Overview of Worldwide Demilitarization Activities Using Dynasafe Detonation Chambers

Harley Heaton - UXB International Inc

Thomas Stock – Dynasafe

Holger Weigel - Dynasafe

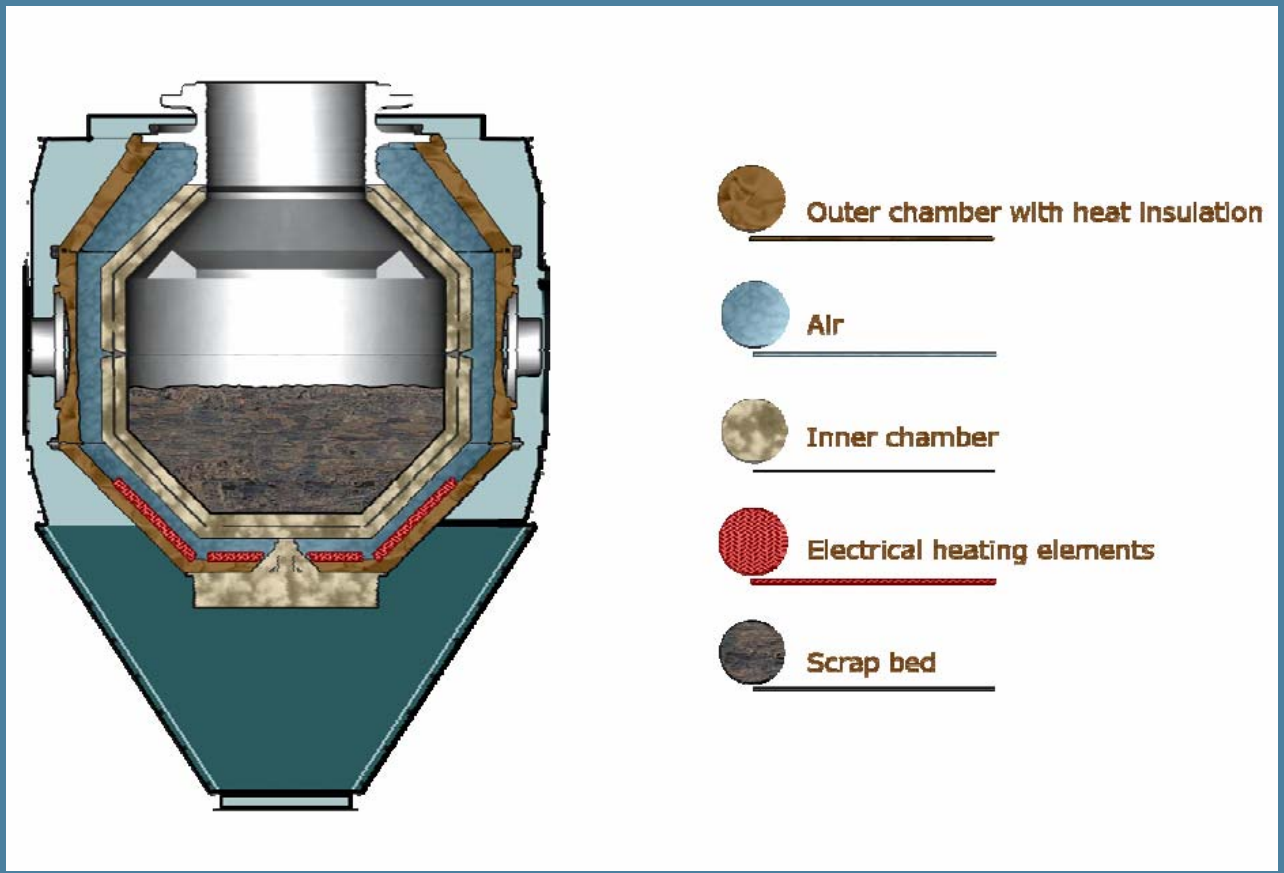
Introduction

- Dynasafe manufactures two distinct types of Detonation Chambers
  - SDC (Static Detonation Chambers) series (hot)
  - cold and transport/storage chambers
- All are completely sealed, gas tight
- Various capacities
- Used for both conventional and chemical munitions
  - also used for airbags, mfg waste, etc.

