

POLAR PAK and the Environment

Engaged two separate engineering consulting firms.

We, at POLAR PAK®, understand that sustainability is one of the most important issues that we face today.

Our goal is to offer our customers products that are economical, functional and environmentally friendly. We are committed to working towards sustainability.

Sustainability is a mutual partnership between our customers and our vendors. We work with them to offer options that will help us in our journey to becoming a more environmentally friendly company.

Our Environmental Policy, is the foundation of our organization's responsibility to protect the environment.

Our Environmental Purchasing Policy, establishes our partnership with our vendors. In the policy we outline initiatives that will help us achieve our goals.

You can view both policies on our website under Integrity and Compliance.

In order to address possible environment concerns, POLAR PAK engaged two separate engineering consulting firms for the purpose in one initiative to develop a comprehensive sustainability plan and in the other to perform a pollution prevention assessment of its plastic sheet extrusion facility.

The sustainability plan took into consideration three key elements of focus; environmental, social and economic impacts of the business operation. The pollution prevention assessment (P2) specifically looked at the business manufacturing process in terms of raw materials procurement, consumption, recyclability and waste reduction/elimination.

SUSTAINABILITY REPORT, 2018

With all plastic packaging, the three cornerstones of minimizing environmental impact are REDUCE, REUSE, and RECYCLE. POLAR PAK containers meet all criteria.

New products are developed to function with the thinnest gauge possible, while still meeting our customers' objectives. Existing items can be reengineered in an effort to reduce the impact on the waste stream while maintaining the functionality of the product.

Our containers can be reused with simple hand washing and drying and are perfect for home use, including storing leftovers.

POLAR PAK manufactures thermoplastic containers in two different materials – Oriented Polystyrene (OPS) and Polyethylene Terephthalate (PETE).

Both types of plastics lend themselves to recycling. Internally, all material waste is ground up and re-extruded into new material.

Both plastics are also recycled post-consumer through curbside collection where facilities are in place to sort and segregate.

POLAR PAK is active in the plastics industry to work with government and waste management groups to develop more plastics recycling across North America.

POLAR PAK and Product Development

Our products are economical, functional, and environmentally friendly.

POLAR PAK and Education

Reduce, Reuse, Recycle.

POLAR PAK believes that it's important to educate our customers as well as our employees about the life cycle of our products. As a result, we offer information on material options and their functionality and affordability. We believe that this information will empower them to make educated choices with respects to packaging and waste reduction.

SUSTAINABILITY REPORT, 2018

In an effort to promote and develop the recycling of thermoformed plastics, POLAR PAK is an active member of the following associations:

CPIA and EPIC – The Canadian Plastics Industry Association and the Environment and Plastics Industry Council. An industry initiative committed to the responsible use and recovery of plastic resources. EPIC is a standing committee of the Canadian Plastics Industry Association (CPIA).

www.cpia.ca/epic/

NAPCOR – The National Association for PET Container Resources

A trade association for the PET plastic industry in the United States and Canada founded in 1987.

NAPCOR's Vision Statement - "To be the credible voice and champion of the PET packaging industry; facilitate solutions to the introduction and use of PET packaging; and to provide education on the benefits of PET packaging." www.napcor.com

CME (Canadian Manufacturers and Exporters) – Promotes the continuous improvement of Canadian manufacturing and exporting through engagement of government at all levels. The Environmental Committee shares information with members regarding energy savings and recycling.

POLAR PAK and Memberships and Associations

Promote the recycling of plastics.

POLAR PAK and Community and Social Responsibility

Committed to
giving back.

POLAR PAK has been a fixture in the Brampton community for over 20 years. POLAR PAK is committed to give back to the community and is involved with many community-building programs & charities as well as our own employee programs.

- Brampton Business Board of Trade – we’ve been an active member in the building of the business community of Brampton, ON.
- William Osler Health Centre Foundation – A combined donation of \$150,000 by POLAR PAK and its employees, was given towards the building of the new Brampton Civic Hospital.
- Domenico DiDimizio Scholarship Award – dedicated to the memory of one our associates, POLAR PAK annually awards employee family members with academic scholarships to pursue their goal for post-secondary education.
- Suggestion Award Program – POLAR PAK encourages ‘new thinking’ and rewards employees that suggest cost-saving ideas.

