Journal of Conventional Weapons Destruction

Volume 4  
Issue 2 The Journal of Mine Action  

June 2000

Mechem

CISR JOURNAL

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The Mechem division of Denel (Pty.) Ltd., South Africa, has a history going back to the late 1960s, when it was a unit of the South African Council for Scientific and Industrial Research. Specializing in landmine detection, demining and UXO disposal, Mechem also offers contract research and development, well-equipped laboratories and an explosive test range, which is used for the development and evaluation of equipment and augments workshops.

Mechem has designed mine-protected vehicles, including the Casspir and Mamba, which are used for demining, and provided safe and reliable transport for operations. Recent developments include add-on armor systems against SF5 mines and modifications to the Schiebel VAMIDS metal detector systems, which enables it to detect and mark the position of mines with minimal metal content.

**Explosive Detection Systems**

Unlike metal detection systems, the Mechem Explosive and Drug Detection System (MEDDS) combines the mechanical concentration of explosive vapors with the acute sense of smell of trained dogs. By using a team of dogs to check MEDDS sample tubes, it is possible to predict the presence of explosives in the sectors of a mine field. MEDDS is used to indicate the presence or absence of vapor, which can emanate from stray ammunition, a weapons cache, UXO or a mine.

Mechem has developed a non-magnetic trillier, or pushed trolley, with a Sachiel VAMIDS array coupled to a computer operated marking system, which paints on the spots where mines are found. The system, mounted on a Casspir, has completed field trials by auditing cleared mine fields in Mozambique.

The International Counter-mine and Canine Training Institute (ICTI) Funded by donors, this school provides training in all aspects of mine detection and clearance. The intention is to enable mine-infested countries to become self-sufficient in demining. Training is offered through a variety of standardized courses. Specific courses can also be designed to meet with client requirements, which may include UXO and terror bomb disposal techniques. Standard courses include the following:

**Basic Demining Course:**
- Mine Awareness
- First Aid
- Metal detection
- Detection with a prodder
- International mine and munitions identification
- Explosive characteristics
- Driver training
- Communications

**Advanced Demining Course:**
- Vapor detection-MEDDS sampling
- Rendering safe of mines and UXO
- MEDDS dog and handler training
- Search dog and handler training
- Communications
- Operational medical care
- Supervision
- Quality assurance
- Statistics
- Logistic support procedures
- Vehicle and mechanical maintenance

**Mine Surveys**

Permanent staff is available for surveying and gathering information about known or suspected mine fields. At the conclusion of an initial survey, Mechem can report the estimated extent of the problem and offer a selection of solutions adapted to the local terrain of the mine field.

**Contact Information**

Mechem

PO. Box 912454
Skeerfontein 0127
South Africa

Tel: +27 12 803 7290
Fax: +27 12 803 7195

E-mail: emark@mechem.denel.co.za

Mechem Casspir on a U.N. convoy.

**Security Devices**

Appealing to a broad range of customers from governments to commercial demining companies, Security Devices offers high quality, economic demining products and has established its presence in the demining community. Andy Smith, an international specialist in humanitarian demining, designs the majority of the equipment Security Devices markets.

**MK3 Personal Protective Equipment**

Presently, Security Devices offers an all-inclusive set of personal protective equipment. This set includes an MK3 demining apron, a 5mm visor and fittings, knee-shin pads and a carry bag to transport these items. Specialists at Security Devices have designed a weatherproof, padded, washable, lightweight carry bag to reduce the bulkiness and weight strain that personal protective equipment often places on deminers.

**MK3 Demining Apron**

The MK3 demining apron does not conform to traditional body armor. Rather than matching previous close-fitting aprons, the designers adapted the MK3 apron to hang comfortably from the shoulders, forming a blast-proof wall between the deminer and the mine. Aware of the environmental conditions under which deminers often work, the specialists designed the apron to support air circulation, which cools the deminers as they work. In addition, the specialists at Security Devices overlapped the apron’s collar with the 5mm visor also supplied in the kit. This modification protects deminers if they detonate a mine while looking down as they work. This apron has been involved in a minimum of 12 pronged incidents, establishing its worth as an effective means of protection.

**5mm Visor**

The 5mm visor, composed of polycarbonate, is equipped with a head-frame made from ballistic Aramid and covered with waterproof nylon. These specifications improve the durability of the visor and the protection it offers, increasing its growing popularity among deminers.

**Knee-Shin Pads**

To improve the comfort factor of demining, designers included knee-shin pads in the personal protective equipment kit. Although the pads do not offer significant protection against exploding ordinance, deminers have reported that the pads are beneficial when they are forced to kneel on damp or rough ground to work. The pads are made of rubber and designed to be flexible to match a deminer’s physical movement.

**Contact Information**

PO. Box 125
Arby Hararo, Zimbabwe, Africa
Tel: +263-4-487064/5
Fax: +263-4-486685
E-mail: secdev@samara.co.zw