SDC Series

- Heated System
  - Temperature held above auto-initiation temperature of all known explosives and propellants
  - Insures *COMPLETE* destruction
    - in one step
    - Without dismantling
  - No counter charges required

Cutaway of SDC series Construction



The SDC Series is Efficient

- Energy from explosives or propellants being processed supplies energy needed to maintain temperature
  - R3 credits
- No external fuel needed
  - indirect heating
  - minimizes resulting gasses needing treatment
  - lower capital and operating costs

The SDC Series is Safe

- *Absolute Minimum munitions handling*
  - *automated feed system*
    - *interlocked*
    - *fail safe*
- *Most munitions need NO preparation*
  - *NO Cutting*
  - *NO Opening*
  - *NO Fuze removal*
- *Submunitions can be fed while still in racks*

The SDC Series is Safe

- Double walled main chamber
  - 300% safety margin
- Feed chambers made to take full rated detonation
- Interlocked feed chambers (2)
  - System is never open to outside during operation

The SDC Series is Clean

- Gas treatment system meets emissions requirements – Domestic and International
- Treatment of “exotic” chemical fills possible
- Metal scrap ready for recycle without additional processing

The SDC Series is Quiet

- No Upset Neighbors
  - cannot be heard outside of building
- Minimal footprint
  - well suited for space limited facilities
  - easy to set-up
  - minimal maintenance

High production rates

Sl. No.	DESCRIPTION OF REJECTED AMMUNITION/ EXPLOSIVE	ACTUAL QUANTITY DESTROYED	DEMIL PROCESS	ACTUAL SHIFTS REQUIRED	CALCULATED PLANT CAPACITY UNITS /SHIFT (10-HOUR SHIFT)
1	Cap Precussion	74,175	DIRECT FEED	0.1	741750
2	Booster Cup	26,900	DIRECT FEED	2.7	9963
3	Detonator	16,415	DIRECT FEED	2.1	7817
4	Cartg. 20mm HE	54,496	DIRECT FEED	7	7785
5	Cartg. 30mm HE	30,005	DIRECT FEED	5.5	5455
6	30mm HE	7,154	DIRECT FEED	1.8	3974
7	Cord Detonating, Meters	200	DIRECT FEED	0.1	2000
8	Cartg. 40mm	19,809	DIRECT FEED	10	1981
9	Electric Fuze	180	DIRECT FEED	0.1	1800
10	Mine M-3 (A/P)	2,316	DIRECT FEED	1.5	1544
11	Hand Grenade MK-2	3,952	DIRECT FEED	3	1317
12	Mine M-14	2,731	DIRECT FEED	3.5	780
13	Flare Trip Wire	1,200	DIRECT FEED	2.5	480
14	Mortar, 60 HE	1,995	DIRECT FEED	4.5	443
15	Cartg. 57mm Recoilless	4,795	DIRECT FEED	11.8	406
16	Cartg. 75mm Recoilless	32,149	DIRECT FEED	95	338
17	Cartg. 105mm HE	5,647	CUT / FEED	18.5	305
18	Mortar, 81 HE	293	DIRECT FEED	1	293
19	Cartg. 106mm Recoilless HEAT	18,948	CUT / FEED	65	292
20	FUZED MINE AT 1B ND	14,106	CUT / FEED	50	282
21	Mine M-2 (A/T)	924	DIRECT FEED	3.5	264
22	Rifle Grenade 73 mm HEAT	9,147	CUT / FEED	35	261
23	68mm Rocket Warhead	741	DIRECT FEED	2.9	256
24	Mortar, 4.2" HE	1,654	CUT / FEED	7.5	221
25	Cartg. 100mm HE	871	CUT / FEED	4	218
26	Cartg. 76mm HE	90	CUT / FEED	0.5	180
27	Proj. 75mm WP	5,145	DIRECT FEED	35	147
28	Mortar 60 WP	825	DIRECT FEED	7	118
29	Proj. 155 HE	874	CUT / FEED	9.2	95
30	Mortar 81 WP	276	DIRECT FEED	4	69
31	Mortar 81 Illum.	475	DIRECT FEED	7	68
32	Proj. 105 WP	1,291	DIRECT FEED	22	59
33	Proj. 155 Illum.	1,305	DIRECT FEED	26	50
34	Mortar 4.2" WP	841	DIRECT FEED	19	44
35	Proj. 155 WP	990	DIRECT FEED	65	15

