

**RCA RESEARCH OPERATIONS RECHARGE CENTER TOOL RATES**

Tool#	Tool Name	Rate	Unit	Min Chg	Location
C01	Synthesis Station	\$12.50	Hourly	4 Hours	R1A 1226
C04	Surface Energy Station	\$10.00	Hourly	1 Hour	R1A 1226
C05	Adhesion Screen	\$50.00	Experiment	1 Experiment	R1A 1226
C06	Paint Booth	\$10.00	Hourly	1 Hour	R1A 1238
C07	Weigh Station (Bohdan)	\$10.00	Hourly	1 Hour	R1A 1226
C08	Solvent Evaporator (Genevac)	\$11.55	Experiment	1 Experiment	R1A 1232
C09	Crystalization Microscope	\$10.00	Hourly	1 Hour	R1A 1226
C10	EIS Test Equipment	\$25.00	Day	1 Day	R1A 1124
C11	Symyx Rapid GPC	\$28.83	Experiment	1 Experiment	R1A 1226
C14	ChemSpeed Reactor	\$100.00	Day	1 Day	R1A 1236
C18	General Shop Tools	\$10.00	Hourly	1 Hour	R1A 1240
C19	Atmospheric Plasma Deposition	\$12.50	Hourly	4 Hours	R1A 1238
C20	Solvent Stripper	\$2.50	Hourly	4 Hours	R1A 1238
C21	Rotovap	\$2.50	Hourly	4 Hours	R1A 1232
C22	Circular Abrader	\$10.00	Day	1 Day	R1A 1226
C23	Cyclic Corrosion Tester	\$0.02	per hour / per panel	1000	R1A 1124
C25	UV Curing Apparatus	\$10.00	Hourly	1 Hour	R1A 1232
C27	Automated Film Thickness	\$10.00	Experiment	1 Experiment	R1A 1226
C31	Supercritical CO2 Solvent Extractor	\$50.00	Experiment	1 Experiment	R1A 1236
C32	Color & Gloss Measurement Station	\$10.00	Experiment	1 Experiment	R1A 1226
C34	Formulation Station	\$50.00	Experiment	1 Experiment	R1A 1226
C35	Coatings Station	\$50.00	Experiment	1 Experiment	R1A 1226
C36	Friction Station	\$50.00	Experiment	1 Experiment	R1A 1226
C37	QUV Chambers	\$0.06	per hour / per panel	1000	R1A 1124
C39	10 liter Reactor w distillation	\$10.00	Hourly	2 Hours	R1A 1238
C40	10 liter Reactor	\$10.00	Hourly	2 hours	R1A 1238
C41	6 liter High Pressure Reactor	\$10.00	Hourly	4 Hours	R1A 1238
C42	High Pressure Parallel Reactors	\$100.00	Day	1 Day	R1A 1236
C43	Crossflow Membrane Flux Cell	\$5.00	Hourly	1 Hour	R1A 1238
C44	Polymer Extrusion/Rubber Blending	\$20.00	Hourly	2 Hours	R1A 1238
C46	Two Roll Mill	\$10.00	Hourly	1 Hour	R1A 1238
C47	Powdernium	\$10.00	Hourly	1 Hour	R1A 1226
C48	Pycnometer	\$10.00	Hourly	1 Hour	R1A 1132
C49	BET Surface Area Measurement	\$20.00	Experiment	1 Experiment	R1A 1132
C50	Welder	\$10.00	Hourly	1 Hour	R2 128
C51	Glovebox	\$20.00	Day (8 Hrs)	1 Day	R1A 1232
C52	DC High Voltage Power Supply	\$5.00	Day	1 Day	R1A 1240
C53	Flaktec Mixer	\$10.00	Hourly	1 Hour	R1A 1226
C54	Corona Treatment Machine	\$30.00	Hourly	1 Hour	R1A 1124
C55	HPLC Series 1100	\$36.80	Hourly	30 minutes	R1A 1132
C56	Sandblaster	\$10.00	Hourly	30 minutes	R2 136
C57	3-Bay Glovebox	\$20.00	Day (8 Hrs)	1 Day	R1A 1226
C58	Automated Puncture Apparatus	\$20.00	Experiment	1 Experiment	R1A 1226
C59	Mortar Grinder Sieve Shaker	\$20.00	Hourly	30 minutes	R2 128
M02	CHNS-932 Combustion Analyzer + VTF-900 Oxygen Analyzer	\$23.07	Sample	1 Sample	R2 152
M03	P-15 Longscan Contact/Stylus Profiler	\$35.98	Hourly	30 minutes	R2 116
M04	Q800 Dynamic Mechanical Analyzer (DMA)	\$57.05	Hourly	30 minutes	R1A 1132
M05	Q1000 Modulated Differential Scanning Calorimeter (DSC)	\$26.79	Hourly	30 minutes	R1A 1132
M06	FTIR Vertex 70 Spectrometer	\$35.02	Hourly	30 minutes	R2 152
M07	GCMS (6890/5973)	\$34.93	Hourly	30 minutes	R1A 1132
M08	4000 Q-Trap Mass Spectrometer / Agilent Series 1100 LCMS (currently unavailable)	\$53.34	Hourly	30 minutes	R2 152
M09	ECA Series 400 MHz NMR Spectrometer (NMR)	\$33.18	Hourly	1 Hour	R2-150

