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Outline

- Incident-Light Microscopy - why?
- The H 600 AM 50
- The Workshop Microscope W-AD 50
- The Zoom Microscope ZM
- Stereo Microscopes
- Examples

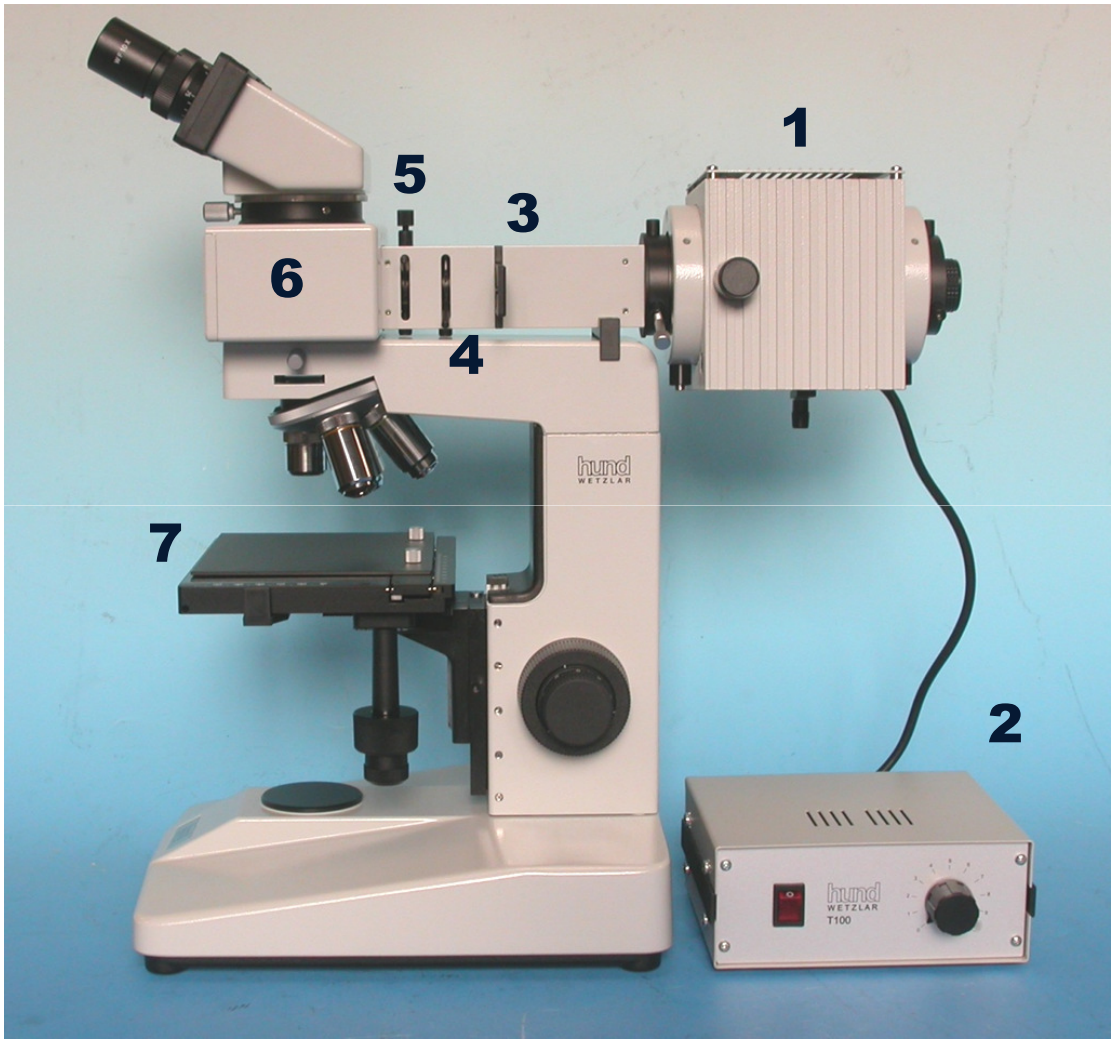
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Incident-Light Microscopy?

- Transmitted-light microscope: object observed „like a photographic slide“
- Opaque objects?
- Large objects?
- Illumination „from above“
- Small free working distance: Illumination through objective, acts as condenser

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The H 600 AM 50



1 Halogen lamp, 50 W

2 Power supply

3 Filter slide

4 Aperture diaphragm

5 Field diaphragm

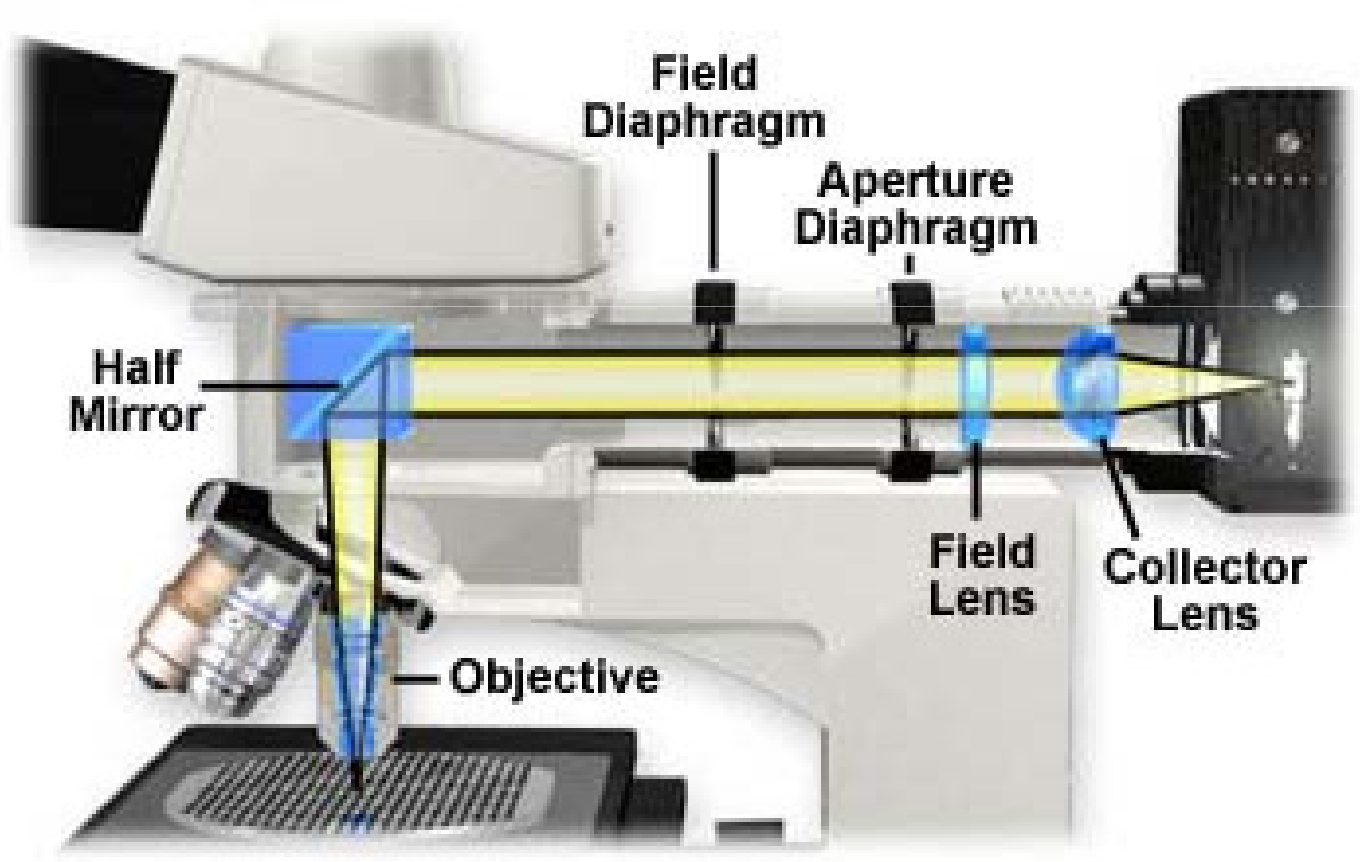
6 Semi-transparent beamsplitter

7 Stage, can be lowered for large specimens

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The H 600 AM 50

Beam Path:



