

MANUAL DEMINING KIT



CONTENTS:

- All the tools for the manual deminer in one convenient, durable splash proof bag.
- Industrial 2 way zip that can be locked, allow easy transport and storage of tools.
- Easy retrieval and inspection of individual tools.
- Signal investigated tools are manufactured from Stainless steel.
- This choice of material prevents fragmentation during detonation.
- Prod
- Bow Saw
- Pruner
- Brush
- Metal File
- Measuring Tape
- Hammer
- Lopper
- Prodding needle
- Terrain tool
- Trowel
- Trip wire feeler
- Magnet
- Knee guards
- Gloves



DEMINING SUIT



INTRODUCTION

Mechem is one of a few commercial Demining companies that truly understand the value of all their employees and therefore strive to provide them with equipment that will assist them to perform the task at hand effectively and safely. Our Demining suits are manufactured according to strict specifications and we encourage design inputs from our users.

DESIGN

Any person who has spent a few hours on their knees in the African sun will know what is important when choosing a Demining Suit. Finding the balance between protection and comfort is what makes a Demining Suit user friendly.

The Mechem Demining suit is manufactured by using Cordura material for the outer and the popular Kevlar inserts for protection. The Cordura outer is light weight, washable, water resistant and robust.

The suit is available in one size but can easily be adjusted by straps and plastic buckles. The plastic buckles are used because it is strong, light weight and safe in case of a detonation.

SPECIFICATIONS

- Protection area covers from chest down to the knees with crotch flap
- Designed to protect shoulders, under arms, groin area and around the side of the body
- Cordura nylon outer material for heat flash resistance
- Polycotton inner for moisture absorption & extra comfort
- Mesh on back panel for maximum ventilation
- Modular clip system for easy adjustment
- Visor holder or positioning flap
- Ballistic material Kevlar or Fraglite optional (working conditions dependant)
- Optional lower leg & full arm protection (working conditions dependant)
- Tested according to STANAG 2920 by the south African Bureau of Standards (SABS) 450m/s

WEIGHT

3KG

COLOUR

AS REQUIRED

SIZE

ADJUSTABLE



Unlike other manufactures and suppliers, Mechem manufacture and use their own suits for Demining operations in countries like Sudan, Eritrea, Angola, DRC, Afghanistan and Mozambique.

DEMINEING HELMET AND VISOR



INTRODUCTION

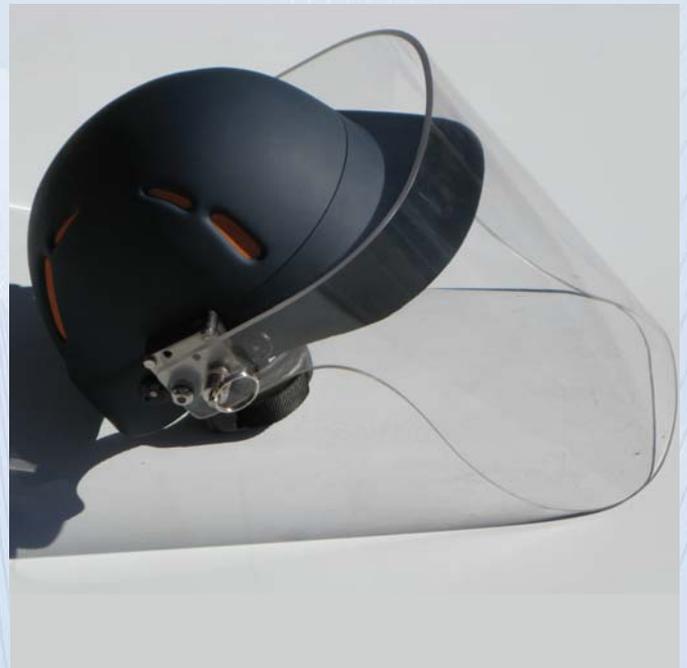
It is important for any Demining Visor to be light weight and comfortable and still offers the required protection. Mechem has tried and tested various Demining Visors and we are convinced that our Helmet and Visor is designed in such a way that the user will enjoy comfort but with the feeling of total protection.

DESIGN

The question remains: do you use only a visor or do you use a helmet/visor combination? Mechem has found that by using the helmet/visor combination pressure on the head and stress on the neck is reduced significantly.

Mechem decided to use a standard helmet which is strong, lightweight and allows sufficient ventilation. The visor is then mounted onto the helmet which also allows the user to change either the helmet and or the visor when damaged.

It is very important that the user can maintain a clear vision at all times and the visor is made of a standard polycarbonate and is formed without reducing the optical quality. The visor can also be adjusted to and open and closed position depending on the user's situation.



