



***PLOFADDER  
50AP, 70AP***

**PORTABLE EXPLOSIVE  
MINEFIELD CLEARING SYSTEMS**

**TECHNICAL DESCRIPTION**

## 1. **INTRODUCTION**

Minefields pose a constant danger to both advancing forces and infantry patrols on peacekeeping missions. In addition to the indiscriminate maiming of individuals, the mobility of such forces is being restricted while subject to enemy fire. Under such circumstances an effective minefield clearing system, that can be rapidly deployed, is essential in order not to lose the initiative and suffer unnecessary casualties.

The Plofadder 50AP and 70AP range of explosive minefield clearing systems are dependable, easy to use and can comfortably be carried by one or more persons over short to medium distances. They are extremely effective and an essential addition to the Engineers Corps' range of specialised equipment.

## 2. **APPLICATION**

The main functional element of the Plofadder minefield clearing systems, a woven explosive line charge insensitive to high shock loads, bullet or fragment impact, is deployed over the minefield by means of a rocket motor.

The shockwave and overpressure caused by the exploding line charge detonates or displaces all anti-personnel mines beneath and on either side of the line charge to create a clearly visible safe pathway. The performance of the 70AP system against minefields under environmentally extreme conditions and different soil types is clearly depicted in Figure 4.

When a minefield is encountered, and a suitable breach position has been identified, the weapon carrier(s) will move in as rapidly as the terrain permits. He/they will set up the system in less than a minute then move away with the fire control unit, while deploying the firing line, to a safe distance or position. Selecting between automatic and manual activates the system before pressing the fire button to launch the rocket motor. In automatic mode the line charge will detonate after pre-set delay after launch. In manual mode the fire button must be pressed again after the pre-set delay to detonate the line charge.

### 3. GENERAL SYSTEM DESCRIPTION



Figure 1 Plofadder 70AP



Figure 2 Remote Firing Unit



Figure 3 Safety and Arming Device

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### 3.1 **PLOFADDER 50AP**

The Plofadder 50AP is identical to the 70AP system shown in Figure 1, except that it has a smaller line charge and the complete system therefor fits into a single rucksack. The line charge is sealed in a watertight bag.

The remote firing unit, Figure 2, is operated by three commercial batteries and houses 50 meters of firing line that allows the operator total control over rocket motor launch and line charge detonation from a safe distance.

The rocket motor is mounted on an integral launch rail that unfolds and locks into the optimum launch angle for deployment of the line charge.

The safety and arming device (SAD), Figure 3, is built into the bottom of the rucksack and directs the firing current for both the ignition of the rocket motor and the detonation of the line charge. The safety and arming device may be replaced without opening the rucksack. The SAD has dual detonating channels to provide high reliability.

### 3.2 **PLOFADDER 70AP**

The 70AP system is operated by two men and basically consists of the same components as the 50AP. The heavier and longer line charge is divided into two sections and carried in separate rucksacks. On deployment, these rucksacks are placed side by side, as shown in Figure 1, and the two parts of the line charge are joined by a quick connection. Total set-up time is less than one minute.

## 4. TECHNICAL DATA

### 4.1 PERFORMANCE (See Figure 3)

	<b>50AP</b>	<b>70AP</b>
Stand-off distance from the edge of the minefield	2 to 8 m	2 to 8 m
Breach width (buried up to 10 mm deep and surface laid mines)	> 0,3 m	>0,5 m
Nominal line charge length (Could be shortened to reduce total mass of the system)	50 m	70 m
Set-up time	<1 min	<1 min

### 4.2. PHYSICAL CHARACTERISTICS

	<b>50AP</b>	<b>70AP</b>
Length:	800 mm	800 mm (each rucksack)
Width:	360 mm	360 mm (each rucksack)
Height:	275 mm	275 mm (each rucksack)
Mass, Operational (client requirement)	25 kg	23 kg (each rucksack)
Mass, explosives (line charge)	8,5 kg	24 kg Total
(motor grain)	0,2 kg	0,315 kg

### 4.3 TEMPERATURE LIMITS

	Minimum	Maximum
Storage, long term (optimum)	+10 °C	+30°C
Operational (perform to specification)	- 30°C	+65°C
Survive and safe operation	- 40°C	+70°C



**Compacted Snow**



**Frozen Arctic Soil**



**Clay and Gravel**

**Figure 4: Performance of Plofadder 70AP minefield breaching systems under different environmental and soil conditions**

#### 4.4 SHELF LIFE LIMITS

Rocket	15+ years
Rocket igniter	10+ years
Line charge	20+ years
SAU	10+ years

The system has been designed from the outset to minimize total lifecycle costs. Systems stored for 20 years or more will probably need to be refurbished (replacing igniters and detonators). The design ensures minimum time and cost for refurbishing, while not breaking any factory seals that could have a detrimental effect on the long-term storage.

#### 4.5 SAFETY

Numerous safety features have been designed into the system to comply with all the relevant Military and STANAG Standards, including electrostatic discharge and EMI protection.

## **5. DEPLOYMENT CHARACTERISTICS**

### **5.1 TRANSPORTABILITY**

The systems are transportable by land, sea and air. They can easily be carried by one person (50AP), or two persons (70AP), under battlefield conditions.

### **5.2 WEATHER AND SURFACE CONDITIONS**

The systems can be deployed in virtually all weather conditions. Accuracy and clearing distances can be influenced by wind speeds above 18 km/h (5 m/s) and terrain sloping by more than 10°. Cross winds will cause the explosive line charge to deploy with a slight lateral arc while slopes and temperatures below – 30°C can influence the specified stand-off and deployed length,

## **6. TRAINING**

Comprehensive operator manuals are supplied with the 50AP and 70AP systems.

A special training system utilising an inert nylon rope with a mass representing the mass of the line charge has been developed for cost-effective training. This system may be repacked and fired at least 5 times after replacing only the rocket motor and the firing line bobbin in the remote firing unit.