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The H 600 AM 50

Dedicated objectives: EPI objectives („over“)



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The H 600 AM 50

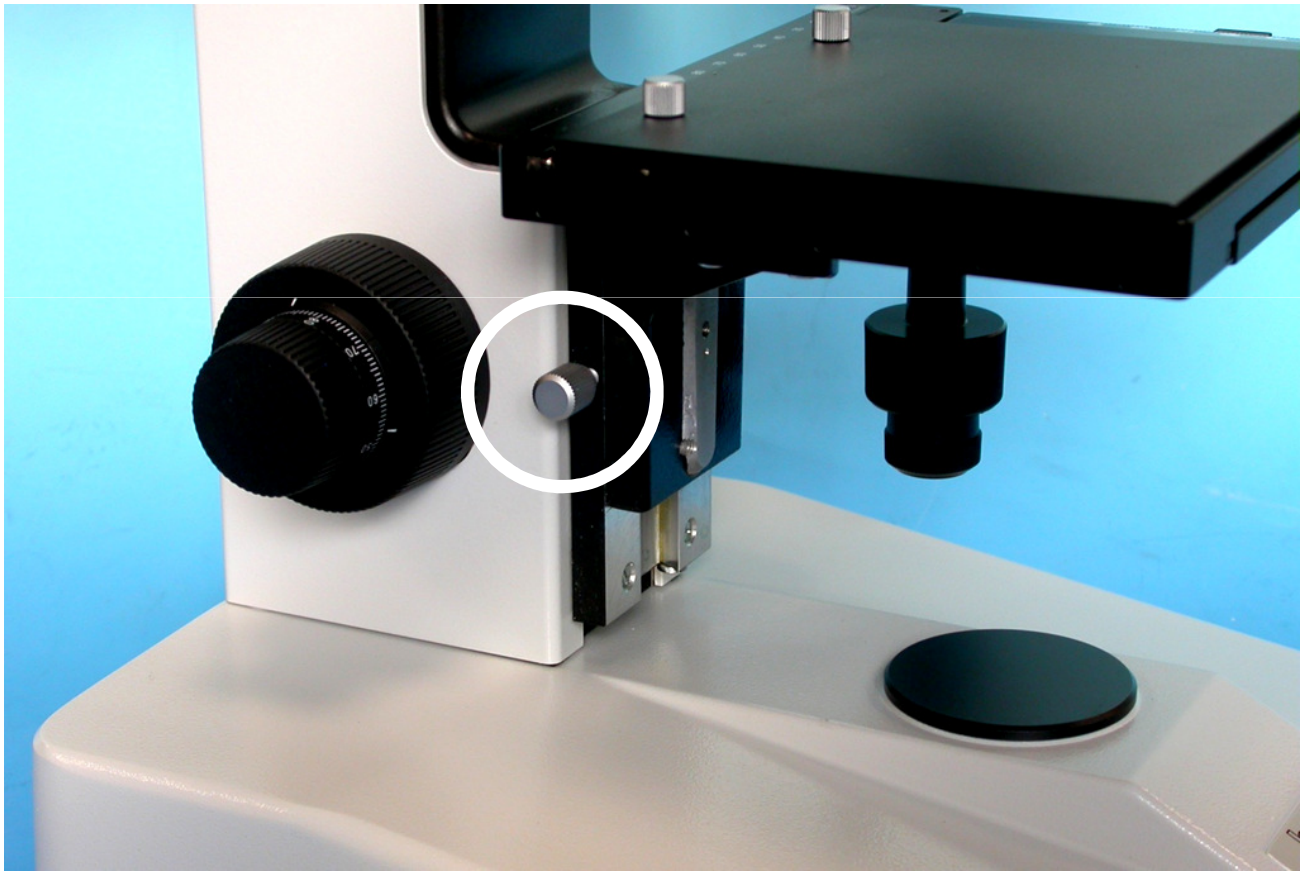
EPI Objectives:

- Reduction of internal reflections: light traps, black surface coatings
- No cover-slip correction
- Tube length 160 mm
- Complete set EPI 4/0,10 – EPI 60/0,85

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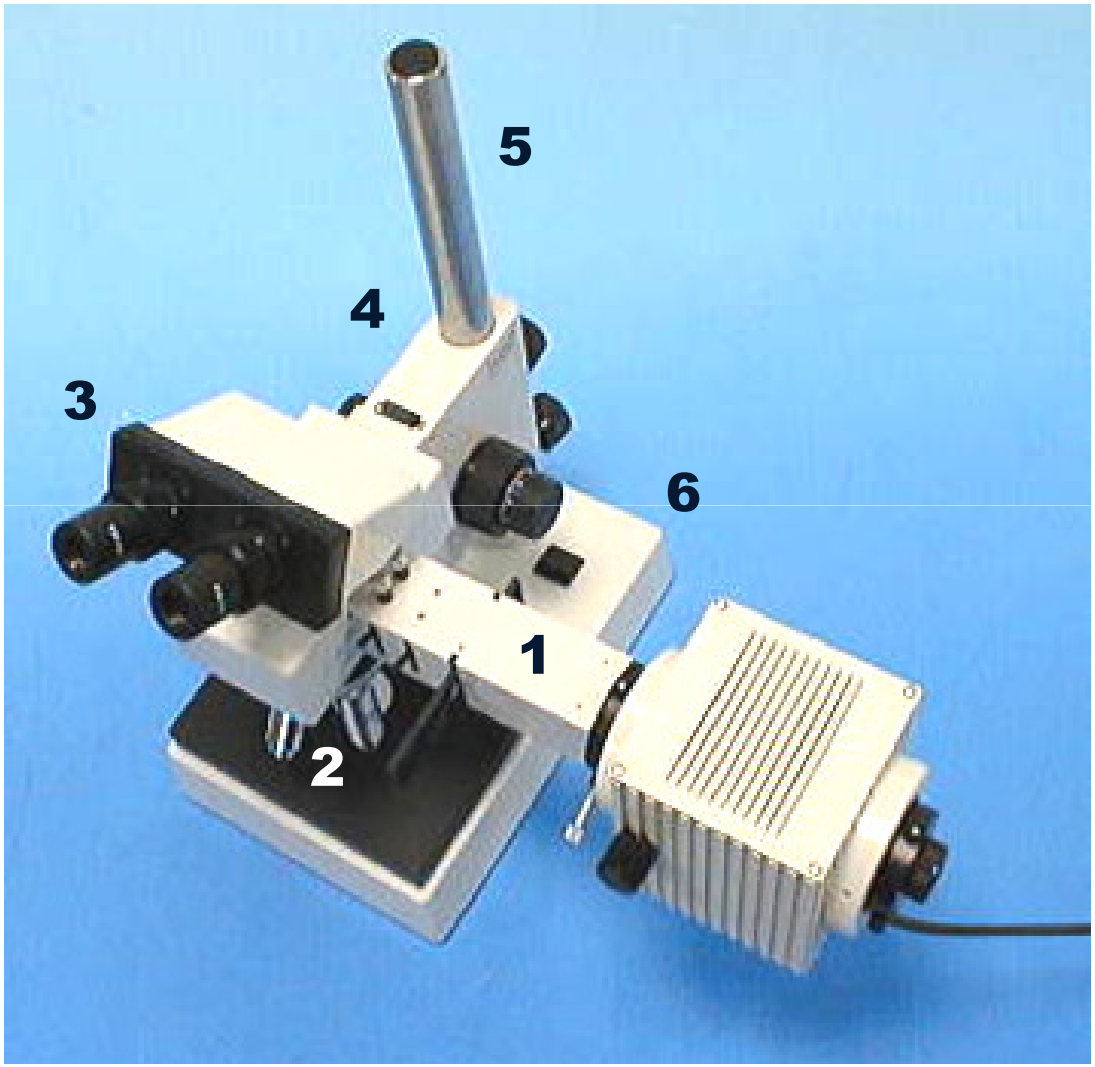
The H 600 AM 50

