

LithOptek **MILARA**

The background features a complex network of glowing orange and yellow lines that resemble a circuit board or data pathways, set against a dark blue and green bokeh background. At the bottom, there is a circular, glowing data visualization or map.

LithOptek **MILARA**

Introducing CDOP: The CD Optimizer

Making Systematic CD Errors
A Thing of the Past

CDOP is the 1st 200mm Industry Solution to Offer ALL these benefits

- Corrects:**
- Systematic CD errors across the wafer
 - CDs to target with nanometer precision
 - Both global and in-die errors
 - CD errors from ALL sources: Litho, Etch, CMP, ... etc.

Each wafer pixel (0.5 × 0.5 mm) is given a unique correction
CD correction at 125,000 locations at 120 WPH!

CD control as good as your metrology

LithOptek CD Optimizer

Available NOW



- Compact footprint & advanced robotics by Milara
- Dual-cassette load port with automatic wafer size detection (100, 150, 200 mm)
- Supports notch/flat, OCR, Si/SiC/glass wafers, etc.
- Easy-to-use interface

LithOptek CD Optimizer

Available NOW



- Uses simple process recipes built from CD-SEM data and resist properties
- Fully tested at MIT Lincoln Laboratory
200 mm Fab
- Ready for High Volume Manufacturing
- Global support provided by Milara-LithOptek partnership

