified during inspection; or
- no later than four years from the date of manufacture.

The new guidance also recommends the use of a checklist for inspection and provides a sample checklist.

Implementation: Over the next year, CI will incorporate this new guidance into the instruction booklets for the Chlorine Institute Emergency Kits “A,” “B,” and “C.” After the updated instruction booklets are published, the related instructional videos will be updated to address the new guidance. Until the updated instruction booklets are published, this CHLOREP Bulletin with the new inspection and storage guidance should be used alongside the respective instruction booklets

Future Work: CI will continue to investigate an appropriate shelf-life recommendation for molded Viton gaskets used in chlorine emergency kits. Currently, the task group is investigating options for physical testing in order to provide more concrete data to help determine an appropriate shelf-life recommendation. Testing results do not necessarily guarantee there will be a change in the Viton gasket shelf-life recommendation, but it will be considered what is most appropriate for the conditions these gaskets are known to be used and stored in.

Contact: Please feel free to contact Robyn Kinsley, CI’s Vice President of Transportation & Emergency Preparedness, (rkinsley@CL2.com or 703-894-4123) should you have any questions.



CHLORINE INSTITUTE EMERGENCY KITS STORAGE, INSPECTION & MAINTENANCE

The following guidance is intended to provide end-users with information that enables an effective maintenance program for the Chlorine Institute Emergency Kits “A,” “B,” and “C” to ensure that all parts are in good, ready-to-use condition for chlorine emergencies. Users should be trained on the inspection and use of the chlorine emergency kits based on the information included herein, as well as included in the applicable kit instruction booklets and videos (available in CI’s online bookstore - <https://bookstore.chlorineinstitute.org/>). Failure to properly follow guidance included in these resources can result in adverse consequences, including the failure to effectively mitigate a chlorine leak. The Chlorine Institute and its members take no responsibility for the performance of users attempting to mitigate a chlorine leak using the Chlorine Institute Emergency Kits “A,” “B,” and “C.”

NOTE

All parts of the Chlorine Institute (CI) Emergency Kits “A,” “B,” and “C” (A-Kit, B-Kit, and C-Kit) should be maintained in a ready-to-use condition.

1. STORAGE

The CI chlorine emergency kits should be stored in an environment that avoids direct sunlight, extreme temperatures, humidity and other environmental impacts that could reduce the useful life and effectiveness of the kit’s components. These types of conditions particularly have the potential of impacting the gaskets, which may include cracking, dry-rotting or other harmful damage that can affect a gasket’s ability to properly seal and mitigate a chlorine leak. It is critical for gaskets to be stored in their original packaging until needed for a response. If the gaskets are not pliable due to cold temperature storage, take steps to warm the gaskets prior to installation to ensure they are pliable and provide an effective seal.

The kits should also be placed in a readily accessible location that is not in too close of proximity to where the chlorine containers are filled, discharged, stored, or otherwise regularly moved. If a chlorine leak occurs, it would result in diminished visibility and increased exposure which will make finding and handling the kits and their components very challenging and potentially result in an inefficient/ineffective response.

2. AFTER USE

Below are recommended steps to take after a chlorine emergency kit has been used in mitigating a chlorine leak.



Replace all gaskets that were used in an emergency.

- Inspect all parts for damage, wear and corrosion.
- Wash all parts that were used with an approximately 5% solution of caustic soda or soda ash to neutralize any residual chlorine.
- After washing, rinse parts with water until they are free of neutralizing solution.
- Dry all parts once they are free of neutralizing solution.
- Lubricate moveable parts with a lubricant that is non-reactive to chlorine. Refer to CI Pamphlet 164 for information on lubricant materials that are compatible with chlorine.
- For the A-Kit and B-Kit, inspect the side patch strap (if used) for wear and replace as necessary.
- Inspect the entire kit to ensure all parts are placed back into the storage container. Refer to the applicable kit instruction booklet for the full list of parts. Order replacement parts, as needed.

It is recommended that an inspection checklist be used and kept on record at least until the next inspection. A sample inspection checklist can be found in the Attachment A.

