



ONION TANK OPERATIONS MANUAL

2014 VERSION B

ONION TANK OPERATIONS MANUAL - Version B

Issue Date: August 2014

PLEASE READ BEFORE USING.

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PRINTED IN CANADA



We Engineer Solutions

2014 Onion Tank Operations Manual (Version B)

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Section 1: Onion Tank Overview

Introduction

This manual provides the necessary information for safe deployment, maintenance and repacking of the SEI Industries Onion tank.

Onion tanks are primarily used for the storage of potable drinking water. Originally designed for use with water purification systems such as Reverse Osmosis Water Purification Units (ROWPU), the Onion tank is typically used to store unprocessed raw water prior to purification and processed potable drinking water after purification. All Onion tank models may be accessed from an open top or zipper access point to test for water quality or to add water maintenance chemicals.

Onion tanks are also deployed to store chemicals used in water management systems or black water for ablation systems. Sewage collection services may also be pumped directly via the open top.

The Onion tank unit consists of a self-supporting tank complete with one of three cover options (see photos below), a groundsheet/carry bag, fill/drain kits and a repair kit.

The Onion tank is constructed using one of five different fabrics. These fabrics are chosen based on what liquid will be stored in the tank and where it will be used.

Model Configurations



Model OTM Onion Tank secured with shock cord

Model OTM ZipperTop Onion Tank

Model OTZ ZipperTite Onion Tank

Product Features

The Onion tank offers these unique features and advantages:

- Unique flotation collar that requires no inflation.
- Form-fitted tops that are held in a closed position with shock cords or zippers.
- ZipperTite models have a water tight zipper opening. Please note that this model does not have a removable top.
- No assembly required. The self-supporting design allows for quick set up and knock down.
- Completely collapsible, the Onion tank can be easily folded into a compact package.
- Deployment anywhere. The tank is designed to be extremely stable with a spill slope rate of 12.7 degrees and a roll over rate of 14.0 degrees as per Department of National Defence (DND) Interim Report 930601 (OTC and OTM models only).
- Minimal site preparation due to its stability on slopes to 12.5 degrees (OTC and OTM models only).
- The ground sheet acts as a carry bag for the tank when it is stored. Optional zipper carry bags are also available.
- Handles on the outside of the tank allow for quick setup and positioning. A handle on the inside facilitates cleaning of the inside of the tank.
- Two fill/drain ports with covers, 180 degrees apart, allows for discharge and filling without changing supply hoses.
- Dry repair kit supplied with each Onion tank.

Available Models

Model OTC has its top secured to the tank with shock cords. The tank is used for water purification systems where the environment is relatively dust-free and it is not subject to severe wind storms.



Model OTCZ has its top attached with a zipper. Normally used in a desert environment, this tank is resistant to most windy conditions. Both the OTC and OTCZ are easy to clean as the top can be completely removed.



Model OTCZT has its top welded to the body with a 1" water tight zipper that unzips across the top. This unit is normally used for processed water on a water purification system unit as it creates a completely enclosed environment which prevents contaminants from entering the tank. The tank has flotation strips built into the top of the tank to permit an operator to access the tank for water quality samples. Environmental conditions have very little effect on this type of tank.



Available Fabrics

Aqua Shield - 24 oz. Mil-Spec (PD-53048) (tan color)

Aqua-Shield is constructed with interpolymer alloy coating approved by the National Sanitation Foundation (NSF), Standard 61, for containment of potable water. Aqua-Shield fabric is suitable for the containment of some acids but not suitable for fuels or oils. Aqua-Shield fabric meets U.S. military specification PD-53048.

Aqua Shield – 30 oz. NSF (black or white, color)

Aqua-Shield is constructed with interpolymer alloy coating approved by the National Sanitation Foundation (NSF), Standard 61, for containment of potable water. Aqua-Shield fabric is suitable for the containment of some acids but not suitable for fuels or oils.

Aqua Shield – 32 oz. Mil-Spec (Mil-T-53029C) (tan color)

Aqua-shield is constructed from urethane-coated nylon approved by National Sanitation Foundation (NSF) Standard 61, for containment of potable water. Aqua-shield fabric is suitable for containment of some acids but is not suitable for fuels or oils. Aqua-Shield fabric meets U.S. military specification MIL-T-53029C and ADTP-2265.