SUSTAINABILITY REPORT, 2018

POLAR PAK is actively pursuing several Energy Conservation & Waste Reduction solutions throughout the organization, and continues to be vigilant about conservation.

As a result of some early initiatives, in June 2010 POLAR PAK was a co-recipient of the inaugural Plastics Stewardship Award presented by the Canadian Plastics Industry Association (CPIA), for its extensive efforts in recycling and energy conservation.

Over the years POLAR PAK made several technological improvements that helped further environmental initiatives. The changes included new technologies that help us conserve energy, reduce carbon emissions and divert waste from the landfill.

We incorporated various energy management tools to analyze the current state of energy consumption at POLAR PAK which also provided future goals and targets that helped reduce the consumption of energy. The tools included:

- CPIA – Energy Assessment
- SMART – Energy Audit
- CME – Energy Benchmark Study

The next few pages describe the different areas assessed where we were able to make significant changes.

POLAR PAK and
Energy
Conservation &
Waste Reduction

We're always
thinking Green.

POLAR PAK and Energy Conservation & Waste Reduction

Lighting – a complete retrofit.

POLAR PAK performed a complete retrofit of all offices and plant lighting.

- We replaced all existing Metal Halide, T12 Fluorescent lamps, and Par75R40 Flood lamps fixtures with more energy efficient fixtures
- Each T12 fixture changed from four T12 bulbs to two T8 bulbs
- Low traffic areas were retrofitted with motion sensors to turn off lights when not in use

This change resulted in an approximate annual savings of 583,959 kWh, that represents a reduction by 65% over original lighting usage.

High efficiency T5 lighting was installed at the two thermoforming plants. Resulting in a saving of approximately 228,000 kWh* of electricity at Thermoforming Plant 2 or 55% of the energy required to light the conventional metal halides.

After the installation at the warehouse the annual savings are approximately 610,000 kWh* (assuming 50% usage).

The T5 1 min. sensor lighting in Extrusion further saves approximately 185,000 kWh* (assuming 50% usage) of electricity.

We noted that the increase in the quality of light provides a safer working environment and thus improves the overall productivity.

SUSTAINABILITY REPORT, 2018

POLAR PAK installed high efficiency tube heaters to warm up the plant during the winter months at Thermoforming Plant 2 and the warehouse.

After the installation at Thermoforming Plant 2 in 2008, there is an estimated 161,000 m³ in natural gas savings* per year. That's one-third of the amount required for the old, less efficient, heating systems.

The tube heaters provide a greater quality of heat from the infrared energy that is produced uniformly throughout the tube.

In addition to the plants, 4 tube heaters were installed at the Distribution Centre.



Tube Heater

POLAR PAK and
Energy
Conservation &
Waste Reduction

Heating –
efficiently warming
up.

POLAR PAK and Energy Conservation & Waste Reduction

Fluid Cooling System – saving water.

An efficient fluid cooling system installed at Thermoforming Plant 1, Plant 2 and Extrusion operates by reusing water, thereby reducing the consumption of water.

The previously operating fluid cooling system lost a considerable amount of water to evaporation and had a capacity of 116 tons.

The new energy saving fluid cooling system loses no water, except when changing molds where 5-10 gallons of water is lost, depending on the machine.

The closed-loop concept was also adopted for the cooling system at Thermoforming Plant 1 where water consumption is reduced by 50%.

The efficient cooling system has the capacity of 140 tons and reaches all the machines in the plant requiring cooled water, unlike the old chiller system. The system's 300 hp motor is highly efficient.

The energy saving cooler, a major part of the cooling system at Thermoforming Plant 2



Our Montréal location has water towers to reduce the use of electricity to cool our process water. Phase 1 was conducted in 2015 and Phase 2 should be completed in 2016. As result of the new process, we saved up to 1,605,791 kWh with Phase 1 and will save 1,291,442 kWh with Phase 2. This represents 1,448,862kg of CO2 emission.



