

Regula

Guide for using
the test object
with the video
spectral comparator
Regula 4306

Test Object Regula 4300

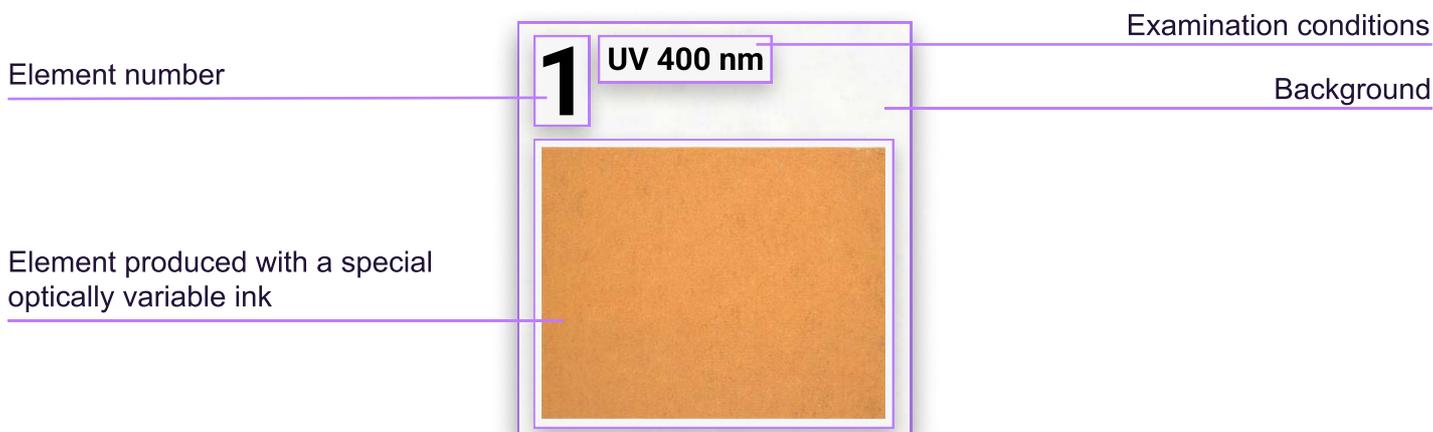


The Test Object contains a hologram and elements produced with the use of modern inks. Such elements are used as security features in security document and banknote production.

The Test Object is intended for experimental research and training workshops on device operation. It can also be used as a specimen for comparative studies with the video spectral comparator Regula 4306 and other Regula comparators.

Below are the explanatory images with comments on the conditions for obtaining them.

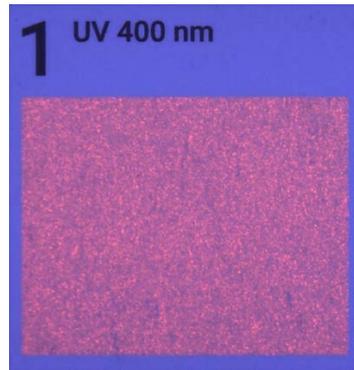
How the test object is arranged



Examination of the elements (except for the elements № 12 and № 15) were carried out using the video spectral comparator Regula 4306.

ELEMENT № 1

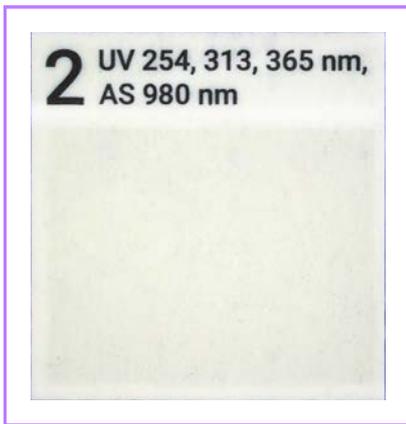
Printed with ink that fluoresces in UV light 400 nm.



