

**RIE-51/RIE-61
SPECIFICATIONS**

JULY 1984



MATERIALS RESEARCH CORPORATION

Orangeburg, New York 10962 U.S.A.

914/859-4200 — Telex: 221862 MRC UR — CABLE: MATRESCO

INTRODUCTION

FOLLOWING IS THE FULL SPECIFICATION FOR THE MATERIALS RESEARCH CORPORATION RIE-51 AND RIE-61 REACTIVE ION ETCHERS.

CONFIGURATIONS/OPTIONS:

THESE SYSTEMS ARE SOLD IN VARIOUS CONFIGURATIONS FROM BASIC MODULES (IN WHICH ONLY THE CHAMBER, CATHODE, GAS DISTRIBUTION FEEDTHROUGH, POWER DISTRIBUTION NETWORK, AND RF POWER MATCHING NETWORK ARE INCLUDED) TO MORE EXTENSIVE CONFIGURATIONS WITH VACUUM PUMPS, POWER SUPPLIES AND ETCH GAS DISTRIBUTION AND CONTROL SUBSYSTEMS.

ITEMS MENTIONED IN THIS SPECIFICATION ARE NOT NECESSARILY INCLUDED IN THE BASIC MODULE OR OTHER CONFIGURATIONS. CONSULT MRC FOR DETAILS OF WHICH ITEMS ARE INCLUDED IN SPECIFIC CONFIGURATIONS.

PROCESS ETCH SPECIFICATIONS NOT INCLUDED:

THE RIE SYSTEMS DO NOT INCLUDE ANY SPECIFICATION ON THE ETCHING OF SPECIFIC FILMS. RIE SYSTEMS ARE DESIGNED AND SOLD PRIMARILY AS A PROCESS DEVELOPMENT TOOL, WITH THE EXPECTATION THAT THE USER WILL DEVELOP PROCESS KNOWLEDGE AND DETAIL.

I. SPECIFICATION SUMMARY- STANDARD HARDWARE AND VACUUM PERFORMANCE.

I.0 CHAMBER: CYLINDRICAL, HELIARC WELDED

1.1 MATERIAL: STAINLESS STEEL - 300 SERIES

<u>1.2</u>	<u>SIZE:</u>	RIE-51	RIE-61
		12" DIAMETER	20" DIAMETER (NOMINAL)
		10" HIGH	8" HIGH (NOMINAL)
		1/2" THICK TOP AND BASE PLATES	1/2" THICK TOP AND BASE PLATES



APPROXIMATE VOLUME= 40 LITERS RIE-61
19 LITERS RIE-51

1.3 PORT CONFIGURATIONS

- 3 - 4" VIEWPORTS (2 CHAMBER, 1 TOP PLATE)
- 2 - CONFLAT BLANKS (2 3/4" FLANGE O.D.)
- 7 - V4 PORTS (6 BLANK, 1 VENT VALVE)
- 1 - 6" ASA PUMP PORT WITH 90° ELBOW
- 1 - PROCESS GAS INLET - 1/4"

1.4. *HINGED TOP PLATE WITH LIFT HANDLE (AIR SPRING ASSIST ON RIE-61)

2.0 CATHODES

2.1 RIE-51 CATHODE: WATER COOLED CATHODE, WITH INTERNAL RESISTANCE HEATER, REMOVABLE/INTERCHANGABLE SUBSTRATE HOLDERS, 6" DIAMETER, NOMINAL, 5" DIAMETER USEABLE

2.2 RIE-61 CATHODE: WATER COOLED CATHODE, WITH INTERNAL RESISTANCE HEATER, REMOVABLE/INTERCHANGABLE SUBSTRATE HOLDERS, 12" DIAMETER NOMINAL, 11" USEABLE.

2.3 COUNTER ELECTRODE: NORMALLY GROUNDED, ADJUSTABLE TO ANODE CATHODE DISTANCE MAY BE OPTIONALLY BIASED OR ISOLATED.

- MINIMUM ANODE/CATHODE SPACING = 0"
- MAXIMUM ANODE/CATHODE SPACING = 6" RIE-51
4" RIE-61

REMOVABLE SURFACE MAY HAVE VARIOUS MATERIALS BONDED TO IT.

