

>>the ability to learn faster than the competition, is perhaps the only real competitive advantage.<< Arie de Geus (Manager, Royal Dutch Shell)

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ENGEL

customer service division
2005

training for the future – be **the first**

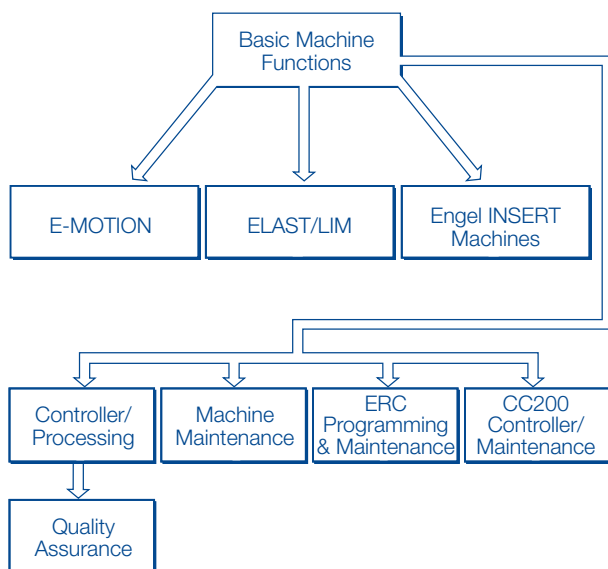
We are pleased to present you with this brochure which outlines our Customer Training plans for 2005. Our Customer Training Center is equipped with “state of the art” audiovisual equipment to ensure the most professional course material presentation, and the classrooms have been designed to enhance the learning experience.

Our Training machines are installed adjacent to the Training classroom. This allows convenient and immediate access to one of several injection molding machines in order to demonstrate and reinforce what has just been discussed in the classroom. It is our goal to offer at least 50% hands-on Training, which will greatly enhance both the learning and retention of the course material.

The Training Center has dedicated machines located in a bright high-bay area, blending pleasing aesthetics with a real-life manufacturing environment. Eight machines are usually available, shared with our Processing Department. We also have a machine equipped with our newest **CC200** controls.

In response to our Customer's comments and suggestions, we are offering a course progression designed to allow entry into our course structure at any level, from participants who are relatively new to the plastics industry, to those who have achieved a certain level of expertise. Please refer to the suggested course structure diagram on page three.

2005 Course Structure



Customized Training Course

A customized training course delivered at your facility offers the following advantages:

- Custom designed (days/times/content flexible)
- Cost savings for larger groups
- Key employees still accessible
- Your machine specific documentation used as a reference
- Specific instructions on your machinery
- Older machines can be addressed (e.g. Repro, CC80, EC88/CC90)

You may design a customized course either by making selections from the various course topics outlined on the following pages, or the Engel Training Department can forward several suggested agendas that you can utilize or build on.

Take advantage of custom designed courses, or participate in a more structured program as laid out in the following pages.

Safety

This course is offered on a no-charge basis to assist our customers in operating Engel injection molding machines and automation systems in a safe manner. We will also review the ANSI safety standards for machines and robotics.

The course will include an overview and discussion of:

- mechanical safeties
- safe procedures for mold installation/removal
- safe start-up and shutdown procedures
- electrical/hydraulic safety
- safe working practices

Duration:	1 day
Fee:	Free
Location:	Guelph
Dates Offered:	Apr. 18 / Dec. 2

Basic Machine Functions

This course is the first in our suggested progression of Engel Training Seminars and is directed to those who are relatively new to the plastics industry.

When successfully completed, course graduates will be able to:

- identify major machine components of both the machine and the robotic system
- understand the nature and function of the machine and robotic safety devices
- understand the main operational screen pages of both machine and robot
- understand the design and function of a general purpose screw
- understand the basic nature of thermoplastic and thermoset molding materials
- manually operate a machine and robot and set both into a dry cycle mode of operation
- understand basic errors and how to eliminate them.