Can treat both Conventional and Chemical Munitions

- Chemical munitions treated:
  - HD
  - DA/DC
  - CS/CN
  - CG (Phosgene)
- With or without explosive charge
- Complete treatment in one step
- Hold Treat Release capability
- Scrap ready for release without additional processing
- No reconfiguration required when changing munition feed types
- Can treat RCWM or stockpile/non-stockpile

Available in Four Sizes

Size	Largest single item (NEW)	Explosive capacity/hr (NEW)
SDC400*	400gr	5kg
SDC800 *	800gr	10kg
SDC1200 *	1200gr	20kg
SDC2000	2300gr	40kg

*Available in Mobile Configuration

- All are re-locatable
- All are available in conventional or conventional/chemical configuration

SDC units in operation around the world

- **Bofors LIAB AB, Sweden,** SDC400,
- Delivered in 1997
- used for destruction of:
  - detonators for anti personal mines.

SDC units in operation around the world

- **FAEX, Spain,** SDC1200,
- delivered in 1997
- used for destruction of
  - Fuzes , AP mine
  - Detonators (millions of units)
  - Detonating cord,
  - Explosives,
  - Propellants, etc.

SDC units in operation around the world

- **Swedish Defence Material Administration, FMV, Sweden,** SDC800
- Delivered in January 1999
- used for destruction of 20 mm anti-aircraft ammunition, fuzes, detonators, pyrotechnic articles, explosives, propellants etc.

SDC units in operation around the world

- **Sumitomo Corporation Europe Plc, Japan,** SDC 1200,
- Delivered in May, 2000
- Used for destruction of AP-mines and explosives

SDC units in operation around the world

- **IDDPortugal,** SDC1200
- Delivered in November 2000
- used for destruction of AP mines, munition components and explosives.

SDC units in operation around the world

- **NKK Japan.** SDC 1200
- delivered 2002 for testing operations with simulate chemical weapons.

SDC units in operation around the world

- **UXB International, USA,** SDC1200
- Delivered 2003
- Installed in Asia
- Used for demil of AP mines, projectiles, mortars, fuzes, detonators, grenades, bulk explosives and propellants, rockets
- HE, smoke, illumination, CS, WP

SDC units in operation around the world

- **UXB International, USA,** SDC2000
- Delivered 2004.
- Installed in Asia
- Used for demil of AP and AT mines, projectiles, mortars, fuzes, detonators, grenades, bulk explosives and propellants, rockets
- HE, smoke, illumination, CS, WP

SDC units in operation around the world

- **GEKA,Germany,** SDC2000
- Delivered 2005
- Used for demil of recovered Chemical Weapons, Airbags, conventional ammunition, bulk explosives and propellants
- Achieved 99.9999999% DRE on HD (non-detect)

Dynasafe Cold Detonation Chambers

- Used for lower rate Demil operations
  - Require counter charges
- Conventional and Chemical configurations
- Many sizes available
  - All are gas tight
  - All are Hold, Treat, Release, Capable

Example conventional chamber

Chemical Configured Chambers

- APG MD – MAPS Facility (2 chambers)
  - HD, VX, GB, Smokes

Transportation Chambers

- Chemical Configuration
  - Totally Gas Tight
  - Over 4000 RCWM moved without incident
  - Equipped with sample ports
  - Can be decontaminated without opening
    - Germany, (2 chambers)
    - Japan/China (2 chambers)

Chemical Configured Transportation Chambers

Transportation Chambers

- Conventional Configuration
  - Many models available
  - All are totally gas tight
- Bomb Squad Units
  - Explosive/Biological/Chemical Capable
  - Can be equipped with Radiation Shield
  - All gas tight
  - All have sample ports
  - All can be decontaminated without opening
  - Heated models available (Mini SDC)

Bomb Squad Chambers