Lowerable Stage:



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Workshop Microscope W-AD



1 Incident-light illuminator

2 Nosepiece

3 Binocular tube

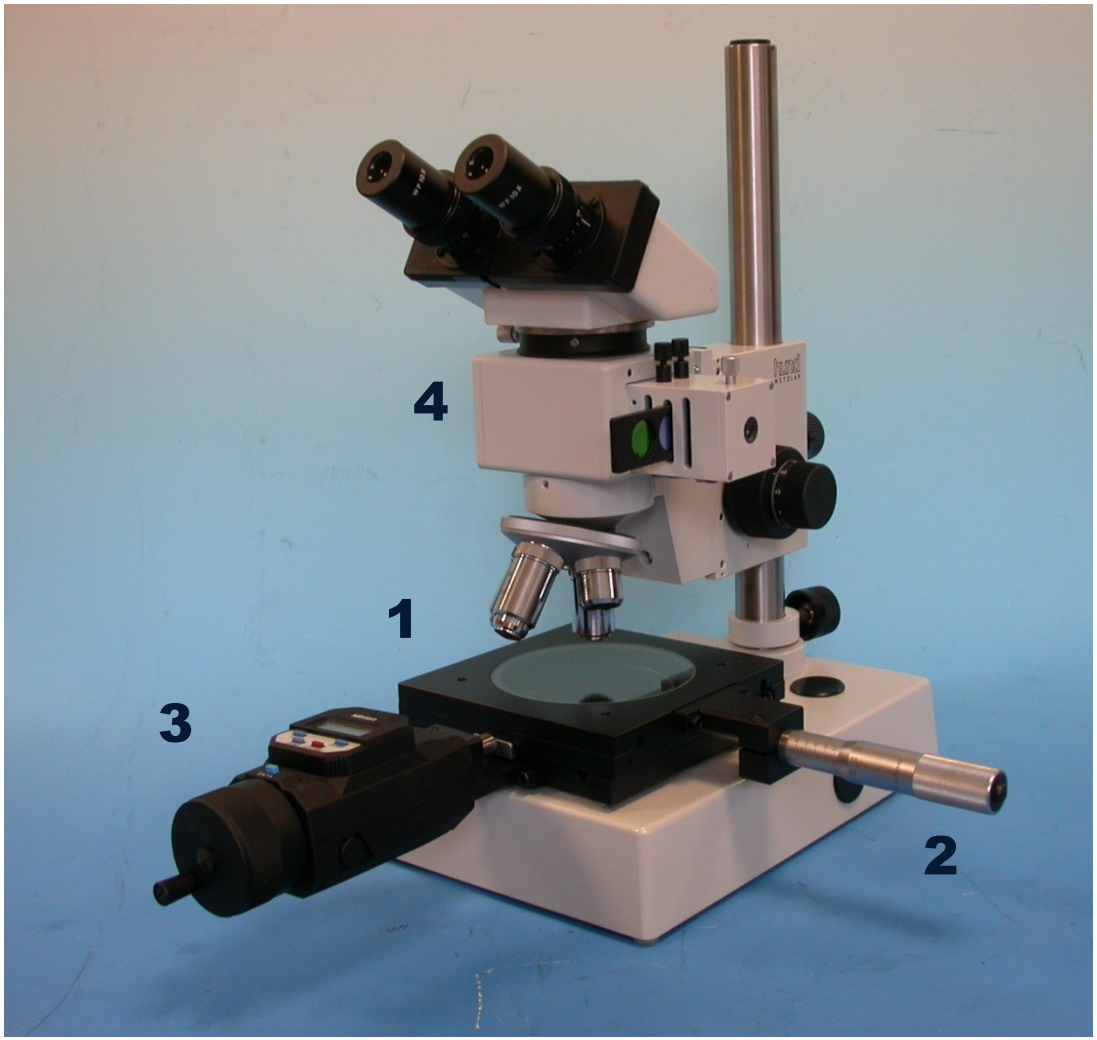
4 Coarse and fine focusing drives

5 Column

6 Stand base

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Workshop Microscope W-AD



1 **Measuring table**

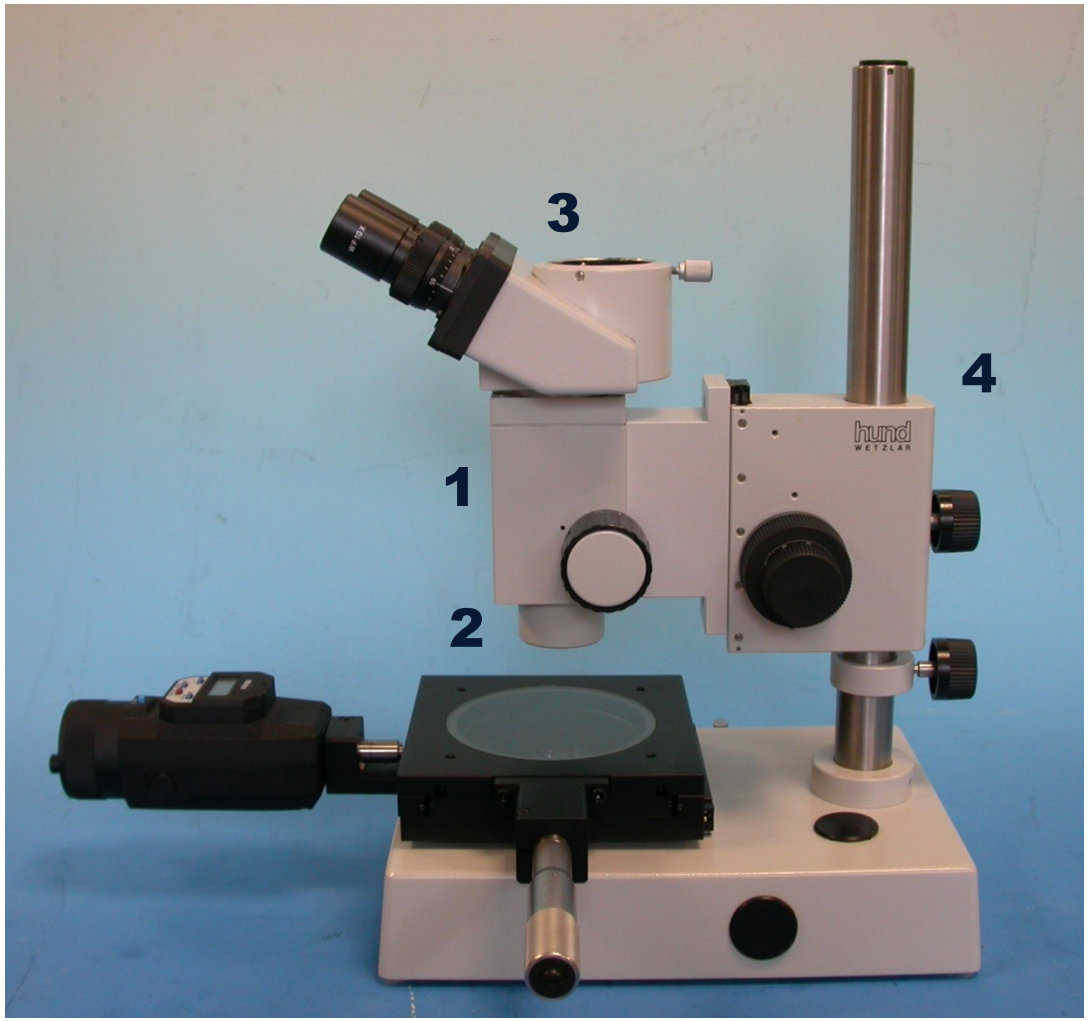
2 **Mechanic micrometer head**

3 **Digital micrometer head**

4 **Compact illuminator for cold-light source, lightguide**

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The Zoom Microscope ZM



1 Zoom system

2 Connector for auxiliary lenses (2x, 5x)

3 Trinocular tube (Ring dovetail!!!)

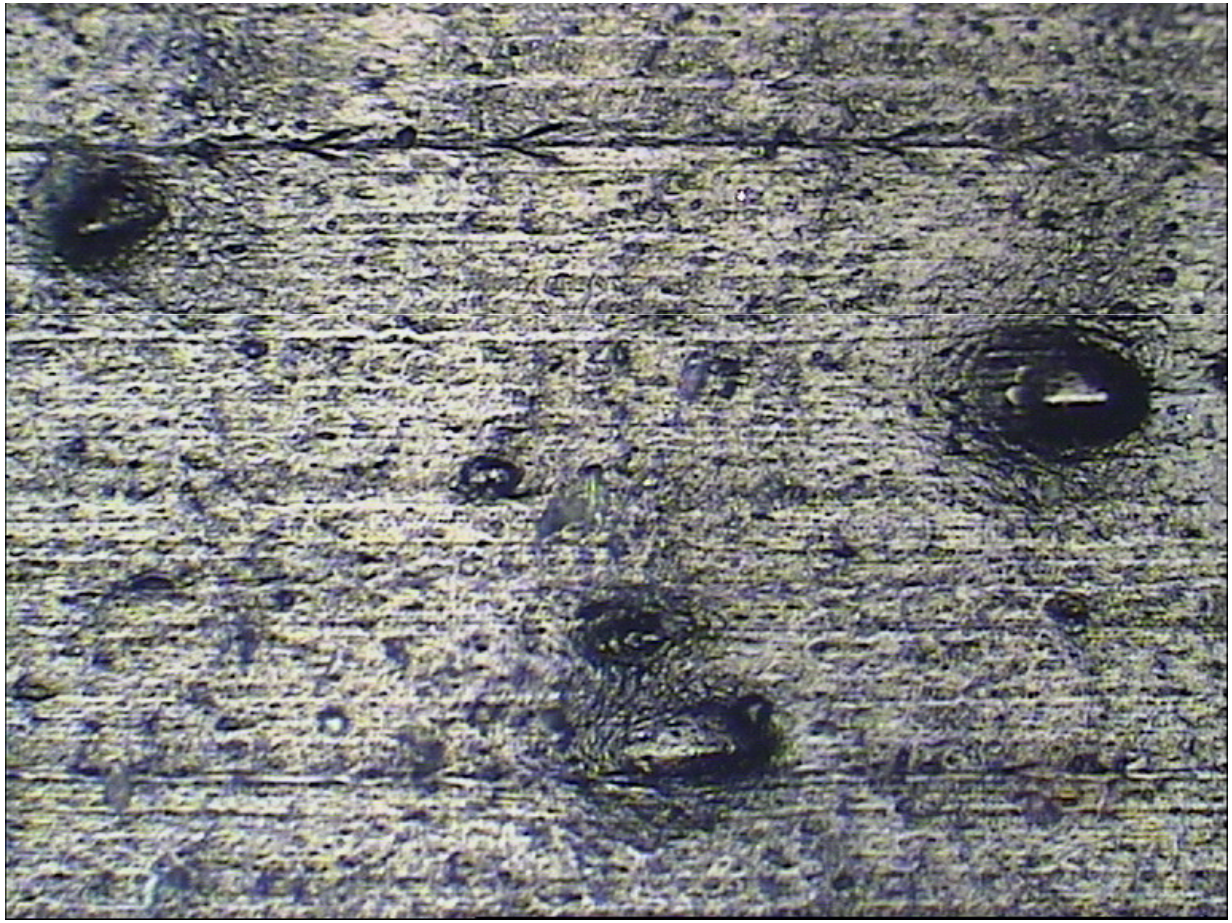
4 Stand W-AD

External illumination necessary!

