

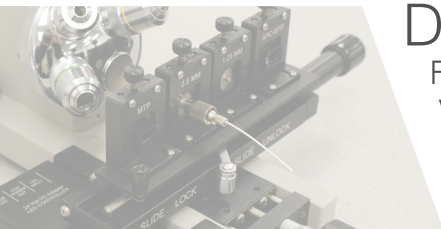
# DE2503

Fiber Optic Inspection Scope

User's Guide



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## DE2503

Fiber Optic Inspection Scope  
Video Microscope

## User's Guide

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# Overview

Manufactured by Domaille Engineering, LLC, the DE2503 Video Microscope is designed for visual end-face inspection of fiber optic connectors in a production environment.

**DE2503:** Our most popular model is equipped with a 4-position linear slide that can be equipped with different connector adapters in each position. The linear slide is locked into position with a quick release lever that permits up to 1/2" travel in the Y-axis for traversing multiple fiber connectors.

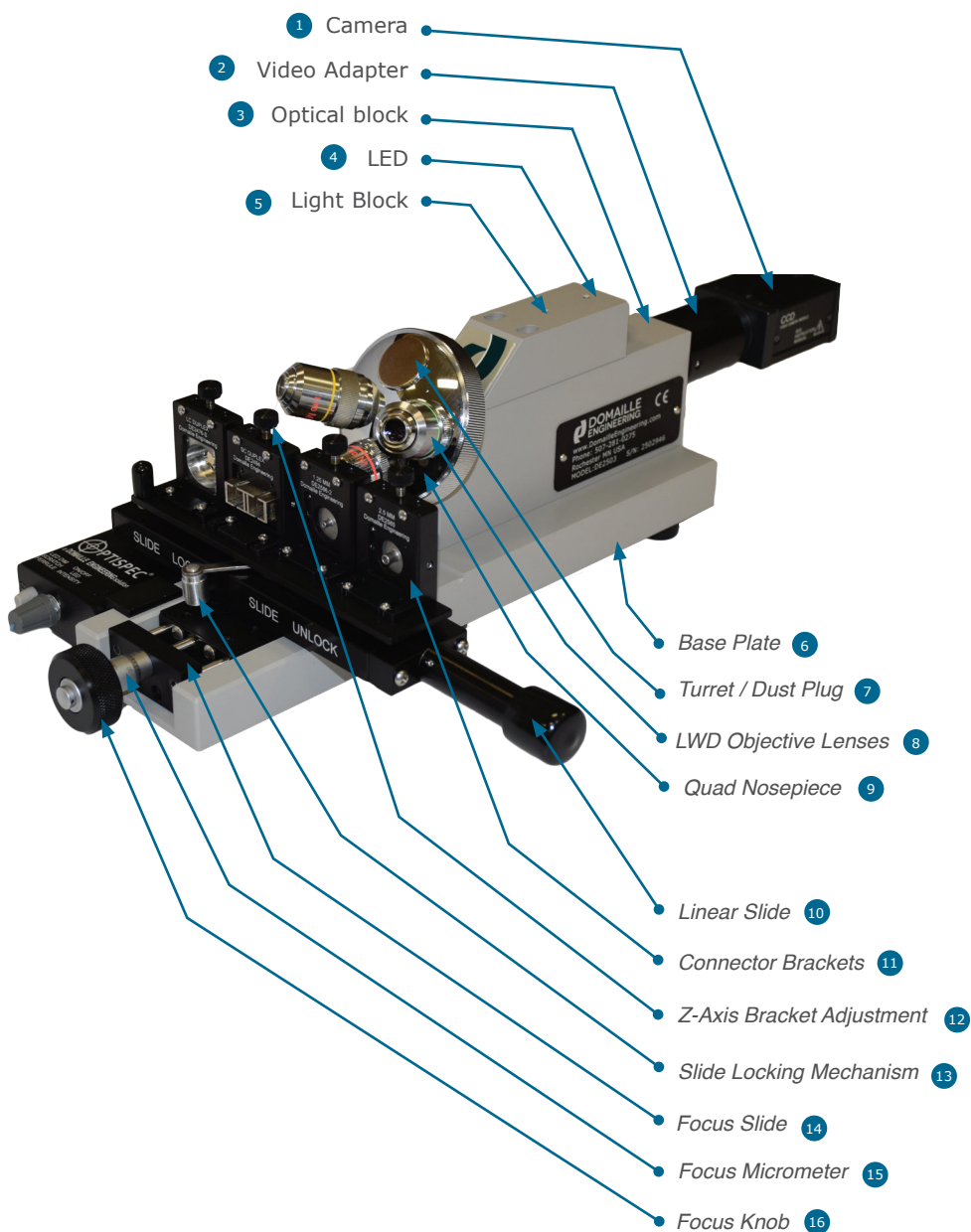
Within this manual is the information needed to operate and maintain the DE2503 Video Microscope. Domaille Engineering LLC, is always designing innovative new products while maintaining and further developing existing ones.