3.0 VACUUM PERFORMANCE: ASSUMES CLEAN, DRY, EMPTY CHAMBER AT 23° C NOMINAL.

**3.1. ULTIMATE: 5 X 10⁻⁷ TORR OR BETTER,
24 HOURS**

**3.2. PUMPDOWN: FROM ATMOSPHERE TO 1 X
10⁻⁶ TORR IN 30 MINUTES OR LESS WITH
MRC SUPPLIED PUMPING STACK**

**3.3. LEAK RATE: FROM 5 X 10⁻⁷ TORR TO
1 X 10⁻⁴ TORR IN 180 SECONDS OR GREATER**



II OPTIONAL ACCESSORIES

1.0. RF GENERATOR:

1.1 POWER 1/2KW, 1.5KW, OR 3.0 KW CONTINUOUSLY RATED. OPERATES ON THE ISM FREQUENCY OF 13.56 MHZ AND MEETS OR EXCEEDS FCC AND OSHA SPECIFICATIONS AS WELL AS THE WEST GERMAN POST OFFICE. STABILITY BETTER THAN 2%. SYSTEM COOLING WILL ALLOW THE SYSTEM TO OPERATE AT 500W CONTINOUS AND 3KW INTERMITTENT.

1.2. TUNING MANUAL TUNING NETWORK

2.0. VACUUM PUMPING EQUIPMENT

2.1. HI VACUUM PUMPS:

1. TURBOMOLECULAR PUMP - MODEL LH450 WITH N₂ PURGE

OR

2. DIFFUSION PUMP - MODEL VHS-6 (2400 L/S FOR AIR) WITH WATER BAFFLES AND FOMBLIN OIL

2.2. ROUGHING/BACKING PUMP

KINNEY MODEL KTC-21 (21CFM) WITH HALOVAC-125 OIL AND OIL RECIRCULATING PUMP.

1" MANUAL LEAK CHECK VALVE

2.3. CONTROLS:

1. ROUGHING VALVE - MANUAL - 1 1/2" STAINLESS STEEL

2. FORELINE VALVE - MANUAL - 1 1/2" STAINLESS STEEL

3. GATE VALVE - MANUAL - 6" ALUMINUM

2.4. GAUGING - HIVAC:

2 - THERMOCOUPLE GAUGES FOR ROUGH AND FORELINE (VARIAN #801)

1 - COLD CATHODE ION GAUGE FOR PROCESS CHAMBER HI VAC (VARIAN #806)

1 - COLD CATHODE ION TUBE - (VARIAN #0524)

19" RACH MOUNT PANEL



3.0. GAS DELIVERY SYSTEM

- 3.1. * COAXIAL PYREX RING (NOMINAL 9" HIGH, 8" DIAMETER RIE-51
14" DIAMETER RIE-61)

TO PROVIDE UNIFORM GAS DISTRIBUTION AND FLOW AT HIGH
PRESSURE OPERATION

- 3.2. GAS MIXING SYSTEM WITH MASS FLOW CONTROLLERS (AVAILABLE
2,3, OR 4 GASES)

- 3.3. * CCl₄ LIQUID SOURCE

- 3.4. * THROTTLE VALVE - MANUALLY ACTUATED THROTTLE VALVE WITH
MANUAL ADJUSTMENT SCREW TO ADJUST CONDUCTANCE IN CLOSED
POSITION -

STAINLESS STEEL
FERROFLUIDIC ROTARY FEEDTHROUGH

- 3.5. * CAPACITANCE MANOMETER HEAD AND DIGITAL DISPLAY FOR PROCESS
PRESSURE READOUT

4.0. PROCESS TIMER

RANGE SECONDS 0-6, 0-60

MINUTES 0-6, 0-60

HOURS 0-6, 0-60

III UTILITIES:

SEE "EQUIPMENT SITE PREPARATION GUIDE" DOCUMENT NO. 115-01-
006 AND INSTALLATION DWG. RIE 51-0101