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Examples

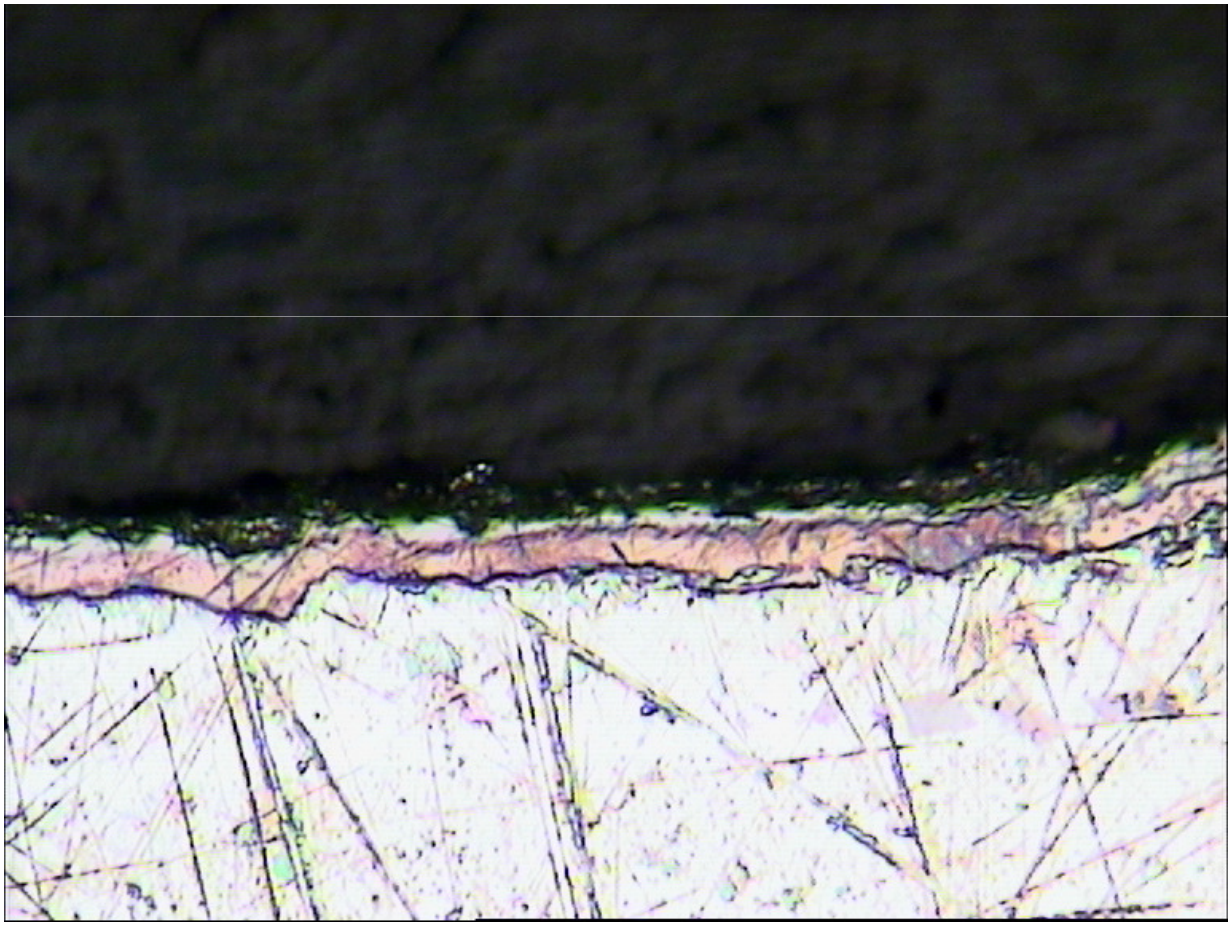
- Tyre rubber: Degree of dispersion



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Examples

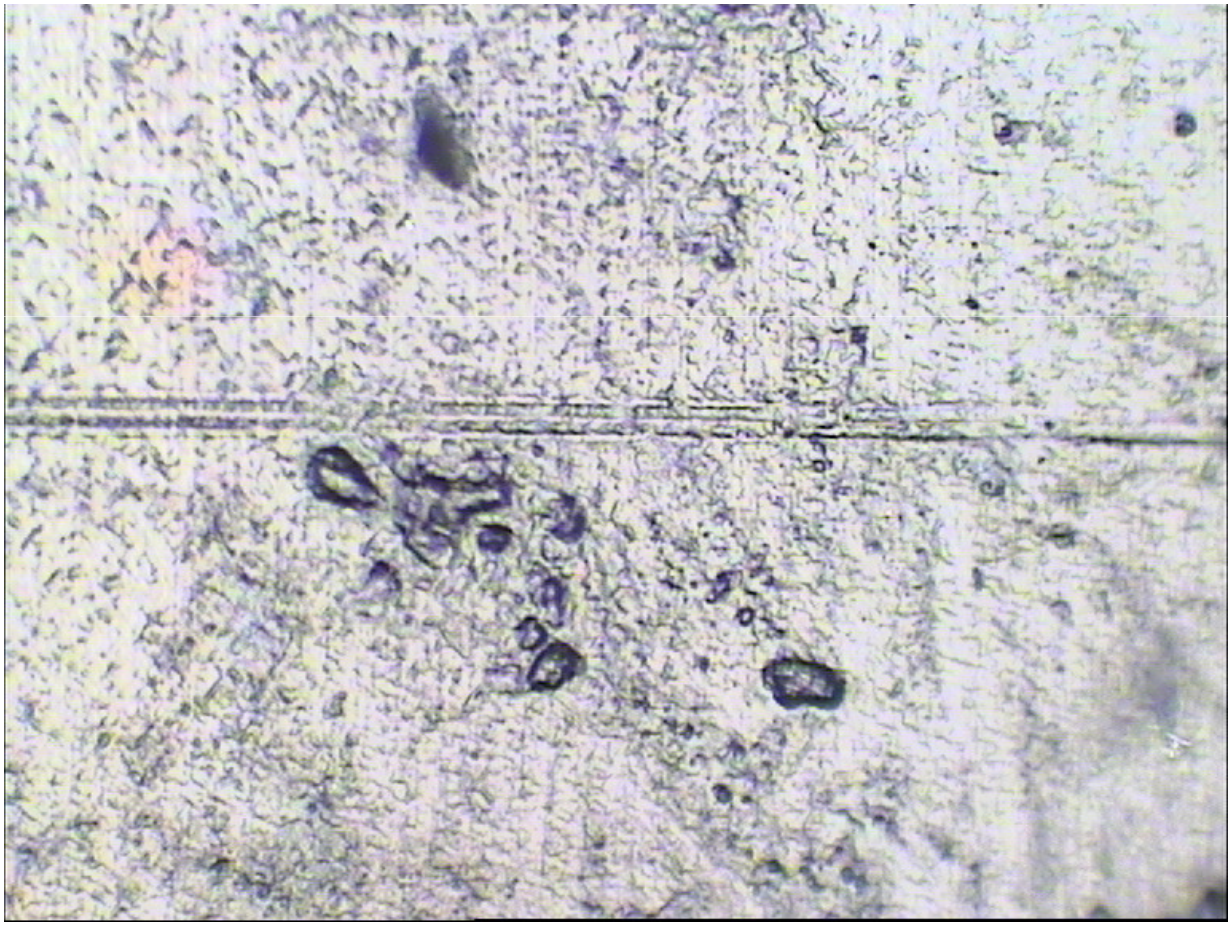
- Galvanic layer systems



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Examples

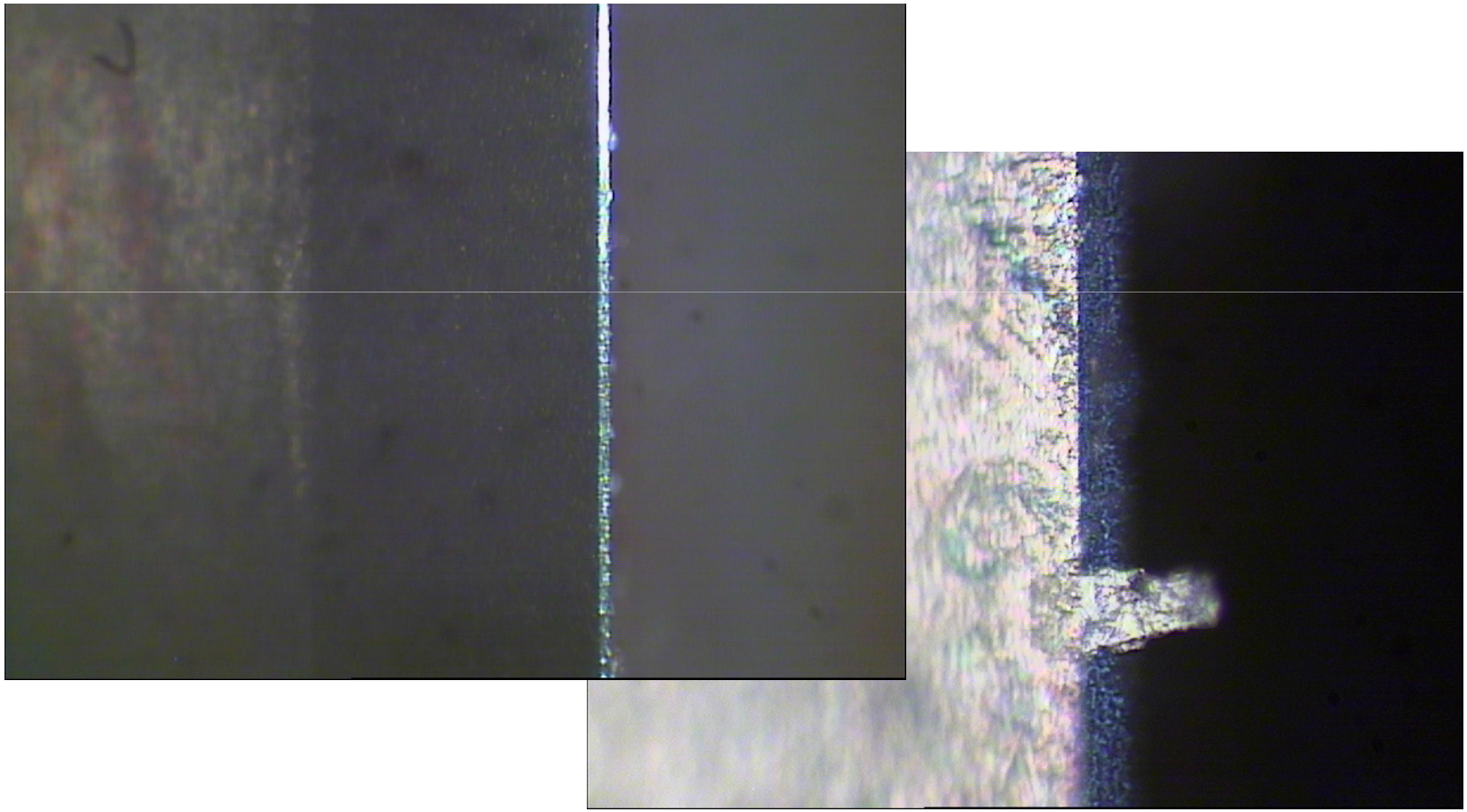
