



## EQUIPMENT

### GLASS LINED REACTORS

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR hP	IMPELLER STYLE	COLUMN D X H	PACKING
R-0002-GL	Glassteel	2	FV to 750 @ 600°F (316°C)	0.75 hP	Straight Blade Turbine	no	no
R-25-GL	Glassteel	25	FV to 30 psig	N/A	N/A	no	no
R-30-GL	Glassteel	30	FV to 15 psig	1 hP	2-Blade Paddle	no	no
R-51-GL/FEP	Glassteel & FEP	50	FV to 15 @ 350°F (177°C)	5 hP air	Dual A310, 16"	no	no
R-53-GL	Glassteel	50	FV to 300 @ 650°F (343°C)	3 hP	3-bl Retreat Crv	no	no
R-55-GL	Glassteel	50	FV to 100 @ 450°F (232°C)	1 hP	3-bl Retreat Crv	no	no
R-56-GL	Glassteel	50	FV to 25 @ 450°F (232°C)	N/A	(Receiver)	no	no
R-58-GL	Glassteel	50	FV to 150 @ 350°F (177°C)	3 hP	3-bl Retreat Crv	no	no
R-100-GL	Glassteel	100	FV to 25 @ 350°F (177°C)	2 hP	3-bl Retreat Crv	6" x 6'	3/8" Ceramic Saddles
R-101-GL	Glassteel	100	FV to 15 @ 350°F (177°C)	2 hP	3-bl Retreat Crv	no	no
R-104-GL	Glassteel	100	FV to 25 @ 450°F (232°C)	N/A	(Receiver)	no	no
R-202-GL	Glassteel	200	FV to 25 @ 350°F (177°C)	3 hP	3-bl Retreat Crv	no	no
R-203-GL	Glassteel	200	FV to 90 @ 500°F (260°C)	2 hP	3-bl Retreat Crv	4"	No Packing – Flash Over

\*Refers to the maximum rated name plate capabilities, actual temperature and pressures achievable will vary based on equipment setup.



## GLASS LINED REACTORS CONT.

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR hP	IMPELLER STYLE	COLUMN D X H	PACKING
R-204-GL	Glassteel	200	FV to 25 @ 450°F (232°C)	N/A	(Receiver)	no	no
R-205-GL	Glassteel	200	FV to 25 @ 450°F (232°C)	N/A	(Receiver)	no	no
R-206-GL	Glassteel	200	100 @ 450°F (232°C)	N/A	3-bl Retreat Crv	no	no
R-300-GL	Glassteel	300	FV to 15 @ 650°F (343°C)	N/A	(Receiver)	no	no
R-501-GL	Glassteel	500	FV to 100 @ 450°F (232°C)	7.5 hP	4-bl Cryolok	6" x 8'	1/4" Hastelloy-C DePak
R-502-GL	Glassteel	500	FV to 100 @ 450°F (232°C)	7.5 hP	3-bl Retreat Crv	6"	Glass Tube Condenser—Flash
R-504-GL	Glassteel	500	FV to 100 @ 450°F (232°F)	10 hP	3-bl Retreat Crv	6"	No Packing – Flash Over
R-505-GL	Glassteel	500	FV to 100 @ 450°F (232°C)	7.5 hP	3-bl Retreat Crv	6" x 5'	1/2" Hastelloy-C DePak
R-1000-GL	Glassteel	1000	FV to 40 @ 350°F (177°C)	10 hP	3-bl Retreat Crv	8" x 4'	3/4" Ceramic Saddles
R-1002-GL	Glassteel	1000	FV to 100 @ 650°F (343°C)	15 hP	3-bl Retreat Crv	12" x 8'	No Packing – Flash Over
R-1003-GL	Glassteel	1000	FV to 100 @ 450°F (232°C)	15 hP	3-bl Retreat Crv	8" x 5'	No Packing – Flash Over

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## EQUIPMENT

### SPECIAL ALLOY REACTORS

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR HP	IMPELLER STYLE	COLUMN D X H	PACKING
R-52-H	Hastelloy-B	50	FV to 15 @ 350°F (177°C)	3 hP	3-bl Retreat Crv	no	no

### SPECIAL ALLOY HIGH PRESSURE REACTORS

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR HP	IMPELLER STYLE	COLUMN D X H	PACKING
A-1gal-Hc	Hastelloy-C	1	10,000 @ 842°F (450°C)	0.5 hP	Magnedrive 2" Dispersamax	no	no
R-103-Ni	Nickel 2000	100	FV to 500 @ 400°F (204°C)	2 hP	3-bl Propeller	8' x 8'	Goodloe, SS

