



Spectator

the Newsletter of the Ontario Section of SPE

March 2016

4th Annual Careers in Plastics Event Thursday April 7th, 2016 – Ryerson University Toronto

The Society of Plastics Engineers (SPE) is a professional society representing nearly 20,000 plastics professionals in more than 70 countries around the world. The objective of the SPE is to promote scientific and engineering knowledge related to plastics.

The SPE will be presenting a Career Night, hosted by the [Ryerson University Career Centre](#), for students interested in pursuing a career in the Plastics Industry. The evening will include a panel discussion with professionals working in plastics and a scientific research poster session.

This will be a great opportunity for college and university students to ask questions about careers in the plastics industry, learn about employer expectations for new graduates seeking employment, network with professionals in the plastics industry, and learn about innovations in plastics research.

To register, please email Nasser Abukhdeir (nmabukhdeir@uwaterloo.ca). The subject of the email should be: "2016 SPE Careers in Plastics Event Registration." In the email, please include the following: (1) Full Name, (2) Company/University/College, (3) Email address, and (4) Phone number.

Register by Tuesday March 29th, registration is free.

Program:

5:00 – 6:30 pm: Registration, Scientific Poster Presentations, Networking and Food (POD 60 Student Lounge)

6:30 – 7:00 pm: Event Introduction by SPE President and Introduction to Panelists (LIB 72 Lecture Hall)

7:00 – 9:00 pm: Panelist Discussion

Location:

Podium (POD 60) and Library (LIB 72) buildings, an interactive map can be found at <http://www.ryerson.ca/maps/>.

Poster Entries:

Email poster abstracts to the SPE Ontario Education Chair by **Friday March 25th** – N.M. Abukhdeir, nmabukhdeir@uwaterloo.ca.

More information:

Contact SPE Ontario Education Chair – N.M. Abukhdeir, nmabukhdeir@uwaterloo.ca or Bruce Howie, President SPE Ontario, bhowie@dominioncolour.com.

A Spring Full of Opportunity

As our mild winter draws to a close we at the SPE Ontario and our members have enjoyed a very interesting technical presentation by Dr. Mark Vincent (Executive Vice President at Dominion Colour Corporation) and a tour of the Toyota Motor Manufacturing Canada (TMMC) plant in Cambridge over the past two months.

The presentation by Dr. Vincent focussed on the science of pigments and their use in the coloration of plastics. In doing so Dr. Vincent (see photo below) explored the performance characteristics of the various types of pigment chemistries used during plastics processing. He examined how attributes such as heat stability, resistance properties and weatherfastness vary according to the pigment used and the polymer being handled. The topic generated several excellent questions and discussion from those present, even after the event.



Our plant tour at TMMC (See photo below) took place on 25th February, and was well received by all who attended. We were given a short presentation related to production at their two plants, and then shown around the facility through both the Toyota Corolla and Lexus RX 350 and now the RX 450 hybrid manufacturing areas. Afterwards all attendees went to Borealis Grille for networking opportunities and a very enjoyable meal. Thanks go out to all members and non-members alike who attended these events.

As we move towards spring we have four more events planned for our members. The next event is the student career night which will be held at and in conjunction with Ryerson University in downtown Toronto. We hope we will entice more students to come along to this very worthwhile evening to obtain advice on how best to approach their job search and what skills employers are looking for. We will also have a poster presentation and networking session during the event.

In late April we are organising a recycling seminar in conjunction with CPIA. Final details of this event will be released closer to the date. This will be followed in May by a presentation which will explore methods for troubleshooting extrusion processes, and how best to solve the several challenges that arise. Finally in June we will have our flagship event, the 50th anniversary golf tournament. We will be sending out more details

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for this event shortly. A list of the remaining events is shown below along with the dates they will take place.

- 7th April 2016 – **Careers in Plastics**
- 21st April 2016 – **Recycling Seminar**
- 19th May 2016 – **'Extrusion Troubleshooting'**.
Presentation by Dr. John Perdikoulis (Compuplast Canada Inc.) and Paul Waller (Plastics Touchpoint Group, Inc)
- 3rd June 2016 – **50th Anniversary Golf Tournament** at Pipers Heath Golf Club.

Please keep checking our SPE Ontario webpage for updates on these events moving forward.

If you have any questions about any of our events please don't hesitate to contact us for more information.

