

Information Paper

ATCL-ACE
24 January 2018

SUBJECT: Reduced Explosives Safety Quantity Distance Storage Unit Information Paper

1. **PURPOSE:** To provide information regarding the type of Reduced Explosives Safety Quantity Distance Storage units being utilized in the Army and the requirements for the safe and effective utilization.
2. With proper approval, any mobile storage container can be used to store Ammunition and Explosives (AE), but the storage capability of many standard commercial mobile storage containers offer no additional Explosives Safety (ES) protections than an intermodal (ISO) Container or Military-Owned Demountable Container (MILVAN). There are manufacturers with special containers (e.g. ARMAG, GOLAN, NABCO, and Mistral) that have different ES approval levels granted by the Department of Defense Explosives Safety Board (DDESB) and the ES standards must be followed.
3. Before purchasing any ammunition storage container, speak with the safety specialist of the installation and/or contact the US Army Technical Center for Explosives Safety (USATCES) to insure the container meets the needs of the installation/unit. AE storage containers can be ES sited as an Aboveground Storage Magazine (AGM), which comes with lesser ES protection and greater Inhabited Building Distance (IBD) quantity distance (QD) requirements. Mobile containers can be used as an arms room, but will have "limited quantities" of 50 lbs. HD 1.2.2, 100 lbs. HD 1.3, and Mission Essential Quantities (MEQ) of HD 1.4 among other governing requirements.
4. There are certain earth-covered magazines (ECMs), AGMs, and containers listed in Table AP 1-4 of Technical Paper 15 (TP15) that have been approved by the DDESB with reduced net explosives weights (NEWs) or reduced QD. These magazines include the GOLAN 5, 10, 15, and 45, NABCO SV-23 and SV-50, Canine Training Aid Explosives Storage Magazine (CETASM), and Advanced Explosive Ordnance Disposal (EOD) Magazine.
5. In areas where it might be difficult to provide proper QD to exposures, mobile containers can be helpful. Organizations that want to use mobile storage containers for reduced QD, must understand there are additional requirements for their usage. There are minimum distance requirements for orienting the magazine door away from occupied spaces and facilities. For example, a mobile storage container authorized to contain up to 30 lbs. HD 1.1, a minimum of 50 feet separation distance is required from the door of the magazine (and any other authorized AE operation(s) at the magazine) to the nearest occupied space or facility. For a mobile storage container authorized to contain 30 to 50 lbs., the minimum distance is 100 feet.
6. The above example is for one brand of containers that has its own set of rules that must be met for reducing QD. If anyone is planning to take advantage of the reduced QD of a mobile storage container, don't forget to allow for enough room between exposures and the door of the magazine. Any IBD, Public Traffic Route Distance (PTRD), and Intraline Distance (ILD) exposure requirements must be met. Finally, there could be specific AE and engineering requirements (e.g. pumice liners) for a container that must be followed in order to be able to use the reduced criteria for that specific container.

ATCL-ACE

SUBJECT: Reduced Explosives Safety Quantity Distance Storage Unit Information Paper

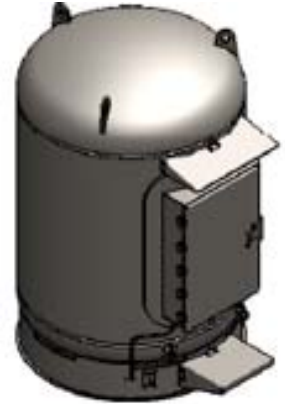
7. Point of contact is Mr. Brook Morris, 918-424-9297, email: brook.a.morris.civ@mail.mil. Alternate point of contact is Mr. Randy Smith, 918-420-8334, email: randy.w.smith2.civ@mail.mil.

CARL A THOMAS
Director, US Army Technical Center for
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CETASM (WORKING DOG ARMAG)

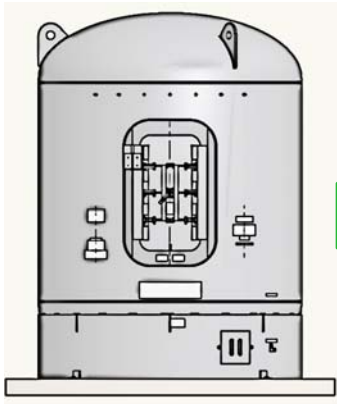


GOLANs

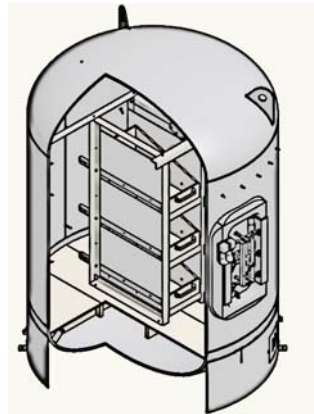


REDUCED ESQD STORAGE UNITS

A reduced QD magazine is a specially designed structure that has been developed to contain or severely limit overpressure, fragment, and thermal effects produced by an internal explosion involving the magazines approved rated explosives capacity.



NABCOs



EOD ARMAG SYSTEM

REDUCED ESQD STORAGE UNITS

| Section Title: | MAX NEW (LBS of HD 1.1 (kilograms-kg)) | MIN IBD (Feet(Meters)) | Slide #: |
|---|---|---------------------------|------------|
| General Information | - | - | 4 |
| CANINE EXPLOSIVE TRAINING AND STORAGE MAGAZINE (CETASM) | 87.5 lbs. (39kg) | 25' (7.62m) | 5 thru 9 |
| ADVANCED EXPLOSIVE ORDNANCE DISPOSAL (EOD)STORAGE MAGAZINE 7'X7'X7' (EODMAG) | 126.2137 lbs. (57kg) | 10' (3.048m) | 10 thru 14 |
| NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5X5X5 | 8.45 lbs. (3kg) | 0 | 15 thru 22 |
| GOLAN 5 STORAGE UNIT | 11 lbs. (4kg) | 30' (3.35m) | 23 thru 25 |
| GOLAN 10 STORAGE UNIT | 22 lbs. (9kg) | 3' (0.914m) | 26 thru 28 |
| GOLAN 15 STORAGE UNIT | 33 lbs. (14kg) | 4' (1.22m) | 29 thru 31 |
| GOLAN 45 STORAGE UNIT | 55 lbs. (25kg) | 5' (1.5m) | 32 thru 34 |
| GOLAN 45 STORAGE UNIT | 100 lbs. (45kg) | 6' (1.82m) | 32 thru 34 |
| NABCO SV-23 STORAGE UNIT (Type One - Used for non-fragmenting explosives only) | 32 lbs. (14kg) | 15' (4.57m) | 35 thru 37 |
| NABCO SV-23 STORAGE UNIT (Type Two - Used for non-fragmenting explosives and DDESB approved fragmenting AE only) | 32 lbs. (14kg) | 15' (4.57m) | 35 thru 37 |

REDUCED ESQD STORAGE UNITS

| Section Title: | MAX NEW (LBS of HD 1.1 (kilograms-kg)) | MIN IBD (Feet (Meters)) | Slide #: |
|--|---|----------------------------|------------|
| NABCO SV-50 STORAGE UNIT | 50 lbs. (22kg) | 35' (10.67m) | 38 thru 40 |
| NABCO SV-80 STORAGE UNIT | 80 lbs. (36kg) | 35' (10.67m) | 41 thru 44 |
| MK 663 Mod 0 CONTAINER STORAGE UNIT | 10-grams (0.01kg) | 0 | 45 |
| ARC 6GT DETONATION CHAMBER | See Tech Data Pkg | See Tech Data Pkg | 46 thru 49 |
| ARC 9GT DETONATION CHAMBER | See Tech Data Pkg | See Tech Data Pkg | 50 thru 55 |
| HESCO BARRICADED ARMAG (Configuration 1) | 110 lbs. (49kg) | 200' (60.96m) | 56 thru 58 |
| HESCO BARRICADED ARMAG (Configuration 2) | 110 lbs. (49kg) | 410' (125m) | 59 thru 60 |
| GENERAL NOTES | - | - | 61 |

REDUCED ESQD STORAGE UNITS

REDUCED ESQD GENERAL INFORMATION

Reduced quantity distance (QD) magazines shall be sited as aboveground magazines (AGMs), using the reduced QD distances established as part of the Department of Defense Explosives Safety Board (DDESB) approval package for each type of magazine. A DDESB-approved site plan staffed through USATCES is required prior to the use of a reduced QD magazine for their designed purpose. Use of reduced QD magazines shall comply with specific provisions for their use (e.g., venting, grounding, and specified storage limitations) identified as part of the DDESB approval package for each type of magazine.

The reduced QD magazine will be located and oriented to maximize protection of surrounding exposures. The selection of a location for the reduced QD magazine shall not be simply for convenience, but shall consider the direction of the door, planned operations, and the need to minimize exposure of personnel and facilities. The reduced QD magazine door must be directed away from occupied spaces and facilities, or at a minimum directed away from the highest exposures with a minimum separation distance of 50 feet.

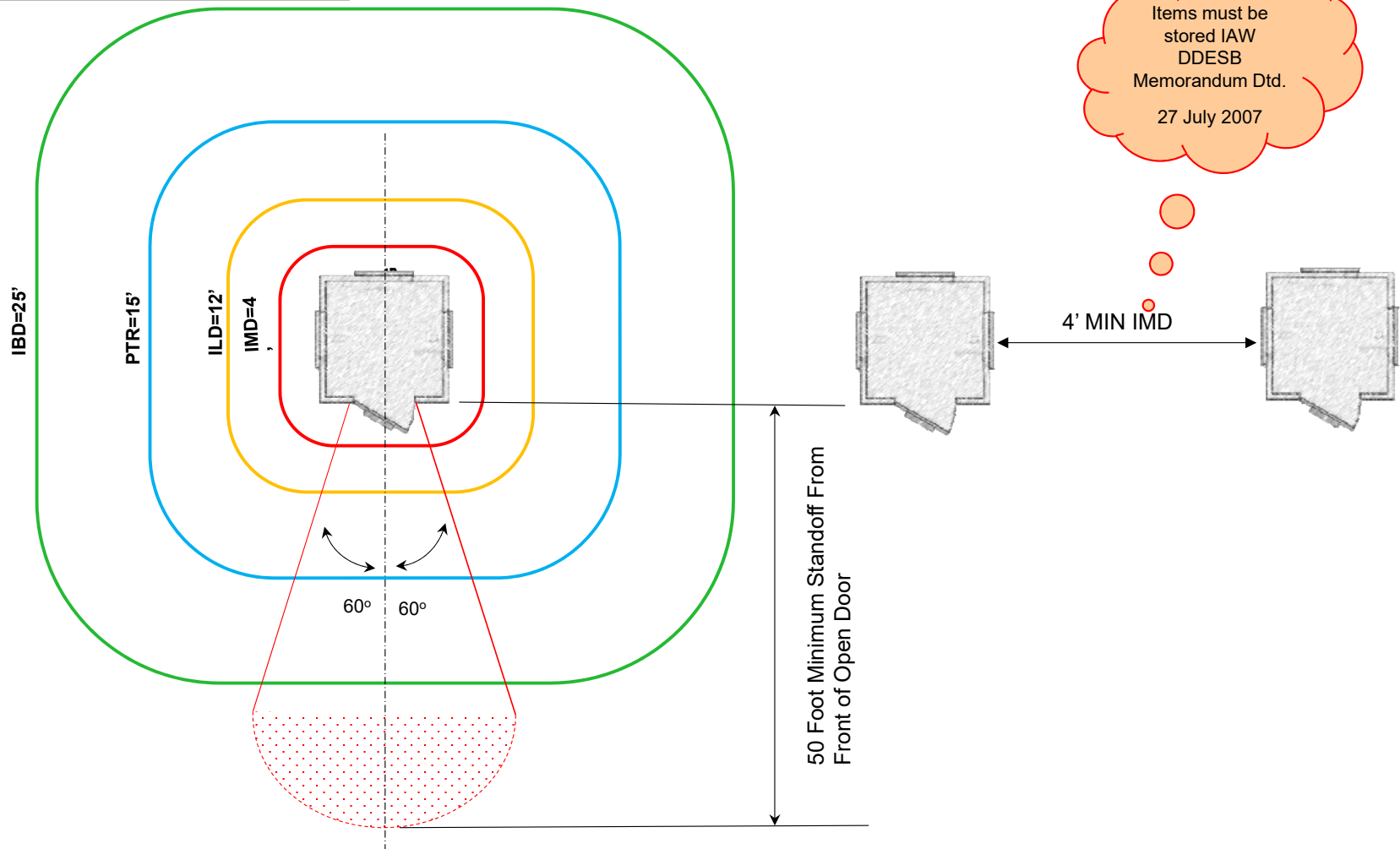
Not all manufactured explosives storage magazines qualify for reduced QD criteria. Only those that have been authorized by the DDESB and listed in their Technical Paper 15 qualify. All others are sited as regular aboveground magazines.

CANINE EXPLOSIVE TRAINING AND STORAGE MAGAZINE (CETASM)

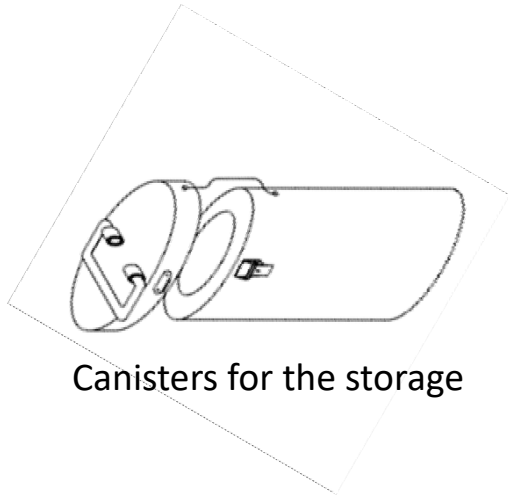
Used for military working dog scent kits



CETASM STORAGE UNIT

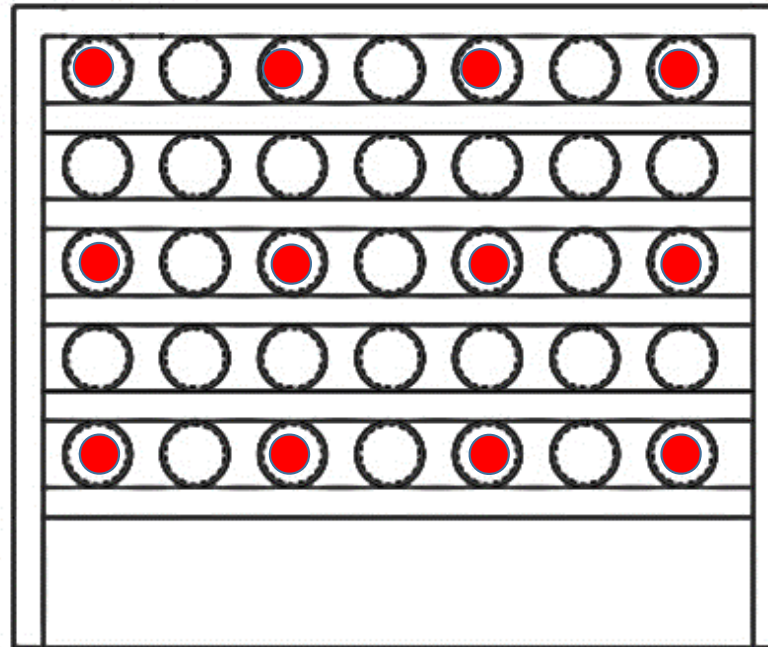


CETASM STORAGE UNIT



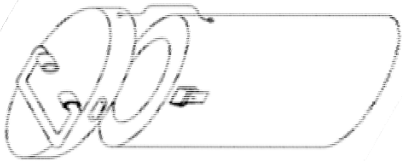
Canisters for the storage

Reference DDESB Memorandum Dtd. 27 July 2007: Any canister containing C-4, ammonium nitrate dynamite (AD), Taggant Composition C-4 (TC4), Semtex-H (SH), PE-4, or urea nitrate (UN) samples shall be separated from any other canister containing C-4, AD, TC4, SH, PE-4, or UN samples by no less than one intervening canister. The intervening canister either may be empty or may contain sand or time-fuse samples. **The minimum one intervening canister separation shall be maintained in the horizontal, vertical, and diagonal directions.**



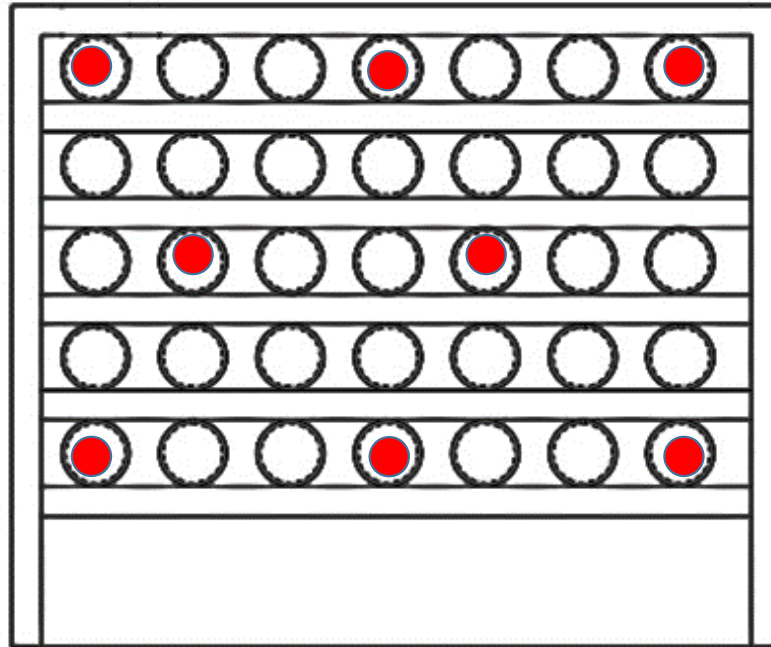
● =Authorized storage locations given the IMD criteria above.