LithOptek CD Optimizer

Available NOW

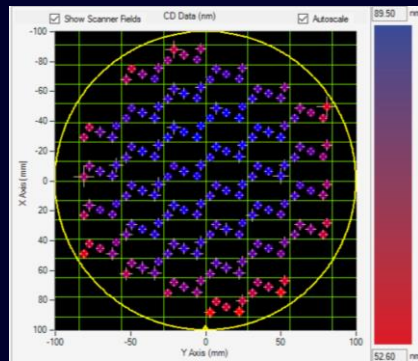


Imagine
eliminating
CD Variations
in your Fab

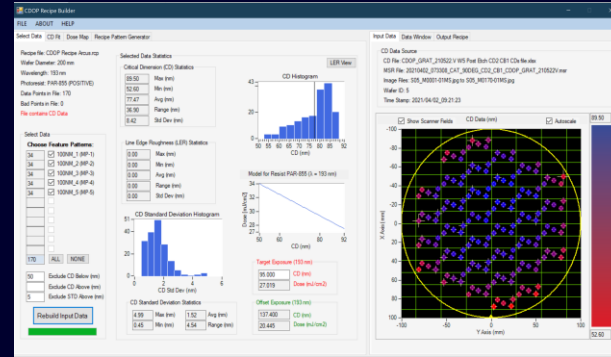
LithOptek CD Optimizer

Easy-to-use Recipe Builder Software

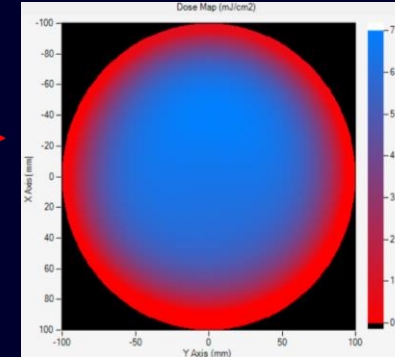
CD error map



Recipe Builder



Recipe File



CDOP Exposure



CDOP Recipe Example

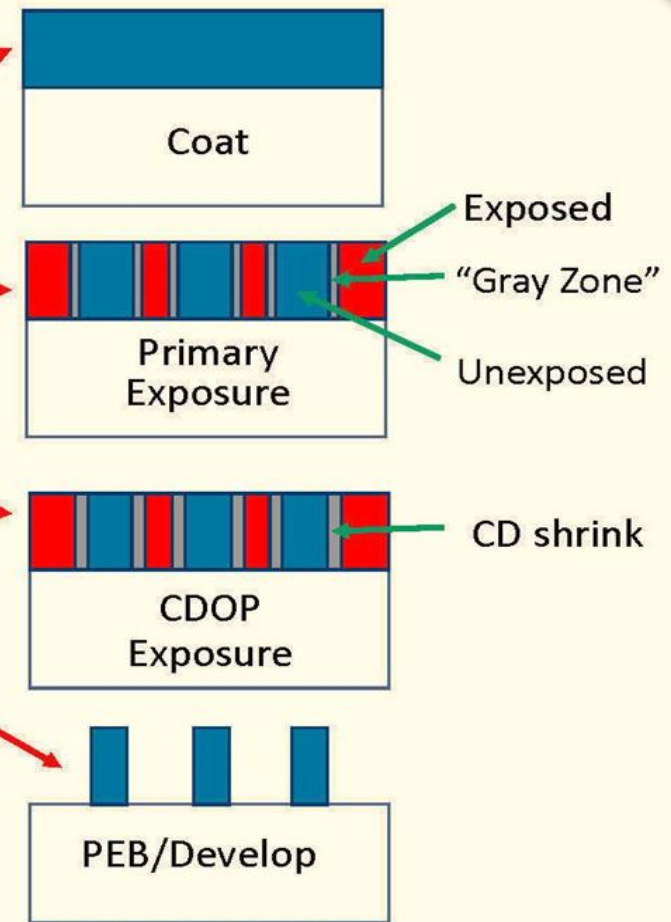
Step 1: Apply resist/ARC using your normal process

Step 2: Perform normal primary exposure (scanner) but with small underdose to bias pattern

Step 3: CDOP exposure adds a small and precise deep-UV trim dose to each pixel to nudge CDs to target

Step 4: Perform normal PEB/develop at end of process
(CDOP exposure can also be performed before scanner.)

Quick and simple process

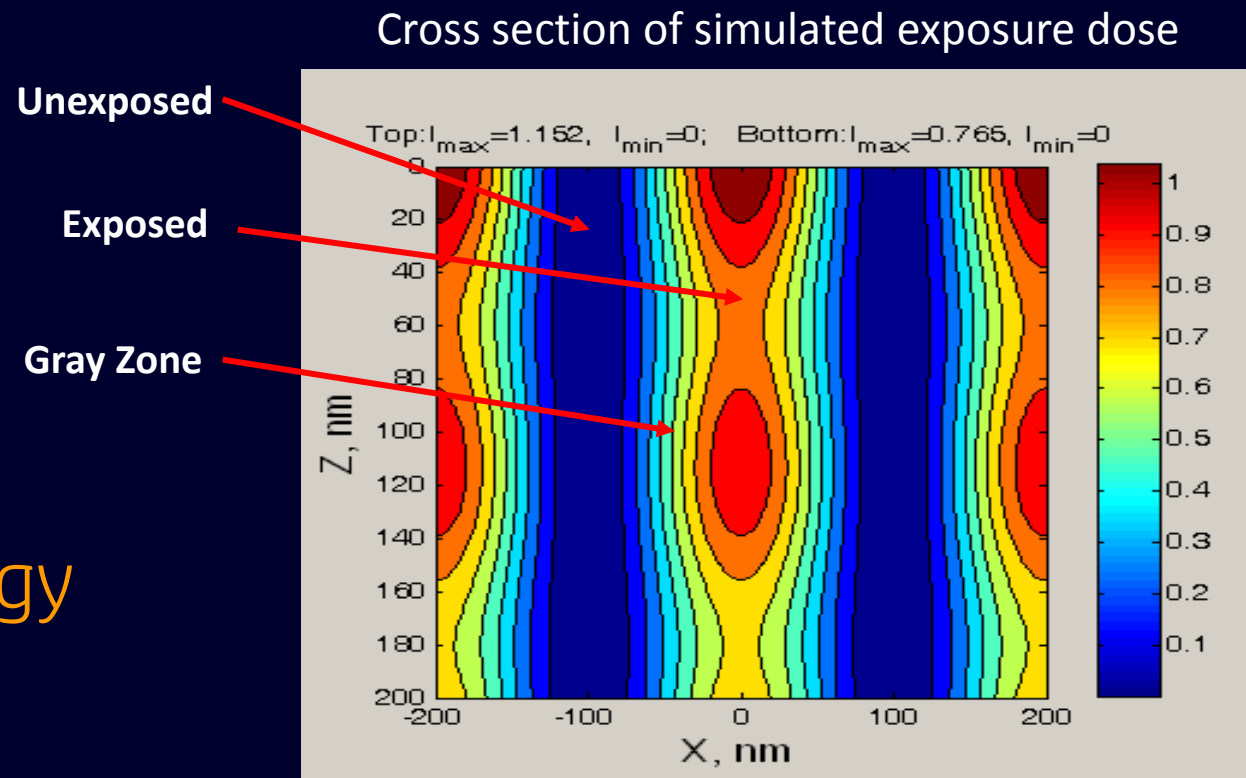


Impossible! How does it work?

