

	<b>OPERATING ZERO BLAST BAG</b>	
	<b>Hazard Identification, Risk Assessment and Control</b>	
<b>Authorised by:</b> Nick Bodley Rev date: 30.03.15	<b>Purpose</b>	This procedure defines the processes to be followed in order to identify health and safety hazards, assess the risks associated with hazards relating to use of aerosol inflated blast hole blocker.
	<b>Scope</b>	This risk Assessment details the safe handling procedures for aerosol-inflated blast hole blockers and positioning of the blast hole blocker in a blast hole.
	<b>Responsibility</b>	Any personnel using ZERO blast bag products are responsible for compliance with and implementing this procedure in their area of responsibility.

## 1 Introduction

This procedure defines the processes to be followed in order to identify health and safety hazards, assess the risks associated with each hazard and apply controls (where required) to reduce associated risks.

## 2. Risk Assessment

When assessing risk, the likelihood of the hazard occurring and the potential consequences if the hazard occurred are to be considered, as described in the following tables.

### Qualitative measures of Likelihood

Level	Descriptor	Description
A	Almost certain	Daily Occurrence: Common or frequent.
B	Likely	Weekly Occurrence: Has happened or a near miss has occurred within PDL Toll.
C	Possible	Monthly Occurrence: Could occur or has been known to have occurred else where.
D	Unlikely	Annual Occurrence: Feasible to occur, not known to have occurred else where.
E	Rare	Once in 5 years: Whilst feasible, considered to be highly unlikely but not impossible.
F	Extremely Rare	< Once in 5 years: Practically impossible.

### Qualitative Measures of Consequence

Level	Descriptor	Example Detail Description
1	Insignificant	No injuries would be expected, possible minor discomfort. Insignificant financial loss
2	Minor	Minor / in-house first aid treatment, able to return to work immediately with no lost time. Minor financial loss
3	Moderate	External medical treatment required possible lost time injury. Moderate Financial Loss
4	Major	Extensive injuries, lost time injury, hospitalisation. High financial loss
5	Catastrophic	Potential death or permanent disability. Detrimental financial loss

### Qualitative Risk Analysis Matrix – Level of Risk

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (Almost certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Moderate)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H
F (Extremely Rare)	L	L	L	M	M

**Legend - E:** Extreme Risk; **H:** High Risk; **M:** Moderate Risk; **L:** Low Risk

### RISK ASSESSMENT: OPERATING ZERO BLAST BAG

STEP	ACTIVITY	HAZARD(S) IDENTIFIED	RISK(1)	RISK CONTROL(S) REQUIRED	RISK (2)
1.	<b>Selection:</b> Select correct size BlastBag™ plug for appropriate hole.	Bag Bursting/hearing/ slumping / misfire	E3 Moderate Risk	Check bag size range and compare with actual hole diameter. Use correct bag for hole range. See Table 1	F1 Low Risk
	and remove from carton just prior to use.	Aerosol Can exploding	F3 Moderate Risk	Storage in accordance with AS2278-2008. Do not expose to direct sunlight.	F2 Low Risk
	Check Chameleon safety logo to make sure bag has been stored safely	Can bursting	F3 Moderate Risk	Check label and understand how it works before handling. Read SOP.	F1 Low Risk
	If DANGER is activated use in accordance with 6.2	Can Bursting	F3 Moderate Risk	Dispose correctly	F1 Low Risk
2.	<b>Positioning:</b> Determine depth. Grasp the canister firmly in one hand and with one firm movement of the thumb activate the latching mechanism of the aerosol until the latch clicks and a steady stream of gas is expelling from the canister.	Pinch Point Muscular /joint pain Slip/trip RSI	C1 Low Risk	PPE-Gloves Stretch prior to activity Clear work area	F1 Low Risk
3.	Quickly lower the BlastBag™ plug down to the required depth until the drop cord is tight.	Muscular /joint pain Slip/Trip	D2 Low Risk	Stretching prior to activity Clear work area	F1 Low Risk
4.	After 15 - 30 seconds the BlastBag™ plug will grip walls of the blast hole. Tugging the drop line will confirm the bag has gripped the walls of the blast hole.	Muscular/Joint Pain Slip/Trip	C3 Moderate	Stretching prior to activity Clear work area	F1 Low Risk