CETASM STORAGE UNIT



Canisters for the storage

Reference DDESB Memorandum Dtd. 27 July 2007: Any canister containing a nitroglycerin dynamite (ND) sample shall be separated from any other canister containing C-4, ND, AD, TC4, SH, PE-4, or UN samples by no less than two intervening canisters. The intervening canisters either may be empty or may contain sand or time-fuse samples. The minimum two intervening canister separation shall be maintained in the horizontal, vertical, and diagonal directions.

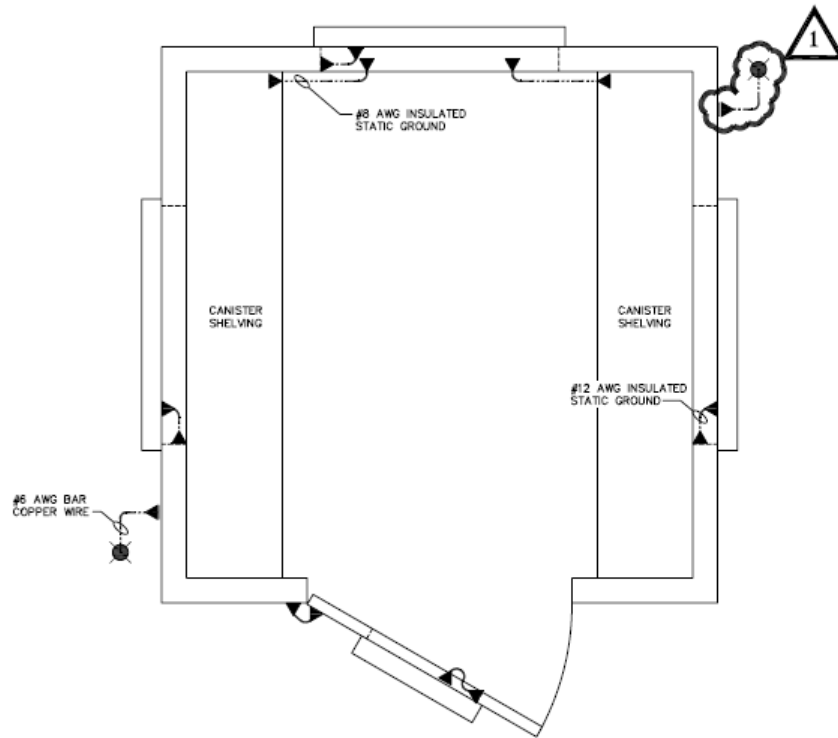


● =Authorized storage locations given the IMD criteria above.

CETASM STORAGE UNIT

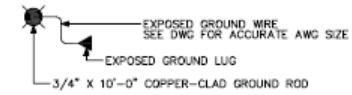
Grounding and Bonding:

The CETASM shall be bonded and grounded in accordance with DOD 6055.9-M, "DOD Ammunition and Explosives Safety Standards," and NFPA 780, "Standard for the Installation of Lightning Protection Systems."



TOP VIEW
SCALE: 1" = 1'-0"

LEGEND:



NOTES:

1. ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NEC) AND ALL OTHER LOCAL GOVERNING BODIES.

ADVANCED EXPLOSIVE ORDNANCE DISPOSAL (EOD) STORAGE Magazine 7'x7'x7' (EODMAG)

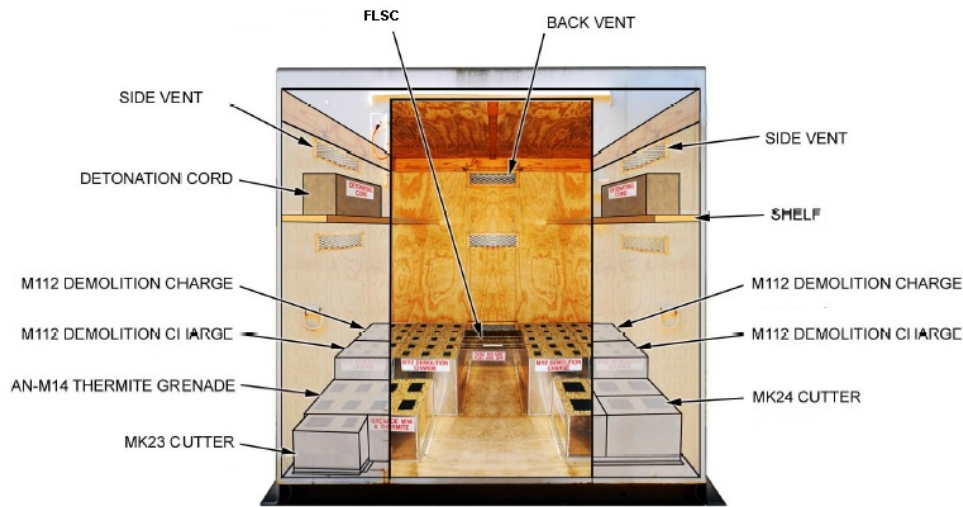


EODMAG STORAGE

The Advanced Explosive Ordnance Disposal Storage Magazine (EODMAG), shown in Figure 1-1, is a deployable explosive storage magazine that provides a minimal Quantity Distance (QD) while storing explosive items found in a typical EOD deployment package. When the EODMAG is loaded with explosives, it has a minimum QD of only 10 feet. The system is made up of two storage magazines utilizing pumice lined containers that when loaded properly prevent sympathetic detonation. The maximum net explosive weight (NEW) per magazine can be found in the table for the specific magazine configuration. The maximum NEW must be followed and the pumice lined containers shown in this publication must be used to retain the 10-foot QD. The Department of Defense Explosive Safety Board (DDESB) has approved this storage system provided that only approved items are stored. Any changes to types, quantities and placement of explosive items are not permitted.



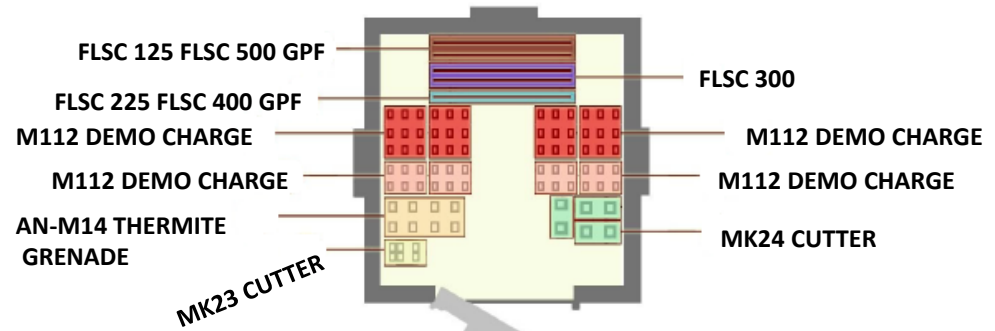
EODMAG STORAGE



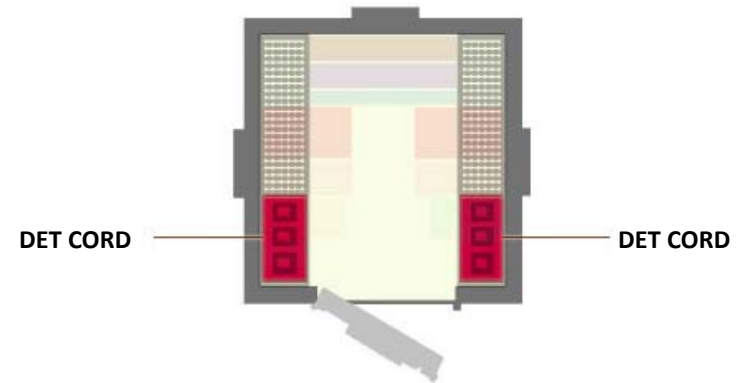
FRONTAL VIEW - INTERIOR

NOTE: Only those pumice-lined containers tested in the sympathetic detonation tests are authorized for use since testing has demonstrated they will limit the maximum credible event to 1.25 lbs C-4. All pumice-lined containers must be in good condition without cracks or other degradation. The containers may not be stacked.

EODMAG STORAGE CONFIGURATION

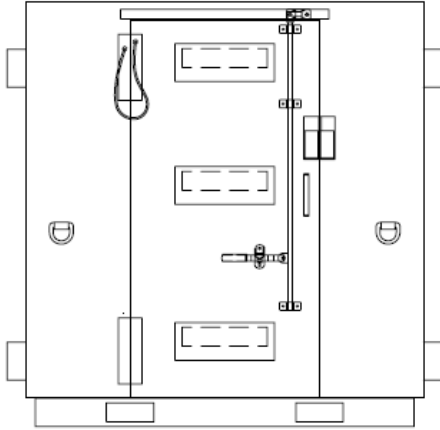


TOP DOWN VIEW - FLOOR STORAGE



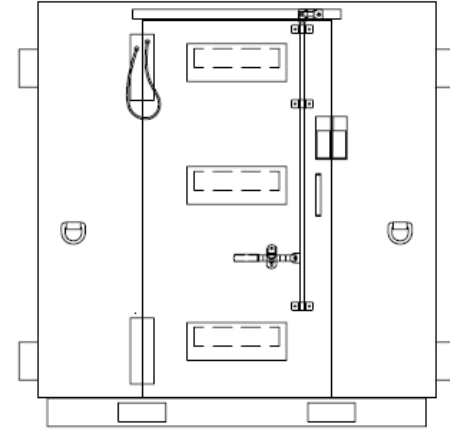
TOP DOWN VIEW - SHELF STORAGE

EODMAG STORAGE



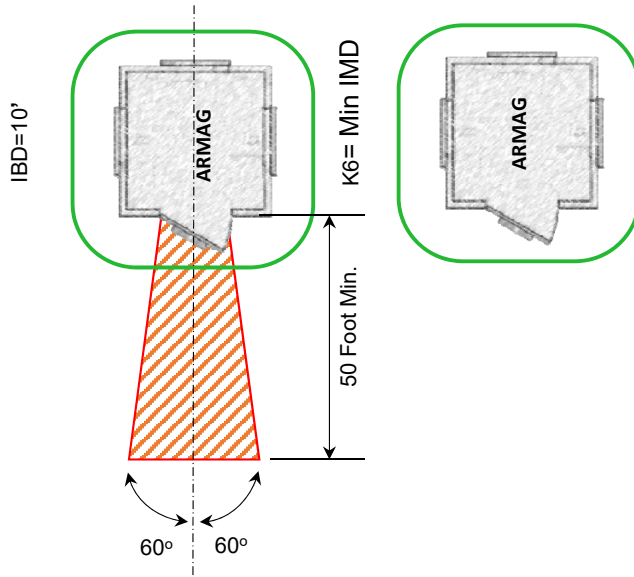
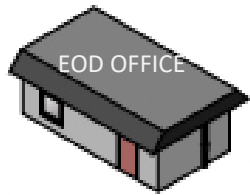
| Nomenclature | DODIC | Haz Class | Total Authorized | Total NEW |
|--------------------------------|-------|-----------|------------------|-----------------|
| Fuze Time Blasting, M700 | M670 | 1.4S | 500 | 0.35 |
| Cord, Detonating | M456 | 1.1D | 1000 | 7 |
| Ignitor Fuze Time, M60 | M766 | 1.4S | 50 | 7 |
| Charge Demo M112 | M023 | 1.1D | 60 | 75 |
| Cutter Mk 23 | ML04 | 1.1D | 6 | 1.713 |
| Cutter Mk 24 | ML05 | 1.1D | 5 | 6 |
| FLSC 125 GPF | ML14 | 1.1D | 3 | 0.2142 |
| FLSC 225 GPF | ML15 | 1.1D | 3 | 0.3855 |
| FLSC 300 GPF | ML16 | 1.1D | 5 | 0.857 |
| * FLSC 400 GPF | ML18 | 1.1D | 3 | 0.8571 |
| * FLSC 500 GPF | ML17 | 1.1D | 3 | 0.6855 |
| Grenade Smoke Red M18 | G950 | 1.4G | 8 | 5.76 |
| AN-M14 Thermite Grenade | G900 | 1.3G | 8 | 13.6 |
| Cartridge Impulse .50 Cal | M174 | 1.4C | 36 | 0.8748 |
| Cartridge .50 Cal RAUFOSS | A606 | 1.4G | 120 | 3.996 |
| Cartridge .50 Cal API M-8 | A576 | 1.4G | 100 | 1.3986 |
| Cap Blasting Electric M6 | M130 | 1.1B | 90 | 0.252 |
| * Cap Blasting Non-Electric M7 | M131 | 1.1B | 100 | 0.27 |
| Total NEW | | | | 126.2137 |

EODMAG: The maximum quantity of explosives permitted in the magazine is 128.24 lbs net explosives weight (NEW). Only the explosive items tested in the sympathetic detonation tests, and as identified by DDESB, can be placed within the magazine. The magazine is a 7 ft x 7 ft steel aboveground magazine with vents.



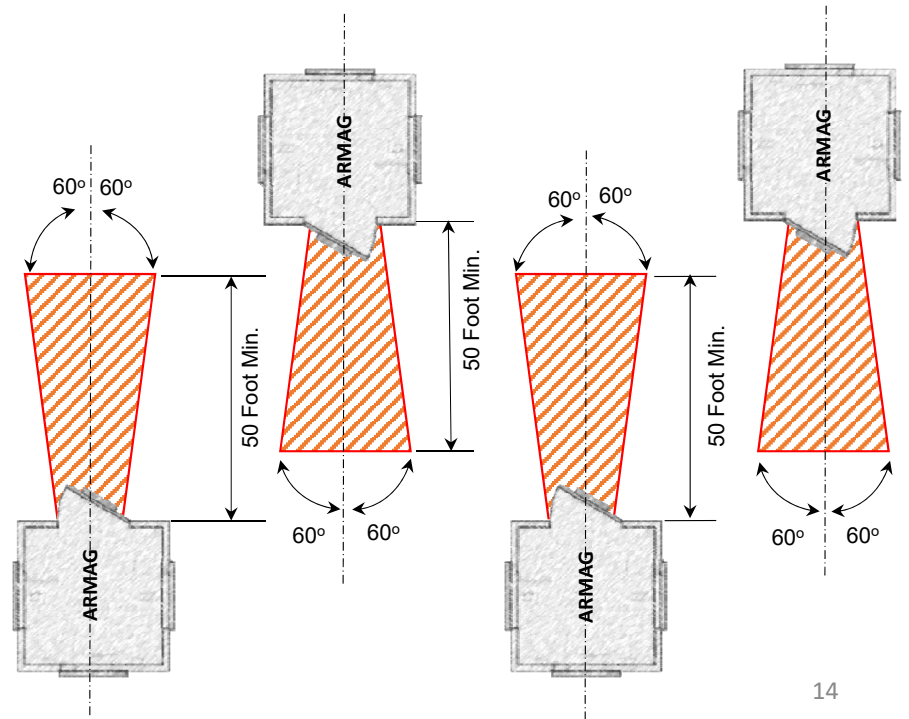
| Nomenclature | DODIC | Haz Class | Total Authorized | Total NEW |
|---------------------------|-------|-----------|------------------|-----------------|
| Fuze Time Blasting, M700 | M670 | 1.4S | 500 | 0.35 |
| Cord, Detonating | M456 | 1.1D | 1000 | 7 |
| Ignitor Fuze Time, M60 | M766 | 1.4S | 50 | 7 |
| Charge Demo M112 | M023 | 1.1D | 60 | 75 |
| Cutter Mk 23 | ML04 | 1.1D | 6 | 1.713 |
| Cutter Mk 24 | ML05 | 1.1D | 5 | 6 |
| FLSC 125 GPF | ML14 | 1.1D | 2 | 0.1428 |
| FLSC 225 GPF | ML15 | 1.1D | 2 | 0.257 |
| FLSC 300 GPF | ML16 | 1.1D | 5 | 0.857 |
| Grenade Smoke Red M18 | G950 | 1.4G | 8 | 5.76 |
| AN-M14 Thermite Grenade | G900 | 1.3G | 8 | 13.6 |
| Cartridge Impulse .50 Cal | M174 | 1.4C | 24 | 0.5832 |
| Cartridge .50 Cal RAUFOSS | A606 | 1.4G | 120 | 3.996 |
| Cartridge .50 Cal API M-8 | A576 | 1.4G | 100 | 1.3986 |
| Cap Blasting Electric M6 | M130 | 1.1B | 6 | 0.0168 |
| | | | Total NEW | 123.6744 |

EODMAG STORAGE



EODMAG POSITIONING

WARNING: Do not position EODMAGs where the doors face each other!
Do not place anything within this 50 foot protection zone



NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'



The Explosive Ordnance Disposal Ready Storage Locker (EODRSL), is a deployable explosive storage magazine that provides a minimal Quantity Distance (QD) while storing explosive items found in a typical Explosive Ordnance Disposal (EOD) deployment package. When the EODRSL is loaded with explosives, **it has a minimum QD of only 0 feet**. The system is made up of one storage magazine utilizing pumice lined containers that when loaded properly prevent sympathetic detonation. The EODRSL has a specific load configuration that must be followed in order to retain the 0 foot ESQD. This magazine incorporates additional venting which is critical to controlling the consequences of an accidental detonation involving the maximum credible event (MCE). MCE represents the worst-case, single, largest detonation event that is expected to occur in the EODRSL magazine equipped with pumice containers. *Use of any other magazine or pumice container negates the 0 foot ESQD and will require the application of a significantly larger ESQD (approximately 474 feet) as required by DOD 6055.09-M.*

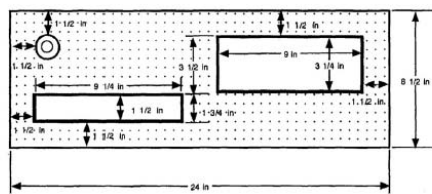
The EOD Quick Response Kit consists of metal tool boxes and pumice formed around Polyvinyl Chloride (PVC) molded inserts. The boxes are filled with pumice by the Ordnance Evaluation section of NAWCWD, China Lake. NAWCWD, China Lake is the only qualified manufacturer of the EOD Quick Response Kit. The tool boxes are 24 inches long, 10 inches high, and 8.5 inches wide. The pumice is mixed with a two-part epoxy composed of equal parts Versimid 140 hardener and Epon 815 resin formed around a PVC molded insert for each explosive item. Each EOD Quick Response Kit is labeled with the box number coinciding with a specific configuration. The eight boxes may be placed on the floor of the RSL in any order. The average gross weight of each box will be 45-50 pounds.