Traditional lithography results in a narrow gray zone between fully exposed and unexposed regions, the CDOP utilizes the gray zone

- CDOP adds a small tailored deep-UV trim dose to each pixel
- Gray zone areas are slightly shifted to smaller CD to hit target

LithOptek's Gray Zone strategy delivers results!



LithOptek CD Optimizer

Robotics by
MILARA

A Collaboration of Technical Expertise
Bringing Tools to Market Quickly

MILARA Handler Tool Interface

The screenshot displays the MILARA Handler v2.1 software interface. At the top, it shows 'Recipe: 200mm' on the left and 'User: Operator' on the right. The main title bar reads 'MILARA Handler v2.1' with 'ATON, Version 1.0.0 Test 001' below it. The interface is divided into several sections:

- CLM1 Input/Output** and **CLM2 Input/Output**: Two vertical panels on the left, each with a '200mm' label and a list of 24 items. Below each list are 'Open', 'Close', and 'Scan' buttons.
- Central View**: A large circular grid of 24 white squares. Below it, the word 'READY' is displayed in green.
- Control Panel**: A central area with a 'RECOVER' button, several 'Check Settings' buttons, and 'LIGHT' and 'DOORS' status indicators.
- Running Cycle**: A large circular graphic with 'RUNNING' in the center, surrounded by a blue ring and a 'Abort' button.
- Bottom Section**: Includes 'PreAligner' and 'OCR' settings, a 'Scan ID' field, and a small circular grid icon.
- Log Window**: A bottom-right panel showing a list of system events with timestamps and descriptions.

Powerful
and
Easy to
use!

MILARA Handler Tool Interface



- Touch screen controls
- Process animation
- Tool config management
- Process recipe library
- Recipe support: Per-slot and per-cassette
- Manual and automatic recipe modes

MILARA Handler Tool Interface



- Robot and Process chamber cameras
- Automatic process monitor, self calibration, logging, and much more . . .


Optional:

Remote operation, SECS/GEM capable



A world map with several location pins in various colors (blue, green, orange, dark blue) placed across North America, Europe, and Asia. The pins are clustered in the USA, Europe, and East Asia.

MILARA Global Service Network



A horizontal line with four colored circles (green, blue, dark blue, orange) above it, corresponding to the four service categories.

Headquarters

Milford, MA USA

Branch Offices

European Office
Plovdiv, Bulgaria

China Office
Beijing, China
Shanghai, China

Manufacturing

Milford, MA USA
Plovdiv, Bulgaria

Sales

Milford, MA USA
Plovdiv, Bulgaria
Beijing, China

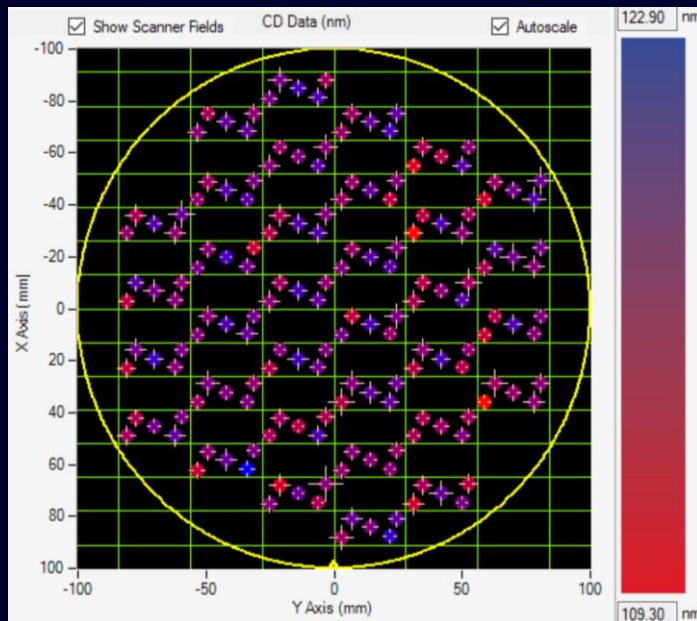
Support

Milford, MA USA
USA West Coast
Plovdiv, Bulgaria
Israel
Singapore
Dongguan, China
Shanghai, China
Suzhou, China
Taoyuan, Taiwan