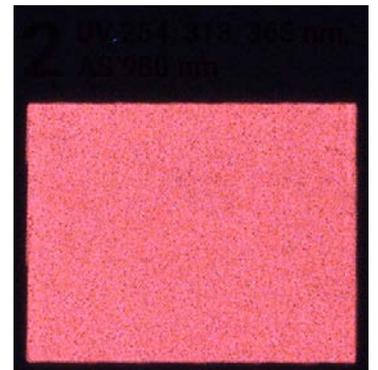
View in UV light 400±5 nm
(aperture 2.0)

ELEMENT № 2

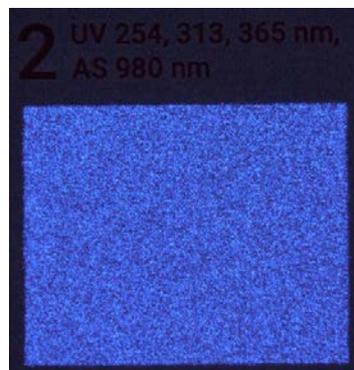
printed with ink that fluoresces in UV light 254, 313, 365 nm and IR light 980 nm (anti-Stokes effect).



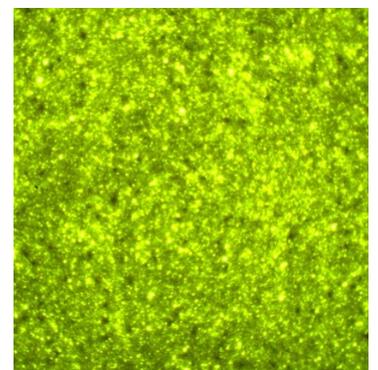
View in UV light 254 nm
(aperture 3.4)



View in UV light 313 nm
(aperture 3.4)



View in UV light 365 nm
(aperture 3.4)



Exposed to high-intensity
IR light 980 nm –
anti-Stokes effect*

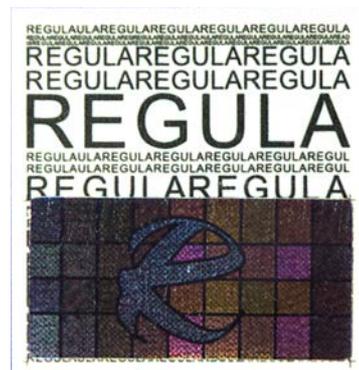
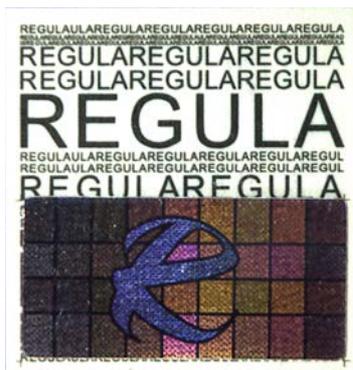
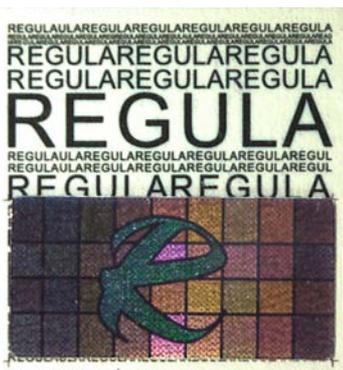
**The image is captured with the spectral luminescent magnifier
Regula 4177 (fragment)*

ELEMENT № 3

The hologram applied by embossing from the master matrix.



