HARMAN HOLO FX

FINE GRAIN HOLOGRAPHIC PLATES

GREEN SENSITIVE GLASS PLATES

Description

HARMAN GREEN SENSITIVE HOLOGRAPHIC PLATES are sensitive over 488nm – 560nm with peak sensitivity at 532nm. They can be used with a wide range of popular lasers such as Solid State frequency-doubled Nd:YAG or Argon Ion gas lasers, both continuous and pulsed. HARMAN holographic plates are coated with fine grain holographic emulsion, crystal sizes typically between 30 – 40nm, capable of very high resolution (more than 7000 cycles/mm) and optical transmission better than 80% at 532nm.

Storage

Unopened packages of HARMAN holographic plates should be stored in a cool, dry place, preferably 10°C (50°F). If stored in a refrigerator, remove packages at least three hours before opening to allow plates to reach room temperature and thus avoid problems associated with condensation forming on the surface. Allowing the plates to reach room temperature before use also helps resolve issues related to material shrinkage such as fringe drift during exposure.

Safelight recommendations

HARMAN green sensitive holographic plates should be handled in Dark Red (ortho) safelight illumination such as the Ilford 906 or equivalent fitted with a 15w bulb. The minimum recommended distance of the safelight from the plate is 1 meter.

Unpacking & handling of Glass Plates

HARMAN Holographic emulsion is coated onto either 2mm or 3mm glass substrate and the plates are packaged in two's, separated by edge protectors, with emulsion sides facing inwards. Please note, there may be some minor marking to the very edge of the plate (<5mm) due to the edge protector being in direct contact with the emulsion face. Please consider this when positioning the subject on the plate during exposure. Care should be taken to avoid glass cuts when handling, always dispose of broken glass appropriately.

Speed characteristics & Exposure times

Exposure time for HARMAN holographic plates will be dependent on wavelength and strength of laser, choice of beam ratio, subject transmission or reflective characteristics and to a lesser extent on processing technique. The speed of this emulsion however would indicate that exposure can be expected to be between 1 and 10 seconds. It is recommended that an initial series of trial exposures be made to determine the correct exposure time. During such trial work it is important to standardize exposure and processing conditions so that subsequent experiments are repeatable.

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Processing of Reflection & Transmission Holograms

HARMAN Holographic plates can be processed in any of the purpose-made holographic developer & bleach combinations, widely available in kit form and offering extremely convenient processing options.

Excellent results have been achieved with TJ1 Developer and Fe III EDTA Bleach under the following typical processing conditions:

Stage	Chemical Bath	Time	Conditions
Development	TJ1	45 seconds	22°C (72°F)
Stop Bath	ILFOSTOP	30 seconds	
Bleach	Ferric III EDTA	4–6 minutes	Bleach until clear + half total time
Wash	Running water	2 minutes	
Iodide Bath	(optional)	2 minutes	
Final Rinse	Distilled or de-ionised water plus 2 drops PhotoFlo or ILFOTOL		
Drying	Room temperature or warm forced air not above 40°C (104°F)		

Pyrogallol based developers are also recommended having shown a lesser degree of collapse than the TJ1 Fe III EDTA bleach combination.

Comprehensive preparation and mixing instructions for these chemicals, along with detailed formulae can be found on www.holowiki.com, follow the links from the home page: Hologram Recording Materials / Silver Halide Chemistry / Silver Halide Processing Chemistry / Silver Processing Formulas.

HARMAN Holographic plates show a good degree of latitude for general use. Optimum densities (prior to bleaching) have been found to be between 2 and 3.

Reflection

Holograms exposed with an ND-YaG Laser and processed in the above chemistry will result in a Cyan or Teal Blue color. This means that for holograms exposed with an ND-Yag at 532nm the reconstruction wavelength is around 482nm, with a reconstruction bandwidth of 25nm FWHM. Results will vary with individual processing techniques.

Transmission

Transmission holograms processed in the TJ1 developer and Fe III EDTA bleach combination shown above yield very low scatter and very high diffraction efficiencies with exposure achieving densities as high as 2.7 as measured on a transmission densitometer (prior to bleaching) and averaging density 0.1 as finished holograms.

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