**Name of the appendix: Safety when working with laser devices**

**1. General**

The purpose of this directive is to prevent employees from being exposed to laser radiation and other risks associated with laser devices. The directive specifies the safety precautions and control measures that users of laser devices must fulfill. Precautions will be described below according to the rating of the various laser risk classes.

**2. Safety precautions**

* 1. Categories of laser hazard ratings:

Class 1: Devices that do not damage the eyes.

Class 2: Continuous wave devices within the range of visible light. Avoid looking directly into the ray of light.

Class 3: Dangerous for direct or reflected radiation into unprotected eye. Use caution in the two aforesaid cases.

Class 4: Class of pulsing devices in the visible light range and infrared, these lasers could cause flammable materials to ignite, may cause burns and damage to skin and damage to the eyes.

* 1. Precautions for various laser classes:

2.1 Lasers from classes 3B and 4:

 Products from these classes will be operated only by workers who have been trained. In order to reduce the risks, the following rules must be followed: Workers must be outside the laser beam trajectory whenever the power of the beam or the trajectory is liable to injure them, unless they are equipped with suitable eye protection (goggles, curtain).

2.2 Close off the beam trajectory with a protective envelope whenever possible.

2.3 Operate the laser using a remote control whenever possible in order to prevent having workers present.

2.4 Install special precautions to prevent unwanted reflections in the invisible spectrum range of distance infrared lasers.

* 1. Laser products from class 3A – 2:

3.1 Only skilled workers are permitted to operate the laser devices.

3.2 Areas where lasers are in use shall feature warning signs.

3.3 Take precautions to ensure that people do not look directly at the laser beam.

3.4 The laser beam must be stopped at the end of its trajectory.

3.5 Position the beam trajectory significantly above or below eye level whenever practical.

* 1. General safety rules for operating laser devices in a laser laboratory:

4.1 Entrance is prohibited when the laser is in use.

4.2 The walls of the laboratory should be painted a bright color.

4.3 Use curtains to cover the windows.

4.4 Remove bright objects from the area of the radiation.

4.5 An exterior warning light must be connected to the laser supply and should operate simultaneously.

4.6 Ensure that there are fire extinguishers in the laboratory.

4.7 The laser device must be stable during radiation and not at eye level.

4.8 A safety instruction sheet specifically for the laser in the laboratory must be kept in a prominent place.

* 1. Safety rules for operators:

5.1 Ensure that all those present, including yourself, are wearing protective goggles suited to the type of laser waves.

5.2 Be sure that the door to the laboratory is locked and the warning light is on.

5.3 Ensure that the laser radiation is effectively blocked.

* 1. Hazards associated with operating lasers (the risks depend on the type of laser being used):

6.1 Associated radiation hazards – ultraviolet.

 There may be a risk from ultraviolet radiation associated with flash bulbs and tubes emitting a continuous laser.

6.2 Electricity hazards – most lasers use a high voltage electricity source and pulsing lasers are particularly hazardous due to the energy that accumulates in the cables.

6.3 Liquid rheogenic refrigerants are liable to cause burns and special precautions must be taken when handling these.

6.4 Other hazards – there is a risk of explosion in cable systems and the “optical pumping” systems when using high power laser systems.

* 1. Safety for laser laboratory workers:

7.1 Any employee who starts working in a laser laboratory with a hazard level 3B and 4 must undergo medical testing – contact the Social Welfare Department.

7.2 A new employee must work under the training and supervision of the laboratory director.

7.3 A new employee will start working after receiving specific safety instructions regarding the laser he will be working with.

7.4 Do not work without suitable eye protection.

7.5 Safety in the laboratory is the responsibility of the laboratory director.

7.6 The laboratory director will conduct safety training for workers once a year.

7.7 Safety instructions that are specific for the laser laboratory must be written up and hung in a prominent place in the laboratory.

* 1. Sources:

Israel Standard IS 1245.

Instructions for Safety in Laboratories with Lasers, of the Safety Institute.

Safety Regulations for Lasers, 2005 – Ministry of Industry, Trade and Labor.