Oxygen Generating Systems Intl.
A Division of Audubon Machinery Corporation

www.ogsi.com
Located in Western New York and only 15 minutes away from Niagara Falls, Oxygen Generating Systems Intl. (OGSI), specializes in manufacturing oxygen generators using Pressure Swing Adsorption technology better known as PSA.
In February 2004, OGSI was acquired by Audubon Machinery Corporation. With the significant financial resources of the new organization, OGSI moved to a new 40,000 ft² facility by late 2005 and is now expanding its operations, developing new products and continuing to enter new markets with its product line.
THE GENERATORS
Convenience and Independence

A leading manufacturer, (OGSI) designs and manufactures on-site oxygen generators, using Pressure Swing Adsorption (PSA) technology. OGSI offers a complete line ranging from 15 SCFH to 5000 SCFH (5tpd).

In addition to manufacturing of generators, OGSI also produces Cylinder Filling Plants with capacities to fill from 1 to 120 cylinders per day for medical or industrial applications.
Problems with LOX Systems:

- Oxygen is produced and stored in a cold liquid state, and then converted to a gas before it is used. Keeping LOX cold is difficult in a warm climate.

- As the LOX gets warmer in a tank, the liquid turns into a gas and generates pressure that must be relieved. This is called boil off and it wastes the oxygen.

- This boil off can waste as much as 1% to 2% of the LOX tank volume per day, even if there is no demand.

- In the US, LOX is considered a hazardous material, as the cold temperature of the LOX could cause severe injuries if it came into contact with skin.

- LOX Tanks are considered to be terrorist targets because of their dangerous nature.

- The oxygen purity from a LOX system is not always as high as what it is advertised to be due to the contamination of the liquids.
Benefits of an OGSI PSA System:

- Oxygen is made and stored as a gas.
- Only make oxygen on demand, and require minimal start-up time after a plant shut down.
- Have no boil off, so no oxygen is wasted.
- O2 purity is 93%, which meets international standards (USFDA, CSA, and ISO) for medical grade gas.
- Include instrumentation and alarms for O₂, CO & CO₂ monitoring.
- A Russian Military Hospital in Moscow changed from LOX to PSA to reduce the danger of a terrorist attack.
TYPICAL SYSTEM CONFIGURATION
OGSI manufactures the smallest PSA Oxygen Cylinder Filling System in the world. This system combines the convenience and cost savings of an on-site oxygen plant with the storage and high pressure attributes of a cylinder. When compared to the cost of one oxygen cylinder in a remote location, it is easy to see how quickly this system will pay for itself. It is designed to run automatically and requires little attention once started.

This is the main reason why the Federal Government is sponsoring the use of the CFP-15+ within Fire Stations across the United States.
OGSI produces Cylinder Filling Plants & Systems for Central Hospital Supply Lines.
Oxygen for Disaster Preparedness

Sold to a US Government Contractor

CFP-15
Trailer Installation

CFP-15M
Mobile Version of a CFP-15
OGSI’s WORLD

From Vancouver, Canada, to the most southern part of South America, and from South Africa to China and Russia; OGSI has installed various plants in all types of environments.
TYPICAL HOSPITAL SYSTEM

Fully Automatic
OGSI can design and install a medical oxygen system with the proper reserve capabilities, monitoring and alarm systems to meet local safety requirements. In the unlikely event the system deviates from its pre-set limits, it automatically switches to the secondary oxygen supply. The system’s alarm calls attention to the problem so that corrective service can be performed. An optional telemetry package allows OGSI’s factory engineers to remotely monitor the system.
NORMS OF COMPLIANCE

- United States Pharmacopeia (FDA)
- Canada Standards (CSA)
- ISO 10083
- Most Health Ministries or Departments around the world.
Elevation above sea level
Consumption:
  ✓ By weekly or monthly average
  ✓ By number of oxygen outlets within the institution
Area available for plant (size, ventilation, power)
Distribution to Central Line
Distribution to a Central line with a Cylinder Filling Station
Cylinder Filling only
How Much Oxygen Do I Need?

