

# CHSOS Academic Technical Photography Kit

## Technical Sheet

The CHSOS Academic Technical Photography Kit is a complete solution for technical photography in cultural heritage, covering ultraviolet, visible, and infrared imaging. It is designed for universities, conservation schools, research institutes, and training laboratories, enabling a wide range of non-invasive imaging techniques.

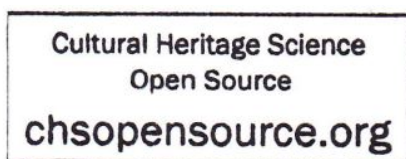
## Included Components

- Modified full-spectrum Nikon D850 camera (UV–VIS–IR)
- 2 × Fabrizio ultraviolet lamps
- 2 × Alice infrared fluorescence lamps
- 2 × Elio halogen lamps
- Robertina filter set (72 mm)
- Pitty polarization filter set
- Technical Photography accessories kit (50 mm lens, AC adapter, remote shutter)
- Pigments Checker STANDARD
- Pigments Checker – Modern & Contemporary Art

## Supported Imaging Techniques

- Visible (VIS)
- Ultraviolet Fluorescence (UVF)
- Ultraviolet Reflected (UVR)
- Infrared (IR)
- Infrared Fluorescence (IRF)
- Infrared False Color (IRFC)
- Infrared Transmitted (IRT)
- Raking Light

The kit integrates with open-source software for image capture and processing, supporting transparent and reproducible documentation workflows. It is intended for educational and research use, providing a robust platform for teaching and advanced technical imaging.



A handwritten signature in black ink, appearing to read "Cosentino Antonino".



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# Modified Full-Spectrum Nikon D850 Camera

## Technical Data Sheet

### 1. Product Overview

The Modified Full-Spectrum Nikon D850 is a professional digital SLR camera converted for ultraviolet (UV), visible (VIS), and infrared (IR) technical photography. The internal UV/IR cut filter is removed to allow full-spectrum sensitivity, enabling advanced imaging applications in cultural heritage diagnostics, conservation science, and scientific research.

### 2. Sensor and Optical Specifications

Base Camera	Nikon D850 (full-frame DSLR)
Sensor Type	FX-format BSI CMOS
Effective Resolution	45.7 megapixels
Spectral Sensitivity	(300-1100nm) UV – VIS – IR (full spectrum)
Filter Modification	Removal of UV/IR cut (hot mirror) filter
Lens Mount	Nikon F-mount

### 3. Imaging Capabilities

- Ultraviolet reflected photography (UVR)
- Ultraviolet fluorescence imaging (UVF)
- Standard visible-light photography (VIS)
- Infrared photography (IR)
- Infrared false-color imaging (IRFC)
- Multispectral imaging workflows

### 4. Core Camera Features

The Nikon D850 provides high dynamic range, low noise performance, and excellent image stability. Features include ISO sensitivity from 64 to 25,600 (expandable), a 153-point autofocus system, EXPEED 5 image processor, and 4K UHD video recording capability. Some standard features, such as sensor dust reduction, may be altered by the conversion process.

### 5. Typical Applications

- Cultural heritage and art conservation imaging
- Technical and multispectral photography
- Infrared reflectography and fluorescence studies
- Scientific and forensic documentation
- Research and educational applications



### 6. Notes on Use

External band-pass filters are required to isolate specific spectral regions during acquisition. The camera is intended for controlled technical photography workflows where calibration and consistent illumination are essential.

# Fabrizio – Ultraviolet Lamp

## Technical Data Sheet

### 1. Product Overview

Fabrizio is a high-performance ultraviolet (UV) LED lamp designed for cultural heritage, art conservation, and scientific examination. It provides intense and spectrally pure UVA radiation optimized for ultraviolet fluorescence (UVF) and reflected ultraviolet (UVR) technical photography.