Refer to Army Technical Manual (TM) A-2-1-143 for further information

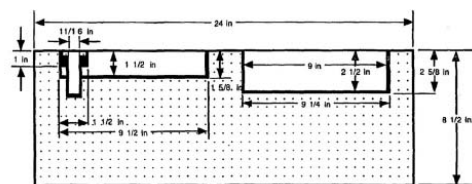
NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'

WARNING:

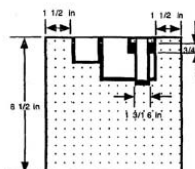
- NEVER** stack the pumice containers on top of each other. Stacking pumice containers could increase the possibility of sympathetic detonation during a catastrophic event.
- Use only pumice containers that are in good condition.** Cracked or degraded pumice could increase the possibility of sympathetic detonation during a catastrophic event.



TOP VIEW

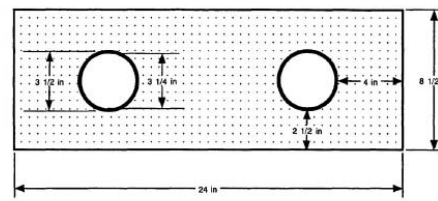


SIDE VIEW

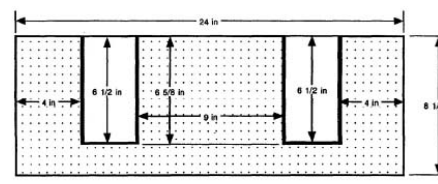


END VIEW

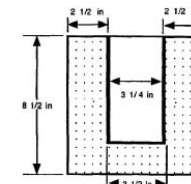
EOD QUICK RESPONSE KIT #1



TOP VIEW



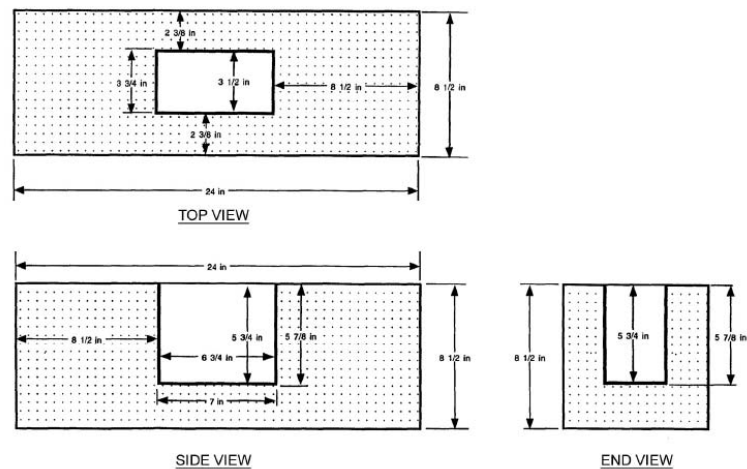
SIDE VIEW



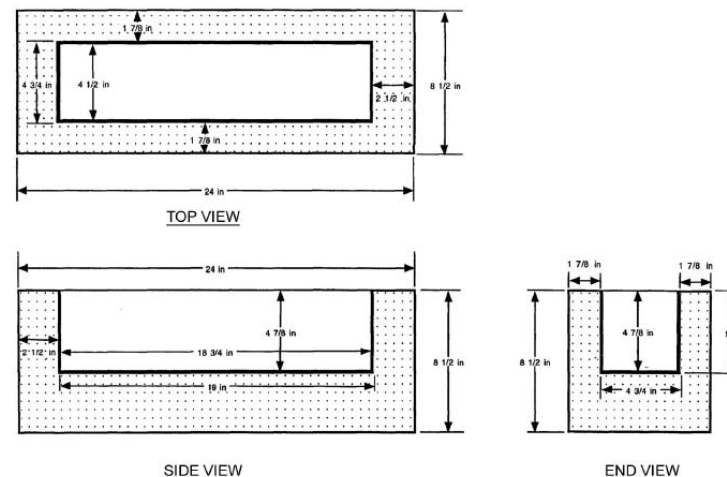
END VIEW

EOD QUICK RESPONSE KIT #2

NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'

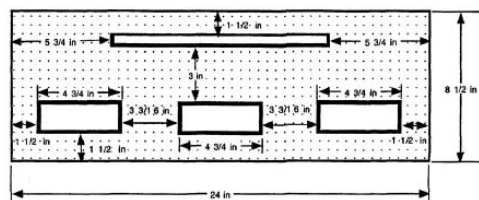


EOD QUICK RESPONSE KIT #3

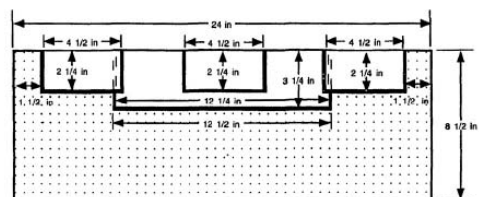


EOD QUICK RESPONSE KIT #4

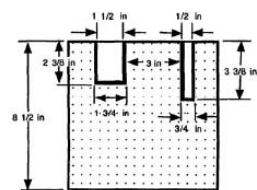
NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'



TOP VIEW

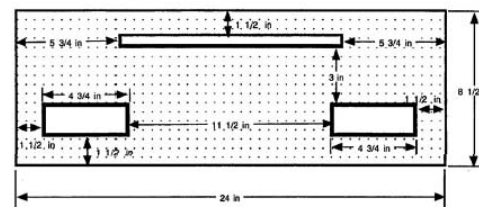


SIDE VIEW

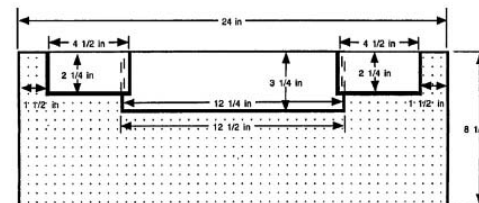


END VIEW

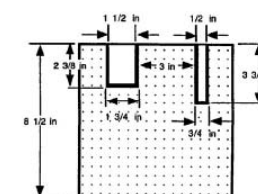
EOD QUICK RESPONSE KIT #5



TOP VIEW



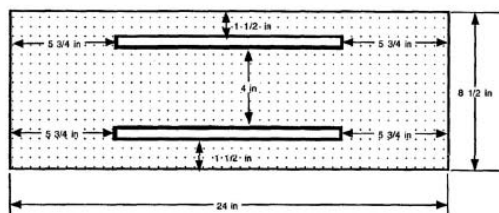
SIDE VIEW



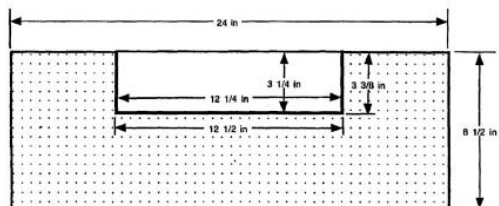
END VIEW

EOD QUICK RESPONSE KIT #6

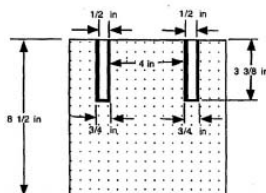
NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'



TOP VIEW

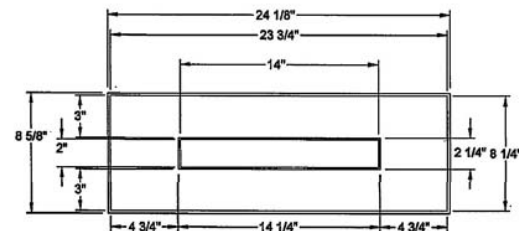


SIDE VIEW

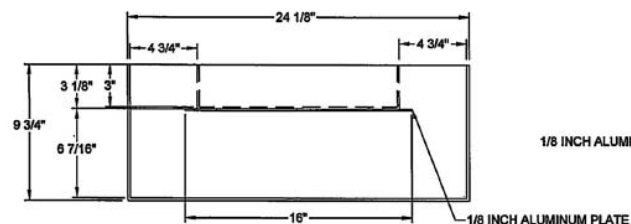


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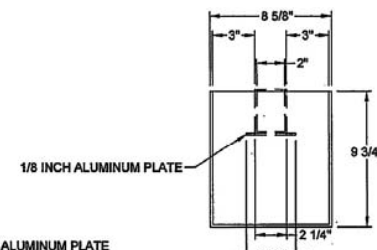
EOD QUICK RESPONSE KIT #7



TOP VIEW



SIDE VIEW



END VIEW

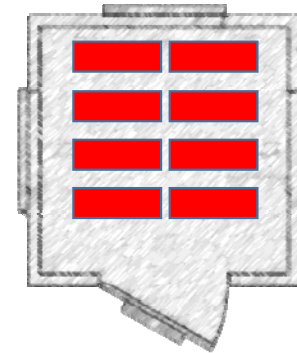
EOD QUICK RESPONSE KIT #8

NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'

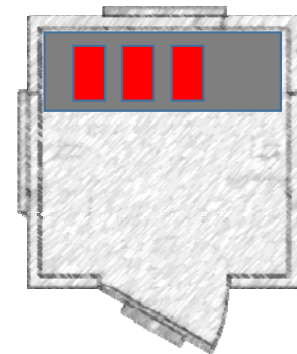


Illustration showing proper storage of EOD Response kits

Top Down View on Floor



Top Down View on Shelf



NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'

EODRSL List of Authorized Explosives

| Floor Storage | Nomenclature | DODIC | Haz Class | Total Authorized | Total N.E.W. (lbs) |
|---------------------------|--------------------------------------|-------|-----------|------------------|--------------------|
| Kit # | | | | | |
| 1 | MK 86 Rigid Linear Demolition Charge | M995 | 1.1D | 1 | 0.05362 |
| | MK 87 Rigid Linear Demolition Charge | M996 | 1.1D | 1 | 0.17875 |
| | MK 88 Rigid Linear Demolition Charge | M997 | 1.4D | 1 | 0.0022 |
| 2 | AN-M14 Thermite Grenade | G900 | 1.3G | 1 | 0.000124 |
| | Smoke Grenade (NALC TBD by User) | G930* | 1.4G | 1 * | 1.2 |
| 3 | FLSC 300 GPF | ML16 | 1.1D | 4 ft | 0.68572 |
| 4 | Cord, Detonating | M456 | 1.1D | 100 ft | 0.7 |
| 5 | Charge Demo (PETN) | M024 | 1.1D | 1 ** | 0.5 |
| | Charge Demo M112 | M023 | 1.1D | 3 *** | 1.5 |
| 6 | Charge Demo (PETN) | M024 | 1.1D | 1 ** | 0.5 |
| | Charge Demo M112 | M023 | 1.1D | 2 *** | 1 |
| 7 | Charge Demo (PETN) | M024 | 1.1D | 2 ** | 1 |
| 8 | Mineral Water Bottles | | 1.1D | 10 | 0.5 |
| Total Floor N.E.W. | | | | | 7.82 |

| Shelf Storage | Nomenclature | DODIC | Haz Class | Total Authorized | Total N.E.W. |
|---------------------------|---|-------|-----------|------------------|--------------|
| | MK 120 Detonator, NONEL | MM55 | 1.4S | 2 Spools | 0.0044 |
| | MK 123 Detonator, NONEL | MM56 | 1.4S | 2 Spools | 0.0088 |
| | MK 126 Detonator, NONEL | MM57 | 1.4S | 2 Spools | 0.0294 |
| | Cap Blasting Electric M6 | M130 | 1.1B | 10 | 0.0292 |
| | Cap Blasting Non-Electric M7 | M131 | 1.1B | 10 | 0.0268 |
| | MK 23 Initiators, NONEL, Initiator Lead | MM93 | 1.4S | 5 | 0.000025 |
| | MK 24 Initiators, NONEL, Single | MM91 | 1.4S | 5 | 0.0015 |
| | MK 25 Initiators, NONEL, Dual | MM92 | 1.4S | 5 | 0.0015 |
| | Fuze Time Blasting, M700 | M670 | 1.4S | 100 ft | 0.27 |
| | Ignitor Fuze Time, M60 | M766 | 1.4S | 10 | 0.001 |
| | .50-Caliber Cartridges | M174 | 1.4C | 10 | 0.255 |
| Total Shelf N.E.W. | | | | | 0.63 |

*Highest N.E.W. chosen for display here.

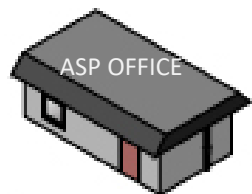
** Only one of the four sheets from the plastic wrapped package is authorized.

*** 1 1/4 lb blocks must be broken into 1/2 lb blocks.

NOTE

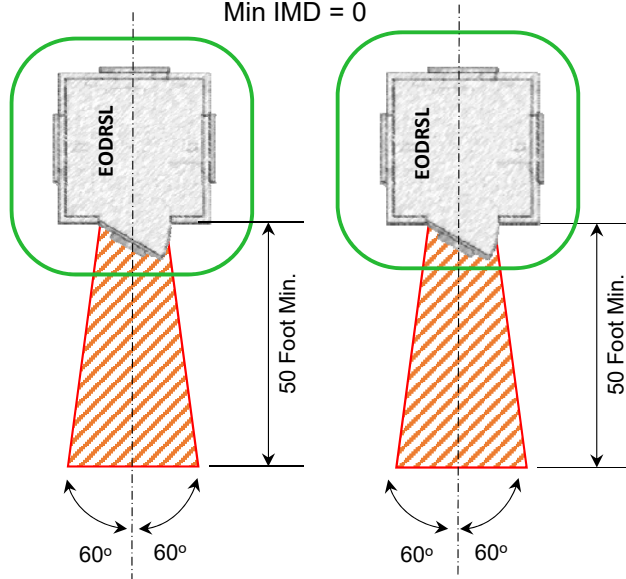
N.E.W.'s are derived from the U.S. Army Defense Ammunition Center's "Hazard Classification of United States Military Explosives and Munitions" revision 16 dated August 2014, otherwise known as the "Yellow Book". N.E.W.'s are not to be used as reference material for EOD blast/frag calculations.

NAVY EOD READY STORAGE LOCKER (EODRSL) ARMAG 5'X5'X5'



IBD= 0'

Min IMD = 0

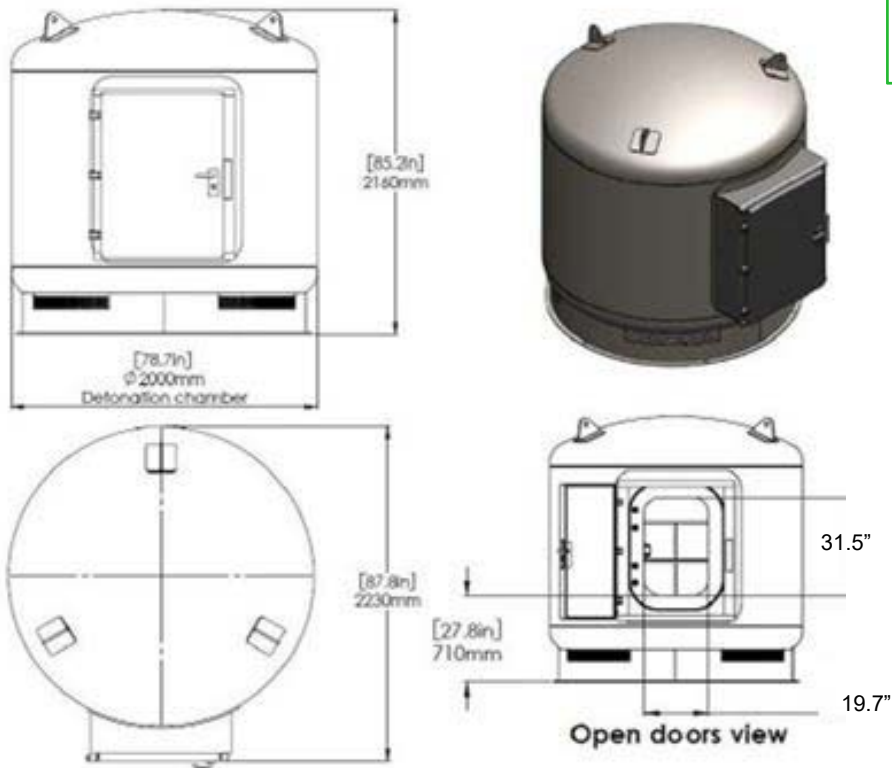


WARNING:

- It is vital to only store authorized explosives in the authorized configuration.
- Do not exceed the maximum MCE and net explosive weight (NEW) per magazine. Failure to do so will negate the DDESB approved 0 foot ESQD assigned to the magazine system.
- Do not store any unauthorized materials or explosives in the EODRSL. Use for unauthorized storage will negate the 0 foot ESQD assigned to the EODRSL.