Aqua-Shield – 28 oz. (orange)

Aqua-Shield is constructed with an alloy coating that combines durability and excellent water containment with a built in cold crack to the standard of MIL-C-20696C. This fabric can be used to contain certain chemicals, but is not for potable water use.

Chem- Shield – 30 oz. (black color)

Chem-Shield Onion tanks are constructed with interpolymer alloy coating that combines excellent durability with resistance to many chemicals. This fabric is suitable for containment of oily water, sludge, black and grey water.

This tank is designed to contain most chemicals, using optional corrosion fittings allows some diluted acids to be stored, but is not for potable water use.

Important Note

Please contact SEI Industries for confirmation of resistance to specific chemicals for any of the fabrics listed above.

Section 2: Installation

Set-Up Procedure

1. Unroll the groundsheet.



2. Spread out the groundsheet and place the Onion tank in the center.



3. Spread out and place the flange at the lowest point.



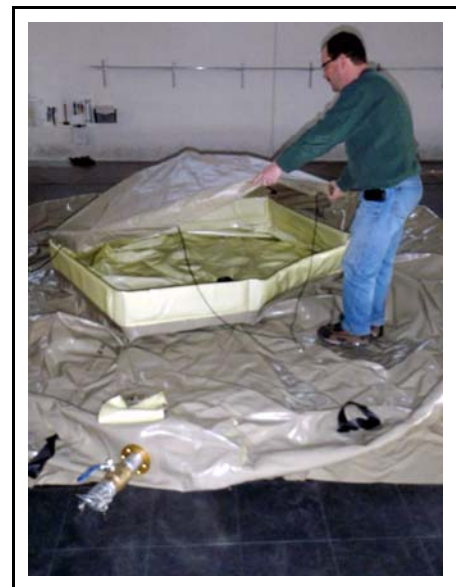
4. Pull (from opposing sides) until the bottom is free of wrinkles.



5. Spread out the cover and install the battens.



6. Place the cover on top of the ring.



7. Attach the three shock cords to the three handles.



8. Open the valve and fill.



For the zipper tank, please follow steps 1 - 6 above and then:

7. Attach zipper ends.
8. Open the valve and fill.

Section 3: Cleaning Instructions

Cleaning Procedure

1. If the area being used is not clean, the ground sheet can be stretched out and cleaned with a pressure washer.



2. Locate the bottom outside handle on the tank and lift the tank clear of the ground.

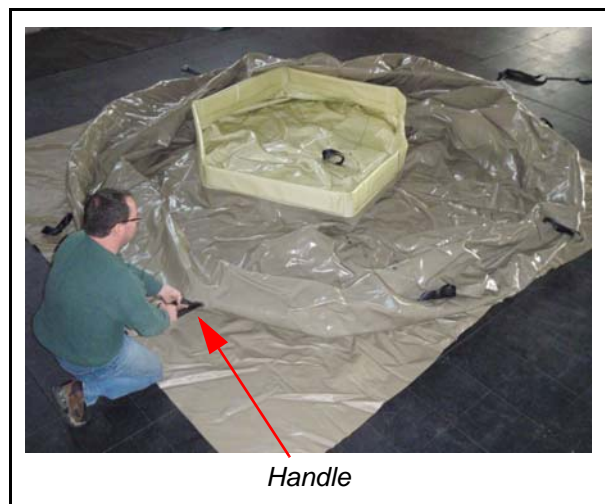


3. Using a pressure washer, wash the outside of the tank. You may have to pull sections of the tank apart to get to all surfaces.



4. Wash all the residue off of the ground sheet, then lower the Onion tank down to the ground sheet. Try to keep the tank on the ground sheet.

5. Locate the handle inside the Onion tank by turning the tank over.



6. Attach the lifting device to the handle and lift the tank clear of the ground. As the tank is being lifted, pull the collar down to expose the interior of the tank.