REMINDER – SPE Ontario website

In the past we have used <http://www.speontario.com> but we have transitioned to a SPE hosted webpage on the main SPE website as it is more efficient to maintain, as well as having greater mobile functionality, and can be accessed by other interested divisions and sections

much more easily. The new address will be <http://www.4spe.org/Communities/sectiondetail.aspx?ItemNumber=5378>. This can be found by going to the SPE main website, then clicking on 'Communities', then 'Sections', then finally 'Ontario'.

Now, when you try to connect to <http://www.speontario.com/> it should transfer you to the new site where you will find the SPE Ontario information page. This will have our events listed and a PayPal link for quick and easy payments. We apologize for any inconvenience caused during this transition, and urge you to save the new SPE Ontario website in your bookmarks.

If you do have any issues as we move to the SPE hosted webpage please contact me, Bruce Howie at bhowie@dominioncolour.com.

We look forward to seeing you at our events over the coming months, and I wish you all the very best of good fortune for 2016.

Bruce Howie
SPE President

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SPECTATOR

Putting A Charge Into Conductive Plastics Demanding electronics require new conductive materials

By Doug Bathauer
Integral Technologies, Bellingham, Washington, USA

The world of conductive plastics/polymers, introduced several decades ago, features breakthrough technologies and novel usage of conductive polymers. These materials conduct electricity and are used in countless applications in many industries because they are easy to extrude or injection mold into desired shapes and sizes.



Figure 1: ElectriPlast pellets

“Conductive polymers are already used in fuel cells, computer displays and microsurgical tools, and are now finding applications in the field of biomaterials,” reports the journal *Acta Biomaterialia*.¹ “These versatile polymers can be synthesized alone, as hydrogels, combined into composites or electrospun into microfibers. They can be created to be biocompatible and biodegradable.”

For example, The University of Auckland’s Polymer Electronics Research Centre was “established in 2003 to promote, facilitate, and advance research in the field of polymer electronics.”² Their research projects include biomedical applications of conducting polymers and nanomaterials and composite plastics for “smart” packaging and organic electronic devices. They are even developing DNA sensor technologies based on conducting polymers, photoluminescent polymers, and quantum dots for gene detection.

To date, conductive polymers have had few large-scale applications aside from ESD (electrostatic dissipation). However, advances in the technological development

of conductive polymers are leading to their incorporation in batteries, super capacitors, biomaterials, solar cells, flexible transparent displays, electromagnetic shielding, stealth aircraft coatings, and more.

Current Needs, New Materials

Today the trend of “lightweighting” holds heavy-weight importance. Analysts predict that automotive lightweighting, the process of reducing weight for improving performance and improving fuel efficiencies, will become a \$300 billion annual market as global trends point to CO₂ reduction and resource efficiencies as being vital to meeting regulatory and industry mandates in the transportation sector. New materials development, including conductive plastics, is a major driver in this trend.

The federal government’s new Corporate Average Fuel Economy (CAFE) standards require automakers to raise the average fuel efficiency of new cars and trucks to 54.5 miles per gallon by 2025. Electrically assisted vehicles can certainly meet or exceed CAFE requirements, but these vehicles carry their own weight issues, as batteries and electrical systems add hundreds of pounds to the vehicle.

The added electronics add another problem that needs to be addressed: electromagnetic compatibility (or needs to be addressed: electromagnetic compatibility (or interference, EMI). Conductive resins will play an ever increasing role in the lightweighting industry. At my company, we’re doing our part in the fight against vehicle obesity by utilizing our conductive hybrid plastics as EMI shielding solutions.

Our patented material—ElectriPlast pellets (Figure 1), which utilize Long Fiber Technology—allow for superior shielding of today’s high voltage components. Our process is compatible with nearly any resin. We typically utilize carbon fiber or stainless steel fiber, but essentially any metal fiber can be used.

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Our material is manufactured specifically for the customer's end-use application by using Flexible Content Technology™. Depending on the application specifications, ElectriPlast varies the composition of the pellet accordingly, ensuring that the final result is the most cost efficient.

We have developed numerous applications for connectors, covers, and enclosures, and are currently



Figure 2: ElectriPlast bipolar plates.

jointly developing shielded cable with Delphi Automotive. We're able to provide the same shield effectiveness as the aluminum or cast aluminum parts, while providing on average a 60% weight savings.