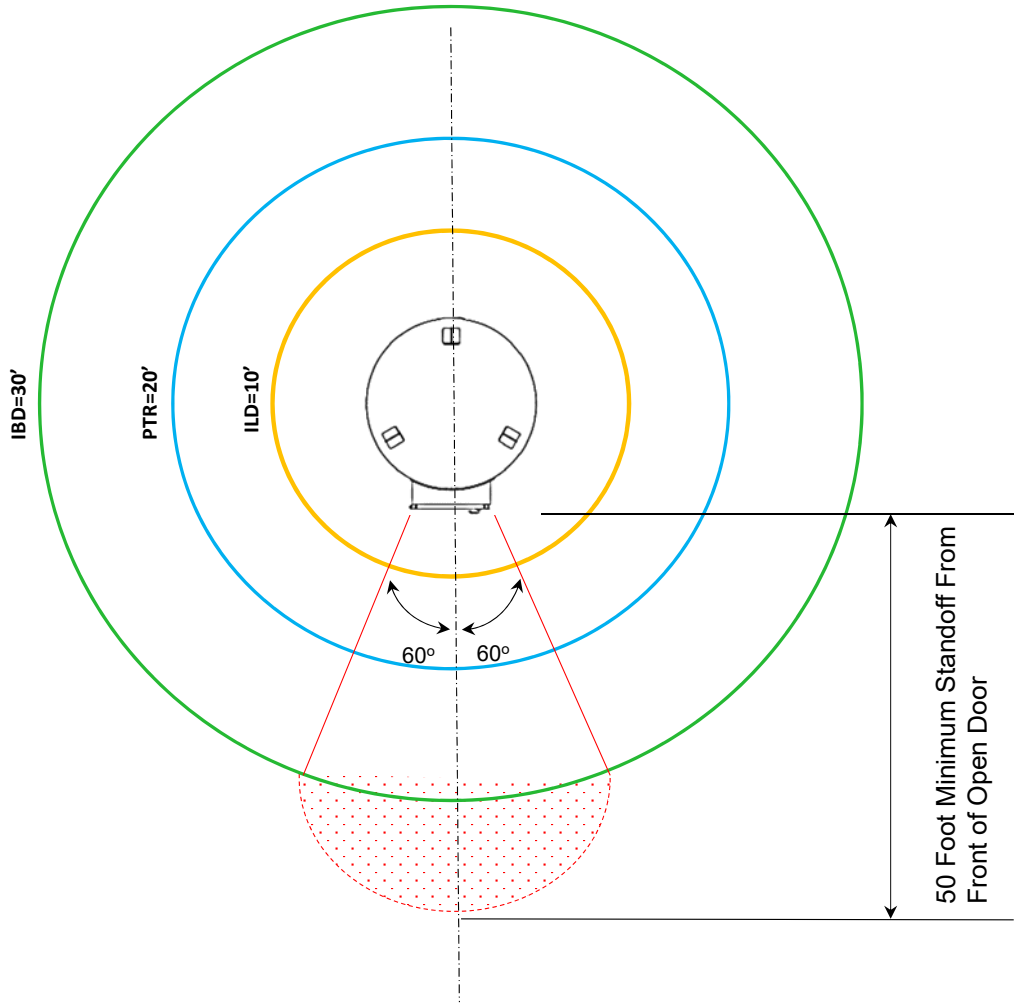
GOLAN 5 STORAGE UNIT

GOLAN 5: Refer to the DDESB approval memo for restrictions and conditions associated with the use of the GOLAN 5. Manufactured by Koors Metals Ltd of Israel. The U.S. distributor is Mistral Security, Inc. NAVFACENGCOM maintains the design drawings and specifications for this container. The GOLAN 5 Protectainer is designed to contain/limit explosion effects from an internal detonation of 5kg (11 lbs. TNT equivalent explosives). It has an internal fragment defeating liner, but it has munition diameter limitations identified on slide 25. Internal pressures are vented slowly through 2 vents in the bottom and around the door.



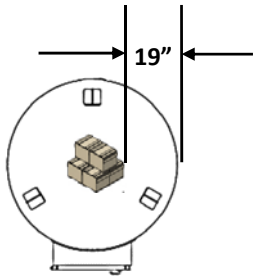
GOLAN 5 STORAGE UNIT

GOLAN 5: The reduced ESQDs are 30 feet IBD, 20 feet PTR, and 10 feet ILD.



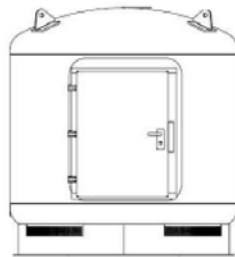
GOLAN 5 STORAGE UNIT

Storage Minimum Standoff Distance = 19-inches
AE to the wall of the protectainer



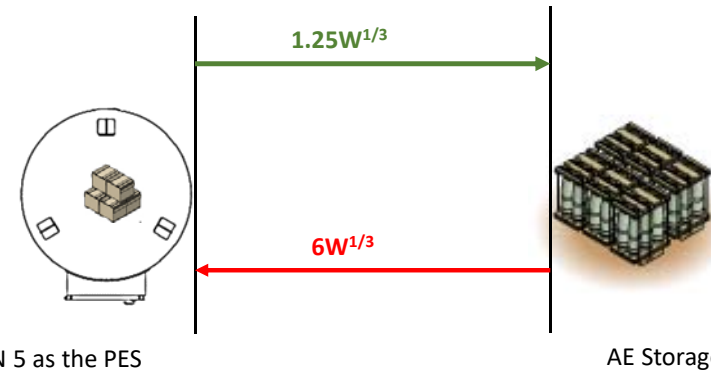
Protectainers can be used for storage of fragmenting munitions with diameters up to 1.6 inches (40mm).

NOTE: Shaped charges will not be stored in the Protectainers.



No minimum IM distance is required between protectainers

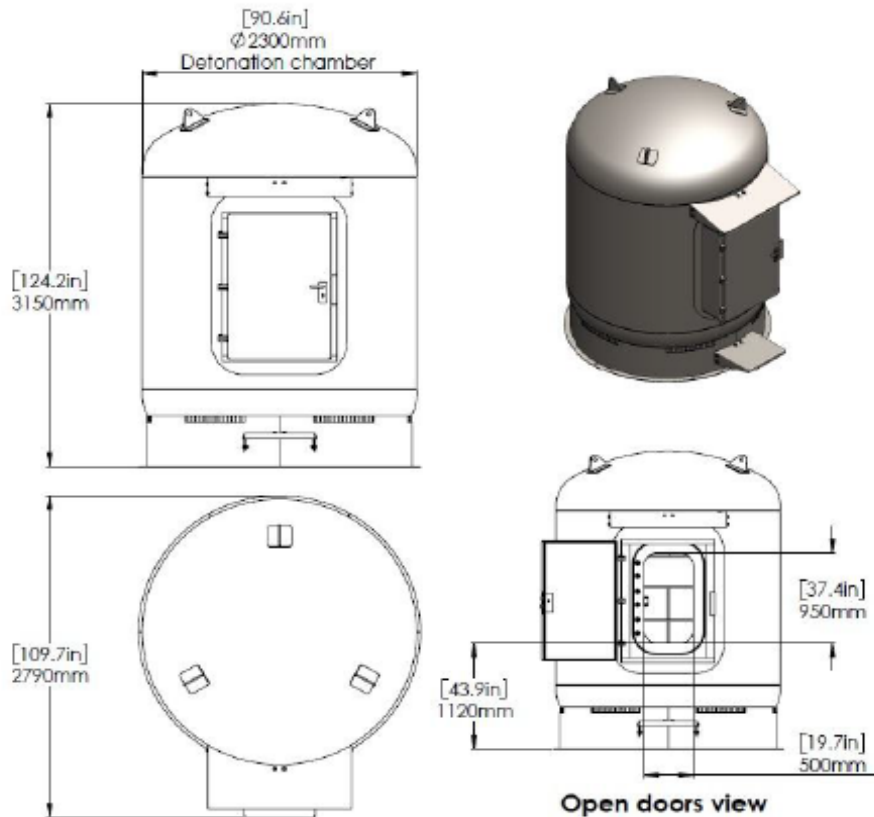
GOLAN 5: A minimum of $1.25W^{1/3}$ separation distance will be maintained from a Protectainer, acting as a potential explosion site (PES), to another explosives storage site.



GOLAN 5: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site..

DDESB mandates the unit will be grounded IAW techniques identified in NFPA 780.

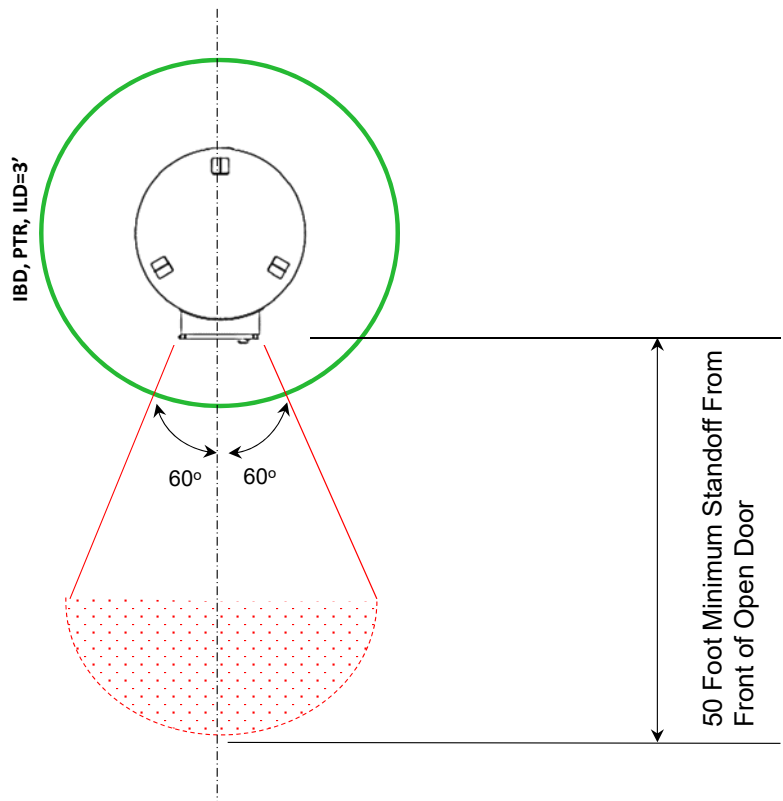
GOLAN 10 STORAGE UNIT



GOLAN 10: Refer to the DDESB approval memo for restrictions and conditions associated with the use of the GOLAN 10. Manufactured by Koors Metals Ltd of Israel. The U.S. distributor is Mistral Security, Inc. NAVFACENGCOM maintains the design drawings and specifications for this container. The GOLAN 10 Protectainer is designed to contain/limit explosion effects from an internal detonation of 10kg (22 lbs TNT equivalent explosives). It has an internal fragment defeating liner, but it has munition diameter limitations associated with it. Internal pressures are vented slowly through 2 vents in the bottom and around the door. The reduced ESQD is 3 feet for IBD, PTR, and ILD based on subsequent testing by the DDESB.

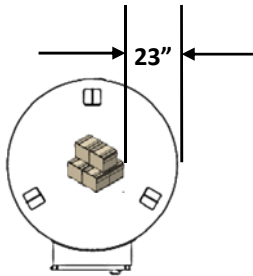
GOLAN 10 STORAGE UNIT

GOLAN 10: The reduced ESQD is 3 feet for IBD, PTR, and ILD.



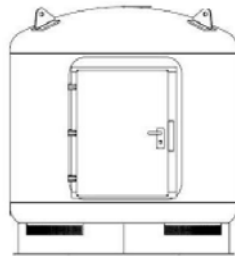
GOLAN 10 STORAGE UNIT

Storage Minimum Standoff Distance = 23-inches
AE to the wall of the protectainer



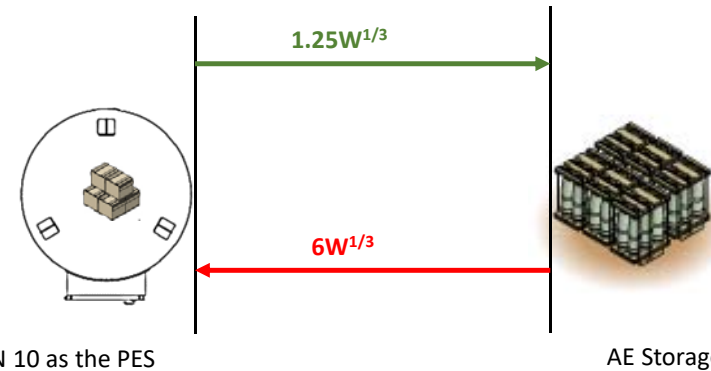
Protectainers can be used for storage of fragmenting munitions with diameters up to 1.6 inches (40mm).

NOTE: Shaped charges will not be stored in the Protectainers.



GOLAN 10: No minimum IM distance is required between protectainers

GOLAN 10: A minimum of $1.25W^{1/3}$ separation distance will be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.

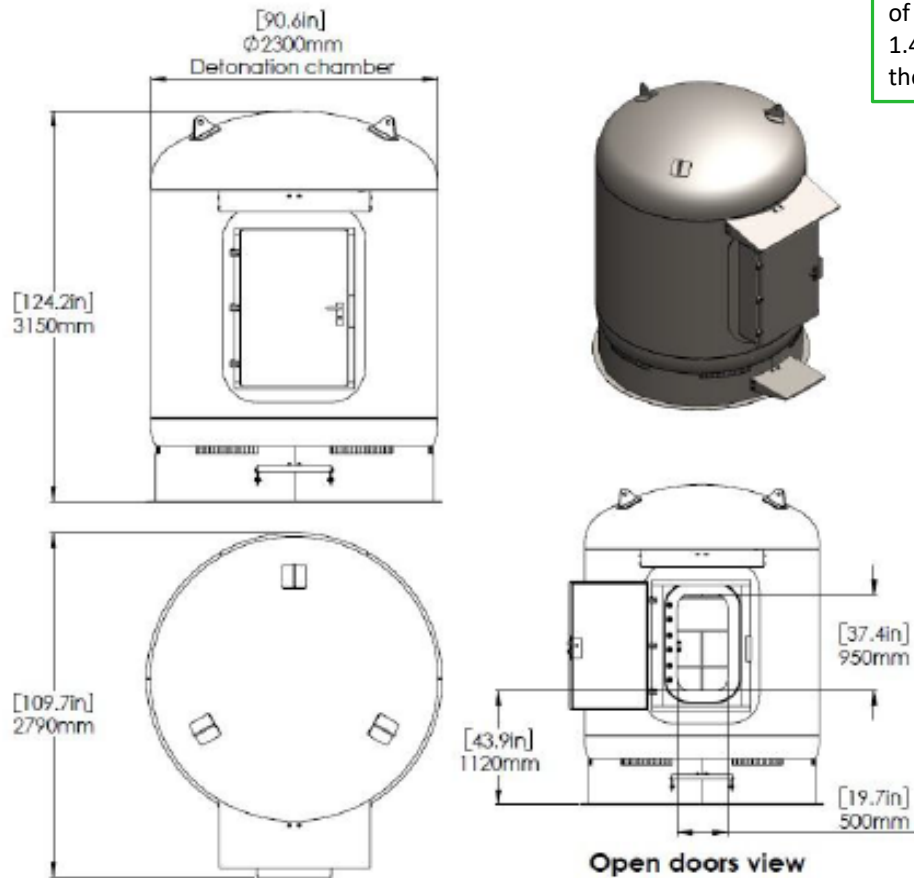


GOLAN 10: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site..

DDESB mandates the unit will be grounded IAW techniques identified in NFPA 780.

WARNING: It is uncertain how many internal explosions involving only the design charge weight of 23 lbs NEW the GOLAN 10 can safely contain without failure. Therefore, following an internal explosion, all elements of the GOLAN 15 must be inspected and the GOLAN 10 re-certified prior to reuse. The manufacturer must develop inspection and recertification guidance, and the DoD Explosives Safety Board must approve this guidance before it can be used by any activity that has experienced an internal detonation.

