



Technical Information

NDT/HOLOGRAPHY

Processing of Holotest plates and films

A. Transmission Holography

1. Development : 2 min. in G 3 p (20° C),
5 min. in Refinal (20° C), or
2 min. in GP 61 (20° C) made up as follows :

GP 61

Water	700 ml
Metol	6 g
Hydroquinone	7 g
Phenidone	0,8 g
Na ₂ SO ₃	30 g
Na ₂ CO ₃	60 g
KBr	2 g
Na ₄ EDTA	1 g
water to make 1 litre	

2. Intermediate rinsing in running water : 2 min. (temperature 20° C \pm 2° C)
3. Fixing in Agfa-Gevaert G 321 (1+4) rapid fixing bath, for 2 min. (temperature = 20° C \pm 2° C).
4. Intermediate rinsing in running water : 2 min. (temperature 20° C \pm 2° C).
5. Bleaching in a bleaching bath made up as follows :

GP 431

Water	600 ml
Fe (NO ₃) ₃ ·9H ₂ O	150 g
KBr	30 g
300 mg of phenosafranin dissolved in 200 ml of ethanol.	
Water to make 1 litre.	

To be used in a dilution of : 1 part of GP 431 + 4 parts of water (temperature = 20° C \pm 2° C).

6. Rinsing in running water : 5 min.
7. Rinsing in demineralized water with 1 part of Agepon for 200 parts of water, for 2 min. at 20° C.
After the treatment, the water should be evenly distributed over the surface of the glass plate or film.
If there are still drops being formed on the surface of the emulsion, the treatment in the Agepon solution is to be extended.
When there is no demineralized water available, rinsing may also be carried out in a solution of 1 part of Agepon for 100 parts of water.
8. The films and plates are to be dried in a vertical position and in a dust-free room, until the emulsion is completely dry.
A forced drying system must not be used and the plates must not be turned around in the course of the drying process.
Irregular drying or remaining water drops may cause stains being formed.

B. White light reflection holography

I. Processing when the colour of the hologram has to approximate as closely as possible to that of the laser light.

1. Development : 2 min. at 20° C in a developer of the following composition :

GP 62

Part A

Water	700 ml
metol	15 g
pyrogallol	7 g
Na ₂ SO ₃	20 g
KBr	4 g
Na ₄ EDTA	2 g
water up to	1000 ml

Part B

water	700 ml
Na ₂ CO ₃	60 g
demineralized water up to	1000 ml

Use :

1 part A + 2 parts of water + 1 part B

Parts A and B keep well as separate solutions.

The ready to use solution can be used for a limited time only (1 to 2 hours). Therefore parts A and B should be mixed immediately before use.

Remark : Pyrogallol is a hardening developing substance which may affect the skin. Therefore always use rubber gloves when working with this developer.

So as to obtain good reflection holograms, a density of ± 3 is to be reached.

2. Intermediate washing in running water : 2 min. (temperature = 20° C \pm 2° C).
3. Bleaching : till completely clear in a bleaching bath of the following composition :

GP 432

water	700 ml
KBr	50 g
boric acid	1.5 g
water to	1000 ml

p-benzoquinone* 2 g/lit. to be added just before use.

The life of the ready to use bleaching bath in a well stopped bottle is limited to 1 week.

Temperature of the bleaching bath : 20° C \pm 2° C.

4. Washing in running water : 5 min. (temperature = 20° C \pm 2° C).
5. Washing in demineralized water with 1 part of Agepon to 200 parts of water for 2 min. at 20° C.
After treatment the water must be evenly spread on the surface of the glassplate or film.
If there is still a formation of drops on the emulsion surface the treatment in the Agepon solution must be prolonged.
When no demineralized water is available, washing can possibly be done in a solution of 1 part of Agepon to 100 parts of water.
6. Drying should take place upright, in a dust-free room until the emulsion is completely dry. Do not use forced drying and never turn the plate during drying. Uneven drying or drops of water which remain on the emulsion will give rise to stains.

II. Colour shifting to a longer wavelength :

To obtain an image in which the colour has been shifted to a longer wavelength than that of the laser light, procedure I may be applied. The bleaching bath, however, should be replaced by the following one :

GP 433

water	700 ml
KI	30 g
boric acid	3 g
water up to	1000 ml

Add 2 g/lit. of p-benzoquinone* just before use.