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M10	Microbalance	\$15.00	Hourly	30 minutes	R2 152
M11	NT3300 Non-Contact Optical Profiler (OP)	\$33.84	Hourly	30 minutes	R1A 1124
M12	Q500 Thermogravimetric Analyzer (TGA)	\$11.88	Hourly	30 minutes	R1A 1132
M13	Thermomechanical Analyzer 2940 (TMA)	\$47.44	Hourly	30 minutes	R1A 1132
M14	XD7600NT Dage X-ray Imaging System (XIS)	\$75.05	Hourly	30 minutes	R2 124A
M15	D8 Discover with GADDS Multipurpose X-Ray Diffractometer (XRD-2)	\$55.46	Hourly	30 minutes	R2 152C
M16	1000 Automatic Mounting Press	\$27.22	Hourly	30 minutes	R2 112
M17	3000 Grinder/Polisher	\$16.79	Hourly	30 minutes	R2 112
M18	Isomet 4000 Linear Precision Saw	\$27.77	Hourly	30 minutes	R2 112
M21	TribolIndenter Nanomechanical Testing System	\$8.15	Hourly	30 minutes	R1A 1124
M23	Series 5500 Atomic Force Microscope/Scanning Tunneling Microscope (AFM)	\$38.35	Hourly	30 minutes	R1A 1124
M24	ARES Rheometer	\$33.95	Hourly	30 minutes	R1A 1226
M26	Pull Tester (PT) (MTS)	\$32.15	Hourly	30 minutes	R2 116
M28	Raman Imaging System (RIS)	\$36.25	Hourly	30 minutes	R1A 1132
M29	Rigaku Ultima IV Versatile X-Ray (XRD)	\$51.50	Hourly	30 minutes	R2 152C
M30	X-Ray Florescence Spectrometer (XRF)	\$57.69	Sample	1 Sample	R2 152C
M31	Scanning Acoustic Microscope (CSAM)	\$46.37	Hourly	30 minutes	R1A 1124
M32	Q2000 Modulated DSC (DSC-2)	\$32.75	Hourly	30 minutes	R1A 1132
M33	Raman Spectrometer System (currently unavailable)	\$40.00	Hourly	30 minutes	R2 116
M34	Scanning Electron Microscope (SEM)	\$29.77	Hourly	30 minutes	R2 116
M35	X-ray Photoelectron Spectroscopy (XPS)	\$50.00	Hourly	30 minutes	R1A 1138
T01	Utility bench	\$12.55	Hourly	30 minutes	R2 122C
T02	Acid bench	\$73.43	Hourly	30 minutes	R2 122C
T03	Convection, Resist bake and Polyimide Ovens	\$8.38	Hourly	30 minutes	R2 122C
T04	Kurt Lesker CMS-18 Sputterer (PVD1)	\$27.40	Hourly	30 minutes	R2 122C
T05	KOH bench - silicon wafer etching	\$79.09	Hourly	30 minutes	R2 122B
T06	SPM Precision Stencil Printer, MPM	\$36.12	Hourly	30 minutes	R2 124A
T07	Nanometrics Nanospec - film thickness	\$21.53	Hourly	30 minutes	R2 122B
T08	Olympus Wafer Inspection & Imaging System (MX50)	\$16.86	Hourly	30 minutes	R2 122C
T09	KLA Tencor Profilometer (P11)	\$26.80	Hourly	30 minutes	R2 122C
T11	Spin coater	\$65.84	Hourly	30 minutes	R2 122B
T12	Solvent Cleaning and Developing Hood	\$63.84	Hourly	30 minutes	R2 122B
T13	SUSS MA-8 Mask Aligner	\$132.23	Hourly	30 minutes	R2 122B
T14	Trion RIE Plasma Etcher	\$55.61	Hourly	30 minutes	R2 122C
T17	Developer	\$45.76	Hourly	30 minutes	R2 122B
T19	Gold Target	\$299.47	Angstroms	1000	R2 122C
T20	HMDS oven	\$41.91	Hourly	30 minutes	R2 122B
T21	Optec Laser (first 100K shots included, then 1 hour/100K)	\$30.90	Hourly	1 Hour	R2 112
T22	Semitool Spin Rinse Dryer (SRD)	\$41.49	Hourly	30 minutes	R2 122C
T23	Microscopes	\$2.93	Hourly	30 minutes	Multiple
T24	Electroplaters	\$75.45	Hourly	30 minutes	R2 124A
T25	Ellipsometer	\$31.10	Hourly	30 minutes	R2 122B
T26	PECVD2	\$49.18	Hourly	30 minutes	R2 122C
T27	Minibrute Tube Furnace	\$24.31	Hourly	30 minutes	R2 122C
T28	Platinum Target	\$330.79	Angstroms	1000	R2 122C
T29	LPKF Circuit Board Milling Machine	\$32.00	Hourly	30 minutes	R2 112
T31	March Plasma Cleaner	\$41.22	Hourly	30 minutes	R2 126B
T32	CSP Ovens	\$11.00	Daily	1 Day	R2 124 & R2 126
T33	Optec Laminator	\$44.24	Hourly	30 minutes	R2 126B
T34	Camelot Dispenser	\$36.22	Hourly	30 minutes	R2 126B
T35	Hanmi mold press	\$58.15	Hourly	30 minutes	R2 126B