### 2. Technical Specifications

UV Emission Type	UVA LED
Peak Wavelength	365 nm
Radiant Power	14,250 mW
Beam Angle	60° focusing lens
UV Purity	Visible and IR radiation filtered
LED Lifetime	30,000 – 50,000 hours
Dimensions	16 × 14 × 14.5 cm
Weight	1.5 kg
Power Supply	110–220 V AC
Power Cable Length	5 m
Mounting	Handheld or photographic tripod adapter

### 3. Optical and Spectral Performance

The lamp integrates a high-power UVA LED source combined with optical filtering to remove residual visible violet light and infrared emission. This ensures accurate fluorescence excitation and minimizes spectral contamination during technical imaging.

### 4. Typical Applications

- Ultraviolet fluorescence (UVF) imaging of artworks
- Reflected ultraviolet (UVR) photography
- Detection of varnishes, restorations, and retouching
- Conservation diagnostics and documentation
- Scientific and forensic UV examination



# Alice – Infrared Fluorescence Lamp Technical Sheet

## Technical Data Sheet

### 1. Product Overview

Alice is a visible light illumination system specifically designed for infrared fluorescence (IRF) photography. The lamp emits high intensity visible radiation optimized to excite infrared emitting pigments, making it particularly suitable for cultural heritage diagnostics, art examination, and scientific imaging. It represents a compact and cost effective alternative to more complex laboratory illumination systems.

### 2. Operating Principle

Infrared fluorescence imaging is based on the excitation of specific materials using visible light, followed by the detection of their fluorescence emission in the near infrared range. Alice provides a controlled visible excitation source that efficiently stimulates pigments such as Egyptian blue and other compounds exhibiting infrared luminescence.

### 3. Technical Specifications

Emission Type	Visible light (blue excitation)
Peak Emission Wavelength	≈ 450 nm
Luminous Flux	≈ 1200 lumens
Spectral Output	Visible only (no IR emission)
Application Mode	Infrared fluorescence excitation
Power Supply 110–240 V AC, 50/60 Hz	
Mounting	Handheld use or standard photo tripod adapter (1/4")

### 4. Optical Performance

The spectral emission of Alice is concentrated in the blue region of the visible spectrum, providing efficient excitation while avoiding direct infrared output. When combined with an infrared sensitive camera and appropriate visible blocking filter, the system enables clear and high contrast infrared fluorescence documentation.

### 5. Typical Applications

- Infrared fluorescence (IRF) imaging of artworks
- Detection and mapping of Egyptian blue pigments
- Examination of cadmium pigments and other luminescent materials
- Cultural heritage diagnostics and conservation studies
- Scientific and technical photography

### 6. Notes on Use

For correct infrared fluorescence imaging, Alice should be used in combination with an infrared sensitive camera system and visible blocking filter on the camera lens. Ambient light should be minimized to avoid contamination of the recorded fluorescence signal.

# Elio – Halogen Lamp Technical Sheet

## Technical Data Sheet

### 1. Product Overview

Elio is a compact halogen illumination system designed for technical photography and scientific imaging. Thanks to its continuous broadband emission, it is suitable for standard visible photography (VIS), infrared imaging (IR), and infrared reflectography (IRR). The use of standard halogen technology ensures reliability, ease of maintenance, and consistent optical performance.

### 2. Operating Principle

The lamp is based on a tungsten halogen filament operating in a halogen gas environment. This configuration allows higher filament temperatures compared to conventional incandescent lamps, producing a stable and continuous spectral output across the visible and infrared regions. The emission can be described as continuous VIS–IR emission.

### 3. Technical Specifications

Lamp Type	Halogen floodlight
Bulb Type	R7S standard halogen bulb
Nominal Bulb Power	150 W
Spectral Emission	Continuous VIS–IR emission
Color Temperature	≈ 2800–3200 K
Power Supply	110–240 V AC, 50/60 Hz
Power Cable Length	5 m
Dimensions	≈ 14 × 13 cm
Weight	≈ 560 g
Mounting	Handheld or photographic tripod adapter

### 4. Typical Applications

- Standard visible-light documentation (VIS)
- Infrared photography (IR)
- Infrared reflectography (IRR)
- Multispectral and technical imaging workflows
- Cultural heritage and conservation diagnostics

### 5. Operation and Maintenance

Elio uses widely available R7S halogen bulbs, which are inexpensive and easy to replace. The lamp housing is designed for straightforward operation and safe thermal dissipation. Regular inspection and bulb replacement ensure optimal illumination stability.