- Inspection of ophthalmic lenses



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Examples

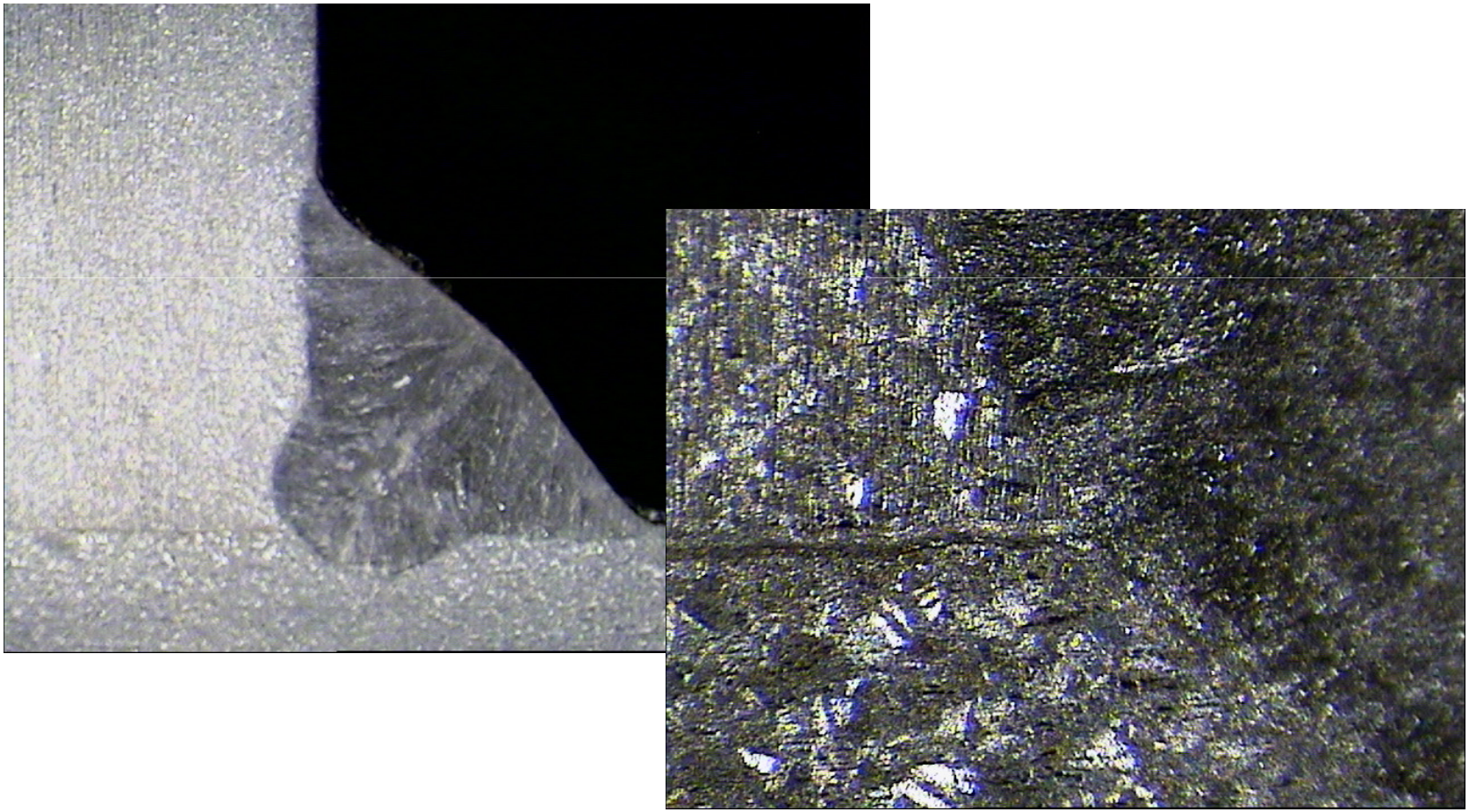
- Grinding tool inspection (ophth. lenses)



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Examples

- Weld seam inspection



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Outline

- Stereo Microscopes - why?
