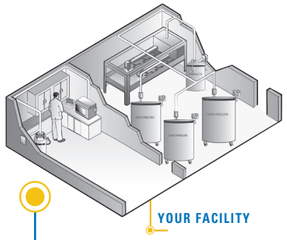

PERMACYL GAS STORAGE

PermaCyl gas storage vessels are the perfect compromise between inefficient dewars and unsightly, outdoor bulk tanks. These state-of-the-art vessels incur low to no product loss and are much safer than liquid dewars.

The benefits of PermaCyl are:

- Very low NER/product loss
- Fast, automatic refills with automatic fill termination
- Extended hold time
- Unique auto shut-off feature for remote filling
- Stainless Steel construction
- Telemetry gauge standard on all Perma-Cyl units
- Installation versatility

PermaCyl vessels eliminate the worry of product depletion, and improve the safety and efficiency of your lab. Get the most out of your gases and start saving money now by installing PermaCyl vessels in your operation.

DATA ONLINE WIRELESS TELEMETRY SYSTEM

Data Online is a reliable and affordable telemetry solution that allows both Middlesex representatives and your lab technicians to remotely monitor your gas inventory levels. The Data Online telemetry system sends a signal to Middlesex when your gas supply needs to be replenished. The Telemetry system also prevents over-ordering and eliminates unnecessary deliveries, saving you time and money.

The Data Online Wireless Telemetry System provides:

- Reliable wireless satellite technology
- Two-way communication
- Real-time data on-demand
- Actual tank level readings
- Flexible software
- Safety and security

ARGON GAS WITH ORCA DELIVERY VEHICLE

Middlesex Gases & Technologies has expanded their MicroBulk delivery services to include argon gas with a new ORCA delivery vehicle.

Middlesex Gases' new ORCA MicroBulk delivery system replaces high pressure cylinder handling and changeouts with a low pressure storage tank. The revolutionary on-site filling technology requires three minutes or less—with zero losses under normal conditions. With the delivery system's "smart" flow-meter and easy-to-read printouts, reports of your delivery are available in seconds.

The MicroBulk delivery system allows assets to be used more fully, reduces labor, eliminates empty-for-full exchange and significantly reduces distribution costs. Usage is monitored and deliveries are scheduled automatically for an **uninterrupted supply of gas**.

Argon gas has many industrial uses. In metal fabrication, it is an inert shielding gas for plasma, MIG & TIG welding applications. For laboratories, it is used for analysis and purging. For electronics manufacturing, it is used for crystal growth and CVD applications.

Specialty Gases & Equipment
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Fax. 617.387.3537
www.middlesexgases.com

Middlesex Gases & Technologies Inc.

MicroBulk Delivery System

THE MIDDLESEX SOLUTION
FOR PROCESS GAS APPLICATIONS

Middlesex Gases & Technologies Inc.

1.800.649.6704 WWW.MIDDLESEXGASES.COM

MICROBULK DELIVERY SYSTEM

PERMA-CYL

When filled by the MicroBulk Truck, the Perma-Cyl vessel is designed to have an actual fill-time of three minutes or less (smaller models) with zero losses under normal conditions. The vessel will allow liquid to be held for long periods without venting, limiting product losses during periods of nonuse and allowing you to take advantage of the same benefits that large consumers like laser manufacturers and biotech firms enjoy.

Features:

- Very low NER/product loss
- Fast, automatic fills utilizing the MicroBulk delivery system
- Unique auto shut-off feature allows remote filling with wall box and piping
- All stainless steel construction
- Telemetry gauge standard on all Perma-Cyl units

How the System Works:

Perma-Cyl is an innovative design, evolving from proven technology we have been using for years on our liquid cylinders. What makes the Perma-Cyl design revolutionary is the:

- Fast fill capability
- No loss/low loss fill with automatic fill termination
- Extended hold time
- Telemetry compatibility

MicroBulk Delivery System

The Middlesex Gases MicroBulk delivery system offers a reliable and secure supply of the gases your business needs. Our system effortlessly manages your MicroBulk and Small Bulk Gas storage and refilling needs. Middlesex Gases' MicroBulk delivery system replaces high-pressure cylinder handling and changeouts with a low-pressure storage tank.

- Highest quality
- Boosts efficiency
- Improves safety and convenience
- Increases productivity and savings
- Saves Floor Space

