

March 27, 2017

**Clarence J. Klassen, P. Eng. (ON)**  
**Electrical Engineer, President**

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In 1999, I formed KlassENgineering Inc. after 20 years' experience in the drive and systems integration business.

I am a licensed Professional Engineer with *Professional Engineers Ontario* (PEO). My area of interest and specialty is in **web handling tension controls**, particularly as used in the **pulp and paper** and plastic film industries.

I specialize in an *on-site* consulting capacity in the evaluation, troubleshooting of paper machine, winder, laminator, supercalender, and coater **tension, offset and wrinkling problems**. I have also been involved with many mechanical rebuilds and electrical upgrades of paper mill equipment. In addition, I am qualified to prepare specifications for new drive and tension control equipment in this industry. I am a team member on many projects working closely with drive vendors, PLC vendors, mechanical equipment vendors, the end user, and systems integrators. My involvement in these jobs has been primarily as a consultant/expert with duration of 1 to 4 weeks. I often provide drive training for maintenance personnel at the end of each installation or upgrade. Over the past six years I have provided drives training specific to web handling through AIMCAL.org in the USA and Europe.

***Professional Memberships:***

- Professional Engineers Ontario, Canada (PEO)
- Technical Advisor to AIMCAL (The Association of Industrial Metallizers, Coaters and Laminators)
- Institute of Electrical and Electronic Engineers (IEEE), Control System Society, Industry Applications Society
- Technical Association of Pulp and Paper Industry (TAPPI)
- PEO Local Chapter Executive chair 2011 to 2016, Chapter Education Coordinator 2008-2011, Chapter Chair 2012 to 2016
- Ontario Society of Professional Engineers (OSPE)
- Chairman and Judge at PEO sponsored *Engineering Challenges* for high school students for 6 years

***Prior Experience:***

- **Opcode Systems Inc.** (1989 to 1999), Secretary. Opcode Systems provided PLC, drive and HMI systems integration services for industry.
- **GE Canada** (1979 to 1989), Requisition Engineer, Drive Systems
- **BSEE** University of Manitoba, 1979

**Other interests:**

- Hiking/Cross Country Skiing/Geocaching
- Woodworking
- Active in my church

My web site with photo is at [www.klassen.on.ca](http://www.klassen.on.ca).

*Clarena Klassen*  
Electronic

## Paper Industry Drive Experience List

1999-2017:

### Paper Machines:

Catalyst Paper Powell River, BC (2)	2017
Catalyst Paper Campbell River, BC (3)	2008
Stora-Enso Kimberly, WI (1)	2004
St. Marys Paper Sault Ste. Marie, ON (3)	2004
Stora-Enso Biron, WI (1)	2002
Stora-Enso Whiting, WI (1)	2002
UPM-Kymmene Miramichi, NB (2)	2004
Georgia Pacific Thorold ON (1 board machine)	1999

### Winders:

Catalyst Paper Crofton, BC	2016
Catalyst Paper Powell River BC (1)	2015
Tolko Industries, The Pas, MB	2010
Atlantic Packaging Whitby ON (1)	2009
Catalyst Paper Campbell River BC (2)	2008
Norske Skog Kawerau, New Zealand (2)	2005
Norske Skog Boyer, Australia (1)	2001
St. Marys Paper Sault Ste. Marie, ON (3)	2002
Stora-Enso Whiting, WI (2)	2003
Stora-Enso Biron, WI (2)	2002
UPM-Kymmene Miramichi, NB (3)	2002
Georgia Pacific Thorold ON (1 board winder)	1999

### Off Machine Coaters:

UPM-Kymmene Miramichi, NB (2)	2007
Stora-Enso Kimberly, WI (3)	2005

### Rereelers:

UPM-Kymmene Miramichi, NB (4)	2001
Stora-Enso Biron, WI (1)	2002
Stora-Enso Whiting, WI (1)	2003

### Supercalenders:

St. Marys Paper Sault Ste. Marie, ON (5)	2002
UPM-Kymmene Miramichi, NB (5)	2005
Stora-Enso Biron, WI (2)	2002
Stora-Enso Whiting, WI (2)	2002