7. At this time, a bleach solution should be made using an 8% bleach and water mixture. Using a pressure washer, wash the inside of the tank. When the tank is clean, wash the ground sheet or floor surface under the tank with the same solution.
8. Leave the Onion tank suspended until it and the ground sheet are completely dry. Then, lower the Onion tank down, keeping it on the ground sheet. Locate the center exterior handle and lift the tank by pulling on the collar to flip it inside out. At this point, the tank should have its normal exterior showing.
9. To clean the top, insert the battens in the bottom of the top, wash the inside and then turn it over and wash the outside with the same bleach/water solution. Hang the top up to dry.
10. Re-fold the Onion tank and the top and return to its ground sheet/carry bag container.

Section 4: Folding Instructions

Folding Procedure

1. Lay flat and pull the bottom out. Note the location of the bottom handle.



2. Fold both sides and tuck in.



3. Fold both sides to the collar joint.



4. Roll from the collar end.



5. Spread out cover and fold top into half.



6. Start at one end and roll up the cover.



7. Fold in the corners of the groundsheet and place the rolled Onion tank and cover on top.



8. Roll up the Onion tank in the groundsheet and secure with straps.



Section 5: Making Repairs

General Repair Information

Please read these instructions carefully and follow them exactly to obtain a good repair. Failure to follow these instructions or poor repair workmanship can lead to failed repairs and/or more damage to the item.

Warning

If repairing a tank, make sure no flammable chemicals are present in the item being repaired.

Marking Leaks

If there are small leaks or scrapes that might be difficult to locate when the item is drained, mark them with a black felt pen or white wax pen prior to draining.

Repair Failures

Repairs will likely fail if:

- The area to be repaired is not perfectly clean and scrubbed to a matte finish before beginning the repair (except when using clamps).
- The repaired area leaks chemicals during the repair.
- Repairs are attempted during wet or cold weather.

Making Emergency/Temporary Repairs

Using a Wooden Screw

Tools and Materials Required

- Wooden screw
- Small knife

Small holes that are leaking may be temporarily plugged using a threaded wooden screw which is provided in the repair kit. Simply insert the plug into the hole, turning clockwise until the plug is tight and the item stops leaking.

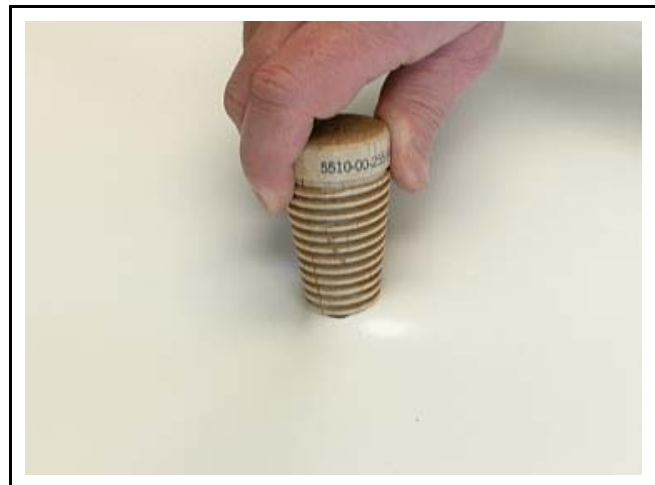


Wooden screws can be used to temporarily repair minor leaks.

Important Note

The wooden screw method is best used on "round-shaped" holes. If the tear is "slit-shaped" then use a knife to make the opening more round. By making the tear more round, you will not damage the fabric as much and you will have less to trim when making permanent repairs.

1. INSERT the screw and turn clockwise until tight.
2. The screw should be REMOVED, once the container is empty, and once you are ready to make permanent repairs using glue or a hot air gun.



Using Sealing Clamps

Tools and Materials Required

- Clamp (correct size needed)
- Small knife

Repair clamps are used for an emergency repair to prevent the loss of liquid through large rips or holes up to 6" in size. For example, if a vehicle accidentally backed into a item and caused a 3" (76 mm) long rip, a repair clamp could be inserted to stop the loss of liquid.

Repair clamps are only used for temporary repairs. The damage should be permanently repaired with a patch when the item can be emptied.

Important Note

Leaving the string on makes it easier to remove the repair clamp when placing a permanent patch on the item.

1. SELECT the largest clamp that will just slip through the hole in the item. The size of cut or hole will determine the size of the sealing clamp to use.

