



# Ciba<sup>®</sup> IRGACURE<sup>®</sup> PAG108

Photoacid-Generator (PAG)

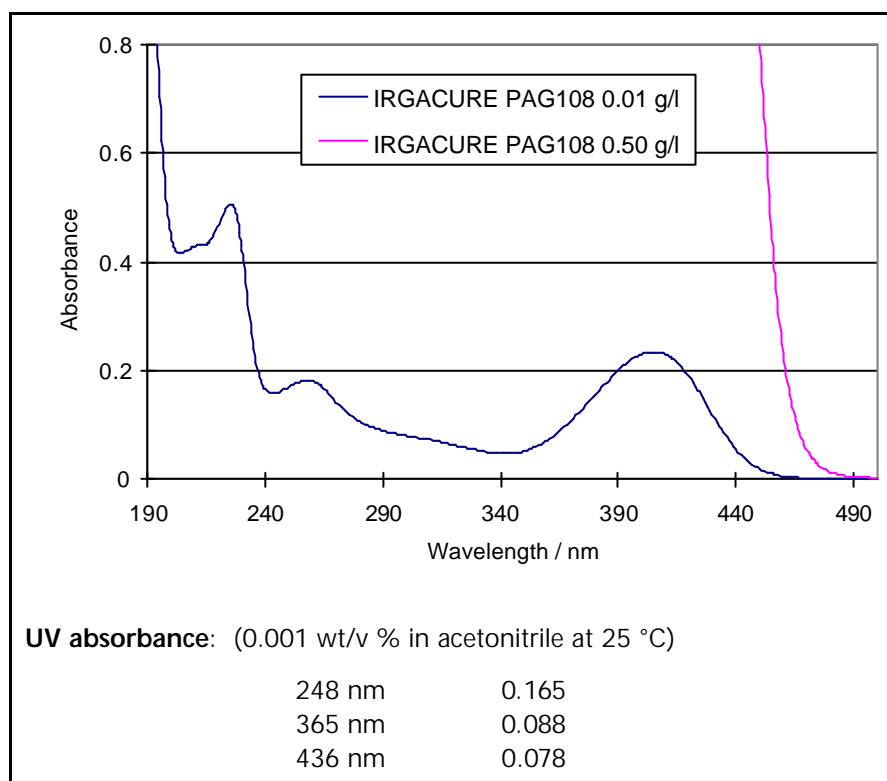
## General

IRGACURE PAG108 is a highly efficient non-ionic photoacid-generator liberating octane-sulfonic acid when exposed to light in a fairly wide spectral range from the Deep-UV-area up to more than 450 nm. Products of similar chemistry but liberating other acids are available in the IRGACURE PAG1xx-series: IRGACURE PAG103 (propane sulfonic acid) and IRGACURE PAG121 (toluene sulfonic acid).

### Features and benefits of IRGACURE<sup>®</sup> PAG 108:

- Halogen-free
- Non ionic
- High sensitivity at g-, h-, i-lines and 248nm (KrF excimer) sources
- Good thermal stability (<140°C)
- High solubility
- Low volatility

## Absorption Spectrum (% in Acetonitrile)



## Physical Properties (typical values)

<u>Appearance:</u>	yellow solid
<u>Thermal Decomposition:</u>	>140 °C (determined by DSC) in polyhydroxystyrene matrix
<u>Melting Point:</u>	89-91 °C



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### Solubility at 25°C (g/100 g solution):

PGMEA >20  
(propylene glycol monomethyl ether acetate)

### Applications

IRGACURE PAG108 may be used, after adequate testing in the following applications:

#### **Imaging:** Photoactive compound in:

- a.) positive photoresists based on photochemical acid generation, such as chemically amplified photoresists, containing acid labile functional groups which - after reaction with the photo-generated acid - enhance the solubility of the resist material in an alkaline developer (i.e. chemically amplified positive resists comprising phenolic and/or acrylic (co-) polymers and acid labile functions such as t-butylesters, t-butylcarbonates, acetals, ketals, silyl ethers, etc.);
- b.) negative photoresists based on acid induced reactions (i.e. electrophilic substitution or crosslinking) which change the solubility of the exposed resist material in a developer.
- c.) photoimaging materials (for example, such as a) and b)) for manufacturing semiconductor devices, like electronic circuits, thin film transistors for LCD, galvano- and plating masks, ion implantation masks, etch resists, printing plates, protective coatings, holograms, etc.
- d.) UV-photoimaging, including deep-UV and near UV radiation sources, particularly from 190 nm to 450 nm wavelength and preferably at mercury i-line (365 nm), h-line (405 nm) and g-line (436 nm) , with lasers, mercury-, metal-halogenide and excimer lamps, through photomasks or by direct write techniques.

#### **Coatings and others:** Photoactive component in:

- a.) Radiation cured coatings based on acid hardening systems with wide photosensitivity spectrum from deep-UV to about 450 nm;
- b.) Color change system based on reaction of a component with acid in the exposed areas and sensitive through the whole UV range.

Concrete examples how to use the PAG in resist formulations are given in the following:



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## Example of Positive Tone Resist (t-BOC type)

Binder polymer:	poly(HS-co-t-BOC HS*)	100 solid parts
PAG	IRGACURE PAG108	4 solid parts
Solvent:	PGMEA	

\* HS = p-hydroxystyrene, Mw 11900, Mw/Mn=1.10, 40% t-BOC-protected

## Sensitivity

PAG	Sensitivity E <sub>0</sub> (mJ/cm <sup>2</sup> ) 254 nm	Dark Erosion (nm/s)
IRGACURE PAG108	17	< 0.1

## Safety and Handling

IRGACURE PAG108 should be handled in accordance with good industrial practice and in conformity with any legal regulations. Detailed information is provided in the Safety Data Sheet. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not be construed as guaranteeing specific properties.

IRGACURE PAG108 is **very sensitive to visible light and should be handled under yellow light conditions**. Opened drums should be closed after use to protect the product against light. Storage in a refrigerator at 3-6°C is recommended.

## Important Notice

IMPORTANT: The following supersedes Buyer's documents. SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled or lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and

Ciba Specialty Chemicals

Coating Effects



## **Ciba<sup>®</sup> IRGACURE<sup>®</sup> PAG108**

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is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.