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DNQ-THBP-Ester - Building Block
In Era of Fast Computing -Contribution from Orion Photosensitive Systems.
India.

DNQ-THBP (Diazo naphthoquinone-Tetra hydroxy benzophenone) photoresists hold a foundational, highly stable market position as the industry standard for legacy and mature semiconductor nodes. While leading-edge fabs have migrated to DUV (ArF/KrF) and EUV systems for sub-node processing, DNQ-THBP systems remain the commercial and industrial workhorses for **g-line (436 nm)** and **i-line (365 nm)** microlithography.

They anchor a global g-line/i-line resist market valued at over **$1.5 billion**.

Market and Technological Status

DNQ-THBP is a positive-tone photoresist system where Novolak resin acts as the base matrix and THBP esterified with DNQ functions as the Photoactive Compound (PAC).

ORION has introduced 3 Types of Building Blocks to suit Demand of Manufacturers who use Microlithography.

1) Orion-P-1403
2) Orion-P-3101
3) Orion-P-1610

Write up Continues.

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Metric / Attribute	G-line Microlithography	I-line Microlithography
Wavelength	436 nm	365 nm
Typical Resolution	> 0.5 µm	0.35 µm to 0.25 µm
Current Market Share	Declining but highly stable in specific niche applications.	**Dominant mid-UV segment**; second largest photoresist type globally.
Key Advantage	High thickness tolerance, robust substrate adhesion, cost-efficiency.	High resolution for legacy metrics, high contrast, steep sidewall angles.
Primary Industry Use	Power devices, discrete components, basic MEMS, old flat-panel displays.	IoT sensors, analog chips, automotive ICs, advanced packaging (TSVs).

Optimization for i-Line Dominance

Because I-line steps require sharper contrast and higher resolutions, modern formulation strategies focus heavily on tailoring the THBP backbone

High Esterification: Maximizing the number of DNQ groups attached to a single THBP ballast prevents "partially exposed" dark erosion, allowing cleaner and Vertical side walls and higher contrast.