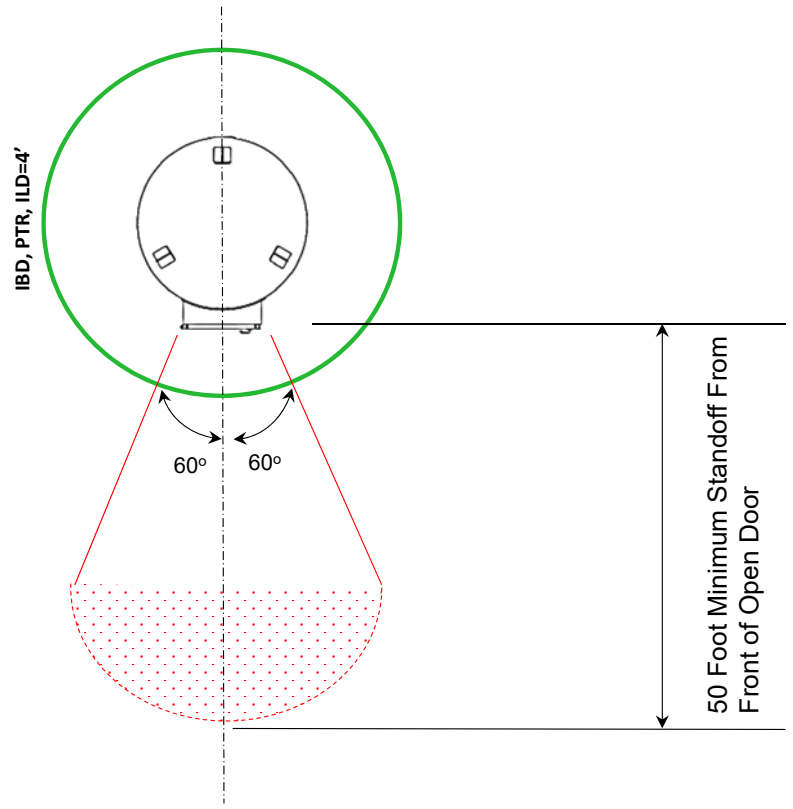
GOLAN 15 STORAGE UNIT



GOLAN 15: The GOLAN 15 explosive containment vessel offers a convenient solution for an on-site storage location of explosives and small caliber ammunition; as well as a solution to store large suspicious objects. GOLAN 15 is approved by DDESB to store explosive materials of up to 15kg. (33 lbs.) of TNT equivalent charge (HD 1.1,1.2,1.3) or 22.7 kg (50 lbs.) of HD 1.4 type. The reduced ESQD is 4 feet for IBD, PTR, and ILD based on subsequent testing by the DDESB.

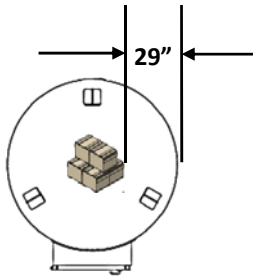
GOLAN 15 STORAGE UNIT

GOLAN 15: The reduced ESQD is 4 feet for IBD, PTR, and ILD.



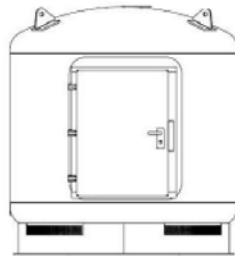
GOLAN 15 STORAGE UNIT

Storage Minimum Standoff Distance = 29-inches
AE to the wall of the protectainer



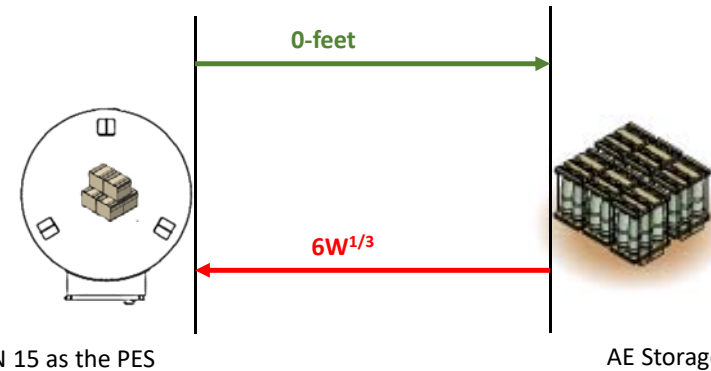
GOLAN 15 can be used for storage of fragmenting AE with diameters ≤ 1.6 inches (40mm). **NOTE:** AE items >1.6 may be stored provided only one item at a time is stored and criteria within DDESB TP-16 are complied with.

NOTE: Shaped charges will not be stored in the protectainers.



GOLAN 15: No minimum IM distance is required between protectainers

GOLAN 15: There is no minimum separation distance to be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.

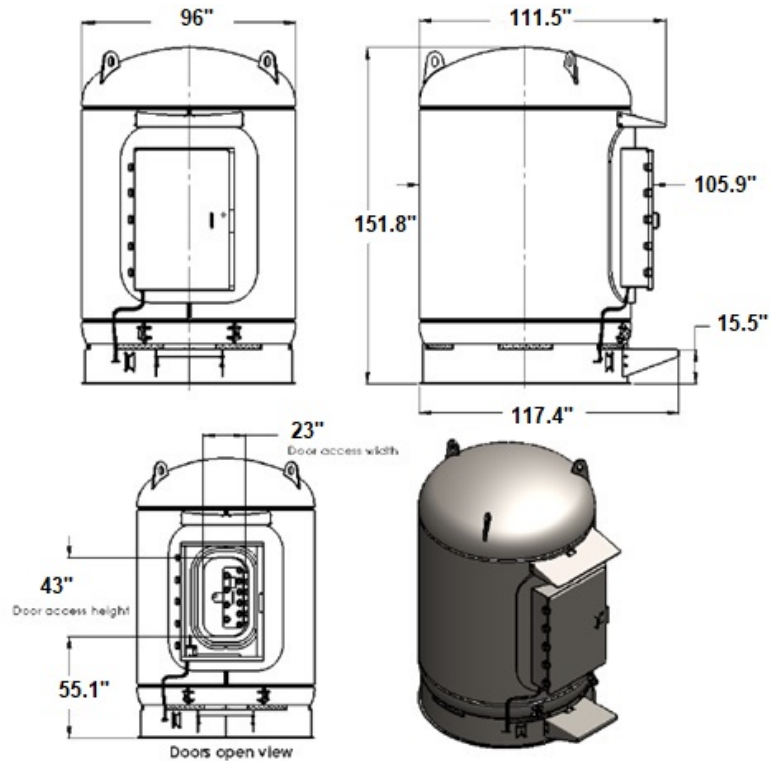


GOLAN 15: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site..

DDESB mandates the unit will be grounded IAW techniques identified in NFPA 780.

WARNING: It is uncertain how many internal explosions involving only the design charge weight of 33 lbs NEW the GOLAN 15 can safely contain without failure. Therefore, following an internal explosion, all elements of the GOLAN 15 must be inspected and the GOLAN 15 re-certified prior to reuse. The manufacturer must develop inspection and recertification guidance, and the DoD Explosives Safety Board must approve this guidance before it can be used by any activity that has experienced an internal detonation.

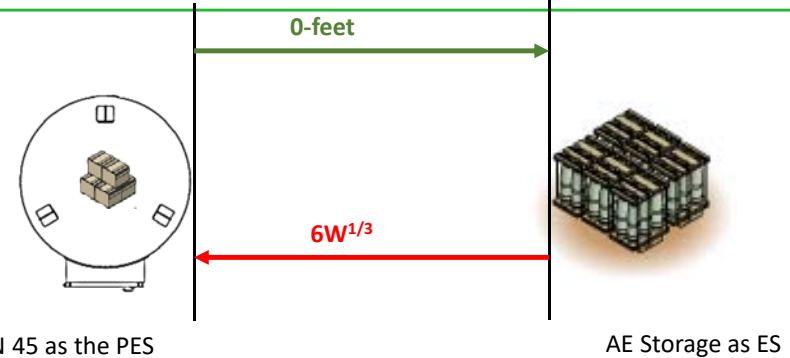
GOLAN 45 STORAGE UNIT



GOLAN 45: No minimum IM distance is required between protectainers

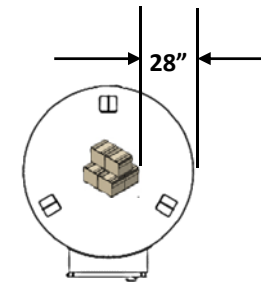
WARNING: Shaped charges will not be stored in the protectainers.

GOLAN 45: Golan 45 is authorized for use for explosives storage up to a maximum of 100 pounds (lbs.) Net Explosive Weight (NEW) of Hazard Division (HD) 1.1, 1.2 and 1.3 (total combined), and Mission Essential Quantity (MEQ) of HD 1.4 materials. There is no minimum separation distance to be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.



GOLAN 45: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site.

Storage Minimum Standoff Distance = 28-inches AE to the wall of the protectainer

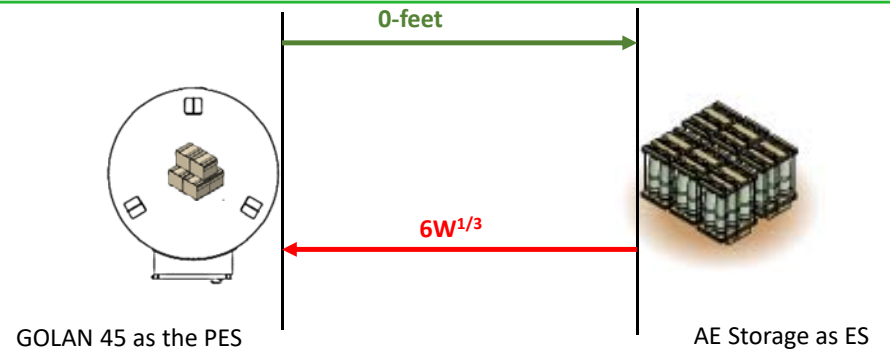


GOLAN 45 STORAGE UNIT

GOLAN 45 can be used for storage of fragmenting AE with diameters ≤ 1.6 inches (40mm). **NOTE:** AE items > 1.6 may be stored provided only one item at a time is stored and criteria within DDESB TP-16 are complied with.



GOLAN 45: Golan 45 is approved with further reduced QD when used for explosives storage not to exceed 55 lbs. NEW of HD 1.1, 1.2 and 1.3 (total combined), and MEQ of HD 1.4 materials. There is no minimum separation distance to be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.

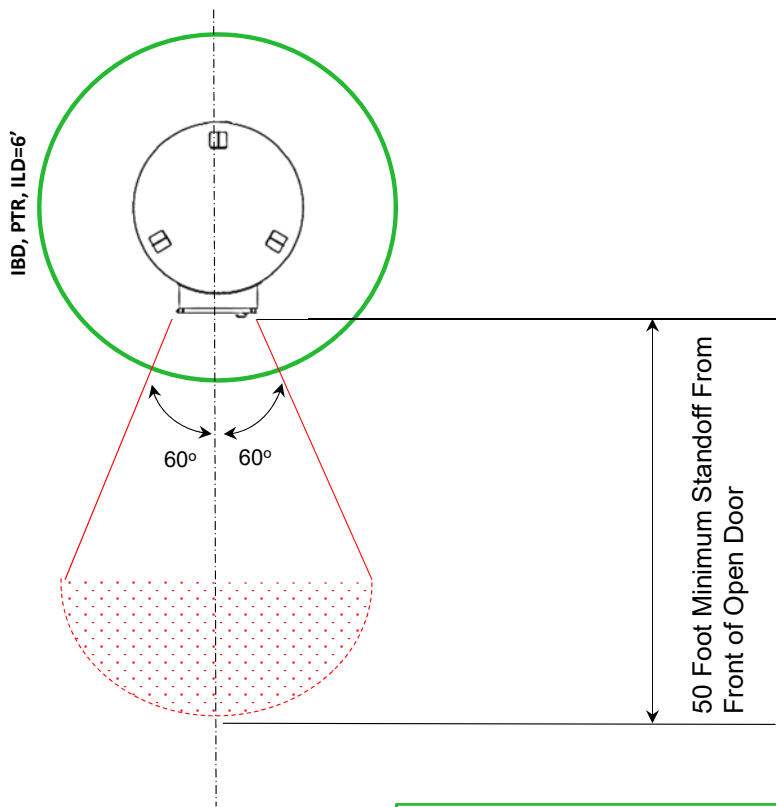


GOLAN 45: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site.

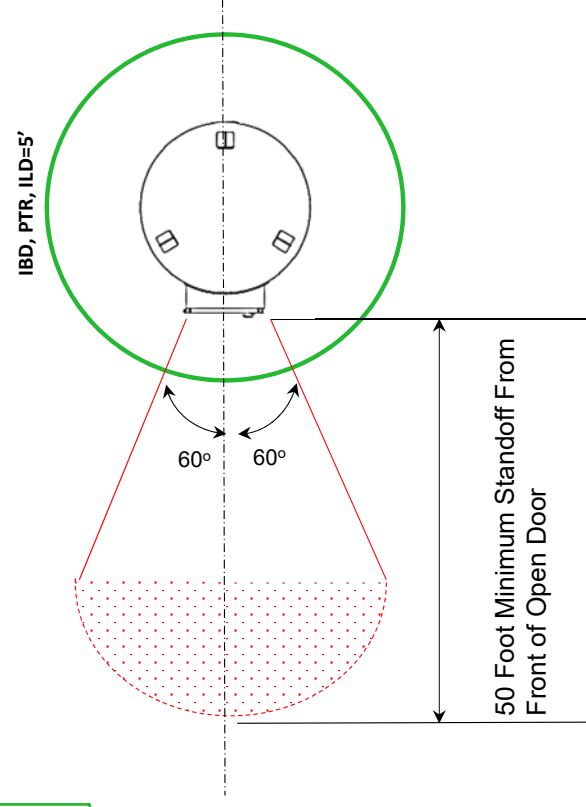
The Golan 45 shall be grounded in accordance with the DOD 6055.09-M and Single Portable Magazines section, of the NFPA 780.

GOLAN 45 STORAGE UNIT

100 pounds (Lbs.) ESQD

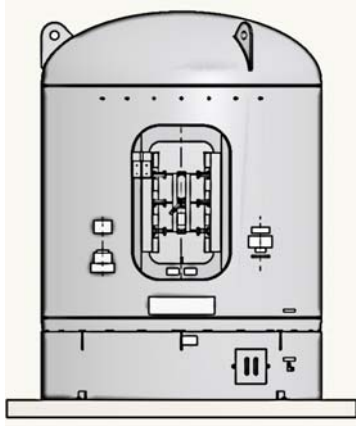


55 pounds (Lbs.) ESQD



GOLAN 45: No minimum IM distance is required between protectainers

NABCO SV-23 (Version One and Two) STORAGE UNIT

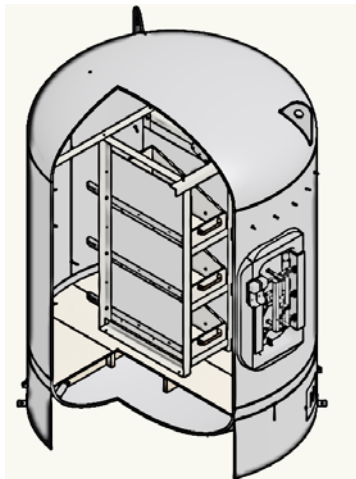


VERSION 1 - USE FOR NON-FRAGMENTING EXPLOSIVES ONLY

VERSION 2 - USE FOR NON-FRAGMENTING EXPLOSIVES AND DD ESB APPROVED FRAGMENTING MUNITIONS ONLY

NABCO SV-23 VER. 1: The SV-23, Version 1, is authorized to store a maximum of 32 pounds of TNT equivalent HD 1.1 (non-fragmenting) or HD 1.3 (non-fragmenting) or 50 pounds HD 1.4. **CAUTION:** Reuse of an SV-23 following an internal explosion in excess of 22 lbs TNT equivalent HD 1.1 is not permitted.

