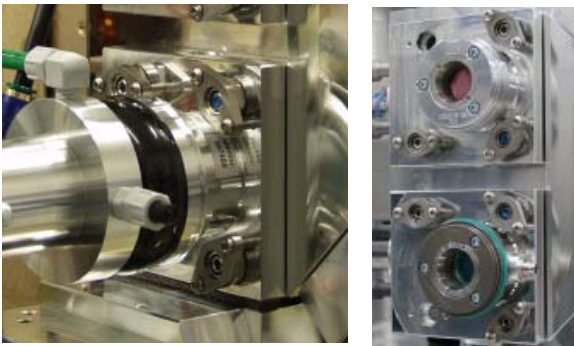




## COURSE DESCRIPTION

TruLaser Maintenance – I is the first course in TRUMPF's two-part TruLaser Maintenance training series. This course focuses on laser optics, mode analysis, beam delivery alignment, and other key preventive maintenance points. The goal of this course is to provide students with knowledge and skills to carry out proper maintenance tasks on all optics. Upon completion of this course, students will be able to perform all required routine maintenance tasks on laser internal optics, and external beam delivery optics.



## TARGET AUDIENCE

Maintenance personnel, operators with maintenance responsibility or Service personnel.

## PREREQUISITES

TRUMPF TruLaser Operator's Course or on-the-job operations/maintenance experience - including the ability to perform nozzle alignment and focus tests.

## COURSE DURATION

5 days

## OBJECTIVES

- Demonstrate laser and electrical safety work practice when performing maintenance on TruLaser machines
- Identify major machine sub-assemblies.
- Name all the buttons and keys on the MMC.
- Start up the machine and perform basic operations
- Perform maintenance on the cutting head.  
Perform mode quality evaluation shot at the cutting head.
- Perform maintenance on the resonator optics and discharge tubes.
- Perform baseline laser power test.
- Align external optics.
- Identify additional maintenance and lubrication tasks.
- Practice troubleshooting bad cutting problems.





Training Department  
c/o TRUMPF Inc.  
111 Hyde Road  
Farmington, CT 06032

Contact Kathy Coco at 860-255-6068  
[training@us.trumpf.com](mailto:training@us.trumpf.com)

## COURSE OUTLINE

- Introduction to laser and electrical hazards, and electrical safe work practices
- Introduction to TRUMPF laser principles and design
  - Laser characteristics, RF excitation theory, resonator theory and design
  - Analyzing the cutting process
  - DIAS III, five major processors, and FocusLine
- Machine components and their locations
- Introduction to cutting head
  - Components of the cutting head
  - Removing and assembling the cutting head
- Perform maintenance on the cutting head
  - Cleaning the focus lens
  - Perform nozzle alignment
  - Perform a focus test
- Introduction to resonator internal optics
  - Cleaning procedures for internal optics
  - Replacement procedures for internal optics
- Introduction to resonator discharge tubes
  - Performing a leak test
  - Practicing replacement procedures
- Mode quality evaluation shots at the cutting head including four-corner crosshair shots
- Introduction to beam alignment
  - Demonstrating safe work practices
  - Performing beam alignment procedures
- Baseline laser power test with a joule stick
- Maintenance schedules
- Lubrication cross-reference chart
- Maintenance tasks associated with laser optics including PM points on the machine, chiller, and vacuum system
- Theory of machine troubleshooting