# Robertina – Technical Photography Filters Set (72 mm)

## Technical Data Sheet

### 1. Product Overview

Robertina is a professional filter set designed for technical photography using full-spectrum digital cameras. The 72 mm version of the kit is optimized for lenses up to 72 mm filter threads and provides controlled isolation of ultraviolet (UV), visible (VIS), and infrared (IR) spectral bands. The system is intended for scientific imaging, cultural heritage documentation, and conservation diagnostics.

### 2. Kit Configuration (72 mm Version)

This technical sheet refers exclusively to the 72 mm version of the Robertina filter kit. The set includes three scientific band-selection filters and dedicated mounting accessories to ensure repeatable and stable imaging conditions during technical photography workflows.

### 3. Included Components

Filter Diameter	72 mm
UV Filter	UV band-pass filter for UV reflectance imaging
VIS Filter	Visible-light band-pass filter for standard color photo
IR Filter	Infrared long-pass filter for IR imaging
Adapter	Lens magnetic adapter
Compatibility	Full-spectrum modified digital cameras

### 4. Optical Function

The Robertina filter set enables precise spectral selection by physically isolating ultraviolet, visible, and infrared radiation reaching the camera sensor. When used with calibrated illumination sources and a full-spectrum camera, the filters allow repeatable acquisition of UV-reflected, visible, and infrared images suitable for comparative multispectral analysis.

### 5. Typical Applications

- Ultraviolet reflectance (UVR) photography
- Standard visible-light documentation (VIS)
- Infrared photography and IR false-color imaging
- Technical imaging workflows
- Cultural heritage and conservation diagnostics

### 6. Notes on Use

The filters are intended for use on lenses compatible with 72 mm filter threads or smaller lenses via the included step-up adapter. Care should be taken to avoid cross-contamination between spectral acquisitions by ensuring correct filter placement and consistent camera positioning.



# Pitty – Polarized Light Photography Kit (72 mm)

## Technical Data Sheet

### 1. Product Overview

Pitty is a complete polarized light photography (PL) kit designed for technical imaging and scientific documentation. The 72 mm version of the kit is optimized for lenses with 72 mm filter threads and enables the reduction of surface reflections through controlled polarization of both illumination and camera optics. It is widely used in cultural heritage, conservation science, and material studies.

### 2. Polarized Light Principle

Polarized light photography is based on the interaction between polarized illumination and a polarizing filter mounted on the camera lens. By adjusting the relative orientation of the polarizers, reflections from glossy or varnished surfaces can be minimized (cross-polarization) or emphasized, allowing improved visualization of surface textures, pigments, and material features.

### 3. Kit Configuration (72 mm Version)

Filter Diameter	72 mm
Camera Filter	Linear polarizing filter for camera lens
Light Polarizers	Polarizing sheets for illumination sources
Mounting System	Standard filter thread
Compatibility	Full-spectrum and standard digital cameras
Use Mode	Cross-polarized

### 4. Typical Applications

- Reduction of specular reflections on varnished or glossy surfaces
- Documentation of paintings, manuscripts, and objects
- Surface texture and pigment visibility enhancement
- Technical photography for conservation and diagnostics
- Comparative before/after reflection analysis

### 5. Notes on Use

For optimal cross-polarized imaging, the polarizers on the illumination sources must be oriented at 90° relative to the camera polarizing filter. Care should be taken to maintain consistent camera position and lighting geometry during acquisition.



# Technical Photography Accessories Kit

## Technical Data Sheet

### 1. Product Overview

This Technical Photography Accessories Kit is designed to support stable, repeatable, and high-quality image acquisition during technical and scientific photography workflows. The kit combines essential accessories commonly used in cultural heritage documentation, conservation imaging, and laboratory photography, ensuring reliable operation of the camera system during extended acquisition sessions.

### 2. Kit Components

Nikon 50 mm Len	Standard 50 mm prime lens for technical photography
Power Adapter	AC power supply adapter for continuous operation
Remote Shutter	Remote control for vibration-free image acquisition

### 3. Functional Description

The 50 mm prime lens provides a neutral field of view suitable for flat artwork and object documentation. The power adapter enables continuous shooting without battery limitations, while the remote shutter minimizes mechanical vibrations during long exposures or multispectral imaging sessions.