SPECIFICATIONS

- The helmet is made of fibreglass and has a high density foam inner.
- The visor is made of 5mm polycarbonate.
- Offers full head, chin and neck protection.
- Light weight, ventilated and comfortable.
- Have an adjustable chin strap.
- The visor can be adjusted to the open and closed position.
- Comes with a carry bag
- Tested according to STANAG 2920 - v 50 of 250 m/s

DIMENSIONS

37cm x 30cm x 24cm

WEIGHT

1.4KG

COLOUR

NAVY BLUE

SIZE

LARGE AND X LARGE

Unlike other manufactures and suppliers, Mechem manufacture and use their own Helmets for Demining operations in countries like Sudan, Eritrea, Angola, DRC, Afghanistan and Mozambique.



MVMMDS

MECHEM VEHICLE MOUNTED METAL DETECTION SYSTEM



The MECHM Vehicle Mounted Metal Detection System (MVMMDS) incorporates a CASSPIR Mine Protected Vehicle (MPV) as the system carrier and utilizes a magnetic pulse induction metal detection system for the detection of metal objects under the ground surface.

The CASSPIR (MPV) is one of the first commercially built Mine Protected Vehicles (MPVs) in the world – and still is a world leader in its class.

The MVMMDS uses an electronic pulse induction metal detection system with sensors mounted on a durable non-metallic (rubber) draw-mat that is drawn behind a suitable Mine Protected Vehicle (MPV).

The draw-mat is towed behind the vehicle and can be configured to be drawn in the centre or to the left- or right side of the vehicle. This versatile repositioning option makes the detection system ideal for roadside sweeping operations.

The rear-mounted detection suite is motivated by operational experience proving the inefficiency of any forward mounting of the sensors. The MPV protects the crew against any injury/death in the event of a mine blast – and any damage to the vehicle can be quickly/economically repaired.

The system comprises three basic elements. The first is the actual electronic detection, the second the signalling and record capacity and lastly the physical marking of the position of the detected item with white marking fluid on the ground.

System Operation

The detection coils are mounted on foam rubber mats that are positioned on to the rear end of the draw-mat.



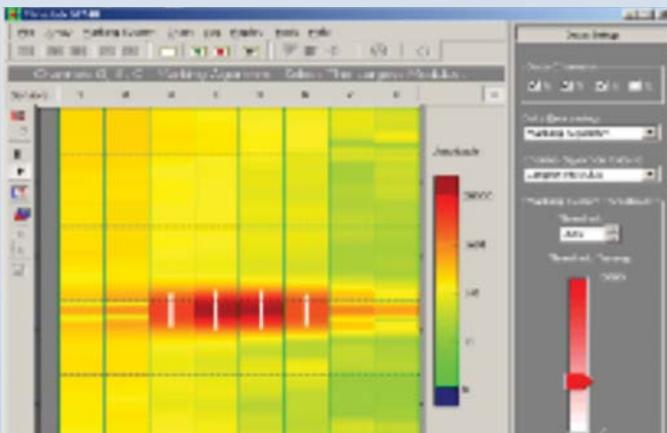
Draw Mat with Marking Nozzles at the rear

Upon detection of a metal object, an electronic signal is sent to the control console inside the vehicle.



Control Console inside the Vehicle

The signal is displayed as a computer generated image to the operator. The system also records all signals.



Computer Generated Image

At the same time a signal is passed onto the marking system and the ground is marked in real time with white bio-degradable marking fluid over the exact position of the detected metal object.



Bio-degradable marking

Operational History

MECHEM has successfully used the system on UN Contracts in the Sudan and Eritrea and thousands of ki-

lometers of roads has been cleared in these countries.

System Performance

The system has been operationally proven on MECHEM contracts over the world. It has a proven ability to detect anti-tank landmines such as the TM 46 and TM57 at a depth of 1,200-mm in rocky shale soil and at speeds of up to 20 km/h (although it is never used at this speed). The standard search path is 2,200-mm wide. This width can be increased to 3,000-mm if the terrain/road allow this.

The preferred speed for the system is 5 km/h. At this speed the MVMMSD has no difficulty to accurately detect and mark TM46 and TM57 anti-tank mines at the depths mentioned. The system can detect and mark minimum metal mines (i.e. containing at least eight grams of metal) at depths of up to 200-mm.

The draw-mat can be deployed in 3 to 5 minutes and is carried on the roof of the vehicle when not used for detection. Under ideal conditions the system can cover 40,000 to 100,000-m² per day.

Repair and Maintenance

The detection and marking systems are modular in nature and can be mounted in most production type MPV's. Similarly repair to the system is modular and field repair friendly.

Transporting the MVMMSD

When the system needs to be relocated or transported over longer distances the vehicle mounted transportation frame is used. The draw-mat is drawn onto its transportation frame with a remotely controlled winch mounted on the frame.

Mounting interfaces between the transportation frame and carrier vehicle can be supplied on request.