## Printing History

Edition 5, January 2015

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# Parts and Functions



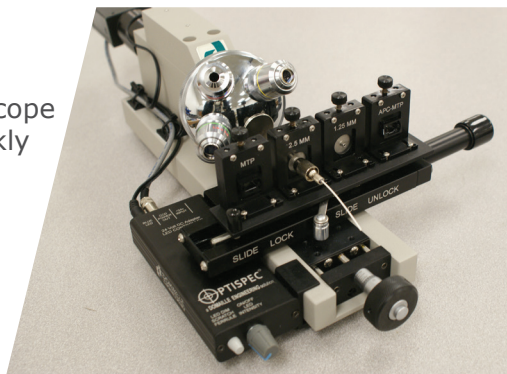
1	Camera	high resolution monochrome which is a standard component of the DE2503 microscope. Other options available.
2	Video Adapter	uses "C" mount to attach the camera to the Optical Block.
3	Optical Block	precision machined aluminum housing for all optics.
4	LED	5 volt, near UV LED with a connector slides into the light block to provide increased contrast of light scratches. Life-span rated @ 100,000 hours.
5	Light Block	centering block for the illumination, the lamp block attaches the illumination to optical block.
6	Base Plate	machined plate to align the optic block with the stage.
7	Turret / Dust Plug	prevents dust from entering the optical system. May be removed for additional objective.
8	LWD Objective Lenses	high quality Long Working Distance Lenses are the primary factor when determining magnification and resolution. Standard models are equipped with: ME - 12006 ME - 12007 ME - 12008 Optional 40x and 3.3x objectives are also available.
9	Quad Nosepiece	four position nosepiece or turret allows quick change of magnifications.
10	Linear Slide	four position linear slide allows the operator to quickly slide and use up to four adapters for viewing a variety of fiber optic connectors. Optional 6-position linear slide available.
11	Connector Brackets	a variety of adjustable receptacles to hold individual connectors.
12	Z-Axis Bracket Adjustment	"up and down" centering adjustment for aligning the fiber optic connectors for viewing.
13	Slide Locking Mechanism	allows the operator to unlock and slide the stage quickly to the next bracket and then re-lock it into position for fine adjustments using the adjustment knob.
14	Focus Slide	this slide moves the stage assembly in and out of focus.
15	Focus Micrometer	precision adjustment for the focus slide.
16	Focus Knob	a grip for the focus micrometer.

## Features

- High Resolution video and camera.
- Quadruple Turret Nosepiece Long Working Distance Optics for UPC, APC, and Multi-Fiber inspection.
- An extensive range of adapters for most connectors.
- Custom adapters available upon request.

## Initial Setup

After unpacking the DE2503 microscope and accessories, set up can be quickly achieved through a few simple connections. There are three main components to the microscope system, the microscope, power adapter/LED Controller, and monitor (or computer using a frame grabber).



The ME-12013 LED Controller operates from a 24 volt DC output power adapter (ME-12015) with switching transformer to accept AC voltage 90-240 volt, 50-60Hz for domestic or international use. This unit is used to power both the camera and the illumination of the microscope.

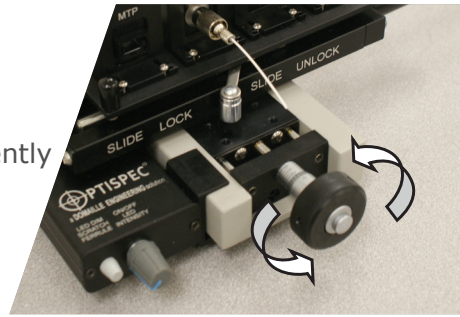
Currently we provide two different monitor types, in several different sizes. These monitors are high resolution monitors specifically chosen to provide the best solution for inspecting connector end-faces. We do not recommend any of the lower priced security type monitors as the resolution and image quality are not sufficient. A computer may also be used to capture images, contact Domaille Engineering for more information on digital camera options or video frame grabbers.

