



LMAS 10.30

PERSONAL PROTECTIVE EQUIPEMENT (PPE)

Responsible Local entity:

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Note:

This document is current at the date shown on this page. The Local Mine Action Standards (LMAS) are subject to regular revision, so users should ensure that they are using the latest version of each document in the standards. The most recent versions of LMAS are available with SMACO office of Rabouni.

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Contents

1. Introduction.....	4
2. General Principle.....	4
3. Suitability of PPE.....	5
4. Minimum PPE Requirements.....	5
4.1 Fragmentation Protection.....	5
4.2 Hand Tools.....	5
4.3 Blast Resistant Footwear.....	6
4.4 Protecting Hearing.....	6
4.5 Mine Clearance and Battle Area Clearance.....	6
4.6. Explosive Ordnance Disposal (EOD).....	6
5. Organisation and Responsibilities.....	6
5.1 Local Mine Action Authority (SMACO) responsibilities.....	6
5.2 Mine Action Organisations responsibilities.....	6
5.3 Mine Action Organisation Employees' responsibilities.....	7
6. General References.....	8
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Foreword

Critical safety, control and quality elements of the International Mine Action Standards (IMAS) have been retained in the Local Mine Action Standards (LMAS), so ensuring that they maintain the principles agreed in IMAS guidelines.

The work of preparing, reviewing and revising LMAS is conducted by a technical committee with the support of international, governmental and non-governmental organisations in Western Sahara, East of Berm (EoB).

In the LMAS, the following words are used to indicate the intended degree of compliance and are to be reflected in Mine Action Organisation Standard Operating Procedures (SOPs):

'Shall', 'will' and 'must' are used to indicate requirements, methods or specifications that are to be applied in order to conform to the standard;

'Should' is used to indicate the preferred requirements, methods or specifications.

'May' is used to indicate a possible method or course of action.

In LMAS:

The term "Demining Organisation" refers to any organisation (government, NGO or commercial entity) responsible for implementing demining projects or tasks. Demining Organisations include headquarters and support elements.

The term "Mine Action Organisation" refers to any organisation (government, military, commercial or NGO/civil society) responsible for implementing mine action projects or tasks. The mine action organisation may be a prime contractor, subcontractor, consultant or agent.

For the purpose of the LMAS, the words "Demining Organisation" and "Mine Action Organisation" are interchangeable and used to describe the same body.

1. Introduction

- 1.1 Risk reduction involves a combination of safe working practices and operating procedures, effective supervision and control, appropriate education and training, equipment of inherently safe design, and the provision of effective Personal Protective Equipment (PPE) and clothing.
- 1.2 PPE should be regarded as a 'last resort' to protect against the effects of mine and ERW hazards. It should be the final protective measure after all planning, training and procedural efforts to reduce risk have been taken. There are a number of reasons for this approach.
- 1.3 First, PPE protects only the person wearing it, whereas measures controlling the risk at source can protect everyone at the demining workplace. Second, theoretical maximum levels of protection are seldom achieved with PPE in practice, and the actual level of protection provided is difficult to assess. To obtain the maximum protection from any PPE it must be correctly fitted and properly maintained and used. And third, PPE may restrict the wearer to some extent by limiting mobility, visibility and comfort, or by requiring additional weight to be carried. The requirements for protection must be balanced against the possibility that wearing too much PPE may impair movement or concentration.

- 1.4** While the risk to deminers comes from all types of explosive ordnance including Anti-Personnel (AP) blast mines, AP fragmentation mines, Anti-Tank (AT) mines and ERW, including unexploded sub-munitions, the AP blast mine occurs in the greatest numbers and features in the most accidents. PPE, therefore, is principally designed to defeat the injuries caused by AP blast mines. At close quarters, AP fragmentation mines and AT mines overmatch PPE currently available, however, due to the area effect of such mines, they also have the potential to cause 'secondary victims' and PPE is intended to provide some protection to these.
- 1.5** In general, when unexploded munitions are encountered in humanitarian demining, they have already malfunctioned, they are usually high in metal content, on or near the surface, and constitute less of a hazard than mines. The varied nature of UXO, however, means that the hazard is best dealt with procedurally rather than by relying on PPE designed primarily for humanitarian demining.
- 1.6** This LMAS provides specifications and guidance on the minimum requirements of PPE for use in Western Sahara, EoB. It does not provide guidance on the design characteristics of PPE garments, or on test and evaluation procedures.

2. General Principle

- 2.1** The primary means of preventing explosive injury in the workplace is by the supervised use of demining tools and processes that reduce the likelihood of an unintended detonation. This is generally effective and unintended detonations are rare events. PPE is provided as a secondary safeguard to protect against the small risk remaining. It is important that the PPE provided should not restrict the application of demining tools and processes in any manner that increases the risk that an unplanned detonation will occur.
- 2.2** The levels of PPE provided for use in suspected hazardous areas must be decided after considering the local risk(s), operational procedures and tools, and local environmental conditions, and after making a written risk assessment. It is possible that different levels of PPE may be appropriate for use during different activities at different parts of a workplace.
- 2.3** Training shall be provided on the proper use, maintenance and storage of all PPE provided and in use within the Mine Action Organisation. Facilities should be provided for its proper storage, carriage, cleaning and maintenance. Equipment shall be examined on a regular basis to ensure that it is suitable for use.

3. Suitability of PPE

- 3.1** PPE provided shall fit the employee, male or female, and be designed to provide reasonable comfort and protection against the predictable risks present at a demining worksite. Other clothing provided shall be suitable for the prevailing weather conditions and include footwear with suitably slip-resistant soles. Cultural practices should also be taken into consideration. If the predictable risk is from AP blast mines, and ERW containing greater than 240g of TNT, and there is a high risk that the mine(s) or ERW may be initiated during the procedures that will be used, the use of other procedures or enhanced protection shall be considered.