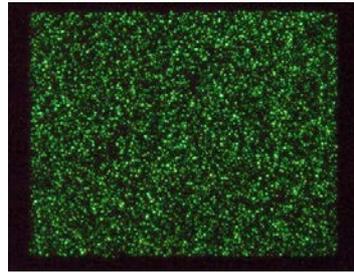
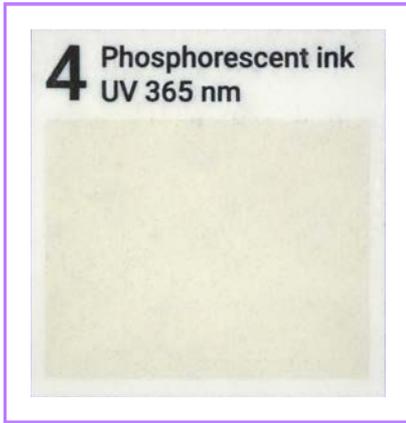
View of the hologram when the light sources switch on horizontally one by one (aperture 1.6, maximum exposure)



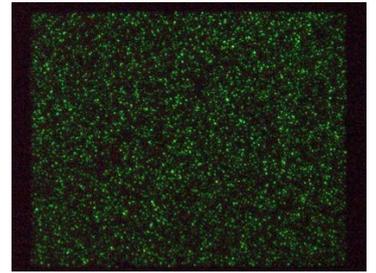
View of the hologram when the light sources switch on vertically one by one

ELEMENT № 4

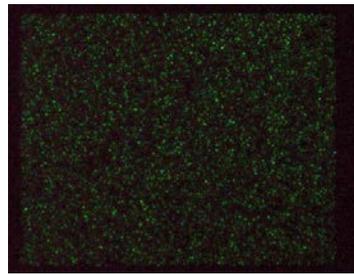
Printed with photochromic ink that fluoresces after being exposed to UV light.



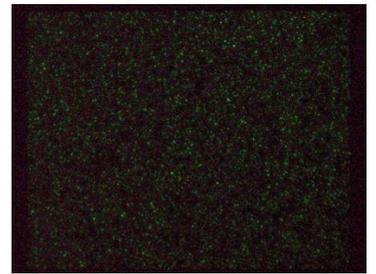
By the end of exposure to UV light



In 100 ms after the end of exposure to UV light



In 200 ms after the end of exposure to UV light



In 300 ms after the end of exposure to UV light

Images of Element 4 were captured with 2000 ms exposure of the light source and 40 ms exposure of the camera.

ELEMENT № 5

Printed with iridescent ink.



At an angle of 25°.
Incident white light
(aperture 6.8)*

**Position of the examined object was adjusted with the tilting stage Regula 4165. The stage was put parallel to the front flap of the device.*

ELEMENT № 6

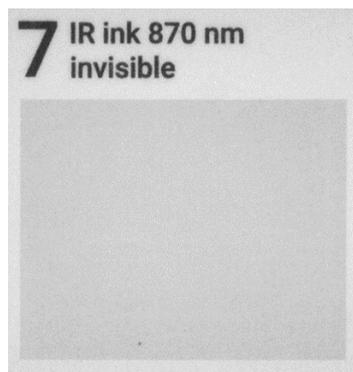
Printed with ink visible in IR light 870 nm.



IR light 850 ± 10 nm
(aperture 4.8)

ELEMENT № 7

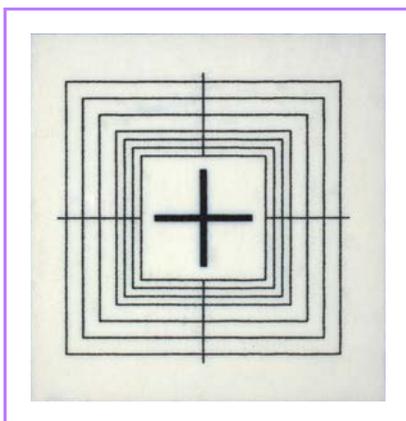
Printed with ink that is invisible (slightly visible) in IR light 870 nm.