# Operation

## Focusing

The Focus Adjustment Knob is conveniently located next to the stage. Turning the knob adjusts the contrast of the image with precision and control.

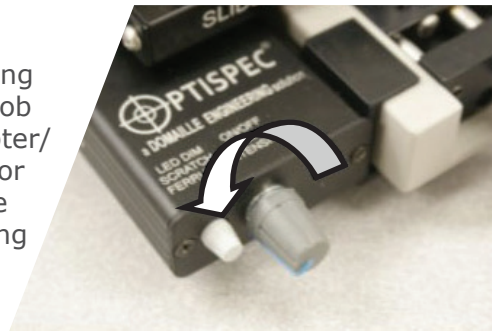
Clockwise = **Focuses the Stage In**  
Counter-clockwise = **Focuses the Stage Out**



## Lighting

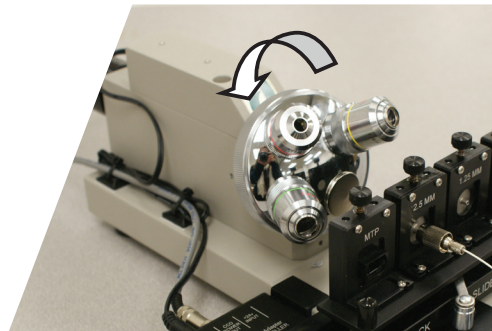
The illumination can be controlled using the "On/Off LED Intensity" control knob located on the ME-12013 power adapter/LED controller. This allows the operator to control the brightness of the image when inspecting the dark fiber cladding and highly reflective metal or ceramic ferrules.

Clockwise = **Increases Illumination**  
Counter-Clockwise = **Decreases Illumination**



## Changing magnifications

The DE2503 model is equipped with three objective lenses: 5x, 10x, and 20x. Mounted to a typical microscope turret or nosepiece allows the operator to quickly change magnifications when inspecting connectors. Optional 3.3x and 40x objectives are also available.

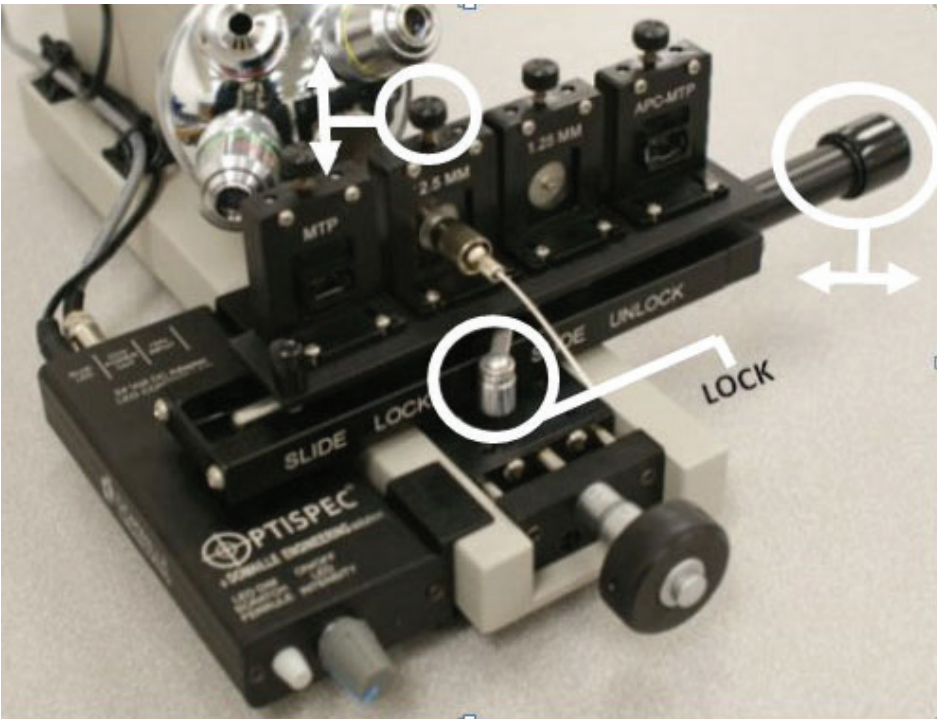




# DE2503 stage adjustments

Centering on the DE2503 can be accomplished along 2 axis. The lever in the front of the stage acts as a lock, flipping the lever to the right hand side of the scope unlocks the stage while flipping it to the left locks the stage.

