מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

יחידת הבטיחות
Safety Unit

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Safety guidelines for laser beam adjustment

1. Objective

Preventing accidents when adjusting the laser beam as a result of exposure to the beam.

2. Method

2.1 Indicate the risks involved when adjusting the laser beam.
2.2 Prepare and perform the laser beam adjustment in laboratories with open laser systems of the Class 3B/4 and Class 3R risk factor in the invisible spectrum.

3. Limiting access

3.1 Only employees performing the laser beam adjustment are allowed entry into the laboratory.
3.2 When exceptional conditions exist at the time of adjustment, a warning sign should be placed at the entrance to the laboratory (Entry Forbidden/Beware of Danger — Laser under Adjustment).
3.3 Verify that the warning and safety measures at the laboratory entrances, such as the interlock, warning lamp, etc., are working and that the employees know where the laser emergency breaker is located.
3.4 Ensure that the laboratory door is closed, the curtains surrounding the staging area are shuttered, and the beam is prevented from penetrating beyond the lab.

4. Preparing the equipment

4.1 Prepare and identify all necessary equipment and materials for the adjustment before beginning work, such as tools, targets, beam blockers, power meter, means of determining the beam's profile, protective goggles suitable for laser risks, a fire extinguisher and first aid equipment.
4.2 Any questions or suggestions relating to laser safety information or measures should be addressed by email to:
Yehuda.moshayev@weizmann.ac.il

5. Optical table safety

5.1 Before beginning the adjustment, remove any jewelry (watches, rings, tags, chains) from the body and any accessory that may reflect the laser beam. Non-reflective tools must be used.
5.2 Remove any unnecessary equipment that is not needed in the adjustment, such as tools (screwdrivers, spanners, electronic components, optics), to minimize the possibility of reflecting a beam.
5.3 Clear access points around the optical table and remove hazards such as cables, fiber optics, sharp corners, and hazardous materials.
5.4 Use beam blockers to prevent direct contact with the laser beam and reflected beam.
5.5 While performing the adjustment, avoid wearing flammable synthetic attire. It is recommended to wear a cotton lab coat.

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5.6 Static electricity prevention in the laboratory should be considered (friction in curtains, lack of moisture, etc.).

6. Protective goggles for lasers

6.1 Ensure that the protective goggles conform to the laser being used.

6.2 Everyone present in the laser hazard zone must wear protective goggles.

6.3 The laser hazard zone, during the adjustment, is the entire area of the laboratory containing the laser. Violation of this provision poses an immediate danger to those present in the laboratory.)

7. Detecting the laser beam

7.1 Direct observation by the eye (intra beam) in the direction of the beam is prohibited. Observation is only allowed using viewing accessories, such as fluorescent devices.

7.2 When using beam imaging tools, reach towards the beam slowly and carefully with a card tilted slightly downward to see the scattered beam's reflection. The optics must be adjusted so that the beam hits the card just before the component surface.

7.3 When observing invisible radiation using IR cards, the adjuster should be aware that there may be reflections and specular reflections off some of these implements.

8. Instructions for adjusting the beam

8.1 Adjusting the laser beam should be performed at the minimum possible beam intensity.

8.2 Follow the directions according to the laser service manual.

8.3 Block any laser beam that is not in use or reflected.

8.4 Insert optical elements only when the beam is blocked. Fasten the elements, consider possible reflection and scattering, and address the

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resulting risks. Add a blocker behind the optical element, and then move the beam to the next optical element.

8.5 If possible, ensure that the beam is horizontal and parallel to the optical table.

8.6 If it is necessary to increase the beam's intensity, beware of the possibility of ignition from the laser beam.

9. Completing the adjustment

9.1 At the end of the adjustment, return the system to normal operation mode (pay attention to the protective cover, interlock and blocks).

9.2 Ensure normal operation.

10. In case of emergency

10.1 In the event of any emergency, accident or near-accident, report immediately the Weizmann Service Center08-934-2999, the Laser Safety Officer, Yehuda Moshayev , Tel. 050-9001995, 08-9345155, and the direct supervisor.

10.2 In case of injury or suspected injury from a laser, the subject must be immediately evacuated to "Kaplan" Medical Center emergency room for a medical examination.