### Other Relevant Industries

Hydraulic Press	Eastern Fluid Power (5), Ontario	2015
High Voltage/Power Tests	GE Canada	2016
Roofing Winders	Macro Engineering (8 lines) for USA	2017
Roofing Winder	Johns Manville USA	2017
Plastic Film	Sigma Plastics, Belleville, ON	2015
Motor/Generator Test	GE Canada, Peterborough, ON	2013
Plastic Film	ExxonMobil Films, Belleville, ON	2012
Plastic Film	Berry Plastics, Belleville, ON	2012
Solar Panels	Nanosolar, Silicon Valley, Macro for OH	2010
Plastic Film	Sealed Air, IA	2008
Corrugated Plastic	Macro Engineering for MS	2007
Plastic Film	ExxonMobil Films, LaGrange, GA	2007

Plastic Film

DuPont Liquid Packaging, Whitby, ON 2001

**Variable Speed Drives:**

ABB ACS 850/880	2017
Mitsubishi A800	2017
GE MV7927 HP drive	2016
ABB DCS 800	2016
GE MV7000 DFE	2015
Rockwell PowerFlex	2013
TME/GE AC drives	2012
Emerson Control Techniques	2012
GE Canada Silpac 3200/3100 dc	2015
Siemens AC and DC	2008
GE Innovation AC and DC Innovation upgrade	2012
SSD	2006
AB 1395 dc/dc drive retrofit	2004
Rockwell 1336 Plus, II, Force	2004
Telemecanique AC	2001

## Safety Related Experience

### Ontario Pre-Start Health and Safety Reviews

Since 2001 KlassENgineering has prepared Pre-Start Health and Safety Reviews (PSR) per Section 7 of the Regulations for Industrial Establishments Occupational Health and Safety Act (Ontario) Regulation 851. I have also designed control circuits to comply with CSA Z432-04 *Safeguarding of machinery* and CSA Z142-02 *Code for Power Press Operation: Health, Safety, and Guarding Requirements*.

I have taken courses in the preparation of PSR's, CSA Z-142 *Code for Power Press Operation: Health, Safety, and Guarding Requirements*, CSA Z462 *Workplace electrical safety* and the Canadian Electrical code to remain current in applicable standards.

These PSR's have been prepared for:

FiberCore OPS Ltd.  
Invista Plastics, Kingston, ON  
Advanced Thermoplastics, Belleville, ON  
Berry Plastics, Belleville, ON  
Continental Conveyors, Napanee, ON  
Deca Cables, Trenton, ON  
Durham College, Whitby, ON  
Eastern Fluid Power, Kingston, ON  
Electro Cables, Trenton, ON  
ExxonMobil, Belleville, ON  
GE Canada, Peterborough, ON  
Grenville Castings, ON  
N2 Tower, Belleville, ON  
Sigma Stretch Films, Belleville, ON

Other safety involves shock and arc hazard reduction for of high voltage product testing.

## Published Papers, Webinars & Courses

2016 - AIMCAL Web Handling Conference Europe/USA – **Good Winding Starts - the First 5 Seconds - Part 2 Drives**

2015 – AIMCAL Web Handling Conference USA – **Drive Auto-Tuning**

2014 Q3&Q4 – Converting Quarterly - **Safety in Web Handling: Part 1 – Standards, Part 2 -**

**The case for safety drives**

2014 - AIMCAL Web Handling Conference USA – **Safety Drives for Web Handling**

2014 - AIMCAL Web Handling Conference USA – **Driving a Roller**

2014 - AIMCAL webinar, **Abbott Apps –Tension Thru Speed**

2013 - AIMCAL Web Handling Conference USA – **Overspeed In Accumulators**

2013 – Oklahoma State University – IWEB Conference - **Web Tension Regulators – Classical Control Heuristics**

2012 - AIMCAL Web Handling Conference Europe & USA – **Additions to Your Drive System and Drive Response Requirements for Web Handling**

2012 – Converting Quarterly Quarter 2– **“How to upgrade your web-handling drive systems”**

2010 to present – AIMCAL **Drives for Web Handling Blog**

2010 to present - AIMCAL Converting School Instructor: **Drives for Web Handling**

2009 - AIMCAL webinar, **Tension Control: Understanding My Drives**

1992 - IEEE Pulp and Paper Industry Technical Conference, **Digital paper machine drive master upgrade** Klassen, C.; Aube, D.