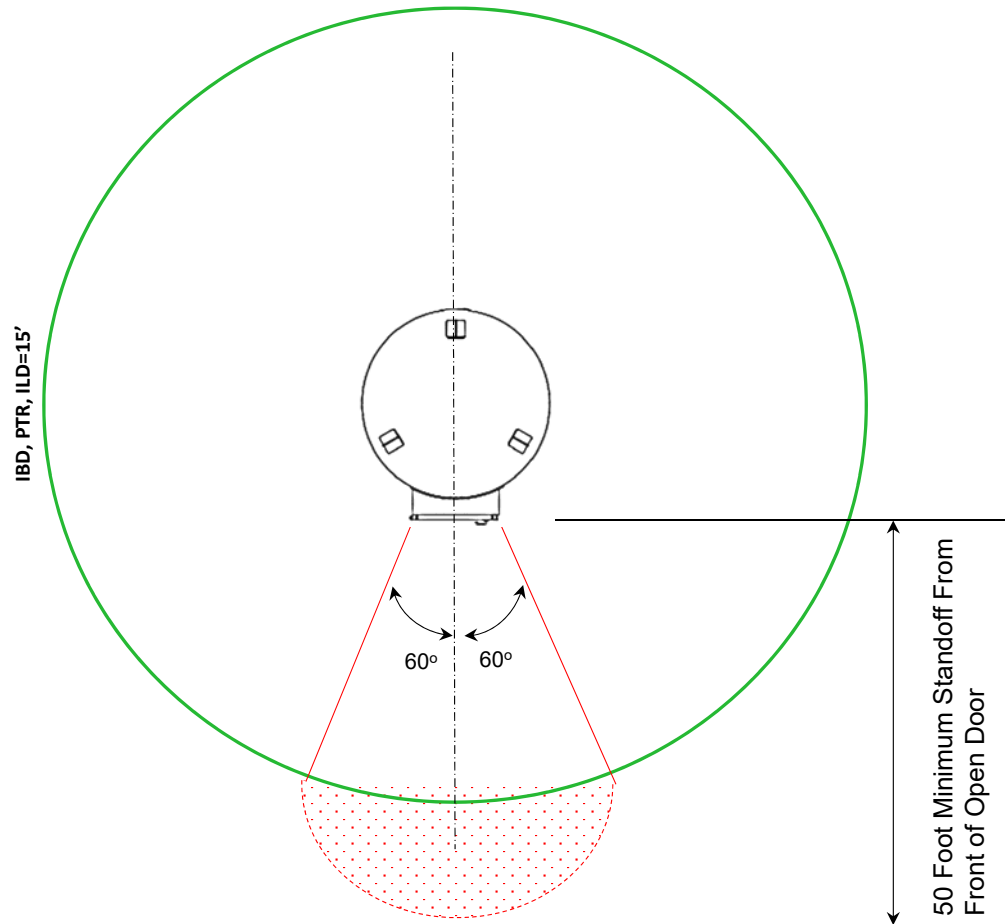
NABCO SV-23 VER. 2: The SV-23, Version 2, is authorized to store 32 pounds of TNT equivalent HD 1.1 (fragmenting or non-fragmenting), or 32 pounds of HD 1.2 (fragmenting), or 32 pounds of HD 1.3 (fragmenting or non-fragmenting), or 50 pounds of IID 1.4. *Refer to DDESB memorandum for further criteria.*



Physical Specifications for Model SV-23:

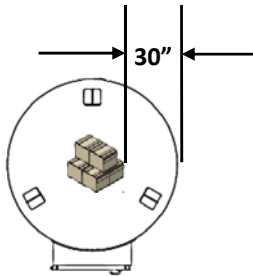
Outside Diameter: 96 inches (2.5 m)
 Door Opening: 22 x 38 inches (56 x 97 cm)
 Weight:16,000 pounds (7,272 kgs)
 Height:11 feet (3.4 m)

NABCO SV-23 (Version One and Two) STORAGE UNIT



NABCO SV-23 (Version One and Two) STORAGE UNIT

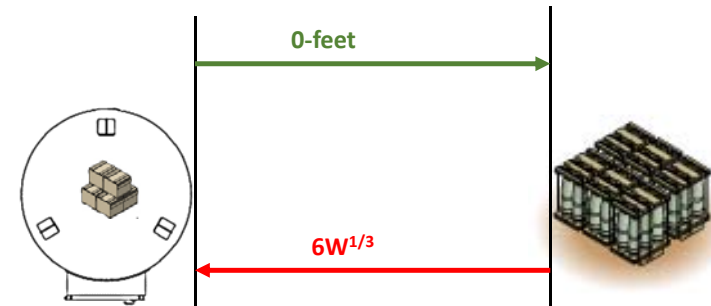
Storage Minimum Standoff Distance = 30-inches
AE to the wall of the protectainer



NABCO SV-23 can be used for storage of fragmenting AE with diameters ≤ 1.6 inches (40mm). **NOTE:** AE items >1.6 may be stored provided only one item at a time is stored and criteria within DDESB TP-16 are complied with.

NOTE: Shaped charges will not be stored in the protectainers.

NABCO SV-23: There is no minimum separation distance to be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.



NABCO SV-23 as the PES

AE Storage as ES

NABCO SV-23: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site..

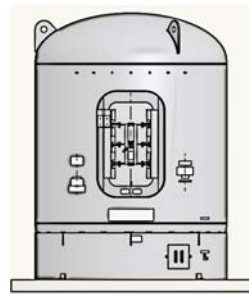
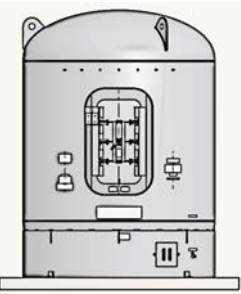
NABCO SV-23:

-shall be grounded in accordance with the DOD 6055.09-M and Single Portable Magazines section, of the NFPA 780.

WARNING:

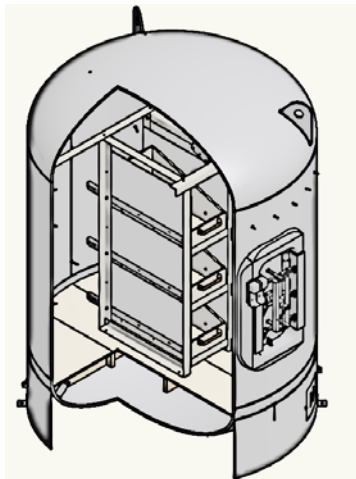
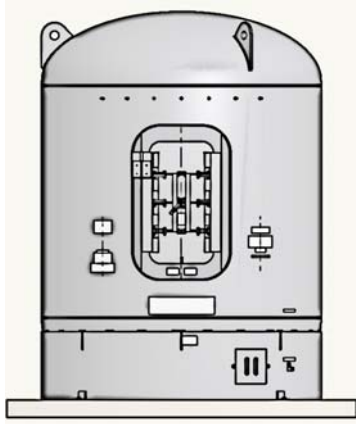
-Reuse of an SV-23, Version One requires re-certification of an SV-23 for reuse after it experiences an internal explosion involving 22 lbs TNT equivalent material or less.

-Reuse of an SV-23, Version Two following an internal explosion is not permitted.



NABCO SV-23: No minimum IM distance is required between protectainers

NABCO SV-50 STORAGE UNIT



NABCO SV-50: The SV-50 is authorized for use for explosives storage up to a maximum of 50 pounds NEW of Hazard Division (HD) 1.1 or HD 1.3 or HD 1.4. Limitations apply to the storage of primary fragment generating munitions. Refer to DDESB memorandum for further criteria.

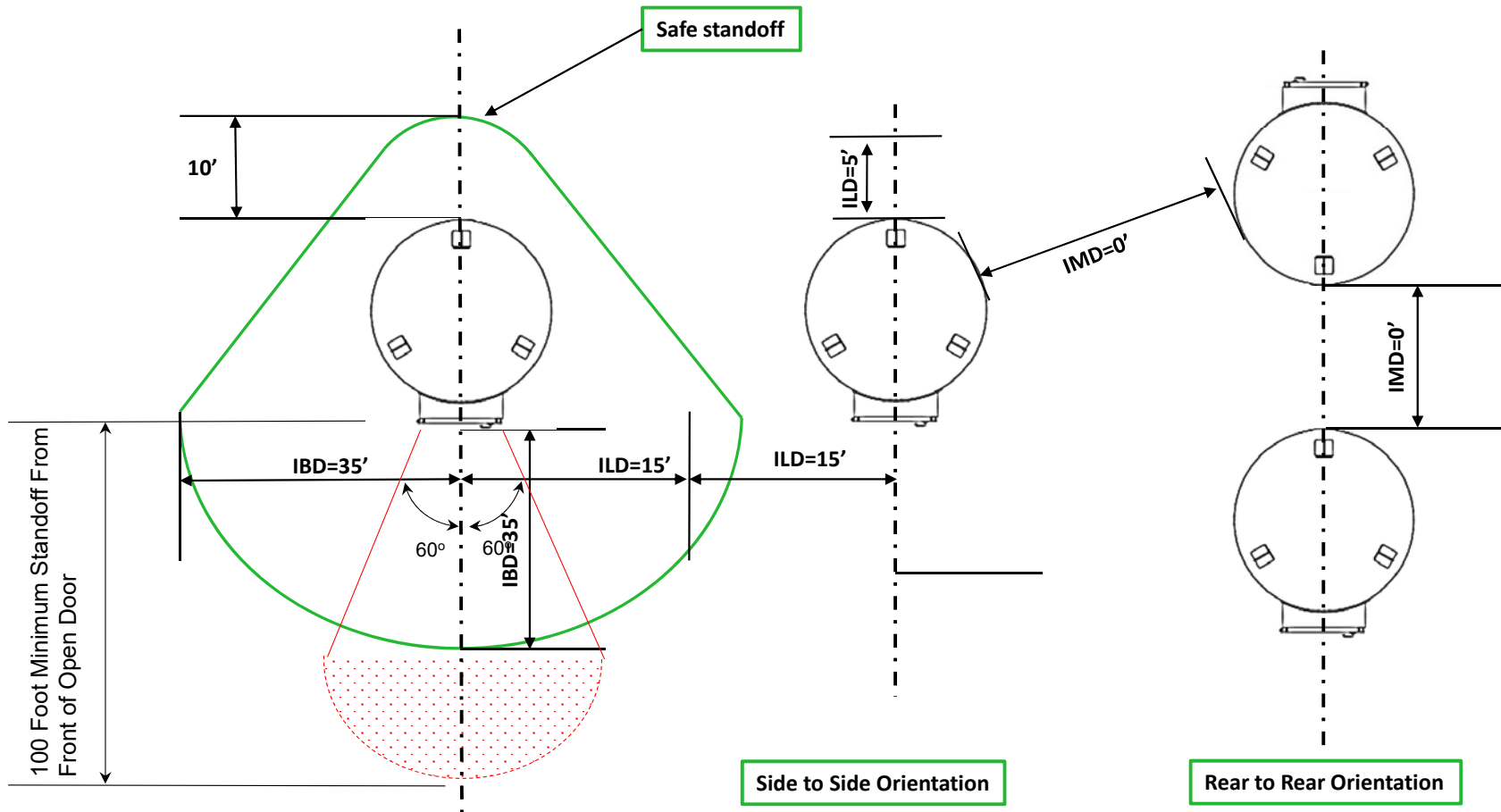


Physical Specifications for Model SV-50:

Outside Diameter: 96 inches (2.5 m)
Door Opening:22 x 42 inches (56 x 107 cm)
Weight:16,000 pounds (7,272 kgs)
Height:11 feet (3.4 m)

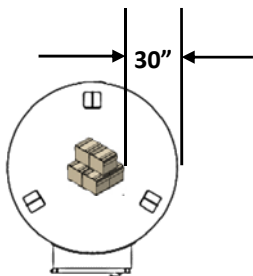
NABCO SV-50 STORAGE UNIT

NOTE: It is highly recommended that ACOMs, ASCCs and DRUs utilize greater distances to prevent encroachment.



NABCO SV-50 STORAGE UNIT

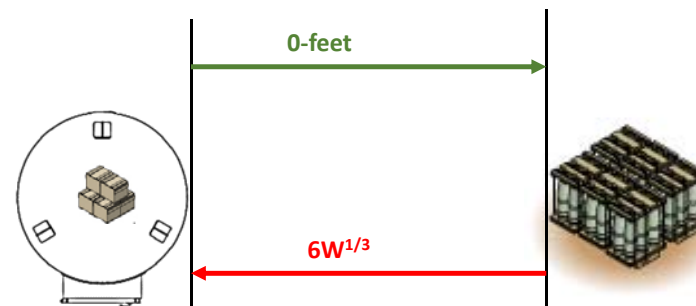
Storage Minimum Standoff Distance = 30-inches
AE to the wall of the protectainer



NABCO SV-50 can be used for storage of fragmenting AE with diameters ≤ 1.6 inches (40mm). **NOTE:** AE items >1.6 may be stored provided only one item at a time is stored and criteria within DDESB TP-16 are complied with.

NOTE: Shaped charges will not be stored in the protectainers.

NABCO SV-50: There is no minimum separation distance to be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.



NABCO SV-50 as the PES

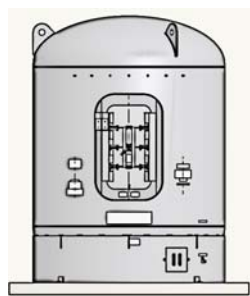
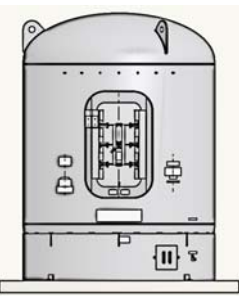
AE Storage as ES

NABCO SV-50: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site..

NABCO SV-50:

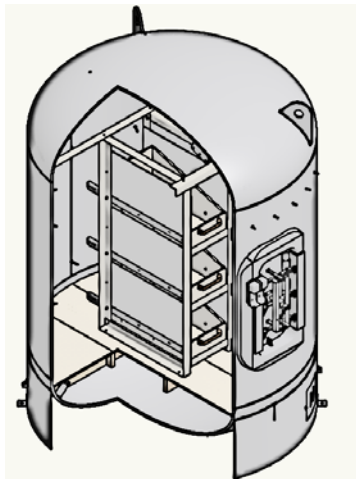
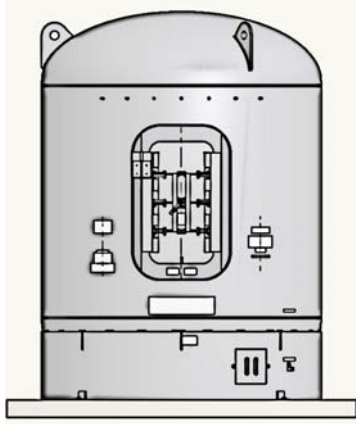
- Shall be grounded IAW NFPA 780
- Each SV-50 shall be labeled on its exterior, near the entrance, with the following markings "USE FOR NON-FRAGMENTING EXPLOSIVES AND DDESB APPROVED FRAGMENTING MUNITIONS ONLY" to clearly identify the type of ammunition and explosives that are permitted to be stored within the SV-50.

WARNING: Reuse of an SV-50 following an internal explosion is not permitted.



NABCO SV-50: No minimum IM distance is required between protectainers

NABCO SV-80 STORAGE UNIT



NABCO SV-80: Based on the testing data, the SV-50 is re-designated as the SV-80, and approval is granted for use of the SV-80 UESM for explosives storage with a reduced quantity-distance (QD). The SV-80 is authorized for use for explosives storage up to a **MAXIMUM** of 80 pounds NEW of Hazard Division (HD) 1.1 , 1.2., or HD 1.3 or mission essential quantities of HD 1.4. Limitations apply to the storage of primary fragment generating munitions. Refer to DDESB memorandum for further criteria.

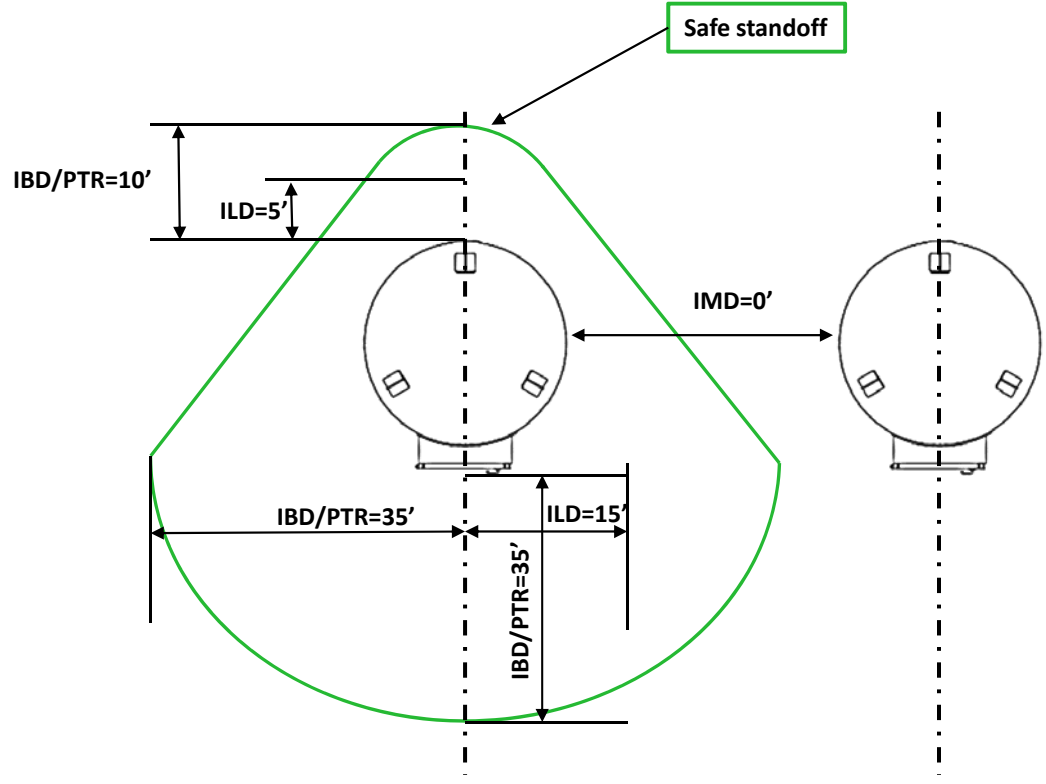


Physical Specifications for Model SV-80:

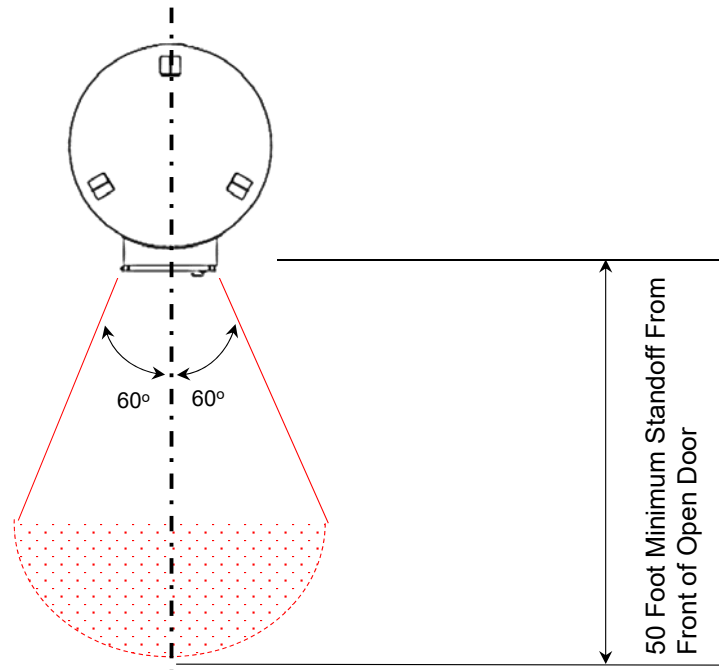
Outside Diameter: 96 inches (2.5 m)
Door Opening:22 x 42 inches (56 x 107 cm)
Weight:16,000 pounds (7,272 kgs)
Height:11 feet (3.4 m)

NABCO SV-80 STORAGE UNIT

NOTE: It is highly recommended that ACOMs, ASCCs and DRUs utilize greater distances to prevent encroachment.