- For a cut or hole up to 2" (5 cm), use a 3" (7.6 cm) clamp.
- For a cut or hole up to 4" (10 cm), use a 5" (12.7 cm) clamp.
- For a cut or hole up to 6" (15 cm), use a 7.5" (19 cm) clamp.

Caution

If you are repairing a filled tank, use caution if deciding to enlarge the slit to insert a clamp. It is very easy to make the slit too large.

2. Keeping hold of the string, SLIP one half of the repair clamp through the hole as indicated.



3. PULL the bolt up through the hole. TURN it until the clamp lines up with the hole.



4. PLACE the top of the clamp over the bolt.



5. TIGHTEN the nut by hand.



Caution

Tightening the nut with tools may break the bolt away from the lower clamp. Overtightening can also deform the clamp and cause leaks.

Using the Hot Air Gun

On most items, hot air gun patching is the preferred method because it provides the most durable, permanent repair possible.

Tools and Materials Required

- Patches
- One plastic hand-held roller
- One hot air gun, Steinel HL 1800 E or equivalent: 120 V-1500 W (800 to 1100 deg. F, 450 litres per min.)
- One wide surface nozzle
- Isopropyl alcohol
- Scissors

Warning

It is extremely dangerous to use a hot air gun in the presence of flammable fumes. There is a high risk of explosion and/or burns.

Warning

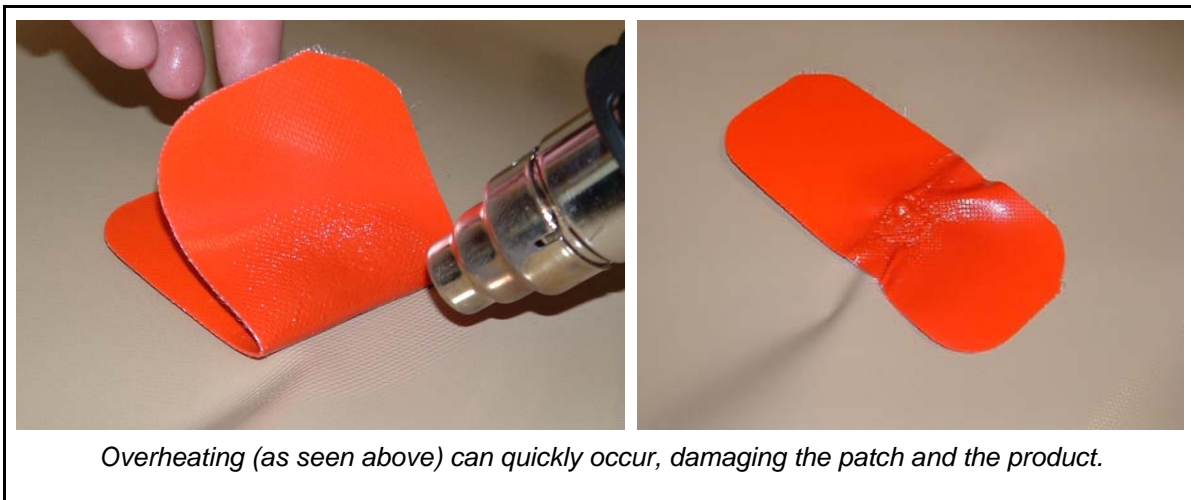
Injury, especially to hands and fingers, can occur when using a hot air gun. Most welding will occur at temperatures of 800-1000 degrees. Wear gloves to protect skin from overheating, burning and blistering.

Hot Air Gun Procedure

1. In a well-ventilated location, CLEAN the area to be repaired as well as one side of the patch (patch should be about 2" larger than the hole) with an abrasive pad. Wipe down the repair area and patch with isopropyl alcohol.
2. MOUNT a wide surface air nozzle on the hot air gun so as to direct the heat flow in a large pattern. Turn the power ON, adjust the temperature in the low range first and let the hot air gun warm up. Increase the temperature as required during the operation. DO NOT OVERHEAT OR BLACKEN THE FABRIC.

**Caution**

Overheating can occur quickly and can damage the product.



3. Starting from the centre of the patch (held down by the roller), concentrate the heat flow equally to patch and fabric. APPLY a light pressure with the roller when the fabric starts melting. This can be seen as small bubbles. DO NOT OVERHEAT.