3.2 While staffs are inside the safety distance for the hazards anticipated at a suspected hazardous area, the minimum requirements under Clause 4.3 below apply. The minimum PPE requirement given below shall be increased if the worksite risk assessment determines that the risk warrants greater protection.

Note: Although this standard gives distances at which the PPE must be effective, this does **not** imply that the wearer will be safe at such distances. Distance reduces the severity of blast effects, so the further away the wearer is, the safer the wearer will be.

4. Minimum PPE Requirements

- a. PPE shall be capable of protecting the parts of the body that are covered against the blast effects of 240g of TNT at distances appropriate to the wearer's activity.
- b. The amount of PPE provided shall be determined as a result of a field risk assessment and management decision. The minimum PPE inside the safety distance of a suspected hazardous area or when engaged in any activity that involves being close to mines and ERW, shall be:
- c. Body armour capable of satisfying the ballistic test outlined in STANAG 2920, achieving a V50 rating (dry) of 450m/s for 1.102g fragments. It shall also be capable of protecting the chest, abdomen and groin area against the blast effects of 240gm of TNT at 60 cm from the closest part of the body; and Eye protection that is held over the eyes in a frame that prevents blast ingress from beneath. The eye protection shall be capable of retaining integrity against the blast effects of 240 gm of TNT at 60 cm and shall provide protection equivalent to not less than 5mm of untreated polycarbonate. However, it is recommended that eye protection should be a part of frontal head protection capable of protecting against the blast effects of 240gm of TNT at 60 cm and providing full frontal coverage of face and throat.

Note: Commonly available industrial safety spectacles do not meet the minimum requirement of this LMAS and shall not be used as demining PPE.

4.1 Fragmentation Protection

- a. The fragmentation danger from most fragmentation mines and unexploded submunitions cannot be protected against with lightweight and practical PPE. This emphasises the need to minimise risk through the use of inherently safe procedures.
- b. Although the level of protection may not be sufficient, PPE provided to reduce the risk from fragmentation mines shall be at least that used as protection against blast hazards described under section 4 above.

4.2 Hand Tools

- a. Hand tools should be constructed in such a way that their separation or fragmentation resulting from the detonation of an AP blast-mine incident is reduced to a minimum.
- b. Hand tools should be designed to be used at a low angle to the ground and should provide adequate stand-off from an anticipated point of detonation
Hand tools should be designed to be used at a low angle to the ground and should provide adequate stand-off from an anticipated point of detonation.

- c. The use of gloves can provide protection against non-explosive injury and should be considered.

4.3 Blast Resistant Footwear

- a. During the risk reduction process, demining organisations may consider providing blast resistant boots for the protection of feet and lower limbs, where there is a significant risk that cannot be reduced by SOPs alone. However, the blast resistant boots being considered should be proven to be effective in reducing the risk presented by the anticipated hazards.
- b. **Note:** The effectiveness and operational benefits of mine boots is still a contentious issue within the mine clearance community, and there are wide ranging views and opinions on their use. Nevertheless mine boots do exist, and therefore demining organizations may wish to evaluate their suitability for their particular operational scenario during the planning phase of a clearance operation. The cost of provision and replacement is high, whilst the benefits are unproven. There is, therefore, a danger that they offer 'false security'.

4.4 Protecting Hearing

When conducting demolitions at minimum safety distances, the use of protection for the eardrums is recommended.

4.5 Mine Clearance and Battle Area Clearance

For PPE requirements during mine clearance and battle area clearance operations see LMAS 10.20 Demining Worksite Safety, tables 1, 2 and 3. Mine Action Organisations shall detail any additional requirements in their SOPs.

4.6 Explosive Ordnance Disposal (EOD)

For PPE requirements for EOD see LMAS 09.30 Explosive Ordnance Disposal. Mine Action Organisations shall detail any additional requirements in their SOPs.

5. Organisation and Responsibilities

5.1 Local Mine Action Authority (SMACO) responsibilities

The SMACO shall:

- a. Establish and maintain national standards to be applied for PPE; Monitor the application of standards.
- b. Undertake periodic reviews of the national standards for PPE and the technologies available to reduce risks.

5.2 Mine Action Organisations responsibilities

Mine Action Organisations shall:

- a. Apply the documented NMAA standards for PPE. Provide PPE for each activity undertaken that meets, or exceeds, the minimum requirements and is appropriate for the wearer, male or female. In this regard, PPE should be provided to employees which is serviceable and appropriate to the risk, local operational procedures, culture and environmental conditions.
- b. Provide training and supervision in the selection of appropriate PPE and the correct use and maintenance of PPE.
- c. Establish and maintain SOPs that specify care and maintenance requirements.

- d. Provide suitable facilities for the storage, carriage, cleaning and maintenance of PPE.
- e. Establish and maintain documented SOPs to undertake periodic reviews of PPE.

5.3 Mine Action Organisation Employees' responsibilities

Employees of Mine Action Organisations shall:

- a. Use PPE in accordance with the requirements specified by their employers and the manufacturer's specification for the PPE, including the use of facilities provided for storage and carriage of PPE.
- b. Clean and maintain the PPE in accordance with the demining organisation's SOPs and/or the manufacturer's specifications or guidelines.
- c. Report to the employer, problems with the equipment or suggested improvements to SOPs, which may reduce the requirement for PPE, or improvements in the design or application of PPE.

6. General References

- a. International Mine Action Standards (IMAS), in particular, 10.30 Safety and Occupational Health Personal Protective Equipment.
- b. LMAS 10.20 Demining Worksite Safety.