IR light 850 ± 10 nm
(aperture 4.8)

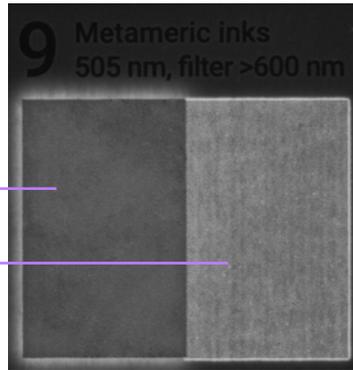
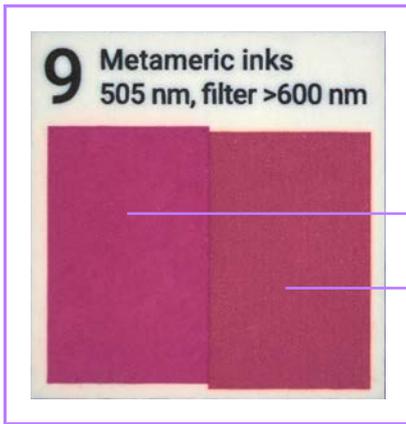
ELEMENT № 8

For camera focus adjustment.



ELEMENT № 9

Printed with metameric inks.



IR luminescence.
Cyan light 505 ± 5 nm.
With the camera filter
>600 nm (aperture 1.6)

Element 9 is printed with metameric inks that look the same in visible light but differ when changing illumination conditions.

ELEMENT № 10

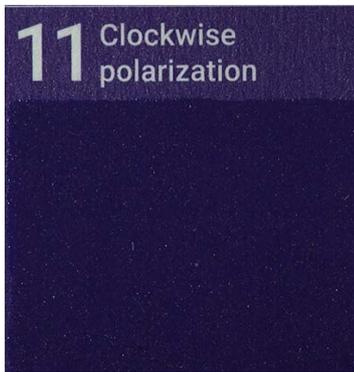
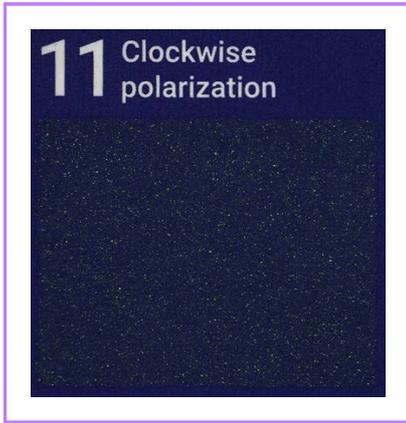
Printed with IR fluorescent inks.



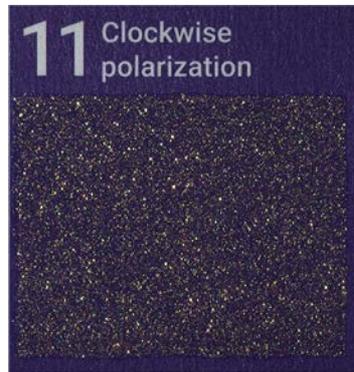
IR luminescence.
Cyan light 530 ± 10 nm.
With the camera filter
695-1000 nm (aperture 2.0)

ELEMENT № 11

Printed with optically variable inks (OVI). Clockwise polarization effect.



In light with anticlockwise polarization. Quenching of particle luminescence is observed (aperture 4.8)



In light with clockwise polarization. Luminescence of golden color particles is increasing (aperture 4.8)

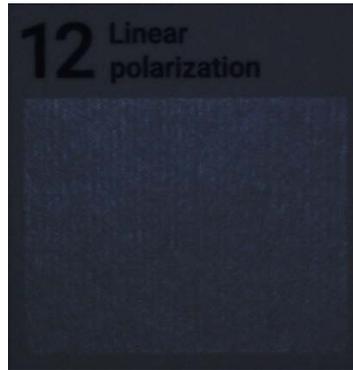
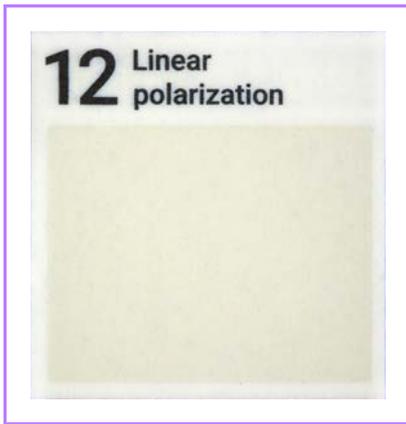


In light with clockwise polarization using a mirror. Combination of gold and green luminescent particles is observed (aperture 4.8)*

** To visualize the effect created by optically variable inks, the mirrored surface is directed towards the left flap.*

ELEMENT № 12

Printed with ink with linear polarization.