Quickly change adapter positions by unlocking the stage and sliding the stage left or right. After locking the stage, use the knob on the right to accurately move the stage along the x-axis up to 0.5 inch. Each adapter has its own individual z-axis adjustment.

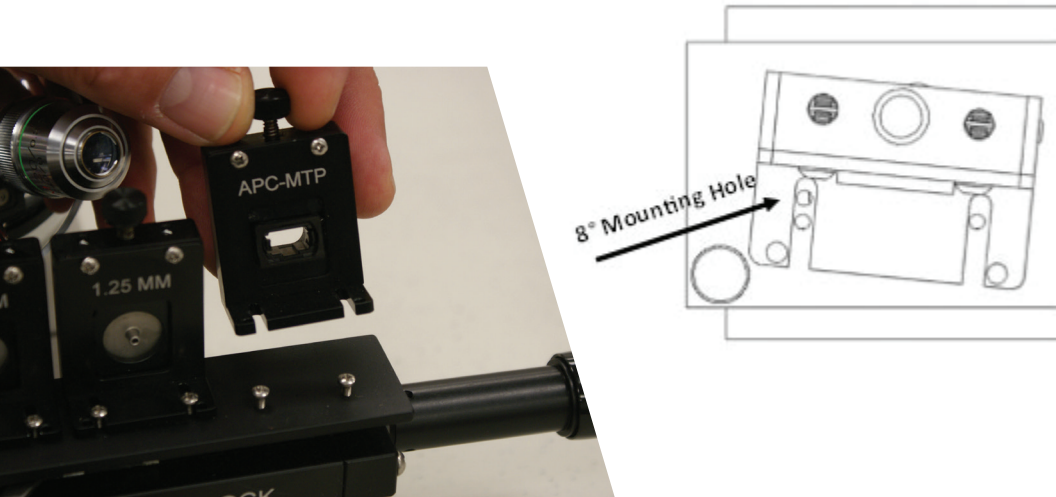




## Changing adapters on the DE2503

Adapters on the DE2503 stage can quickly be changed out by loosening the two screws. When aligning the adapters use the lower powered 5x objective.

Individual adapters can be moved back and forth to align them with others. This is used to “parfocal” the adapters to one another. Being parfocal minimizes the amount of focusing required when switching connector styles.



## Setting APC adapters on the DE2503

Use the two end positions on the DE2503 stage for setting up 2.5mm or 1.25mm adapters. A third mounting hole is provided to angle the adapter at 8°. Insert the connector key up on the left hand position and key down on the right hand position.

As with setting up any bracket it may be easier to use the low (5x) powered objective first. The angle can then be checked by inserting a connector and making sure the light is centered.

# Preventive Maintenance

## Caution:



The following instructions should only be performed by qualified service personnel.

## Warning:



If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



There is NO SERVICEABLE EQUIPMENT inside the ME-12013 LED controller. All equipment requiring repair should be sent back to the manufacturer or an authorized dealer.

*Note: The DE2503 microscope is relatively low in maintenance. Basic care and precaution in using the instrument is required. Depending on cleanliness of the general working area as well as the age of the equipment, we would suggest at least semi-annual service and maintenance.*

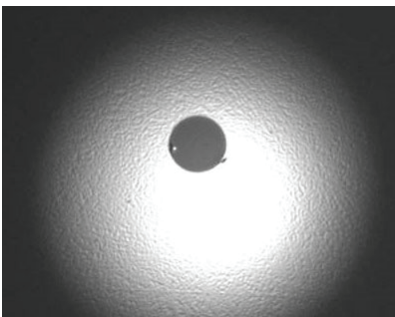
## General cleaning

Harsh solvents are not recommended on a regular basis. Typical safe de-greaser solvents can be used to clean old grease or grime from mechanical parts. Lens cleaner offered at most photo/camera supply stores is safe to use on the optics of our microscopes. Lens cleaner can be used with a soft lens tissue/cloth to remove any soil, fingerprints, etc. from the front of the objectives.