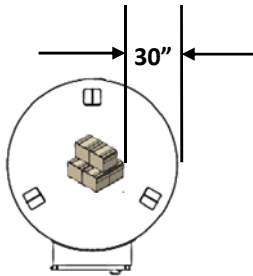


NABCO SV-80 STORAGE UNIT



NABCO SV-80 STORAGE UNIT

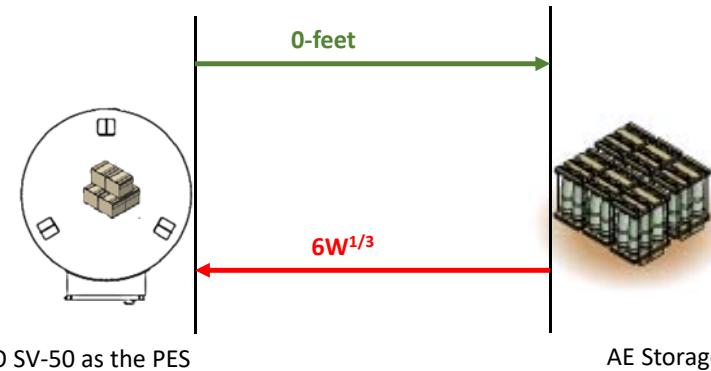
Storage Minimum Standoff Distance = 30-inches
AE to the wall of the protectainer



NABCO SV-80 can be used for storage of fragmenting AE with diameters ≤ 1.6 inches (40mm). **NOTE:** AE items >1.6 may be stored provided only one item at a time is stored and criteria within DDESB TP-16 are complied with.

NOTE: Shaped charges will not be stored in the protectainers.

NABCO SV-80: There is no minimum separation distance to be maintained from a protectainer, acting as a potential explosion site (PES), to another explosives storage site.

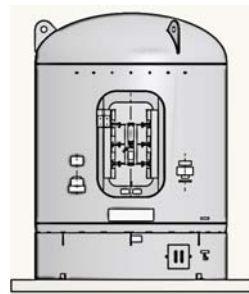
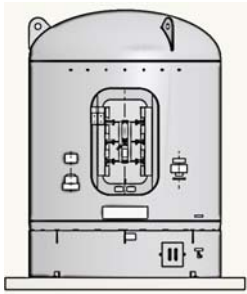


NABCO SV-80: A minimum of $6W^{1/3}$ separation distance will be maintained from any PES that does not totally contain blast hazards to a protectainer acting as an exposed site..

NABCO SV-80:

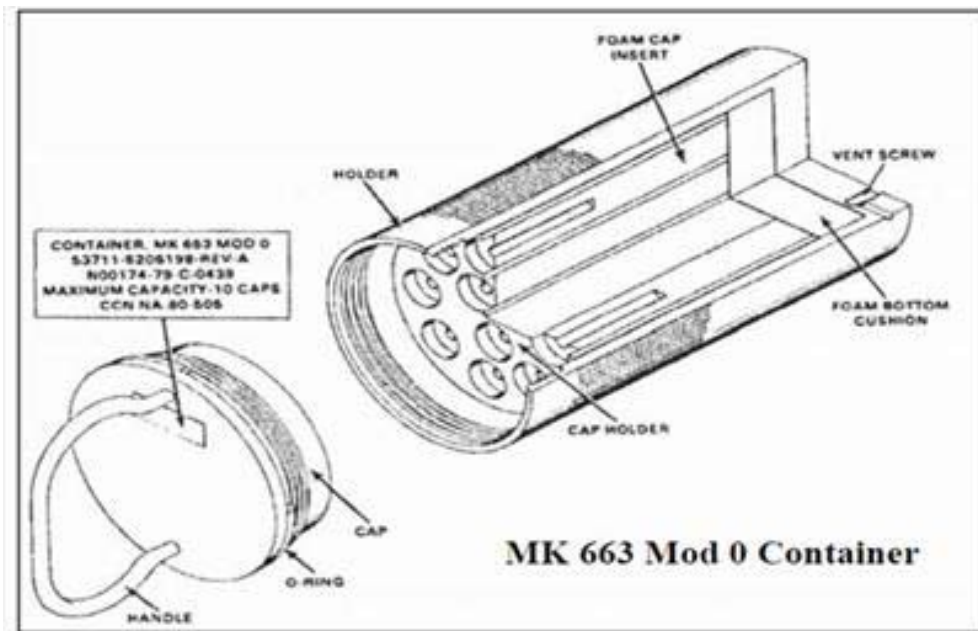
- Shall be grounded IAW NFPA 780
- Each SV-50 shall be labeled on its exterior, near the entrance, with the following markings "USE FOR NON-FRAGMENTING EXPLOSIVES AND DDESB APPROVED FRAGMENTING MUNITIONS ONLY" to clearly identify the type of ammunition and explosives that are permitted to be stored within the SV-50.

WARNING: Reuse of an SV-80 following an internal explosion is not permitted.



NABCO SV-80: No minimum IM distance is required between protectainers

MK 663 Mod 0 CONTAINER STORAGE UNIT



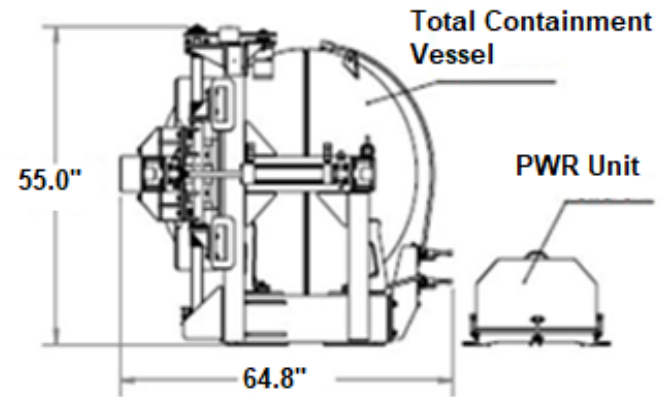
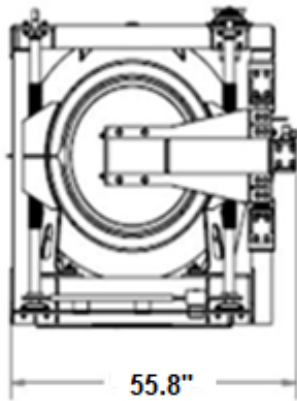
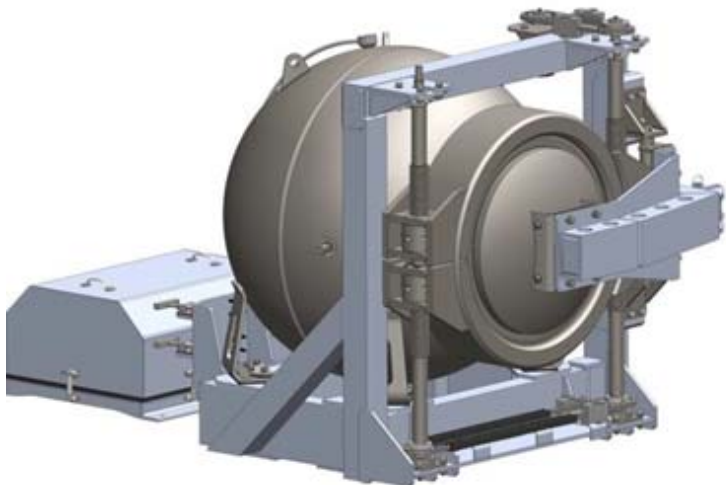
At times there is a need to store very small amounts of high explosives. Such might be the case for a laboratory that might need to store gram sized samples of the explosives in order to be able to run comparative tests on impure samples or unknown compounds. Sometimes a laboratory is in a populated dense environment and finding the default minimum separation of 200 feet would not be possible and the situation would require a DA Form 7632, Deviation Approval and Risk Acceptance Document (DARAD)...which seems excessive when considering the blast would be coming from a sample of a few grams of explosives. Explosives safety site plans have been approved where a wing of a building must be evacuated in order to conduct tests on very small explosives samples. A request from HQ, US Army Corps of Engineers (USACE) got the ball rolling on this issue. On 28 January 2011 the Department of Defense Explosives Safety Board (DDESB) approved one solution to the storage aspect of this problem.

The DDESB approved the use of the MK 663 Mod 0 blasting cap container for storage of up to 10 grams of high explosives. With the lid screwed on the MK 663 Mod 0, there is no Quantity Distance (QD) arc required for up to 10 grams of explosives. Now, provided the lid stays on, you can store very small amounts of explosives inside the lab without a QD arc. If the sample is needed for testing, then QD rules would apply to that sample(s) undergoing tests; but while the explosives are in storage, which is most of the time, use of the MK663 Mod 0 container(s) would result in a zero QD arc from the laboratory or similar facility. Plus, given the thick steel skin of the MK 663 Mod 0 container, it is immune to lightning. So, by broadening the use of an existing tool, the explosives safety community has increased safety and decreased explosives safety distance separations. It's a win/win situation.

One note of caution, the MK 663 Mod 0 was initially approved for storage and shipping of blasting caps. This DDESB expansion of the role of the MK 663 Mod 0 does not authorize its use as a shipping container for laboratory sized samples.

ARC 6 GT STORAGE and BLAST CONTAINMENT CHAMBER

VESSEL SPECIFICATIONS:
Width: 55.8 Inches
Height: 55 Inches
Length: 64.8 Inches
Weight: 3,800 lbs.



ARC 6 GT STORAGE and BLAST CONTAINMENT CHAMBER

The ARC 6 GT is intended for use by first responders (e.g., Explosive Ordnance Disposal (EOD) and bomb squad units), to provide a means to safely transport improvised explosive devices (IED) and unexploded AE, and if necessary, contain/limit explosion effects from accidental or intentional detonations involving such items. The ARC 6 GT is not intended for use as a storage unit or designed for routine destruction of AE.

CAUTION: The ARC 6 GT is intended to be utilized for conventional AE only!
Use with biological or chemical AE is not authorized!

ARC 6 GT STORAGE and BLAST CONTAINMENT CHAMBER

Minimum Safety Distances.

(1) It is strongly recommended by Mistral that whenever explosive material is placed inside the ARC 6, that it be used in the GT configuration (i.e., sealed door and closed valve) as that configuration minimizes all risk to surrounding exposures in the event of an accidental initiation of the contents.

(2) **Applicable EOD criteria/guidance applies during actual emergency response to operations associated with the use of the ARC 6 GT.** The application of appropriate safety distances to unrelated personnel and other exposures shall be determined in accordance with those criteria, taking into consideration the information provided below.

(3) When the ARC 6 is in the GT configuration, a 3 foot minimum required safety distance is recommended by Mistral to unrelated personnel from an accidental explosion inside the sealed ARC 6 GT. **A distance less than the 3-foot Mistral recommended minimum distance should never be used. That distance protects from chamber distortion and movement and other proximity effects. When the door is open or an explosive device is located outside the container,** the three-foot safety distance is no longer appropriate and on-site emergency response personnel should determine the applicable safe distance for all personnel.

(4) In the event it's not possible to place the ARC 6's valve in the GT configuration, a minimum distance of 4 feet provides the DoD-required overpressure protection to unrelated personnel from an accidental, internal detonation in the ARC 6. However, as mentioned above in subparagraph (1) above, Mistral strongly recommends that the ARC 6 always be used in the GT configuration.

(5) When the ARC 6 GT is used for training that involves explosives devices, such operations shall be conducted only at locations that have DDESB approved explosives site plans and that allow for the net explosive weight (NEW) and type of operations (e.g., charge build-up) being performed as part of the training evolution.

(6) When the ARC 6 is used in training that involves intentional, internal detonations, Mistral always recommends the use of the ARC 6 in the GT configuration as noted above in subparagraph (1) above. **For intentional detonations, DOD 6055.09-M requires K328-equivalent (0.067 psi overpressure/140 dB noise level) safe separation distance is required to all non-essential personnel from an intentional detonation.** Based on explosive testing conducted, and since blast overpressure is contained to the immediate vicinity, a distance of 25 feet will provide 140 dB noise level protection. If lesser distances are used, hearing protection is required.

(7) Public traffic route, intraline, and intermagazine distances are not applicable to the use of these containers, for their intended purposes in both operational and training scenarios.

ARC 6 GT STORAGE and BLAST CONTAINMENT CHAMBER

MANDATORY MAINTENANCE:

Required maintenance shall be conducted in accordance with the ARC 6 GT Mistral Operating Guide to ensure proper function of the ARC 6 during operations/training use.

CAUTION: AFTER ACTION'S FOLLOWING AN INTERNAL DETONATION:

Following an internal detonation, a post-detonation inspection shall be conducted and repairs made in accordance with Mistral's ARC 6 GT Operating Guide. In the event any of the maximum allowable fiducial measurements are exceeded (as described in the Mistral Operating Guide), or if an ARC 6 shell exhibits any cracking, or has any internal fragment penetrations that exceed the specified maximum depth given in the Mistral Operating Guide, that ARC 6 shall be immediately taken out of service. Close coordination will be maintained with Mistral in the event of any unexpected damage, prior to any repairs being performed, and before any unit is returned to service.

ARC 9 GT STORAGE and BLAST CONTAINMENT CHAMBER



VESSEL SPECIFICATIONS:

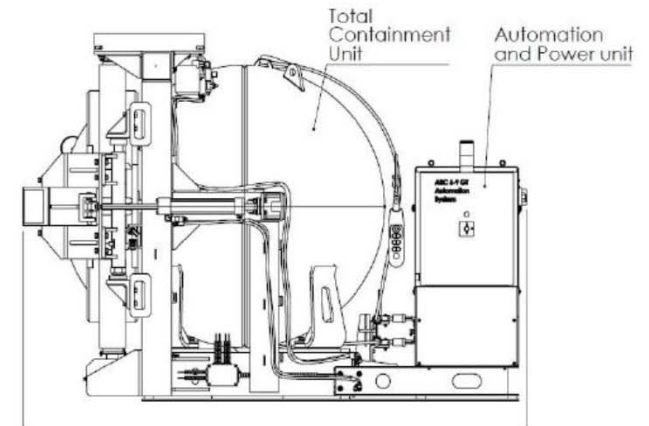
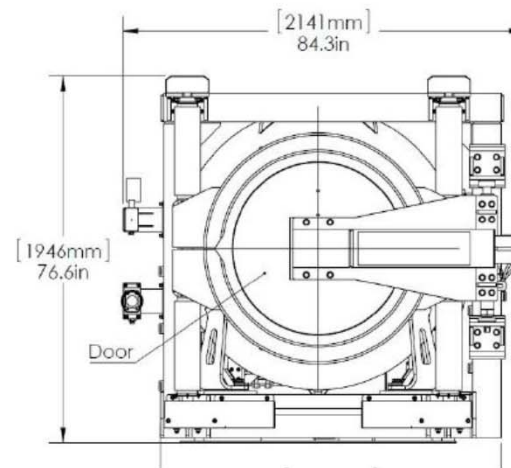
Width – 84.3 inches (214 cm)

Height – 76.6 inches (195 cm)

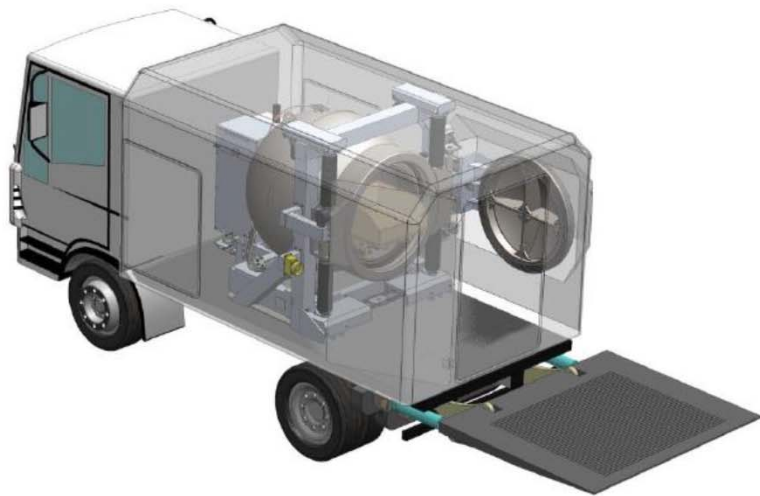
Length – 105.7 inches (269 cm)

Weight – 9,200 lb. (4,180 kg)

Front Access port diameter 35" (88.9 cm)



ARC 9 GT STORAGE and BLAST CONTAINMENT CHAMBER



Additional Configurations



ARC 9 GT STORAGE and BLAST CONTAINMENT CHAMBER

The **ARC 9 GT** is intended for use by first responders (e.g., Explosive Ordnance Disposal (EOD) and bomb squad units), to provide a means to safely transport and temporarily hold improvised explosive devices (IED) and unexploded ordnance, and if necessary, contain/limit explosion effects from accidental or intentional detonations involving such items.

CAUTION: The ARC 9 GT may not be used for AE storage or routine destruction of AE.

