

PROCESSING

hologram processing ←

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processing

Recommended processing for holographic exposures made on BB plates.

PLEASE NOTE: The following formulas are given only as a guide, since different processing techniques work better for different types of holographic exposure.

The BB family of emulsions can be used for both transmission and reflection holography. Depending on the application, different processing schemes can be applied. The following processing is intended as a guideline that will result in bright and low scatter holograms:

<u>Presensitisation</u>	Water, TEA solution, 2 min. See procedures below
<u>Exposure</u>	150 – 300 $\mu\text{J}/\text{cm}^2$
<u>Development</u>	AA developer (<u>transmission</u> , <u>reflection</u>), Pyrogallol (<u>reflection</u>)
<u>Washing</u>	Water, 5-10 min
<u>Bleach</u>	EDTA bleach
<u>Final Wash</u>	Water, 5-10 min
<u>Final Rinse</u>	Water with wetting agent, 1 minute

PRESENSITISATION

One of the characteristics of the BB plates is that the plates appear to become insensitive after a few weeks. This is due to a desiccation that can easily be addressed by a simple method, which renders the plate as sensitive as when it was first coated.

The process is called presensitisation and there are two procedures.

A. Presensitisation methods for interferometry, security and colour holograms.

1. Prepare a solution of water with a few drops (3 or 4) of photographic wetting agent (Ilfotol or Kodak FotoFlo).
2. Stir enough to homogenize the solution.
3. Soak the plate for 2 to 3 minutes in the appropriate safelight conditions in a tray of the solution with the emulsion facing up.
4. There are various methods for drying the plate. Favourites are squeegeeing and then air drying with a warm fan heater on the glass side of the plate. Blotting with high quality absorbent blotting paper is another option, followed by warm air fan as before.
5. The presensitisation will last for about 2 days.

B. Presensitisation methods for display holograms.

The method is the same, except that the solution also contains a 3% solution of TEA (triethanolamine).

Example solution would be 1 litre of water, a few drops (3 or 4) of wetting agent, 30ml TEA. Make sure mix is stirred adequately. The

solution can be reused many times.

The TEA confers more sensitivity than the plate would normally have, so if high sensitivity is required, use this method. TEA results also in some emulsion preswelling, and therefore there will be a colour shift in reflection holograms. To change the colour shift, different TEA concentrations can be used. To avoid colour shift, use method **A** or alternatively soak the plate after TEA treatment in a tray with water for 6 to 8 minutes and then dry.

PROCESSING THE PLATES FOR TRANSMISSION AND MASTER HOLOGRAMS.

The standard developer used for BB plates is a vitamin C based formula, which is very low in toxicity and is a fast developer. It is also re-useable until it slows down development time. Keep stoppered to avoid oxidation by air.

The recipe is, in the following order:

De-ionized Water	1/L
Ascorbic Acid	20g
Sodium Carbonate	20g
Sodium Hydroxide	6.5g
Phenidone	1g

A 30s development time @ 20°C is recommended.
After development, wash and put in bleach.

PROCESSING THE PLATES FOR REFLECTION HOLOGRAMS

A pyrogallol developer is recommended, and then the EDTA bleach as described above.

The general recipe for the pyrogallol reflection developers is:

Solution A	
De-ionized Water	0.5/L
Pyrogallol	5g
Solution B	
De-ionized Water	0.5/L
Sodium Carbonate	30g

Mix equal quantities of solutions A and B just before development.
A 1 minute development time at 20° C is recommended.
After development, wash and put in bleach.

BLEACH.

We recommend an Ferric EDTA based bleach, because it is re-useable and gives good results.

De-ionized Water	1/L
EDTA di-sodium salt	30g
Ferric Sulphate	30g
Potassium Bromide	30g
30% Sulphuric Acid	30ml
(or 90% Sulphuric Acid)	(10ml)

Bleach until emulsion clear of black silver.