PJLA Calibration & Testing Accreditation #68528

ilac-MRA

PERMA-CYL On-Site Storage System – Microbulk Solutions

SPECIFICATIONS																	
DESCRIPTION	230L MP, LCCM Sq/Rnd Base w/Casters	230L HP, LCCM Sq/Rnd Base w/Casters	265L MP, LCCM Sq/Rnd Base w/Casters	265L HP, LCCM Sq/Rnd Base w/Casters	300L MP Plate Base	450L HP Plate Base	450L MP Plate Base	450L VHP Plate Base	700L HP Plate Base	1000L HP Plate Base	1000L VHP Plate Base	1500L HP Pallet Base	1500L VHP Pallet Base	2000L HP Pallet Base	2000L VHP Pallet Base	3000L HP Pallet Base	3000L VHP Pallet Base
CAPACITY (Liters)																	
Gross	240	240	276	276	330	450	450	450	688	1,056	1,056	1,550	1,550	2,042	2,042	2,911	2,911
Net	230	230	265	265	300	420	420	420	645	950	950	1,455	1,455	1,945	1,945	2,707	2,707
CAPACITY (Gallons)																	
Gross	63.4	63.4	72.9	72.9	81.2	118.9	118.9	118.9	181.8	279.0	279.0	409.5	409.5	539.5	539.5	770	770
Net	60.8	60.8	70.0	70.0	79.3	111.0	111.0	111.0	170.4	251.0	251.0	384.4	384.4	513.9	513.9	715	715
MAWP																	
psig	230	350	230	350	300	350	250	500	350	350	500	350	500	350	500	350	500
bar	15.9	24.1	15.9	24.1	20.7	24.1	17.2	34.5	24.1	24.1	34.5	24.1	34.5	24.1	34.5	24.1	34.5
MAXIMUM PRE-SET OPERATING PRESSURE																	
psig	125	300	125	300	250	300	125	450	300	300	450	300	450	300	450	300	450
bar	8.6	20.7	8.6	20.7	17.2	20.7	8.6	31.0	20.7	20.7	31.0	20.7	31.0	20.7	31.0	20.7	31.0
DESIGN SPECIFICATIONS																	
	DOT	DOT	DOT	DOT	ASME	DOT/ASME	ASME	ASME	ASME	ASME	ASME	ASME	ASME	ASME	ASME	ASME	ASME
STORAGE CAPACITY (1)																	
Nitrogen																	
SCF	5,024	4,734	5,769	5,769	7,380	8875/10332	10,332	10,332	15,860	24,350	24,350	35,790	35,790	47,847	47,847	66,592	66,592
Nm^3	142	134	152	152	193	271/272	272	272	449	689	689	1,013	1,013	1,257	1,257	1,750	1,750
Oxygen																	
SCF	6,244	5,930	7,186	7,186	9,100	11124/12760	12,760	12,760	19,600	30,070	30,070	44,220	44,220	59,089	59,089	82,239	82,239
Nm^3	177	168	189	189	184	315/336	336	336	554	850	850	1,250	1,250	1,553	1,553	2,161	2,161
Argon																	
SCF	6,073	5,763	6,982	6,982	8,850	10812/12478	12,478	12,478	19,160	29,400	29,400	43,220	43,220	57,786	57,786	80,425	80,425
Nm^3	172	163	183	183	234	306/328	328	328	542	832	832	1,223	1,223	1,519	1,519	2,115	2,115
CO2																	
SCF	N/A	4,500	N/A	N/A	N/A	8312/8200	N/A	8,200	12,608	19,960	19,960	29,340	29,340	38,048	38,048	52,954	52,954
Nm^3	N/A	N/A	N/A	N/A	N/A	235/232	N/A	232	357	564	564	830	830	1,000	1,000	1,390	1,390
THERMAL PERFORMANCE (2) (NER%/Day)																	
N_2	1.8%	1.8%	2%	2%	1.2%	1.9%/1.6%	1.6%	1.6%	1%	1%	1%	1%	1%	1%	1%	1%	1%
O_2-Ar	1.12%	1.12%	1.4%	1.4%	.74%	1.2%/1%	1%	1%	.62%	.62%	.62%	.62%	.62%	.62%	.62%	.62%	.62%
CO_2	.6%	.6%	N/A	N/A	.4%	.6%/.5%	.5%	.5%	.3%	.3%	.3%	.3%	.3%	.3%	.3% .3%	.3%	.3%
GAS DELIVERY RATE (LIN/LAR/LOX)																	
SCF/H	400	400	400	400	500	575	575	575	660	960	960	1,350	1,350	1,350	2,000[3]	1,350	2,000
Nm^3h	10.5	10.5	10.5	10.5	14.1	15.1	15.1	15.1	18.6	25.2	25.2	35.4	35.4	35.4	52.4	35.4	52.4
GAS DELIVERY RATE (CO_2)																	
SCF/H	N/A	133	N/A	N/A	N/A	192	192	192	220	320	320	450	450	450	667	450	450
Nm^3h	N/A	3.8	N/A	N/A	N/A	5.4	5.4	5.4	6.2	9.0	9.0	12.7	12.7	12.7	17.5	12.7	12.7
DIMENSIONS																	
Diameter																	
in	26	26	26	26	26	30	30	30	42	42	42	48	48	48	48	59	59
mm	660	660	660	660	660	762	762	762	1,067	1,067	1,067	1,219	1,219	1,219	1,219	1,499	1,499
Height																	
in	61.8/62	61.8/62	64.6/64.8	64.6/64.8	68	68	68	68	60	81	81	91	91	117	117	122	122.5
mm	1,570/1,575	1,570/1,575	1,641/1,646	1,641/1,646	1,727	1,727	1,727	1,727	1,524	2,058	2,058	2,311	2,311	2,970	2,970	3,099	3,112
Tare Weight																	
lbs	300	340	340	340	450	688	605	812	1,065	1,750	2,250	3,080	3,350	3,860	3,860	3,300	4,250
kg	136	154	154	154	204	312	274	368	483	794	1,020	1,395	1,518	1,751	1,751	1,497	1,928

All specifications are subject to change without prior notice.
1) Values are based on net capacity at 0 psig (0 bar) for ASME vessels. CO_2 vessels are based on net capacity at 300 psi (20.7 bar). DOT vessels are per code.
2) Values are based on gross capacity.
3) Optional 3,500 SCF/H (92 Nm^3h) model available.
All dimensions are measured from the floor to the top of the handling ring.
All of the plumbing components fit under the handling ring.

Patents: 5,787,942 • 5,954,101 • 5,136,852 • 6,542,848 - Other Patents Pending
DOT - Department of Transportation, 4L Code
ASME - American Society of Mechanical Engineers, Section VIII, Division 1
Contact Factory for Canadian and New York City Approvals.