Case Study: CDOP Correction

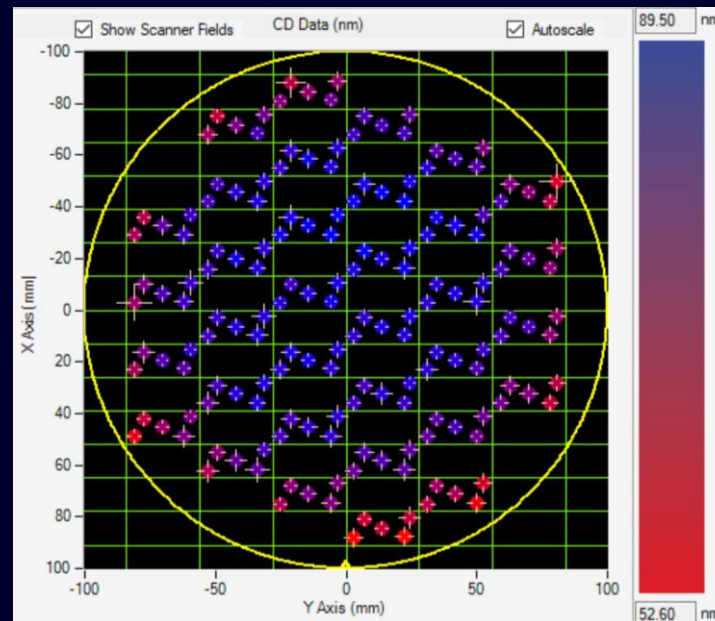
CD Correction of 100 nm L/S pattern flattened to 55 nm target

After litho (193 nm)



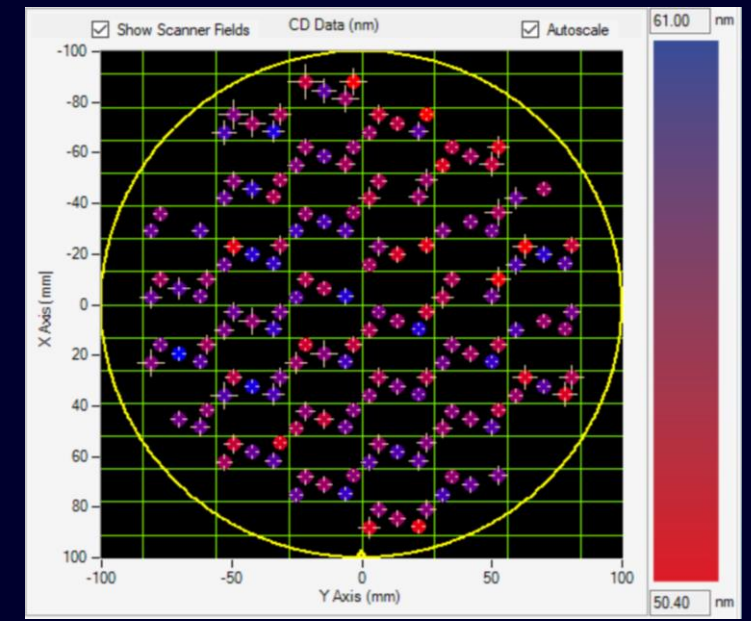
2.07 nm STD

After etch (no CDOP)



8.42 nm STD

After CDOP + etch



2.11 nm STD

> 3X reduction of CD variation!

CDOP Testing & Demonstration

> 3X reduction of CD variation!

CDOP **Testing & Demonstration**

Available NOW

CDOP Testing & Demonstration

Interested customers can run test wafers on our CDOP tool at MIT Lincoln Laboratory's fully-equipped 200mm Microelectronics facility.

The Microelectronics Laboratory is a state-of-the-art semiconductor research and fabrication facility that supports the design, fabrication, and packaging of novel devices.



LL MIT - Microelectronics Laboratory facility
Lexington, MA

Check Out CDOP: the CD Optimizer

Join Us in the Fight to Eliminate
CD Variations . . .

one wafer at a time

LithOptek **MILARA**

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