

Maintenance

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Maintenance

Here are The Edge Laser cutter maintenance routines. There is a regular schedule, but maintenance is only carried out when required. The tasks below are based on the maintenance established when we first took delivery of the Laser and have been sourced from the Trello Fab Lab Equipment Logs.

Daily Maintenance: OPEN

- Check internal mirror and laser optics at open and clean if necessary
- Check "Last Cleaned" plate on Atmos Extractor to ensure maintenance is up to date
- Check that the machine was given general clean after last use
- Record Date, Time & Initials on "Last Checked" plate

Daily Maintenance: Every 2 Hours of Operation

- Check internal mirror and laser optics and clean if necessary
- Check for excessive debris on Lens Cone and in bed
- Check Lens retaining collar is screwed in tight
- Record Date, Time & Initials on "Last Checked" plate
- Wipe down inside of machine with baby wipes to get rid of dust

Daily Maintenance: CLOSE

- Remove cutting bed and clean debris from under bed. Wipe down with baby cloth
- Check and clean internal mirror and laser optics if required
- Remove Lense collar and clean thread on collar and Laser head
- Remove laser head nozzle and clean inside and out with baby wipes
- Wipe exterior down with baby wipe
- Power down Laser
- Delete all old cut files from RayJet software
- ~~Clean up files from desktop.~~ not needed as edgeuser account refreshes on restart
- Shut down laser computer
- Put scrap pieces into scrap box

Weekly Maintenance

- ~~Clean mirrors inside side panel.~~ Not needed weekly - inspect only and clean if needed
- Clean any debris from side housing
- Scrub air-intake with toothbrush
- Clean entire enclosure
- Check bed alignment plate screws (on bottom of bed) - tighten if needed
- Clean glass
- Check/replace top foam filter and clean top of extractor

- Photograph laser lens and note any damage in log

Lens and Mirror Cleaning and Inspection

The RayJet lens is the most delicate part of the machine. It has a relatively soft Zinc Selenide (ZnSe) Lens, which is vulnerable to scratches from cleaning with dust on the lens, scraping, drop or thermal shock. Trotec Lenses are manufactured by <http://www.iiviinfrared.com/>, which as of 11/2021 is down. However there is a web archive of their cleaning handling page [here](#)

For a comprehensive overview of cleaning a ZnSe lens, check out the ULO Optics [cleaning page](#).

The RayJet can take either 1.5 inch or 2 inch lenses. We have been supplied with two types of lens - one fits on top of the lens holding nut (2 inch lens - black), the other below (1.5 inch lens - red). The current lens is a 2 inch top mounted.

The mirror located in the lens housing is much more robust, but still requires delicate handling.

Before you start

You will need:

- lens cleaning solution
- lens cleaning tissue
- a sheet of polypropylene or a clean cloth
- The lens loupe - and/or your glasses :)

Cleaning Lens and Mirror

This procedure is adapted from the official [trotec manual](#)

Never use a cleaning tissue twice. Dust accumulated in the cleaning tissue could scratch the lens surface.

Remove Lens and Mirror

1. Move bed to about 10cm below lens assembly
2. Turn off Laser or power down with the button on the front panel
3. Move the lens to about the centre of bed, place sheet of poly or clean cloth under lens
4. Loosen mirror nuts, remove and place upside-down on poly
5. Loosen lens holding nut (turn **clockwise** for 2 inch top-seated lens - **counter-clockwise** for 1.5inch bottom seated lens)
6. Remove lens by sliding **straight out**
7. Place lens carefully on poly or cloth

Inspect and Clean Mirror

1. blow off the mirror the squeezy blower
2. Check the surface of the mirror again
3. If necessary clean the mirror
 1. Spray with cleaner
 2. Put on gloves
 3. tilt to wash away coarse soiling
 4. Dab dry with a clean cloth
 5. Spray again and wipe clean with a new damp cloth (spray cloth with cleaner)
 6. if necessary dry with a clean cloth
 7. Replace Mirror

Inspect and Clean Lens

1. blow off the mirror the squeezy blower
2. Check the surface of the lens again
3. If necessary clean the lens
 1. Hold the lens assembly by its edge and spray
 2. While holding the lens at an angle, flush both surfaces of the lens, to wash away coarse soiling
 3. Put the lens on a clean lens cleaning tissue
 4. Put on gloves
 5. Spray some lens cleaning liquid on **one** side of the lens
 6. Leave the liquid to take effect for approximately one minute
 7. Gently wipe it away with lens cleaning tissues soaked with lens cleaning liquid
 8. Dry this side of the lens with dry lens cleaning tissues and repeat the cleaning process on the other side of the lens
4. Examine the lens. If it is still soiled, repeat the cleaning process until the lens is clean
 1. **this process may have to be repeated - with baked on crud expect at least five cleaning cycles**
5. Carefully insert the lens holder with lens into the working head
6. The side marked "top" is facing up. This is guaranteed by the design of the lens holder
7. Tighten the lens holder - turning **counter-clockwise** for a 2 inch (black) lens and **clockwise** for a 1.5 (red) lens

Laser Cutter Air Filter Maintenance

How often should this be done? Maintenance of the Atmos500 is essential to keep fumes and particulates from the Fabrication Lab air. The top filter is augmented by a thin layer of rockwool insulation, which is the regular consumable for the filter.

Before you start

Always wear gloves and a respirator type mask. Collect a bin liner from the cleaning store.

1. Unlock top filter with large allan key from service kit
2. roll-up rockwool and place in garbage bag
3. Check filth level on filter liner (the cream coloured foam)
 1. if there are visible beads of gunk, then discard into bin
4. wipe down internals of top filter
5. replace filter liner
6. tear off a section of rockwool, make a layer about 1 inch thick
7. lay rockwool on top of filter liner
8. close and lock top filter
9. update filter maintenance panel

Baseline Measurements for Filter

This is the base line measurement for the Atmos 500. Any time the filter components are changed refer to these settings.

- Activated Carbon only 27%
- Activated Carbon + (new) HEPA only 27-28 %
- Activated Carbon + (new) HEPA + fiber filter 29 %
- Activated Carbon + (new) HEPA + fiber filter + foam 34%