- Optical Setup
- Stereo Microscope Heads
- Stand Systems
- Illumination Systems
- Example

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Stereo Microscopes – Why?

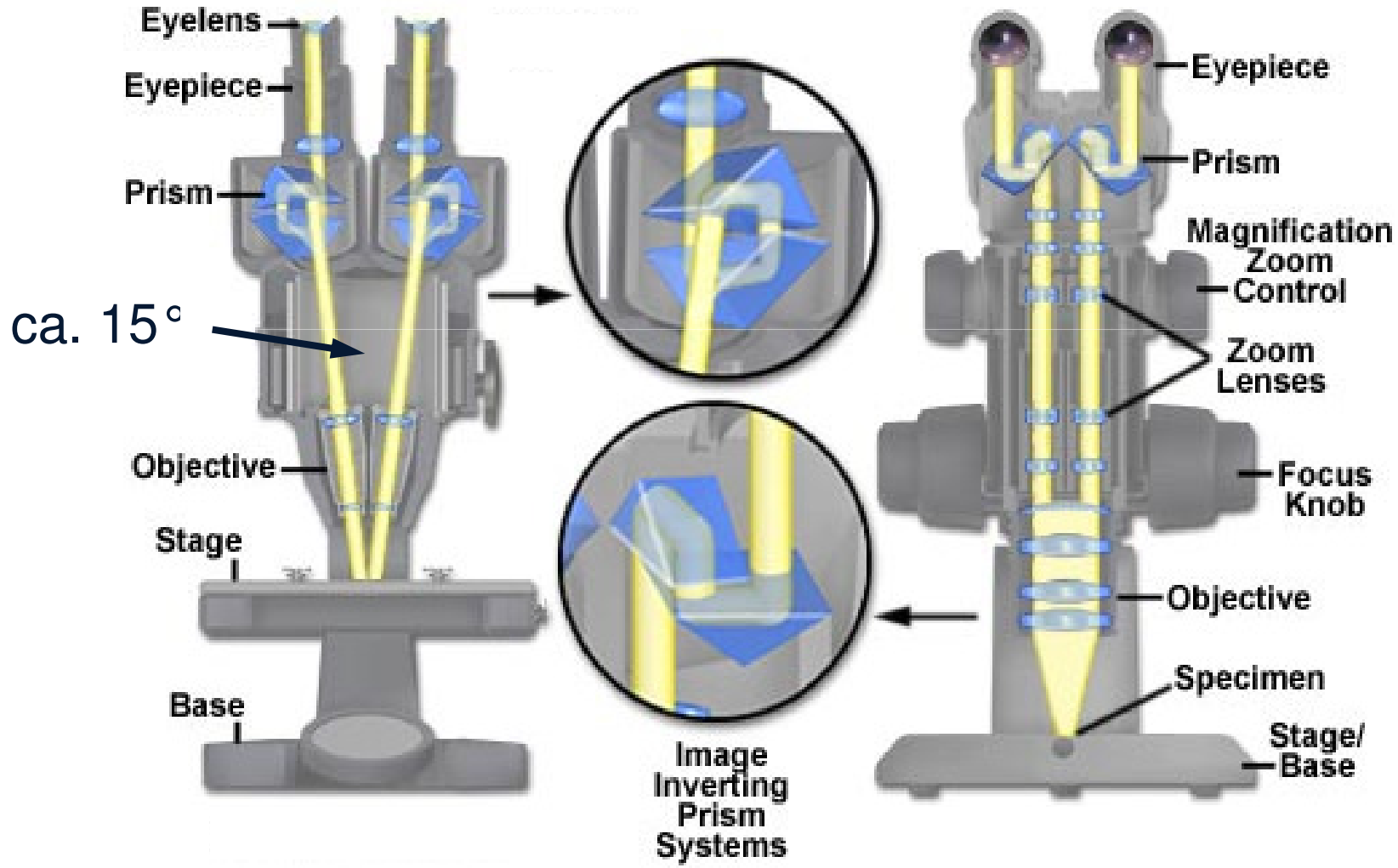
- Stereoscopic image
- One microscope for each eye
- Magnification changer: continuous or discrete
- Inspection of PCBs
- Section of laboratory animals