The efficient fluid cooling system at Thermoforming Plant 2

SUSTAINABILITY REPORT, 2018

A high efficiency compressor with a high efficiency motor was installed at Thermoforming Plant 1 in November 2008.

The heat recovered from the compressor is a major contributor to the heating provided in the plant.

As a result of the compressor, there is a 10,437,350,400 Btu per year* in energy savings.

The old 300 hp compressors were water-cooled and consumed 26 m3 of water per day in the summer and 18 m3 of water in the winter. In addition to this, water leaks were evident in the old system.

With the new system, the whole process uses 5m3, but the compressor itself does not consume any water. In addition, the quality of air that reached the machines is free of oil-mist or any other contaminations.

POLAR PAK and Energy Conservation & Waste Reduction

Compressor – more heating efficiencies.



The newly installed compressor at Thermoforming Plant 1

POLAR PAK and Energy Conservation & Waste Reduction

Dock Area Insulation – containing heat.

R-10 insulation was added to the inner docking area at Thermoforming Plant 1 which accomplished a 30°C greater indoor temperature compared to the outdoor temperature.

The 'R' value in 'R-10' is a measure of thermal resistance. The greater the value, the greater the resistance to the warm air escaping.

To make certain that the heat produced from the existing 130,000 Btu/hr heater does not escape, a roll-in door was put in so the insulated portion of the dock remained 30°C or greater.



Insulation of R-10 insulation at the inner portion of the dock at Thermoforming Plant 1

SUSTAINABILITY REPORT, 2018

We reviewed ways to reduce carbon emissions by reducing the number of trucks on the road for both internal and external deliveries.

For Resin Delivery we analyzed the shipping of resin pellets to the Extrusion Plant from our suppliers.

POLAR PAK used to take delivery of resin by tanker truck. In our new distribution centre, we are now able to take delivery of resin by rail, thus reducing truck travel by 74%. This significantly reduces our carbon footprint by an estimated 50 tonnes per year.

For Inter-Company Deliveries we analyzed the shipping of post-industrial trim between our Thermoforming Plants and Extrusion Plant.

Because trim scrap was shipped to be ground up in the Extrusion Plant, with the installation of grinders at our Thermoforming Plants we reduced the number truck shipments by 80%.

Our Carbon Reduction estimates per plant are an estimate of 1.5 tonnes per year for Plant 1 and 1.4 tonnes for Plant 2.

Our use of tankers with further reduces truck shipments by 95% at Thermoforming Plant 2). This results in a Carbon Reduction estimate of an additional 0.5 tonnes per year.

POLAR PAK and
Energy
Conservation &
Waste Reduction

Transportation –
reducing
emissions.

Stationary
railcar at the
Distribution
Centre



The in-line
grinder at
Thermoforming
Plant 2

POLAR PAK and Energy Conservation & Waste Reduction

Recycling – in our manufacturing areas.

In our manufacturing area 5 tons of cardboard gets recycled every month (total for all locations).

The frequency of cardboard pick up is three times per week from all locations.

The amount of material, including cardboard, packaging material, and metal pipes, recycled annually is approximately 320 tons.

In our Montréal manufacturing facility, we also optimize our packaging to reduce use of cardboard and film. We try to get the product as thin as possible to reduce the use of plastic. We recycle paper, cardboard and plastic.

Cardboard packaging collected for recycling



SUSTAINABILITY REPORT, 2018

The installation of more paper recycling bins in the office areas has resulted in our achieving our goal of recycling minimum 70% of all our paper.

We've reduced paper consumption by 25% by reducing office printing and encouraging electronic file usage.

POLAR PAK and
Energy
Conservation &
Waste Reduction

Recycling – in our
offices.

POLAR PAK and Energy Conservation & Waste Reduction

Energy efficient
roofing.

To help reduce electricity costs and lessen urban heat, island effect, we installed a new White Duro-Last® Cool Zone roofs to Extrusion, Tool & Die, Thermoforming Plant 2 and the Distribution Centre.