### 304 STAINLESS STEEL REACTORS

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR HP	IMPELLER STYLE	COLUMN D X H	PACKING
R-102-SS	Stainless Steel	100	FV to 90 @ 250°F (127°C)	3/4 hP	Lightnin	no	no

### 316 STAINLESS STEEL REACTORS

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR HP	IMPELLER STYLE	COLUMN D X H	PACKING
R-31-SS	Stainless Steel	30	FV to 60 @ 350°F (177°C)	3 hP	4-bl Strt Turbine	no	no
R-60-SS	Stainless Steel	60	FV to 150 @ 450°F (232°C)	5 hP	Lightnin A-310/A-100	no	no
R-503-SS	Stainless Steel	500	FV to 75 @ 650°F (343°C)	7.5 hP	3-bl Retreat Crv	no	no



## 316 SS HIGH PRESSURE REACTORS

NAME	CONSTRUCTION MATERIAL	VOLUME (GALLONS)	WORKING PRESSURE & TEMPERATURE*	MOTOR HP	IMPELLER STYLE	COLUMN D X H	PACKING
A-0.3L-SS	Stainless Steel	300 ml	5400 @ 650°F (343°C)	0.5 hP	Magnedrive Variable Speed Dispersamax	no	no
A-2L-SS	Stainless Steel	2 liter	5500 @ 650°F (343°C)	1 hP	Magnedrive Variable Speed Dispersamax	no	no
A-3L-SS	Stainless Steel	3 liter	8550 @ 100°F (38°C)	N/A	None	no	no
A-1gal-SS	Stainless Steel	1	3000 @ 650°F (343°C)	0.33 hP	Magnedrive Variable Speed Dispersamax	no	no
A-30-SS	Stainless Steel	30	2500 @ 600°F (316°C)	5 hP	Magnedrive Variable Speed Dispersamax	no	no
A-100-SS	Stainless Steel	100	5000 @ 662°F (350°C)	7.5 hP	Magnedrive Variable Speed, 8 Impellers 4-Rushton & 4 Pumper Props	no	no
A-250-SS	Stainless Steel	250	2000 @ 650°F (343°C)	7.5 hP	Advanced Gas Rxr Mixer with Variable Speed Magnedrive	no	no
R-201-SS	Stainless Steel	200	FV to 300 @ 400°F (204°C)	3 hP	Dual A100, 14"	no	no
R-1001-SS	Stainless Steel	1000	FV to 250 @ 600°F (316°C)	7.5 hP	Dual A-320, 30"	no	no

\*Refers to the maximum rated name plate capabilities, actual temperature and pressures achievable will vary based on equipment setup.



## EQUIPMENT

### TUBULAR FIXED BED REACTORS

CAPACITY (VESSEL ID NO.)	WORKING PRESSURE (PSIG)	RATED MAXIMUM TEMPERATURE	AGITATOR MOTOR	IMPELLER STYLE
1.0 Liter 1.5" x 40" Tube Jacketed	4,500	800°F (427°C)	N/A	N/A

### ALL GLASS PILOT PLANT REACTOR SYSTEMS

CAPACITY (VESSEL ID NO.)	VACUUM / PRESSURE	RATED MAXIMUM TEMPERATURE	AGITATOR MOTOR	IMPELLER TYPE
200 Liter Reboiler/Reactor 6" x 5' Column (23 HETP) Goodloe™ Hastelloy™ Packing Electric Mantle Heat 2 x 50 Liter Receivers	Vacuum to 0.5 torr	508°F (250°C)	0.5 hP	Variable Speed
50 Liter Electric Mantle Heat or Cooling Bath	Vacuum to 0.1 torr	508°F (250°C)	0.5 hP	Variable Speed
20 Liter Jacket Process Reactor, ChemGlass	Vacuum to 2 torr, 10 psig max	392°F (200°C)	Air	Variable Speed, Teflon Paddle and Pitched Blade
10 Liter Glass Rotary Evaporator External Condenser (BUCHI-ROTOVAP™)	Vacuum to 1 torr	255°F (110°C)	0.5 hP	Rotating Flask

