Materials Development Corporation

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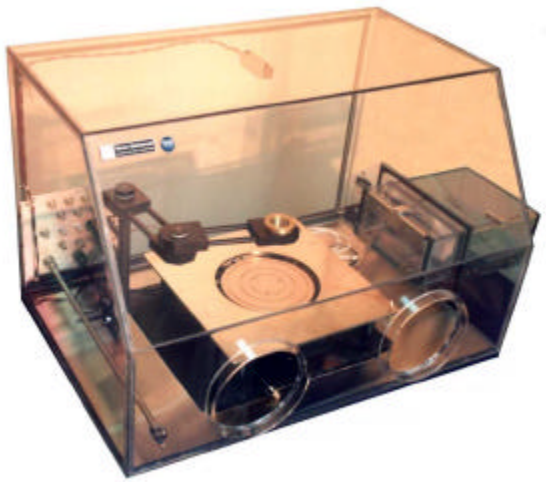
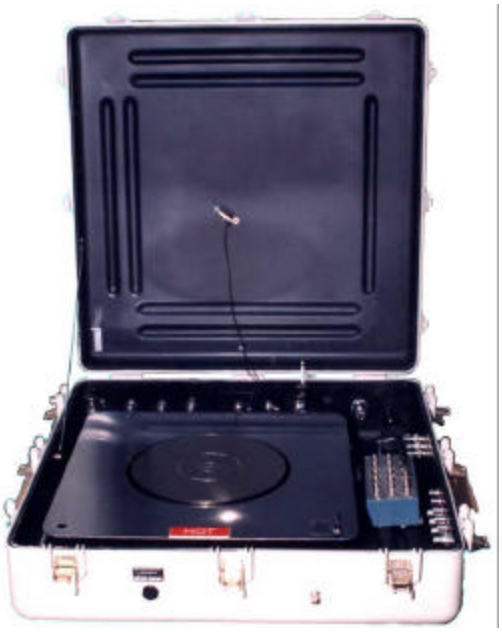
PRODUCT INFORMATION
COPPER DIFFUSION TEST SYSTEMS

MDC announces the addition of software and hardware for copper diffusion studies to its CSM/Win suite of semiconductor test systems and software. This new CSM/Win feature plays an important part in the development of processes and materials for the next advance in integrated circuit technology that employs copper as a conductor. Special Current-Voltage Bias-Temperature Stress (IV-BTS) software can measure the degradation of insulator quality due to copper diffusion. Multiple test sites can be stressed with a constant voltage while the current through each site is measured and recorded. The Current-Voltage Bias-Temperature Stress test supplements conventional MOS C-V measurements and Triangular Voltage Measurements (TVS) that are also employed in copper diffusion studies.

Also available from MDC are sealed test chambers that facilitate testing in an inert atmosphere where the copper will not oxidize. Two test chambers configurations are available to use with the MDC QuietCHUCK Hot Chuck System. The Model DG-8 enclosure surrounds the probe station with an airtight glove box. The glove box also includes a video microscope and enough room to adjust probes while heating. The Model D3-STC is a hermetically sealed dark box that is a little larger than the standard 10-probe enclosure.



MDC Glove Box for Cu Diffusion Testing
Model DG-8 includes airlock for transfer of samples, a hot chuck for temperature stress, video microscope stand, and feedthrough panel for multiplexer and instrument connections.



MDC Hermetic Enclosure
Model D3-STC hot chuck and enclosure includes hermetically sealed feedthroughs for all electrical and utility connections.

MDC COPPER DIFFUSION TEST SYSTEMS

Enclosure Specifications

Hot Chuck:

Diameter: 200 mm
Type: Cast Aluminum,
Temperature Range: Ambient to 350ºC

Dimensions:

Part Number	Width	Depth	Height
DG-8	35" (89 cm)	24" (61 cm)	23" (58 cm)
DG-8 Airlock	10" (25 cm)	10" (25 cm)	4.5" (11 cm)
D3-STC	24" (61 cm)	24" (61 cm)	8" (20 cm)

Connectors:

Vacuum and Nitrogen: Stainless Steel Swagelok-type
Thermocouples: Type J, Hermetically Sealed, Two used
BNC/Triaxial: Hermetically sealed

Residual Oxygen Content after purging: <1 ppm

Instrument Specifications

Components: Voltage Sources, Current Monitor, SMU.
Computer with Windows 98 or Windows 2000
MDC CSM/Win Software
Optional Meters for C-V or TVS measurements
Hot Chuck Controller
Optical or Video Microscope

Tests: IV-Bias Temperature Stress
Triangular Voltage Sweep
Capacitance-Voltage
Forced Voltage or Forced Current Insulator Integrity

Voltage Range: Meter Dependent. Typically 0 to 100 Volts, or 0 to 500 Volts.
Current Range: Meter Dependent. Typically 0 to 100 mA.

Multiplexer Specifications

Number of Probes: 10 Maximum

Design: Sampling Type. All test devices are kept at constant bias. Current through each device is sampled in sequence.

Leakage Current: 100 pA