## Centering the illumination

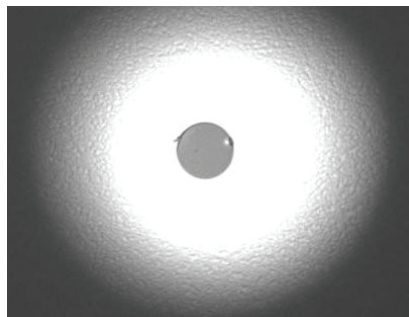
Centering the illumination of the DE2503 is critical in order to maximize performance of the microscope. All scopes are set up from the factory, but replacing lamps or periodic cleaning of the beam splitter may require the operator to re-center the illumination.

1. Using a 3/32" hex wrench, loosen the four socket head screws surrounding the light block.
2. While viewing a fiber on the monitor, slide the light block around until the greatest amount of light is over the cladding area of the fiber.
3. Re-tighten the four screws.



### **Incorrect Illumination:**

Notice how the light is towards the bottom of the screen.



### **Correct Illumination:**

Notice how the light surrounds the cladding. Light scratches can now be easily detected.

## Cleaning objective lenses

Oils, dirt, and finger prints may reduce the resolving power of the objective lenses. To ensure maximum levels of performance of the DE2503, wipe the lens of the objectives with a lint-free tissue and lens cleaner. Ordinary lens cleaner, available at most photography supply stores works the best. Perform this procedure weekly or as needed, depending on the type of environment inspection is being held.



## Cleaning the prism

Primarily an issue with older models, where frequent changes of the tungsten lamp caused debris to fall onto the prism. If for some reason the illumination or resolution diminishes and cleaning the objectives had no effect, cleaning the prism may be accomplished in just a few simple steps.



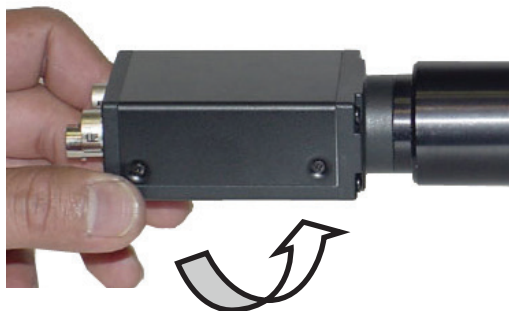
1. Using a 3/32" hex wrench, remove the four socket head screws surrounding the light block.
2. Lift the light block off of the microscope exposing the prism or beam splitter.
3. Without removing the prism, use clean compressed air to blow any debris off of the top of the prism.
4. If there is still visible dirt and debris, use lens cleaner and lint-free lens cloth to clean the prism. Use caution not to leave any streaks.
5. Replace the light block and follow the procedures for centering the illumination as described on page 9.

## Cleaning the camera

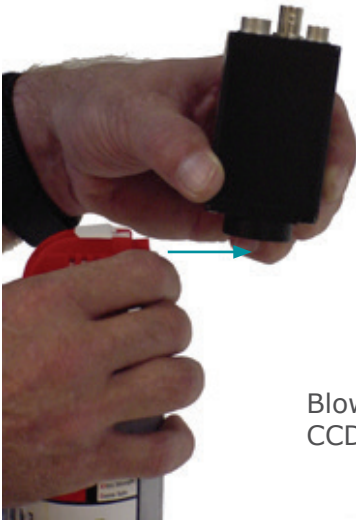
**Use extreme caution when attempting to clean the camera. Any scratches, solvent, streaks or dirt left on the IR filter of the camera will show up in the field of view of the microscopes.**

Before attempting to clean the IR filter on the camera, first confirm that the visible dirt on the monitor is actually on the camera. While viewing the suspected dirt on the video monitor, slowly rotate the camera on the Microscope.

Due to the orientation of the camera, if the dirt remains in the same spot and does not rotate with the camera, then it most likely is on the camera itself.



1. Carefully unscrew the camera from the camera mount.
2. Using clean, compressed air, blow across the surface of the IR filter.
3. Recheck the camera for dirt.
4. If the dirt is still there, use plastic tweezers, soft lens cloth and lens cleaner to carefully wipe the surface of the IR filter. Use a wiping spiral pattern from center of filter out to edges to remove debris.
5. Re-check the camera for dirt.
6. Repeat this process until the camera is clean.