4. ROLL the patch down to fuse it to the fabric, moving roller and gun simultaneously. Repeat on the unfused portion of the patch. Let the repaired area cool down. Attempt to peel off at the edges with your fingers. If there is even a slight peel, repeat the operation locally. Otherwise, the repair is finished.

Potable Water Repairs

Tank Sterilization Procedure

Warning

If the tank contained any water while being repaired, the evaporating solvent may leave a toxic residue in the water. Tanks used for drinking water **MUST BE STERILIZED IMMEDIATELY BEFORE USE.**

1. Prepare a sterilizing solution by mixing two ounces of household bleach (6% sodium hypochlorite) in two gallons of water. One gallon of this solution will treat 15 gallons of water in the tank.
2. The bleach solution should be mixed outside the tank to be sure the bleach is well blended.
3. Add one gallon of this sterilizing solution for each 15 gallons of water. Continue until the tank is 10% full to ensure the sterilization solution is in contact with all areas of the tank.
4. Allow the tank to sit for three hours. Make sure there are no air pockets in the tank. Any entrapped air will prevent the solution from contacting the tank surface.
5. Drain the solution and flush several times with potable water.
6. A taste of chlorine may remain. This can be reduced by adding vinegar to the rinse water and allowing it to sit in the tank. If you do this, complete one final rinse with clean water (no vinegar).

Section 6: Repair Kits

Repair Kit Lists

Caution

Do not use glue on potable water Onion tanks.

Important Note

It is the responsibility of the dealer and end user to ensure that the importation of glue is allowed in the country of use. In some areas shipping restrictions do not allow us to ship glue.



Part No.	Description
OTA050	Repair Kit Envelope Onion Tank Aqua-Shield NSF
OTA055	Repair Kit Envelope Onion Tank Chem-Shield
OTA060	Repair Kit Envelope Onion Tank Mil-Spec

Part No.	Description	QTY.
REPP001B	POUCH FOR REPAIR KIT	1
REPB001	WEIGHT BAG	1
PP504	ABRASIVE PAD	2
PP510	ROLLER PLASTIC 1 ¼"	1
PP513	SCISSORS	1
TT106	CLAMP MEDIUM	1
REPP136	PATCH AQUA –SHIELD NSF	5
REPP120	PATCH CHEM-SHIELD	5
REPP132	PATCH MIL-SPEC	5

Note: Select patch required for your Onion tank.

Section 7: Part Numbers

Complete Tank Models

Shock Cord Model

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec	Capacity		
			US Gal.	Litres	Imp Gal.
OTC0265	OTCC0265	OTCM0265	265	1000	225
OTC0800	OTCC0800	OTCM0800	800	3000	650
OTC1500	OTCC1500	OTCM1500	1500	5800	1250
OTC2000	OTCC2000	OTCM2000	2000	7500	1650
OTC3000	OTCC3000	OTCM3000	3000	11500	2500

ZipperTop Model

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec	Capacity		
			US Gal.	Litres	Imp Gal.
OTT0265	OTT0265	OTTM0265	265	1000	225
OTT0800	OTT0800	OTTM0800	800	3000	650
OTT1500	OTT1500	OTTM1500	1500	5800	1250
OTT2000	OTT2000	OTTM2000	2000	7500	1650
OTT3000	OTT3000	OTTM3000	3000	11500	2500

ZipperTite Model

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec	Capacity		
			US Gal.	Litres	Imp Gal.
OTZ0265	OTZC0265	OTZM0265	265	1000	225
OTZ0800	OTZC0800	OTZM0800	800	3000	650
OTZ1500	OTZC1500	OTZM1500	1500	5800	1250
OTZ2000	OTZC2000	OTZM2000	2000	7500	1650
OTZ3000	OTZC3000	OTZM3000	3000	11500	2500

Tanks Only

Shock Cord Model

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec	Capacity		
			US Gal.	Litres	Imp Gal.
OTC0266	OTCC0266	OTCM0266	265	1000	225
OTC0801	OTCC0801	OTCM0801	800	3000	650
OTC1501	OTCC1501	OTCM1501	1500	5800	1250
OTC2001	OTCC2001	OTCM2001	2000	7500	1650
OTC3001	OTCC3001	OTCM3001	3000	11500	2500