Bipolar Battery Plates

A bipolar battery concept was published in the early 1920s, and there are multiple patents awarded for the design of bipolar batteries and bipolar plates. However, there are no commercially viable, high-volume-capable design solutions for a true bipolar battery and bipolar plate due to the non-existence of a practical, fully defined, and high-volume manufacturable design of the bipolar plate using conventional high-volume production processes.

The evolution from monopolar to bipolar technology reduces battery weight and overall size. However, commercialization has been hampered by challenges ranging from corrosion to current leakage. The bipolar capabilities remain attractive because of the energy and power capabilities that could be packaged into a relatively low-cost offering.

The development of an operationally reliable and manufacturable bipolar battery will further extend lead acid capabilities and prove disruptive to the energy storage industry. By utilizing Long Fiber Technology, my company has been addressing hurdles to scalability by redefining the bipolar plate design based on a plate core made of conductive loaded resins with metal-covered surfaces. In several lead

acid battery technologies, including bipolar and lead/carbon, the ElectriPlast material can be used as the electrode plate (Figure 2).

"The molding process for our bipolar battery allows us to produce a nearly unlimited number of 3-D shapes and sizes which allow the bipolar plate and integral structures to be executed in any desired embodiment," says Slobodan "Bob" Pavlovic, vice president, engineering, of ElectriPlast Corp. "And the inherent conductivity of ElectriPlast eliminates the need for conductive vias or other means to connect electrically two sides of the plate—a common solution for quasi-bipolar plates."

The plates are lightweight and easy to assemble into the bipolar battery package; they can also be made as a drop-in replacement for some existing quasi-bipolar plates. Bipolar technology eliminates the use of a top lead to connect the plates, thereby reducing weight by over 50%. These unique characteristics allow the technology to be applied in other sectors such as motorcycles, golf carts, and forklifts.

However, the applications for bipolar plates are not limited to transportation, as the bipolar technology can be used in stationary applications, including flow batteries that are being developed to improve grid efficiency and for fuel cells for baseload power.

Increasing Demands

The fast growth in portable smart devices, as well as electric automobiles, has led to increasing demands for battery power. However, R&D and innovation of battery technology has not kept pace with strides on the consumer electronics and "green" automotive side, or with the burgeoning demand for power storage.

Conductive plastic will continue to innovate in the battery technology sector to meet growing demand in the transportation and dynamic energy storage marketplaces. Advantages include high conductivity, corrosion resistance, flexibility, moldability, and cost effectiveness.

REFERENCES

1. www.sciencedirect.com/science/article/pii/S1742706114000671
2. www.chemistry.auckland.ac.nz/en/about/our-research/research-centres/polymer-electronics-research-centre.html

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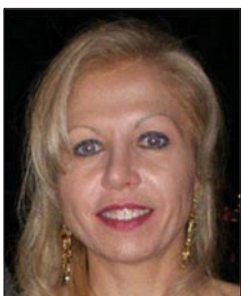
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☐ **Student: \$31** (Graduation date is required) _____

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By signing below, I agree to be governed by the Bylaws of the Society and to promote the objectives of the Society. I certify that statements made in the application are correct and I authorize SPE and its affiliates to use my phone, fax, address and email to contact me.

Signature _____ Date _____



EXPAND YOUR KNOWLEDGE AND YOUR NETWORK

7th April 2016

Careers in Plastics 2016
Ryerson University, Toronto
Please note change in date.
See cover for more details.

21st April 2016

Recycling Seminar

19th May 2016

'Extrusion Troubleshooting'

Presentation by
Dr. John Perdikoulis
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3rd June 2016

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The Spectator is sent to over 400 plastics industry professionals, and viewed by over 10,000 people on the SPE Website.

Through these mediums we are able to inform our membership of monthly meetings, industry news, our annual Christmas dance, our annual Minitec, University Night, and our golf tournament, as well as other activities within the plastics industry.