5.	A firm upward pull on the drop line will break the tag from the top of the BlastBag™ plug when in position allowing the drop cord to be retrieved.	Muscular/Joint Pain Slip/Trip	C3 Moderate	Stretching prior to activity Clear work area	F1 Low Risk
6.	<b>Removal:</b> If the bag needs to be removed from the blast hole this can be done by bursting the bag in situ, waiting for deflation and then retrieving the bag.	Foreign body in eye Cut/Impale Asphyxiation, Freeze burn from liquid gas	C3 Moderate	Stretching prior to activity Correct PPE Clear working Area Well ventilated area Do not breathe in gas vapour	E2 Low Risk
7	<b>Important Steps:</b> For best results in all ground types, wait 10-15 min before loading on top of BlastBag™ plug and 30 min if ambient is less than 15 degrees C	Hole slumping and misfires	D3 Moderate	Follow SOP	F3 Low Risk
	Always kick in at least 2 boot loads of drill cuttings to protect bag from falling stemming or debris	Slip /Trip	C3 High	Stretch prior to activity and ensure even footing	E2 Low Risk
	For shale bands or muddy condition it is best to use 2 bags to increase wall contact and reduce the chance of slippage.	Hole slumping and misfires	C3 High	Wait at least 5 minutes for lower bag to complete inflation otherwise risk overpressure and bursting	E3 Moderate Risk

## 2 SAFETY AND HAZARDS

- 2.1 Aerosol canister prone to de-crimp if exposed to elevated temperatures or direct sunlight for prolonged periods of time.
- 2.2 Aerosol canister exploding after being punctured or incinerated.
- 2.3 Debris in eyes and or propellant in face if lanced incorrectly.
- 2.4 Freeze burn from liquidified gas propellant.
- 2.5 Inhalation risk where inflated bag is discharged in enclosed area or many bags are lanced in quick succession - hazard inherent in all self-inflating bags due to oxygen displacement.

## 3 SAFE HANDLING PROCEDURES

### 3.1 Storage:

Store as per AS2278-2008 and Australian dangerous goods code. Do not store above 50C, do not store in direct sunlight, keep BlastBag™ plugs in box until ready for use.

### 3.2 Transport:

Transport as UN1950 Class 2.2, Hazchem code 2Y.

### 3.3 Disposal:

If Chameleon Label reads safe bag can be disposed of normally by first initiating the bag and allowing it to fully inflate with no gas in liquid form. Bag should then be pierced in a well-ventilated area and allowed to deflate prior to disposal. If an inflated bag needs to be removed from a blast hole, lance in position and remove from hole using drop cord, avoid breathing in gas. Although gas is non-toxic, excessive levels can present asphyxiation risks as gas cannot be substituted for breathable air.

### 3.4 Overheating:

Aerosol cans may explode due to expansion of gas if overheated. Do not approach if Chameleon Indicator reads DANGER and HOT! Make all crew and supervisor aware and allow product to cool, remove from heat source if safe to do so.

### 3.5 Spills:

Spills or leaking cans should be moved to a well-ventilated area and handled with correct PPE.

### 3.6 Enclosed areas:

Although contents of aerosol are non-toxic, injuries may be sustained through asphyxiation if cans are allowed to discharge in a confined space.

## 4 MATERIALS / EQUIPMENT

### 4.1 BlastBag™ Plug

### 4.2 Drop cord (string or rope)

### 4.3 PPE

### 4.4 Bust and Retrieval Tool



## 5 SAFE WORKING PROCEDURE

### 5.1 Select correct size BlastBag™ plug for appropriate hole and remove from carton just prior to use.

#### 5.1.1 Bag has a label with design hole size on it, check table below for safe range:

Model	Part #	Design Hole Diameter (mm)	Safe Hole Range (mm)
WOMBAT – ZERO	30-059	270mm	250mm – 290mm
PLATYPUS – ZERO	30-046	230mm	215mm – 240mm
BILBY – ZERO	30-028	203mm	170mm – 203mm
KOALA – ZERO	30-039	165mm	115mm – 165mm
QUOKKA – ZERO	30-051	102mm	76mm – 102mm

