A Focus on Service

Improved Longevity

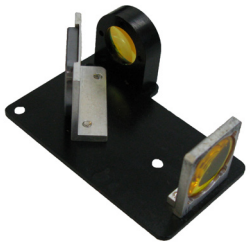
Getting the most out of your optics

Dear Service,

I am having trouble keeping my optics clean and when I do clean them, they tend to scratch. I've also noticed that when scratched, I have less power and my overall quality is diminished. Do you have any best practices when it comes to cleaning and maintaining the optics of the laser system?

Damaged Optics

Thank you for taking the time to ask this question. The optics of your laser system are arguably one of the most important components of the laser system. Maintaining the optics is vital to successful laser processing. Unfortunately, they are often one of the most mistreated components of a laser system. Scratches on the surface of the optics will alter how the beam travels and/or how the beam focuses, resulting in low power and/or poor quality. Below we outline how to properly care for and clean the optics of your laser system.



First, never clean the optics if they appear to be clean. Excessive cleaning will prematurely remove the optical coating. Also, try not to touch the optical surface as the oils on your skin may damage the coating. Finally, never clean the optics right after they have been used to process material or immediately after cleaning, since thermal shock can cause the optics to crack.

To clean your optics gather Industrial Packed 100% Cotton Swabs and Lens Cleaning Solution. These supplies are provided with the laser system at purchase, but you can contact your local Authorized Representative to purchase more if supplies are running low. It is important not only to use the correct cleaning solution but the correct cotton swab as well. A swab that is not made of 100% cotton and is not industrial-packed could cause a film and/or lint to contaminate the optics. When using a cotton swab to clean the optics, we have found it effective to use a rolling motion, which reduces the chances of scratching the optics.

#2 Mirror & Beam Window or Collimator

When cleaning the #2 mirror and the Beam Window or Collimator, moisten a cotton swab with the lens cleaning solution. Gently roll the cotton swab across the optics once. Do not drag the swab or roll it back and forth, as doing so can scratch the surface of the optics. Continue this procedure with a fresh cotton swab until the optics are free of debris.

#3 Mirror & Focusing Optics

When cleaning the #3 mirror and the focusing optics, flood the surface of the optics with the lens cleaning solution. If heavy debris is present let the solution soak for 1 minute. Roll a fresh cotton swab across the optics in one direction using a fresh swab after each pass. Repeat this step on both sides when cleaning the focusing optics.

Key Considerations

With all this in mind, you may still be wondering, "how often do I need to inspect/clean the optics of the laser system?" The official answer: the optics should be inspected after every 8 hours of use. But this is dependent on the laser process and the material you are using. Since some materials release notable amounts of effluent during laser processing, it may be advisable to decrease the amount of time between inspections. You should also always begin the day by inspecting the optics of your laser system prior to laser processing.

Remember, by properly maintaining your optics, you can expect your laser system to continue to perform consistently. Continue on to the next page for complete optics cleaning instructions and a recommended maintenance schedule.

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Optics Maintenance

A visual inspection of the #2 and #3 mirrors, beam window and focusing lens should be performed at least once a day.

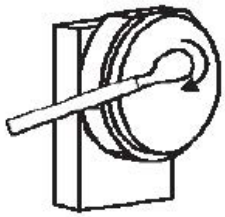
Caution: Do not clean an optic that is visually clean. Excessive cleaning can damage the optical coatings. To prevent contamination, wash your hands thoroughly before handling and cleaning any optic. Try not to touch the optical surfaces with your fingers by handling the edge or optical housing only. Fingerprints can damage the optical coatings. Never clean any optic right after laser processing because the optic may be hot and the cool lens cleaning solution may thermally shock and crack the optic.

#2 Mirror

1. VLS Desktop & ILS
   - To gain access to the #2 mirror, grasp the protruding tab of the #2 mirror and pull toward the center of the system. The mirror is held in place with magnets.

   - or -

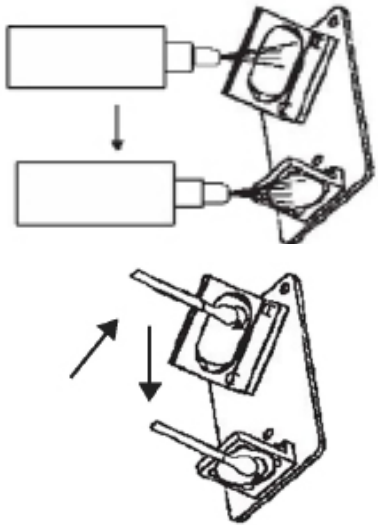
   VLS & PLS Platform
   - To gain access to the #2 mirror, the mirror cover must be removed. Remove the thumbscrew and slide the cover to the right and then lift the cover straight up.



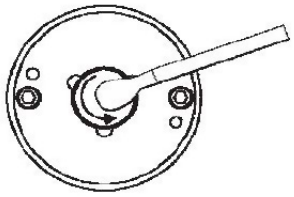
2. Inspect the #2 mirror and clean it only if there is debris present.
3. To clean the #2 mirror with a cotton swab, moisten the cotton swab with the lens cleaning solution supplied with the laser system. Do not use other types of cleaners or solutions.
4. Gently roll the cotton swab across the mirror once. Do not drag the swab or roll it back and forth as this can scratch the mirror. If the mirror did not come clean, use a fresh cotton swab and repeat the procedure.

#3 Mirror and Focusing Lens

1. The #3 mirror and the focusing lens are both mounted to the front cover.
2. To gain access to the #3 mirror and the focusing lens, hold the front cover with one hand and remove the two/three thumbscrews with the other hand. Pull the front cover straight out.
3. Tilt the front cover enough to enable you to apply the lens cleaning solution directly to the #3 mirror and the focusing lens.
4. Flood the reflective surface of the #3 mirror with the solution. If heavy debris is present, let the solution soak in for a minute.
5. Roll a fresh cotton swab across the mirror in one direction. Use a fresh swab for each pass. Be gentle when cleaning the optic to avoid scratching the surface. Repeat this procedure for the focusing lens, but make sure you clean both sides of the lens.



Beam Window or Collimator



The beam window or collimator is where the laser beam enters into the processing area. It is located in the upper left-hand corner of the engraving area against the back wall and is yellow in color. It is only necessary to clean the front side of the beam window. Do not remove the optic to clean it; simply clean it in the same manner as the #2 mirror.

Note: If your system is equipped with Air Assist, you must remove the beam window protector to gain access to this optic to clean it. Rotate the beam window protector counterclockwise and then off at a 45-degree angle. If the beam window protector is stuck, use a 1/16 Allen wrench to slightly loosen the screw and try again. Set the protector off to the side and clean the optic, if necessary. Reinstall the beam window protector being careful not to scratch the optic.

Key Inspection Considerations

- Always inspect the laser systems optics prior to laser processing.
- Low debris operation - After every eight hours of operation.
- High debris operation - After every four or less hours of operation.