MECHEM STEEL WHEEL

MECHEM STEEL WHEEL FOR CASSPIR & TAPIR MINE PROTECTED VEHICLES



GENERAL

The SteelWheel is an excellent innovation that was designed to assist MECHEM countermine teams in their operations. This tool allows teams to safely clear anti-personnel (AP) minefields.

Steel Wheels for fast and cost effective vast area reduction.

The wheels are used on MECHEM's CASPIR and TAPIR Mine Protected Vehicles (MPV) to simply drive over and detonate anti-personnel landmines within the safety of the MPV.

No damage is done to the MPV or the SteelWheels itself during these demining operations.

THREAD

The heavy thread pattern used on the Steel Wheel not only assists in off-road traction but, fine vegetation is mulched in the process.

This makes the area available for further quality assurance by MECHEM dog teams etc.

The thread patterns used on the SteelWheels are directional. Left hand and right hand wheels are manufactured in deep dish fashion.

The main reason for this is to maintain a turning circle as close as possible to that of the standard MPV.



MECHEM VEGETATION CLEARING SYSTEM



The **MECHEM Vegetation Clearing System (MVCS)** was developed to assist demining personnel in the safe clearing of light to medium (50mm diameter max) plant growth in areas suspected to be contaminated by Landmines.

The system consists of a standard TLB (Tractor Loader Backhoe) fitted with a shrapnel proof armoured shield and an adapted vegetation clearing attachment **MECHEM** currently uses the **JCB-3CX**.

Operating Platform

The Operating Platform offered is a standard TLB. Whilst certain modifications to the TLB are necessary to optimise its performance in the Vegetation Cutting role, care has been taken not to invalidate the standard manufacturers warrantee.

The most notable modifications are improvements to the plat-

form stabilisers and the addition of extra ballast in the front-loading bucket to counter balance the 5.7m maximum cutting reach of the system.

Ballistic Protection

The system was designed to be operated from a confirmed safe area (whilst cutting vegetation in the area suspected of being polluted by land-mines). The operating platform has therefore been fitted with a ballistic shield to protect the operator from any shrapnel that might originate from land-mines detonating as a result of the vegetation cutting process. It is therefore standard procedure to always ensure that the protective shield is positioned directly between the operator and the cutting area when working in an unsafe area.

As a result of the abovementioned the operating platform is not mine protected (protected against a landmine detonating under the vehicle as a result of its operation in unsafe terrain).

Vegetation Cutting Attachment

The heavy duty cutter attachment utilises two hardened swivel mounted cutting blades mounted on a central beam. The beam is driven by a standard angle gearbox which in turn is driven by an 80kW hydraulic motor through a power take-off shaft. The hydraulic motor is driven from the standard operating platform hydraulic supply.

Hydraulic power supply is provided by the operating platform via reinforced hydraulic hoses fitted with quick release type couplings. This provides easy coupling to the hydraulic motor that is mounted on the cutter body.

Being fully manoeuvrable as far as tilting, lift and lowering goes, some "limiting aids" are incorporated to assist operators in the application of the cutter. This is mainly to aid in cutting height control where a height-adjustable skid is fitted on the rear of the cutter.

A robust wheel type roller is provided on the side of the cutter body to assist in the prevention of 'ditching' the cutting blades. This feature increases the life of the cutting blades considerably.

An adjustable friction clutch is incorporated in the drive train to protect the drive system should there be a sudden cutting beam stoppage (Rocks, large tree stumps etc.).

A "purpose manufactured interface" provides the link between the hydraulic arm of the operating platform and the vegetation cutting attachment.

This interface allows easy "pin type" fitting and removal of the cutter from the operating platform. This ensures that the TLB can also be used in its standard role by merely replacing the vegetation cutting attachment with a standard tool.



Robust Wheel Type Roller



Height Adjustable Skid

Hydraulic Motor

Application of the MVCS

The system is ideally suitable to clear light to medium vegetation with a stem thickness of a maximum of 50-mm.

The system shall typically be applied from a confirmed 'Safe Area' - cutting vegetation in an area suspected of being contaminated by landmines. The cutting action should be in a permissible arc of 60 degrees in order to ensure adequate protection for the operator.

The maximum reach of the cutting attachment is 5.7m. The cutting attachment allows lateral cuts (per attachment swing arc) of a maximum of 1 meter per side stroke – within a cutting arc of 80°.

Transporting the MVCS

The MVCS is transported on a 10 tonne 6x4 Truck. The machine is reversed onto the truck using a purpose built ramp that duplicates as a trailer, drawn behind the vehicle to transport the standard TLB attachments.



Minimum Power Specifications for the MVCS

Minimum Hydraulic pressure	220 Bar
Min. Hydraulic Flow:	137 l/min
Min. Cutter-Blade Revolutions:	1010 R.P.M.
Min. Backhoe Arm Carry Capacity:	1000Kg@ 5,5Meters.