Table 1: Sizing Chart

- 5.2 Determine what depth the bag is to be placed in the hole.
- 5.3 Prepare drop cord allowing an extra 1.5m to prevent a RSI from bending.
- 5.4 Either tie or clip the drop cord onto the hang tab:
  - 5.4.1 Top hole for shallow hole (requires low force ~7kg force to break)
  - 5.4.2 Bottom hole for deep holes (requires high force ~15kg force to break)
- 5.5 Grasp the canister firmly in one hand and with one firm movement of the thumb push in the latching mechanism of the aerosol until the latch clicks and a steady stream of gas is expelling from the canister.
  - 5.5.1 First indent for fast inflation
  - 5.5.2 Second indent for slow inflation (ensure hand is not obstructing trigger from the back)
- 5.6 The BlastBag™ plug will now begin to inflate. Note after the mechanism has been latched the inflation process can not be stopped, but can be slowed by turning bag upside down.
- 5.7 Quickly lower the BlastBag™ plug down to the required depth until the drop cord is tight.
- 5.8 After approximately 15 - 30 seconds the BlastBag™ plug will grip the walls of the blast hole.
- 5.9 Tugging the drop line will confirm the bag has gripped the walls of the blast hole.
- 5.10 A firm upward pull on the drop line will break the tag from the top of the BlastBag™ plug when in position allowing the drop cord to be retrieved.
- 5.11 If the bag needs to be removed from the blast hole this can be done by bursting the bag in situ using a special tool, waiting for deflation and then retrieving the bag with the drop cord.
- 5.12 If a slower inflation time is required, the ZERO model is equipped with a second speed achieved by pressing the trigger to the second notch. An additional tag can also be attached to the bottom of the bag and the bag introduced into the hole inverted. This will slow the release of gas further but is only recommended in holes up to 230mm, do not invert bag if there is no hangtab to facilitate connection with drop cord.
- 5.13 For best results in all ground types, wait 10-15 min before loading BlastBag™ plug and 30 min if ambient is less than 15 degrees C (double times if bag has been inserted upside down)
  - a. For shale bands or mud condition (or when heavy rain is predicted) it is best to use 2 bags to increase wall contact and reduce the chance of slippage.
  - b. Always kick in at least 2 boot loads of drill cuttings to protect bag from falling stemming and larger debris.

## 6 SOP for Chemeleon™ Safety Label

### 6.1 How it Works



Safely stored T<50C



Incorrectly stored T=50C



Danger T>70C



Product <50C but no longer Safe

SAFE	Green / Black	Product has been stored correctly and is safe for use.
SAFE HOT	Green / Yellow	Product been stored incorrectly and has reached 50 deg C. Activate immediately or move to cooler storage area until HOT disappears. Product is now SAFE.
DANGER HOT	Green / Red / Yellow	DANGER storage temperature has reached in excess of 70 deg C and product is unsafe to use. Do not handle, remain a safe distance from product and allow it to cool down. SAFE lettering has disappeared.
DANGER	Green / Red / Black	Product has cooled but storage temperature has at some point reached in excess of 70 dec C and product could have been stressed beyond serviceability HOT will disappear but DANGER remains visible, use product in accordance with Safe Use Procedure (6.2)

### 6.2 Safe Use Procedure

The following outlines manufactures recommendations for safe use of Blast Bags that have been exposed to excessive heat as depicted by the Chameleon safety label

As per table above, If the following is visible:



“Product has cooled but storage temperature has at some point reached in excess of 70 dec C and product could have been stressed beyond serviceability  
HOT will disappear but DANGER remains visible, use product with care.”

- 6.2.1 If DANGER activated label is noticed, handle with care being sure to keep product cool, the cooler the product gets, the safer it becomes
- 6.2.2 If possible wait until temperature is below 25C
- 6.2.3 With necessary PPE – gloves, eye protection, protective footwear, face bag away from person on the ground face up (trigger window pointing to the sky)
- 6.2.4 With top of can facing away from person ensure there is no plant or personnel in line of fire
- 6.2.5 While bending to a crouched position, place protective footwear on base of can and activate latch with caution.
- 6.2.6 Bag will begin to inflate, pressure has been released and bag is now safe as propellant cools product further, risk has been eliminated and it is safe to use bag and allow inflation to complete.



### Exclusion of Liability

*MTi Group Pty Ltd does not accept any liability for any loss or damage suffered or incurred by any person or entity however caused relating in any way to the improper use of this product or the failure to follow the operating procedures of the product. This exclusion of liability does not seek to exclude any liability that cannot be excluded under statute.*

### Disclaimer by MTi Group Pty Ltd

*This is an important document that should be read in its entirety. If you do not understand it you should consult MTi Group Pty Ltd without delay and seek guidance prior to the use of the product.*