ZipperTop

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec	Capacity		
			US Gal.	Litres	Imp Gal.
OTT0266	OTTC0266	OTTM0266	265	1000	225
OTT0801	OTTC0801	OTTM0801	800	3000	650
OTT1501	OTTC1501	OTTM1501	1500	5800	1250
OTT2001	OTTC2001	OTTM2001	2000	7500	1650
OTT3001	OTTC3001	OTTM3001	3000	11500	2500

ZipperTite

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec	Capacity		
			US Gal.	Litres	Imp Gal.
OTZ0266	OTZC0266	OTZM0266	265	1000	225
OTZ0801	OTZC0801	OTZM0801	800	3000	650
OTZ1501	OTZC1501	OTZM1501	1500	5800	1250
OTZ2001	OTZC2001	OTZM2001	2000	7500	1650
OTZ3001	OTZC3001	OTZM3001	3000	11500	2500

Tops Only

Shock Cord

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec
White	Black	Tan
OTAC0265	OTACC0265	OTACM0265
OTAC0800	OTACC0800	OTACM0800
OTAC1500	OTACC1500	OTACM1500
OTAC2000	OTACC2000	OTACM2000
OTAC3000	OTACC3000	OTACM3000

ZipperTop

Aqua-Shield NSF	Chem.-Shield	Aqua-Shield Mil-Spec
White	Black	Tan
OTT0265	OTTTC0265	OTTM0265
OTT0800	OTTTC0800	OTTM0800
OTT1500	OTTTC1500	OTTM1500
OTT2000	OTTTC2000	OTTM2000
OTT3000	OTTTC3000	OTTM3000

Ground Sheets and Carry Bags

Ground Sheet /Carry Bag

Part No.	Description
OTAG0265	Ground/Sheet Carry Bag 265 USG
OTAG0800	Ground/Sheet Carry Bag 800 USG
OTAG1500	Ground/Sheet Carry Bag 1500 USG
OTAG2000	Ground/Sheet Carry Bag 2000 USG
OTAG3000	Ground/Sheet Carry Bag 3000 USG

Zipper Carry Bag

Part No.	Description
FFBZ00500	Bag Zipper Tote 500 Gal Or Less
FFBZ01000	Bag Zipper Tote 1000 Gal Or Less
FFBZ01500	Bag Zipper Tote 2000 Gal.
FFBZ02500	Bag Zipper Tote 3000 Gal Or Less

Fitting Kits

Part No.	Description
OTA001	Fitting Kit Standard Aluminum
OTA005	Fitting Kit Nbc Stainless Steel
OTA010	Fitting Kit Nato Aluminum

Fitting Kit - Onion Tank



Fitting Kit - Onion Tank OTA001

Item	Part No.	Description	Qty.
1	PKO20	Tool Box Plastic 16"	1
2	PLA200	Dust Cap Aluminum 2" Camlock	2
3	PLA300	Adapter 'F' 2" Camlock X 2" Mnpt Alum	2
4	PLB550	Valve Ball Full Port 2" Fnpt Brass	2
5	PLSS02040	Nipple Stainless Steel 2" Npt X 4" Long	2
6	PP022	Loctite Pst Pipe Sealant, 6 MI	3
7	MN011	Folding Instruction Sheet Onion Tank	1

