

PAS 5500/8TFH-A

Description

The PAS 5500/8TFH-A KrF Step-and-Scan system is a dedicated lithography tool for thin-film head (TFH) production on 125-mm, 150-mm, and 200-mm AlTiC wafers.

It combines a powerful, variable NA up to 0.8 lens with the proven thick AlTiC wafer handling of a PAS body and specific alignment improvements for the TFH environment.

The result is a new standard for TFH production at current and future technology nodes.

TFH manufacturing involves printing sub-100-nm isolated features, which demands extremely low lens aberration levels. The PAS 5500/8TFH-A uses the proven ultra-low aberration KrF lens from the XT platform on the PAS body, ensuring excellent performance and a low cost of ownership.

The low thermal conductivity of AlTiC wafers means maximum throughput on the track is restricted, allowing the PAS 5500/8TFH-A more time for alignment and wafer stabilization. In addition, the PAS 5500/8TFH-A features further improvements to the dynamics.

Together, these translate into industry-leading overlay and stitching performance on AlTiC wafers.

Technical Specifications

Lens	
Wavelength:	248 nm
NA:	0.55-0.80 (variable)
Resolution:	≤ 110 nm
Field size, for reticle with pellicle	
• Max X:	26.0 mm
• Max Y:	33.0 mm
CD Uniformity @ 90-nm isolated lines	
• BF:	≤ 6 nm
• Over 0.3- μ m defocus:	≤ 14 nm
CD Uniformity @ 110-nm L/S	
• BF:	≤ 7 nm
• Over 0.4- μ m defocus:	≤ 10 nm
Distortion (Dynamic):	≤ 9 nm
Image plane deviation:	≤ 55 nm
Astigmatism:	≤ 40 nm
Overlay	
Single-machine on AITiC:	≤ 8 nm
Matched-machine on AITiC:	≤ 17 nm
TFH Specific	
Stage grid verification XY, YX on AITiC:	< 8 nm
Colinearity using 3 fields for 2" rowbars on AITiC:	< 15 nm
Wafer Throughput	
50-mJ/cm ² exposure dose, for critical overlay layers	
• 200-mm wafers, 46 shots:	≥ 25 wph
Illumination and Dose Control	
Integrated slit uniformity:	≤ 0.5%
Lasers	
Type:	Cymer ELS6610
Power:	20 W
Beam Delivery:	≤ 20-m remote capability

Key Features and Benefits

SmartStart

Enables user-defined wafer accommodation, meandering routing in X, and system start-up via the job definition to provide stable production performance for small AITiC wafer batch sizes in combination with TFH-specific off-line data analysis software.

Proven AITiC Wafer Handling

Proven handling of 1.2 mm thick (125 mm, 150 mm or 200 mm diameter) and 2.0 mm thick (125 mm and 150 mm diameter) AITiC wafers.

KrF Starlith 870 Projection Lens with Variable NA Up to 0.80

Ultra-low aberration levels enable isolated line imaging below 90 nm.

UNICOM, ADE

UNICOM enables automatic optimization of the slit uniformity per illumination setting. Meanwhile, the automatic DOE exchanger (ADE) can hold up to 5 Diffractive Optical Elements (DOEs).

IOSc-4

The latest overlay capability configuration.

PAS 5500 Step-and-Scan Body

Improved dynamics and interferometer control enable best-in-class performance.

Multiple Exposure Technique

Enables different illumination modes and imaging settings with multiple masks, and allows user-defined image sequence orders.