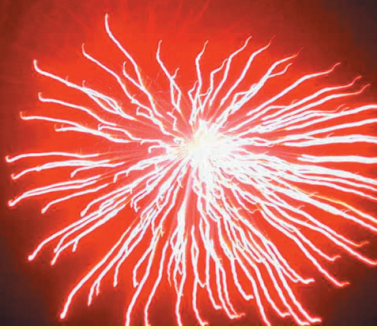


The Circuit

Volume 16

Issue 1



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Understanding Electricity

Years ago it was simple! Understanding electricity was easy as touching two wires with your hands; when you received a shock, you understood.



With the technology of today, understanding the basic terminology is important. On page 74 of our CSA catalogue you will find the electrical characteristics of our cable. What does it all mean?

First some basics...

DC

Direct Current electricity is a direct flow of electrons through a conductor such as a copper wire. This flow of electrons through a wire can be thought of as similar to the constant flow of water through a hose. A battery or DC generator usually provides the source of electrons. The rate of current flow is measured in amperes (amps).

AC

Alternating Current electricity is a back and forth movement of electrons in a wire, similar to sloshing water back and forth in a hose. When the force of a negative (-) charge is at one end of a wire and a positive (+) potential is at the other end, the electrons in the wire will move away from the (-) charge, just like in DC electricity. But if the charges at the ends of the wires are suddenly switched, the electrons will reverse their direction. Frequency is the number of direction change cycles in a second.

Voltage (V)

Voltage is the potential for doing work in an electrical system. Measured in volts, work involves moving electrons from one point to another. Think of voltage as water pressure. This water pressure (voltage) causes the water to flow (current) in a hose (conductor). An increase in the voltage applied to a circuit will result in an increase in the current flow.

Now the terms in our catalogue...

Resistance (R)

In this case resistance is not futile. Resistance is the opposition to the flow of electrons through a wire in a DC circuit, measured in ohms. In terms of water moving through a hose, the larger the diameter of the hose (wire), the lower the resistance, therefore the greater the flow of water (electrons).

Impedance (Z)

Impedance is similar to resistance in that it is affected by frequency and applies to AC circuits. It is also measured in ohms. It is the opposition to the flow of electrons. At low frequencies the impedance is largely a function of the conductor size, but at high frequencies, conductor size, insulation material and insulation thickness all affect the cable's impedance.

Capacitance (C)

Cable capacitance indicates how much charge the cable can store within itself and is usually measured as Pico farads per metre (pf/m). When a voltage signal is being transmitted by a twisted pair, the insulation of the individual wires becomes charged by the voltage within the circuit. Since it takes a certain amount of time for the cable to reach its charged level, it slows down and interferes with the signal being transmitted. The lower the capacitance of the cable, the better the signal transmission.

(continued on page 2)

SHAWFLEX

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Understanding Electricity

Cable capacitance can be reduced by:

- increasing the insulation wall thickness
- decreasing the conductor diameter
- using an insulation with a lower dielectric constant

Dielectric Constants of various insulation materials:

- XLPE - 2.3
- FR XLPE - 2.7
- PVC - 5.0 to 6.0

Inductance (L)

When current flows through a wire a magnetic field is created around the wire. This generates voltages along the wire as the current changes. Inductance is the amount of energy stored in the magnetic field to limit the rate at which current can change. Inductance is measured in millihenries (mH). The L/R ratio is important in determining if a cable is suitable for an intrinsically safe application.

Welcome

Welcome Jeff Rerrie to the ShawFlex Team. Jeff is our new Central Canada Region Manager. Jeff comes to us with a background in sales and service in the electrical industry in both manufacturing and distribution.

To contact Jeff phone 416 744 5833 (direct line) or email him at jrerrie@shawflex.shawcor.com.

Mensa Brain Teaser, Volume 15

Which of the following triangles works with the series listed in Volume 15?

Answer: D

Correct answers were received from Alec Themistocles, Gary Mistak - Anixter Toronto; Dave Budgen - NCS Toronto; Cheryl Arnold - Wire Express, Toronto; Jim Walsh, Hugo Langlois, Derek Kilian - Nedco; Bryce Bell, Westburne, Edmonton; Greg Menzies, Rob Turza - Noramco, Burnaby; Derek Muirhead, Gord Morter, Jeff Wilson - Texcan; Debra Thompson - NCS Vancouver; Tom McKee - ECS; Lorraine Halchuk, James Critoph, Jan McIlveen, Graeme Burkett - Anixter West.

Our apologies to Eastern Canada, we misplaced the winners from this region.

New Challenge

K	16
Y	2
P	11
E	22
L	?

15
A

13
B

11
C

18
D

8
E

6
F

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News from Across the Country

Western Droppings

Suncor's first "Super Load" made it to For McMurray 18 January 2005. Taking 12 days and moving at a rate of 20 kph, this 850 t convoy of seven trucks, 352 wheels and pilot vehicles moved the first of three parts to finish the coker on Suncor's site.

The cold weather delayed the unit from moving for a couple of days but overall Suncor is happy with the complete transfer. This unit was started in 2003, completed in December and will now move up to For McMurray in sections from Nisku. The next portion is slated to move at the end of January 2005. Part of project Millennium put two coker pairs in and left space for this coker pair that is being moved up currently.

On a down note, the Suncor fire in early January will definitely disrupt output until the third quarter of this year, reducing production to about half the normal plant capacity. The business interruption policy kicks in after 30 days which will help to lessen the financial impact of this fire. Currently it is believed the damage is limited to a coker fractionators and supporting equipment including electrical supply and heat trace as well as structural steel. Suncor's plans of meeting the 260,000 barrels per day by year end have not changed and they do not foresee this changing.

Central Crums

Stelco's future still unknown?

Hamilton Ontario's Stelco Steel entered bankruptcy protection last January as it struggled with many issues which included escalating retiree expenses and higher costs for raw materials such as scrap metal.

Stelco is seeking offers to beat a proposal by Deutsche Bank AG that would provide the steel maker with \$900 million in financing.

Among the bidders for Stelco's steel operations in Hamilton and Nanticoke, ON are: OAO Severstal of Russia; Pittsburgh based United States Steel Corp.; Algoma Steel Inc. of Sault Ste. Marie, ON; London based Mittal Steel Co., NV; and a joint venture of mining giant Sherritt International Corp. and Ontario Teachers Pension Plan.

Ontario based Algoma Steel's offer, if successful, would allow Algoma to leapfrog Dofasco Inc. as Canada's largest steel maker by sales and help it compete against rivals in the United States where consolidation has put more than half of steel production capacity in the hands of three companies - U.S. Steel Corp., International Steel Group, Inc., and Nucor Co.

The new deadline for all bids is 14 February, up from a previous deadline of 31 January 2005.

Eastern Tidbits

The LNG project near Levis, known as Rabaska, is gathering momentum. The \$2.5 billion project is being steered by Enbridge Gaz de France and Gaz Métro. The consortium has gone as far as offering to purchase the homes of people that are within a 1.5 km radius and are opposed to the project. This could be the first such project in the province of Quebec.

The pulp and paper industry is experiencing tough times of late. Following the Gaspesi Paper fiasco comes the announcement of Abitibi-Consol closing the Port-Alfred plant due to poor markets. A-C is also closing a plant in Texas.

Domtar Paper is also experiencing hard times which resulted in the closing the plant in Cornwall.

The strong Canadian dollar is partly the reason these plants are no longer competitive.