Coaxial light. The camera filter with linear polarization – at an angle of 45°

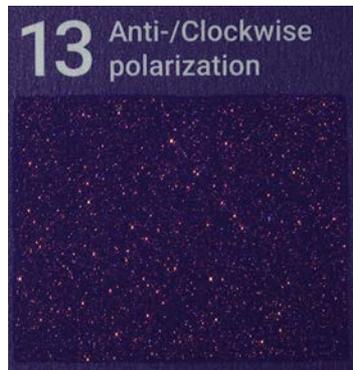
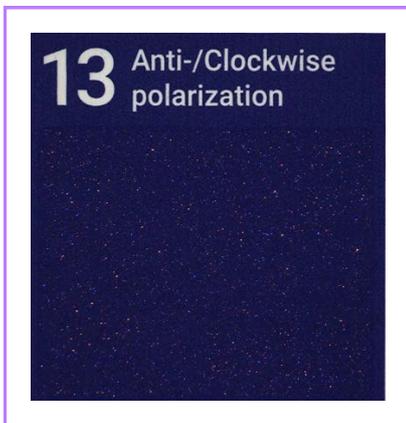


Coaxial light. The camera filter with linear polarization – at an angle of 135°

Element 12 was examined with the video spectral comparator Regula 4307.

ELEMENT № 13

Printed with ink with anticlockwise and clockwise polarization effect.



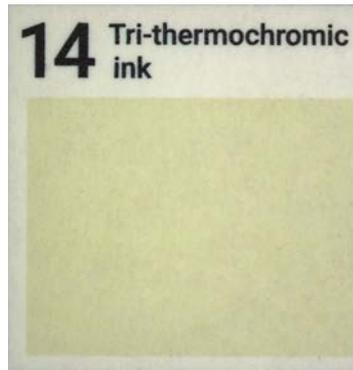
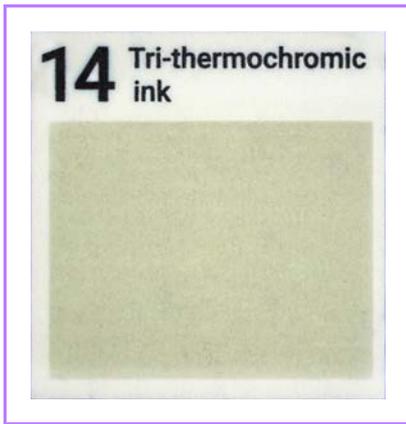
In light with anticlockwise polarization. Luminescence of red color particles is increasing (aperture 4.8)



In light with clockwise polarization. Luminescence of blue color particles is increasing (aperture 4.8)*

ELEMENT № 14

Printed with thermochromic ink that changes color when heated.



Incident white light.
At a temperature 40°C

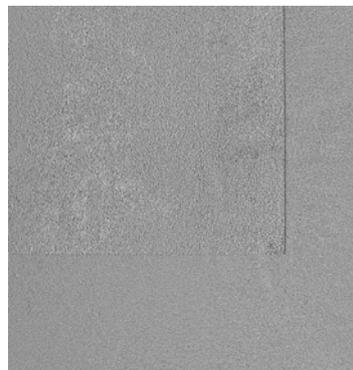


Incident white light.
Combined: a fragment with
ink heated up to 40°C (left)
and a fragment at room
temperature (right)

** Element 14 was examined by heating with the help of the thermostage Regula 4168.*

ELEMENT № 15

Printed with magnetic ink.



Exposed to a magnetic
field

The image was captured with the visualizer of magnetic properties Regula 4197 (fragment).