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Friday, June 03, 2016

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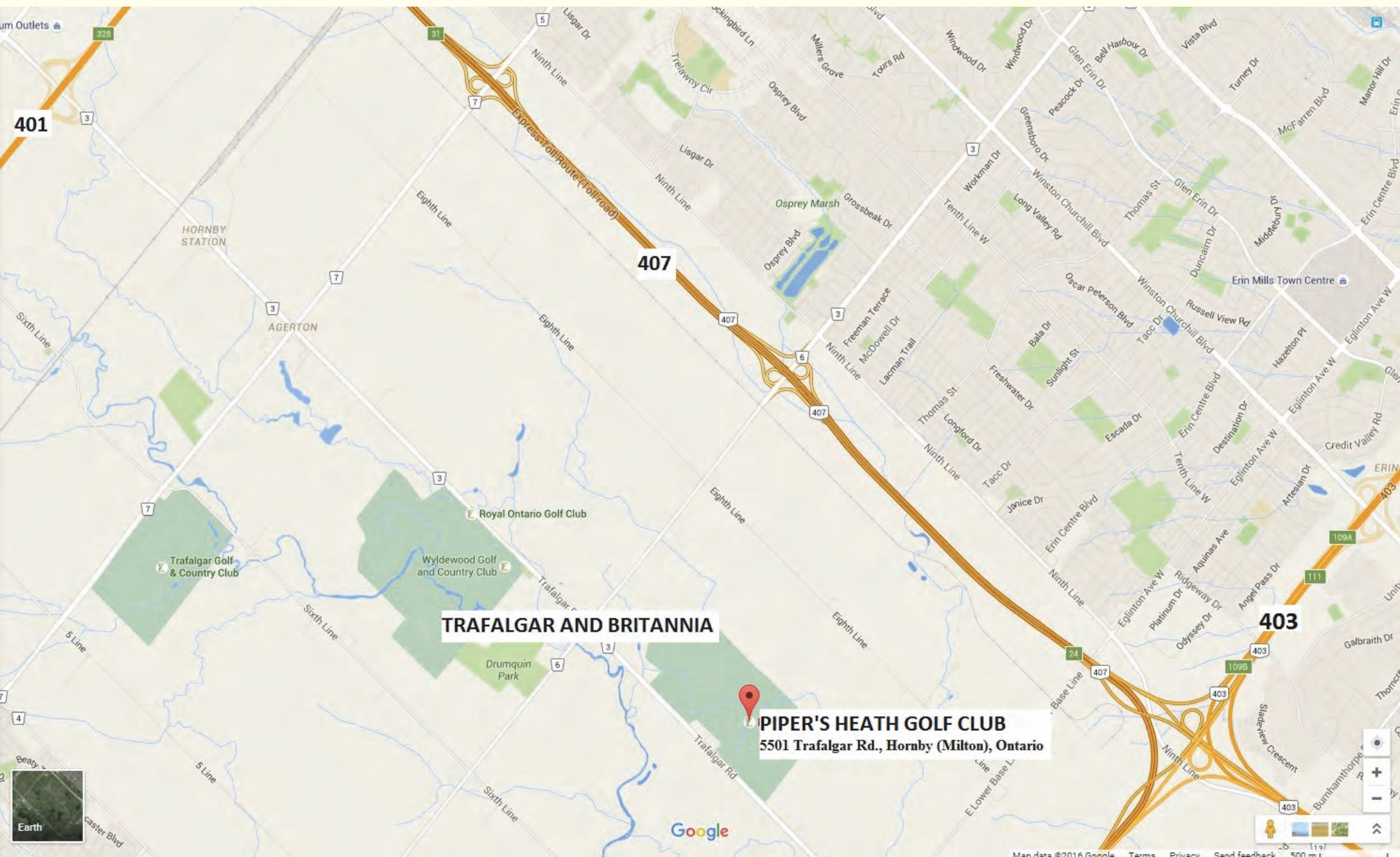
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50th Annual SPE Ontario Golf Tournament *Sponsorship Package*

Friday, June 3, 2016

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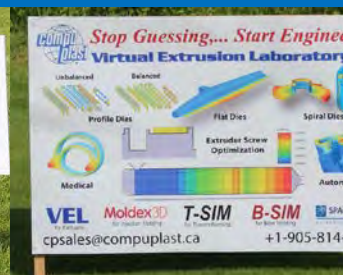
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- A large banner with your corporate logo displayed at the event registration desk.
- A large banner with your corporate logo displayed in the dinner hall.
- Your corporate logo will be displayed on 4 holes.
- 1 pop-up banner with your corporate logo and marketing images will be placed on one side of the projector screen, during the dinner presentation.
- Your corporate logo will be inserted in all slides of the powerpoint presentation.
- Your corporate logo will be seen on the event registration page of SPE Ontario's website.
- Our President will thank your company at the start and end of the dinner presentation.
- Your company's brochure and a USB memory drive with your company's promotional material/videos will be given to each participant.
- You may provide all the participants with up to 5 items with your corporate logo on them.
- You will receive TWO Foursome passes and EIGHT dinner tickets (\$1,600 value).