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Optical Setup

Greenough

Telescope



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Optical Setup

- **Advantages Greenough:**
  Simple, robust
- **Disadvantages Greenough:**
  Poorly flexible optical system, “cosine error” in measuring tasks

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Optical setup

- **Advantages telescope system:**
  Observation at right angles to the object, parallel beams for easy optical retrofits
- **Disadvantages telescope system:**
  Complicated setup, expensive

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Stereo Microscope Head

Wiloskop–F Zoom

- Continuous zoom range:
  0,67x … 4,5x
- Eyepieces WF 10x/20:
  Magnification range:
  6,7x … 45x



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Stereo Microscope Head

hund WETZLAR

Accessories:

- Eyepieces: 10x (in range of delivery), 15x, 20x
- Auxiliary lenses: 0.3x; 0.5x; 1.5x, 2x
- Measuring eyepiece, camera adapters, …

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Stand Systems

Stand ST

- Without illumination

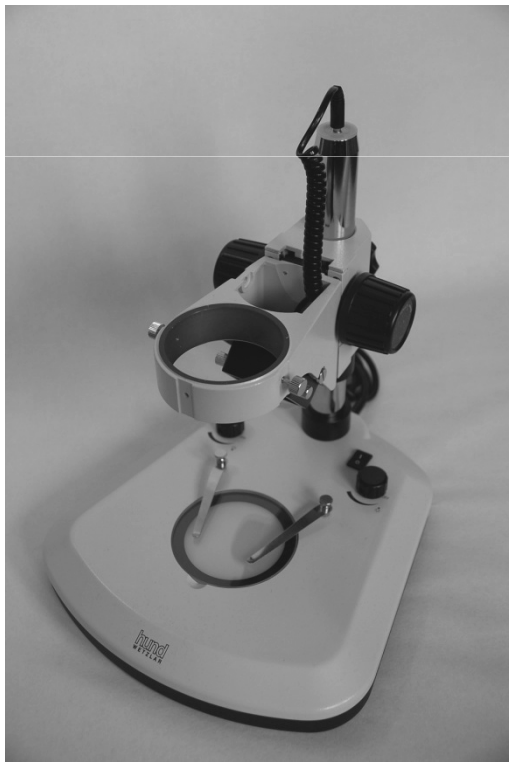




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Stand ST-AD LED

- Transmitted-/incident-light illumination (LEDs)

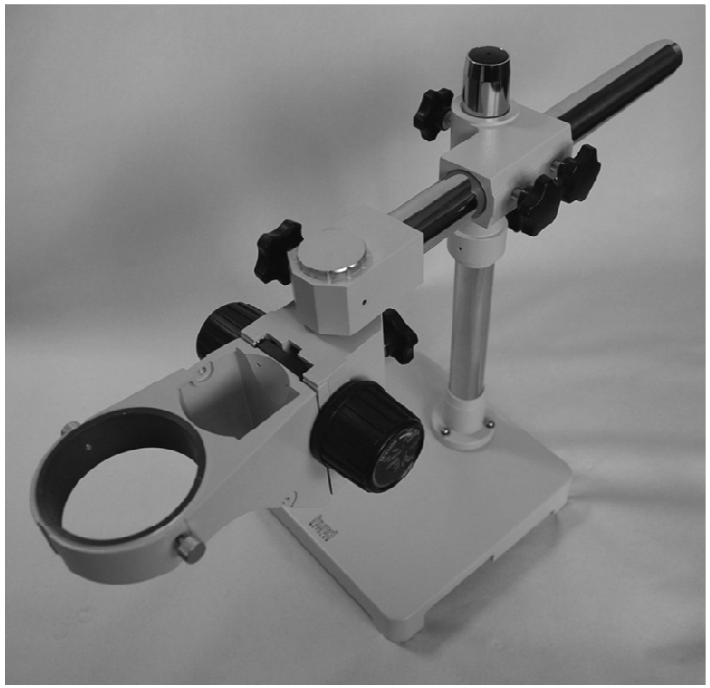




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Stand ST-S

- Boom stand without illumination



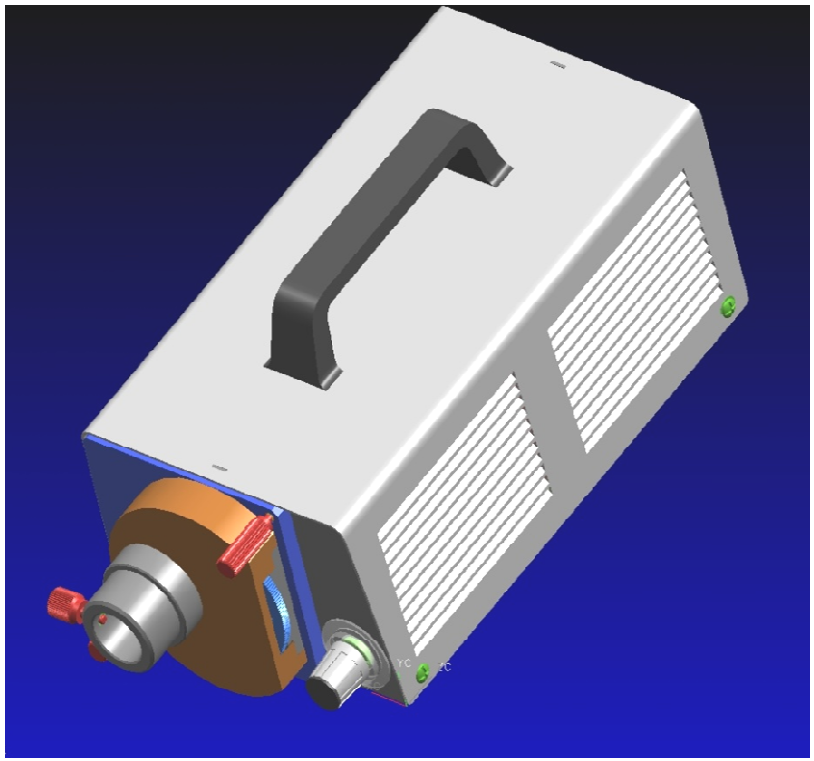


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Illumination

FLQ 85 E/M

- Halogen lamp 85 W
- Variety of lightguides (1, 2, 3 arms, flexible)



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Illumination

FLQ 150 M

- Halogen lamp 150 W
- Variety of lightguides (1, 2, 3 arms, flexible)