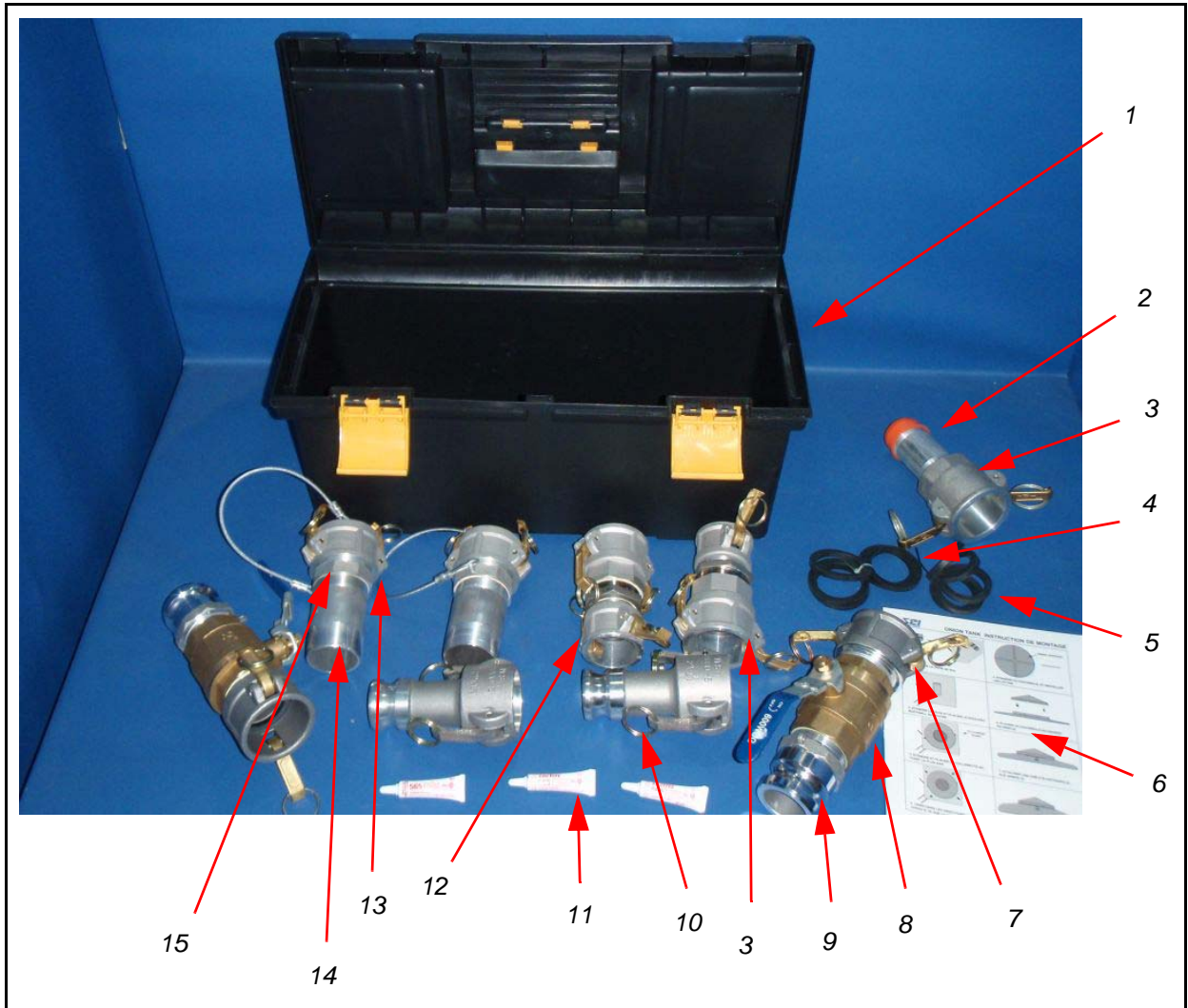
Fitting Kit NBC - Onion Tank OTA005

The NBC fitting kit has the same components as the standard kit, except all fittings are stainless steel.

Item	Part No.	Description	Qty.
1	PKO20	Tool Box Plastic 16"	1
2	PLSS200	Dust Cap 2" Camlock Stainless Steel	2
3	PLSS300	Adapter 'F' 2" Camlock X 2" Mnpt Stainless	2
4	PLSS502	Valve Ball Full Port 2" Fnpt Stainless	2
5	PLSS02040	Nipple Stainless Steel 2" Npt X 4" Long	2
6	PP022	Loctite Pst Pipe Sealant, 6 MI	3
7	MN011	Folding Instruction Sheet Onion Tank	1

Fitting Kit NATO Onion Tank

(BWD-007-19, NSN 5430-21-910-1031)



Fitting Kit NATO Onion Tank

(BWD-007-19, NSN 5430-21-910-1031 continued)