Blow air across and not directly at the CCD chip of the camera.

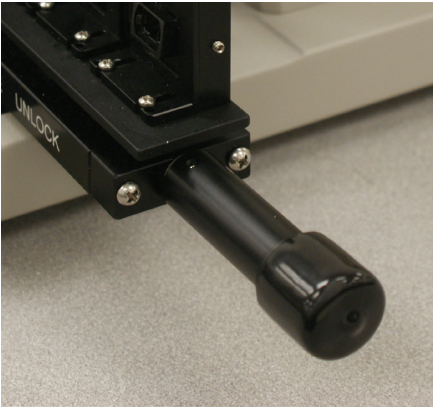


As a last resort, carefully try to wipe stubborn dirt from the IR filter in the front of the camera. Use Lens Cleaner and Lens Cloth obtainable from any retail camera store.

## DE2503 stage maintenance

Periodically clean and lubricate the slide on the DE2503 to ensure reliable and accurate position of the test connectors.

1. Using a small Philips head screw driver, unscrew the two button head screws on the right side of the slide.
2. Carefully slide the top of the stage assembly away from and off of the dovetail base.

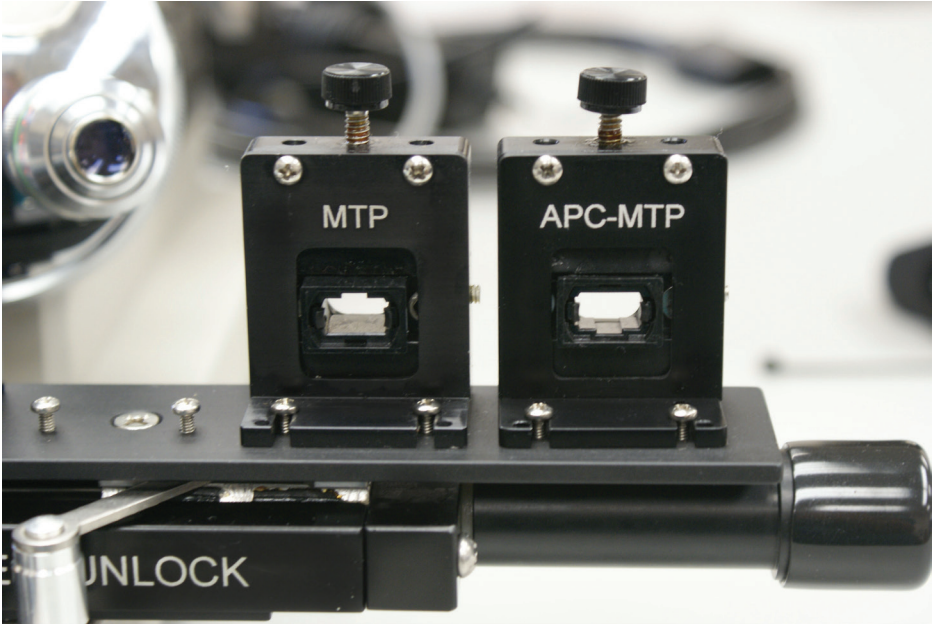


3. Clean the dovetail and the slider using any common de-greaser. Be sure to remove any debris such as connector caps that may have fallen into the slide.





4. Using a medium grease, lightly spread the grease over the dovetail and pads of the slider.
5. Re-fit the top half of the slide back on to its dovetail base and run it back and forth to further distribute the grease.
6. Replace the end of the slide.



## Lubricating the focus micrometer

Occasional lubrication of the focus micrometer will ensure accurate and repeatable results.

1. Unscrew the focus knob and carefully remove the micrometer drum.
2. Clean the micrometer drum with de-greaser.
3. Lubricate the drum and threads with a light grease.
4. Carefully replace the micrometer drum by screwing it back into the housing.

## Determining actual magnification

The best method to calculate the exact "total" magnification used on the DE2503 is to measure the cladding on the video display. Take the measurement in millimeters and divide that amount by the 125 micron cladding. The result is the "total" optical and video magnification being used.