3. ROUTINE INSPECTION

It is recommended that the kits be inspected annually, at minimum. Increased inspection frequency may be necessary if the kits are at a site located in a geographical area that may experience extreme weather conditions (e.g., high heat, extreme cold, excessive rain/humidity, flooding, hurricanes, etc.). The purpose of this routine inspection is to ensure that all parts in the kits are present and in good, ready-to-use condition. Refer to the applicable kit instruction booklet for the full list of parts. Any defective or damaged parts should be replaced. Moveable parts should be lubricated with a lubricant that is non-reactive to chlorine (see CI Pamphlet 164).

The kit storage boxes should be sealed after each inspection. Such seals should be broken only by authorized persons or for use in a response. Many kit owners coordinate routine inspection as part of training drills.

It is recommended that an inspection checklist be used and kept on record at least until the next inspection. A sample inspection checklist can be found in the Attachment A.

3.1 GASKET INSPECTION

Gaskets are critical to the effectiveness of the kit mitigating a chlorine leak. Ensure all gaskets are still in their original packaging and have never been used. Replace the gaskets if they are not in their original packaging.

As part of the routine kit inspection, gaskets should be inspected (while still in their original packaging) for the following:

- Discoloration;
- Cracking;
- Brittleness;
- Loss of pliability;
- Compressed or distorted;
- Cuts/Gouges;
- Warping; and
- Other damage or defects.

NOTE

Be sure to inspect interior of molded gaskets, particularly in the corners where some of these conditions may initially become evident.



If any of these conditions are discovered, the gasket should be replaced.

All Viton® gaskets are stamped with the date of manufacture. It is strongly recommended that the Viton gasket be removed from emergency use after no more than a four-year (4-year) shelf-life. For further guidelines concerning the Viton® gaskets, consult the kit manufacturer or The Chlorine Institute.

Gaskets that have been replaced may be used for training purposes.

NOTE

If used for training, the gasket should be very obviously marked, accordingly, to ensure it is not accidentally used in an emergency.

4. SPARE PARTS

Spare parts for the chlorine emergency kits may be purchased from the kit manufacturer. For more information on ordering spare parts, consult the kit manufacturer or The Chlorine Institute.



ATTACHMENT A

This checklist is developed as a sample that can be used for the purpose of routinely inspecting a Chlorine Institute Emergency Kit and for inspections of the kits after use in an emergency. Refer to the applicable kit instruction booklet for a full parts list. The user may further develop their own checklist, as needed, based on their facility's operations and circumstances. It is recommended that the checklist be kept on record at least until the next inspection.

Metal Parts

- 1. All metal parts have been inspected for damage or defects.
- 2. All metal parts have been washed/neutralized with a 5% solution of caustic soda or soda ash after use in an emergency (if applicable).
- 3. All metal parts have been rinsed with water after use in an emergency until they are free of neutralizing solution (if applicable).
- 4. All parts have been dried (if applicable).
- 5. Any damaged or defective metal parts have been replaced or a replacement has been ordered. List parts that were replaced (add lines, as needed):

Part No.:	Date Replaced:
<hr/>	
Part No.:	Date Replaced:
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Part No.:	Date Replaced:
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- 6. All moveable parts are lubricated with a lubricant that is non-reactive to chlorine (see CI Pamphlet 164).

Gaskets

- 7. All gaskets are in their original packaging.
- 8. All useable gaskets have been inspected for damage or defects:
 - Discoloration;
 - Cracking;
 - Brittleness;
 - Loss of pliability;
 - Compressed or distorted;
 - Cuts/Gouges;
 - Warping; and
 - Other damage or defects.



9. Record the Viton® gasket's date of manufacture:

10. Any damaged or defective gaskets (including gaskets that were just used in an emergency) have been replaced or a replacement has been ordered. List all gaskets that were replaced (add lines, as needed):

Gasket Part No.: _____ Date Replaced: _____

Gasket Part No.: _____ Date Replaced: _____

Gasket Part No.: _____ Date Replaced: _____

Other Parts

11. The side wall strap has been inspected for wear and replace, if needed. Date of replacement (if applicable): _____

Storage Box

12. All kit parts have been placed back into the storage box.

13. The storage box has been sealed.

14. The storage box was placed back in a readily accessible location.

Completed By: _____

Date Completed: _____