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T36	ADT wafer dicing saw	\$45.27	Hourly	30 minutes	R2 126B
T37	Trumpf laser marker (currently unavailable)	\$46.13	Hourly	30 minutes	R2 126B
T38	Checksum Circuit Tester	\$11.70	Hourly	30 minutes	R2 126B
T39	OGP Measuring System (Smartscope)	\$23.35	Hourly	30 minutes	R2 126A
T40	Solderball attach tooling	\$20.26	Hourly	30 minutes	R2 126A
T41	High Force die bonder	\$65.46	Hourly	30 minutes	R2 126A
T42	Low Force die bonder	\$63.53	Hourly	30 minutes	R2 126A
T44	K&S 8028 wire bonder	\$53.41	Hourly	30 minutes	R2 126A
T45	Milara screen printer	\$36.11	Hourly	30 minutes	R2 126A
T46	Austin America Aqueous Cleaner	\$29.96	Hourly	30 minutes	R2 126A
T47	Electrovert Reflow Oven	\$41.02	Hourly	30 minutes	R2 126A
T48	MyData Pick & Place	\$93.99	Hourly	30 minutes	R2 126A
T49	DEK stencil printer	\$38.12	Hourly	30 minutes	R2 126A
T50	Dage pull/shear tester	\$27.90	Hourly	30 minutes	R2 126A
T51	Microhardness Tester	\$23.84	Hourly	30 minutes	R2 126A
T53	TrioTech autoclave	\$22.00	Daily	1 Day	R2 126B
T54	Espec Temperature/Humidity Chamber	\$22.50	Daily	1 Day	R2 112
T55	Westbond Manual Wirebonder	\$43.96	Hourly	30 minutes	R2 126B
T56	Tresky Semi-automated die bonder	\$42.00	Hourly	30 minutes	R2 126A
T57	Orbital Welder (Swagelok)	\$35.00	Hourly	30 minutes	R2 124
T58	Thermal Shock Chamber	\$27.50	Daily	1 Day	R2 112
T61	Battery Tester	\$2.96	Hourly	30 minutes	R1A 1130
T62	Dimension Elite 3D Printer	\$11.04	Hourly	30 minutes	R2 112
T63	HIPPO Laser	\$46.13	Hourly	30 minutes	R2 154
T64	Thermal IR Camera	\$22.00	Hourly	30 minutes	R2 112
T65	Big Sky Laser System with LA Vision Cameras	\$45.00	Hourly	30 minutes	R2 154
T66	LA Vision Cameras (without Laser)	\$20.00	Hourly	30 minutes	R2 154
T67	Cascade Probe Station	\$25.00	Hourly	30 minutes	R2 112
T68	Micro-manipulator	\$15.00	Hourly	30 minutes	R2 124
T70	Agilent PNA-X Vector Network Analyzer	\$80.00	Day (8 hrs)	1/2 Day	R2 120
T71	Tektronix Real-Time Spectrum Analyzer	\$60.00	Day (8 hrs)	1/2 Day	R2 120
T72	Agilent Spectrum Analyzer	\$40.00	Day (8 hrs)	1/2 Day	R2 120
T73	RF Signal Generator	\$40.00	Day (8 hrs)	1/2 Day	R2 120
T74	RF Impedance/Material Analyzer	\$40.00	Day (8 hrs)	1/2 Day	R2 120
T75	METCAL APR-5000 Rework Station	\$40.00	Day (8 hrs)	1/2 Day	R2 120
T76	RF Power Meter	\$30.00	Day (8 hrs)	1/2 Day	R2 120
T77	Logic Analyzer	\$30.00	Day (8 hrs)	1/2 Day	R2 120
T78	Oscilloscope	\$30.00	Day (8 hrs)	1/2 Day	R2 120
T79	Pulse Pattern Generator	\$30.00	Day (8 hrs)	1/2 Day	R2 120
T80	Function Generator	\$20.00	Day (8 hrs)	1/2 Day	R2 120
T81	Soldering Station	\$15.00	Day (8 hrs)	1/2 Day	R2 120
T82	Free Fall Shock Machine (Drop Tester)	\$26.19	Hourly	1 Hour	R2 112
T83	Agilent Semiconductor Device Analyzer	\$40.00	Day (8 hrs)	1/2 Day	R2 112
T84	Acid Decapsulator	\$57.50	Hourly	30 minutes	R2 124A
T85	HAST Chamber	\$20.00	Daily	1 Day	R2 112

\*All tools are available during normal NDSU business hours and subject to proper scheduling  
*Rates subject to change without notice.*