Duration:	3 days
Fee:	\$860
Location:	Guelph
Dates Offered:	Feb. 15-17 / April 19-21 / June 21-23 / Aug. 30-Sept. 1 / Nov. 8-10

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Controller/Processing

This course is designed for those whose job involves molding quality plastic parts with an Engel molding machine. The course is structured to impart the knowledge required to successfully operate the machine in a basic manner and to effectively employ some of the more advanced controller programs.

When successfully completed, course graduates will be able to:

- understand the details of the general machine cycle
- set the clamping unit, including mold protection
- set the ejector and core functions
- set injection unit and heats
- set the injection and plasticizing functions
- eliminate primary error messages
- dry cycle the machine
- employ the printer and diskette function
- set up the machine to run plastic parts
- set up and employ the Process Data/Graphics programs
- set up and employ the Micrograph/Microplast/Microflow programs
- set up and employ the Quality Data Statistics program
- set up the Autoprotect mold protection program
- set up the programmable core function
- set up the Weekly Timer program
- troubleshoot molding problems

Duration: 3 days
Fee: \$860

Location: Guelph
Dates Offered: Jan. 11–13 / Feb. 1–3 / Mar. 15–17 /
Apr. 12–14 / May 10–12 / June 14–16
July 19–21 / Sept. 20–22 / Oct. 12–14
Nov. 29–Dec. 1 / Dec. 20–22

Location: Chicago
Dates Offered: May 3–5 / Oct. 4–6

Location: Santa Ana
Dates Offered: Mar. 21–23 / June 27–29 / Sept. 26–28

Quality Assurance – 2 days (\$600)

This course is designed for people whose job involves molding quality plastic parts with an Engel molding machine and for maintaining that quality through the use of various quality programs installed within the machine. The course is structured to impart the knowledge required to successfully set up and operate the quality programs to provide statistical and/or process monitoring information for internal or Customer required data purposes.

When successfully completed, course graduates will be able to:

- set up and employ the Process Data Report program
- set up and employ the Statistics Monitoring program
- set up and employ the Process Data Graphics program
- set up and employ the Micrograph Plus program
- set up and employ the Microplast program
- set up and employ the Microflow program
- set up and employ the Quality Data Statistics program
- realize the effect that machine calibrations have on processing parameters
- optimize temperature control parameters (PID optimization)

Duration: 2 days
Fee: \$600
Location: Guelph
Dates Offered: March 8–9 Aug. 23–24

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CC200 Controls/Maintenance – 4 days (\$1000)

This course is designed for people whose job involves molding quality plastic parts with an Engel CC200 molding machine and for those who troubleshoot and/or maintain the machine. The course is structured to impart the knowledge required to successfully operate the machine in a basic manner and to minimize machine downtime. We will also discuss and demonstrate how to effectively employ some of the more advanced controller programs.

When successfully completed, course graduates will be able to:

- understand the main differences between the CC200 and CC100 controls
- install and work with the Virtual machine
- identify and understand the screen symbols
- employ the help screens to access machine documentation
- employ the error screens (1-7) to troubleshoot minor machine problems
- input data using Quick Setting (graphical) or Profiling (numerical) methods
- employ the Data Dialog Function (read/write mold set-ups)
- set up and employ the Quality and Monitoring programs
- set up and employ the Sequence Editors
- understand the function and purpose of the various hardware components
- identify machine electric/hydraulic components through schematics and to relate that to the operation of the machine
- examine digital inputs/outputs, analog inputs/outputs from the service level screens
- access and understand machine variables (parameters)
- complete a machine calibration procedure including strokes, speeds and pressures (EHV pump)
- troubleshoot instructor induced controls/electrical problems

Duration:	4 days
Fee:	\$1000
Location:	Guelph
Dates Offered:	Aug. 16–19 Oct. 18–21

Maintenance

This course is designed for those whose job involves troubleshooting and/or maintaining the Engel molding machine. The course is structured to impart the knowledge required to successfully minimize machine downtime.