Item	Part No.	Description	Qty.
1	PKO21	Tool Box Plastic 19"	1
2	PLSS01540	Nipple Stainless Steel 1 ½ " NPT X 4" Long	1
3	PLA421	Camlock 2" Coupler X 1 ½" FNPT Alum	3
4	PL002	Gasket, Buna-N For 2" Camlock	5
5	PL001	Gasket, Buna-N For 1.5" Camlock	5
6	MN011	Folding Instruction Sheet Onion Tank	1
7	PLA250	Coupler 'B', 2" Camlock X 2" MNPT, Alum	2
8	PLB550	Valve Ball Full Port 2" FNPT Brass	2
9	PLA300	Adapter 'F' 2" Camlock X 2" MNPT Alum	2
10	PLA420	Camlock 2" Coupler X 1 ½" Adapter 'A' Alum	2
11	PP022	Loctite PST Pipe Sealant, 6 ml	3
12	PLA251	Coupler 'B', 1 ½" Camlock X 1 ½" MNPT Alum	2
13	PLA200	Dust Cap Aluminum 2" Camlock	2
14	PLSS02040	Nipple Stainless Steel 2" NPT X 4" Long	2
15	PLA350	Adapter 'A', 2" Camlock X 2" FNPT Alum	2

Section 8: Optional Equipment

SmartSensor

SmartSensor is a self-contained, microprocessor-based, battery-powered, multi-function water quality indicator specifically adapted to the needs of the defence sector for use in both combat and humanitarian situations. Paramount to any military operation is the access to and availability of safe and potable water. The SmartSensor is offered by SEI Industries as a verification and monitoring tool to ensure the quality and supply of potable water.

The SmartSensor uses a proprietary array of military grade digital sensors to measure, compute, log, and display the pH, ORP, free chlorine, alkalinity, total dissolved solids and temperature levels of a water sample in real time. International patents are pending.

Features

- Verifiable time-stamped readings are displayed, stored and can be downloaded on demand.
- Fool-proof: can be used by anyone without training.
- No human intervention needed to measure and monitor the water chemistry.



Benefits

- Available free chlorine is the most widely accepted standard measurement in determining the quality of water.
- ORP measurements provide an international standard which show the effectiveness of the agent in a water sample.
- pH measurement provides an indication of safe, chemically-neutral water for drinking, bathing and cooking.
- Alkalinity, as derived from total dissolved solids, provides a window into potentially hard contaminants in a water source.

For more information on the SmartSensor, please contact SEI Industries.

Section 9: Warranty

SEI Industries Ltd. (the company) agrees to grant a warranty for a period of one year from the date of purchase of an Onion tank on the following conditions:

- a) The company's sole obligation under this warranty is limited to repairing or replacing, at the company's sole discretion, any product shown to be defective.
- b) The company's products are not guaranteed for any specific length of time or measure of service, but are warranted only to be free from defects in workmanship and material for a period of one year to the original purchaser.
- c) To the extent allowable under applicable law, the company's liability for consequential and incidental damages is expressly disclaimed. **The company's liability in all events is limited to and shall not exceed, the purchase price paid.**
- d) This warranty is granted to the original purchaser of the Onion tank and does not extend to a subsequent purchaser or assignee.
- e) The company must receive notification in writing of any claims of warranty from the original purchaser which must give details of the claimed defect in the product.
- f) Where the original purchaser is claiming under warranty, the product must be returned to the company for inspection with all transportation and duty charges prepaid.
- g) The warranty does not extend to any product that has been accidentally damaged, abraded, altered, punctured, abused, misused or used for a purpose which has not been approved by the company.
- h) This warranty does not apply to any accessories used with the product that are not supplied by the company and any warranty on such accessories must be requested from the manufacturer or dealer of the accessories.
- i) In the event the original purchaser does not give notice of a warranty claim, within one year of the original purchase of the product, it is understood that the purchaser has waived the claim for warranty and the purchaser and/or any subsequent purchaser must accept the condition of the product, without warranty.
- j) Any technical information supplied by the company regarding the product is not a condition of warranty but rather is information provided by the company to the best of its knowledge.
- k) There are no implied warranties nor is there any warranty that can be assumed from any representation of any person, except the company itself.

Exclusions

- l) This warranty is void if the product is not installed, used and/or maintained in accordance with the operations manual supplied by SEI.
- m) Onion tanks are designed and manufactured with substantial safety margins. It is the responsibility of the user to ensure that the tank is maintained to a safe standard.