- Estimated
- Historical
- Calculated

Hospital System Sizing Estimator

[# of beds \times 0.75 \text{ liters per minute (LPM)}] + [# of other outlets* \times 10 \text{ liters per minute (LPM)}] = \text{ total liters per minute (LPM)}

* \text{ Liters per minute (LPM)} \times 2.1 = \text{ Standard Cubic Feet per Hour (SCFH)}
CONSUMPTION RATES

When an annual, monthly or weekly consumption is used to determine the appropriate size of a plant, we just bring it down to Standard Cubic Feet per Hour (SCFH).

Caution is advised however because average flow calculations do not cover the hours of high demand of a hospital.
All plants are assembled on top of a skid, and needs to be located indoors with good ventilation.

A walkway of not less than 4 feet must be allowed around the skid for easy service and maintenance.
Power connection can be made from above the plant.

Hospital Maternidad Dr. Oropeza Caricuao – Caracas, Venezuela
Hospital and Cylinder Filling Plants are assembled on metal skids.
Skids are custom made to fit each application.
All skid components are wired and factory checked before shipment.
Cylinder Filling Area

Vacuum Pump

Manifold

High Pressure Valve
Because of their size, some AST and OST tanks are shipped separately and assembled at the final destination.
OGSI skids have central power distribution boxes requiring only (1) connection by the customer.
INITIAL START-UP

After a CFP System has been delivered to its final destination and OGSI receives notification that everything is ready to go, a technician from the factory will visit the location.

The technician will stay for a maximum of three (03) days to commission the system and provide training to local personnel for service and maintenance.
To determine the oxygen production cost, we need to know the cost of a KWH of power at the location.

### Cylinder Filling

<table>
<thead>
<tr>
<th>Model</th>
<th>SCF Production</th>
<th>Cylinders Per Day</th>
<th>Nominal KWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFP-15</td>
<td>15</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>CFP-175</td>
<td>175</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>CFP-250</td>
<td>250</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>CFP-375</td>
<td>375</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>CFP-500</td>
<td>500</td>
<td>50</td>
<td>32</td>
</tr>
<tr>
<td>CFP-650</td>
<td>650</td>
<td>60</td>
<td>53</td>
</tr>
<tr>
<td>CFP-1000</td>
<td>1000</td>
<td>100</td>
<td>62</td>
</tr>
<tr>
<td>CFP-1250</td>
<td>1250</td>
<td>120</td>
<td>98</td>
</tr>
<tr>
<td>CFP-1800</td>
<td>1800</td>
<td>180</td>
<td></td>
</tr>
</tbody>
</table>

**Near Sea Level Elevations**
IT TAKES ONLY ABOUT 10 KILOWATTS OF ENERGY TO FILL (1) CYLINDER (244 SCF/6M3).

IF A KWH COSTS US 8.8¢, A FULL CYLINDER WILL COST ONLY 0.88 US¢
Schlyer Machine (SMC) has been a manufacturer of the highest-quality animal cage washers, rack washers, bottle washers, bottle fillers (automatic and manual) and accessories for the Life Sciences Research Field since 1977. Our commitment to the ideals of simplicity, quality, durability and ease-of-service make our vivarium washroom equipment the best value available. SMC offers standard and custom designs.

The IMT Solar Division specializes in providing Quality Control equipment for photovoltaic module manufacturers and independent test labs. IMT also manufactures, sells and distributes high-precision I-V Curve analyzers and Sun Simulators – often used by testing agencies and government regulators. We are also the PV industry’s best source for Silicon Solar Irradiance Sensors and Data Loggers, and offer training programs to educate the educators and even public awareness programs.

Starboard Sun is an Engineering firm specializing in the application of internationally recognized special renewable energy products including: Superwind Micro Wind Turbines, SolarNova Building Integrated Solar PV Modules, and Eco-Energy Charge Controllers. Historically Starboard was associated with its work in Marine Environments, including powering ANTONS, light houses and tsunami buoys, however customer demand has resulted in our work spreading to all of grid applications in over 17 countries and even the Arctic circle!
IN CONCLUSION

OGSI plants can provide a significant return on investment.

CONTACT US:

www.ogsi.com
Email: ogsimail@ogsi.com
Tel: (716) 564-5165 or Fax: (716) 564-5173

Or via Skype. Please check our website for details.