When successfully completed, course graduates will be able to:

- identify machine electric/hydraulic components through schematics and to relate that to the operation of the machine
- troubleshoot the machine using machine, system, or EBIAS error messages
- determine System Errors when the screen is blacked out
- load the machine Ebias software
- use simple electric troubleshooting tools
- understand the main operator screen pages and functions
- examine digital inputs/outputs, analog inputs/outputs from the service level screens
- employ all aspects of the System Data Report program to troubleshoot operator caused errors
- conduct a scheduled preventive maintenance review
- troubleshoot instructor induced electrical problems
- complete a machine calibration procedure including strokes, speeds, pressure and the new EHV pump (smart pump)
- complete a heat PID calibration
- change electronic control cards

Duration:	3 days
Fee:	\$860
Location:	Guelph
Dates Offered:	Jan. 25–27 / Mar. 29–31 / May 25–27 / Aug. 3–5 / Sept. 13–15 / Dec. 13–15
Location:	Chicago
Dates Offered:	Apr. 26–28 / Aug. 23–25
Location:	Santa Ana
Dates Offered:	Mar. 16–18 / June 22–24 / Sept. 21–23
Location:	York (Large Machines)
Dates Offered:	May 17–19 / Oct. 4–6

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ERC Programming/Maintenance

This course is designed for people whose job function includes setting up and programming the Engel robot as well as for those whose job function includes troubleshooting and/or maintaining the Engel ERC handling system.

When successfully completed, course graduates will be able to:

- understand the various components of the ERC handling system
- understand the various safety gate packages available
- understand the Workroom Supervision Program and relevant errors
- manipulate the ERC using the hand held control unit
- auto reference and home the robot
- create a Teach Home Run
- program the ERC to employ any standard programs
- program the ERC to employ the Teach program and its components
- understand the mechanical and electronic structure of the ERC control system
- troubleshoot digital inputs/outputs using the system computer
- relate the electric schematic package to the ERC controls and main electrical panel (North American & Austrian schematics)
- troubleshoot a variety of instructor induced electrical and program problems
- create custom waiting points and error messages
- troubleshoot the pneumatic system
- troubleshoot the lubrication system
- calibrate and adjust the zero point offset of any axis to compensate for motor or belt change

Duration:	3 days
Fee:	\$860
Location:	Guelph
Dates Offered:	Jan. 18–20 / Mar. 1–3 / May 17–19 July 26–28 / Sept. 27–29 / Dec. 6–8

Engel E-MOTION Machines

This course is intended for E-MOTION machine Operators and Maintenance staff. Current Engel Machine Operators will benefit from the similarities between the CC100 E-MOTION controls and the CC100 machine controls employed on hydraulically powered machines. This course will include a complete overview of E-MOTION design and structure as well as extensive coverage of the electric servo drive system of all major machine functions. Calibration issues and troubleshooting procedures will also be addressed.

When successfully completed, course graduates will have had exposure to:

- the structure and design of the E-MOTION machine
- molding with an E-MOTION machine
- other Quality Control and Monitoring programs
- the E-MOTION electric system
- E-MOTION troubleshooting procedures
- normal machine calibrations

Duration:	3 days
Fee:	\$860
Location:	Guelph
Dates Offered:	Sept. 7–9

Engel ELAST/LIM Machines

This course is designed for those whose primary function is to set up and operate an ELAST or LIM molding machine. We employ state-of-the-art molding machinery for hands-on practice and demonstration purposes.

When successfully completed, course graduates will have had exposure to:

- an overview of the ELAST and LIM molding processes
- a review of the ELAST and LIM machine main components
- band feeder set-up procedures
- the main controller screen pages and functions
- the heat time calculation program (HR-Soft)
- compression/injection transfer procedures
- ELAST and LIM processing troubleshooting
- other special programs such as QDS, Micrograph Plus, PD Report/Graphics, etc

Duration:	3 days
Fee:	\$860
Location:	Guelph
Dates Offered:	July. 12–14

Engel INSERT Machines

This course is designed for people whose job involves molding quality plastic parts with an Engel INSERT molding machine and for those who troubleshoot and/or maintain the machine. The course is structured to impart the knowledge required to successfully operate the machine in a basic manner and to minimize machine downtime. We will also discuss and demonstrate how to effectively employ some of the more advanced controller programs.