The high reflectivity and emittance characteristics of the cool zone roof is what helps reduce electricity and the urban heat island effect; it also increases the life span of the existing insulation. As a side note, the membrane included reused scrap material.

SUSTAINABILITY REPORT, 2018

Returnable Bin Program

In partnership with selected local customers, POLAR PAK is implementing a returnable plastic tote/bin program for finished goods, to reduce the amount of corrugated boxes. Bins are returned and reused – For example:

5M034B-TB-DB-2 - 360/cs
5M034B-TB-DB-2-RB – 3600/bin

For every bin that is used, we reduce the number of boxes by 10.

New Rolls Size

Extrusion is producing larger material rolls (42" OD) for thermoforming purposes which reduces truck travel by 50%.

Cleaning Products

The cleaning products used are environmentally preferred. They promote the safety of the personnel using it, all employees effected and the natural environment.

The products are biodegradable, free of carcinogens and teratogens as well as phosphates and fragrances.

They are Green Seal and/or Environmental Choice Certified and approved by U.S. EPA Designed for the Environment Program.

POLAR PAK and
Energy
Conservation &
Waste Reduction

Other
conservation
initiatives.

Plastic Pallets

By substituting plastic pallets for wood pallets (internal network) we reduce the impact on the environment. The plastic pellets are more durable and last longer. They are also lighter in weight.

POLAR PAK and Energy Conservation & Waste Reduction

Lighting Sample Calculations.

Lighting Calculation:

Of fixtures: 121
Of fixtures before (assumption): 121
Load for T5: 240 W
Load for Metal Halides (MH): 455 W
hours of operation (assumption)/year: 8760 h (365 days)

Before:

Energy consumed = (# of fixtures x # hours of operation x Load MH) ÷ 1000
= (121 x 8760 x 455) ÷ 1000
= 482281.8 kWh

After:

Energy consumed = (# of fixtures x # hours of operation x Load MH) ÷ 1000
= (121 x 8760 x 240) ÷ 1000
= 254390.4 kWh

Difference:

Energy Consumed Before – Energy Consumed After
= 482281.8 – 254390.4
= 227891.4 kWh

SUSTAINABILITY REPORT, 2018

Tube Heating calculation:

Assumptions:

Heating runs (5 months/year-3650 hrs)

- full capacity at 10%
- half capacity at 50%
- zero capacity at 40%

Total time running: $(3650 \times 0.1) + (0.5 \times 3650)(0.5) + (0 \times 3650) = 1,277.5$ hrs

Full capacity of Air-O-Mix systems (2): 6,875,000 BTU/hr

Full capacity of Tube heaters (20): 2,215,514 BTU/hr

Initial heating system:

Gas usage = Total capacity \div 3,412.3BTU/kWh x total time running \div 10.83 kWh/m³

$$= (6,875,000) \div 3,412.3 \times (1,277.5) \div 10.83$$

$$= 237,661 \text{ m}^3$$

Tube Heating:

Gas usage = Total capacity \div 3,412.3BTU/kWh x total time running \div 10.83 kWh/m³

$$= (2,215,514) \div 3,412.3 \times (1,277.5) \div 10.83$$

$$= 76,587.83 \text{ m}^3$$

Difference:

Old Heating System – Tube Heating

$$= 237,661 - 76,587.83$$

$$= 161,073.2 \text{ m}^3$$

POLAR PAK and
Energy
Conservation &
Waste Reduction

Tube Heating
Sample
Calculations.

Conversion data:

BTU \square kWh: 3,412.3BTU/kWh

kWh \square m³: 10.83 kWh/m³ (Natural gas)

POLAR PAK and Energy Conservation & Waste Reduction

Compressor Sample Calculations.

Compressor Calculation 1:

- Recoverable heat as a percentage of the unit's output: 80% = 0.80
- Compressor bhp: 600 bhp
- Conversion factor: 2,545 BTU/bhp-hour
- Hours of operation: 3 shifts/365 days = (365-9) x 24 = 8,544 hours

Energy Savings

= 0.80 x compressor bhp x conversion factor x hours of operation
= 0.80 x (600) x (2,545) x (8,544)
= 10,437,350,400 BTUY per year