MEMO
Scientific imaging for art conservation

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PHOTOGRAPHY
Material

• Hasselblad, IR inside filter removed
• Lens 80 and 120 mm corrected with IR aberrations
• Phocus capture software (working space Hasselblad RGB, export Adobe RGB)
• Flashs Broncolor for Visible and IR, UV fluo lamps 365nm
• Calibration : Qpcard, Spectralon, Colorchecker
• Filters
  • IR : RG780 – block visible and IR pass
  • Vis : BG38 – block IR
  • Fluo UV : GG395 UV block + BG38 –block IR
  • Reflexion UV : UG11 – block visible+IR and pass UV
• Photoshop for post-production (working space Adobe RGB)
VISIBLE SHOOTING

• BG38 filter
• Color charts Qpcard, Colorchecker and spectralon
• 1/60e F11 50 ISO

• Adjust the charts values :
  • QP Card : Lab 95 0 0 / 48 0 0 / 32 00

Better : make ICC or DNC profile of the shooting
Fluo UV shooting

• Filters GG395 + BG38
• UV Target chart

• 32 seconds / F11 / 50 ISO

• Using UV fluorescence target protocol from UV innovation: [http://www.uvinnovations.com](http://www.uvinnovations.com)

Adjust exposure slider until the RGB values of brightest grey patch equal 130 +/-3 units with Prophoto or 148 with Adobe RGB
IR shooting

• Filter RG780
• Spectralons

• 1/60
• F11
• 50 ISO

• Put to grey level with G and B to 0
• Adjust the white and grey charts values as visible image
Export from Phocus

• Tiff 16
• Adobe RGB

• Go to Photoshop
Visible Post production in Photoshop

• As white and grey were adjusted while shooting, adjust the black charts values to:

  • QP Card :
    • Lab  95 0 0 / 48 0 0 / 32 0 0
    • RGB    241 / 112 / 65

  • Spectralon : 250 / 80 / 30
Cliquez sur l'image pour définir un nouvel échantillonnage de couleur. Option : Ctrl.
IR Post production in Photoshop

• Note the white spectralon value of visible image to adjust IR spectralon, export BW IR image

IRFC
• On visible image, move the red layer to the green one (copy paste)
• Move the green layer to the blue one
  ( ie. erase Blue layer of visible image)
• Copy the IR red layer to the visible red layer (copy paste)
• adjust size of IR layer only
• Compare colors to reference database
Kremer n° 10350
Chrysocolla
Bluish green, copper silicate, 0 - 120 µm

Kremer n°103601
Malachite Fibres,
fine 0 - 80 µm

Pigment database for comparison
https://copa.hypotheses.org/
Fluo UV Post production in Photoshop

• With eyes, close to vision

or

• Using UV fluorescence target protocol from UV innovation: http://www.uvinnovations.com

Adjust exposure slider until the RGB values of brightest grey patch equal 130 +/-3 units with Prophoto or 148 with Adobe RGB
RADIOGRAPHY
kiloVolts

- total flow needed to go through the object
- need more kV to go through material with higher atomic number
- Need more to go through thicker material

- 100 kV for easel painting or wood sculpture (less than 40 cm)
- 160 kV for gold jewel
- 420 kV for bronze statues (5 cm thickness) or (30 cm thickness) marble

marble
milli Amperes

- Amperes are influential on the contrast

Time

- Determine the global exposition of image
Example : Van Gogh
Hôpital saint Paul à Saint Rémi de Provence

• Générateur iSovolt cegelec 160/ds1 bridé à 100kv
• 700 laser 5 rpm 4000 et rpm 3000
Intensity [mA]=7
Tension [kV]=40
Time [s]=120

White ok
Black blocked

=> low flow and contrast
Intensité [mA]=5
Tension [kV]=40
Time [s]=90

White near overexposed
Dark area too black

=> Low contrast
Intensity [mA] = 3
Tension [kV] = 40
Time [s] = 90

White are overexposed
Black ok (see the canvas)

=> increase contrast
Intensité [mA]=4
Tension [kV]=40
Temps d'exposition [s]=90

White OK
Black near OK

=> increase flow and low contrast
Intensité [mA]=3
Tension [kV]=42
Time [s]=90

Radio OK