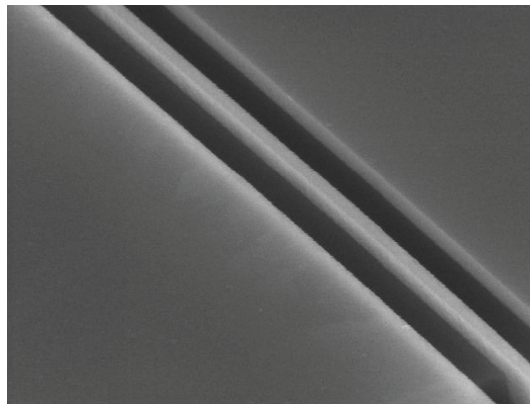


# NanoCD Standards for Mask Handling Tools

**STAY IN LINE WITH SUB-100 NM ACCURACY.** The NanoCD™ (NCD) is the first commercially available standard to provide line width accuracy calibration at the 130 nm, 90 nm, 65 nm and 45 nm nodes. Use it for tool matching, calibrating the width CD-AFM tip or diagnostics in a CD-SEM, and prevent bias from ever leaving the mask shop.

On the left is an isometric view of a NanoCD 70 nm line, which extends to 3 mm total certified length. At right, the NanoCD is shown mounted into a 6" x 6" x ¼" aluminum carrier.



## PRODUCT DESCRIPTION

The NanoCD consists of a small chip containing a single isolated line 4 mm long (3 mm long), offering thousands of distinct measurement sites. Chips are fabricated at VLSI Standards using a patented technique that results in lines with high uniformity and low associated uncertainty, unachievable through conventional lithography methods. For compatibility with reticle handlers, the chip is mounted to an aluminum replica of a quartz photomask.

Global alignment marks, rulers and pattern recognition features extending from the chip to the reticle ensure that the target is always located, and measurements can be repeated.

The width of the line, or the Critical Dimension (CD), is certified with TEM and is traceable to NIST and to the international system of units (SI) through the atomic lattice spacing of single crystal silicon.

## PRODUCT SPECIFICATIONS

- **Substrate**  
152 mm x 152 mm x 0.25 mm Al carrier
- **Nominal CD Values**  
25 nm, 45 nm, 70 nm, or 110 nm
- **Accuracy**  
25 nm  $\pm$  0.5 nm, 45 nm  $\pm$  0.7 nm,  
70 nm  $\pm$  0.7 nm, 110  $\pm$  0.8 nm
- **Material of CD line**  
Amorphous Silicon
- **Length of Line**  
3 mm certified
- **Defectivity of Line**  
5% Max. (150  $\mu$ m of total 3,000  $\mu$ m)
- **Traceability**  
Traceable to the SI units through the atomic lattice spacing in the silicon crystal by TEM



**NCD**

**NanoCD Standard for Mask Handling Tools**

Application: Line Width Calibration  
 Equipment: CD-AFM and CD-SEM  
 Features: Amorphous Silicon Isolated Line  
 Traceability: NIST  
 Product Range: 25 nm to 110 nm

Reticle Size Layout	6" x 6" x 1/4"		
	X	XY	Multiple X
<b>Line Width (nm)</b>			
25	NCD625-25X	NCD625-25XY	
45	NCD625-45X	NCD625-45XY	
70	NCD625-70X	NCD625-70XY	
110	NCD625-110X	NCD625-110XY	
25-45			NCD625-2D-25-45X
45-70			NCD625-2D-45-70X
70-110			NCD625-2D-70-110X
25-45-70			NCD625-3D-25-45-70X
45-70-110			NCD625-3D-45-70-110X
25-45-70-110			NCD625-4D-25-45-70-110X