All banners, marketing items, logos, promotional material, USB memory drives, etc. must be provided by the sponsor one week prior to the event.





Dinner Sponsor \$1600

- A large banner will be displayed at the entrance of the dining room.
- Your corporate logo will be displayed on each table.
- Your company's brochure will be placed on each chair.
- Your corporate logo will be displayed on 2 holes.
- 1 pop-up banner with your corporate logo and marketing images will be placed on one side of the projector screen, during the dinner presentation.
- Our President will thank your company at the start and end of the dinner presentation.
- You may provide all the golfers and diners with up to TWO items with your corporate logo on them.
- You will receive ONE Foursome pass and FOUR dinner tickets (\$800 value).

Raffle & Prize Table Sponsor \$1200

- A large banner with your corporate logo will be displayed behind the prize table.
- Your corporate logo will be displayed on 1 hole.
- You may place a brochure stand with your company's brochures near the prize table.
- You will receive ONE Foursome pass and FOUR dinner tickets (\$800 value).

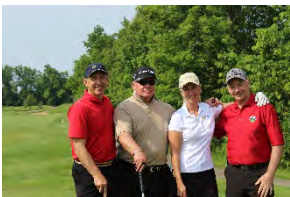
HOLE-IN-ONE Sponsor \$1600

- This is our most popular attraction. Your company's name will appear in all promotional material for the hole-in-one contest.
- Your corporate logo will be displayed on the designated "hole-in-one" hole.
- You may pitch a hospitality tent near the tee box of the "hole-in-one" hole.
- You may provide all the golfers and diners with up to TWO items with your corporate logo on them.
- You will receive ONE Foursome pass and FOUR dinner tickets (\$800 value).

Golf Cart Sponsor \$1200

- Your corporate logo will be displayed in each golf cart.
- Your company's brochure will be placed in each golf cart.
- Your corporate logo will be displayed on 2 holes.
- You may provide all the golfers and diners with golf balls and tees with your corporate logo on them.
- You will receive ONE Foursome pass and FOUR dinner tickets (\$800 value).





Half-way House Sponsor \$1500

- The \$1500 will be used to provide each golfer with one burger/sandwich/hot-dog and one non-alcoholic beverage.
- Two pop-up banners may be placed near the half-way house.
- Marketing items (pens, pads, golf balls, etc.) may be placed near the half-way house.

Longest Drive Men \$300 per hole

- Your corporate logo will be displayed on the tee block of the designated hole.
- One pop-up banner may be placed near the tee block.
- Marketing items (pens, pads, golf balls, etc.) may be placed near the tee block.
- You will receive ONE golf pass (\$150 value).

Longest Drive Women \$300 per hole

- Your corporate logo will be displayed on the tee block of the designated hole.
- One pop-up banner may be placed near the tee block.
- Marketing items (pens, pads, golf balls, etc.) may be placed near the tee block.
- You will receive ONE golf pass (\$150 value).

Closest-to-Pin Men \$300 per hole

- Your corporate logo will be displayed on the tee block of the designated hole.
- One pop-up banner may be placed near the tee block.
- Marketing items (pens, pads, golf balls, etc.) may be placed near the tee block.
- You will receive ONE golf pass (\$150 value).

Closest-to-pin Women \$300 per hole

- Your corporate logo will be displayed on the tee block of the designated hole.
- One pop-up banner may be placed near the tee block.
- Marketing items (pens, pads, golf balls, etc.) may be placed near the tee block.
- You will receive ONE golf pass (\$150 value).

Hole Sponsor \$150 per hole

- Your corporate logo will be displayed on 1 hole.
- One pop-up banner may be placed near the tee block.
- Marketing items (pens, pads, golf balls, etc.) may be placed near the tee block.

All banners, marketing items, logos, promotional material, USB memory drives, etc. must be provided by the sponsor one week prior to the event.

Contact: vijay@compuplast.com or karen.schnuelle@cgtower.com