When successfully completed, course graduates will be able to:

- understand the details of the general Engel INSERT machine cycle
- set the rotary table and clamping unit, including mold protection
- set the ejector and core functions (programmable)
- set injection unit, heats and complete a heat PID calibration
- set the injection and plasticizing functions
- employ the printer and diskette function
- set up the machine to run plastic parts
- set up and employ the Process Data/Graphics programs
- set up and employ the Micrograph/Microplast/Microflow programs
- set up the Autoprotect mold protection program
- identify machine electric/hydraulic components through schematics and to relate that to the operation of the machine
- employ all aspects of the System Data Report program to troubleshoot operator caused errors
- troubleshoot the machine using machine, system, or EBIAS error messages
- load the machine Ebias software
- examine digital inputs/outputs, analog inputs/outputs from the service level screens
- conduct a scheduled preventive maintenance review
- troubleshoot instructor induced electrical problems
- complete a machine calibration procedure including strokes, speeds and pressures

Duration:	4 days
Fee:	\$1000
Location:	Guelph
Dates Offered:	Apr. 26–29 / Oct. 25–28

Controller/Processing		
Guelph	Jan. 11–13 Mar. 15–17 May 10–12 July 19–21 Oct. 12–14 Dec. 20–22	Feb. 1–3 Apr. 12–14 June 14–16 Sept. 20–22 Nov. 29–Dec. 1
Santa Ana	Mar. 21–23 Sept. 26–28	June 27–29
Chicago	May 3–5	Oct. 4–6
CC200 Controls/Maintenance		
Guelph	Aug. 16–19	Oct. 18–21
Quality Assurance		
Guelph	March 8–9	Aug. 23–24
Maintenance		
Guelph	Jan. 25–27 May 25–27 Sept. 13–15	Mar. 29–31 Aug. 3–5 Dec. 13–15
Santa Ana	Mar. 16–18 Sept. 21–23	June 22–24
Chicago	April 26–28	Aug. 23–25
Maintenance (large machines)		
York	May 17–19	Oct. 4–6
ERC Programming/Maintenance		
Guelph	Jan. 18–20 May 17–19 Sept. 27–29	Mar. 1–3 July 26–28 Dec. 6–8
Basic Machine Functions		
Guelph	Feb. 15–17 June 21–23 Nov. 8–10	April 19–21 Aug. 30–Sept. 1
Safety		
Guelph	April 18	Dec. 2
Engel E-MOTION Machines		
Guelph	Sept. 7–9	
Engel ELAST/LIM Machines		
Guelph	July 12–14	
Engel INSERT Machines		
Guelph	Apr. 26–29	Oct. 25–28

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Special Notes

To Register

To register, or for further information, please call the Engel Training Department at 519.836.7783 ext. 2342, fax your request to 519.826.4610, or e-mail to training@engel-ec.com.

We request that a purchase order accompany all course registrations.

Course Times

Most of our seminars are scheduled between 8:30 a.m. and 4:30 p.m. each day.

Contact the Engel Training Department for an exact timetable.

Hotel Reservations & Directions

If hotel accommodation is required for any of our courses, we can send you a selection of moderately priced hotels located a short driving distance from the course location (Guelph, York, Santa Ana or Chicago). We can also send directions to the seminar of your choice with the course confirmation shortly before the course date.

Refreshments

Refreshments will be supplied throughout the course. In addition, all lunches will be provided in our company cafeteria.

Cancellations

We reserve the right to cancel any course up to one week before the due date. In this event, a full refund will be made for any fees paid in advance.

If you are unable to attend a course for which you are registered, please inform Engel at least ten working days prior to the course date. Otherwise, a 50% service charge will be applied to your account. Of course, you are free to nominate another person in your place, in which case no service charge will be applied.

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