Air Force Institute for Operational Health Assessment of Handheld Laser De-Paint System

WHO
The Health and Safety Division of the Air Force Institute for Operational Health (AFIOH/RSH)

WHAT
An ergonomic survey to evaluate and describe the process used to remove paint from metal surfaces with a handheld, class IV, laser technology. Two different units were assessed:
- 40-watt handheld laser unit
- 120-watt handheld laser unit

WHY
Part of an overall operational and environmental health assessment of handheld laser technology application in de-painting processes by the Air Force Research Laboratory (AFRL) at Wright Patterson AFB (WPAFB) for potential implementation at depots.

RECOMMENDATIONS
To reduce the potential risk for musculoskeletal disorders of the neck, shoulder and/or wrist/hand, both tools should be redesigned to decrease non-neutral postures, grip forces, and repetition by addressing:
- handle shape, sharp edges, and diameter
- material
- weight
- balance
- hose attachments
- sequential laser firing mechanism

The operator added a nozzle end to the 40-watt handheld laser to serve as a capture vent. The ventilation hose is not attached.

The 120-watt handheld laser at the time of the evaluation.

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• In a fixed location such as a depot, consider using an overhead suspension system for supporting handheld tools.

• Consider permanent or portable scaffolding frames to allow workers to position themselves appropriate to the work area on the aircraft.

• Because the area to be cleaned may be located in unusual places, stair ladders with appropriate railings, and/or power lift platforms with appropriate railing and safety features should be considered in order to align the worker with the work.

• If the product to be cleaned is removed from the aircraft, use support frames that can clamp the piece in place and position it at a height and angle appropriate to the user and the tool.

• Provide proper mats for cushioning the lower extremities during prolonged standing.

In a deployed environment, equipment would be similar, but may have to be more portable such as portable stair ladders, suspension frames (hoist), and A frames.

The goal is to protect the worker from injury and work-related musculoskeletal disorders, while maintaining effective work strategies.