ARC 9 GT STORAGE and BLAST CONTAINMENT CHAMBER

-Authorized NEW: ARC 9 GT Authorized Explosives Rating: 19.8 pounds (9.00 kg) of TNT equivalent material.

-Repetitive shots: Based on the results of testing, the ARC 9 GT is approved for 5 internal detonations involving the authorized explosives rating given above in paragraph. Following each internal detonation, the inspection and repair requirements shall be followed. After 5 internal detonations, ARC 9 shall be taken out of service, inspected and repaired if necessary as detailed in SLIDE 51 before any unit is returned to service.

-Fragmenting Items:

(1) Munitions up to 40mm in diameter and other explosives devices that would produce fragmentation effects similar to 40mm (e.g., similar or less fragment velocity and mass) are permitted to be placed directly on the internal shelf within the ARC 9.

(2) Munitions or explosive items that would produce fragmentation effects more hazardous than 40mm (e.g., greater fragment velocity or mass), but not more hazardous than 81mm/2.5-inch outside diameter, Schedule 40, pipe bomb fragmentation (e.g., similar or less velocity and mass) shall be placed on the internal shelf of the ARC 9 GT and inside the Mistral-designed fragment attenuating box detailed in Mistral Security Inc., Drawing No. Fr-Bo 81 9.0001 Rev. D, Fragmentation Box, approved 9 January 2014 with the cover installed.

Such items that do not fit inside the fragment attenuating box are not permitted to be placed into the ARC 9, unless they have been assessed in accordance with DDESB TP 16, "Methodologies for Calculating Primary Fragment Characteristics to validate that fragments produced in the event of a detonation do not perforate the ARC 9's shell.

(3) Munitions or explosive items that produce fragmentation effects more hazardous than 81mm/2.5-inch OD, Schedule 40, pipe bomb (e.g., greater fragment velocity or mass) are not permitted to be placed into the ARC 9, unless they have been assessed in accordance with DDESB TP 16, "Methodologies for Calculating Primary Fragment Characteristics to validate that fragments produced in the event of a detonation do not penetrate the ARC 9's shell.

NOTE: The ARC 6 shall not be utilized for shape charges.

ARC 9 GT STORAGE and BLAST CONTAINMENT CHAMBER

-Minimum Safety Distances

(1) It is strongly recommended by Mistral that whenever explosive material is placed inside the ARC 9, that it be used in the GT configuration (i.e., sealed door and closed valves), as that configuration minimizes all risk to surrounding exposures in the event of an accidental initiation of the contents.

(2) Applicable EOD criteria/guidance applies during actual emergency response to operations associated with the use of the ARC 9 GT. The application of appropriate safety distances to unrelated personnel and other exposures shall be determined in accordance with those criteria, taking into consideration the information provided below.

(3) When the ARC 9 is in the GT configuration, a 5 foot minimum safety distance is required to protect unrelated personnel from an accidental explosion inside the sealed ARC 9 GT. When the door is open or an explosive device is located outside the container, the 5 foot safety distance is no longer appropriate and on-site emergency response personnel should determine the applicable safe distance for all personnel.

(4) In the event it is not possible to close the vents of the ARC 9, but the door is sealed, a minimum distance of 10 feet (ft.) provides the DOD-required overpressure protection to unrelated personnel from an accidental, internal detonation in the ARC 9. However, as mentioned in subparagraph (1) above, Mistral strongly recommends that the ARC 9 always be used in the GT configuration.

(5) When the ARC 9 GT is used for training that involves explosives devices, such operations shall be conducted only at locations that have DDESB approved explosives site plans or are approved in accordance with service-level range safety program, and that allow for the net explosive weight (NEW) and type of operations (e.g., charge build-up) being performed as part of the training evolution.

(6) When the ARC 9 is used in training that involves intentional, internal detonations, Mistral always recommends the use of the ARC 9 in the GT configuration as noted in subparagraph (1) above. **For intentional detonations, DOD 6055.09-M requires K328- equivalent safe separation distance to all non-essential personnel from an intentional detonation. Based on explosive testing conducted, and since blast overpressure corresponding to K328 is contained to the immediate vicinity of ARC 9, a distance of 25 ft. will provide 140 dB noise level protection.** If lesser distances are used, hearing protection is required.

(7) Public traffic route, intraline, and intermagazine distances are not applicable to the use of these containers, for their intended purposes in both operational and training scenarios.

ARC 9 GT STORAGE and BLAST CONTAINMENT CHAMBER

ARC 9 GT Maintenance Requirements

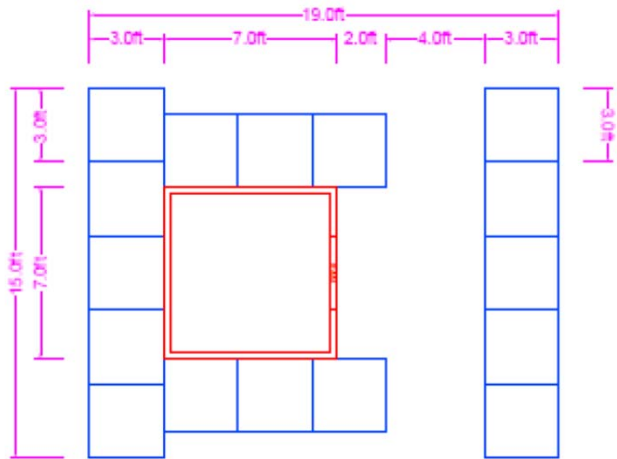
Following an internal detonation, a post-detonation inspection shall be conducted and repairs made in accordance with Mistral's ARC 9 GT Operating Guide in. After 5 internal detonations or in the event that any of the maximum allowable fiducial measurements are exceeded (as described in the Mistral Operating Guide), or if an ARC 9 shell exhibits any cracking, or has any internal fragment penetrations that exceed the specified maximum depth given in the Mistral Operating Guide, the ARC 9 shall be immediately taken out of service. Close coordination will be maintained with Mistral in the event of any unexpected damage, prior to any repairs being performed, and before any unit is returned to service.

HESCO BARRICADED ARMAG, 7'X7'X7'

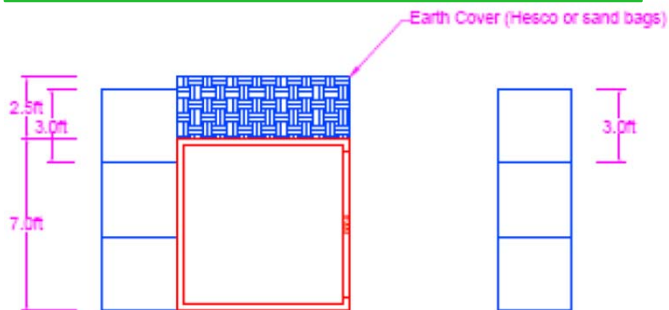
The HESCO barricaded ARMAG has been approved by DDESB for two configurations outlined in the upcoming slides.



HESCO BARRICADED ARMAG, 7'X7'X7'



Configuration (1) Top Down View

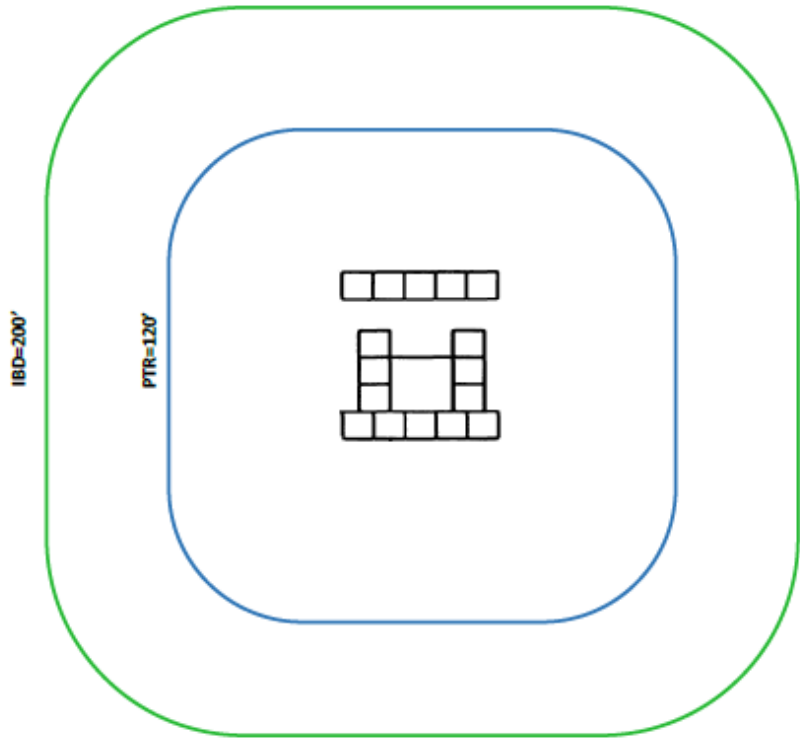


Configuration (1) Side Cut Away View

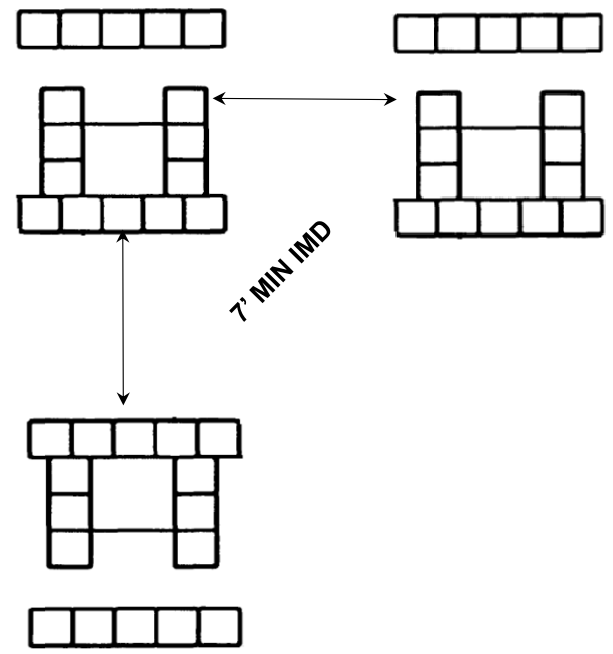
Configuration (1): is a 7 feet (ft) x 7 ft x 7 ft ARMAG Inc. Type 2 explosive storage magazine. The barricade is an Expeditionary Barrier System (EBS) as described in MIL-DTL- 32488, Detail Specification, Expeditionary Barrier System (EBS) with four walls made of 42 inch thick (Type 1) cells, and a roof made of 24 inch (Type 2) cells placed over fiberglass decking and supported by Type 1 cell walls.



HESCO BARRICADED ARMAG, 7'X7'X7'

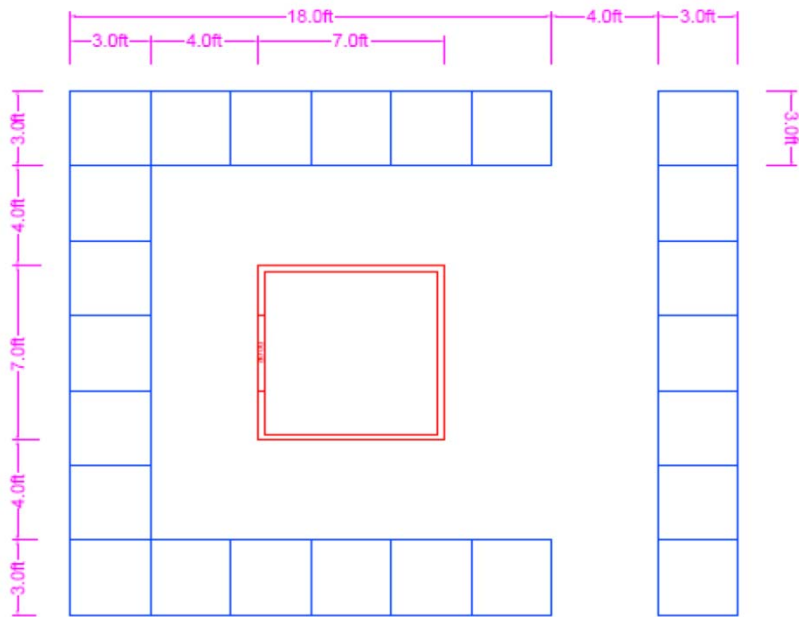


Each storage magazine shall be grounded in accordance with DoD 6055.09-M, DoD Ammunition and Explosives Safety Standards and the techniques defined within NFPA 780.



HESCO BARRICADED ARMAG, 7'X7'X7'

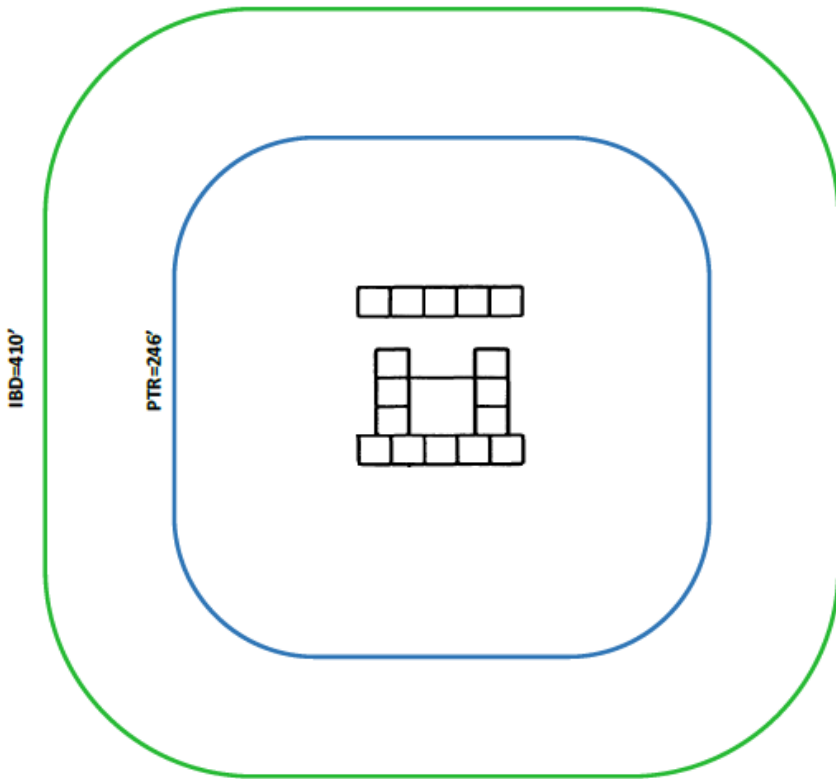
Configuration (2): is a 7 ft. x 7 ft. x 7 ft. ARMAG Inc. Type 2 explosive storage magazine. The barricade is made up of four EBS walls with 42 inch thick (Type 1) cells as described in MIL-DTL-32488, Detail Specification, Expeditionary Barrier System (EBS).



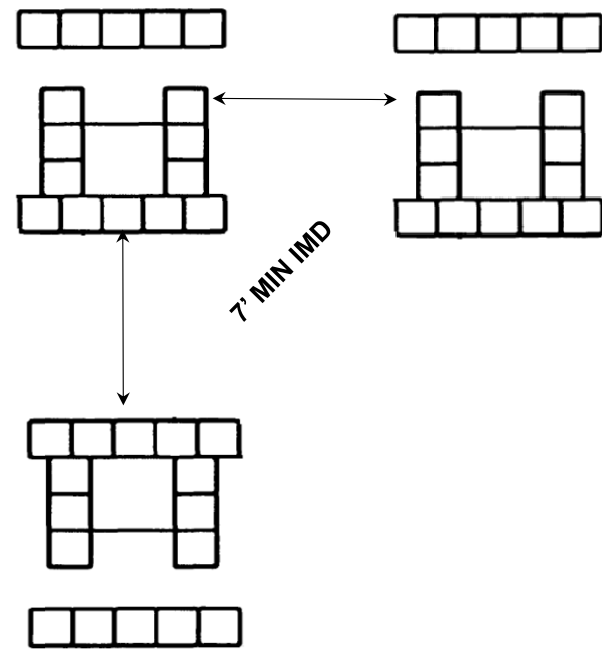
Configuration (2) Top Down View



HESCO BARRICADED ARMAG, 7'X7'X7'



Each storage magazine shall be grounded in accordance with DoD 6055.09-M, DoD Ammunition and Explosives Safety Standards and the techniques defined within NFPA 780.



Configuration (2)

REDUCED ESQD STORAGE UNITS

GENERAL NOTES:

Requested changes shall be routed through USATCES for concurrence prior to substitution, removal from authorized site, addition, or modification of any storage medium.

- a. Only approved magazine designs (per the approved drawings) shall be used.
- b. Only approved pumice container designs (per the approved drawings) shall be used.
- c. Only approved load-out configurations are permitted.
- d. Approved total NEW and MCE shall not be exceeded.
- e. No explosive items shall be introduced that is more sensitive to initiation by propagation than items currently approved.
- f. No stacking of containers (to include on shelves) is permitted.
- g. No combustible packaging (with the exception of packaging associated with items stored in the closed metal containers on the installed shelves) is permitted inside the magazines.
- h. Magazine vents shall not be blocked/restricted.
- i. All HD 1.4 explosives, except what is authorized to be placed in the toolkits, shall be stored in closed metal containers placed on the installed shelves.
- j. No boxes shall overhang the installed shelves.
- k. Pathways shall be maintained to give personnel access to all pumice containers and to items on shelves.
- l. All HD 1.1 explosive items shall be located in pumice containers on the floor.