*For example: taking a set of calipers, we measured the diameter of the ferrule viewed through DE2503 on a monitor to be approximately 53.49mm.*

*Actual size on display/cladding diameter in mm = total magnification  
 $53.49\text{mm} / .125\text{mm} = 427.92X$*



## Limited Warranty

Domaille Engineering, LLC ("Domaille") products are warranted by Domaille to be free from defects in workmanship and materials for a period of one-year from the original purchase date. This warranty covers defects in materials or workmanship only and does not include damage due to abuse, misuse, problems with electrical power, problems with compressed air supply, servicing not authorized by Domaille, failure to properly care for and maintain the products, or normal wear and tear. In addition, use of parts, components, or accessories not supplied or approved by Domaille will void this warranty.

Domaille's sole liability arising from any use of its products and this warranty is limited to repair or, at Domaille's sole discretion, replacement of defective products or defective component parts thereof. To request warranty service, you must contact Domaille at 7100 Dresser Dr. N.E., Rochester, MN 55906, USA. If warranty service is required, Domaille will issue a Return Material Authorization Number (RMA#). You must ship the products back to Domaille in their original or equivalent packaging, pre-pay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. Along with your RMA # include your name, telephone number, return address, proof of original purchase date, and a description of the claimed defect. If the defect is covered by this limited warranty, Domaille will repair or replace (at its option) the product or the defective component part(s) and ship them freight prepaid to an address in the continental U.S. Shipments to locations outside of the U.S. that are not the original shipped to location will be made freight collect or will be shipped to the original shipped to location, at the discretion of Domaille.

**NO WARRANTY OTHER THAN THE ABOVE LIMITED WARRANTY IS MADE, EITHER EXPRESS OR IMPLIED. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ONE YEAR LIMITED WARRANTY PERIOD. DOMAILLE SHALL HAVE NO LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RELATING TO ITS PRODUCTS.**

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# Product Summary:

Domaille Engineering's mission is to provide our customer with the highest quality solution through the innovative use of technology that allows our customers to gain a competitive edge. Our core competencies in engineering and precision manufacturing provide OEM's and fiber optic customers effective and cost efficient solutions.

From our world renowned APM-HDC-5300 polishing machine to our patented MT EZ AbraSave® fixtures, Domaille Engineering equipment provides the highest yields and throughput in the fiber optic industry.

The Domaille APM-HDC-5300 interface allows user to program a soft ramp of pressure and speed. This feature along with accurate force, speed, and time enables customers to consistently meet the most demanding fiber optic polishing specifications.

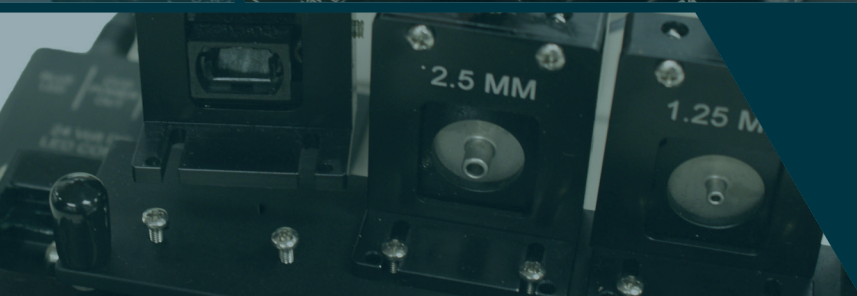
Our patented AbraSave® fixture line utilizes Unique Path Technology which reduces polishing time and polishing film costs. The AbraSave® technology delivers the greatest consistent fiber protrusion for the best polishing results in the fiber optic industry.

The OptiSaber™ laser cleaver family is a Domaille solution addressing process variation associated with cracking, which is typical of mechanical cleaving process. Our OS7000M patent pending MT adapter allows users to cleave both UPC and APC ferrules with a few simple adjustments. The OptiSaber™ OS7000S single fiber laser cleaver has several different single fiber adapters to choose from depending on connector type.

Domaille Engineering proudly offers our OptiSpec® product line of fiber optic microscopes. Our OptiSpec® microscope line offers customers high quality fiber optic inspection capabilities for both production and laboratory settings.

View all of our products, including the Universal Cure Oven and Air Cleanse System, at [www.DomailleEngineering.com](http://www.DomailleEngineering.com).





Domaille Engineering, LLC  
7100 Dresser Drive NE  
Rochester, MN 55906

Phone: 507-281-0275  
Fax: 507-281-8277  
[info@domailleengineering.com](mailto:info@domailleengineering.com)

[www.DomailleEngineering.com](http://www.DomailleEngineering.com)