### SHORT PATH DISTILLATION APPARATUS

NAME	CONSTRUCTION MATERIAL	VACUUM / PRESSURE	WORKING PRESSURE & TEMPERATURE	AGITATOR MOTOR	IMPELLER TYPE
POPE WFE 316 SS	316 Stainless Steel	1.0 ft² Pope WFE 316 SS Internal & External Condensers	0.05 torr @ 650°F (343°C)	0.5 hP	4-Wipers
UIC WFE 316 SS	316 Stainless Steel	3.2 ft² UIC WFE 316 SS Internal & External Condensers Equipped with 2-Stage Degasser	0.02 torr @ 650°F (343°C)	1 hP	4-Roller Wipers



## ANCILLARY EQUIPMENT

### FILTRATION

316 SS Perforated Basket Centrifuges:

- 48" x 30", Bottom Discharge, 25 hP
- 48" x 24", Top Unloading, 25 hP
- 24" x 14", Top Unloading, 10 hP

316 SS Nutsche Pressure Filter, 92 gal., 80 psig

316 SS Sparkler Pressure Filters, 12" & 18", jacketed

Stainless Steel and Polypropylene Bag & Cartridge Filters  
(Single and Multiple Element/Bag)

Sintered Metal Mott Filters

Large Ceramic and Polypropylene Buchner Filters

### DRYING

Abbe, 304 SS Double Cone Tumble Dryer  
50 ft<sup>3</sup>, to 250°F (121°C)

Stokes, 316 SS Double Cone Tumble Dryer/Blender,  
25 ft<sup>3</sup>, to 250°F (121°C)

Patterson Kelly, 316 SS, V-Cone Tumble Dryer/Blender,  
5 ft<sup>3</sup>, to 180°F (82°C)

Vacuum Tray Dryer, 250 ft<sup>2</sup>, to 180°C

Large Lab and Pilot Plant Size Vacuum and Air Ovens

### PROCESS HEATING

(2) Fulton Hot Oil Boilers, 1.6 MM Btus/Hour, to 650°F (343°C)

High Pressure Steam Boiler  
2.4 MM Btus/Hour, 2425 lbs/Hr Steam @ 90 psig, 320°F (160°C)

High Pressure Steam Boiler  
1.32 MM Btus/Hour, 713 lbs/Hr Steam @ 90 psig, 320°F (160°C)

40 kW Electric Heater to 625°F (330°C), 0.14 MM Btus/Hour

### PROCESS COOLING

Edwards Air Chiller, 30 Ton Capacity at -4°C

Lab Chillers, -15°C to 110°C

### VACUUM CAPABILITY

(9) Kinney Vacuum Pumps, 130 cfm at 2-10 torr

Lab Vacuum Pumps, 5.6 to 35.4 cfm at 1x10<sup>-4</sup> torr

Kinney Vacuum Pump, 107 cfm at 0.02 torr

### AUXILIARY EQUIPMENT

High Pressure Liquid Feed Pumps to 0.43 gpm @ 5,000 psig

High Pressure Gas Feed Compressors to 9 lbs/Hr H<sub>2</sub> @ 5,000 psig

Heat Exchangers (Glass, Glass-Lined Steel, 316 SS, Teflon®)

Hot Boxes (24 Drum Capacity) 10°C to 180°C

316 SS DeLumper™



## EQUIPMENT

### ANCILLARY EQUIPMENT CONT.

#### ENVIRONMENTAL

Packed Tower Liquid Scrubber Systems for Ventilation of All Production Areas

Primary Emission Control Scrubbers (Packed Tower, Eductor Type, and Bubbler)

Carbon Bed Absorption System

Zero Process Discharge to POTW or Rivers

Controlled Waste Management Program Utilizing Properly Certified Waste Haulers and Disposal Firms

Solvent Recovery Condensers on Vacuum Exhaust

#### SAFETY

Portable and Area Hazardous Condition Monitors/Alarms

Facility Fully Sprinklered

Segregated Hazardous Material Storage Areas

Operators Trained and Certified in SOGMA's Chemical Operations Training Program

Nitrogen Supply via Liquid Bulk Tank Facility Wide

Natural Gas Fired Back Up Electrical Generator  
135 Kva, 100 KW

#### ANALYTICAL SERVICES

Chromatography (HPLC, GPC, and GC)

FTIR Spectrophotometry

UV/Visible Spectrophotometry

Viscometry (Capillary and Brookfield)

Karl Fischer (Coulometric and Volumetric) Analysis

Titrimetric Analysis

Note: NMR, GC/MS, and other instrumental analyses available locally through special arrangements with Pittsburgh Universities and outside laboratories.