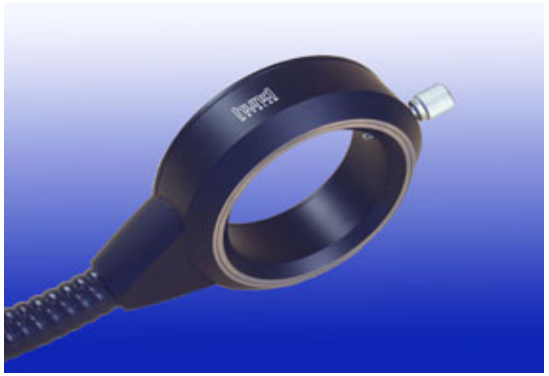
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Additional Accessories: Ring lights

- 4 and 8 spots, fiber light ring







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hund WETZLAR

Additional Accessories: LED system

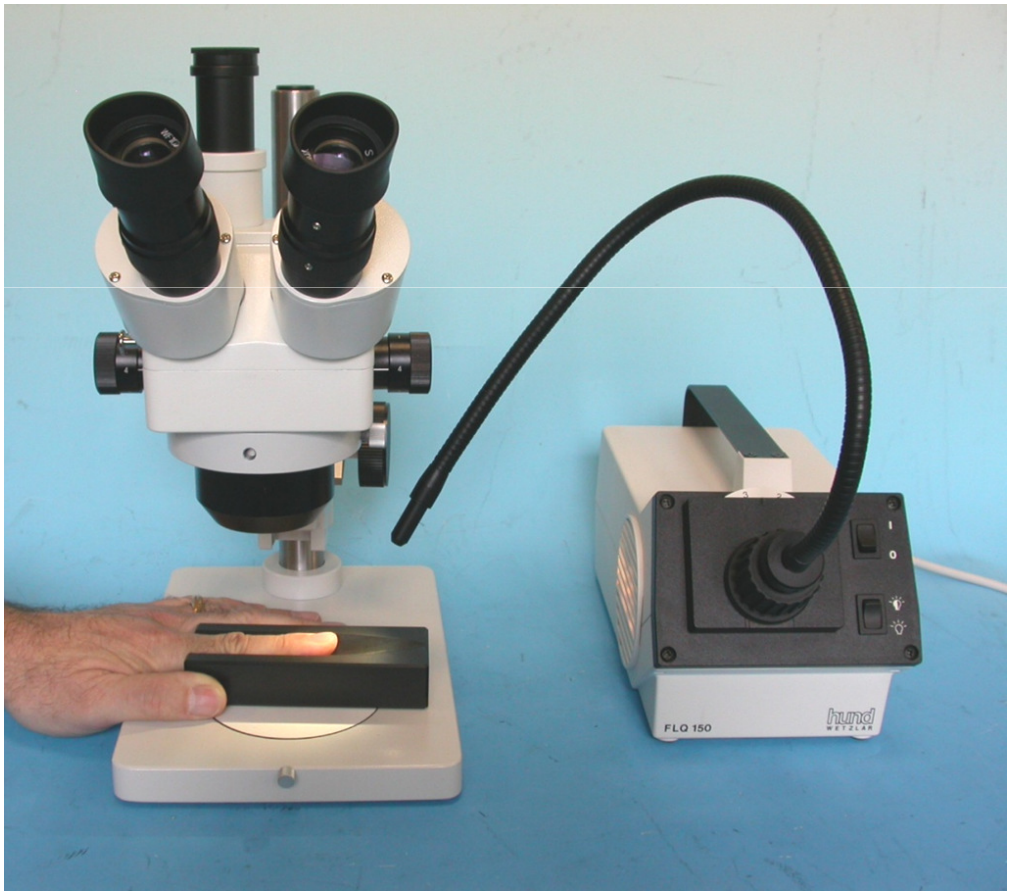
- Spots, segmentable ring light



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Example

Capillary Microscope



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Example

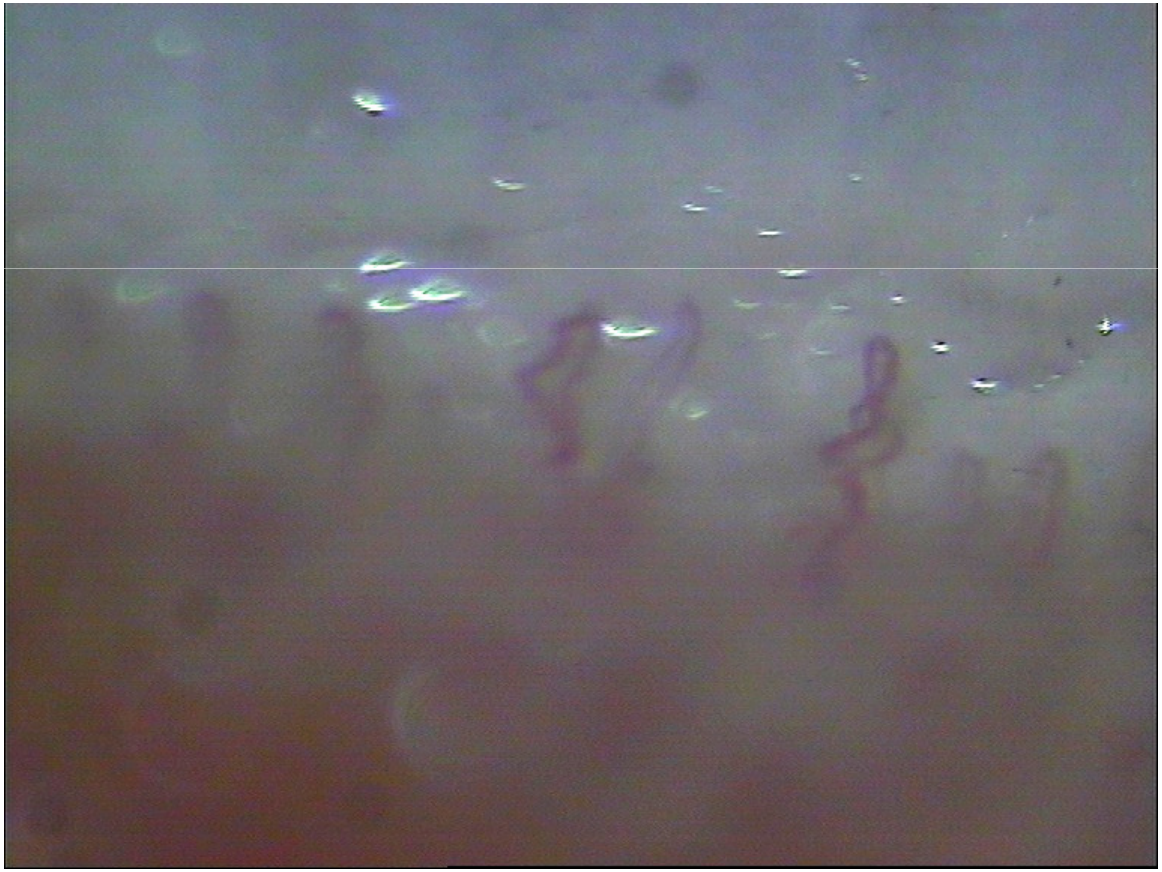
Capillary Microscope

- Investigation of finger capillaries
- Goal: Early diagnosis of rheumatic diseases
- Necessary accessories: finger holder, immersion oil
- Illumination: FLQ 150 M

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Example

Capillary Microscope: Result



Finger nail

Capillaries

Cuticle

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Summary

Incident-Light Microscopy:

- For opaque specimens
- Mainly for industrial applications
- Full objective set: EPI objectives
- Large specimens:
  lowerable stage (H 600 AM 50),
  stand with column (W-AD 50)

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Summary

Stereo Microscopes:

- Stereoscopic image
- Industrial applications, but also BioMed
- Different illumination concepts
- Wide spectrum of optical accessories

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