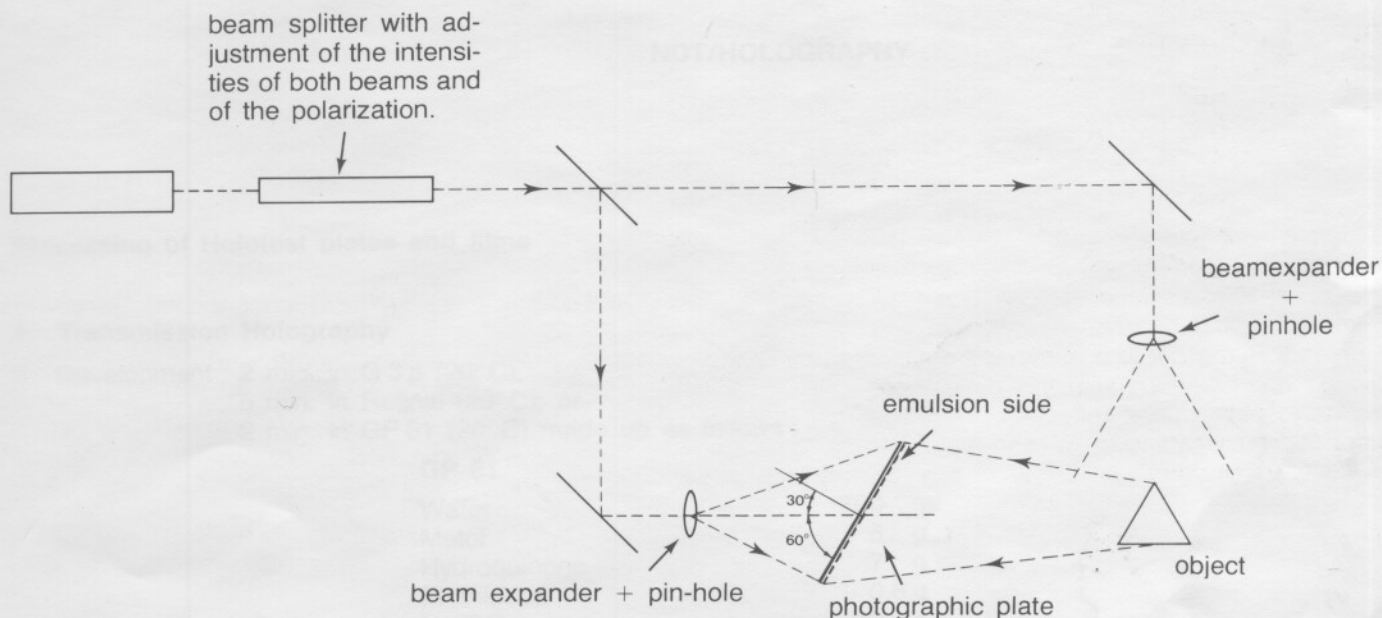
The holographic picture obtained in this way is slightly less sharp than the one of procedure I. The colour, however, has been shifted to longer wavelengths.

* Caution : the odour of p-benzoquinone in powder form is very irritating.

III. Colour shifting to a shorter wavelength :

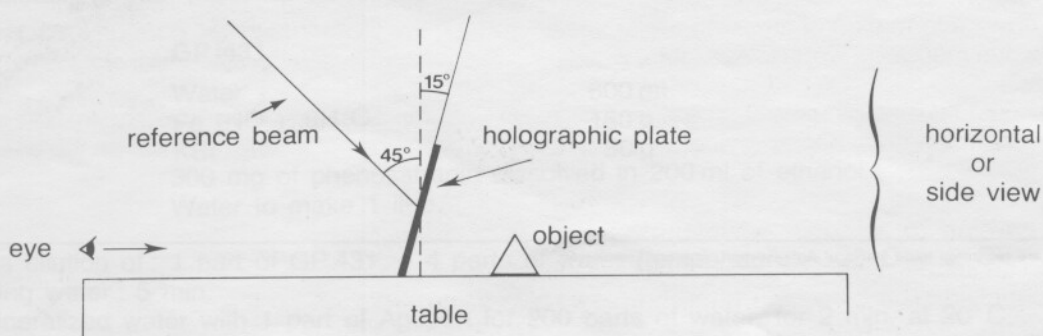
1. To obtain a holographic picture with a shorter wavelength than that of the laser light the developing bath G 3 p (developing time 2 min. at 20° C), Refinal (developing time 5 min. at 20° C) or GP 61 (developing time 2 min. at 20° C) is to be used in procedure I. The further course of the processing is the same as that of procedure I.
2. The colour of reflection holograms that are processed the same way as transmission holograms will also shift towards a shorter wavelength.

Lay-out for reflection holography



Important notes

1. The ratio between the object beam and the reference beam should be 1 - 1,5 to 2.
2. The polarisation of the two beams must be equal.
3. Scattered light that could reach the plate must be avoided.



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