### 4. Typical Applications

- Technical and multispectral photography
- Cultural heritage and conservation documentation
- Long-exposure imaging and low-light acquisition
- Studio and laboratory photography setups
- Vibration-free image capture for high-resolution cameras

### 5. Notes on Compatibility

The accessories in this kit are intended for use with digital cameras commonly employed in technical photography workflows. Compatibility may depend on camera model and mounting standards; users should verify electrical and mechanical interfaces prior to installation.





# Pigments Checker – STANDARD

## Technical Data Sheet

### 1. Product Overview

Pigments Checker STANDARD is a curated reference collection of historically significant pigments from prehistory to approximately 1950. The set is designed for non-invasive technical imaging and spectroscopic examination of pigments commonly found in cultural heritage objects. It serves as a standardized reference tool for conservation science, research, and education.

### 2. Physical Description

Type	Standard pigments reference board
Historical Scope	Antiquity to early 20th century
Support	Archival cellulose-cotton board
Binder	Acrylic (stable and uniform)
Swatches	Hand-applied pigments
Applications	TP, MSI, IRR, Reflectance, Raman, XRF

### 3. Pigment Selection Criteria

The STANDARD set includes one representative pigment for each historically relevant pigment type. The selection prioritizes historically authentic materials and recipes, when possible, and pigments are verified through spectroscopic analysis in collaboration with scientific laboratories.

### 4. Imaging and Analytical Methods

The Pigments Checker STANDARD is designed for use with a wide range of non-invasive examination techniques including technical photography (UVR, VIS, IR, IRF, IRFC, IRT), infrared reflectography (IRR), multispectral imaging (MSI), reflectance spectroscopy, Raman spectroscopy, and X-ray fluorescence (XRF).

### 5. Typical Applications

- Calibration and validation of imaging workflows
- Comparative pigment analysis across spectral domains
- Training and education in conservation science
- Reference support for spectral databases
- Laboratory and field testing of analytical instruments

### 6. Handling and Conservation Notes

The Pigments Checker should be handled as a painted reference object. Exposure to strong light should be minimized, and the board should be stored in stable environmental conditions. Minor variations between pigment swatches are inherent to the hand-applied nature of the samples.



# Pigments Checker – Modern & Contemporary Art

## Technical Data Sheet

### 1. Product Overview

Pigments Checker – Modern & Contemporary Art is a reference collection of pigments commonly used from the mid 20th century to the present. The set is specifically designed to support non invasive technical imaging and spectroscopic examination of modern and contemporary artworks, including synthetic organic and inorganic pigments.

### 2. Physical Description

Type	Modern & contemporary pigments reference board
Chronological Scope	ca. 1950 – present
Support	Archival cellulose-cotton board
Binder	Acrylic (stable and uniform)
Swatches	Hand-applied pigment areas with reference markers
Applications	TP, MSI, IRR, Reflectance, Raman, XRF

### 3. Pigment Selection Criteria

The Modern & Contemporary Art set focuses on pigments introduced or widely adopted during the 20th and 21st centuries. Selection emphasizes materials frequently encountered in modern artistic practice, including synthetic organics, modern inorganic pigments, and industrial colorants, chosen for their relevance in conservation diagnostics.

### 4. Imaging and Analytical Methods

The Pigments Checker – Modern & Contemporary Art supports a wide range of non invasive analytical techniques, including technical photography (UVR, VIS, IR, IRF, IRFC, IRT), infrared reflectography (IRR), multispectral imaging (MSI), reflectance spectroscopy, Raman spectroscopy, and Xray fluorescence (XRF).

### 5. Typical Applications

- Identification of modern and synthetic pigments
- Calibration of multispectral and technical imaging workflows
- Conservation studies of modern and contemporary artworks
- Training and education in modern materials analysis
- Reference comparison for spectroscopic databases

### 6. Handling and Conservation Notes

The reference board should be handled as a painted object. Exposure to strong light should be limited, and storage in stable environmental conditions is recommended. Variations between swatches reflect authentic pigment behavior.

